SECTION 07 52 00

 MODIFIED BITUMINOUS MEMBRANE ROOFING

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\*\* NOTE TO SPECIFIER \*\* DERBIGUM Americas, Inc.; Modified Bituminous Membrane Roofing.

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 This section is based on the products of DERBIGUM Americas, Inc., which is located at:
 4800 Blue Parkway.
 Kansas City, MO 64130.

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 DERBIGUM Americas, Inc. made its introduction to the United States roofing market in 1979 when a group of roofing contractors-turned-investors purchased the marketing and manufacturing rights to DERBIGUM in North America. Known then as DERBIGUM America Corporation, DERBIGUM offered American building owners a durable alternative to failing built-up roofs and flimsy EPDM and PVC single ply membranes. Its success and acceptance was immediate.

Today, DERBIGUM is an undisputed industry leader. With 350 employees worldwide, the company is present across the United States, Europe, Africa and Asia. Three production sites - two in Belgium and one in the US - turn out over 161 million square feet of DERBIGUM membranes and 77 million lbs of liquid products annually.

See our SpecWizard: [Click Here](http://www.arcat.com/specwizard/07550per/index.htm)

1. GENERAL
	1. SECTION INCLUDES

\*\* NOTE TO SPECIFIER \*\* Delete items below not required for project.

* + 1. Modified Bituminous Roof Systems.
		2. Roof Insulation.
		3. Roof Flashings.
		4. Roof Accessories.
	1. RELATED SECTIONS

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

* + 1. Section 32 90 00 - Planting.
		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. ASTM C 726 - Standard Specification for Glass Fiber/Mineral Fiber Roof Insulation Board
		2. ASTM C 728 - Standard Specification for Perlite Thermal Insulation Board.
		3. ASTM C 1289 - Standard Specification for Faced Rigid Cellular Polyisocyanurate Thermal Insulation Board.
		4. ASTM C 1549 - Standard Test Method for Determination of Solar Reflectance Near Ambient Temperature Using a Portable Solar.
		5. ASTM D 41 - Standard Specification for Asphalt Primer Used in Roofing, Dampproofing and Waterproofing.
		6. ASTM D 312 - Standard Specification for Asphalt Used in Roofing.
		7. ASTM D 3960-92: VOC emissions of asphalt based, cold adhesives.
		8. ASTM D 4586 - Standard Specification for Asphalt Roof Cement, Asbestos-Free.
		9. ASTM D 4601 - Standard Specification for Asphalt-Coated Glass Fiber Base Sheet Used in Roofing.
		10. ASTM D 5147 - Standard Test Method for Sampling and Testing Modified Bituminous Sheet Materials.
		11. ASTM D 6223: Standard specifications for APP modified bitumen sheet materials using a combination of polyester and fiberglass reinforcements.
		12. ASTM D 6509 - Standard Specification for Atactic Polypropylene (APP) Modified Bituminous Base Sheet Materials Using Glass Fiber Reinforcements.
		13. ASTM E 408 - Standard Test Methods for Total Normal Emittance of Surfaces Using Inspection-Meter Techniques.
		14. AAMA 2605 - Voluntary Specification, Performance Requirements and Test Procedures for Superior Performing Organic Coatings on Aluminum Extrusions and Panels.
		15. ASCE 7 - Minimum Design Loads for Buildings and Other Structures.
		16. Factory Mutual Standard 4470 - Approval Standard for Class 1 Roof Covers.
		17. Federal Specification # HH-I-1972 - Faced polyisocyanurate roof insulation board.
		18. Membrane Immersion Test - Modified Bitumen Membrane Asphaltic Impregnation Evaluation, as published in the "Proceedings of the Fourth International Symposium on Roofing Technology".
		19. NRCA - Low Slope Roofing and Waterproofing Manual.
		20. NBS-BSS #55 - Tensile strength for fully adhered, asphalt based roof systems.
		21. SMACNA - Architectural Sheet Metal Manual.
		22. Underwriters Laboratories - Roofing Systems and Materials Guide (TGFU).
	1. DEFINITIONS
		1. Roofing Terminology: Refer to ASTM D1079 and the glossary of the National Roofing Contractors Association (NRCA) Roofing and Waterproofing Manual for definitions of roofing terms related to this section.
	2. DESIGN / PERFORMANCE REQUIREMENTS
		1. Provide an installed roofing membrane and base flashing system that does not permit the passage of water, and will withstand the design pressures calculated in accordance with the most current revision of ASCE 7.
		2. Perform work in accordance with all federal, state and local codes.
		3. Exterior Fire Test Exposure: Provide a roofing system achieving a UL Class rating for roof slopes indicated on the Drawings.

\*\* NOTE TO SPECIFIER \*\* Delete roof class rating not required.

* + - 1. UL Class A rating.
			2. UL Class B rating.
			3. UL Class C rating.

\*\* NOTE TO SPECIFIER \*\* Retain the next paragraph if wind calculations are to be based on ASCE-7.

* + 1. Windstorm Classification: Provide a roofing system which will achieve the required uplift resistance as calculated in accordance with the most current revision of ASCE 7 or as listed in the current FM Approval Guide.

\*\* NOTE TO SPECIFIER \*\* Delete roof wind uplift rating not required where recovering an existing roof.

* + - 1. 60 psf of uplift resistance.
			2. 75 psf of uplift resistance.
			3. 90 psf of uplift resistance.
			4. 105 psf of uplift resistance.

\*\* NOTE TO SPECIFIER \*\* Retain the next paragraph if wind calculations are to be based on FM ratings.

* + 1. FM Rating: Provide a roofing system which will achieve the following rating as listed in the current FM Approval Guide.
			1. FM 1-60.
			2. FM 1-90.
			3. FM 1-105.
			4. FM 1-120.
			5. FM 1-135.
			6. FM 1-205.
			7. FM 1-270.
			8. FM 1-300.
			9. FM 1-\_\_\_

\*\* NOTE TO SPECIFIER \*\* Retain the next two paragraphs only if Derbibrite or DerbiSolar is specified.

* + 1. Energy Star: Roof System shall comply with the initial and aged reflectivity required by the U.S. Federal Government's Energy Star program.
		2. LEED: Roof system shall meet the reflectivity and emissivity criteria to qualify for one (1) point under the LEED credit category, Credit 7.2, Landscape & Exterior Design to Reduce Heat Island - Roof.

\*\* NOTE TO SPECIFIER \*\* Retain the next paragraph only if DerbiGreen Vegatative Roofing System is specified.

* + 1. LEED: Roof system shall meet the reflectivity and emissivity criteria to qualify for one (1) point under the LEED credit category, Credit 7.2, Landscape & Exterior Design to Reduce Heat Island - Roof.
	1. SUBMITTALS
		1. Submit under provisions of Section 01300.
		2. Product Data: Manufacturer's data sheets on each product to be used, including:
			1. Manufacturer's published specifications, base flashing details, and installation instructions for the specified system.
			2. Submit Material Safety Data Sheets on all roofing materials to be used.
		3. Shop Drawings: Provide plan, section, elevation and perspective drawings as necessary to depict all flashing and project conditions on the project, including but not limited to the following:
			1. Roof system and base flashing configuration.
			2. Penetration details.
			3. Termination details.
			4. Fastening patterns.
			5. Tapered insulation design.
		4. Verification Samples: For each finish product specified, two samples, minimum size 6 inches (150 mm) square, representing actual product, and color.
		5. Manufacturer's Certificates: Certify products meet or exceed specified requirements.
		6. Closeout Submittals: Provide an executed copy of the manufacturer's warranty outlining its terms, conditions, and exclusions from coverage.
	2. QUALITY ASSURANCE
		1. Manufacturer Qualifications: All primary products specified in this section shall be supplied by a single manufacturer with a minimum of 10 years experience.
			1. ISO 9000 Certification: Manufacturer must provide documentation showing current ISO 9001:2000 certification for the specific manufacturing plant where the modified bitumen membrane products specified are produced.
			2. ISO 14000 Certification: Manufacturer must provide documentation showing current ISO 14001:1996 certification for the specific manufacturing plant where the modified bitumen membrane specified products are produced.
		2. Installer Qualifications: A single installer, approved by the roof system manufacturer, with a minimum of 3 years documented experience in installing products of the same type and scope as specified.
		3. Organize a pre-installation conference held approximately two weeks prior to commencing Work specified. Representatives of the Owner, Architect, roofing contractor, installer, and roofing systems manufacturer must be present.
			1. Review installation procedures, materials to be used, submittals, schedules, and all related work required under this section. Finalize schedule and confirm availability of materials, equipment, installer's personnel, and facilities needed to complete work as planned.
			2. Review anticipated weather conditions and procedures for coping with unfavorable conditions, and maintaining the water tightness of the roof system.
			3. Tour roofing areas, inspect and discuss condition of substrate, roof drains, penetrations, curbs, and any work performed by other trades.
			4. Review structural loading limitations of deck and inspect deck for acceptability as roof substrate.
			5. Review inspection and quality control procedures to be used.
			6. Record discussions of conference, including decisions and agreements reached. Furnish copy of record to each party attending. If disagreements exist at the conclusion of the conference, determine how disagreements will be resolved, and set a date for reconvening conference.

\*\* NOTE TO SPECIFIER \*\* Include the following paragraph for reroofing projects. Delete if not required.

* + 1. Moisture Survey: Installer shall complete a moisture survey to identify areas of the existing roof system that are wet. Provide the manufacturer and Architect with a roof plan showing the locations and size of wet areas that are to be removed.
		2. Roofing systems manufacturer shall provide qualified company personnel to attend pre-construction and in-progress meetings, and to perform periodic job site visits as necessary. Manufacturer shall also provide field inspectors to perform regular in-progress and final quality assurance inspections. Provide copies of the manufacturer's field auditor inspection report to the Architect and Owner.
	1. DELIVERY, STORAGE, AND HANDLING
		1. Store products in manufacturer's unopened packaging until ready for installation.
		2. Store pail goods in their original undamaged containers in a clean, dry location within their specified temperature range.
		3. Store roll goods on end on pallets in a clean, dry, protected area. Do not double stack modified bitumen products.
		4. Store and dispose of hazardous materials, and materials contaminated by hazardous materials, in accordance with requirements of local authorities having jurisdiction.
	2. 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.
	3. WARRANTY
		1. Provide manufacturer's roof system guaranty with single source coverage and no monetary limitation (NDL) where the manufacturer agrees to repair or replace components in the roofing system, which cause a leak due to a failure in materials or workmanship.

\*\* NOTE TO SPECIFIER \*\* Select one of the following guaranty duration paragraph and delete those not required.

* + - 1. Duration: Ten years from the date of substantial completion.
			2. Duration: Fifteen years from the date of substantial completion.
			3. Duration: Twenty years from the date of substantial completion.
1. PRODUCTS
	1. MANUFACTURERS
		1. Acceptable Manufacturer: DERBIGUM Americas, Inc., which is located at: 4800 Blue Pkwy.; Kansas City, MO 64130; Toll Free Tel: 800-727-9872; Tel: 816-921-0221; Fax: 816-924-1542; Email: elizabeth@derbigum.us; Web: [www.derbigum.us](http://www.derbigum.us)

\*\* 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.
	1. SCOPE / APPLICATION

\*\* NOTE TO SPECIFIER \*\* Insert Performance roof specification. The performance roof specification can be found in the most current version of the Derbigum Specifications and Details Guide.

* + 1. Install Performance roof specification:\_ \_ \_ \_-\_ \_

\*\* NOTE TO SPECIFIER \*\* Retain the next paragraph if a non-insulated new construction application is present on the project.

* + 1. Where located on the Drawings, install a new roof system consisting of a multiple ply modified bitumen membrane system installed in cold adhesive or by heat welding, with new sheet metal flashing and trim.

\*\* NOTE TO SPECIFIER \*\* Retain the next paragraph if insulated new construction applications are present on the project.

* + 1. Where located on the Drawings, install a new roof system consisting of new rigid roof insulation, a multiple ply modified bitumen membrane system installed in cold adhesive, and new sheet metal flashing & trim.

\*\* NOTE TO SPECIFIER \*\* Retain the next paragraph if insulated roof replacement applications are present on the project.

* + 1. Where located on the Drawings, remove and properly dispose of the existing roof membrane, base flashings, roof insulation, and sheet metal flashing and trim. Install a new roof system consisting of new rigid roof insulation, a multiple ply modified bitumen membrane system installed in cold adhesive, and new sheet metal flashing & trim.

\*\* NOTE TO SPECIFIER \*\* Retain the next paragraph if roof re-cover applications are present on the project.

* + 1. Where located on the Drawings, remove and properly dispose of the existing base flashings, and sheet metal flashing and trim. Prepare the existing smooth BUR to act as a substrate for the recover membrane. The new roof system shall consist of a new modified bitumen membrane system installed in cold adhesive or by heat welding, with new sheet metal flashing and trim.

\*\* NOTE TO SPECIFIER \*\* Retain the next paragraph if roof DERBIGREEN Vegetative Roofing System applications are present on the project.

* + 1. Where located on the Contract Drawings, install a new roof system as specified above suitable for use with the specified DERBIGREEN Vegetative Roofing System.

\*\* NOTE TO SPECIFIER \*\* Delete the next article if insulation is not required or is specified elsewhere. Retain only insulation types required on the project.

* 1. INSULATION AND SUBSTRATE MATERIALS
		1. Derbiboard: Rigid polyisocyanurate board with a glass fiber facer. Meets or exceeds the requirements of ASTM C 1289 and Fed. Spec. # HH-I-1972.

\*\* NOTE TO SPECIFIER \*\* Insert insulation thickness and thermal value in the next two paragraphs.

* + - 1. Minimum Thickness: \_\_\_\_\_.
			2. Average Thermal Resistance (LTTR value): \_\_\_\_\_.

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

* + 1. Derbiboard CA: Rigid polyisocyanurate board with a glass fiber facer. Meets or exceeds the requirements of ASTM C 1289 and Fed. Spec. # HH-I-1972.

\*\* NOTE TO SPECIFIER \*\* Insert insulation thickness and thermal value in the next two paragraphs.

* + - 1. Minimum Thickness: \_\_\_\_\_.
			2. Average Thermal Resistance (LTTR value): \_\_\_\_\_.
		1. Dens-Deck Prime: Gypsum cover board with a primed glass fiber facer.

\*\* NOTE TO SPECIFIER \*\* Select board thickness. Delete three of the next four paragraphs.

* + - 1. Thickness: 1/4 inch (6mm).
			2. Thickness: 3/8 inch (10mm).
			3. Thickness: 1/2 inch (13mm).
			4. Thickness: 5/8 inch (16mm).

\*\* NOTE TO SPECIFIER \*\* Select board size. Delete one of the next two paragraphs.

* + - 1. Dimensions: 48 inch by 96 inch (1219mm x 2438mm).
			2. Dimensions: 48 inch by 48 inch (1219 mm x 1219mm).
		1. Securock: Fiber reinforced cementitious roof board.

\*\* NOTE TO SPECIFIER \*\* Select board thickness. Delete three of the next four paragraphs.

* + - 1. Thickness: 1/4 inch (6mm).
			2. Thickness: 3/8 inch (10mm).
			3. Thickness: 1/2 inch (13mm).
			4. Thickness: 5/8 inch (16mm).

\*\* NOTE TO SPECIFIER \*\* Select board size. Delete one of the next two paragraphs.

* + - 1. Dimensions: 48 inch by 96 inch (1219 mm by 2438 mm).
			2. Dimensions: 48 inch by 48 inch (1219 mm by 1219 mm).
		1. Perlite Insulation: Expanded perlite board meeting or exceeding the requirements of Fed. Spec. HH-I-529b and ASTM C 728.
			1. Maximum board size: 48 inches by 48 inches (1219 mm by 1219 mm).
			2. Board Density: 9 lb/cf (144 kg/cm) minimum.

\*\* NOTE TO SPECIFIER \*\* Select board thickness. Delete one of the next two paragraphs.

* + - 1. Board Thickness: 1/2 inch (13mm).
			2. Board Thickness: 3/4 inch (19mm).
		1. Wood Fiber Insulation: Overlayment board made of cellulose fiber meeting or exceeding the requirements of Fed. Spec, LLL-I-535, Class C, ANSI/ASTM C 208.
			1. Board Thickness: 1/2 inch (13 mm).
		2. Derbicant Strip: Atactic Polypropylene (APP) cant strip cut at angles to provide a 45 degree angle between horizontal and vertical surfaces.
		3. Perlite Tapered Edge Strip: Tapered expanded perlite edge strips meeting or exceeding the requirements of Fed. Spec. HH-I-529b and ASTM C 728.
		4. Fiberglass Insulation: Fiberglass roof insulation meeting or exceeding the requirements ASTM C 726. Inorganic glass fibers bound by a resinous binder, manufactured in rigid board form and top surfaced with an asphalt adhered kraft cover to provide an impact resistant surface for the roofing membrane.
			1. Maximum board size: 48 inches by 48 inches (1219 mm by 1219 mm).

\*\* NOTE TO SPECIFIER \*\* Insert insulation thickness and thermal value in the next two paragraphs.

* + - 1. Minimum Thickness: \_\_\_\_\_.
			2. Average Thermal Resistance (LTTR value): \_\_\_\_\_.
	1. BASE AND PLY SHEETS
		1. Derbibase: Smooth, fiberglass reinforced, Atactic Polypropylene (APP) base ply. Waterproof when side and end laps are welded.
			1. Thickness: 80 mils (2mm).
			2. Tensile Strength at 77 degrees F (MD/XD): 150 lbf / 150 lbf.
		2. Derbibase Ultra: Smooth, fiberglass reinforced, Atactic Polypropylene (APP) base ply. Waterproof when side and end laps are welded.
			1. Thickness: 120 mils (3mm).
			2. Tensile Strength at 77 degrees F (MD/XD): 150 lbf / 150 lbf.
		3. PRS Modified Base Sheet: ASTM D 4601 Type II Smooth, fiberglass reinforced, Styrene Butadine Styrene (SBS) base ply.
			1. Thickness: 45 mils (mm).
			2. Tensile Strength at 77 degrees F (MD/XD): 65 lbf / 65 lbf.
		4. PRS Glass Base: ASTM D 4601 Type II, UL G2 oxidized asphalt fiberglass base sheet.
			1. Tensile Strength at 77 degrees F (MD/XD): 63 lbf / 63 lbf.
		5. PRS Glass Ply IV: ASTM D 2178 Type IV/ UL G1 fiberglass ply sheet.
			1. Tensile Strength at 77 degrees F (MD/XD): 53 lbf / 48 lbf.
		6. PRS Glass Ply VI: ASTM D 2178 Type VI/ UL G1 fiberglass ply sheet.
			1. Tensile Strength at 77 degrees F (MD/XD): 73 lbf / 68 lbf.
		7. PRS Vented Base: ASTM D 4897 Type II / UL G2 asphalt coated fiberglass venting base sheet with mineral granules embedded on the underside.
			1. Tensile Strength at 77 degrees F (MD/XD): 67 lbf / 61 lbf.
		8. Derbigum GP: ASTM D 6223 Type I smooth surfaced Atactic Polypropylene (APP) membrane with fiberglass and polyester dual reinforced mat.
			1. Tensile Strength at 77 degrees F (MD/XD): 85 lbf / 80 lbf.
		9. DerbiSolar Base, fiberglass/polyester composite mat reinforced, with factory bonded, acrylic surface, APP modified bitumen membrane 12 meter in length. Energy Star Compliance: The membrane system must be Energy Star approved for solar reflectance properties.
	2. MODIFIED BITUMINOUS MEMBRANE
		1. Derbigum GP: ASTM D 6223 Type I smooth surfaced Atactic Polypropylene (APP) membrane with fiberglass and polyester dual reinforced mat.
			1. Thickness: 160 mils (4mm).
			2. Tensile Strength at 77 degrees F (MD/XD): 85 lbf / 80 lbf
			3. Elongation at 77 degrees F (MD/XD): 5.5 percent / 5.5 percent.
			4. Tear Resistance at 77 degrees F (MD/XD): 130 / 130
			5. Low Temperature Flex: minus 20 degrees C.
		2. Derbigum GP-FR: ASTM D 6223 Type I fire resistant, smooth surfaced Atactic Polypropylene (APP) membrane with fiberglass and polyester dual reinforced mat.
			1. Thickness: 160 mils (4mm).
			2. Tensile Strength at 77 degrees F (MD/XD): 85 lbf / 85 lbf.
			3. Elongation at 77 degrees F (MD/XD): 5.5 percent / 5.5 percent.
			4. Tear Resistance at 77 degrees F (MD/XD): 135 / 135.
			5. Low Temperature Flex: minus 18 degrees C.
		3. Derbigum XPS: ASTM D 6223 Type I triple reinforced, smooth surfaced Atactic Polypropylene (APP) membrane with fiberglass mat and glass and polyester composite mat.
			1. Thickness: 160 mils (4mm).
			2. Tensile Strength at 77 degrees F (MD/XD): 120 lbf / 140 lbf
			3. Elongation at 77 degrees F (MD/XD): 5.0 percent / 5.0 percent.
			4. Tear Resistance at 77 degrees F (MD/XD): 225 / 245
			5. Low Temperature Flex: minus 18 degrees C.
		4. Derbigum XPS-FR: ASTM D 6223 Type I fire resistant, triple reinforced, smooth surfaced Atactic Polypropylene (APP) membrane with fiberglass mat and glass and polyester composite mat.
			1. Thickness: 160 mils (4mm).
			2. Tensile Strength at 77 degrees F (MD/XD): 120 lbf / 140 lbf.
			3. Elongation at 77 degrees F (MD/XD): 5.0 percent / 5.0 percent.
			4. Tear Resistance at 77 degrees F (MD/XD): 225 / 245
			5. Low Temperature Flex: minus 20 degrees C.
		5. Derbicolor GP: ASTM D 6223 Type II dual reinforced, granule surfaced Atactic Polypropylene (APP) membrane with fiberglass and polyester dual reinforced mat.
			1. Thickness: 180 mils (4.5mm).
			2. Tensile Strength at 77 F (MD/XD): 85 lbf / 85 lbf
			3. Elongation at 77 F (MD/XD): 5.0 percent / 5.0 percent.
			4. Tear Resistance at 77 F (MD/XD): 135 / 135
			5. Low Temperature Flex: minus 18 degrees C.
		6. Derbicolor GP-FR: ASTM D 6223 Type II dual reinforced, fire resistant, granule surfaced Atactic Polypropylene (APP) membrane with fiberglass and polyester dual reinforced mat.
			1. Thickness: 180 mils (4.5mm).
			2. Tensile Strength at 77 F (MD/XD): 85 lbf / 85 lbf.
			3. Elongation at 77 degrees F (MD/XD): 5.0 percent / 5.0 percent.
			4. Tear Resistance at 77 degrees F (MD/XD): 135 / 135
			5. Low Temperature Flex: minus 20 degrees C.
		7. Derbicolor XPS: ASTM D 6223 Type II triple reinforced, granule surfaced Atactic Polypropylene (APP) membrane with fiberglass mat and glass and polyester composite mat.
			1. Thickness: 180 mils (4.5mm).
			2. Tensile Strength at 77 degrees F (MD/XD): 120 lbf / 120 lbf
			3. Elongation at 77 degrees F (MD/XD): 5.0 percent / 5.0 percent.
			4. Tear Resistance at 77 degrees F (MD/XD): 200 / 200
			5. Low Temperature Flex: minus 20 degrees C.
		8. Derbicolor XPS-FR: ASTM D 6223 Type II fire resistant triple reinforced, granule surfaced Atactic Polypropylene (APP) membrane with fiberglass mat and glass and polyester composite mat.
			1. Thickness: 180 mils (4.5mm).
			2. Tensile Strength at 77 degrees F (MD/XD): 120 lbf / 120 lbf.
			3. Elongation at 77 degrees F (MD/XD): 5.0 percent / 5.0 percent.
			4. Tear Resistance at 77 degrees F (MD/XD): 200 / 200
			5. Low Temperature Flex: minus 18 degrees C.
		9. Derbibrite: ASTM D 6223 Type I coated Atactic Polypropylene (APP) membrane with a composite fiberglass and polyester dual reinforced mat. ENERGYSTAR Rated.
			1. Thickness: 140 mils (3.5mm).
			2. Tensile Strength at 77 degrees F (MD/XD): 85 lbf / 80 lbf.
			3. Elongation at 77 degrees F (MD/XD): 5.5 percent / 5.5 percent.
			4. Tear Resistance at 77 degrees F (MD/XD): 130 / 130
			5. Low Temperature Flex: minus 20 degrees C.
			6. Reflectivity:
				1. Initial: 0.76 in accordance with ASTM C 1549.
				2. Aged: 0.68 in accordance with ASTM C 1549.
			7. Emissivity: 0.94 in accordance with ASTM E 408.

\*\* NOTE TO SPECIFIER \*\* Retain only components required on this project and delete all others.

* 1. SHEET METAL AND FLASHINGS
		1. General: New sheet metal flashings shall be a minimum 24 gauge, and conform to NRCA and SMACNA recommendations for fabrication, attachment, and installation.
			1. Follow all recommendations for configuration, thickness, and fastening of sheet metal and coping contained in the current edition of the NRCA Low Slope Roofing and Waterproofing Manual.
			2. Where new metal will come in contact with existing metal, use similar metals. Otherwise, new sheet metal for curbs, vents, wall counterflashing, and other penetrations will be galvanized steel.
			3. New metal copings on the perimeter walls must be pre-finished.
		2. Perlok 90 Parapet Wall Coping:

\*\* NOTE TO SPECIFIER \*\* Select Material. Where custom metal is specified, enter Delete two of the next three paragraphs.

* + - 1. Coping Cap Material: Aluminum.

\*\* NOTE TO SPECIFIER \*\* Select gauge. Delete one of the next two paragraphs.

* + - * 1. Thickness: 050 inch (1.3mm).
				2. Thickness: 063 inch (1.6mm).

\*\* NOTE TO SPECIFIER \*\* Select finish. Delete four of the next five paragraphs.

* + - * 1. Finish: Mill.
				2. Finish: Clear Anodized.
				3. Finish: Bronze Anodized.
				4. Finish: Black Anodized.
				5. Finish: Kynar 500 fluorocarbon finish meeting requirements of AAMA 2605. Color as selected by the Architect.
			1. Coping Cap Material: 24 Gauge Galvanized Steel.
				1. Thickness: 24 Gauge.
				2. Finish: Mill.
			2. Cleat Material: 20 gauge galvanized steel.
		1. Perlok 90 Fascia:

\*\* NOTE TO SPECIFIER \*\* Select Material. Where custom metal is specified, enter Delete two of the next three paragraphs.

* + - 1. Fascia Material: Aluminum.

\*\* NOTE TO SPECIFIER \*\* Select gauge. Delete one of the next two paragraphs.

* + - * 1. Thickness: 050 inch (1.3mm).
				2. Thickness: 063 inch (1.6mm).

\*\* NOTE TO SPECIFIER \*\* Select finish. Delete four of the next five paragraphs.

* + - * 1. Finish: Mill.
				2. Finish: Clear Anodized.
				3. Finish: Bronze Anodized.
				4. Finish: Black Anodized.
				5. Finish: Kynar 500 fluorocarbon finish meeting requirements of AAMA 2605. Color as selected by the Architect.
			1. Fascia Material: 24 Gauge Galvanized Steel.
				1. Thickness: 24 Gauge.
				2. Finish: Mill.
			2. Clip Material: 24 gauge galvanized steel.

\*\* NOTE TO SPECIFIER \*\* Select clip finish. Delete one of the next two paragraphs.

* + - * 1. Finish: Mill.
				2. Finish: Kynar 500 fluorocarbon finish meeting requirements of AAMA 2605.
		1. Perlok 150 Parapet Wall Coping:

\*\* NOTE TO SPECIFIER \*\* Select Material. Where custom metal is specified, enter Delete two of the next three paragraphs.

* + - 1. Wall Coping Material: Aluminum.

\*\* NOTE TO SPECIFIER \*\* Select gauge. Delete one of the next two paragraphs.

* + - * 1. Thickness: 050 inch (1.3mm).
				2. Thickness: 063 inch (1.6mm).

\*\* NOTE TO SPECIFIER \*\* Select finish. Delete four of the next five paragraphs.

* + - * 1. Finish: Mill.
				2. Finish: Clear Anodized.
				3. Finish: Bronze Anodized.
				4. Finish: Black Anodized.
				5. Finish: Kynar 500 fluorocarbon finish meeting requirements of AAMA 2605. Color as selected by the Architect.
			1. Wall Coping Material: 24 Gauge Galvanized Steel.
				1. Thickness: 24 Gauge.
				2. Finish: Mill.
			2. Cleat Material: 16 gauge galvanized steel.
		1. Perlok 150 Fascia:

\*\* NOTE TO SPECIFIER \*\* Select Material. Where custom metal is specified, enter Delete two of the next three paragraphs.

* + - 1. Fascia Material: Aluminum.

\*\* NOTE TO SPECIFIER \*\* Select gauge. Delete one of the next two paragraphs.

* + - * 1. Thickness: 050 inch (1.3mm).
				2. Thickness: 063 inch (1.6mm).

\*\* NOTE TO SPECIFIER \*\* Select finish. Delete four of the next five paragraphs.

* + - * 1. Finish: Mill.
				2. Finish: Clear Anodized.
				3. Finish: Bronze Anodized.
				4. Finish: Black Anodized.
				5. Finish: Kynar 500 fluorocarbon finish meeting requirements of AAMA 2605. Color as selected by the Architect.
			1. Fascia Material: 24 Gauge Galvanized Steel.
				1. Thickness: 24 Gauge.
				2. Finish: Mill.
			2. Clip Material: 24 gauge galvanized steel.
		1. Perlok Gutter System:

\*\* NOTE TO SPECIFIER \*\* Select gutter shape. Delete two of the next three paragraphs.

* + - 1. Shape: IG-1.
			2. Shape: IG-2.
			3. Shape: Box.

\*\* NOTE TO SPECIFIER \*\* Select Material. Delete three of the next four paragraphs.

* + - 1. Material: 24 gauge steel

\*\* NOTE TO SPECIFIER \*\* Select Finish. Delete three of the next four paragraphs.

* + - * 1. Finish: Mill.
				2. Finish: Anodized, Clear.
				3. Finish: Anodized. Color as selected by the Architect.
				4. Finish: Kynar 500. Color as selected by the Architect.
			1. Material: 0.040 inch aluminum.

\*\* NOTE TO SPECIFIER \*\* Select Finish. Delete three of the next four paragraphs.

* + - * 1. Finish: Mill.
				2. Finish: Anodized, Clear.
				3. Finish: Anodized. Color as selected by the Architect.
				4. Finish: Kynar 500 fluorocarbon finish meeting requirements of AAMA 2605. Color as selected by the Architect.
			1. Material: 0.050 inch aluminum.

\*\* NOTE TO SPECIFIER \*\* Select Finish. Delete three of the next four paragraphs.

* + - * 1. Finish: Mill.
				2. Finish: Anodized, Clear.
				3. Finish: Anodized. Color as selected by the Architect.
				4. Finish: Kynar 500 fluorocarbon finish meeting requirements of AAMA 2605. Color as selected by the Architect.
			1. Material: 0.063 inch aluminum.

\*\* NOTE TO SPECIFIER \*\* Select Finish. Delete three of the next four paragraphs.

* + - * 1. Finish: Mill.
				2. Finish: Anodized, Clear.
				3. Finish: Anodized. Color as selected by the Architect.
				4. Finish: Kynar 500 fluorocarbon finish meeting requirements of AAMA 2605. Color as selected by the Architect.
			1. Downspouts: Fabricated from the same metal and finish as the gutter, with either closed or open face as selected by the Architect.
		1. Perlok Counterflashing:

\*\* NOTE TO SPECIFIER \*\* Select Material. Delete three of the next four paragraphs.

* + - 1. Material: 24 gauge steel
			2. Material: 0.040 inch aluminum.
			3. Material: 0.050 inch aluminum.
			4. Material: 0.063 inch aluminum.

\*\* NOTE TO SPECIFIER \*\* Select Type. Delete one of the next two paragraphs.

* + - 1. Type: One-piece counterflashing with 3 inch (76mm) lap joint for or surface or reglet installation.
			2. Type: Two-piece "snap-in" counterflashing with 3 inch (76mm) lap joint at receiver and flashing for surface mount, reglet, stucco, or masonry installation.
		1. Perlok Pitch Pans:
			1. Dimensions: 3 inch (76mm) flanges with adjustable width from 4 inches to 7 inches (102mm - 178mm), and adjustable height from 2 inches to 4 inches (52mm - 102mm).
			2. Material: Copper.
			3. Material: Galvanized Steel.
			4. Material: Stainless Steel.
		2. Stack Vent and Drain Lead: Minimum 3 pound (1.36 kg) lead.

\*\* NOTE TO SPECIFIER \*\* Include the following paragraph if required for vegetative roof system and delete if not required. Verify the additional roof loads required. Contact the manufacturer for additional information.

* + 1. DERBIGREEN Vegetative Roofing System: System consists of double interlocking trays, connectors, stainless steel trim elements, and walk pads.
			1. DERBIGREEN Tray: 100 percent post-industrial recycled content, injection molded, 100 mm polypropylene trays 2 foot square by 4- 5/8 inch deep.
				1. Trays have ten water-retention ridges and troughs. Troughs are 3/4 inch wide by 5/8 inch deep with eleven corresponding ridges. Molded drain holes consist of nine 5/8 inch by 3/8 inch areas with thirteen 5/32 inch holes located strategically for overflow and to create the lateral flow of water through the media and across the ridges. Eleven 1/8 inch storm water metering holes offset at the center of each trough. Tray will permit an instantaneous 1 inch rainstorm to drain in 2.2 minutes.
				2. Double Interlocking Design: Two flat and two overlapping top edges are designed to connect and hold adjacent trays together and encapsulate the roof area providing the means to overfill the trays with growing media. Quick-lock fasteners provided to aid in mitigating shifting and wind uplift. Hook and quick-lock fastener are provided for drip irrigation system.
				3. Tray Sides: Sloped at 5 degree angle from top to bottom. A 5/8 inch clearance above underlying roof membrane is provided to allow air and water to flow freely under and around trays.
				4. Fully saturated weight with mature plants and engineered growing media is approximately 23-26 lb. per square foot.
			2. Edge Elements and Trim: Stainless steel 26 gauge. edge flashing and trim ispre-drilled to accommodate quick-lock fasteners and notched to allow for tray placement and irrigation access.
			3. Walk Pads: 3/4 inch thick by 2 foot square dense rubber mats, compsed of 100 percent recycled materials, color as selected from manufacturers standard selections. Pads are held in place by the DERBIGREEN flashing and placed end to end for access and high traffic areas as indicated.

\*\* NOTE TO SPECIFIER \*\* Coordinate with the manufacturer for the selection of these products and include in Section 02900

* + - 1. Drip irrigation for vegetative roofing system is specified in Section 02900.
			2. Plants and Planting including growing media for vegetative roofing system is specified in Section 02900.
	1. FASTENERS AND ACCESSORIES

\*\* NOTE TO SPECIFIER \*\* Retain fasteners required on this project from the following seven options.

* + 1. Perlok Standard Roofing Fastener: Drill point fastener for installation of insulation and base sheets to steel and wood decks.
		2. Perlok 14: Drill point fastener with 13 threads per inch for installation of insulation and base sheets to steel, wood and structural concrete decks.
		3. Perlok Heavy Duty Roofing Fastener: Drill point fastener for installation of insulation and base sheets to light gauge steel, OSB or aluminum decks.
		4. Perlok Extra Heavy Duty Roofing Fastener: Drill point fastener for installation of insulation and base sheets to steel and wood decks.
		5. Perlok CR 1.2 Base Sheet Fastener: One-piece base sheet fastener for installtation of base sheets to poured lightweight insulating concrete and gypsum decks.
		6. Perlok CR Base Sheet Fastener 1.7: One-piece fastener for installation of base sheets to poured lightweight insulating concrete and gypsum decks.
		7. Perlok Dual Fastener: Fastener for installation of roof insulation, base sheet, and/or recover board to cementitious wood fiber and poured gypsum decks.
		8. Flashing Nails: 11 gauge, barbed galvanized with 1 inch (25mm) diameter heads of sufficient length to penetrate the full depth of the nailer. For concrete and masonry substrates, case hardened nails for concrete must be used. Tin caps must be used with all flashing nails. Alternatively, large head Simplex nails may be used without tin caps.
		9. Wood Nailers and Curbs: #2 pressure treated dimensional lumber.

\*\* NOTE TO SPECIFIER \*\* Retain the next article only if hot asphalt is not specified for insulation or base/interply applications. Retain only included asphalt types required and delete all others.

* 1. BITUMEN
		1. Asphalt Bitumen: ASTM D 312.

\*\* NOTE TO SPECIFIER \*\* Select asphalt type. Type IV required above a 2:12 slope Delete three of the next four paragraphs.

* + - 1. Type III Asphalt.
			2. Type IV Asphalt.
			3. Type III SEBS Asphalt.
			4. Type IV SEBS Asphalt.
	1. ADHESIVES, COATINGS AND PRIMERS

\*\* NOTE TO SPECIFIER \*\* Retain only required adhesives, coatings and primers and delete those not required.

* + 1. Permastic: Cold applied adhesive for use with modified bitumen membranes, base sheets and other cold process roofing system components.
			1. Application Rate: 1.5 to 3.0 gallons per 100 square feet, depending on substrate (0.6 - 0.91 l/sm).
			2. Volatile Organic Compound (VOC) limits: 180 g/l.
		2. Perflash: ASTM D 4586 Asphalt flashing cement for adhering modified bitumen membranes to vertical surfaces and flashing modified bituminous membranes to metal components.
			1. Application Rate: 7.5 gallons per 100 square feet (3.0 l/sm) at a 1/8 inch (3mm) bed.
			2. Volatile Organic Compound (VOC) limits: 165 g/l.

\*\* NOTE TO SPECIFIER \*\* The following Insulation Adhesive is only for use over concrete decks or for the top layer of insulation. Delete if not required.

* + 1. OlyBond 500 Spot Shot Roof Insulation Adhesive, by OMG Roofing Products Company - Fast acting, dual component, low rise urethane foam adhesive for application of the top layer of insulation using the specially designed dispensing tool.
		2. Permastic IA: Cold applied adhesive for adhering insulation to concrete roof decks and subsequent insulation panels in multi-layer applications.
			1. Application Rate: 1.5 to 3.0 gallons per 100 square feet (0.6 - 0.91 l/sm).
			2. Volatile Organic Compound (VOC) limits: 245 g/l.
		3. Permastic IA Strips: Double sided, self-adhering, asphalt based insulation adhesive strips.
			1. Thickness: 60 mils (1.5mm).
			2. Volatile Organic Compound (VOC) limits: 0 g/l.
		4. Permalume Premium: Protective aluminum coating for protection of new and weathered modified bituminous membranes.
			1. Application Rate: 0.75 gallons per 100 square feet (0.3 l/sm).
			2. Volatile Organic Compound (VOC) limits: 500 g/l.
			3. Reflectance:
				1. Initial: 0.77 in accordance with ASTM C 1549.
				2. Aged: 0.53 in accordance with ASTM C 1549.
			4. Emissivity: 0.58 in accordance with ASTM E 408.
		5. Permacool: Water based white roof coating formulated to adhere to modified bitumen membranes.
			1. Application Rate: 2.0 - 2.5 gallons per 100 square feet (0.8 - 1.0 l/sm).
			2. Volatile Organic Compound (VOC) limits: 100 g/l.
			3. Reflectance:
				1. Initial: 0.86 in accordance with ASTM C 1549.
				2. Aged: 0.53 in accordance with ASTM C 1549.
			4. Emissivity: 0.90 in accordance with ASTM E 408.
			5. Elongation at 73 degrees F: 300 percent.
			6. Tensile Strength at 73 degrees F: 200 percent.
		6. PRS Primer: ASTM D 41 primer for use as a general priming coat with asphaltic roof membrane systems to improve adhesion to various surfaces.
			1. Application Rate: 1.0 - 2.0 gallons per 100 square feet (0.4 - 0.8 l/sm).
			2. Volatile Organic Compound (VOC) limits: 500 g/l.
		7. Permacool Primer: Thin viscosity water based to improve adhesion to modified bitumen membranes.
			1. Application Rate: 2.0 - 2.5 gallons per 100 square feet (0.8 - 1.0 l/sm).
			2. Volatile Organic Compound (VOC) limits: 100 g/l.
1. EXECUTION
	1. EXAMINATION
		1. Do not begin installation until substrates have been properly prepared.
		2. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.
	2. PREPARATION
		1. Clean surfaces thoroughly prior to installation.
		2. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

\*\* NOTE TO SPECIFIER \*\* Delete roof decks not present from the following seven paragraphs.

* + 1. Steel Decks:
			1. Steel decks must be a minimum thickness of 22 gauge (0.8 mm) and shall have a G-90 galvanized finish.
			2. All surface corrosion must be removed, and repairs to and severely corroded areas made. Fasten any loose or inadequately secured decking and replace irreparable decking.
		2. Structural Concrete Decks:
			1. Minimum deck thickness for structural concrete is 4 inches (102 mm).
			2. Allow the roof deck to properly cure prior to application of the roofing system.
			3. When insulation or roofing is to be adhered with hot asphalt, prime the deck with ASTM D 41 primer, at one gallon per 100 square feet (0.4 l/sm). Allow the primer to dry prior to the application of the roofing system.
		3. Dimensional Wood Decks:
			1. Wood decks must be at least 1 inch (25 mm) thick (nominal).
			2. All boards must be bearing on rafters at each end and be securely nailed.
			3. Tape and staple fastening systems may be used on wood decks when they comply with local building codes.
		4. Plywood and Oriented Strand Board (OSB) Decks:
			1. Sheathing must be exterior grade, minimum 4 ply, and not less than 15/32 inch (12 mm) thick.
			2. Panels must have 1/8 inch to 1/4 inch (3mm to 6mm) gaps between panels and match vertically at joints.
		5. Lightweight Insulating Concrete Decks:
			1. Lightweight insulating concrete decks must have a minimum thickness of 2 inches (51 mm), a minimum compressive strength of 125 psi (0.86 MPa) and a minimum density of 22 pcf (352 kg/sm).
			2. Lightweight insulating concrete decks are acceptable only on slopes up to 1 inch per foot (83 mm/m).
		6. Cementitious Wood Fiber Decks:
			1. All cementitious wood fiber deck panels must be anchored against uplift and lateral movement.
			2. The deck must be installed level. Any deflection, irregularities, or otherwise damaged panels must be corrected or replaced.
			3. Install a mechanically attached base sheet prior to installation of insulation or roofing membrane.
		7. Gypsum Decks:
			1. Gypsum decks must be smooth and free from deflections or ridges.
			2. An average fastener withdrawal resistance as recommended by the fastener manufacturer must be obtained; however, at no time may it be less than 40 lbs. (178 N) per fastener.
			3. Wet or frozen poured gypsum decks are not acceptable.
			4. Poured-in-place gypsum roof decks contain a large percentage of moisture. All necessary precautions must be taken to avoid the entrapment of moisture under the roofing system. Install topside and/or perimeter venting.
	1. INSTALLATION
		1. Install all roofing systems system components in accordance with manufacturer's instructions.
	2. INSULATION INSTALLATION
		1. Do not apply roof insulation until all other Work which requires foot equipment traffic on the roof.
		2. Securely attach Insulation to the roof deck using the required fastener density and pattern as listed in the current Derbigum Specifications and Details Guide. A minimum FM 1-60 attachment is recommended.
		3. Do not install wet, damaged or warped insulation boards.
		4. Install insulation boards with staggered board joints in one direction (unless taping joint).
		5. Install insulation boards snug. Gaps between board joints must be less than 1/4 inch (6 mm). Fill all gaps in excess of 1/4 inch (6 mm) with insulation material of the same type.
		6. Wood Nailers: Install minimum 3-1/2 inch (89 mm) wide nailers at all locations indicated on the Drawings. Nailers must be of equal thickness as the insulation with a minimum 1 inch (25 mm) and securely fastened to the deck.
		7. Install cant strips at the transition between roof deck and wall/curb surfaces in all membrane flashing applications. Where necessary to accommodate differential movement between the wall and roof deck, vertical wood nailers, of sufficient height to provide a minimum 8 inch (203mm) base flashing height, may be mechanically fastened to the insulation stops in accordance with NRCA recommendations and the Drawings.
		8. 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.
		9. Do not install insulation over old lightweight insulating concrete decks without the use of a vapor retarder.
		10. Do not install any more insulation than will be completely waterproofed each day.
	3. BASE / INTERPLY INSTALLATION
		1. Apply approved base sheets over insulation or deck surfaces using methods approved by the manufacturer for the specified roof system.
		2. Apply approved interply sheets over appropriate base sheets using methods approved by the manufacturer for the specified roof system.
		3. Strap and backnail base and interply sheets where roof slopes exceed 2 inches per foot (2:12).
	4. MEMBRANE INSTALLATION
		1. Apply roof system in strict accordance with manufacturer's published recommendations.
		2. Unroll membranes and allow them to relax prior to application. Application of sheet materials directly from the factory roll may increase the incidence of wrinkling during or subsequent to application.
		3. Starting at the low point of the roof area, unroll membrane into position with 3 inch (76mm) side laps and end laps staggered a minimum of 12 inches (305mm).

\*\* NOTE TO SPECIFIER \*\* Retain the next paragraph only if roof membrane is installed using cold adhesive.

* + 1. Cold Process Membrane Application:
			1. Plan Work and foot traffic so adhesive is not tracked across the top of the finished base ply membrane.
			2. Starting at the low point of the roof area, rolls of modified cap sheet shall be unrolled into position with 3 inch (76mm) side laps and end laps staggered a minimum of 12 inches (305mm).
			3. Pull the end of each sheet straight back onto itself so that the sheet is folded approximately in half, maintaining alignment of the individual sheets and uniformity of the side laps.
			4. Apply adhesive uniformly over the previously marked area with a 1/4 inch notched squeegee at the minimum rate of 1-1/2 to 2 gallons per 100 SF, keeping the adhesive from the side and end lap areas of adjacent rolls.
			5. Roll the sheet into the adhesive commencing with the first roll in the gang, maintaining alignment of the roll and uniformity of the side laps. Broom the membrane as necessary to insure embedment of the membrane into the adhesive.
			6. Repeat the procedure on the opposite end of the rolls of the membrane. Side and end laps must be left clean and fee of adhesive.

\*\* NOTE TO SPECIFIER \*\* Retain the next paragraph only if roof membrane is installed by hot air welding.

* + 1. Heat-Welded Membrane Application:
			1. Installation substrate must be clean, smooth and dry. Do not apply membrane directly to a fresh asphalt glaze or flood coat, or over previous plies with excessive asphalt bleed out at laps.
			2. On slopes less than 3/4 inch per foot (62 mm per meter), install membrane perpendicular to the slope.
			3. On slopes 2 inch per foot (62 mm per meter) and over, install membrane parallel to the roof slope and back nailed in accordance with the manufacturer's guidelines.
			4. Install full width cap sheets, lapping 3 inches (76 mm) on the sides and 6 inches (152 mm) on ends. Stagger adjacent end laps a minimum of 18 inches (457 mm) apart. Stagger all side and end laps from previous plies.
			5. Unroll membrane approximately 10 feet (3000 mm), and align. Apply uniform heat across the exposed back surface of the membrane and lap areas until the compound reaches the proper application temperature and exhibits a slight sheen. Avoid overheating, which may cause poor adhesion or damage the membrane. Slowly unroll the membrane as heat is applied.
			6. Re-roll the opposite end of the membrane and install in the same manner.
		2. Side and End Laps:
			1. Heat weld side and end laps of the modified bituminous membrane using hot air welding equipment.
			2. Roll with a 20 pound steel roller while the bitumen is still warm. Edge of the lap must be left untooled, with a continuous bead of bitumen visible at the seam.
	1. MEMBRANE BASE FLASHING
		1. Maximum flashing length is feet (3.05 m) when the membrane flashings are between 8 inches (203 mm) and 14 inches (356 mm) high.
		2. Priming: Prime all metal surfaces with asphalt primer and allow them to dry prior to application of the flashing membrane.
	2. Install the first base flashing ply after completing the field base ply.
	3. At the conclusion of the field top ply, install the second ply of base flashing membrane. This will result in "lacing" of the field and base flashing membranes.
		1. Stripping Plies:
			1. At metal flanges, install a stripping ply over the field base ply, extending a minimum of 4 inches (102 mm) beyond the flange of the metal.
			2. Set the metal flange over the stripping ply in a bed of Perflash flashing cement and mechanically anchor.
			3. Apply top ply over the primed metal flange.
			4. Where the edge of stripping plies meets the metal detail (i.e., outside edge of perimeter metal or against vent pipes), apply a bead of Perflash flashing cement to provide a continuous seal and fill in any gaps that may allow standing water at this point.
		2. High Wall Flashings: When flashing vertical surfaces above 14 inches (356 mm) high, the membrane must be installed the width of the roll and pre-cut to the desired height.
		3. Seal the top edges of all base flashings with asphalt flashing cement and reinforcing fabric to provide protection until metal counter flashing is installed.
		4. Curb and Corner Flashings:
			1. All inside and outside corners require a boot to provide weather protection at the lap joint. Boot must be a minimum 2 inch (51mm) radius beyond all intersecting surfaces, and have a minimum of 1/4 inch (6mm) follow of modified bitumen beyond all edges.
			2. Install boots at the inside and outside corners (underneath) prior to installing the flashing membrane.
			3. In lieu of Derbigum membrane boots, the corners may be reinforced with a five-course treatment, consisting of alternating layers of Perflash and glass fabric mesh.
		5. Mechanically fasten the top of all vertical base flashing membranes. Install fasteners appropriate to the substrate 8 inches (203 mm) on center.
		6. Metal Counter Flashing: All vertical base flashings must be covered by metal counter flashing to form a continuous water shedding surface over the top of membrane flashing. Extend metal counter flashing a minimum of 3 inches (76 mm) over the top of the membrane flashing.
		7. Metal Face Securement: Install Hook strips (cleats) on all metal extending over roof edges (coping metal, gravel stop/eave strip, perimeter curb metal, etc.) in accordance with recommendations in the NRCA Roofing and Waterproofing Manual. Appropriate provision must be made in accessory metal to allow for expansion and contraction of the metal sections without interrupting the integrity of the waterproofing assembly.
		8. Roof Drains:
			1. All roof drains must be sumped and free of all rust, debris and dirt.
			2. Install the base ply and cut so that the base ply stops short of the clamping ring.
			3. Install a 36 inch square piece of smooth membrane over the drain opening, in accordance with manufacturers recommendations for the roof system specified. Cut a hole to the inside edge of the drain base.
			4. Thoroughly clean the drain bowl flange, and prime to receive the membrane. Apply Perflash to the clamping ring area.
			5. Install a 30 inch (762mm) square, 4 lb (1.81 kg) lead flashing over the membrane into a bed of Perflash cement and install the top layer of field membrane extending to the inside edge of the drain bowl.
			6. The field membrane, the new drain lead, and stripping membrane are to extend under the properly secured and tightened compression clamping ring assembly. Cut holes in the membrane to align with the clamping bolts, install the clamping ring and tighten the bolts to provide uniform compression of the flashing membrane at the drain.
		9. Pitch Pockets:
			1. Fabricate and install new pitch pockets from galvanized steel in accordance with NRCA recommendations.
			2. Fill the pocket halfway to the top with non-shrink grout and the remainder with pourable sealer or Perflash.
			3. Slope fill away from the penetration to the edge of the pocket.
			4. Install metal rain collars with drawbands that cover and overlap the entire pocket and caulk the top of the drawband with sealant.
			5. Strip in the metal flanges of the pitch pocket per the sequence described above for stripping plies.
	4. VEGITATIVE ROOF COMPONENTS
		1. General: Place DERBIGREEN trays on any roofing media assuming structural capacity and integrity has been verified by the Architect. Roof membrane system must be inspected and approved for DERBIGREEN installation by a DERBIGUM technical representative prior to placement of growing medium.
		2. DERBIGREEN Trays: Place trays directly onto the roofing surface or membrane.
			1. Orient so that each tray interlocks with either an adjoining tray or with a DERBIGREEN edge element.
			2. Position so that the bottom troughs of the trays are perpendicular to the slope of the roof, except for minor areas of crickets.
			3. Insert quick-lock fasteners in the trays and edge flashing to secure the tray field.
		3. Growing Medium: Immediately after the installation of the trays, the growing medium must be installed or a temporary weight system must be used to prevent DERBIGREEN tray movement due to weather and jobsite conditions. Coordinate with growing media specified in Section 02900.
		4. Irrigation System: Irrigation system shall be installed and tested prior to installing the growth media. Coordinate with irrigation system specified in Section 02900.
		5. After installation of irrigation system and placement of growing medium plants will be installed as specified in Section 02900.
		6. Flashings: Install DERBIGREEN interlocking metal anchor flashing at all penetration edges where the DERBIGREEN trays are not installed due to openings.
			1. Install DERBIGREEN interlocking metal anchor flashing to anchor all edges of the DERBIGREEN tray system to either the parapet wall of the building or, as necessary, to the DERBIGREEN walk pad system.
			2. Install an additional layer of roofing membrane under each flashing joint.
			3. Top fasten DERBIGREEN interlocking metal anchor flashing to the parapet with anchors depending on the substrate of the parapet wall. Fasten concrete walls 12 inch on center with a 1/4 inch lead drive pin. Fasten wood backed parapet walls with a minimum of 12 stainless steel fasteners at 12 inches on center. Gypsum sheathing or other low strength parapet walls shall have an 18 gauge by 4 inch galvanized steel strip installed to the structural framing for fastening of DERBIGREEN interlocking metal anchor flashing with a minimum of 12 stainless steel fastener at 12 inch on centers.
		7. Walkways: Where trays are further than 6 inches from the parapet wall, install DERBIGREEN walk pads. Install walk pad locking trim flashing with a minimum of 3/4 inch overlap at flashing joints. Install the walk pad cut to size to fit the gap between the DERBIGREEN Tray and the parapet wall. Use an additional layer of roofing membrane under each flashing joint. Install walk pad locking parapet flashing as described above.
	5. INSPECTION AND QUALITY CONTROL
		1. The roofing system manufacturer shall provide a qualified, trained auditor to perform a final inspection to insure the roof system has been installed properly and according to the manufacturer's recommendations and guaranty requirements. Upon completion of the inspection, copies of the inspection report will be provided to the Architect and Contractor. Any corrective action deemed necessary to comply with the manufacturer's specifications must be completed prior to final close-out.
	6. PROTECTION AND CLEANING
		1. Protect new roof system during remainder of construction period. Plan work so traffic over new roof system is kept to a minimum. Where traffic must continue over new roof system, provide protection for the finished roof.
		2. Provide protection for masonry and other building surfaces against damage of staining from roofing operations. Any surfaces damaged or stained as a result of roofing operations shall be cleaned, repaired or replaced as necessary by the roofing contractor.
		3. Job site shall be maintained in a clean, orderly fashion, and free of debris. Store materials and equipment so operations of building are not interrupted.
		4. Touch-up, repair or replace damaged products before Substantial Completion.

END OF SECTION