SECTION 07 52 00

MODIFIED BITUMINOUS MEMBRANE ROOFING

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\*\* NOTE TO SPECIFIER \*\* Malarkey Roofing Products; commercial and residential roofing.
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This section is based on the products of Malarkey Roofing Products, which is located at:
3131 N. Columbia Blvd. P. O. Box 17217
Portland, OR 97217
Toll Free Tel: 800-545-1191
Tel: 503-283-1191
Fax: 503-289-7644
Email: [request info (jkouba@malarkeyroofing.com)](http://admin.arcat.com/users.pl?action=UserEmail&company=Malarkey+Roofing+Products&coid=33038&rep=&fax=503-289-7644&message=RE:%20Spec%20Question%20(07550mrp):%20%20&mf=)
Web: <https://malarkeyroofing.com>
 [ [Click Here](http://www.arcat.com/arcatcos/cos33/arc33038.html) ] for additional information.
Since 1956, Malarkey Roofing Products; has operated as a family owned, professionally managed, privately held company, headquartered in Portland, Oregon.
At Malarkey Roofing, we believe in creating long-term value for our customers and business partners. Our commitment challenges us to find and improve the ways we manufacture products to support our customer's needs. Striving for excellence propels our company to new heights in polymerization and the development of long lasting products.
Maintaining our commitment to dependable roofing products is the vital key to our future success. Malarkey Roofing Products; is not satisfied to rest on our past accomplishments and accolades. Our goal is to make products that improve people's lives and balance environmental and economic interests.

1. GENERAL
	1. SECTION INCLUDES
		1. Modified bitumen roofing system. Includes vapor retarder, insulation, and accessory products.
	2. RELATED SECTIONS

\*\* NOTE TO SPECIFIER \*\* Delete any sections below not relevant to this project; add others as required.

* + 1. Section 02 41 16 - Structure Demolition.
		2. Section 06 10 00 - Rough Carpentry.
		3. Section 07 62 00 - Sheet Metal Flashing and Trim.
		4. Section 22 30 00 - Plumbing Equipment.
	1. REFERENCES

\*\* NOTE TO SPECIFIER \*\* Delete references from the list below that are not actually required by the text of the edited section.

* + 1. American Society of Civil Engineers (ASCE): ASCE 7 - Minimum Design Loads for Buildings and Other Structures.
		2. ASTM International (ASTM):
			1. ASTM C208 - Standard Specification for Cellulosic Fiber Insulating Board.
			2. ASTM C728 - Standard Specification for Perlite Thermal Insulation Board.
			3. ASTM D312 - Standard Specification for Asphalt Used in Roofing.
			4. ASTM D1079 - Standard Terminology Relating to Roofing and Waterproofing.
			5. ASTM D1227 - Standard Specification for Emulsified Asphalt Used as a Protective Coating for Roofing.
			6. ASTM D1970 - Standard Specification for Self-Adhering Polymer Modified Bituminous Sheet Materials Used as Steep Slope Roofing Underlayment for Ice Dam Protection.
			7. ASTM D2178 - Standard Specification for Asphalt Glass Felt Used in Roofing and Waterproofing.
			8. ASTM D3909 - Standard Specification for Asphalt Roll Roofing (Glass Felt) Surfaced with Mineral Granules.
			9. ASTM D4479 - Standard Specification for Asphalt Roof Coatings Asbestos-Free.
			10. ASTM D4586 - Standard Specification for Asphalt Roof Cement, Asbestos-Free.
			11. ASTM D4601 - Standard Specification for Asphalt-Coated Glass Fiber Base Sheet Used in Roofing.
			12. ASTM D6152 - Standard Specifications for SEBS Modified Mopping Asphalt Used in Roofing.
			13. ASTM D6162 - Standard Specification for SBS Modified Bituminous Sheet Materials Using a Combination of Polyester and Glass Fiber Reinforcements.
			14. ASTM D6163 - Standard Specification for Styrene Butadiene Styrene (SBS) Modified Bituminous Sheet Materials Using Glass Fiber Reinforcements.
			15. ASTM D6164 - Standard Specification for Styrene Butadiene Styrene (SBS) Modified Bituminous Sheet Materials Using Polyester Reinforcements.
			16. ASTM D7505 - Standard Specification for Self-Adhesive Polyester Fabric Reinforced Polymer Modified Asphalt Steep Slope Roll Roofing Surfaced with Mineral Granules.
			17. ASTM D7530 - Standard Specification for Self-Adhesive Glass Fiber Fabric Reinforced Polymer Modified Asphalt Steep Slope Roll Roofing Surfaced with Mineral Granules.
			18. ASTM E108 - Standard Test Methods for Fire Tests of Roof Coverings.
		3. Factory Mutual Approvals: RoofNav Approval Guide.
		4. National Roofing Contractors Association (NRCA) - Roofing and Waterproofing Manual.
		5. Intertek Testing Services (ITS) - Fire Resistance Directory, Current Edition.
		6. Underwriters Laboratories (UL) - Certifications Directory, Current Edition.
	1. PERFORMANCE REQUIREMENTS

\*\* NOTE TO SPECIFIER \*\* Delete items not required.

* + 1. Roof Design: Comply with requirements of the following:
			1. Codes and Standards: Applicable at project location.
			2. ASCE 7: Minimum design loads.
			3. Fire Hazard Classification: ASTM E108, UL, or Intertek Fire Hazard Classification specified, Class A.
	1. DEFINITIONS
		1. Roofing Terminology: Refer to ASTM D1079 and glossary of NRCA's "The NRCA Roofing and Waterproofing Manual" for definition of terms related to roofing work in this Section.
		2. Hot Roofing Asphalt: Roofing asphalt heated to its equiviscous temperature (EVT), the temperature at which its viscosity is 125 centipoise for mop-applied roofing asphalt and 75 centipoise for mechanical spreader-applied roofing asphalt, within a range of plus or minus 25 degrees F (4 degrees C), measured at the mop cart or mechanical spreader immediately before application.
	2. PERFORMANCE REQUIREMENTS
		1. Material Compatibility: Provided roofing materials shall be compatible with one another under conditions of service and application required, as demonstrated by membrane roofing manufacturer based on testing and field experience.
	3. SUBMITTALS
		1. Submit under provisions of Section 01 30 00 - Administrative Requirements.
		2. 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.
		3. Shop Drawings: Include plans, sections, details of construction and relationship with adjacent construction, including flashings and copings. Include details of insulation, slope of tapered insulation as applicable, crickets, saddles, and insulation fastening pattern.
		4. Samples for Verification: For the following products:
			1. Sheet roofing materials, including base sheet, base/ply sheet, roofing membrane sheet, flashing backer sheet, membrane cap sheet, and flashing sheet, of color specified.
			2. Roof insulation.
			3. Six insulation fasteners of each type, length, and finish.
		5. Qualification Data: For qualified Installer. Letter from manufacturer stating the installer is approved to install the specified roofing system and obtain specified warranties.
		6. Maintenance Data: For roofing system, include in maintenance manuals.
		7. Warranties: Sample of special warranties.
	4. QUALITY ASSURANCE
		1. Manufacturer: Company specializing in manufacturing the products specified in this Section with minimum five years documented experience.
		2. Applicator: Company specializing in applying bituminous roofing with minimum five years documented experience and approved by materials manufacturer.
		3. Work of this Section shall conform to NRCA Roofing and Waterproofing Manual and manufacturer's instructions. It is the responsibility of the applicator to identify and resolve conflicts or disparities between NRCA requirements and manufacturer's requirements.
		4. Materials: Provide top quality materials of manufacturer, certified as to type and weight conformance with specifications.
		5. Source Limitations: Obtain components including roof insulation, cover board, asphalt, mastics, and coatings from same manufacturer as membrane roofing.
		6. Provide roof insulation materials bearing approval markings on the bundle, package or container, indicating materials have been produced under examination and follow-up service.
		7. For asphalt bitumen provide label on each container, indicating flash point (FP), finished blowing temperature (FBT), softening point (SP), equiviscous temperature (EVT) and type of asphalt.
		8. Contractor shall be responsible for coordinating pre-roofing conference at least one week prior to initiation of roofing work. Manufacturer representative, manufacturer, foreman for roofing contractor, estimator for roofing contractor, architect, owner representative, sheet metal contractor, general contractor, and other required parties shall be present to discuss execution of the Work.
	5. DELIVERY, STORAGE, AND HANDLING
		1. Deliver roofing materials to project site in original containers with seals unbroken and labeled with manufacturer's name, product brand name and type, date of manufacture, approval or listing agency markings, and directions for storing and mixing with other components.
		2. Store liquid materials in their original undamaged containers in a clean, dry, protected location and within the temperature range required by roofing system manufacturer. Protect stored liquid material from direct sunlight.
			1. Discard and legally dispose of liquid material that cannot be applied within its stated shelf life.
		3. Protect roof insulation materials from physical damage and deterioration by sunlight, moisture, soiling, and other sources. Store in a dry location. Comply with insulation manufacturer's published installation instructions for handling, storing, and protecting during installation.
		4. Handle and store roofing materials and place equipment in a manner to avoid permanent deflection of deck.
	6. PROJECT CONDITIONS
		1. 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.
		2. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit roofing system to be installed according to manufacturer's published installation instructions and warranty requirements.
	7. WARRANTY
		1. Manufacturer's Warranty: Manufacturer's standard or customized form, without monetary limitation, in which manufacturer agrees to repair or replace components of membrane roofing system that fail in materials or workmanship within specified warranty period. Warranty shall include membrane roofing, base flashings, roof insulation, cover boards, and other components of the membrane roofing system.

\*\* NOTE TO SPECIFIER \*\* Delete warranty lengths not required.

* + - 1. Warranty Period: 10 years from date of Substantial Completion.
			2. Warranty Period: 15 years from date of Substantial Completion.
			3. Warranty Period: 20 years from date of Substantial Completion.
			4. Warranty Period: 25 years from date of Substantial Completion.
			5. Warranty Period: 30 years from date of Substantial Completion.
		1. Installer's Warranty: Submit roofing Installer's warranty, covering the Work of this Section, including all components of membrane roofing system such as membrane roofing, base flashing, roof insulation, fasteners, cover boards, substrate boards, vapor retarders, and walkway products, for the following warranty period:
			1. Warranty Period: Two years from date of Substantial Completion.
1. PRODUCTS
	1. MANUFACTURERS
		1. Acceptable Manufacturer: Malarkey Roofing Products, which is located at: 3131 N. Columbia Blvd. P. O. Box 17217; Portland, OR 97217; Toll Free Tel: 800-545-1191; Tel: 503-283-1191; Fax: 503-289-7644; Email: [request info (jkouba@malarkeyroofing.com)](http://admin.arcat.com/users.pl?action=UserEmail&company=Malarkey+Roofing+Products&coid=33038&rep=&fax=503-289-7644&message=RE:%20Spec%20Question%20(07550mrp):%20%20&mf=); Web: <https://malarkeyroofing.com>

\*\* NOTE TO SPECIFIER \*\* Delete one of the following two paragraphs; coordinate with requirements of Division 1 section on product options and substitutions.

* + 1. Substitutions: Not permitted.
		2. Requests for substitutions will be considered in accordance with provisions of Section 01 60 00 - Product Requirements.
	1. SBS-MODIFIED ROOFING ASSEMBLY

\*\* NOTE TO SPECIFIER \*\* Delete items not required.

* + 1. System Design: Comply with requirements of the following:
			1. Codes and Standards: Applicable at project location.
			2. ASCE 7: Minimum design loads.
			3. Fire Hazard Classification: ASTM E108, UL, or Intertek Fire Hazard Classification specified, Class A.
		2. Substrate Board Over Decking: Gypsum core board with fiberglass mat facers.

\*\* NOTE TO SPECIFIER \*\* Delete types not required.

* + - 1. Thickness: 1/2 inch (13 mm).
			2. Thickness: 5/8 inch (16 mm).
			3. Primed: Manufacturer's standard shop-applied primer compatible with materials and adhesive.
		1. Vapor Retarder:

\*\* NOTE TO SPECIFIER \*\* Delete types not required.

* + - 1. Malarkey 515 Pano Base, ASTM D4601 Type II.
			2. Malarkey 501 Paragon MOD Base, ASTM D4601 Type II.
			3. Malarkey 500 Pano Ply 4, ASTM D2178 Type IV.
			4. Malarkey 506 Pano Ply 6, ASTM D2178 Type VI.
			5. Malarkey 401 Arctic Seal, ASTM D1970.
			6. Malarkey 610 Paragon ULTRA SA Base, ASTM D6163 Type I, S.
			7. Malarkey 620 Paragon ULTRA TG Base, ASTM D6163 Type I, S.
			8. Malarkey 420 OmniSeal Ply, ASTM D1970.
		1. Insulation:

\*\* NOTE TO SPECIFIER \*\* Delete types not required.

* + - 1. Type: Manufacturer's recommended reformed rigid polyisocyanurate board, ASTM C1289.
			2. Type: Non-tapered.
			3. Type: Tapered.
			4. Thickness: Refer to the Drawings.
			5. Thickness: To achieve an average R-value of \_\_\_\_.
		1. Cover Board Over Insulation:

\*\* NOTE TO SPECIFIER \*\* Delete types not required.

* + - 1. Type: Manufacturer's recommended high-density wood fiber, 1/2 inch (13 mm) thick, ASTM C208 Type II.
			2. Type: Gypsum core board with fiberglass mat faces, 1/4 inch (6 mm) thick, primed.
			3. Type: Gypsum core board with fiberglass mat faces, 1/4 inch (6 mm) thick, unprimed.
			4. Type: Gypsum core board with fiberglass mat faces, 1/2 inch (13 mm) thick, unprimed.
			5. Type: Gypsum core board with fiberglass mat faces, 1/2 inch (13 mm) thick, primed.
			6. Type: Gypsum core board with fiberglass mat faces, 5/8 inch (16 mm) thick, unprimed.
			7. Type: Gypsum core board with fiberglass mat faces, 5/8 inch (16 mm) thick, primed.
		1. Insulation Accessories: Cant strips, tapered edges, and as recommended by manufacturer.
		2. Sheet Materials:

\*\* NOTE TO SPECIFIER \*\* Delete types not required.

* + - 1. Malarkey 501 Paragon MOD Base, ASTM D4601 Type II, 90 lb (41 kg), 3 square roll.
			2. Malarkey 602 Paragon ULTRA Base, ASTM D6163 Type I, S, 90 lb (41 kg), 1.5 square roll.
			3. Malarkey 610 Paragon Ultra SA Base, ASTM D6163 Type I, S, 85 lb (39 kg), 1 square roll.
			4. Malarkey 620 Paragon ULTRA TG Base, ASTM D6163 Type I, S, 76 lb (34.5 kg),1 square roll.
			5. Malarkey 350 Paragon CHROMA Cap, ASTM D3909, CRRC Listed, 78 lb (35.4 kg), 1 square roll.
			6. Malarkey 601 Paragon MOD Cap, ASTM D3909, CRRC Listed, 100 lb (45 kg), 1 square roll.
			7. Malarkey 625 Paragon ULTRA Cap, ASTM D6163 Type I, G, CRRC Listed, 100 lb (45 kg), 1 square roll.
			8. Malarkey 630 Paragon ULTRA TG Cap, ASTM D6163 Type I, G, 107 lb (48.5 kg), 1 square roll.
			9. Malarkey 640 Paragon POLY Cap, ASTM D6164 Type I, G, 105 lb (48 kg), 1 square roll.
			10. Malarkey 524G RCap Plus Reflective Cap, ASTM D3909, CRRC Listed, CEC Title 24 Part 6 Cool Roof Requirements, 78 lb (35.4 kg), 1 square roll.
			11. Malarkey 626G Paragon RCap Reflective Cap, ASTM D3909, ASTM D6163 Type I, G, CRRC Listed, CEC Title 24 Part 6 Cool Roof Requirements, 100 lb (45.4 kg), 1 square roll.
			12. Malarkey 410 OmniSeal Base, ASTM D4601 Type II, 80 lb (36.3 kg), 2 square roll.
			13. Malarkey 420 OmniSeal Ply, ASTM D1970, ASTM D4601, ASTM D6163 Type I, 80 lb (36.3 kg), 2 square roll.
			14. Malarkey 430 OmniSeal Cap, ASTM D3909, ASTM D7530, 78 lb (35.4 kg), 1 square roll.
			15. Malarkey 435 OmniSeal Cap Plus, ASTM D3909, ASTM D6164, ASTM D7505, 90 lb (40.8 kg), 1 square roll.
			16. Malarkey 440 OmniSeal Poly Cap, ASTM D7505, 90 lb (40.8 kg), 1 square roll.
		1. Adhesives:

\*\* NOTE TO SPECIFIER \*\* Delete types not required.

* + - 1. ASTM D312 Asphalt No Smell, Type III.
			2. ASTM D312 Asphalt No Smell, Type IV.
			3. SEBS Asphalt meeting ASTM D6152.
			4. SBS Trowel Grade Adhesive, ASTM D4586.
			5. Modified Bitumen Adhesive, ASTM D3019 Type III, low VOC, cold process adhesive. Karnak 66 Spray Grade or ASTM D4479.
			6. Plastic Cement, ASTM D4586.
			7. Primer, ASTM D41.
			8. Insulation Adhesive, low rise foam adhesive, Millennium 1 step or PG1 by Royal Adhesives.
		1. Flashing Materials:

\*\* NOTE TO SPECIFIER \*\* Delete types not required.

* + - 1. Malarkey 501 Paragon MOD Base, ASTM D4601 Type II, 90 lb (41 kg), 3 square roll.
			2. Malarkey 602 Paragon ULTRA Base, ASTM D6163 Type I, S, 90 lb (41 kg), 1.5 square roll.
			3. Malarkey 610 Paragon Ultra SA Base, ASTM D6163 Type I, S, 85 lb (39 kg), 1 square roll.
			4. Malarkey 620 Paragon ULTRA TG Base, ASTM D6163 Type I, S, 76 lb (34.5 kg),1 square roll.
			5. Malarkey 350 Paragon CHROMA Cap, ASTM D3909, CRRC Listed, 78 lb (35.4 kg), 1 square roll.
			6. Malarkey 601 Paragon MOD Cap, ASTM D3909, CRRC Listed, 100 lb (45 kg), 1 square roll.
			7. Malarkey 625 Paragon ULTRA Cap, ASTM D6163 Type I, G, CRRC Listed, 100 lb (45 kg), 1 square roll.
			8. Malarkey 630 Paragon ULTRA TG Cap, ASTM D6163 Type I, G, 107 lb (48.5 kg), 1 square roll.
			9. Malarkey 640 Paragon POLY Cap, ASTM D6164 Type I, G, 105 lb (48 kg),1 square roll.
			10. Malarkey 524G RCap Plus Reflective Cap, ASTM D3909, CRRC Listed, CEC Title 24 Part 6 Cool Roof Requirements, 78 lb (35.4 kg), 1 square roll.
			11. Malarkey 626G Paragon RCap Reflective Cap, ASTM D3909, ASTM D6163 Type I, G, CRRC Listed, CEC Title 24 Part 6 Cool Roof Requirements, 100 lb (45.4 kg), 1 square roll.
			12. Malarkey 420 OmniSeal Ply, ASTM D1970, ASTM D4601, ASTM D6163 Type I, 80 lb (36.3 kg), 2 square roll.
			13. Malarkey 430 OmniSeal Cap, ASTM D3909, ASTM D7530, 78 lb (35.4 kg), 1 square roll.
			14. Malarkey 435 OmniSeal Cap Plus, ASTM D3909, ASTM D6164, ASTM D7505, 90 lb (40.8 kg), 1 square roll.
			15. Malarkey 440 OmniSeal Poly Cap, ASTM D7505, 90 lb (40.8 kg), 1 square roll.
			16. Malarkey EZ Seal, Poly Methyl Methacrylate (PMMA) Liquid Applied Membrane. Multi-component resin system.
		1. Mechanical Fasteners:

\*\* NOTE TO SPECIFIER \*\* Delete type not required.

* + - 1. FM approved fasteners for wood deck as specified, of sufficient length to provide sufficient penetration into deck, per requirements of Factory Mutual and acceptable to membrane manufacturer; nails with 1 inch (25 mm) diameter metal cap.
			2. Factory-coated steel fasteners and metal plates complying with corrosion-resistance provisions in FM Approvals 4470, designed for fastening roofing components to substrate, tested by manufacturer for required pullout strength, and acceptable to roofing system manufacturer.
		1. Walkway Pads:
			1. Malarkey 140 Recycled Rubber Walkboard Pad: Reconstituted rubber, textured, slip-resistant, manufactured as a rooftop walk pad for foot traffic and acceptable to roofing system manufacturer, 1/2 inch (13 mm) thick, minimum. Pad Size: 3 feet by 4 feet (0.9 m x 1.2 m).
			2. Malarkey 141 Recycled Rubber Walkboard Pad: Reconstituted rubber, textured, slip-resistant, manufactured as a rooftop walk pad for foot traffic, and acceptable to roofing system manufacturer, 3/8 inch (10 mm) thick. Pad size: 2.7 ft by 3 ft (0.8 m x 0.9 m).
1. EXECUTION
	1. EXAMINATION
		1. Verify surfaces and site conditions are ready to receive work. Verify deck is supported and secured. Concrete topping shall be properly cured before installation of asphalt primer and roofing system.
		2. Verify that roof openings, curbs, pipes, sleeves, ducts, and vents through roof are solidly set.
		3. Beginning of installation means installer accepts substrate.
	2. PROTECTION
		1. Protect building surfaces against damage from roofing work. Provide protection under kettles when damage to area is likely. Provide safety barriers and other protection devices as needed to protect property and people.
	3. PREPARATION
		1. Accurately lay out work surfaces for materials application. Verify acceptability of concrete topping for roofing. Position felts perpendicular to the incline starting at the low point of the roof.
		2. Install material to substrate as required to produce an even substrate that will maintain the required slope for drainage.
	4. GENERAL INSTALLATION
		1. Drains, penetrations, and terminations shall be installed in strict accordance with practices set forth in the NRCA Roofing Manual or manufacturer of membrane. Mechanical equipment requiring fastening shall be fastened with hex head screws with neoprene washers.
		2. Asphalt Bitumen Heating: Heat and apply bitumen in accordance with Equiviscous Temperature Method (EVT Method) as recommended by NRCA. Do not raise temperature above minimum normal finished blowing temperature necessary to attain EVT (25 degrees F or 4 degrees C) at point of application more than one hour prior to time of application. Discard bitumen which has been held at temperature exceeding Finished Blowing Temperature (FBT) for a period exceeding three hours. Determine flash point, FBT and EVT of bitumen, either by information from bitumen producer or by suitable tests, determine maximum fire-safe handling temperature, and do not exceed that temperature in heating bitumen; but in no case heat bitumen to a temperature higher than 25 degrees F (4 degrees C) below flash point. Inter-ply mopping of asphalt shall be a nominal 25 lbs. per 100 sq.ft. (11.3 kg per 9.3 sq.m).
		3. Cants: Provide cants at all intersections with vertical surfaces. Install in accurate lengths, cut to suit conditions; miter all corners and intersections.
		4. Cut-Offs: Provide cut-offs at end of each day's work, to cover exposed felts and insulation. Remove cut-offs before resuming work.
	5. SUBSTRATE BOARD APPLICATION
		1. Install substrate board with long joints continuous on the top flange of the flute on steel decks and end joint staggered a minimum of 24 inches (610 mm).
		2. Attach boards to substrate with screws and plates according to the wind uplift requirements.
	6. VAPOR RETARDER APPLICATION

\*\* NOTE TO SPECIFIER \*\* Delete substrate types not required.

* + 1. Non-Nailable Substrate: To the primed substrate apply two plies of specified ply sheet in continuous moppings of hot asphalt at the rate of 25 lbs. per 100 sq.ft. (11.3 kg per 9.3 sq.m).
		2. Non-Nailable Substrate: To the primed substrate apply one ply of specified torch-applied 620 membrane.
		3. Non-Nailable Substrate: To the primed substrate apply one ply of self-adhering 610, 401, or 420 membranes.
		4. Nailable Substrate:

\*\* NOTE TO SPECIFIER \*\* Delete nailable substrate types not required.

* + - 1. Mechanically attach one ply of SBS modified base sheet to the substrate and apply one ply of SBS modified base sheet in a continuous mopping of hot asphalt the rate of 25 lbs. per 100 sq.ft. (11.3 kg per 9.3 sq.m).
			2. Mechanically attach one ply of SBS modified base sheet to the substrate and apply one ply of specified ply sheet in continuous moppings of hot asphalt at the rate of 25 lbs. per 100 sq.ft. (11.3 kg per 9.3 sq.m).
			3. Mechanically attach one ply of SBS modified base sheet to the substrate and apply two plies of specified ply sheet in continuous moppings of hot asphalt at the rate of 25 lbs. per 100 sq.ft. (11.3 kg per 9.3 sq.m).
			4. Apply a layer of red rosin paper loose laid over the nailable substrate; mechanically attach one ply of standard asphalt base sheet to the substrate and apply one ply of specified ply sheet in continuous moppings of hot asphalt at the rate of 25 lbs. per 100 sq.ft. (11.3 kg per 9.3 sq.m).
			5. Apply a layer of red rosin paper loose laid over the nailable substrate; mechanically attach one ply of standard asphalt base sheet to the substrate and apply two plies of specified ply sheet in continuous moppings of hot asphalt at the rate of 25 lbs. per 100 sq.ft. (11.3 kg per 9.3 sq.m).
			6. Mechanically attach one ply of standard asphalt base sheet to the substrate and apply one ply of specified torch-applied base sheet.
	1. INSULATION APPLICATION, INSULATED ROOF ASSEMBLIES
		1. Install insulation with long joints of insulation in a continuous straight line with end joints staggered between rows, abutting edges and ends between boards. Fill gaps exceeding 1/4 inch (6 mm) with insulation. Cut and fit insulation within 1/4 inch (6 mm) of nailers, projections, and penetrations.
		2. Install insulation under area of roofing to achieve required thickness. Where overall insulation thickness is 2.7 inches (68 mm) or more, install two or more layers with joints of each succeeding layer staggered from joints of previous layer a minimum of 6 inches (152 mm) in each direction.

\*\* NOTE TO SPECIFIER \*\* Delete fastening/adhesive types not required.

* + 1. Mechanically Fastened and Adhered Insulation: Install first layer of insulation to deck using mechanical fasteners specifically designed and sized for fastening specified board-type roof insulation to deck type. Set each subsequent layer of insulation in a solid mopping of hot roofing asphalt applied within plus or minus 25 degrees F (14 degrees C) of equiviscous temperature.
		2. Fully Adhered Insulation: Set each layer of insulation in a solid mopping of hot roofing asphalt applied within plus or minus 25 degrees F (14 degrees C) of equiviscous temperature.
		3. Ribbon Strip Adhered Insulation: Set each layer of insulation in low rise foam adhesive. Adhesive bead spacing shall be:
			1. Adhesive Spacing at Corners (inches on center): \_\_\_\_\_.
			2. Adhesive Spacing at Perimeter (inches on center): \_\_\_\_\_.
			3. Adhesive Spacing at Field (inches on center): \_\_\_\_\_.
	1. COVER BOARD APPLICATION
		1. Install per manufacturer's instructions for asphalt adhesion, applying asphalt at rate of 25 lbs. per 100 sq.ft. (11.3 kg per 9.3 sq.m).
		2. Ribbon Strip Adhered Insulation: Set each layer of insulation in low rise foam adhesive. Adhesive bead spacing shall be:
			1. Adhesive Spacing at Corners (inches on center): \_\_\_\_\_.
			2. Adhesive Spacing at Perimeter (inches on center): \_\_\_\_\_.
			3. Adhesive Spacing at Field (inches on center): \_\_\_\_\_.
		3. Mechanically fasten through all layers of insulation and coverboard to the deck with screws and plates to meet wind up-lift design pressures.
		4. Cover board shall be installed tightly butted at the end and sides, all short directions staggered a minimum of 12 inches (305 mm).
	2. SBS MODIFIED MEMBRANE APPLICATION, GENERAL
		1. Install roofing membrane system according to roofing system manufacturer's published installation instructions and applicable recommendations in ARMA/NRCA's "Quality Control Guidelines for the Application of Polymer Modified Bitumen Roofing" and as follows:
			1. Base Sheet: One, installed over cover board or substrate as applicable.
			2. Number of Ply Sheets: \_\_\_\_\_\_\_\_\_.

\*\* NOTE TO SPECIFIER \*\* Delete type not required.

* + - 1. Surfacing Type: Mineral granule-surfaced cap sheet or reflective cap sheet.
			2. Surfacing Type: Aggregate.
		1. Where roof slope exceeds 1 inch per 12 inches (25 mm per 305 mm), install roofing membrane sheets parallel with slope (strapped installation) and back-nailed.
		2. Coordinate installation of roofing system so insulation and other components of the roofing membrane system not permanently exposed are not subjected to precipitation or left uncovered at the end of the workday or when rain is forecast.
			1. At end of each day's work, provide tie-offs to cover exposed roofing membrane sheets and insulation with a course of coated felt set in roofing cement or hot roofing asphalt, with joints and edges sealed.
			2. Complete terminations and base flashings and provide temporary seals to prevent water from entering completed sections of roofing system.
			3. Remove and discard temporary seals before beginning work on adjoining roofing.
	1. BASE SHEET INSTALLATION
		1. Install lapped base sheet course, extending sheet over and terminating beyond cants. Attach base sheet as follows:

\*\* NOTE TO SPECIFIER \*\* Delete type not required.

* + - 1. Adhere to substrate in a solid mopping of hot roofing asphalt.
			2. Adhere to substrate in a continuous void-free application of Modified Bitumen Adhesive at the rate of 1-1/2 to 2 gallons per 100 sq.ft. (5.7 L to 7.6 L per 9.3 sq.m) to form a uniform membrane without glass-fiber sheets touching.
			3. Mechanically attach according to manufacturer's published installation instructions.
			4. Torch-apply according to the manufacturer's published installation instructions.
			5. Adhere self-adhering sheet per manufacturer's published installation instructions.
	1. INTER-PLY SHEET INSTALLATION

\*\* NOTE TO SPECIFIER \*\* Delete type not required.

* + 1. Install inter-ply sheets according to roofing system manufacturer's published installation instructions starting at low point of roofing system. Align ply sheets without stretching. Extend sheets over and terminate beyond cants.
		2. At side laps of inter-ply sheets, install in shingle-lap fashion to ensure the required number of inter-ply sheets cover substrate at any point. Shingle in direction to shed water.
		3. Embed each inter-ply sheet in a continuous void-free mopping of hot roofing asphalt to form a uniform membrane without glass-fiber base/ply sheets touching.
		4. Embed each inter-ply sheet in a continuous void-free application of Modified Bitumen Adhesive at the rate of 1-1/2 to 2 gallons per 100 sq.ft. (5.7 L to 7.6 L per 9.3 sq.m) to form a uniform membrane without glass-fiber sheets touching.
		5. Torch-apply according to manufacturer's published installation instructions.
		6. Apply self-adhering inter-ply sheet(s) according to manufacturer's published installation instructions.
	1. SBS MODIFIED CAP SHEET MEMBRANE INSTALLATION

\*\* NOTE TO SPECIFIER \*\* Delete type not required

* + 1. Install bituminous roofing membrane cap sheet according to roofing manufacturer's published installation instructions, starting at low point of roofing system. Extend roofing membrane sheets over and terminate beyond cants, installing as follows:
			1. Adhere to substrate in a solid mopping of hot roofing asphalt applied at not less than 425 degrees F (218 degrees C).
			2. Adhere to substrate in a continuous void-free application of Modified Bitumen Adhesive at the rate of 1-1/2 to 2 gallons per 100 sq.ft. (5.7 L to 7.6 L per 9.3 sq.m) to form a uniform membrane without SBS Modified Membrane touching glass-fiber mid-ply / base sheets touching.
			3. Adhere to substrate with torch application.
			4. Adhere to substrate by application of self-adhering membranes. Roll to ensure adhesion.
			5. Unroll roofing membrane sheets and allow them to relax for minimum time period required by manufacturer.
		2. Laps: Accurately align roofing membrane sheets, without stretching, and maintain uniform side and end laps. Stagger end laps. Completely bond and seal laps, leaving no voids.
			1. Repair tears and voids in laps and lapped seams not completely sealed.
			2. Apply broadcast/finish roofing granules to cover exuded bead at laps while bead is hot.
		3. Install roofing membrane sheets so side and end laps shed water.
	1. BASE FLASHING INSTALLATION

\*\* NOTE TO SPECIFIER \*\* Delete type not required

* + 1. Install base flashing over transitions to vertical surfaces, at roof edges, and at penetrations through roof according to manufacturer's published installation instructions and as follows:
			1. Prime substrates with asphalt primer if required by built-up roofing manufacturer.
			2. Backer Sheet Application: Mechanically fasten backer sheet to walls or parapets. Adhere backer sheet over built-up roofing at cants and on non-nailable substrates in a solid mopping of hot roofing asphalt or modified flashing cement.

\*\* NOTE TO SPECIFIER \*\* Delete flashing sheet application options not required.

* + - 1. Flashing Sheet Application: Adhere flashing sheet to substrate in a solid mopping of hot roofing asphalt applied at not less than 425 degrees F (218 degrees C) or modified flashing cement. Apply adhesive to back of flashing sheet if recommended by roofing manufacturer.
			2. Flashing Sheet Application: Adhere flashing sheet to substrate with torch application.
			3. Flashing Sheet Application: Adhere flashing sheet to substrate with application of self-adhering membrane according to manufacturer's published installation instructions. Roll to ensure adhesion.
		1. Extend base flashing up walls or parapets a minimum of 8 inches (203 mm) above built-up roofing and 4 inches (102 mm) onto field of built-up roofing.
		2. Mechanically fasten top of base flashing securely at terminations and perimeter of roofing. Seal top termination of base flashing with a strip of glass-fiber fabric set in asphalt roofing cement.
		3. Roof Drains: Set 30-by-30-inch (762 mm x 762 mm) metal flashing in bed of asphalt roofing cement on completed built-up roofing. Cover metal flashing with built-up roofing cap sheet stripping and extend a minimum of 6 inches (152 mm) beyond edge of metal flashing onto field of built-up roofing. Clamp built-up roofing, metal flashing, and stripping into roof drain clamping ring. Install stripping according to roofing manufacturer's published installation instructions.
		4. Apply EZ Seal PMMA Liquid Applied Membrane where indicated on the project drawing or as noted in these specifications.

END OF SECTION