DERBIGUM®

SPECIFICATION AND DETAIL GUIDE

QUALITY POLICY

DERBIGUM provides products and services that consistently reflect
the highest quality standards, the objectives and goals of our company
and thoroughly satisfy our customers' expectations
based on a commitment to continuous improvement.

ENVIRONMENTAL POLICY

DERBIGUM is committed to operating as an environmentally responsible manufacturer.
In all areas of operation, we comply fully with the spirit of all environmental laws and other requirements,
while working to insure we maintain environmental respect for our community, our nation and our world.
Through consistent monitoring and measuring our objections and a continuous search for improvement
in our environmental efforts, we will prevent pollution and have a positive effect of this environment.

MISSION STATEMENT

We are a global manufacturer of high quality Modified Bitumen roofing systems.
We have over 35 years of proven performance in the United States, over 40 years worldwide
and in all climatic conditions. We produce sustainable roofing systems
installed by select, trained roofing contractors that add value to the building owner
and provide long term water proofing service life.

We create a positive customer experience by anticipating needs
throughout the roofing process and roof life,
thereby exceeding the expectations of internal and external customers.
DERBIGUM will create a personal, trusting relationship with customers
through a respectful attitude and education.

Our objective is total customer satisfaction through clear, concise communication
and unparalleled service before, during and after installation.

DERBIGUM Americas, Inc.
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DERBIBRITE

DEAD LEVEL ROOF

CONSTRUCTION DETAILS

The information included in this manual is intended to provide assistance in the proper selection and application of DERBIGUM materials and the appropriate DERBIGUM roofing membrane system by DERBIGUM Authorized Contractors (hereinafter referred to as DACs).

All references to DERBIGUM membranes will refer to Derbigum, Derbicolor, or Derbibrite unless noted otherwise.

It is the belief of DERBIGUM and our DACs that business integrity is the only sound policy for business success. We believe that performance is a shared value between the owner and the roofing contractor, and so our DACs subscribe to the following Code of Practice:

The DAC will exercise the highest degree of skill and care in performing their function as an installer of the DERBIGUM roofing system specified for each project. The quality of any roofing system depends on the skill and craftsmanship of the DAC's roofing mechanics, and in recognition of this fact, the DAC will endeavor to maintain a skilled and experienced workforce for the installation of DERBIGUM roofing systems.

The DAC will perform all roofing and related work in accordance with the published applicable membrane roofing specifications.

Only selected roofing contractors become DACs. For information on DACs in your area, contact DERBIGUM at (800) 727-9872 or info@derbigum.us.

Since the overall performance of a roofing system may be affected by factors other than improper roof system installation, **DERBIGUM assumes no responsibility for design of the roofing facility, the performance of the substrate over which the DERBIGUM roofing membrane system is installed, or the performance of products not manufactured and sold by DERBIGUM.**

DERBIGUM reserves the right to modify, delete from, or add to the contents of this manual without notice. Every effort will be made to communicate changes or modifications as soon as practical, but no assurances are given that changes will be received prior to issuance of an updated manual.

Requests for modification to published specifications must be submitted in writing to the DERBIGUM Director of Technical Services for approval prior to installation of the roofing assembly.

MEMBRANES

PRODUCT DESCRIPTION AND USES	APPLICATION METHOD
DERBIGUM XPS is a premium 4.0 mm (160 mil) smooth surface APP membrane. Derbigum XPS is triple reinforced with a fiberglass mat, fiberglass and polyester scrim composite to provide maximum resistance to weathering, high tensile properties and puncture resistance. May be used as roofing and flashing membrane.	Permastic with heat welded laps or heat welded
DERBIGUM XPS-FR is a premium 4.0 mm (160 mil) smooth surface, fire-resistant APP membrane. Derbigum XPS-FR is triple reinforced with a fiberglass mat, a fiberglass and polyester scrim composite to provide maximum resistance to weathering, high tensile properties and puncture resistance. May be used as roofing and flashing membrane.	Permastic with heat welded laps or heat welded
DERBIGUM GP is a high quality 4.0 mm (160 mil) smooth surface APP membrane. Derbigum GP is dual reinforced with a fiberglass mat and polyester scrim to provide superior resistance to weathering, high tensile properties and puncture resistance. May be used as roofing and flashing membrane.	Permastic with heat welded laps or heat welded
DERBIGUM GP-FR is a high quality 4.0 mm (160 mil) smooth surface, fire-resistant APP membrane. Derbigum GP FR is dual reinforced with a fiberglass mat and polyester scrim to provide superior resistance to weathering, high tensile properties and puncture resistance. May be used as roofing and flashing membrane.	Permastic with heat welded laps or heat welded
DERBIGUM P is a high quality 4.0 mm (160 mil) smooth surface APP membrane. Derbicolor P is single reinforced 250 gram polyester mat reinforced with glass strands that provides high tensile properties and puncture resistance. May be used as roofing and flashing membrane.	Permastic with heat welded laps or heat welded
DERBIGUM P-FR is a high quality 4.0 mm (160 mil) smooth surface, fire-resistant APP membrane. Derbicolor P-FR is single reinforced 250 gram polyester mat reinforced with glass strands that provides high tensile properties and puncture resistance. May be used as roofing and flashing membrane.	Permastic with heat welded laps or heat welded
DERBICOLOR XPS is a premium 4.5 mm (180 mil) granule surfaced* APP membrane. Derbicolor XPS is triple reinforced with a fiberglass mat, fiberglass and polyester scrim composite to provide maximum resistance to weathering, high tensile properties and puncture resistance. May be used as roofing and flashing membrane.	Permastic with heat welded laps or heat welded
DERBICOLOR XPS-FR is a premium 4.5 mm (180 mil) granule surfaced,* fire-resistant APP membrane. Derbicolor XPS FR is triple reinforced with a fiberglass mat, fiberglass and polyester scrim composite to provide maximum resistance to weathering, high tensile properties and puncture resistance. May be used as roofing and flashing membrane.	Permastic with heat welded laps or heat welded
DERBICOLOR XPS-FR-CR is a premium 4.5 mm (180 mil) highly reflective granule surfaced,* fire-resistant APP membrane. Derbicolor XPS FR CR is triple reinforced with a fiberglass mat, fiberglass and polyester scrim composite to provide maximum resistance to weathering, high tensile properties and puncture resistance. May be used as roofing and flashing membrane.	Permastic with heat welded laps or heat welded
DERBICOLOR GP is a high quality 4.5 mm (180 mil) granule surfaced* APP membrane. Derbicolor GP is dual reinforced with a fiberglass mat and polyester scrim to provide superior resistance to weathering, high tensile properties and puncture resistance. May be used as roofing and flashing membrane.	Permastic with heat welded laps or heat welded
DERBICOLOR GP-FR is a high quality 4.5 mm (180 mil) granule surfaced,* fire-resistant APP membrane. Derbicolor GP FR is dual reinforced with a fiberglass mat and polyester scrim to provide superior resistance to weathering, high tensile properties and puncture resistance. May be used as roofing and flashing membrane.	Permastic with heat welded laps or heat welded
DERBICOLOR GP-FR-CR is a high quality 4.5 mm (180 mil) highly reflective granule surfaced,* fire-resistant APP membrane. Derbicolor GP FR CR is dual reinforced with a fiberglass mat and polyester scrim composite to provide maximum resistance to weathering, high tensile properties and puncture resistance. May be used as roofing and flashing membrane.	Permastic with heat welded laps or heat welded

*__NOTE:__ Derbicolor granules are available in autumn, red, weathered wood, olivine, slate grey, black, white and CR bright white. Custom color options are also available.

LENGTH	WIDTH	WEIGHT	COVERAGE*	PACKAGING	CERTIFICATIONS
33 ft 6 in (10.2 m)	39 3/8 in (1.0 m)	97 lb/sq (43.9 kg)	1 square 100 ft^2 (9.2 m^2)	20 rolls/pallet ≈ 1,940 lb (878 kg)/pallet	UL Listed; Meets ASTM D6223 criteria for Type II products; Meets various FM constructions and severe hail requirements.
33 ft 6 in (10.2 m)	39 3/8 in (1.0 m)	97 lb/sq (43.9 kg)	1 square 100 ft^2 (9.2 m^2)	20 rolls/pallet ≈ 1,940 lb (878 kg)/pallet	UL Listed; Meets ASTM D6223 criteria for Type II products; Meets various FM constructions and severe hail requirements.
33 ft 6 in (10.2 m)	39 3/8 in (1.0 m)	94 lb/sq (42.6 kg)	1 square 100 ft^2 (9.29 m^2)	20 rolls/pallet ≈ 1,940 lb (878 kg)/pallet	UL Listed; Meets ASTM D6223 criteria for Type I products; Meets various FM constructions and severe hail requirements.
33 ft 6 in (10.2 m)	39 3/8 in (1.0 m)	94 lb/sq (42.6 kg)	1 square 100 ft^2 (9.29 m^2)	20 rolls/pallet ≈ 1,940 lb (878 kg)/pallet	UL Listed; Meets ASTM D6223 criteria for Type I products; Meets various FM constructions and severe hail requirements.
33 ft 6 in (10.2 m)	39 3/8 in (1.0 m)	94 lb/sq (42.6 kg)	1 square 100 ft^2 (9.29 m^2)	20 rolls/pallet ≈ 1,940 lb (878 kg)/pallet	UL Listed; Meets ASTM D6223 criteria for Type I products; Meets various FM constructions and severe hail requirements.
33 ft 6 in (10.2 m)	39 3/8 in (1.0 m)	94 lb/sq (42.6 kg)	1 square 100 ft^2 (9.29 m^2)	20 rolls/pallet ≈ 1,940 lb (878 kg)/pallet	UL Listed; Meets ASTM D6223 criteria for Type I products; Meets various FM constructions and severe hail requirements.
33 ft 6 in (10.2 m)	39 3/8 in (1.0 m)	110 lb/sq (49.8 kg)	1 square 100 ft^2 (9.29 m^2)	20 rolls/pallet ≈ 2,200 lb (996 kg)/pallet	UL Listed; Meets ASTM D6223 criteria for Type II products; Meets various FM constructions and severe hail requirements.
33 ft 6 in (10.2 m)	39 3/8 in (1.0 m)	110 lb/sq (49.8 kg)	1 square 100 ft^2 (9.29 m^2)	20 rolls/pallet ≈ 2,200 lb (996 kg)/pallet	UL Listed; Meets ASTM D6223 criteria for Type II products; Meets various FM constructions and severe hail requirements.
33 ft 6 in (10.2 m)	39 3/8 in (1.0 m)	110 lb/sq (49.8 kg)	1 square 100 ft^2 (9.29 m^2)	20 rolls/pallet ≈ 2,200 lb (996 kg)/pallet	UL Listed; Meets ASTM D6223 criteria for Type II products; Meets various FM constructions and severe hail requirements.
33 ft 6 in (10.2 m)	39 3/8 in (1.0 m)	110 lb/sq (49.8 kg)	1 square 100 ft^2 (9.29 m^2)	20 rolls/pallet ≈ 2,200 lb (996 kg)/pallet	UL Listed; Meets ASTM D6223 criteria for Type II products; Meets various FM constructions and severe hail requirements.
33 ft 6 in (10.2 m)	39 3/8 in (1.0 m)	110 lb/sq (49.8 kg)	1 square 100 ft^2 (9.29 m^2)	20 rolls/pallet ≈ 2,200 lb (996 kg)/pallet	UL Listed; Meets ASTM D6223 criteria for Type II products; Meets various FM constructions and severe hail requirements.
33 ft 6 in (10.2 m)	39 3/8 in (1.0 m)	110 lb/sq (49.8 kg)	1 square 100 ft^2 (9.29 m^2)	20 rolls/pallet ≈ 2,200 lb (996 kg)/pallet	UL Listed; Meets ASTM D6223 criteria for Type II products; Meets various FM constructions and severe hail requirements.

***NOTE:** All sizes and weights shown are nominal and subject to normal manufacturing tolerances.

	PRODUCT DESCRIPTION AND USES	APPLICATION METHOD
MEMBRANES	**DERBICOLOR P** is a high quality 4.1 mm (161 mil) granule surfaced,* APP membrane. Derbicolor P is single reinforced 250 gram polyester mat reinforced with glass strands that provides high tensile properties and puncture resistance. May be used as roofing and flashing membrane.	Permastic with heat welded laps or heat welded
	DERBICOLOR P-FR is a high quality 4.1 mm (161 mil) granule surfaced,* fire-resistant APP membrane. Derbicolor P FR is single reinforced 250 gram polyester mat reinforced with glass strands that provides high tensile properties and puncture resistance. May be used as roofing and flashing membrane.	Permastic with heat welded laps or heat welded
	DERBICOLOR P-FR-CR is a high quality 4.1 mm (161 mil) highly reflective granule surfaced,* fire-resistant APP membrane. Derbicolor P FR CR is single reinforced 250 gram polyester mat reinforced with glass strands that provides high tensile properties and puncture resistance. May be used as roofing and flashing membrane, and as walkway material.	Permastic with heat welded laps or heat welded
	DERBIBRITE is a high quality 3.5 mm (140 mil) fiberglass/polyester composite mat with an acrylic top surface to provide maximum reflectivity, high tensile properties and puncture resistance. May be used as roofing and flashing membrane. Meets ENERGY STAR initial and aged solar reflectance requirements, test method ASTM C1549, ASTM C1371 and ASTM E408 for determination of reflectivity and emittance.	Permastic with heat welded laps
	DERBIPURE is a 3.5 mm (140 mil) bitumen free waterproofing membrane based on vegetal components reinforced with a composite glass/polyester reinforcement and coated with a highly reflective surface.	Permastic, mechanically fastened or heat welded
BASE SHEETS	**DERBIBASE ULTRA** is a premium, high quality 3.0 mm (120 mil) APP modified base/ply sheet designed to provide easy mechanical or Permastic adhesive application. Derbibase Ultra is mid-reinforced with a fiberglass mat to provide tensile, tear and puncture strength while maintaining sheet flexibility.	Permastic, mechanically fastened or heat welded
	DERBIBASE is a high quality 2.0 mm (80 mil) APP modified base/ply sheet. Derbibase is mid-reinforced with a fiberglass mat to provide tensile, tear and puncture strength while maintaining sheet flexibility.	Permastic or mechanically fastened
	DERBIBASE HV is a high quality 3.0 mm (120 mil) APP modified base/ply sheet specially designed for use in high velocity wind areas. Derbibase HV is mid-reinforced with a 220 gram polyester mat combined with fiberglass runners to provide tensile, tear and puncture strength.	Mechanically fastened
	PRS MODIFIED GLASS BASE is a SBS polymer modified bitumen base sheet reinforced with a non-woven glass fiber mat. This base sheet is intended for use in place of a regular fiberglass base ply with any Derbigum membrane in a multi-ply roof membrane assembly, especially when the base ply is to be mechanically fastened.	Permastic, hot asphalt or mechanically fastened
	PRS GLASS BASE is an oxidized asphalt fiberglass base sheet for use in applicable Derbigum specifications.	Hot asphalt or mechanically fastened
	PRS VENTED BASE is a heavyweight venting base sheet constructed with a fiberglass mat coated with asphalt. The bottom surface is embedded with mineral granules and embossed with a pattern.	Mechanically fastened
	PRS SA BASE is a SBS modified asphalt, self adhered, fiberglass reinforced base sheet with a white, fire resistant coating that is applied directly to the top surface of the fiberglass membrane.	Self adhered
	PRS GLASS PLY VI is a premium fiberglass ply sheet for use in applicable Derbigum specifications.	Hot asphalt or mechanically fastened
	PRS GLASS PLY IV is a standard fiberglass ply sheet for use in applicable Derbigum specifications.	Hot asphalt or mechanically fastened

LENGTH	WIDTH	WEIGHT	COVERAGE*	PACKAGING	CERTIFICATIONS
33 ft 6 in (10.2 m)	39 3/8 in (1.0 m)	105 lb/sq (47.6 kg)	1 square 100 ft² (9.2 m²)	20 rolls/pallet ≈ 2,100 lb (952 kg)/pallet	UL Listed; Meets ASTM D6222 criteria for Type I products; Meets various FM constructions & severe hail requirements.
33 ft 6 in (10.2 m)	39 3/8 in (1.0 m)	105 lb/sq (47.6 kg)	1 square 100 ft² (9.2 m²)	20 rolls/pallet ≈ 2,100 lb (952 kg)/pallet	UL Listed; Meets ASTM D6222 criteria for Type I products; Meets various FM constructions & severe hail requirements.
33 ft 6 in (10.2 m)	39 3/8 in (1.0 m)	105 lb/sq (47.6 kg)	1 square 100 ft² (9.29 m²)	20 rolls/pallet ≈ 2,100 lb (952 kg)/pallet	UL Listed; Meets ASTM D6222 criteria for Type I products; Meets various FM constructions & severe hail requirements.
33 ft 6 in (10.2 m)	39 3/8 in (1.0 m)	94 lb/sq (42.6 kg)	1 square 100 ft² (9.29 m²)	20 rolls/pallet ≈ 1,880 lb (852 kg)/pallet	UL Listed; Meets ASTM D6223 criteria for Type I products; Meets various FM constructions & severe hail requirements.
33 ft 6 in (10.2 m)	39 3/8 in (1.0 m)	94 lb/sq (42.6 kg)	1 square 100 ft² (9.29 m²)	20 rolls/pallet ≈ 1,880 lb (852 kg)/pallet	UL Listed; Meets ASTM D6509 criteria & various FM constructions
49 ft 6 in (15.0 m)	39 3/8 in (1.0 m)	72 lb/sq (32.6 kg)	1.5 squares 150 ft² (13.9 m²)	20 rolls/pallet ≈ 2,160 lb (978 kg)/pallet	UL Listed; Meets ASTM D6509 criteria & various FM constructions
66 ft 5 in (20.1 m)	39 3/8 in (1.0 m)	47 lb/sq (21.3 kg)	2 squares 200 ft² (18.5 m²)	20 rolls/pallet ≈ 1,880 lb (852 kg)/pallet	UL Listed; Meets ASTM D6509 criteria & various FM constructions
49 ft 6 in (15.0 m)	39 3/8 in (1.0 m)	72 lb/sq (32.6 kg)	1.5 squares 150 ft² (13.9 m²)	20 rolls/pallet ≈ 2,160 lb (978 kg)/pallet	Meets ASTM D6509 criteria & various FM constructions
108 ft (32.9 m)	36 in (0.9 m)	31 lb/sq (14 kg)	3 squares 291.7 ft² (27 m²)	20 rolls/pallet ≈ 1,860 lbs (844 kg)/pallet	Meets ASTM D6163 Type I criteria & various FM constructions
108 ft (32.9 m)	36 in (0.9 m)	≈ 26.2 lb/sq (11.8 kg)	3 squares 291.7 ft² (27 m²)	20 rolls/pallet ≈ 1,570 lb (712 kg)/pallet	UL Listed G2 Classification; Meets ASTM D4601 Type II & various FM constructions
32 ft 11 in (10.2 m)	36 in (0.9 m)	≈ 87 lb/sq (39.4 kg)	1 square 108 ft² (10 m²)	20 rolls/pallet ≈ 1,740 lbs (789 kg)/pallet	Meets ASTM D4897 Type II
66 ft 10 in (20.4 m)	39 3/8 in (1.0 m)	≈ 31.2 lb/sq (14.1 kg)	2 squares 180 ft² (16.7 m²)	25 rolls/pallet ≈ 1,560 lb (708 kg)/pallet	Meets ASTM D4601 Type II criteria
180 ft (54.9 m)	36 in (0.9 m)	≈ 9.9 lb/sq (4.5 kg)	5 squares 487 ft² (45.2 m²)	20 rolls/pallet ≈ 990 lbs (449 kg)/pallet	UL Listed G2Classification; Meets D2178 criteria for Type VI & various FM constructions
180 ft (54.9 m)	36 in (0.9 m)	≈ 9 lb/sq (4 kg)	5 squares 487 ft² (45.2 m²)	20 rolls/pallet ≈ 900 lbs (408 kg)/pallet	UL Listed G1 Classification; Meets D2178 criteria for Type IV & various FM constructions

*__NOTE:__ All sizes and weights shown are nominal and subject to normal manufacturing tolerances.

ADHESIVES

PRODUCT DESCRIPTION AND USES	APPLICATION METHOD
ASPHALT PRIMER is an asphaltic based primer used to improve adhesion to concrete, metal and porous insulation surfaces or recover applications.	Roll, brush or spray application
PERMASTIC is a one-part, thixotropic asphaltic based adhesive specially formulated for adhering the field of Derbigum roofing membranes and base plies in all approved specifications. Permastic is a low-odor, low-VOC, asbestos free product which can be used with confidence over a wide range of application conditions.	Notched squeegee or spray applied
PERFLASH is a premium grade modified asphalt flashing cement specially formulated for adhering Derbigum flashing membranes to vertical surfaces in all approved specifications. Perflash's asbestos free formation is designed to be used in both cold and warm climates and on a variety of surfaces. Perflash may be used for filling pitch pans, setting roof drain leads, metal flashing components, etc.	Trowel or gloved hand
PLASTIC ROOF CEMENT Made of refined asphalt, solvents and non-asbestos fillers to be used as to temporarily patch for cracks, breaks in roof surfaces, daily water cutoffs or roofing metal embedment	Trowel, putty knife or gloved hand
DERBIBOND LR is a highly elastomeric, one-step, all-purpose, foam adhesive designed to adhere a variety of insulation types, board stocks and to most roof substrates in both new and re-roof applications.	See manufacturer's list of approved applicators
DERBIBOND LR Green is a highly elastomeric, one-step, all-purpose, foam adhesive that has a 45% renewable material content. Designed to adhere a variety of insulation types, board stocks and to most roof substrates in both new and re-roof applications	See manufacturer's list of approved applicators
DERBIBOND PG is a fast-acting, dual-component, low-rise polyurethane foam adhesive designed to adhere a variety of insulation types, board stocks and to most roof substrates in both new and re-roof applications.	Approved low pressure pump cart
Olybond 500 Spot Shot is a fast-acting, two component, low-rise polyurethane foam adhesive designed to adhere to a wide selection of common roof decks, insulation types and materials. Spot Shot is perfect for crickets, smaller roofs, hard to reach areas and rooftop repairs.	Spot Shot applicator
Olybond 500 is a fast-acting, two component, low-rise polyurethane foam adhesive designed to adhere to a wide selection of common roof decks, insulation types and materials.	PaceCart 2
Olybond 500 Green is a dual-component, low-rise polyurethane foam adhesive based on renewable resources. Designed to adhere a variety of insulation types, board stocks and to most roof substrates in both new and re-roof applications.	Spot Shot applicator or PaceCart 2
Insta Stik is a single-component, moisture-cured polyurethane adhesive for attaching compatible roof insulation boards to roof decks and substrates.	Hose and Nozzle application

WEIGHT	COVERAGE*	PACKAGING	CERTIFICATIONS
5 gallon pails (19 L) 55 gallon drums (208 L)	Minimum of 0.5 - 0.75 gal/sq (0.2-0.3 L/m^2) Absorption rate will vary	42 pails/pallet ≈ 2,150 lb (975 kg)/pallet 4 drums/pallet ≈ 2,250 lb (1,022 kg)/pallet	UL Listed; FM approved and ASTM D41;
5 gallon pails (19 L) 55 gallon drums (208 L) 350 gallon reusable tank (1,323 L)	Minimum of 1.5 - 2.5 gal/sq (0.6 - 0.8 L/m^2) Absorption rate will vary	42 pails/pallet ≈ 2,150 lb (975 kg)/pallet 4 drums/pallet ≈ 2,250 lb (1,022 kg)/pallet 1 drum ≈ 3,800 lb (1,725 kg)	UL Listed; FM approved
30 ounce cartridge (0.88L) 3 gallon pails (11.4 L) 5 gallon drums (18.9 L)	Coverage will vary with application and absorption rate	12 cartridges/box 3 gallon pails #/pallet ≈ 2,150 lb (975 kg)/pallet 5 gallon pails #/pallet ≈ 2,150 lb (1,022 kg)/pallet	
5 gallon pails (19 L) 55 gallon drums (208 L)	Coverage will vary with application and absorption rate	42 pails/pallet ≈ 2,150 lb (975 kg)/pallet 4 drums/pallet ≈ 2,250 lb (1,022 kg)/pallet	Meets ASTM D-4586 Type 1
4 - 1.5 L cartridges per case	600 ft^2 (55.74 m^2)	Packaging varies depending on amount ordered.	UL Listed; FM approved
4 - 1.5 L cartridges per case	600 ft^2 (55.74 m^2)	Packaging varies depending on amount ordered.	
5 gallon box set (18.9 L) 15 gallon drum set (56.78 L) 50 gallon tank set (189 L)	Box: 2,000 - 2,500 ft^2 (185-232 m^2) Drum: 6,000 - 7,500 ft^2 (557-696 m^2) Tank:20,000 - 25,000 ft^2 (1,860 - 2,322 m^2)	Packaging varies depending on amount ordered.	UL Listed; FM approved
4 - 1.5 L cartridges per case	4 - 6 squares	Packaging varies depending on amount ordered.	UL Listed; FM approved
5 gallon box set (18.9 L)	10 - 20 squares	Packaging varies depending on amount ordered.	UL Listed; FM approved
4 - 1.5 L cartridges per case 5 gallon box set (18.9 L)	4 - 6 squares	Packaging varies depending on amount ordered.	UL Listed; FM approved
30 lb(13.6 kg) 23 lb (10.43 kg) chemical net weight	≈ 9 squares	40 tanks/pallet ≈ 1,250 lb (566.9 kg)/pallet	UL Listed; FM approved

*__NOTE:__ All sizes and weights shown are nominal and subject to normal manufacturing tolerances.

	PRODUCT DESCRIPTION AND USES	APPLICATION METHOD
INSULATION/COVERBOARD	**DERBIBOARD** is a high performance Polyisocyanurate insulation board designed to provide a clean, strong base for a variety of roofing systems. The polyiso foam has superior fire resistance as well as the ability to retain high "R" values. The foam core is integrally bonded to inorganic coated glass facers for added strength, dimensional stability and resistance to mold growth.	Perlok fasteners, hot asphalt or low rise foam (per mfg recommendations)
	DERBIBOARD CA is a high performance Polyisocyanurate insulation board designed to provide a clean, strong base for a variety of roofing systems. The polyiso foam has superior fire resistance as well as the ability to retain high "R" values. The foam core is integrally bonded to inorganic coated glass facers for added strength, dimensional stability and resistance to mold growth. Derbiboard CA is specially manufactured for use with asphaltic cold adhesives.	Perlok fasteners, hot asphalt or low rise foam (per mfg recommendations)
	DERBIBOARD or DERBIBOARD CA Tapered is offered in a variety of slopes to achieve positive drainage to prevent ponding as well as long term thermal resistance.	Hot asphalt or low rise foam (per mfg recommendations)
	ROXUL Monoboard® is a rigid, single density, dimensionally stable, mineral wool insulation board. Roxul's unique non-directional structure is denser than traditional insulations, reducing airflow and sound transmissions for excellent noise reduction. Mineral wool also has superior fire resistance, the ability to retain high "R" values in colder temperatures and resistance to mold growth.	Permastic or mechanically fastened (per mfg recommendations)
	ROXUL Monoboard® Plus is a rigid, single density,dimensionally stable, mineral wool insulation board coated with a top layer of bitumen. Roxul's unique non-directional structure is denser than traditional insulations, reducing airflow and sound transmissions for excellent noise reduction. Mineral wool also has superior fire resistance, the ability to retain high "R" values in colder temperatures and resistance to mold growth.	Permastic, hot asphalt or mechanically fastened (per mfg recommendations)
	ROXUL TopRock® is a rigid mineral wool insulation board with a high-density coverboard for durability and enhanced strength. Roxul's unique non-directional structure is denser than traditional insulations, reducing airflow and sound transmissions for excellent noise reduction. Mineral wool also has superior fire resistance, the ability to retain high "R" values in colder temperatures and resistance to mold growth.	Permastic or mechanically fastened (per mfg recommendations)
	ROXUL TopRock® DD Plus is a rigid mineral wool insulation board with a high-density coverboard coated with a top layer of bitumen. Roxul's unique non-directional structure is denser than traditional insulations, reducing airflow and sound transmissions for excellent noise reduction. Mineral wool also has superior fire resistance, the ability to retain high "R" values in colder temperatures and resistance to mold growth.	Permastic, hot asphalt or mechanically fastened (per mfg recommendations)
COATINGS	**PERMACOOL PRIMER** is a proprietary, thin viscosity, water-based light grey primer formulated to promote the adhesion of Permacool to Derbigum, Derbicolor and Derbibrite membrane surfaces.	Airless spray-gun or roller
	PERMACOOL is a proprietary water-based white, highly reflective, high performance roof coating. Formulated with a unique polymer resin blend, to provide superior adhesion to Derbigum, Derbicolor and Derbibrite membrane surfaces. Excellent water resistance.	Airless spray-gun or roller
	PERMALUME is a premium grade fibered aluminum roof coating designed for applications where fire retardants are not required.	Roller or brush applied

LENGTH	WIDTH	WEIGHT	COVERAGE*	PACKAGING	CERTIFICATIONS
48 in, 96 in (1.22 m, 2.44 m)	48 in (1.22 m)	Varies	N/A	Packaging varies depending on the thickness of board. Refer to the product data sheet.	UL Listed; FM approved and ASTM C1289-95, Type II
48 in, 96 in (1.22 m, 2.44 m)	48 in (1.22 m)	Varies	N/A	Packaging varies depending on the thickness of board. Refer to the product data sheet.	UL Listed; FM approved and ASTM C1289-95, Type II
48 in (1.22 m)	48 in (1.22 m)	Varies	N/A	Packaging varies depending on the thickness of board. Refer to the product data sheet.	UL Listed; FM approved and ASTM C1289-95, Type II
48 in (1.22 m)	48 in (1.22 m)	Varies	N/A	Packaging varies depending on the thickness of board. Refer to the product data sheet.	UL Listed; FM approved
48 in (1.22 m)	48 in (1.22 m)	Varies	N/A	Packaging varies depending on the thickness of board. Refer to the product data sheet.	UL Listed; FM approved
48 in (1.22 m)	48 in (1.22 m)	Varies	N/A	Packaging varies depending on the thickness of board. Refer to the product data sheet.	UL Listed; FM approved
48 in (1.22 m)	48 in (1.22 m)	Varies	N/A	Packaging varies depending on the thickness of board. Refer to the product data sheet.	UL Listed; FM approved
N/A	N/A	10.2 lb/gal (1.22 kg/L)	2 coat application 1st: 0.5 gal/sq (1 gal/sq on Derbicolor) 2nd: 1.5 gal/sq at 90° to first coat	5 gallon pails (19 L); 42 pails/pallet ≈ 2,150 lb (975 kg) 55 gallon drums (208 L); 4 drums/pallet ≈ 2,250 lb (1,022 kg)	ASTM D6083
N/A	N/A	11.2 lb/gal (1.34 kg/L)	2 coat application 1st: 0.75 gal/sq (1 gal/sq on Derbicolor) 2nd: 1.25 gal/sq at 90° to first coat	5 gallon pails (19 L); 42 pails/pallet ≈ 2,150 lb (975 kg) 55 gallon drums (208 L); 4 drums/pallet ≈ 2,250 lb (1,022 kg)	
N/A	N/A	8.5 lb/gal (1.01 kg/L)	75-100 ft^2/gal	5 gallon pails (19 L); 36 pails/pallet ≈ 1,530 lb (693.9 kg) 55 gallon drums (208 L); 4 drums/pallet ≈ 1,870 lb (848.2 kg)	UL Listed; FM approved and ASTM D2824, Type II

*__NOTE:__ All sizes and weights shown are nominal and subject to normal manufacturing tolerances.

1.0 DESIGN CONSIDERATIONS

1.1 Building Codes & Regulatory Agencies: The structural roof deck over which the DERBIGUM roofing system is to be installed must conform to all applicable local or model building codes. Current recommendations from the FM Global, or requirements for Underwriter's Laboratories (UL) Constructions/Classifications, or other building code requirements for roofing must be considered at the time of design.

DERBIGUM assumes no responsibility for determining code or insurance requirements. DERBIGUM will not be responsible for wind related damages, hail, mold, natural occurrences or design unless additional guaranty rider is purchased.

1.1.1 Specifications and Plan Review: Any review of roof specifications or plans by DERBIGUM is for the sole purpose of determining DERBIGUM's material compatibility.

1.1.2 DDL Specifications: For tear-off and replacement roofs over concrete or insulated steel decks where the installation of a tapered insulation system is not possible, DERBIGUM offers the DDL Specification in a low slope situation. The information addressed in Section 15.0 lists the requirements for roof projects that will qualify for a DDL guaranty.

1.2 Reference Documents: The current edition of "The Roofing and Waterproofing Manual," published by the National Roofing Contractors Association (NRCA) forms the basis for DERBIGUM Roof Specifications over various substrates and under varying service conditions.

The joint NRCA/ARMA publication, "Quality Control Recommendation for Polymer Modified Bitumen Roofing" forms the basis for procedures shown in this manual.

1.3 Vapor Retarders: The necessity for inclusion of a vapor retarder in the roofing assembly should be determined by the building designer based on current or anticipated facility occupancy requirements. The current edition of the NRCA Energy Manual contains recommendations for inclusion (or exclusion) of vapor retarders in the roofing assembly depending on geographic area, anticipated interior relative humidity and dew point calculations. DERBIGUM assumes no responsibility for determining whether or not a vapor retarder is to be included in the roofing assembly, the performance of any vapor retarder membrane specified to be used in the roof system, or damage to the Derbigum roofing membrane assembly caused by failure to include an effective vapor retarder in the roofing assembly.

1.4 Expansion Joints: Although Derbigum roofing membranes are manufactured with adequate physical properties to compensate for normal thermal loading on the roofing membrane, expansion joints should be included in the roof deck and the roofing assembly as recommended in the current edition of the NRCA Roofing and Waterproofing Manual.

Typical field experience indicates expansion joints should be considered under the following conditions:

- Every 200 to 300 lineal feet of roof deck.
- Where the structural deck changes directions.
- Where different deck types intersect.
- Whenever additions are connected to existing buildings.
- At re-entry corners.

DERBIGUM assumes no responsibility for rupturing or splitting of the Derbigum roofing membrane caused by failure to include functional expansion joints in the roof area.

1.5 Area Dividers/Control Joints: Area dividers may be used to separate roof areas where expansion joints are not appropriate. Area dividers should not restrict the flow of surface drainage water, or additional drains should be installed to facilitate roof drainage.

1.6 Drainage of Roof Surfaces: The roof deck/roof substrate must be designed to result in positive drainage from the roof surface to interior or perimeter drainage systems. In general, the roof surface should be clear of all standing water within 72 hours. Drainage may be facilitated by sloping the structural deck, installation of tapered roof insulation, crickets/saddles, or by installing additional roof drains. The recommendations for roof slope and drainage contained in the current edition of the NRCA Roofing and Waterproofing Manual should be followed in the design of the roofing assembly. Due to the thickness of the Derbigum membrane, minor water accumulation may occur at the finished laps. This occurrence, as well as minor "bird baths," are not considered ponding conditions. DERBIGUM Guaranties exclude areas of ponding water on the roof surface from guaranty coverage *(see Section 14.0 in this publication).*

1.6.1 Drainage of Roof Systems for DDL Specifications: The roof deck/roof substrate of the specified DDL roof system allows standing water for up to seven days after the end of rain. Within the seven day time frame the standing water must have evaporated or drained from the roof surface. **Note: If standing water is a constant situation, then this roof does not qualify for a DDL Guaranty** *(see Section 15.0 for DDL requirements).*

1.7 Walkways and Walkway Material: Walkways should be included on the roof surface at each roof access point, beneath ladders to adjacent roof areas and around mechanical equipment.

If a logical traffic pattern between roof mounted equipment units can be established, a continuous and dedicated walkway should be installed to provide additional protection for the Derbigum roofing membrane against mechanical and foot traffic damage. One additional layer of Derbigum or Derbicolor may be used for walkways.

The DERBIGUM walkway membrane may be adhered with Permastic, or by heat welding over the Derbigum roofing membrane.

1.8 Flashings: To minimize shear and tensile forces, flashings should be adhered only to walls, curbs and nailers that are fastened to the deck or deck structural system. *Refer to Section 13.0 for complete flashing and detail recommendations.* (Details shown are for minimum specifications). Construction of flashing membranes must be of the same number and type of plies as in the field area. For those details not shown, DERBIGUM accepts NRCA recommended details for modified bituminous roof membrane assemblies.

1.9 Roof Replacement/Tear-Off: The decision to replace or recover an existing roof is the responsibility of the building owner, specifier or contractor. Replacement should be considered mandatory if the existing roof system is deteriorated or if leaving the roof in place creates potential problems for the performance of the recover system. All specifications in this guide are acceptable for roof replacement/tear-off.

1.10 Recover Recommendations: In order to obtain a DERBIGUM Guaranty for any roofing installation applied over an existing roofing assembly, DERBIGUM requires the completion of an approved nondestructive evaluation using infrared, electronic capacitance, or nuclear methods/technology. In lieu of a nondestructive evaluation, core cuts may be taken a minimum of one every 10 squares in the existing roof assembly (i.e., at least 4 ft x 4 ft roof cuts or cylindrical plugs of all existing roofing materials), down to the structural deck to confirm the existing roof is dry and free of trapped moisture. The DAC must provide written verification to DERBIGUM of the method used for determining the condition of the existing roof system. This written verification must include a roof diagram indicating where core cuts were taken, or a copy of the nondestructive roof scan. The DAC must also confirm that all wet roofing materials have been entirely removed and replaced prior to recover. DERBIGUM requires all existing membrane flashing and stripping plies, drain leads, roof jacks, pitch pans and VTR be removed. The decision to reuse existing metal components is the responsibility of the designer. A verified moisture scan and signed certificate need to completed before substrate is approved for recover.

It is the responsibility of the DAC, architect or roof system designer to determine the suitability of the existing lightweight insulating concrete (LWIC) roof deck in recover or tear-off applications. The DAC must provide written confirmation that the roof deck has been investigated and determined dry prior to recover.

DERBIGUM will not be responsible for determining the suitability of any lightweight insulating concrete roof decks or existing substrates to receive a Derbigum recover roof system.

The use of lightweight insulating fills over existing structural concrete roof decks, vapor barriers or existing roofing membrane systems is not recommended unless inspected and accepted in writing by the lightweight fill manufacturer. Additionally, DERBIGUM recommends one way roof vents be installed at the rate of one every ten squares.

In all applications (new, tear-off, & recover), LWIC and cellular concrete applications installed over non-vented substrates must be pre-approved in writing by the LWIC manufacturer on an individual job basis. *(Please refer to the guaranty Section 14.0 of this manual for additional requirements regarding guaranties in recover or tear-off applications.)*

1.10.1 Recover with Recovery Roof Insulation: Roof insulation boards used in recover applications must be one of the following: a minimum 1/2 inch (1.3 cm) thick wood fiber, 3/4 inch (1.9 cm) Perlite, 1 inch (2.54 cm) Derbiboard or other polyisocyanurate with approved cover board, 1/2 inch (1.3 cm) gypsum roof board, 1 inch (2.54 cm) Roxul monoboard or 1/2 inch (1.3 cm) ISO HD. As code and insurance criteria permit, thicker insulation may be required. Additionally, thicker insulations may be used to increase the energy efficiency of the roof assembly. All existing wet roof insulation must be removed and replaced with new, dry insulation prior to installation of the Derbigum roof system. When recovery insulation is to be installed over an existing aggregate surfaced roof, all loose aggregate must be removed from the existing roof and the roof surface leveled prior to application of the Derbigum roof system. If recovery insulation is to be adhered to the existing roof surface, the prepared existing smooth roof surface must be clean and primed with Derbigum Asphalt Primer according to directions. The primer must be allowed to dry prior to adhesive application of the recovery roof insulation. Recovery roof insulation must then be adhered to the existing smooth roof surface in continuous moppings of Type III asphalt or low rise foam insulation adhesive. Low rise foam must be clean and primed if required by manufacturer. Adhesion should be verified by bonded pull test conducted by low rise foam manufacturer and the test report forwarded to DERBIGUM Tech Services. As an alternate method, depending on deck type, the new recovery insulation may be mechanically attached through the existing roofing assembly to the structural roof deck in accordance with current FM Global recommendations for roof system securement.

CAUTION: If the existing waterproofing bitumen is coal tar pitch, penetration of the existing roofing membrane with mechanical fasteners may result in pitch drippage to the interior at fastener penetrations, and mechanical attachment of the new roofing materials through the existing roofing membrane should be avoided. DERBIGUM ASSUMES NO RESPONSIBILITY FOR PITCH DRIPPAGE FROM EXISTING ROOFING MEMBRANES. Recover System Guaranties include only DERBIGUM guaranty products installed during the new recover application. If membrane is mechanically fastened it no longer qualifies as a vapor barrier.

1.10.2 Recover without Recovery Roof Insulation: Recover of existing roofing membranes without recovery roof insulation is allowed if the existing roofing system is smooth or granular surfaced and secured to the substrate. The Derbigum membrane and base plies must always be set in Permastic or the base ply may be mechanically attached with the proper

base sheet fastening pattern through the existing roof system prior to the application of the Derbigum roof membrane in Permastic. *(See 1.10.1 regarding pitch drippage.)* Direct recovery of an existing aggregate surfaced roof membrane is not allowed.

When recovering an existing roof, the surface must be clean, dry and free of all loose granules. Priming of the existing surface and additional Permastic will be required.

1.10.3 Contractor Responsibilities: In addition to the previously referenced requirements, the DAC will be responsible for removal of all existing membrane flashings at curbs, walls, existing penetrations and replacing metal/lead flashing with new flashings including pitch pans and lead jacks. The DAC is responsible for the attachment of all existing insulation to metal/nailable decking. If existing insulation is not properly attached, reattach with appropriate fasteners down through the existing roof and insulation and into the existing deck. The DAC is to comply with all building codes related to the total number of existing roofs allowed without removal and all regulations relating to permissible live and dead loading of roof deck structures which may be applicable to roofs incorporating DERBIGUM's materials.

2.0 MATERIAL HANDLING RECOMMENDATIONS

2.1 Storage and Handling of Materials: Rolled roofing materials must be stored on end on raised platforms and protected from the weather until fully installed in the roofing system. Materials should be used on a first-in, first-out basis to minimize handling and storage damage.

Factory applied shipping shrouds are designed for shipping and handling only. These shrouds are not intended as a sole source of protection while stored on the roof.

All insulation materials should be protected from extended sun and moisture exposure, stored in a dry place, or fully covered on raised platforms and handled in a manner to minimize edge damage.

Adhesives, flashing cements and coatings should be stored in original containers with lids tightly in place and protected from weather exposure. Material from damaged containers should be used first unless contaminated or hardened, in which case the materials should be removed from the site.

2.2 Handling of Derbibrite: When installing Derbibrite membranes it is recommended that clean cloth gloves and white shoe covers be worn making sure not to transfer soil markings to the membrane.

2.3 PIMA Technical Bulletin 109: Exercise care during handling of polyiso insulation to prevent breaking or crushing of the square edges and surfaces. Remove the polyiso bundles from trucks with proper equipment. Other means of mishandling, such as pushing pallets off the edge of the truck or "rolling" the pallet across the roof deck, must be avoided.

3.0 COLD WEATHER APPLICATIONS

(For Permastic Cold Weather Applications, See 9.2)

3.1 Special precautions: Care must be taken during application of heavy polymer modified bituminous membranes when ambient temperatures are below 40°F (4.4°C). Rolled materials should be stored in protected or heated areas on the site and brought to the roof as necessary for application.

Derbigum, Derbicolor, Derbibrite, Derbibase Ultra and Derbibase rolls must be rolled out and allowed to relax.

3.2 Permastic Requires: Permastic requires warming to maintain the material at or above 65°F (18.3°C) for suitable squeegee application. Spray grade Permastic requires warming to between 100° to 110°F (37.8° to 43.3°C). Permastic pails and drums require stirring prior to application.

4.0 ROOF DECK RECOMMENDATIONS

4.1 General Roof Deck Conditions: Recommendations contained in the Deck and Structural Design Section of the current edition of The NRCA Roofing and Waterproofing Manual should be considered a part of general recommendations for Derbigum roof systems. Responsibility for design and acceptance of the roof deck and roof deck system components lies with the Architect, Engineer or Designer. DERBIGUM and/or DAC assume no responsibility for roofs designed with slope insufficient to facilitate free drainage of surface water from the roof surface or for the structural integrity of the roof deck. In addition, there are specific recommendations for various deck types that must be followed.

4.1.1 Steep Slope or Barrel Roofs with Insulation: Roof decks with slopes of 2/12 (2" in 12")(16.7%) or greater must have a NRCA approved wood nailers installed equal in thickness to the thickness of the roof insulation, secured to the structural roof deck spaced 8 ft (2.4 m) face to face and perpendicular to the slope of the roof. NRCA approved wood nailers must be a minimum 2 inches wide (5.1 cm) and shimmed to ensure that tops of nailers are flush with the adjacent surfaces of insulation boards. Roof insulation must be either mechanically attached or set into Type III asphalt or low rise adhesive between the wood nailers. System base plies and roofing membranes must be "strapped" (run parallel to roof slope) with ends mechanically secured to the wood nailers 6 inches (15.2 cm) on center across the width end of the sheet.

4.1.2 Steep Slope or Barrel Roofs without Insulation: On "nailable" roof decks with slopes of 2/12 (2" in 12")(16.7%) or greater, base sheets (and red rosin sheets, if applicable) must be mechanically secured to the roof deck using appropriate fasteners installed in accordance with FM Global attachment requirements and/or recommendations. All base sheets and roof system plies must be "strapped" (run parallel to roof slope) with roll ends staggered and mechanically secured to the roof deck using annular shank, large head ($^{15}/_{16}$ inch diameter) roofing nails installed 6 inches (15.2 cm) on center across the width

(end) of the sheet. End laps of adjacent sheets must cover the fasteners at roll ends by a minimum of 4 inches (10.2 cm) *(Refer to section 5.1.4 Steep Roofs).*

On non-nailable roof decks, roof system plies must be "strapped" (run parallel to roof slope) and set in Permastic applied at a minimum rate of 2-2 1/2 gal/sq for system base ply to insulation application and 1 1/2-2 gal/sq for between ply application. Roll ends must be mechanically secured at all nailers using appropriate fasteners at 12 inches (30.5 cm) on center across the width of the roll. End laps of adjacent sheets must cover the fasteners at roll ends by a minimum of 4 inches (10.2 cm).

4.2 Structural Concrete: Structural concrete (≈150 lb/ft^3 density or 2.4 gm/cm^3) roof decks should be trowel surfaced. The deck must be cured to equilibrium moisture content and should be free of all curing compounds that act as release agents. Prior to the application of any bituminous adhesive or asphalt materials, prime the deck surface with PRS Primer (ASTM D41), and allow the primer to dry. The NRCA "Deck Dryness Test" should then be successfully performed prior to starting work. If insulation is to be used in the roof system over a structural concrete roof deck, acceptable roof insulation must be installed in a continuous mopping of Type III asphalt.

Hot asphalt or approved low rise foam insulation adhesive may be used to secure either a minimum 3/4 inch (1.9 cm) Perlite insulation board, a minimum 1/2 inch (3.8 cm) or a 3/8 inch (0.95 cm) minimum gypsum cover board. Derbiboard maximum size is 4 ft x 4 ft and maximum thickness for any individual layer of a multi-layered application is 2.7 inches to the concrete roof deck. The concrete roof deck must be primed and allowed to dry approximately one hour. Install the roof insulation over the concrete deck in Low Rise Foam or bulbs of Type III Asphalt.

Irregularities of the structural concrete roof deck will hamper the bond that occurs between the Derbiboard and the structural concrete roof deck. Because the insulation board will only bond to the structural deck where there is direct contact, additional approved low rise foam insulation adhesive or Type III Asphalt may need to be installed in the low areas of the structural concrete deck, maximizing the contact between Derbiboard and the structural concrete deck. Scoring the insulation facer prior to installation will enhance the adhesion to the uneven concrete surface.

When no insulation is to be installed over structural concrete roof decks, the base ply must either be fully adhered in Permastic, torched or installed in hot asphalt to a dry, primed concrete deck in accordance with NRCA recommendations. DERBIGUM assumes no responsibility for blistering of Derbigum roof membranes heat fused directly to structural concrete or LW structural concrete roof decks.

4.3 Lightweight Structural Concrete (LW): Lightweight structural concrete (≈100 lb/ft^3 density or 1.6 gm/cm^3) must be treated in the same manner as "structural concrete" roof decks *(see 4.2)* for installation of a Derbigum roof system. In addition, precautions must be taken to minimize exposure of these types of decks to moisture and freezing prior to the application of the roofing system. Moisture retained in the lightweight structural concrete roof deck will be vaporized under sun load and may cause release of roof system components adhered to the deck surface. *(Refer to NRCA guidelines)*

4.4 Lightweight Insulating Concrete Roof Decks (LWIC): ≈22 to 28 lb/ft^3 density or 0.35 to 0.45 gm/cm^3 LWIC roof decks should be installed in compliance with the manufacturer's published recommendations by an applicator licensed by the manufacturer. LWIC decks must be installed over slotted (not edge vented) steel form deck, with a minimum of 2 inches (5.1 cm) cementitious fill thickness and a minimum cement to aggregate ratio of 1:6. Minimum deck density must be 22 lb/ft^3 (0.35 gm/cm^3). The deck surface should be trowel smooth, free of depressions and ridges, and must be evenly feathered at tie-in areas. Attachment of an approved base sheet, vented base sheet, Derbibase or PRS Modified Base Sheet to a LWIC deck must be by means of mechanical fasteners recommended by the concrete deck fill manufacturer or supplier. Lightweight deck fasteners must be incorporated in roofing membrane systems installed over LWIC Roof Decks, and installed in accordance with the current FM Global recommendations for quantity and spacing. Supplemental disks are required with LWIC fasteners for roofing assemblies requiring FM Global wind uplift classification.

The use of lightweight insulating fills over existing structural concrete roof decks, vapor retarders, or existing roofing membrane systems is not recommended unless inspected and accepted in writing by the roof deck manufacturer. Follow LWIC manufacturer's recommendations for surface and perimeter venting.

> In all applications, (new, tear-off, and recover) LWIC cellular concrete applications and deck conditions must be pre-approved in writing by the deck manufacturer and forwarded to the DERBIGUM Director of Technical Services.

4.5 Pre-Stressed and Pre-Cast Concrete Roof Decks: Individual deck sections must be trowel smooth, undamaged and positively secured at the end and side laps using appropriate weld plates or other specified method of securement. There must be maximum 1/8 inch (3.2 mm) surface differential between deck sections. All side and end joints of the concrete deck panels must be grouted and stripped in with either a
10 inch (25.4 cm) wide strip of approved coated fiberglass base ply, or PRS Modified Base Sheet over the primed cementitious deck panels. Attachment must be with Permastic or Type III asphalt on one side of the grouted joint only to allow for differential movement. Another option is to heat weld a 12 inch (30 cm) piece of Derbigum on one side of the primed grouted joint only to allow for differential movement.

Lightweight concrete fill installed as a leveling course must be treated similarly to requirements indicated herein for Lightweight Structural Concrete. Lightweight insulating concrete installed over concrete tees or panels is not an acceptable substrate for DERBIGUM roof specifications unless inspected and accepted in writing by the roof deck manufacturer. DERBIGUM recommends one way roof vents be installed at the rate of one every ten squares.

4.6 Poured Gypsum Roof Decks: Poured Gypsum roof decks must be a minimum of 2 inches (5.1 cm) thick and reinforced with wire mesh. Either an asphalt coated fiberglass base ply, ventilating base sheet, or PRS Modified Base Sheet must be attached in accordance with the current FM Global recommendations for quantity and spacing of appropriate fasteners prior to installation of insulation or the Derbigum roof membrane. Insulation must be adhered to a mechanically attached base ply in either approved low rise foam insulation adhesive or in solid uniform moppings of Type III Asphalt. When no insulation is specified, the Derbigum roof membrane should be bonded to a mechanically secured base ply. Do not adhere the Derbigum roof membrane directly to the gypsum roof deck.

4.7 Thermoset (asphalt/Perlite) Insulating Fill: Hot-applied fill material applied over structural roof decks to provide insulation and slope-to-drain must have a minimum compacted density of 18 to 22 lb/ft^3 (0.29 to 0.35 gm/cm^3). If the total thickness of the fill is greater than 6 inches (15.2 cm), the fill must be installed in two or more compacted layers. Thermoset insulating fills must be protected from moisture exposure prior to the time of application of the roofing membrane. Thermoset insulating fill must be covered by a glass fiber or polymer modified asphalt base sheet set in a solid mopping of Type III asphalt prior to application of Derbigum roof membranes. Treated wood nailers must be installed at all roof perimeters and projections through the roof.

4.8 Cementitious Wood Fiber Roof Deck (CWF): Cementitious wood fiber deck panels must be secured to the structure in accordance with the deck manufacturers' published recommendations. CWF roof decks must be covered with the Derbigum roof system immediately following deck installation in order to keep the deck panels dry. A red rosin sheet (required on tear-off/replacements where the factory applied facer is not present) and either a PRS Glass Base Sheet, PRS Modified Base Sheet or Derbibase must be mechanically secured to the roof deck using appropriate fasteners installed in accordance with current FM Global recommendations for quantity and spacing prior to the installation of roof insulation. Insulation over a CWF roof deck should be installed over the mechanically attached base ply(s) in low rise foam insulation adhesive or in a solid uniform mopping of Type III Asphalt. Another option is to mechanically attach the roof insulation to the CWF deck with approved deck fasteners. The approved roof insulation may be mechanically attached over a loose base sheet with approved CWF roof insulation fasteners. Under no condition must the Derbigum roof membrane be adhered directly to the cementitious wood fiber roof deck, and all Derbigum roof membranes must be installed over a minimum thickness $^1/_2$ inch (1.3 cm) of acceptable roof insulation installed over CWF roof decks.

4.9 Steel Roof Decks: Steel roof decks must be covered with one or more layers of rigid roof insulation prior to the application of the Derbigum roof membrane. A double layer of insulation is encouraged when specified insulation thicknesses permit. The base layer must be mechanically attached to the steel roof deck in accordance with current FM Global recommendations, and the top layer adhered to the base layer in either approved low rise foam insulation adhesive or in solid uniform moppings of Type III Asphalt. The insulation board thickness must be sufficient to span the flute openings without damage when subjected to normal roof construction traffic. Edges of roof insulation must be supported by the bearing surface (ribs/top flange) of the roof deck or on top of supported piece or pieces of insulation added in the flutes. Roof insulation must be installed over steel roof decks in compliance with recommendations contained in the current edition of FM Global Loss Prevention Data Sheet 1-29.

Steel roof decks must be a minimum 22 gauge (0.8 mm) secured to structural steel and at side laps in accordance with the recommendations contained in the current FM Global Loss Prevention Data Sheet 1-29 and/or local code requirements. Spans between structural members must not exceed the current FM Global recommendation for the individual deck type. The roof deck surface must be smooth and straight. The deck panels must be installed so that they run straight from panel to panel so that the insulation can be installed in straight lines with the side edges bearing on the ribs. There should be a maximum of $^1/_8$ inch (3.2 mm) difference in panel elevations at laps. Debris, moisture, ice and snow must be removed from the deck surfaces prior to installation of the roof insulation.

DERBIGUM supports the NRCA recommendation for use of galvanized steel roof decks to minimize long-term corrosion damage to the structural roof deck. Application of a permanent protective coating of paint over primed steel roof deck surfaces should be considered prior to installation of the roofing assembly.

4.10 Wood Plank Roof Decks: Wood plank roof decks must be a nominal 1 inch (2.5 cm) thick. Prior to the application of the Derbigum roof membrane or insulation, wood plank roof decks must be covered with a red rosin sheet and one of the following: Derbibase, PRS Modified Base Sheet, or PRS Glass Base ply (DERBIGUM recommends two plies of the Glass Base when the Derbigum/Derbicolor is heat welded). Do not install a Derbigum roof membrane directly to a wood plank roof deck. Fasteners for the mechanically attached base sheet must be annular shank, with minimum head diameter of $^{15}/_{16}$ inch. Holes/knots in excess of $^1/_2$ inch (1.3 cm) diameter and cracks in excess of $^1/_4$ inch (6.4 mm) in the wood roof deck must be covered with minimum 24 gauge (0.6 mm) galvanized steel secured using barbed galvanized roofing nails installed 2 inches (5.1 cm) on center around the perimeter of the repair metal.

4.11 Veneer and Non-Veneer Wood Panel Roof Decks: Veneer plywood panels must be minimum five ply laminate American Plywood Association (APA) rated minimum Grade CD, minimum $^{15}/_{32}$ inch (12 mm) thick and be rated Exposure 1 by the manufacturer. Interior grade plywood with exterior glue is not acceptable. Panels must meet or exceed a span rating of 32/16 and must be supported by structural members on a maximum of 24 inch (61 cm) centers.

Non-veneer type panels, oriented strand board (OSB) ONLY, must be APA rated, minimum $^{15}/_{32}$ inch (12 mm) thick with a span rating of 32/16. Non-APA rated panels are not acceptable substrates for Derbigum roof systems. Securement and spacing of plywood roof deck panels to the structure must be in accordance with the current recommendations of the APA. Panels must be supported by structural members on a maximum of 24 inch (61 cm) centers.

Prior to the application of the Derbigum roof membrane or insulation, plywood roof decks must be covered with a red rosin sheet and one of the following: Derbibase, PRS Modified Base Sheet, or PRS Glass Base ply (DERBIGUM recommends two plies of the Glass Base when the Derbigum/Derbicolor membrane is heat welded). Both sheets must be mechanically secured to the deck panels with $^{15}/_{16}$ inch diameter head annular shank fasteners prior to the application of the Derbigum membrane or roof insulation.

To minimize the potential of base sheet wrinkling, the base plies must be unrolled in place, tacked at one end and allowed to relax. Starting at the tacked end, work out all wrinkles prior to mechanically fastening the remaining portion of the base sheet. In cold weather applications, it is recommended the base sheet be cut in half and allowed to relax prior to application.

The red rosin separator and base ply must be installed in accordance with recommendations contained in the current edition of The NRCA Roofing and Waterproofing Manual indicating spacing and quantity of fasteners, and in accordance with the FM Global or UL recommendations or requirements (if applicable). The Derbigum roof membrane must be applied over the mechanically attached base ply(s). Do not attach Derbigum roof membrane directly to the plywood deck panels.

DERBIGUM assumes no responsibility for damage to a Derbigum roofing system caused by or related to deterioration of plywood roof decks.

4.12 Composite Roof Decks: Derbigum roof membranes may be installed over composite roof decks; however, DERBIGUM assumes no responsibility for the structural integrity of such decks, the performance of these types of roof decks, damage to the Derbigum roof membrane caused by deck components, or damage to the deck assembly during the time of application of the Derbigum roof system. Specific job approval and specifications must be obtained in writing from the DERBIGUM Director of Technical Services prior to bidding Derbigum roof membranes over a composite roof deck.

4.13 Gypsum Cover Board/Thermal Barrier Roof Boards: Derbigum roof membranes may be adhered to approved Gypsum roof boards designed for commercial roofing applications. The Derbigum membranes may be adhered using Permastic or by heat welding. Acceptable thicknesses are: $^{1}/_{4}$ inch, $^{3}/_{8}$ inch, $^{1}/_{2}$ inch or $^{5}/_{8}$ inch depending upon the application. Install per manufacturers guidelines.

4.14 Other Roof Decks: Roof decks other than those listed may be considered as acceptable substrates to receive a Derbigum roof system on an individual project basis by submittal of all pertinent information to the DERBIGUM Director of Technical Services. Acceptance must be obtained in writing prior to commencement of construction.

5.0 INSULATION RECOMMENDATIONS

5.1.1 General: Roof insulation board materials used inconjunction with Derbigum roof systems must be specifically manufactured for use as roof insulation and be listed and approved by FM Global, or the material must be listed in the Building Materials Directory of Underwriters Laboratories.

Roof insulation boards larger than 4 ft x 4 ft must be mechanically fastened. Roof insulation boards installed with asphalt, insulation adhesive or installed in a single layer application may be no larger than 4 ft x 4 ft. Insulation board joints must be staggered a minimum of 6 inches (15.2 cm) in one direction. 4 ft x 8 ft boards may be used as the bottom layer in multiple layer applications.

It is recommended that roof insulation in all roofing assemblies requiring high "R values" be installed in two layers, with the joints in each layer offset a minimum 6 inches (15.2 cm) so that there is no continuous vertical joint through the multiple insulation layers. On steel roof decks, insulation boards must be supported on longitudinal edges by the bearing surface of the steel roof deck, and insulation board edges must not be cantilevered over flute openings in the steel roof deck.

Roof insulation must be mechanically secured to steel roof decks in accordance with current recommendations by FM Global, Underwriters Laboratories Constructions/Classifications and the NRCA Roofing and Waterproofing Manual.

Roof insulation may be installed to a mechanically fastened base sheet, or to a primed structural concrete roof deck by using approved low rise foam insulation adhesive or hot asphalt.

5.1.2 Derbicant, Cant Strips and/or Tapered Edge: are required at the intersection of all roofs and vertical surfaces to be flashed or at transitions of different thicknesses of insulation. They must be placed either on top of the roof insulation or insulation stops, or directly to the deck on non-insulated decks. Cant strips must be nailed to the deck or insulation stop and to the wall, curb, or vertical nailer where possible. When nailing is not possible, or when using fiberboard or Perlite cant strips, secure using Perflash flashing cement or Type III asphalt.

Perlite cant strips must conform to ASTM C728 and wood fiber cant strips must conform to ASTM C208. Heat welding the flashing membranes requires the use of Perlite cant strips or Derbicant non flammable material that meets UL Fire Resistant Class 25. All saddles and crickets must taper to zero.

5.1.3 Insulation Stops/Nailers: Install insulation stops/nailers at all open eaves and edges. Insulation stops/nailers must be treated wood blocks the same thickness as the roof insulation and must be approximately 6 inches (15.2 cm) wide. Install wood nailers around all roof openings, vents, stacks, drains, etc. Nailers must be secured in place for the mechanical attachment of metal flanges.

5.1.4 Steep Roofs: To stabilize the insulation on steep slopes, wood insulation stops, a minimum 2 inches (5.1 cm) wide and equal to the thickness of the roof insulation, must either be installed on top of the vapor retarder (if used), or on the roof deck at right angles to the direction of the slope. These insulation stops must be secured mechanically by nails, screws or bolts to the roof deck. Nailers are not required on slopes of less than 2 inches (5.1 cm) per foot unless required by the insulation manufacturer or specifier. The insulation stops must be spaced approximately 8 ft (2.44 m) face to face on slopes of 2 to 3 inches (5.1 - 7.6 cm) per foot. On slopes greater than 3 inches (7.6 cm) per foot, nailers should be placed approximately 4 ft (1.2 m) face to face. The roof insulation must be secured to the roof deck using either Permastic, mechanical fasteners, approved low rise foam insulation adhesive, hot asphalt between the insulation stops, or in accordance with FM Global recommendations. *For further information see Section 4.1.1.*

DERBIGUM will not be responsible for penetrating through vapor barrier or retarder in recovery applications.

5.2 Roof Insulation Boards

5.2.1 Wood Fiber Roof Insulation: Wood fiber roof insulation boards must have an asphalt sealer applied to at least one side to form a sealed mopping surface, and must comply with physical properties set forth in ASTM C208 for roof insulation. Wood fiber roof insulation must be covered with an acceptable PRS Base Sheet either embedded in a uniform application of Permastic, or set in Type III asphalt prior to the application of any Derbigum roof membrane.

Acceptable thicknesses for wood fiber must be a minimum 1/2 inch (1.3 cm) for single layer and a minimum 1/2 inch (1.3 cm) in recover or overlay specifications; or the minimum thickness recommended by FM Global for FM applications. Wood fiber roof insulation must be primed prior to installing the approved base ply in Permastic. Additionally, the Permastic rate for the base ply application must be a minimum of 2 1/2 - 3 gal/sq (1.0 - 1.22 L/m^2). *See Permastic chart, page 26 for squeegee recommendations.*

5.2.2 Perlite Roof Insulation: Perlite roof insulation boards must have a factory applied asphalt sealer applied to a minimum of one side and must be lightly coated with an asphalt primer prior to receiving Permastic. Perlite roof insulation must comply with physical properties set forth in the ASTM C728. Perlite roof insulation must be covered with an approved base ply embedded in a uniform application of Permastic, or set in Type III asphalt prior to the application of any Derbigum roof membrane.

Acceptable thicknesses for Perlite insulation must be a minimum of 3/4 inch (1.9 cm) for single layer and a minimum 1/2 inch (1.3 cm) in recover or overlay specifications.

NOTE: 1/2 in (1.3 cm) Perlite roof insulation is not FM Global approved. Perlite roof insulation must be primed prior to installing the approved base ply in Permastic. Additionally, the Permastic rate for the base ply application must be a minimum of 2 1/2 - 3 gal/sq (1.0 - 1.22 L/m^2). *See Permastic chart, page 27 for squeegee recommendations.*

DERBIGUM will not be responsible for membrane blisters related to Perlite or Perlite based roof insulation boards.

5.2.3 Polyisocyanurate Roof Insulation: Plastic foamed roof insulation boards may be overlaid with either a minimum 1/2 inch (1.3 cm) thick layer of wood fiber, 1/2 inch (1.3 cm) Perlite or 3/8 inch (0.95 cm) gypsum roof cover board. The overlay insulation board must be installed by one of the following methods: Permastic, approved low rise foam insulation adhesive, hot asphalt, or by mechanically fastening in accordance to the roof insulation manufacturers recommendations. This must be in accordance with recommendations contained in the current edition of The NRCA Roofing and Waterproofing Manual.

DERBIGUM recommends the use of multiple layers of Derbiboard when the total required insulation thickness is equal to or greater than 3 inches (7.62 cm). When installing Derbiboard insulation in low rise foam insulation adhesive or hot asphalt the maximum dimension of the insulation board is 4 ft x 4 ft (1.2 m x 1.2 m).

5.2.4 Expanded Polystyrene (Bead Board) Insulation: Expanded polystyrene insulation boards (EPS) are not accepted in Derbigum Roof Systems without prior approval from the DERBIGUM Director of Technical Services.

5.2.5 Extruded Polystyrene Roof Insulation: Extruded polystyrene roof insulation boards manufactured for use in inverted roof membrane assemblies may be used in Derbigum protected membrane (PM) specifications.

5.2.6 Cellular Glass Roof Insulation: Cellular glass roof insulation boards must comply with physical properties set forth in ASTM C552. Cellular glass roof insulation in either tapered or uniform thickness boards is acceptable for use with Derbigum roof systems. Because of the nature of the material, the PRS Glass Base Sheet, Derbibase, PRS Glass Ply IV or VI must be applied in Permastic or Type III asphalt to the top surface of the insulation boards.

Acceptable thickness for cellular glass roof insulation is a minimum 1 1/2 inches (3.8 cm).

5.3 Approved Roof Insulation Fasteners

5.3.1 #12 Perlok, #14 Perlok and #15 Perlok: for use with steel, wood and concrete roof decks.

5.3.2 Perlok spike: for use with structural concrete roof decks.

5.4 Approved Roof Insulation Adhesives

5.4.1 Approved Low Rise Foam Insulation Adhesive: For use with structural concrete roof decks and Derbiboard or for adhering Derbiboard to Derbiboard. Can also be used to install Derbiboard to vapor barriers.

Figure 1: Corner Application - 4 inch ribbon spacing for adhering insulation to substrate with Low Rise Foam:

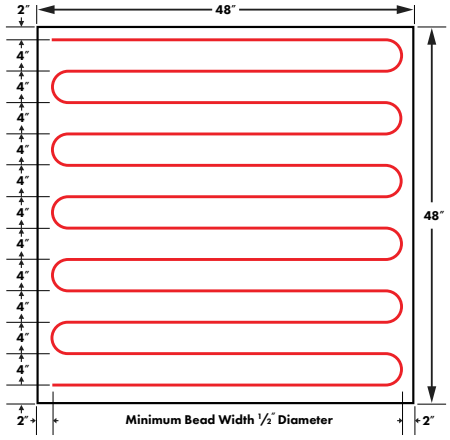


Figure 2: Perimeter Application - 6 inch ribbon spacing for adhering insulation to substrate with Low Rise Foam:

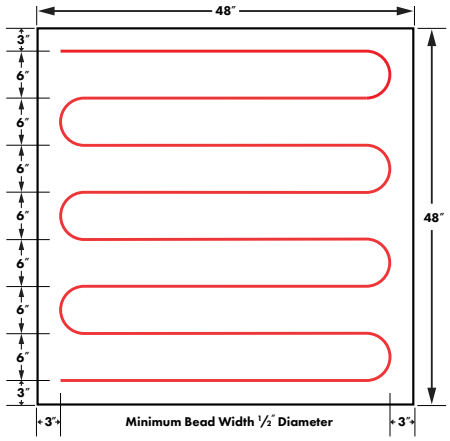
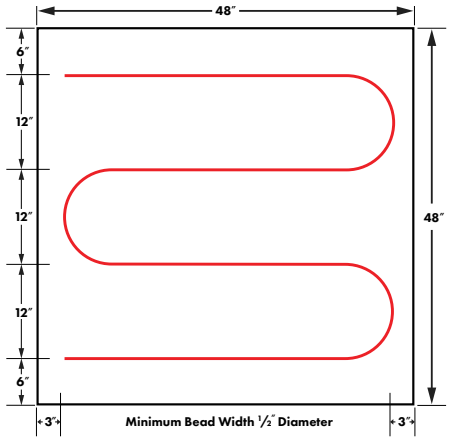


Figure 3: Field Application - 12 inch ribbon spacing for adhering insulation to substrate with Low Rise Foam:



6.0 BASE AND PLY SHEET APPLICATIONS

6.1 General: System plies and base plies used in conjunction with Derbigum roof systems must be specifically manufactured for this purpose and be listed and approved by FM Global, or listed in the Building Materials Directory of Underwriters Laboratories, Inc. Type IV & VI felts can not be installed in Permastic in a multi-ply application.

6.1.1 Nailing: Work in one direction to avoid wrinkles.

6.1.2 Valleys and Waterways: On roof slopes exceeding 1 inch (2.54 cm) the valleys and waterways must receive an extra ply of Derbigum which must be at least the width of the roll and must extend at least 8 inches (20.0 cm) up the valley area. This ply must be applied prior to the Derbigum field ply in order to prevent a back water lap in the low area. On Derbicolor/Derbibrite roof membrane systems, the extra ply must be a smooth Derbigum in order to provide a smooth and positive bond between the two membranes.

6.1.3 Back Nailing: On slopes greater than 2/12 provisions for back nailing end laps, system plies, base plies and Derbigum membranes must be provided as explained in Section 5.1.4 of this manual. Evenly space end lap fasteners with a minimum of 4 fasteners per end lap. For slopes of 2 inches (5.1 cm) or less the specifier or contractor should consider back nailing of felts based on individual job conditions. Use the strapping method for ply direction and to facilitate nailing. On non-nailable decks, provide wood nailer strips in deck. Nailers must be placed at right angles to the slope.

Back nailing of side laps is not recommended.

6.2 Approved System Ply and Base Ply Fasteners: The following fasteners are intended for use in securing approved plies to nailable decks without roof insulation. Refer to the current edition of the NRCA's Commercial Low Slope Materials Guide, or to the specific manufacturer for brand name and types of fasteners.

6.2.1 Wood Deck Fasteners: Roofing nails for use with wood decks, except plywood, must be 11 gauge barbed, galvanized with $^{7}/_{16}$ - $^{5}/_{8}$ inch (1.1 - 1.6 cm) diameter heads, long enough to enter nailers and sheathing at least $^{3}/_{4}$ inch (1.9 cm), but must not penetrate sheathing. Tin caps must be used with these nails. Large head Simplex® Nails may be used without tin caps.

Only the following may be used on wood or plywood decks: Strong Hold® one piece nails having an angular ring shank, minimum 1 inch (2.54 cm) square heads, or large-head Simplex Nails minimum $^{5}/_{16}$ inch (0.8 cm) head diameter.

6.2.2 Lightweight Deck Fasteners: Perlok CR Base sheet fastener is designed to secure base sheets to a minimum 2 inches (5.1 cm) thickness of poured lightweight insulating, concrete or various gypsums.

6.3 Other Nailable Deck Fasteners:

6.3.2 TruFast Insuldeck Loc-Nail: For base sheet attachment to cementitious wood fiber decks.

6.3.3 TruFast FM Series Fastener: Designed for base sheet attachment to lightweight insulating concrete and poured gypsum roof decks.

6.3.4 TruFast Twin Loc-Nail: Ideal for base sheet, recovery board and insulation attachment to lightweight insulating concrete, cementitious wood fiber and poured gypsum.

Figure 4: Recommended fastener placement for mechanically attaching a base ply to wood substrates. Red rosin is required on all wood decks and on tectum roof decks that do not have factory applied facers; i.e. in tear-off situations.

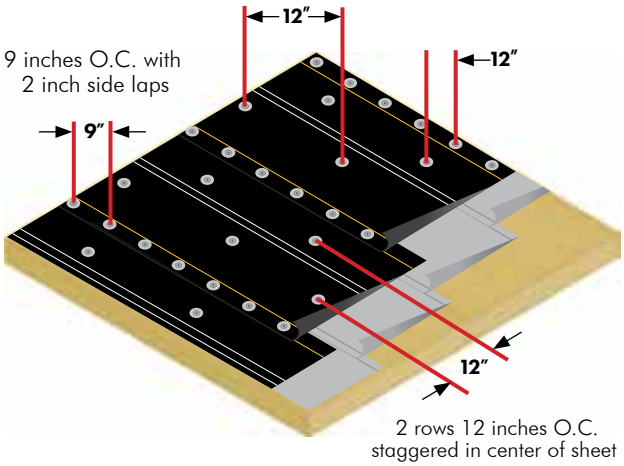
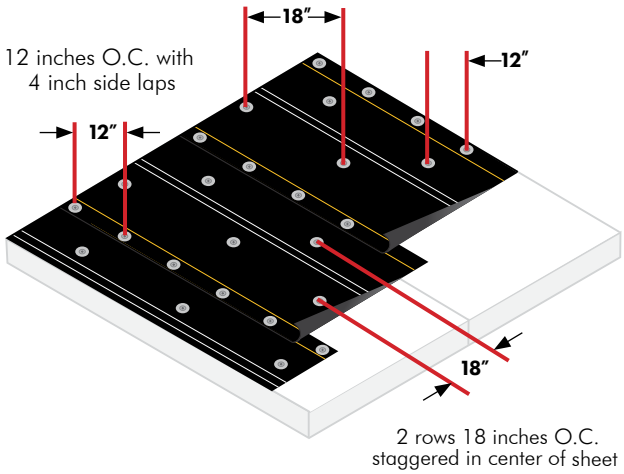
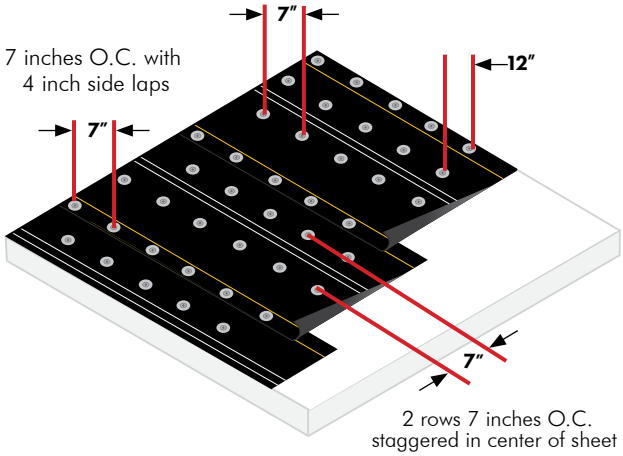


Figure 5: Recommended fastener placement for simultaneously attaching base sheet and roof insulation to metal deck. *Refer to pages 38-42 for specific fastener patterns.*



For FM Global approved fasteners, patterns, and requirements in the corners and perimeters, refer to the current FM Global Approval Guide and FM Global Property Loss Prevention Data Sheets.

Figure 6: Recommended fastener placement for attaching a base ply to field of lightweight insulating concrete.



6.4 Approved Base and Ply Sheet Products

6.4.1 Derbibase Ultra: A heavy weight APP modified base/ply sheet reinforced with a non-woven glass fiber mat that must comply with physical properties set forth in ASTM D6509. Derbibase Ultra is intended for use with Derbigum membranes in a multi-ply roof membrane assembly.

6.4.2 Derbibase: An APP modified base/ply sheet reinforced with a non-woven glass fiber mat that must comply with physical properties set forth in ASTM 6509. Derbibase is intended for use with Derbigum membranes in a multi-ply roof membrane assembly.

6.4.3 PRS Glass Base: Asphalt-coated glass fiber base sheet must comply with physical properties set forth in ASTM D4601.

6.4.4 PRS Modified Base Sheet: An SBS modified base sheet reinforced with a non-woven glass fiber mat intended for use with Derbigum membranes in a multi-ply roof membrane assembly.

6.4.5 PRS Glass Ply Felts: PRS Glass Ply IV or VI comply with ASTM D2178, Type IV or Type VI, G1 specifications.

6.4.6 PRS Vented Base Sheet: Venting asphalt coated glass fiber base sheets must comply with physical properties set forth in ASTM D3672.

6.5 Installation of Base Sheets: Approved base sheets must be applied over insulation or deck surfaces by mechanically fastening prior to application of Derbigum membranes.

Base sheets (and red rosin sheets, if applicable) must be mechanically attached to nailable roof decks, plywood decks, wood plank, and spot adhered to non-nailable roof decks prior to application of Derbigum membranes. Glass fiber base sheets must be extended over the roof deck/insulation surface and allowed to "relax" prior to attachment. All wrinkles in the base sheet must be smoothed prior to application of the Derbigum membrane. Wrinkles in the base plies will telegraph through the Derbigum membrane.

To reduce incidents of wrinkling, it is recommended that a modified base sheet be used.

Mechanical attachment of base sheets must be in compliance with current FM Global recommendations.

6.5.1 DERBIGUM/Derbibase Ultra/Derbibase Sheet in Permastic: When installing these base/ply sheets, Permastic can be applied to most standard rigid insulation boards or tapered roof insulation boards which have a top surface that is designed to resist absorption of cold adhesives or hot asphalt. Most commercial roof insulations are manufactured with a surfacing such as a fiber glass facer. Porous insulations such as Perlite or wood fiber must be sealed with an asphalt primer or the use of a pre-primed insulation material prior to applying Permastic.

When applying Permastic to Perlite or wood fiber use a minimum application rate of 2 - $2^1/_2$ gal/sq (0.8 - 1.0 L/m^2). *Refer to Section 5.0, Insulation Recommendations for specific Permastic rates when adhering base plies to insulation boards.* Installing glass ply sheets Type IV or VI in Permastic adhesive is not recommended.

6.5.2 Asphalt Type and Heating Temperatures: Mopping asphalt used to adhere roof insulation, cant strips, base plies, etc. should be Steep Grade (ASTM D312 Type III or Type IV) asphalt. Type IV, ASTM D312 asphalt must be used on slopes over $^1/_2$" in 12" (4.2%). Hot asphalt must be applied within the EVT range specified by the asphalt manufacturer and supplier. If the EVT is not known, generally recommended asphalt temperatures at the point of application (mop bucket, felt layer, mechanical mopper) are:

Type III: 400°- 450°F (204°- 232°C)

Type IV: 425°- 475°F (218°- 246°C)

Asphalt must not be heated above the flash point, above 525°F (274°C) nor held between 500°- 525°F (260° - 274°C) for more than four hours.

Asphalt moppings should be applied in a uniform layer between plies of the roofing membrane to ensure a positive bond between layers of the roofing membrane. Recommended application rate of mopping asphalt should be 23 - 25 lb/100 ft^2 (1.1 - 1.2 kg/m^2).

CAUTION: When roofing grade asphalts are heated to excessive temperatures, they can emit fumes that may be in excess of federal, state or local clean air guidelines. Heating of asphalt in standard roofing kettles may in fact violate these guidelines. To ensure compliance with established environmental guidelines, it is recommended you consult with the manufacturer of the asphalt in use or use asphalt fume reduction equipment.

6.6 Phased Construction: The NRCA defines phased construction to be "The installation of a roof system in two or more separate time intervals." DERBIGUM understands the NRCA's position on phased construction, however, we recognize that some amount of phased construction may be necessary on some projects. The base layer of membrane may be exposed for up to two weeks before the installation of the cap sheet. Preparing the surface to receive the cap sheet is critical to the finished performance of the roofing system. The DAC is responsible for the preparation of the existing base layer of membrane prior to installation of the cap sheet. Please contact the DERBIGUM Technical Services Department for recommendation on your specific project.

7.0 APPLICATION RECOMMENDATIONS FOR DERBIGUM, DERBICOLOR AND DERBIBRITE ROOF MEMBRANES

Application of the roof membrane must begin in the valley or lowest point in the roof and work must proceed up the slope to avoid back water laps.

7.1 General: Polymer modified asphalt roofing membranes must be unrolled and allowed to relax prior to application. Application of the Derbigum/Derbicolor/Derbibrite membranes directly from the factory roll may increase the incidence of wrinkling in the cross machine direction during or subsequent to application. If a multiple-head heat welding apparatus is to be used, the membranes must be unrolled to ensure alignment, heat weld the tail of the roll and re-roll for application.

7.2 Cold Weather Application: Special precautions must be taken during application of Derbigum membranes when ambient temperatures are below 40°F (4.4°C). Rolled materials must be stored in protected and heated areas on the site and brought to the roof as necessary for application. Derbigum/Derbicolor/Derbibrite/Derbibase Ultra/Derbibase rolls must be rolled out to allow the membrane to relax. The use of half sheets may be required. *Refer to Section 9.2 for additional cold weather application guidelines.*

7.2.1 Permastic Requires: Permastic requires warming to maintain the material at or above 65°F (18.3°C) for suitable squeegee application. Spray grade Permastic requires warming to between 100°- 110°F (37.8°- 43.3°C).

7.3 Roof Slope: Application must begin in the valley or lowest point in the roof and work must proceed uphill to avoid back water laps. Derbigum/Derbicolor/Derbibrite membrane may be "shingled" or "strapped." The "strapped" method is recommended over a 2/12 slope. For slopes under 2/12, the strapped method is acceptable provided there is positive slope and no back-water laps. On slopes greater than 2/12 provisions for backnailing system plies, base plies and Derbigum/Derbicolor/Derbibrite membranes must be provided as detailed in Section 5.1.4: Steep Roofs.

7.4 Application Precautions: Caution should be taken to not damage the completed Derbigum/Derbicolor/Derbibrite roof membrane surface during application. When using the heat welded method, always place a protective material or a piece of scrap membrane under the propane tank. Use two-wheel carts when possible and avoid dragging and scooting propane tanks and equipment across the membrane surface.

When using Permastic to install the base ply or the Derbigum/Derbicolor/Derbibrite roof membranes, lay the roof membranes out so that the Permastic adhesive will NOT be walked in by the roof mechanics. Permastic is "slick" when first installed and should be treated with the same precaution as hot mopping asphalt. When using Permastic, it is recommended to keep an area of the roof dedicated for cleaning the shoes of the roof mechanics. This can be a small basin or an insulation board that is covered with talc or limestone. Occasionally walking in the talc or limestone will minimize the amount of Permastic that may be "tracked" onto the finished Derbigum/Derbicolor/Derbibrite roof surface during application.

7.4.1 **Derbibrite** has a release film on the backside of the membrane for protection of the white acrylic coated top surface. As the membrane is rolled out to relax the release film must be removed. When installing the Derbibrite membrane it is recommended that clean cloth gloves be worn as not to soil the membrane. DERBIGUM recommends that 100% UV sunglasses be worn during the installation due to the high reflectivity. When walking on the Derbibrite membrane DERBIGUM recommends wearing protective shoe covers.

Coating of the side lap is not required to maintain the Energy Star® initial reflectivity rating. Coating of the side lap is for aesthetics only. PermaCool Roof Coating may be used for this purpose.

CAUTION: The application of coating on the side lap will not weather in color at the same rate as the acrylic surface that is factory applied. At a close range a variation in the hue of the white coating will be noticeable.

7.5 **Double-Layer DERBIGUM Applications:** In a double-layer Derbigum application the top layer of Derbigum/Derbicolor/Derbibrite must be off-set from the base layer of Derbigum a minimum of $^1/_2$ sheet. The top layer of Derbigum/Derbicolor may be adhered by heat welding or by setting into a uniform layer of Permastic applied at a nominal rate of $1^1/_2$ - 2 gal/sq (0.6 - 0.8 L/m^2). It is recommended that Derbibrite be installed in Permastic adhesive only. Alternative application methods must be pre-approved in writing by the DERBIGUM Director of Technical Services.

7.6 **DERBIGUM/Derbicolor Membrane Installation:** Derbigum/Derbicolor membrane may be installed either with Permastic or by heat-welding. The following two sections describe the recommended application techniques for both installation options.

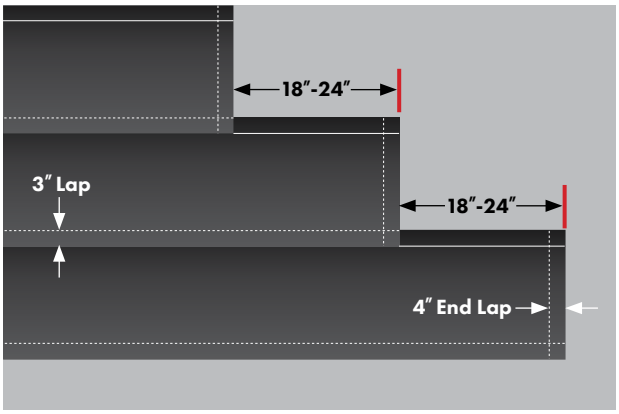
8.0 APPLICATION RECOMMENDATIONS FOR HEAT-WELDED DERBIGUM/DERBICOLOR ROOF MEMBRANES

8.1 **DERBIGUM/Derbicolor Installation Options:** Two methods of installation are recognized as being acceptable for installation of Derbigum/Derbicolor membranes: 1) Offsetting of end laps in the Derbigum/Derbicolor membrane or 2) the use of belly bands (header plies) to seal buttered ends of smooth Derbigum membranes.

8.1.1 **Offsetting of End Laps:** End Laps in the Derbigum/Derbibrite/Derbicolor membrane must be staggered (off set) a minimum of 18 inches (46 cm) to facilitate bonding of the membrane with minimum layers of material *(See Figure 7).* The outside edge of the bottom layer of the Derbigum/Derbibrite/Derbicolor membrane should be cut at a 45° angle (dog eared)*(see 9.3.1)* to provide a smooth transition for the Derbigum/Derbibrite/Derbicolor membrane at the lap area. Special attention is required at Derbigum/Derbibrite/Derbicolor membrane "T" laps (joints at the intersection of perpendicular and parallel laps) to ensure proper fusion and sealing of the Derbigum/Derbibrite/Derbicolor membrane during application.

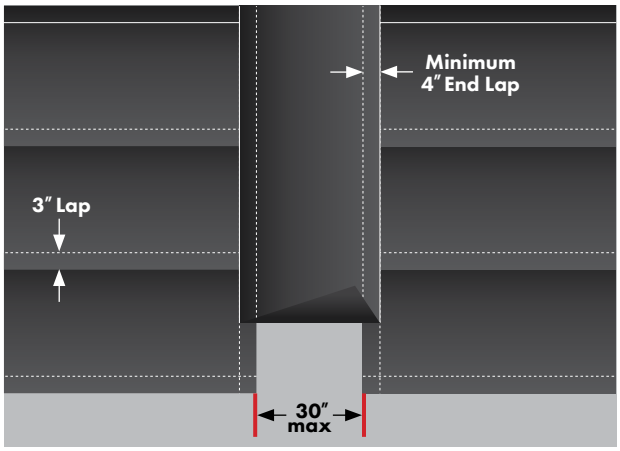
NOTE: All end laps must have granules embedded when installing Derbicolor in a header sheet configuration.

Figure 7: Staggered (Off-set) End Lap



8.1.2 **Header Sheets (Belly Bands):** Smooth or unsurfaced Derbigum roofing membrane sheets may be buttered at ends of rolls and the buttered joints closed by "header" sheets installed over buttered roll ends perpendicular to the roofing membrane sheets. Extreme caution must be taken at overlap areas of the header sheet to insure that the Derbigum membrane is positively sealed in T-lap areas at the header sheet juncture. When using a header ply the underlying end laps can be spaced a maximum 30 inches (76.2 cm) apart *(See Figure 8).*

Figure 8: Header Sheet



30" maximum for Derbigum
27" maximum for Derbicolor and Derbibrite

8.2 Heat Welding of DERBIGUM/Derbicolor membranes: The basic tools for heat welded systems include:

- Roof trowel (round nosed)
- Roofers knife
- Propane vapor tank and torch assemblies complete with regulator and pressure gauges
- Hot air/electric welder
- Minimum 20 lb (9 kg) steel roller 6 inches (15.2 cm) wide
- One Type ABC fire extinguisher for each work area

All Derbigum/Derbicolor membranes may be heat welded onto horizontal or vertical surfaces using a propane torch or hot air welder suitable for the application. A small $^{3}/_{4}$ - 1 inch (1.9 - 2.5 cm) diameter torch head is recommended for flashing and detail work. **Side and end laps of all Derbigum/Derbicolor membranes must be heat welded to provide immediate, positive sealing of the membrane at lap areas.** A minimum 20 lb (9 kg) steel roller must be used on all side and end laps, following immediately behind the propane or electric welder. The edge of the seam must be left untooled (not buttered), a continuous bead of molten asphalt must be visible at all laps/seams after application. Care must be taken during all heat welding applications not to overheat the Derbigum/Derbicolor membrane causing damage to the membrane and/or reinforcements during application.

8.3 Treatment of Side and End Laps: A minimum 20 lb (9 kg) steel roller must be used on all side and end laps, following immediately behind the propane or electric welder. Applying uniform pressure across the lap area while the asphalt is warm will ensure a positive bond. The edge of the seam must be left untooled (not buttered), a continuous bead of asphalt must be visible at all laps/seams after application *(See Figure 9)*.

When using Derbicolor, the granule surfacing must be treated at end lap areas by heating and embedding the granules into the modified asphalt using a trowel or special lap treatment equipment so that asphalt-to-asphalt fusion is attained at end lap areas. This technique is also required for adhering flashing membranes and stripping plies to field membranes.

Figure 9: Heat welding installation of Derbigum

Side laps must be a minimum 3 inches (7.6 cm) and end laps must be a minimum 4 inches (10.2 cm).

For DDL Specifications: Side laps must be a minimum 4 inches (10.2 cm) and end laps must be a minimum 6 in. (15.2 cm). *(See Section 15.0 for DDL Specifications)*

9.0 APPLICATION RECOMMENDATIONS FOR PERMASTIC APPLICATION OF DERBIGUM ROOF MEMBRANES

(All references to Derbigum will refer to Derbigum, Derbicolor or Derbibrite, unless noted.)

9.1 Permastic Application of DERBIGUM Membranes: The basic tools for Permastic adhered systems include items referenced in Permastic Informational Chart *(page 23)*.

All laps of the Permastic adhered application **MUST** be heat welded. Hot air equipment may be used on the laps in lieu of open flame torches.

9.1.1 Permastic adhesive is the only acceptable adhesive to adhere DERBIGUM roof membranes as indicated in individual DERBIGUM roof specifications. Surfaces acceptable for application of Permastic include glass fiber or polymer modified asphalt base sheets, existing prepared smooth surfaced roof membrane, concrete roof decks, or approved roof insulation and Gypsum coverboards. Permastic must be applied onto the substrate material by trowel, squeegee or spray method. Care must be taken not to spread adhesive onto the side or end lap areas of the Derbigum membrane. When spraying Permastic, Derbigum recommends installing Permastic by the squeegee method at perimeters, penetrations, HVAC or any areas that might come in contact with the Permastic over spray. Derbigum roof membrane side and end laps must be heat welded and contamination of lap areas by adhesive may inhibit bonding during this process. Be certain that all lap surfaces are free of adhesives prior to heat welding the laps.

9.2 Cold Weather Application (40°F or lower) Recommendations for Permastic Adhered Derbigum Roof Membranes: The following recommendations and considerations should be given when installing Derbigum roof membranes in Permastic during cold weather conditions.

- Pre-warm the Derbigum membrane to approximately 80°-100°F (27°-38°C). Use a warm storage area or lightly warm (do not heat weld) the underside of the roll with a roofing torch while embedding the membrane into the Permastic.
- Permastic may require warming to maintain the material at or above 65°F (18°C) for suitable application. This can be accomplished by storing the Permastic material in a heated trailer or penthouse prior to installation. Spray grade Permastic requires warming to between 100° - 110°F (37.8° - 43.3°C). Permastic pails and drums require stirring prior to application.
- The Derbigum material must be rolled out in place to allow it to relax. Pull back one half of the sheet onto itself to allow for warming on the bottom surface. The membrane needs to feel warm to the touch of the hand (i.e. over 92°F or 33°C) before it is set into the adhesive. While the membrane is relaxing, apply Permastic to the substrate. Lightly warming the backside of the Derbigum material will enhance the attachment when installed into the Permastic when outside temperature is below 40°F.

- To facilitate the relaxing process and to minimize the occurrence of membrane wrinkling, Derbigum can be cut into half sheets and allowed to relax prior to installing into Permastic.
- The header sheets may be heat fused into place to set up control grids wherever possible. The end laps are to be heat fused to the header sheets when they are overlapped into place.
- For application rates refer to the Permastic Information Chart *(page 25)* and the individual specification pages located in the Specifications & Detail Guide.
- The completed Derbigum membrane needs to be broomed or rolled prior to welding of the laps. This will help embed the membrane into the adhesive and ensure adhesive contact.

9.3 DERBIGUM Installation Options: Two methods of installation are recognized as being acceptable for installation of Derbigum membranes: Offsetting of end laps in the Derbigum membrane *(see Figure 7, page 22)* or the use of belly bands (header plies) to seal buttered ends of Derbigum membranes *(see Figure 8, page 22).*

9.3.1 Offsetting of End Laps: End laps in the DERBIGUM membrane must be staggered (offset) a minimum of 18 inches (46 cm) to facilitate bonding of the membrane with minimum layers of material. The outside edge of the bottom layer of the DERBIGUM membrane should be dog eared (by cutting a 45° angle) to provide a smooth transition for the DERBIGUM membrane at the lap area. Special attention is required at DERBIGUM membrane "T" laps (joints at the intersection of perpendicular and parallel laps) to ensure proper fusion and sealing of the DERBIGUM membrane during application *(See Figure 7, page 22).*

9.3.2 Header Sheets: Smooth or unsurfaced DERBIGUM roofing membrane sheets may be buttered at ends of rolls and the buttered joints closed by "header" sheets installed over buttered roll ends perpendicular to the roofing membrane sheets. Extreme caution must be taken at overlap areas of the header sheet to ensure that the DERBIGUM membrane is positively sealed in T-lap areas at the header sheet juncture. When using a header ply the underlying end laps can be spaced a maximum 30 inches (76.2 cm) apart *(See Figure 8, page 22).*

9.4 Application of the Derbigum Roofing Membrane in Permastic: Rolls of Derbigum roof membrane must be unrolled into position and the Derbigum membrane allowed to relax. Derbigum membrane must be shingled from the low areas on the roof or "strapped" parallel to the slope of the roof deck. End laps must be staggered a minimum of 18 inches (46 cm).

With Derbigum rolls laid out over the substrate, mark the area to which Permastic is to be applied. Pull the end of each Derbigum sheet straight back onto itself so that the sheet is folded approximately in half, or back roll while maintaining alignment of the individual sheets and uniformity of side laps. Apply Permastic uniformly over the exposed substrate area previously marked to define boundaries of the finished roofing membrane by squeegee at a minimum rate of 2-2$^1/_2$ gal/sq for system base ply to insulation and 1$^1/_2$-2 gal/sq for between ply application keeping Permastic from the side and end lap areas of adjacent Derbigum membrane. Roll the Derbigum membrane onto the Permastic adhesive commencing with the first roll maintaining alignment of the roll and uniformity of the side laps. Roll or broom the membrane as necessary to ensure embedment of the membrane into the adhesive. Repeat the procedure on the opposite end of the rolls of Derbigum membrane and set in place.

A header sheet can then be set in Permastic overlapping a minimum of 4 inches (10.2 cm) across the ends of the rolls. All edges of the header ply lapped over ends of Derbigum membrane must be heat welded and rolled with a minimum 20 lb (9 kg) steel roller.

In cold weather applications, unroll the Derbigum membrane with the black (bottom) surface of the roll up to allow the product to relax. To facilitate the relaxing process, and to minimize the occurrence of membrane wrinkling, Derbigum membrane should be cut into half sheets and allowed to relax prior to installing into the Permastic.

9.5 Treatment of Side and End Laps: A minimum 20 lb(9 kg) steel roller must be used on all side and end laps, following immediately behind the propane or electric welder. Applying uniform pressure across the lap area while the asphalt is warm will ensure a positive bond. A continuous bead of asphalt should be visible at all laps/seams after application, the edge of the seam must be left untooled (not buttered). End laps must be a minimum 4 inches and side laps 3 inches *(See Figure 9, page 23).*

NOTE: Remove excessive Permastic that is in contact with the lap by scraping smooth with a roofing trowel. Clean the affected area with mineral spirits and allow to dry prior to heat welding the lap.

For DDL Specifications: Side laps must be a minimum 4 inches (10.2 cm) and end laps must be a minimum 6 inches (15.2 cm). *See Section 15.0 for DDL specifications.*

When using Derbicolor, the granule surfacing must be treated at end lap areas by heating and embedding the granules "degranulate" into the modified asphalt using a trowel or special lap treatment equipment so that asphalt-to-asphalt fusion is attained at end lap areas. This technique is also required for adhering flashing membranes and stripping plies to field membranes.

Weather permitting, in cold weather applications (40°F or lower), leave all side and end laps open for at least an hour after application prior to sealing the laps.

9.6 Application of Derbigum Membrane Walkways: Additional layers of Derbigum membrane may be installed over Derbigum membranes to form walkways across the roof surface. Granule surfaced membranes of a contrasting color are recommended. Derbigum membranes must be heat welded or set in Perflash or Permastic on the surface of the existing roofing membrane. Roll ends may be buttered, with the Derbigum membrane extending continuously across the roof surface. No "gaps" between rolls are necessary or desirable.

An extra ply of Derbigum is required under concrete pavers or wooden sleepers of raised walkways.

SPRAY OR SQUEEGEE APPLICATION

REQUIRED ITEMS	QUANTITY	USE
Roofing Trowel (Round Nosed)	1 per crew member	Holding the side lap during torching
Roofing Knife	1 per crew member	For cutting the roofing membrane
36" Push Broom (Heavy Duty) or garden type drum roller	1 per crew member	Broom/Roll over membrane to insure full contact with Permastic
1/4 inch V-Notched Squeegee for inter-ply application 1 1/2 - 2 gal/sq	2 per crew member	Spreading of Permastic when using 5 gallon pails
3/8 inch V-Notched Squeegee for membrane to substrate 2 - 2 1/2 gal/sq	2 per crew member	Spreading of Permastic in tight areas or at perimeters
1/2 inch V-Notched Squeegee for rough substrate/ uneven application and high-absorbing insulations (Perlite Wood Fiber) 2 1/2 - 3 gal/sq	2 per crew member	Checking application rate on spray areas **DAC is responsible for monitoring coverage rates**
Squeegee Replacement Blades	1-5 packs per crew member	Check and replace daily, if needed, for worn areas
Propane Torch & Vapor Tank with Regulator & Pressure Gauge	1 per lap seaming or flashing team	For heat welding seams
Electric Hot Air Welder may be used as an alternative to the hand held propane torch — requires a 7,500 watt generator	1 per crew member	For heat welding seams
20 Pound Steel Roller (Minimum 6 inches Wide)	1 per lap seaming team	For rolling in seams with torch application
Hand Roller	1 per lap flashing team	For rolling flashing seams with torch application
2 inch PVC Pipe: Length equal to width of roll being installed	1 per crew member	To prevent creasing of membrane at fold back point
ABC Type Fire Extinguisher	1 per torch	For fire safety

SPRAY APPLICATION

REQUIRED ITEMS	QUANTITY	USE
Spray Rig with In-line Heater *(Contact DERBIGUM rep for specifications and requirements)*	1 per crew member	Application of Permastic by spray
Liquid Propane - 100 lb Bottle	2 per crew member	For in-line heater
Gasoline	5 gallons	Pump motor
Mineral Spirits	5 gallons	General cleaning of equipment
Tools: 18 inch Pipe Wrench Large Channel Locks (or 2nd Pipe wrench)	1 per spray rig	Connection/disconnection of pump to adhesive tank
Extra spray tip Large Channel Locks (or 2nd Pipe wrench)	1 per spray rig	Use while cleaning original tip
Empty 5 gallon buckets	2 per spray rig	Flushing, cleaning, etc.

10.0 SURFACING

DERBIGUM will not be responsible for the color fastness of mineral surfaced membranes or for the appearance or performance of field applied roof surfacings provided by others. When required, consult the UL Directory for specific material and recommended application coverage.

10.1 Application of PERMALUME® Coating: Permalume aluminum roof coating may be applied to Derbigum roofing membrane surfaces by roller or brush. Permalume coating must not be reduced to facilitate the application. The minimum recommended application rate for Permalume coating is 2 coats applied at $^3/_4$ gal/sq (0.3 L/m^2) per coat. Coverage of the Derbigum roofing membrane must be complete, with no voids or "light" areas in the aluminum coating. Roof surface temperature at the time of application must be 80°F (27°C) or higher.

10.2 PermaCool: Acrylic roof coating must not be applied when there is a potential for the temperature to drop below freezing prior to complete "cure" of the coating. Acrylic coatings should not be applied to roofs susceptible to poor drainage. PermaCool conforms to ASTM D6083.

10.3 Acrylic Finish: Acrylic roof coatings, conforming to ASTM D6083.

10.4 Aluminum Coating: Aluminum coating conforming to ASTM D2824, Type III.

10.5 Emulsion: Fibrated emulsion conforming to ASTM D1227.

10.6 Granules: No. 11 roofing granules.

10.7 Aggregate Surfacing: Aggregate surfacing may be applied to any Derbigum roofing membrane at the option of the Owner or Specifier. Aggregate used to surface Derbigum roofing membranes must comply with ASTM D1863 or D448 for size and moisture content. Pour coats of hot asphalt must be minimum 60 lb/100 SF (3 kg/m^2). The asphalt type used as the pour coat must be dictated by the slope on the finished roofing membrane. Asphalt with the lowest softening point temperature commensurate with the roof slope should be considered. Aggregate may also be applied in Permastic at an approximate rate of 3 gal/sq (1.2 L/m^2).

DERBIGUM will not be responsible for punctures or damage to the Derbigum membrane caused by gravel or slag.

10.8 Derbibrite Side Lap Coating: PermaCool Roof Coating may be applied to the Derbibrite lap line.

11.0 FIRE SAFETY RECOMMENDATIONS

11.1 General: The applicator of heat welded roofing membranes must have a reference copy of "Torch Applied Roofing Do's and Dont's" published by the Asphalt Roofing Manufacturers Association (ARMA) and contractors should see that their field applicators are schooled in proper application and safety techniques related to heat welded roofing membrane systems.

Torch application of Derbigum/Derbicolor may pose a threat of fire if strict application standards and procedures are not followed. All operators of torch equipment should be thoroughly trained in a program similar to the current CERTA program, offered by the Midwest Roofing Contractor's Association (MRCA).

The use of Perlite insulation cant strips and tapered insulation greatly reduces the danger of fire beneath heat welded membranes and membrane flashings.

11.2 Propane Equipment: All regulators, valves, tanks, hoses and torch assemblies should be free from leaks. Check for leaks using liquid soap. Do not use equipment until all gas leakage has been corrected. Propane tanks should be secured in an upright position or secured to a wheeled dolly to minimize the potential for upset. Do not use open flame within 10 ft (3 m) of propane tanks. Do not bypass valves or regulators on propane equipment. All torches should be equipped with a support rest to maintain the torch head upright during periods of non-use.

11.3 Use of Heat Welding Equipment: A fire extinguisher of an appropriate type should be easily accessible to all work areas where heat welding equipment is in use. Do not use open flame around open penetrations or "blind" areas where the conditions beneath are not visible. Keep all combustible materials a safe distance from open flames. Avoid prolonged application of heat to all surfaces. Consider "back-torching" flashing membranes for application to penetration curbs or at areas where the entire area to which the torch must be applied is not visible.

11.4 Fire Watch: A fire watch should be maintained on the project, per CERTA guidelines, following the last heat welding work on the job each day. Special attention is required at perimeters and penetrations where heat welded flashings have been installed. Any detected "hot spot" should be investigated prior to crew departure to insure that necessary corrective action can be taken to replace smoldering materials if required. Comply with all local ordinances and code requirements for fire watch following heat welded roofing system applications.

12.0 DERBIGUM APPLICATION SUMMARY

12.1 Field Plies: Derbigum field plies should be fully adhered, free of buckles/mole runs and burned areas. All Derbigum side and end laps must be heat welded and rolled with a minimum 20 lb (9 kg) steel roller. All end laps are to be staggered or capped with a header sheet.

12.2 Wall and Curb Flashings: Derbigum flashing plies must be fully adhered with a continuous bead of molten asphalt visible at all laps. All Derbigum flashings must be top nailed and covered with a metal counter flashing. Install boots at all inside and outside corners *(See Figure 10, page 28)*. Termination bars are to be utilized in conjunction with metal counter flashings.

All curb flashings must be elevated a minimum 8 inches above the roof line.

CAUTION: When cutting Derbigum flashing membranes, care must be taken not to cut the finished Derbigum surface.

12.3 Perimeter Flashings: All metal incorporated in to the perimeter flashing must be primed, stagger nailed 3 - 4 inches o.c. (7.6 cm - 10.2 cm) and sandwiched between two plies of Derbigum. The primed metal must be set in a bed of Perflash. For DDL Specifications all flashings must be a minimum 2 ply flashing with a similar cap sheet and base sheet used - consistent with the cap and base sheet used in the field of the roof.

12.4 Drains and Penetrations: Drains must be sumped to provide positive drainage. Drains must be sumped a minimum of 4 ft for insulated roofs and when utilizing retro-fit drains. Lead flashings must be primed on both sides and sandwiched between the membrane and stripping ply to provide an initial positive bond. They must extend under the clamping ring and be bent down into the drain. DERBIGUM recommends torching the membrane in the sump area, however, Perflash is acceptable.

NOTE: Perflash should always be used in the sump area. Relief cuts made to the field membrane at the drain sump are not allowed. The drain clamping ring must be secured at the membrane to the drain interface to ensure a watertight seal. The drain dome (strainer) must be attached to the drain's clamping ring/bowl.

12.5 Pitch Pans: Pitch pans need to be filled with Perflash or another pourable sealer insuring that the pipe penetration is completely surrounded. Nailers must be provided for mechanical securement of the flange. All joints of the metal pitch pan must be soldered to prevent migration of the Perflash. All metal surfaces must be primed before installation of the Derbigum flashing. DERBIGUM requires installation of an umbrella hood which will act as a first defense against leaks and protect the Perflash inside the pan from UV degradation. If an umbrella is installed above the pan, the clamping ring must be secured and the top edge of the umbrella caulked with a polyurethane sealant. Pitch pans containing multiple penetrations must be installed per detail P-15, page 104. Pitch pans are considered maintenance items and are the owner's responsibility.

DERBIGUM highly recommends the use of Derbiflash liquid applied membranes in lieu of pitch pans.

12.6 Vents and Penetrations: Vent stacks require a minimum height of 8 inches above the finished roof system. When the 4 lb lead is installed, a minimum 1 inch must be rolled down into the pipe and 4 inched out onto the field of the roof over the Derbigum membrane. After the lead flashing is primed, the Derbigum flashing membrane is installed and it must extend past the lead flashing a minimum of 4 inches A bead of Perflash is to be positioned completely around the vent projection at the base.

13.0 FLASHING RECOMMENDATIONS

13.1 General Flashing Recommendations: Membrane base flashings must be constructed over the top of the completed roof membrane and onto vertical surfaces using Derbigum membrane. Derbigum flashing membranes may be set in Perflash or applied by heat welding. Wood or plywood panel surfaced walls must be covered with a mechanically attached base ply or self adhering base sheet prior to the application of Derbigum flashing membrane. All concrete and masonry surfaces must be clean, dry and primed with asphalt primer prior to the installation of the flashing materials. Tops of all Derbigum membrane flashings must be mechanically secured at the top edge 8 - 12 inches (20.3 - 30.4 cm) on center using fasteners appropriate to the material to which the flashing membranes are to be secured. Tops of all membrane flashings must be temporarily sealed using Perflash, or flashing cement reinforced with woven glass fiber fabric, immediately following completion of membrane flashings and prior to installation of metal counterflashing. Termination bars must be used in conjunction with metal counter flashings.

The ROOF DETAILS listed in this manual represent **minimum** membrane requirements. All vertical laps of Derbigum flashing membranes are to be heat welded and rolled with a minimum $^1/_4$ inch (0.64 cm) flow of modified bitumen beyond the lap edge.

The flashing membrane height must be a **minimum** 8 inches (20 cm) and a **maximum** 24 inches (61 cm) above the roof surface (*See High Wall Flashing Detail, P-2B on page 99).* Wall surfaces above 24 inches (61 cm) are not considered part of the flashing specification. Waterproofing of this area is not covered under the DERBIGUM Roofing Guaranties. Top edges of all membrane flashings must be covered with metal counterflashing extending a minimum of 3 inches (7.6 cm) down over the top edges of the membrane flashings in general compliance with recommendations contained in the NRCA Construction Details and the SMACNA Architectural Sheet Metal Manual. Termination bars are not accepted as a sole termination and securement of membrane base flashings.

NOTE: For difficult or low flashing conditions please request the Derbiflash Liquid Applied Flashing Membrane technical data sheet and installation guide from your Regional Sales Manager or the Technical Services Department.

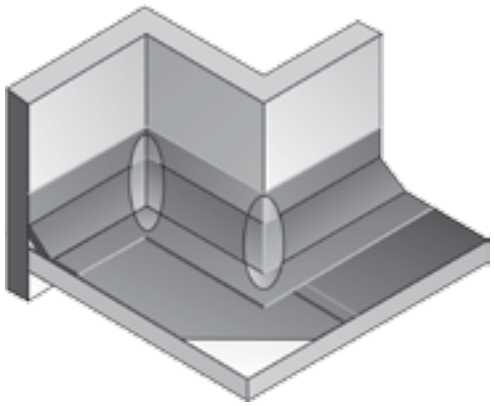
On recover applications, all existing flashing membrane at walls, curb and parapet flashings and edge metal must be removed and replaced with new Derbigum flashings and new edge metal. All wall, curb and parapet flashing details must contain the same number of base and membrane plies as installed in the field.

The decision to reuse existing metal components is the responsibility of the designer.

13.1.1 Curbs and Corner Flashings: All corners flashed with Derbigum smooth membranes, both inside and outside, require a boot (a boot is a piece of Derbigum membrane cut into an oval shape covering overlapped joints at the corner), or a sock (a sock is a piece of Derbigum membrane cut into an oval shape installed under the overlapping joints at the corner to provide positive weather protection at the lap joint).

When flashing with Derbicolor membranes, reinforce the inside and outside corners (underneath) with Derbigum prior to installing the Derbicolor flashing membrane. An alternative method for reinforcing all inside and outside corners of Derbicolor flashings is to install a minimum three (3) course application of alternating Perflash and glass fabric mesh top coated with granules or coating.

Figure 10: Typical Boot Detail



Boot size must be a minimum of $1^1/_2$ inch (3.8 cm) radius beyond all intersecting surfaces and have a minimum of $^1/_4$ inch (0.64 cm) flow of modified bitumen extending beyond all edges. The shape and configuration may vary.

13.2 Derbicant, Cant Strips and/or Tapered Edge: Cant strips are required at the transition and vertical intersections of roof deck and wall/curb surfaces in all membrane flashing applications.

Tapered Edge Strips fabricated from Perlite/Wood Fiber/ Polyiso roof insulation should be used for transition to drains, saddles, and crickets or to provide positive slope at perimeter or penetration flashing. The use of Perlite insulation cant strips and tapered insulation may reduce the danger of fire beneath heat welded membranes and membrane flashings.

13.3 Derbigum Membrane Flashings: Derbigum membrane flashing must be applied by heat welding or set in Perflash.

If the flashing membrane is set in Perflash adhesive, it must be a solid layer of Perflash adhesive in the field of the membrane. Perflash adhesive must NOT be applied to the lap areas. All laps and the flashing membrane on the vertical of the roof area must be heat welded.

When using Perflash adhesive to secure Derbigum flashing membranes, the substrate and the back of the flashing membrane are to be coated with Perflash. Perflash should be applied either with a trowel or gloved hand.

Perflash adhesive must be applied $^1/_{16}$ inch (0.16 cm) thick to both surfaces to obtain an optimum full coverage of $^1/_8$ inch (0.32 cm). For best results, utilize a notched adhesive spreader for this type of application.

To ensure a proper bond the flashing membrane must be tightly matted without bridging and then rubbed into place. On Derbicolor flashing membranes, it is recommended that the flashing surface be rolled. The flashing sheet must be continuously supported by the substrate material without voids or bridging.

When flashing vertical surfaces above 14 inches (35.6 cm) high, it is recommended that the membrane be installed the width of the roll and pre-cut to the desired height required. The maximum flashing length is 10 ft (3.05 m) when the Derbigum membrane flashings are between 8 inches (20 cm) and 14 inches (35.6 cm) high.

When installing Derbigum membrane flashings onto the finished Derbicolor field membrane, the granule surface to which the flashing membrane will be installed will need to be heat treated prior to heat welding the flashing membrane into place. Preheat the granule surface and press the granules in to the product with a warmed trowel in order to provide an asphalt to asphalt bond.

13.5 Accessory Metal Components: All metal flashings and components are maintenance items. Recommendations for configuration and accessory metal types contained in the NRCA Construction Details and/or the Architectural Sheet Metal Manual available from The Sheet Metal Air Conditioning Contractor's National Association (SMACNA) must apply to all Derbigum roof system specifications. Metal included in Derbigum roof systems must be primed and installed in general compliance with the recommendations published in these reference sources.

DERBIGUM assumes no responsibility for the selection or performance of accessory metal used with Derbigum roofing membranes, or for damage to the Derbigum roofing membrane system caused by movement of accessory metal.

When installing Derbicolor roof membranes the stripping ply must be a smooth Derbigum product and may be installed under the metal flange prior to the installation of the Derbicolor membrane. This will eliminate a back-water lap at the edge detail and will provide for a positive bond between the Derbicolor field membrane and the stripping ply.

13.4.1 Metal Counterflashing: All membrane flashings on Derbigum roofing systems must be covered by metal counterflashing to form a continuous watershed over the tops of membrane flashings. Metal counterflashing must extend a minimum of 3 inches (7.6 cm) down over the tops of membrane flashings.

13.4.2 Roof Penetrations: Install all pipes, vents, ducts, stacks, and openings through the roof deck before roofing is applied. No projections are allowed to be constructed through or within 12 inches (30.48 cm) of the perimeter flashing. Derbigum

membrane should not be bonded directly to any hot exhaust or discharge pipe. A separate sheet metal stack flashing with appropriate rain collar must be utilized.

For DDL specifications: all pipes, posts or penetrations must utilize Derbiflash liquid applied flashing membranes or approved flashing detail.

13.4.3 Damage to Roof Membrane System: DERBIGUM assumes no responsibility for damage to the roofing membrane or stripping plies caused by improperly secured metal components contained in the roofing assembly.

13.4.4 Metal Face Securement: Hook strips (cleats) must be installed 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 and/or FM Global Loss Prevention Data Sheet 1-49. Appropriate provisions must be made in accessory metal to allow for expansion and contraction of the metal sections without interrupting the integrity of the waterproofing assembly.

13.5 Fasteners: The General Guide To Fasteners in the current edition of The NRCA Roofing and Waterproofing Manual contains appropriate recommendations for fastener options. Fasteners appropriate to the substrate must be selected. Fasteners are critical to the performance of the roofing system, and therefore must be adequately protected against corrosion. Mechanical fasteners used in Derbigum roof systems must be protected to meet or exceed FM Global Standard 4470, Appendix E.

13.6 Roof Drains: Drains are to be sumped 4 ft x 4 ft to provide positive drainage. The roof drain sump must be clean and free of all rust and dirt. Install base sheet or base ply and cut so that base sheet stops short of clamping ring. Install a 36 inches (0.9 m) square piece of smooth Derbigum membrane heat fused or set in Perflash over the drain opening and cut a hole to the inside edge of the drain base. The drain bowl flange is to be thoroughly cleaned, wire brushed (if necessary), and primed to receive the Derbigum membrane. Apply plastic roof cement or Perflash to the clamping ring area. Install a 30 inches (0.76 m) square 4 lb lead flashing over the Derbigum membrane into a bed of Perflash cement. Then install the top ply of Derbigum extending to the inside edge of the bowl. The Derbigum field membrane, the new drain lead and the Derbigum 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. Field laps from top ply of Derbigum shall not extend under the clamping ring. Derbigum requires a 4 ft x 4 ft sump for all drain applications.

13.7 Flashing/Detail Summary: Construction details contained herein are based on guide details developed by the National Roofing Contractors Association and are reproduced with consent from the NRCA. They are intended to represent general guidelines for terminating or interrupting the roofing membrane system.

14.0 DERBIFLASH APPLICATION RECOMMENDATIONS

(For use on Derbicolor and Derbibrite membranes)

14.1 Surface Preparation: All surfaces must be free from gross irregularities, loose, unsound or foreign material such as dirt, ice, snow, water, grease, oil, release agents, paints, coatings, lacquers, excess granules, or any other condition that would be detrimental to adhesion of the primer and membrane. This requires careful preparation of existing horizontal and vertical substrates; cracks are filled, expansion joints are prepared, flashings are removed or modified, and termination points are determined. Substrates and penetrations may require sandblasting or grinding in some cases to achieve a suitable surface.

14.1.1 Concrete/Masonry: Grind or scarify surface. Repair and prepare uneven areas with a repair mortar mixed in the field from one part HC/C primer and three parts #1/2 kiln-dried sand. Polymer-modified repair mortar can also be used, but typically requires 3-7 day curing time.

14.1.2 Metal: Clean and prepare to near white metal in accordance with SSPC - SP3 (power tool clean). Provide a roughened surface. NOTE: a wire brush finish is NOT considered to be a roughened finish.

14.1.3 Plywood: Smooth and seal joints and knotholes with a high-quality polyurethane sealant.

14.1.4 All Substrate Surfaces: As a final step following mechanical surface preparation on substrate, wipe the substrate surface with MEK or Acetone Cleaner to remove residue, and allow surface to dry completely before applying primer.

14.2 HMS/MS Primer Application (Substrate Only): Remove the inner bag from the aluminum packaging. Knead larger bag section of resin Component A thoroughly until a uniform consistency and appearance is achieved. Pull away the rubber cord separating the two components so that resin Component A and hardener Component B can be mixed together. Knead the bag quickly and thoroughly for approximately 60 seconds so that a homogeneous primer is formed. The primer should be a uniform color, with no light or dark streaks present.

Cut off one corner of the bag and pour all of the primer onto the substrate surface or into a separate container. Working quickly, brush or roll the primer evenly onto the surface to fully saturate the substrate in one application. Do not allow ponding of the primer. Do not extend primer past the required extent of the membrane flashing termination.

Do not apply primer to Derbibrite membranes. Always provide membrane to membrane bonding.

14.2.1 HMS/MS Primer Working/Cure times: Working time, including mixing time, is 30 – 45 minutes. DO NOT continue to use primer once it has begun to thicken and become warm to the touch. Primer curing time is typically 4 hours, but will be longer in colder weather.

14.3 HC/C Primer Working/Cure times:: Working time, including mixing time, is 45 – 60 minutes. DO NOT continue to use primer once it has begun to thicken and become warm to the touch. Primer curing time is typically 12 hours, but will be longer in colder weather. Expect a 24 hour curing time in temperatures between 40 – 50°F.

14.3.1 HC/C Primer Sand Application: Apply/broadcast kiln-dried surfacing sand into wet Primer to achieve 100% surface coverage. Excess sand shall be removed once primer has fully cured.

14.4 HEF/EF Membrane Application: Remove the inner bag from the aluminum packaging. Knead larger bag section of resin Component A thoroughly until a uniform consistency and appearance is achieved. Pull away the rubber cord separating the two components so that resin Component A and hardener Component B can be mixed together. Knead the bag quickly and thoroughly for approximately 60 seconds so that a homogeneous resin is formed. The resin should be a uniform color, with no light or dark streaks present. Pour resin into a separate container.

Apply 2/3 of the mixed resin liberally to the primed substrate surface, rolling or brushing with a broad, even stroke. More resin must be applied to the substrate because this application both adheres the membrane to the substrate and also saturates the fleece.

Cut and fit fleece prior to application of any resin. Fleece overlaps shall be 2 inches. Cut and fit fleece to conform tightly to the substrate/penetration. Neat and accurate fleece cutting and fitting is the key to achieving a professional result.

Roll out the fleece directly into the resin, avoiding folds and wrinkles. Use the roller to work the resin into the fleece, saturating from the bottom up, and forcing any trapped air out from beneath the fleece. The appearance of the fleece should be a light opaque gray with no white spots. White spots are indications of unsaturated fleece or lack of adhesion. Remove fleece from the substrate and apply additional resin under the fleece, and reinstall the fleece to address this condition.

Apply 1/3 of the mixed resin to the fleece surface to finish the fleece saturation, rolling or brushing with a broad, even stroke to achieve a glossy appearance. Apply additional resin between fleece layers at all overlaps. The fleece can only hold so much resin and all excess should be rolled forward to the unsaturated fleece areas. The correct amount of resin will leave no whiteness in fleece and there will be a slightly fibrous surface texture.

14.4.1 HEF/EF Resin Working/Cure times: Working time, including mixing time, is 45 – 60 minutes. DO NOT continue to use resin once it has begun to thicken and become warm to the touch. EF Resin initial curing time is typically 6 hours, but will be longer in colder weather. Expect an 8 hour curing time in temperatures between 40 – 50°F.

14.5 Application Summary:

- Adequate surface preparation is the key to achieving a good bond to the substrate surface.
- Do not apply primers and resins to wet or damp surfaces. Pay attention to the dew point on the substrate surface.
- Primers and resins are moisture sensitive. Avoid contaminating the substrate surface and newly applied materials with sweat, condensation from coolers or water bottles, etc., as blisters will develop.
- Tape off substrates with duct tape or painters tape prior to primer and membrane application, and then remove tape before primer/resin cure. This will result in a clean termination line.
- Take the time to cut and fit reinforcement fleece when the fleece is dry and prior to resin application. This is particularly important at penetration flashings that require the use of multiple pieces of reinforcing fabric.
- Make sure that sufficient resin is applied to the substrate surface before the fleece reinforcement is placed into the wet resin. Lack of sufficient resin under the fleece reinforcement will result in unsaturated fleece and a poor bond to the substrate surface. Applying additional resin over the top of the fleece cannot penetrate through the fleece to address this problem.
- Roll out all air bubbles from beneath the membrane so that full bonding to the substrate surface is achieved.

15.0 DERBIGUM ROOFING MEMBRANE GUARANTY

For a complete explanation of DERBIGUM guaranty application procedures, please refer to the Guaranty Application Form, or call the Guaranty Department at (800) 727-9872. The following information offers general guidelines.

15.1 General: The goal of DERBIGUM is to provide the building owner with a superior roofing system, and assurance of long-term roof system performance.

DERBIGUM combines the application expertise of the DERBIGUM Authorized Contractor (DAC) with superior quality roofing membrane materials. When purchased in conjunction with the Derbigum roof membrane system the Derbigum Roofing Membrane Guaranty warrants material quality, roof membrane performance and workmanship of the DAC for the specified time period.

15.2 Terms of Guaranty: The DERBIGUM Roofing Membrane Guaranty may be purchased for a ten (10), fifteen (15), or twenty (20) year period at the option of the Owner or Specifier. DERBIGUM roofing membrane specifications eligible for the DERBIGUM Roofing Membrane Guaranties are listed in this publication. Other membrane assemblies may be guaranteed when authorized in writing by the DERBIGUM Director of Technical Services prior to installation of the roofing membrane system.

15.3 Facilities Not Eligible for Guaranty: No DERBIGUM Roofing Membrane Guaranty will be issued for a roof on a freezer facility, heated tank or silo, patio, promenade, parking roof, swimming pools or any roof deck surface which may contribute to the deterioration of the roofing assembly. Guaranties for roofs on condominiums or residential dwellings will be eligible only if written approval from the DERBIGUM Director of Technical Services is obtained in advance of roof system application and if all special conditions are jointly accepted by DERBIGUM and owners of individual units.

15.4 Conditions not Eligible for Guaranty: A DERBIGUM Roofing Membrane Guaranty will not be issued for roofing membrane systems installed over fire-retardant treated plywood roof decks. To guaranty lightweight insulating concrete fills poured over existing roofing membranes or non-venting roof decks, the LWIC manufacturer must forward to DERBIGUM, in writing, the acceptance of the application.

No DERBIGUM Roofing Membrane Guaranty will be issued on roofs which pond water in excess of the industry accepted seventy-two hours without written approval of the Director of Technical Services of acceptable provisions to address such ponding. *(Please refer to section 15.0 for DDL guaranty requirements).* The DERBIGUM Roofing Membrane Guaranty will be void in those areas of ponding conditions that are evident and are contributing to roof leaks at the time of any claim against the guaranty.

DERBIGUM assumes no responsibility for the selection or performance of accessory metal used with Derbigum roofing membranes, or for damage to the Derbigum roofing membrane system caused by movement of accessory metal or delamination of the Derbigum membrane from metal surfaces.

15.5 Recover Requirements: All existing roofs to receive Derbigum recover applications must be dry. This needs to be confirmed by either core cuts or performing a nondestructive evaluation (NDE). All verifications must be provided to DERBIGUM in writing prior to the roofing guaranty being issued.

Recover System guaranties include, within the guaranty, only DERBIGUM products installed during new recover application.

The DAC must also be responsible for the following:

- Removal of all existing membrane curb, wall flashings, penetration membrane and metal/lead flashing and replaced with new.
- Attachment of all existing insulation and/or membrane to metal/nailable decking, found not to be properly attached, must be properly attached using new fasteners through the existing roof and insulation and into the existing deck.
- Compliance with all building codes related to number of existing roofs allowed without removal, and all regulations relating to permissible live and dead loading of roof deck structures which may be applicable to roofs incorporating DERBIGUM's materials.
- Compliance with Derbigum Recover Recommendations *(Section 1.10).*

15.6 Guaranty Application Procedures: Application for the DERBIGUM Roofing Membrane Guaranty must be received and the installation authorized prior to commencement of any work on the project. DERBIGUM reserves the right not to issue the Derbigum Roofing Membrane Guaranty for any facility if application procedures are not completed in accordance with DERBIGUM policy. Payment in full for the stipulated Guaranty charges must be received prior to issuance of the Guaranty.

15.7 Manufacturer Guaranty: DERBIGUM is neither a engineer or designer and assumes no liability for the same. DERBIGUM guaranties the performance of all materials manufactured or sold by the company. DERBIGUM assumes no responsibility for the performance characteristics of substrates, roof decks, metal components or materials built into the Derbigum system that are manufactured by others.

15.8 Owner Maintenance: Roof Maintenance is the responsibility of the building owner. Failure to properly maintain the roof will result in the guaranty being void.

Please refer to the NRCA/ARMA Roof Repair Maintenance Guidelines for recommended maintenance procedures. For specific recommendations for maintaining DERBIGUM installations, please consult your local Sales Manager or DERBIGUM Technical Service Department at (800) 727-9872. The following are typical maintenance recommendations:

- At least twice a year, the owner should have the roof inspected by either their own maintenance personnel or by the DAC who installed the system. At this time, debris must be removed from the roof, especially around drains, scuppers, and gutters. Ponding water on a roof surface may be the most significant factor in shortening the system's life. Standing water places a live load on the building's structural integrity, and also provides water for vegetation growth and temperature differentials, which lead to system damage during freeze-thaw cycles. Positive drainage and routine maintenance can minimize these potential problems.
- If your Derbigum system is surfaced with a field applied roof coating, periodically re-coat the Derbigum membrane. Adding a reflective coating may lower the interior temperature during summer months, thus decreasing the load and expense of running your air conditioning. The fresh coating reflects ultra-violet sun rays and helps prolong the life of your Derbigum system.
- If new "roof mounted" equipment is to be added, **DERBIGUM must be notified in advance of the project or the guaranty may be void.** Cutting through the Derbigum roof to add equipment or piping must be coordinated or performed by an approved DAC. Flashing the new unit must be done with Derbigum material, per DERBIGUM published specifications.
- Repairs performed or materials furnished by others must be authorized, in writing, by DERBIGUM, in advance or the guaranty will be void.
- The owner is responsible for controlling unnecessary roof traffic, limiting unauthorized access to the roof and monitoring the use of tools or movement of objects that may cause damage.
- If your roof contains pitch pans, all pitch pans must have the bottom two thirds filled with a non-shrink grout and then the top portion topped off and crowned with Perflash Modified Bitumen Based Flashing Cement or similar material. The upper lip of the pitch pan metal is to be turned in to better hold the adhesive and we recommend the addition of an umbrella rain cap where possible. **DERBIGUM does not guaranty the performance of the pitch pans as they are a maintenance item.**
- If your building is subject to significant roof traffic, DERBIGUM recommends the installation of walk treads; (*see Section 1.7 Walkways & Walkway Material for approved products and recommendations).*
- Do not fasten guide wires to your roof. Anchor these devices on masonry, or consult an approved DAC for advice.

15.9 Guaranty Summary:

- Contact your local sales manager or DERBIGUM Technical Services for guaranty fees and for Derbigum roof membrane specifications for extended guaranties.
- Refer to actual Guaranty for specific coverages and conditions.
- DERBIGUM approved components are required for all DERBIGUM guaranties.
- Derbigum & Derbicolor may be used in any standard specification.
- All fire rated (FR) Derbigum/Derbicolor/Derbibrite products are acceptable for extended guaranties.
- Extended guaranties over insulated lightweight concrete roof decks require prior written approval from the DERBIGUM Director of Technical Services.

16.0 DERBIGUM DDL GUARANTY

The roof deck/roof substrate of the specified DDL roof system allows standing water up to seven days after the end of rain. Within the seven day time frame the standing water must have evaporated or drained from the roof surface. Note: If standing water is a constant situation, then this roof does not qualify for a DDL Guaranty.

For tear-off and replacement roofs over concrete or insulated steel decks where the installation of a tapered insulation system is not possible, DERBIGUM offers the DDL Specification in a low slope situation. The information addressed in this section lists the requirements for roof projects that will qualify for a DDL guaranty. In addition to the following requirements, all previously addressed installation procedures listed in this publication must be followed.

16.1 Terms of Guaranty: The DDL Guaranty may be purchased for a 10, 15, 20, or 25 year period. The DDL Specifications are listed in this publication.

16.2 Facilities NOT Eligible for a DDL Guaranty: DDL Guaranty will not be issued over a freezer facility, heated tank, silo, patio, promenade, parking roof, or recover applications.

16.3 Conditions NOT Eligible for a DDL Guaranty: DDL Guaranty will not be issued over a wood, insulated lightweight concrete, gypsum, tectum, cementitious wood fiber or composite roof decks.

DERBIGUM assumes no responsibility for damage to the membrane due to building movement or delamination of roofing granules.

16.4 DDL Requirements: Owner or Specifier is responsible for structural load requirements. Owner or Specifier is responsible for determining building code and insurance compliancy. The owner is required to have annual inspections of the roof and documentation is to be provided to DERBIGUM. It is the owners responsibility to remove dirt, debris and plant life from the roof. If annual inspections and maintenance are not performed, the DDL Guaranty will be null and void.

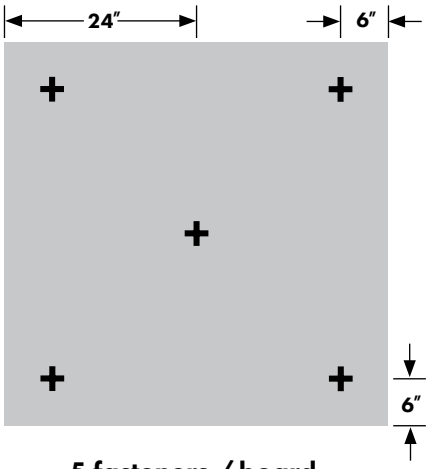
16.5 DDL Requirement Summary:

- Side laps will be a minimum of 4 inches (10.2 cm) and end laps a minimum of 6 inches (15.2 cm)
- All flashings must be a 2 ply flashing.
- All curb flashings must be elevated minimum 8 inches above roof line.
- Drain sumps must be a minimum of 4 ft.
- Prior to installing 4 lb leads, field wrap pipe penetrations with Derbigum membrane and torch to field ply.
- DERBIGUM requires one layer to be fully torched or heat welded in the system.

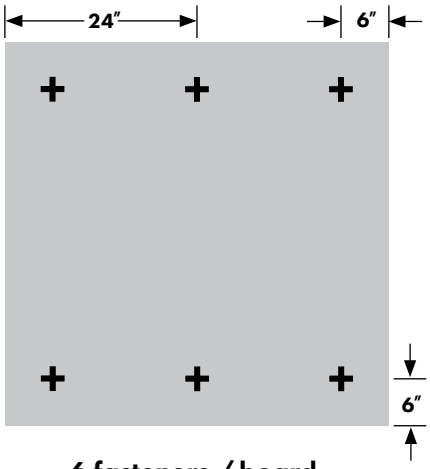
Derbibrite and Derbipure membranes are NOT eligible for DDL Specifications.

COVERAGE	VALIDITY	REQUIREMENTS
Limited Material Warranty: Provides full replacement for Derbigum materials should roof leaks occur as a result of defects in the manufacturing of the Derbigum material, or from normal wear and tear caused by the elements at any time during the 10 year commitment.	10 year	All Derbigum materials All Permastic/Perflash adhesives
Roof Membrane Guaranty: In addition to the Limited Material Warranty description, the Roof Membrane Guaranty covers roof leaks related to workmanship of the DAC in the installation of the Derbigum membrane. Includes a final site inspection upon completion as well as a follow up inspection in 18 months.	10 year	All specifications are eligible
	15 year	Derbibase must be used as base ply for field and flashing applications. Recover applications must follow Section 14.5 Recover Requirements
	20 year	In addition to the 15 year requirements, all 2 ply Derbigum/Derbicolor specifications or 1 ply Derbibase Ultra and 1 ply Derbigum/Derbicolor specifications with the top ply installed in Permastic adhesive or heat welded and with laps heat welded are eligible. Derbibrite must be installed in Permastic with laps hot air welded. New or replacement applications only.
Roof System Guaranty: In addition to the Roof Membrane Guaranty, the Roof System Guaranty includes replacement of DERBIGUM approved roof insulation as necessary to correct roof leaks. Includes a minimum of a final and 18 month inspection.	10 year	All specifications are eligible.
	15 year	Derbibase must be used as base ply for field and flashing applications. New or replacement applications only.
	20 year	In addition to the 15 year requirements, all 2 ply Derbigum/Derbicolor specifications or 1 ply Derbibase Ultra and 1 ply Derbigum/Derbicolor specifications with the top ply installed in Permastic adhesive or heat welded and with laps heat welded are eligible. Derbibrite must be installed in Permastic with laps hot air welded. New or replacement applications only.
DDL Guaranty: In addition to the Roof System Guaranty, the DDL Guaranty includes standing water on 20% of the roof surface for up to 7 days after rain. Annual inspections are required by the owner after completion of the roof, for the duration of the guaranty.	10 year	2 plies of Derbibase + 1 ply of Derbigum
	15 year	1 ply Derbibase + 1 ply Derbibase Ultra + 1 ply Derbigum
	20 year	2 plies of Derbibase Ultra + 1 ply of Derbigum
	25 year	3 plies of Derbigum or 1 ply of Derbibase Ultra + 2 Derbigum

4 x 4 FEET FASTENING PATTERNS



5 fasteners / board



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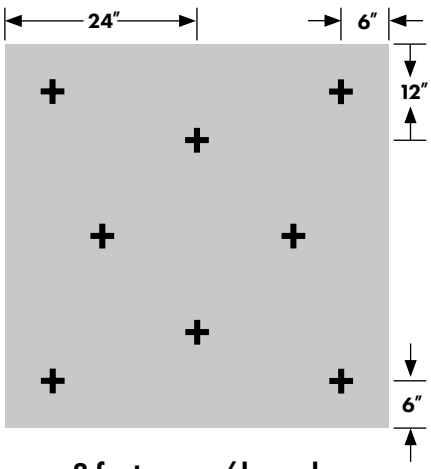
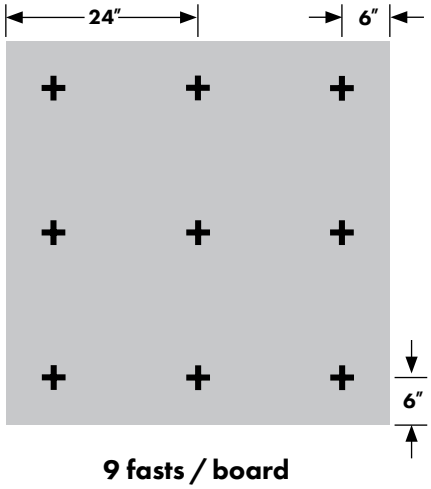
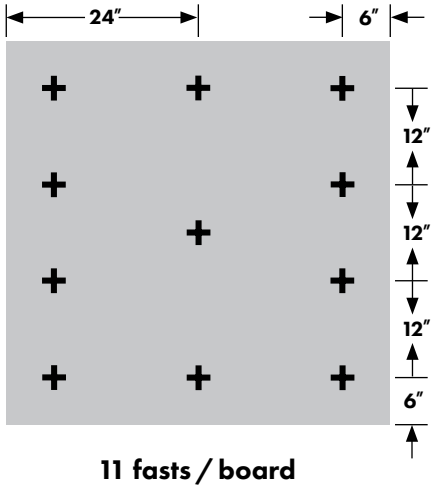


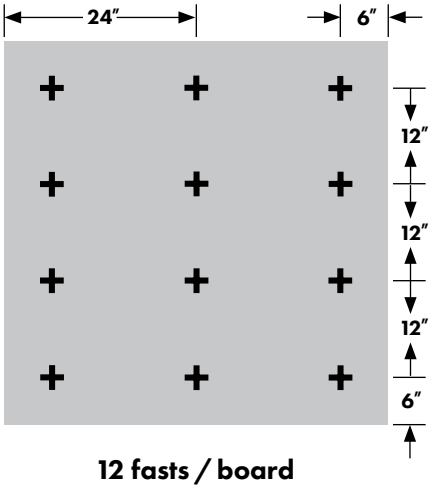
8 fasteners / board



9 fasts / board



11 fasts / board



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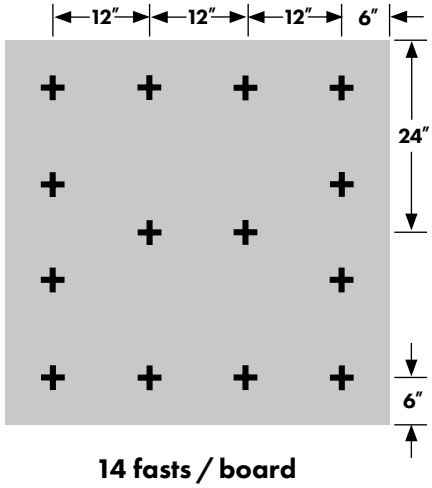
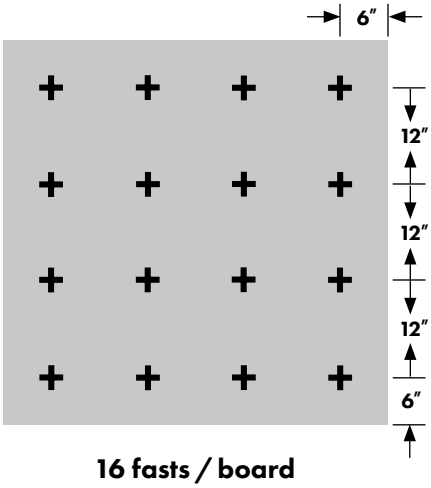
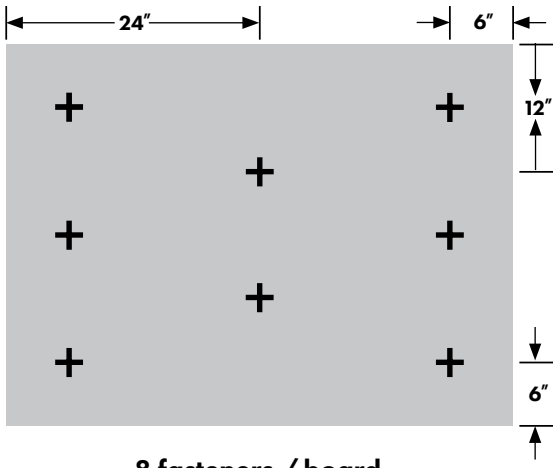


14 fasts / board



16 fasts / board

NOTE: Please refer to the current FM Global Property Loss Prevention Data Sheets 1-28 and 1-29 for specific fastener location tolerances, field, perimeter and corner fastening details.



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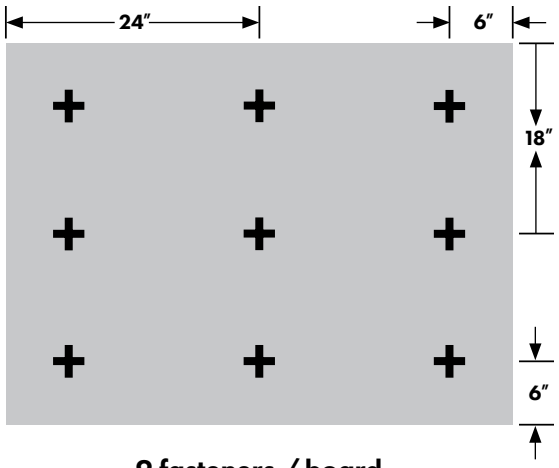
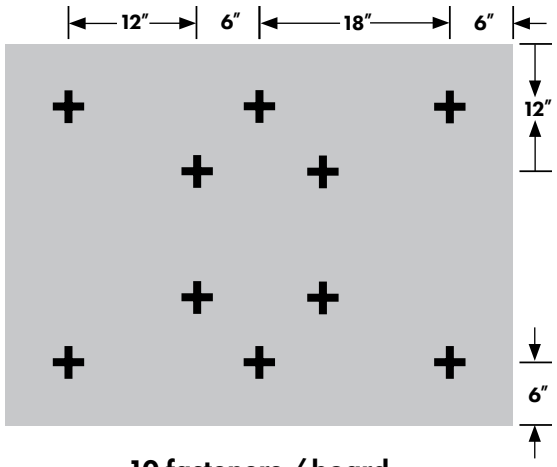
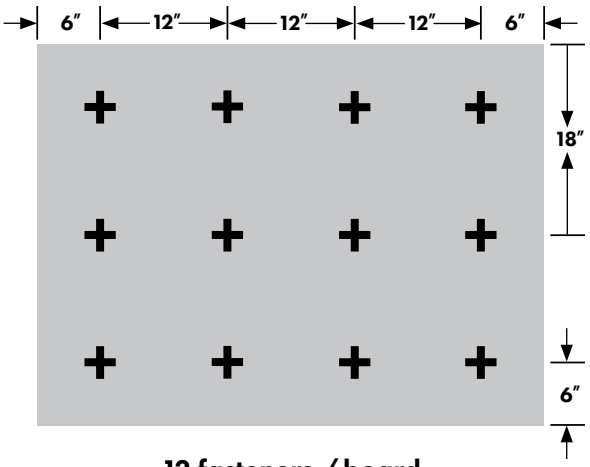


9 fasteners / board

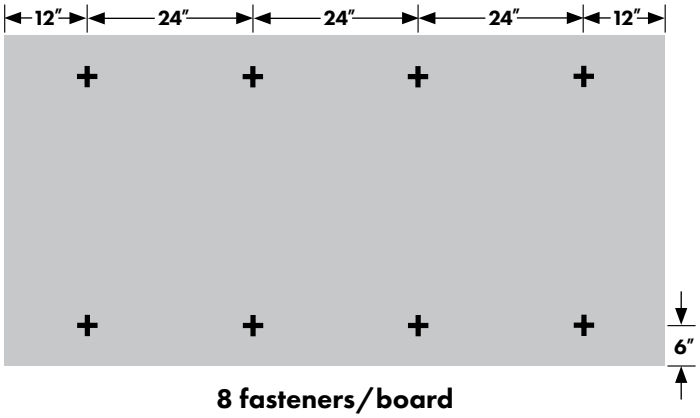


10 fasteners / board

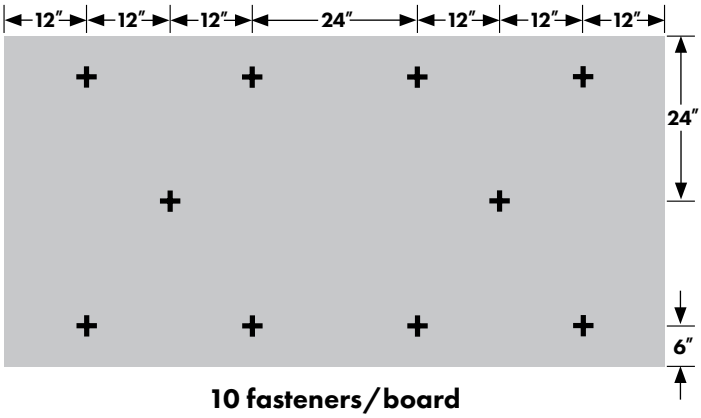


12 fasteners / board

NOTE: Please refer to the current FM Global Property Loss Prevention Data Sheets 1-28 and 1-29 for specific fastener location tolerances, field, perimeter and corner fastening details.



8 fasteners/board



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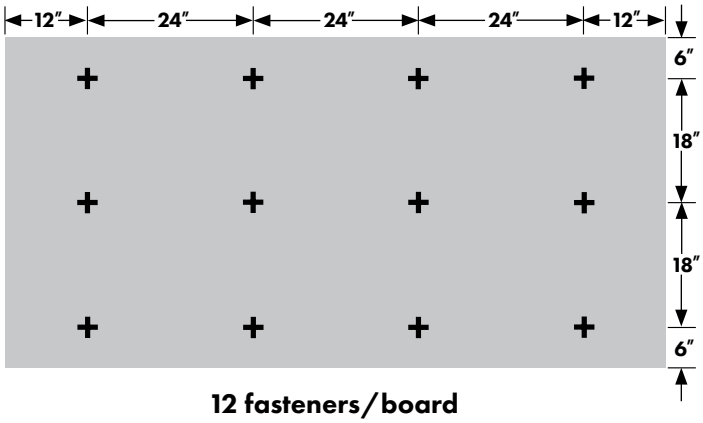
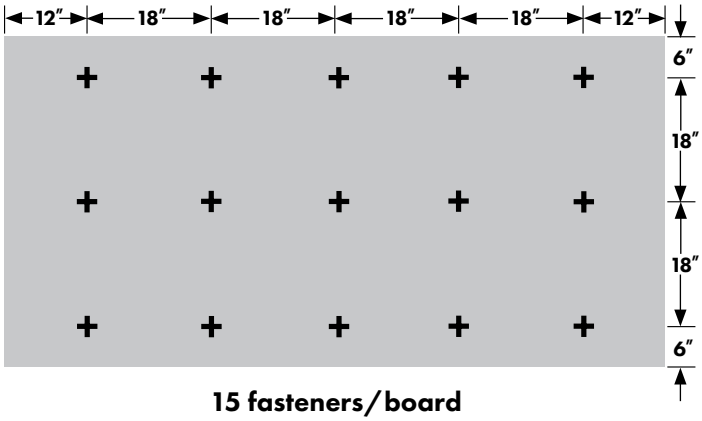
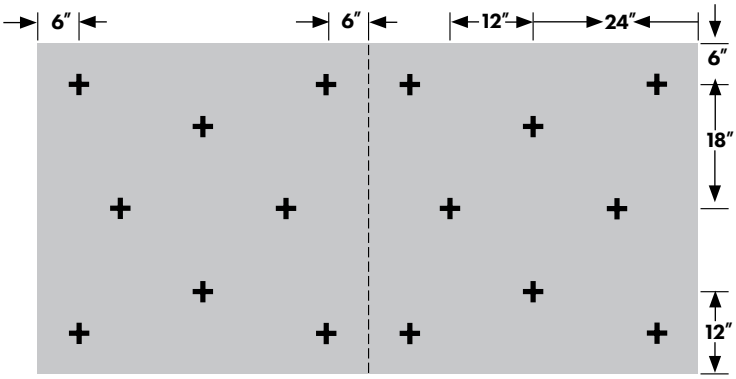


12 fasteners/board



15 fasteners/board



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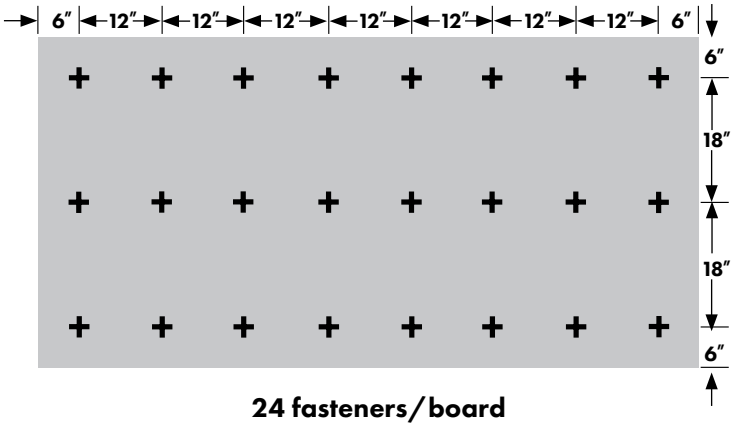
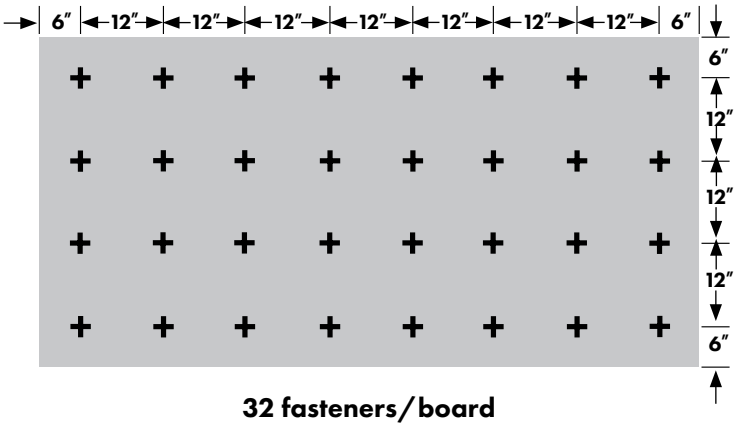


24 fasteners/board

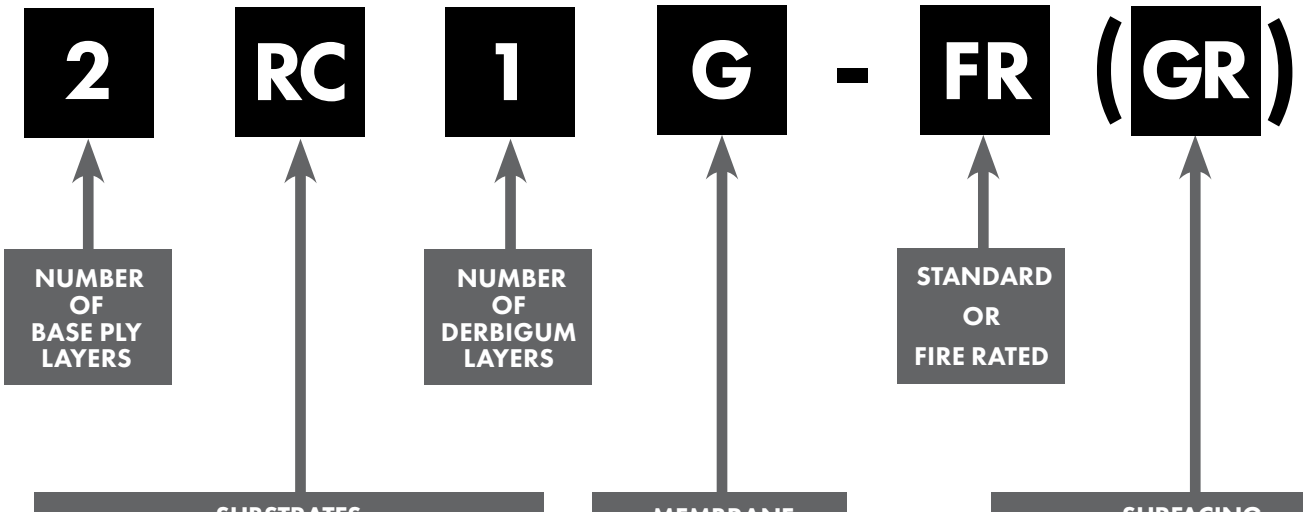


32 fasteners/board

NOTE: Please refer to the current FM Global Property Loss Prevention Data Sheets 1-28 and 1-29 for specific fastener location tolerances, field, perimeter and corner fastening details.

Below is a brief explanation of the coding system Derbigum has in place to quickly identify different roofing systems.

- On double-layer Derbigum applications where both XPS + GP, XPS + P or GP + P are used, use the following example: 1IGX-( ), to indicate one base ply, insulated substrate and Derbigum GP as the bottom layer with Derbigum XPS as the top layer.
- ( ) to include the designation for both membrane type and surfacing.
- Fire rated (FR) products are acceptable in all Derbigum specifications.
  For specific FR classifications consult the current edition of the UL Directory.
- In multiple ply systems utilizing Derbicolor as the top membrane, all underlying Derbigum plies must be smooth.
- Two layers of membrane are required above fasteners & plates.



SUBSTRATES	
I	Insulated
N	Nailable
C	Uninsulated structural concrete
R	Recover w/o recovery board
RC	Recover with recovery board

MEMBRANE	
P	P
G	GP
X	XPS
B	Derbibrite

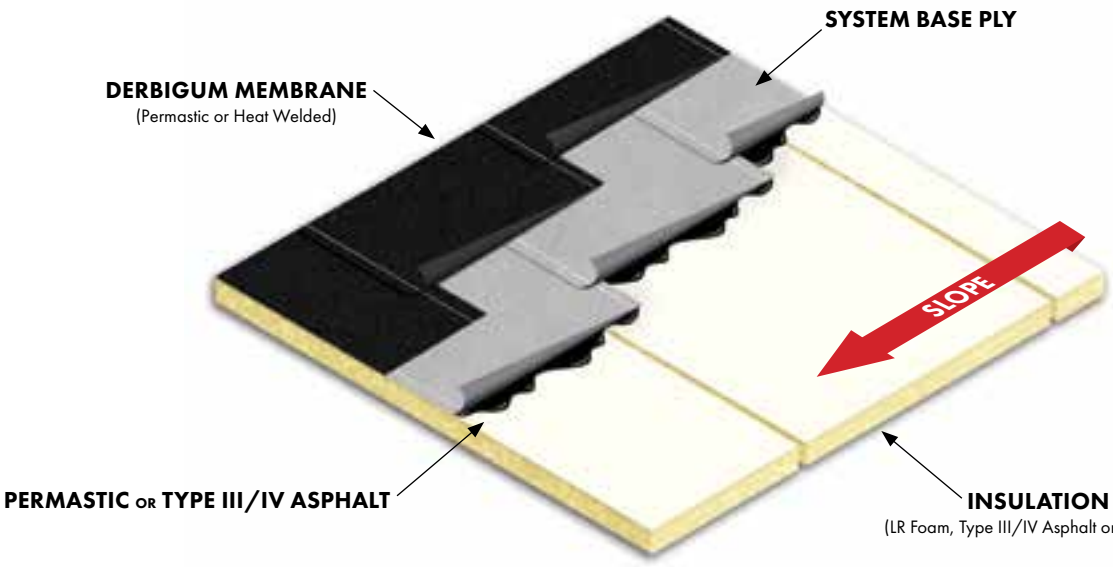
SURFACING	
U	Unsurfaced
DC	Derbicolor
C	Coated
G	Gravel
EG	Emulsion & Granules
PM	Protected Membrane
GR	Green Roof

For Green Roofs; see page 67
For Derbibrite; see page 70
For Dead Level Roofs; see page 81

Substrate	System Base / Membrane	Specification Number*			Guaranty Availability (Years)**
		XPS	GP	P	
Insulated: New, Replacement, Recover with Approved Insulations	1 base ply + 1 Derbigum	1I1X-( )	1I1G-( )	1I1P-( )	10, 15
	2 base plies + 1 Derbigum	2I1X-( )	2I1G-( )	2I1P-( )	10, 15
	3 base plies + 1 Derbigum	3I1X-( )	3I1G-( )	3I1P-( )	10, 15, 20
	1 base ply + 2 Derbigum	1I2X-( )	1I2G-( )	1I2P-( )	10, 15, 20
	2 base plies + 2 Derbigum	2I2X-( )	2I2G-( )	2I2P-( )	10, 15, 20
	0 base plies + 2 Derbigum	0I2X-( )	0I2G-( )	0I2P-( )	10, 15, 20
	1 Ultra Base + 1 Derbigum	1I1X-( )	1I1G-( )	1I1P-( )	10, 15, 20
	1 PRS SA Base + 1 Derbigum	1I1X-( )	1I1G-( )	1I1P-( )	10, 15
Nailable: New, Replacement, Uninsulated Plywood, Wood, LWIC and Cementitious Wood Fiber	1 base ply + 1 Derbigum	1N1X-( )	1N1G-( )	1N1P-( )	10
	2 base plies + 1 Derbigum	2N1X-( )	2N1G-( )	2N1P-( )	10, 15
	3 base plies + 1 Derbigum	3N1X-( )	3N1G-( )	3N1P-( )	10, 15, 20
	1 base ply + 2 Derbigum	1N2X-( )	1N2G-( )	1N2P-( )	10, 15, 20
	2 base plies + 2 Derbigum	2N2X-( )	2N2G-( )	2N2P-( )	10, 15, 20
	1 Ultra Base + 1 Derbigum	1N1X-( )	1N1G-( )	1N1P-( )	10, 15, 20
Structural Concrete: Uninsulated Non-Nailable	1 base ply + 1 Derbigum	1C1X-( )	1C1G-( )	1C1P-( )	10, 15
	2 base plies + 1 Derbigum	2C1X-( )	2C1G-( )	2C1P-( )	10, 15
	3 base plies + 1 Derbigum	3C1X-( )	3C1G-( )	3C1P-( )	10, 15, 20
	1 base ply + 2 Derbigum	1C2X-( )	1C2G-( )	1C2P-( )	10, 15, 20
	2 base plies + 2 Derbigum	2C2X-( )	2C2G-( )	2C2P-( )	10, 15, 20
	0 base plies + 2 Derbigum	0C2X-( )	0C2G-( )	0C2P-( )	10, 15, 20
	0 base plies + 1 Derbigum	0C1X-( )	0C1G-( )	0C1P-( )	10
	1 Ultra Base + 1 Derbigum	1C1X-( )	1C1G-( )	1C1P-( )	10, 15, 20
Recover: Over Existing DERBIGUM System	0 base plies + 1 Derbigum	0R1X-( )	0R1G-( )	0R1P-( )	10
	1 base ply + 1 Derbigum	1R1X-( )	1R1G-( )	1R1P-( )	10, 15
	2 base plies or 1 Derbigum + 1 Derbigum	2R1X-( )	2R1G-( )	2R1P-( )	10, 15, 20
Recover: Over Existing Qualified Roof	1 base ply + 1 Derbigum	1R1X-( )	1R1G-( )	1R1P-( )	10
	recover board + 1 base ply + 1 Derbigum	1RC1X-( )	1RC1G-( )	1RC1P-( )	10, 15
Protected Membrane:	0 base plies + 2 Derbigum	0C2X-(PM)	OC2G-(PM)	OC2G-(PM)	10, 15, 20
	1 Ultra Base + 1 Derbigum	1C1X-(PM)	1C1G-(PM)	1C1G-(PM)	10, 15, 20
Green Roof:	0 base plies + 2 Derbigum	0I2X-(GR)	0I2G-(GR)	0I2P-(GR)	10
	1 base ply + 1 Derbigum	1C1X-(GR)	1C1G-(GR)	1C1P-(GR)	10
	1 base ply + 2 Derbigum	1C2X-(GR)	1C2G-(GR)	1C2P-(GR)	10, 15, 20

* Refer to Specification Number Key on page 39

** See Section 14.0 for specific application requirements.



1	I	1	X
1	I	1	G
1	I	1	P

MATERIAL REQUIREMENTS	QUANTITY/100 SF
Roof Insulation	Per Project Requirements
Low Rise Foam Insulation Adhesive, Type III/IV Asphalt, Perlok or Approved Fasteners	Per Project/Code Requirements
Derbibase, Derbibase Ultra, PRS Glass Base or PRS Modified Base	1 Ply
Permastic or Type III/IV Asphalt	For application rates refer to Section 9.0
Derbigum P/GP/XPS or Derbicolor P/GP/XPS	1 Ply

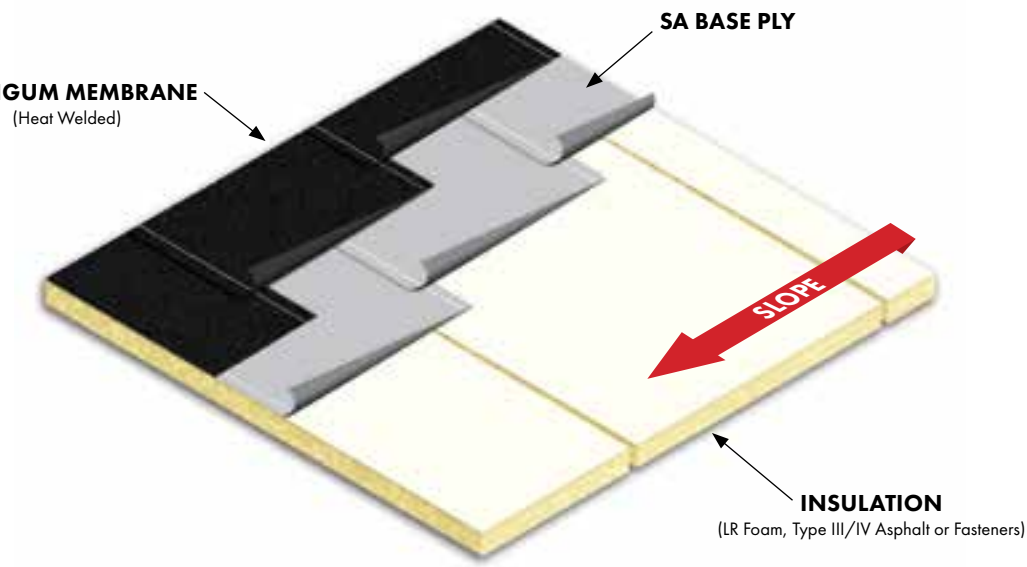
Slope: Positive. *(Refer to UL & FM Requirements for Fire and Wind ratings.)*

Insulation: Approved insulation boards must be adhered/attached in accordance with stipulations in Section 5.0, General Insulation Recommendations. Insulation installed over steel roof decks must be secured in accordance with the latest edition of FM Loss Prevention Data Sheet 1-29. When adhering base plies in hot asphalt over the cellular plastic foam insulation, the cellular plastic foam insulation must be overlaid with a layer of minimum $^{1}/_{2}$ inch (1.3 cm) wood fiber, $^{3}/_{4}$ inch (1.9 cm) Perlite or $^{3}/_{8}$ inch (0.95 cm) gypsum cover board in accordance with NRCA recommendations.

Base Ply: Install the system base ply by shingling from the low point on the roof or by strapping with the slope of the roof deck. Secure base sheet in a solid layer of Permastic applied at a minimum rate of 2 - 2 $^{1}/_{2}$ gal/sq; or set in, minimum 25 lb/100 ft^2 (1.2 kg/m^2) moppings of hot Steep Grade (Type III) or Special Steep (Type IV) asphalt. Side laps must be minimum 3 inches (7.6 cm) and be offset a minimum 12 inches. End laps must be a minimum 4 inches (10.2 cm). **NOTE:** Derbibase must be installed in Permastic or mechanically attached in accordance to FM Global recommendations. When installing a base ply over Derbiboard insulation, the application rate of Permastic must be at a minimum rate of 2 - 2 $^{1}/_{2}$ gal/sq (0.8 -1.0 L/m^2).

DERBIGUM Membrane: Install the Derbigum membrane by shingling from the low point on the roof or by strapping with the slope of the roof deck, running the Derbigum membrane parallel to the direction of the system base ply. The Derbigum membrane must be set in a solid uniform layer of Permastic applied at a nominal rate of 1$^{1}/_{2}$ - 2 gal/sq (0.6 - 0.8 L/m^2) or adhered by heat welding solidly over the base ply. **Permastic MUST NOT be applied to membrane lap and seam areas.** Side laps must be minimum 3 inches (7.6 cm) and offset the side laps of base ply by a minimum 12 inches (30.5 cm). End laps must be a minimum 4 inches (10.2 cm). Side and end laps must be heat welded, rolled with a minimum 20 lb (9 kg) steel roller and have a continuous bead of molten modified bitumen visible at all laps/seams.

PERMASTIC Application: Permastic adhesive must be applied by spray, squeegee or trowel in a uniform layer at a minimum rate per application rates in Section 9.0, with the system base ply or DERBIGUM membrane set immediately into the Permastic.



1	I	1	X
1	I	1	G
1	I	1	P

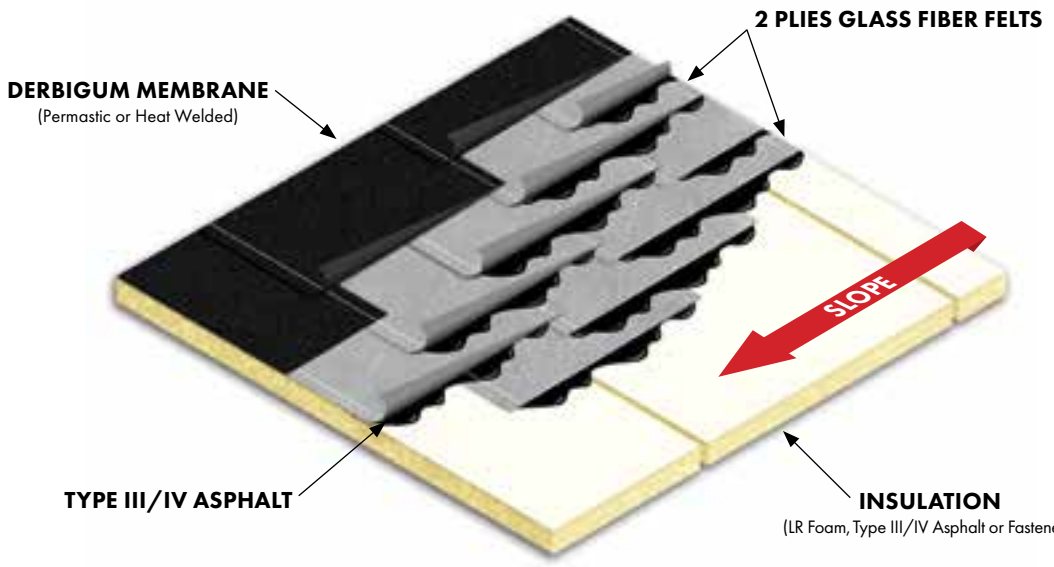
MATERIAL REQUIREMENTS	QUANTITY/100 SF
Roof Insulation	Per Project Requirements
Low Rise Foam Insulation Adhesive, Type III/IV Asphalt, Perlok or Approved Fasteners	Per Project/Code Requirements
PRS SA Base	1 Ply
Derbigum P/GP/XPS or Derbicolor P/GP/XPS	1 Ply

Slope: Positive. *(Refer to UL & FM Requirements for Fire and Wind ratings.)*

Insulation: Approved insulation boards must be adhered/attached in accordance with stipulations in Section 5.0, General Insulation Recommendations. Insulation installed over steel roof decks must be secured in accordance with the latest edition of FM Loss Prevention Data Sheet 1-29. When adhering base plies in hot asphalt over the cellular plastic foam insulation, the cellular plastic foam insulation must be overlaid with a layer of minimum $^{1}/_{2}$ inch (1.3 cm) wood fiber, $^{3}/_{4}$ inch (1.9 cm) Perlite or $^{3}/_{8}$ inch (0.95 cm) gypsum cover board in accordance with NRCA recommendations.

Base Ply: Install the base ply membrane by shingling from the low point on the roof or by strapping with the slope of the roof deck.

DERBIGUM Membrane: Install the Derbigum membrane by shingling from the low point on the roof or by strapping with the slope of the roof deck, running the Derbigum membrane parallel to the direction of the system base ply. The Derbigum membrane must be adhered by heat welding solidly over the base ply. Side laps must be minimum 3 inches (7.6 cm) and be offset from side laps of base ply minimum 12 inches (30.5 cm). End laps must be a minimum 4 inches (10.2 cm). Side and end laps must be heat welded, rolled with a minimum 20 lb (9 kg) steel roller, with a continuous bead of molten modified bitumen visible at all laps/seams after application.



2 I 1 X
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MATERIAL REQUIREMENTS	QUANTITY/100 SF
Roof Insulation	Per Project Requirements
Low Rise Foam Insulation Adhesive, Type III/IV Asphalt, Perlok or Approved Fasteners	Per Project/Code Requirements
PRS Glass Ply IV or PRS Glass Ply VI	2 Plies
Type III/IV Asphalt	Per Product Requirements
Permastic	For application rates refer to Section 9.0
Derbigum P/GP/XPS or Derbicolor P/GP/XPS	1 Ply

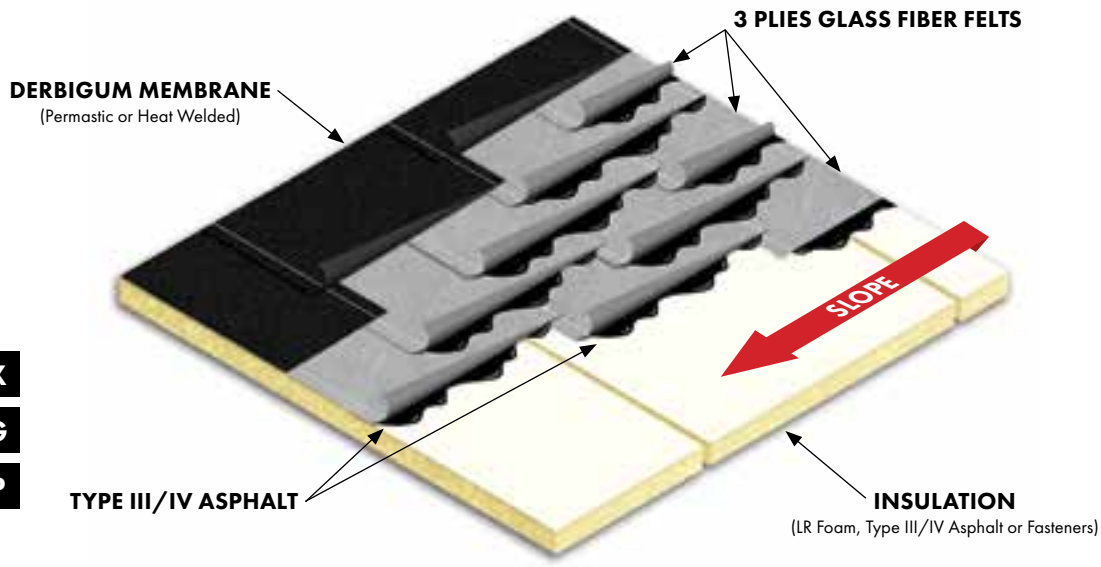
Slope: Positive. *(Refer to UL & FM Requirements for Fire and Wind ratings.)*

Insulation: Approved insulation boards must be adhered/attached in accordance with stipulations in Section 5.0, General Insulation Recommendations. Insulation installed over steel roof decks must be secured in accordance with the latest edition of FM Loss Prevention Data Sheet 1-29. When adhering base plies in hot asphalt over the cellular plastic foam insulation, the cellular plastic foam insulation must be overlaid with a layer of minimum $^1/_2$ inch (1.3 cm) wood fiber, $^3/_4$ inch (1.9 cm) Perlite or $^3/_8$ inch (0.95 cm) gypsum cover board in accordance with NRCA recommendations.

Base Ply: Install two plies Type IV or Type VI glass fiber felts shingle fashion starting from the low point on the roof or strapping with the slope in the roof deck set in solid, minimum 25 lb/100 ft^2 (1.2 kg/m^2) moppings of hot Steep Grade (Type III) or Special Steep (Type IV) asphalt. Plies must have a 11 $^1/_3$ inches (29 cm) exposure and be installed over minimum 18 inches (46 cm) wide starter or header plies at perimeters and penetrations.

DERBIGUM Membrane: Install the Derbigum membrane by shingling from the low point on the roof or by strapping with the slope of the roof deck, running the Derbigum membrane parallel to the direction of the system base ply. The Derbigum membrane must be set in a solid uniform layer of Permastic applied at a nominal rate of 1$^1/_2$ - 2 gal/sq (0.6 - 0.8 L/m^2) or adhered by heat welding solidly over the base ply. **Permastic MUST NOT be applied to membrane lap and seam areas.** Side laps must be minimum 3 inches (7.6 cm) and offset the side laps of base ply by a minimum 12 inches (30.5 cm). End laps must be a minimum 4 inches (10.2 cm). Side and end laps must be heat welded, rolled with a minimum 20 lb (9 kg) steel roller and have a continuous bead of molten modified bitumen visible at all laps/seams.

PERMASTIC Application: Permastic adhesive can be applied by spray, squeegee or trowel in a uniform layer at the minimum application rates outlined in Section 9.0. System base ply or DERBIGUM membrane should be set immediately into the Permastic.



3 I 1 X
3 I 1 G
3 I 1 P

MATERIAL REQUIREMENTS	QUANTITY/100 SF
Roof Insulation	Per Project Requirements
Low Rise Foam Insulation Adhesive, Type III/IV Asphalt, Perlok or Approved Fasteners	Per Project/Code Requirements
PRS Glass Ply IV or PRS Glass Ply VI	3 Plies
Type III/IV Asphalt	Per Product Requirements
Permastic	For application rates refer to Section 9.0
Derbigum P/GP/XPS or Derbicolor P/GP/XPS	1 Ply

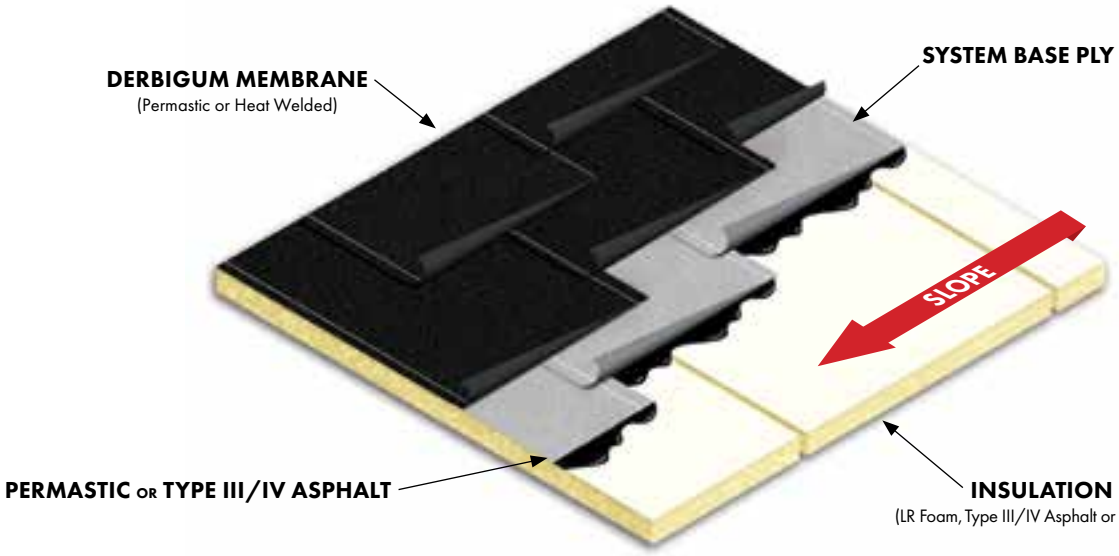
Slope: Positive. *(Refer to UL & FM Requirements for Fire and Wind ratings.)*

Insulation: Approved insulation boards must be adhered/attached in accordance with stipulations in Section 5.0, General Insulation Recommendations. Insulation installed over steel roof decks must be secured in accordance with the latest edition of FM Loss Prevention Data Sheet 1-29. When adhering base plies in hot asphalt over the cellular plastic foam insulation, the cellular plastic foam insulation must be overlaid with a layer of minimum $^{1}/_{2}$ inch (1.3 cm) wood fiber, $^{3}/_{4}$ inch (1.9 cm) Perlite or $^{3}/_{8}$ inch (0.95 cm) gypsum cover board in accordance with NRCA recommendations.

Base Ply: Install three plies Type IV or VI glass fiber felts shingle fashion starting from the low point on the roof or strapping with the slope in the roof deck set in solid, minimum 25 lb/100 ft^2 (1.2 kg/m^2) moppings of hot Steep Grade (Type III) or Special Steep (Type IV) asphalt. Plies must have a 11 $^{1}/_{3}$ inches (29 cm) exposure and be installed over minimum 18 inches (46 cm) wide starter or header plies at perimeters and penetrations.

DERBIGUM Membrane: Install the Derbigum membrane by shingling from the low point on the roof or by strapping with the slope of the roof deck, running the Derbigum membrane parallel to the direction of the system base ply. The Derbigum membrane must be set in a solid uniform layer of Permastic applied at a nominal rate of 1$^{1}/_{2}$ - 2 gal/sq (0.6 - 0.8 L/m^2) or adhered by heat welding solidly over the base ply. **Permastic MUST NOT be applied to membrane lap and seam areas.** Side laps must be minimum 3 inches (7.6 cm) and offset the side laps of base ply by a minimum 12 inches (30.5 cm). End laps must be a minimum 4 inches (10.2 cm). Side and end laps must be heat welded, rolled with a minimum 20 lb (9 kg) steel roller and have a continuous bead of molten modified bitumen visible at all laps/seams.

PERMASTIC Application: Permastic adhesive can be applied by spray, squeegee or trowel in a uniform layer at the minimum application rates outlined in Section 9.0. System base ply or Derbigum membrane should be set immediately into the Permastic.



1	I	2	X
1	I	2	G
1	I	2	P

MATERIAL REQUIREMENTS	QUANTITY/100 SF
Roof Insulation	Per Project Requirements
Low Rise Foam Insulation Adhesive, Type III/IV Asphalt, Perlok or Approved Fasteners	Per Project/Code Requirements
Derbibase, Derbibase Ultra, PRS Glass Base or PRS Modified Base	1 ply
Permastic	For application rates refer to Section 9.0
Derbigum P/GP/XPS or Derbicolor P/GP/XPS	2 Plies

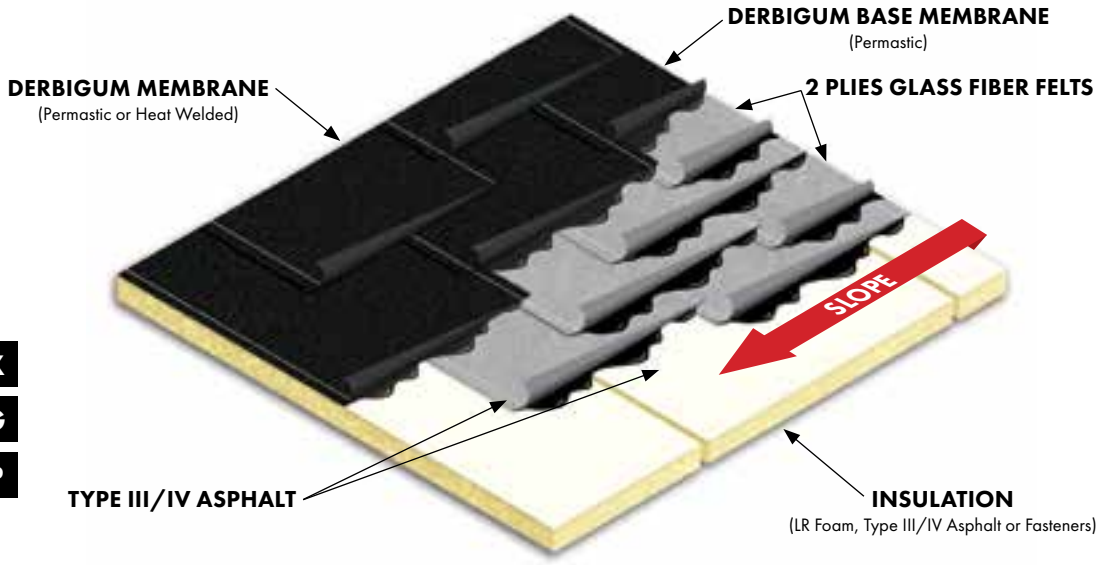
Slope: Positive. *(Refer to UL & FM Requirements for Fire and Wind ratings.)*

Insulation: Approved insulation boards must be adhered/attached in accordance with stipulations in Section 5.0, General Insulation Recommendations. Insulation installed over steel roof decks must be secured in accordance with the latest edition of FM Loss Prevention Data Sheet 1-29. When adhering base plies in hot asphalt over the cellular plastic foam insulation, the cellular plastic foam insulation must be overlaid with a layer of minimum $^{1}/_{2}$ inch (1.3 cm) wood fiber, $^{3}/_{4}$ inch (1.9 cm) Perlite or $^{3}/_{8}$ inch (0.95 cm) gypsum cover board in accordance with NRCA recommendations.

Base Ply: Install the membrane system base ply by shingling from the low point on the roof or by strapping with the slope of the roof deck in solid, nominal 25 lb/ just called (1.2 kg/m^2) moppings of hot Steep Grade (Type III) or Special Steep (Type IV) asphalt; or in a solid layer of Permastic applied at a minimum rate of 1 $^{1}/_{2}$ - 2 gal/sq (0.6 - 0.8 L/m^2). Side laps must be minimum 3 inches (7.6 cm) and be offset a minimum 12 inches. End laps must be a minimum 4 inches. **NOTE:** Derbibase must be installed in Permastic or mechanically attached in accordance to FM Global recommendations. When installing a base ply over Derbiboard insulation, the application rate of Permastic must be at a minimum rate of 2 - 2 $^{1}/_{2}$ gal/sq (0.8 -1.0 L/m^2).

DERBIGUM Membrane: Install the Derbigum membrane by shingling from the low point on the roof or by strapping with the slope of the roof deck, running the Derbigum membrane parallel to the direction of the system base ply. The Derbigum membrane must be set in a solid uniform layer of Permastic applied at a nominal rate of 1 $^{1}/_{2}$ - 2 gal/sq (0.6 - 0.8 L/m^2) or adhered by heat welding solidly over the base ply. Stagger the second layer of Derbigum a half sheet from the Derbigum ply below. Adhere the top sheet of Derbigum with Permastic applied at the specified rate listed above or by heat welding. **Permastic MUST NOT be applied to membrane lap and seam areas.** Side laps must be minimum 3 inches (7.6 cm) and offset the side laps of base ply by a minimum 12 inches (30.5 cm). End laps must be a minimum 4 inches (10.2 cm). Side and end laps must be heat welded, rolled with a minimum 20 lb (9 kg) steel roller and have a continuous bead of molten modified bitumen visible at all laps/seams.

PERMASTIC Application: Permastic adhesive can be applied by spray, squeegee or trowel in a uniform layer at the minimum application rates outlined in Section 9.0. System base ply or Derbigum membrane should be set immediately into the Permastic.



2 I 2 X
2 I 2 G
2 I 2 P

MATERIAL REQUIREMENTS	QUANTITY/100 SF
Roof Insulation	Per Project Requirements
Low Rise Foam Insulation Adhesive, Type III/IV Asphalt, Perlok or Approved Fasteners	Per Project/Code Requirements
PRS Glass Ply IV or PRS Glass Ply VI	2 Plies
Type III/IV Asphalt	Per Product Requirements
Permastic	For application rates refer to Section 9.0
Derbigum P/GP/XPS or Derbicolor P/GP/XPS	2 Plies

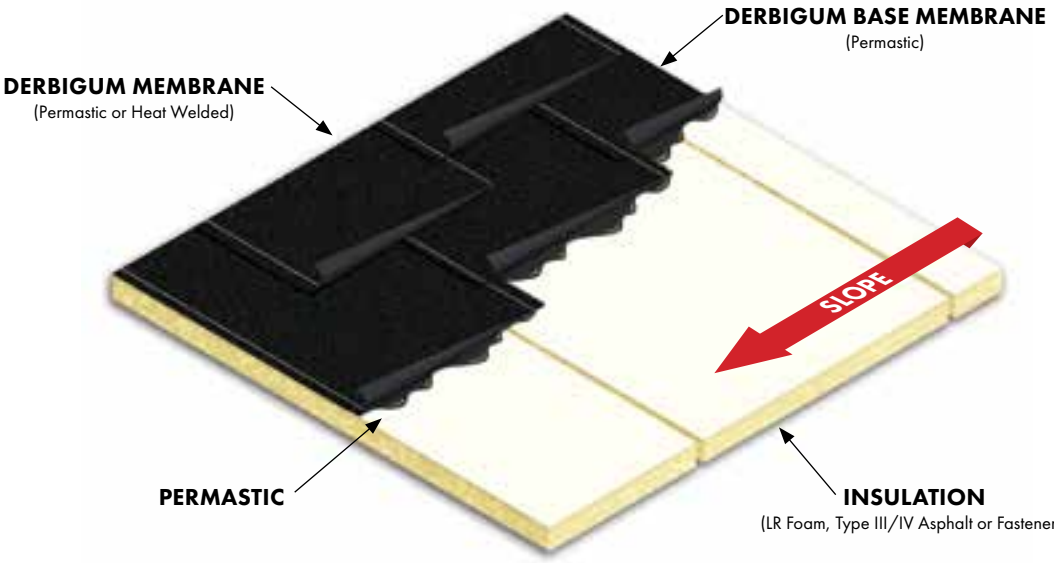
Slope: Positive. *(Refer to UL & FM Requirements for Fire and Wind ratings.)*

Insulation: Approved insulation boards must be adhered/attached in accordance with stipulations in Section 5.0, General Insulation Recommendations. Insulation installed over steel roof decks must be secured in accordance with the latest edition of FM Loss Prevention Data Sheet 1-29. When adhering base plies in hot asphalt over the cellular plastic foam insulation, the cellular plastic foam insulation must be overlaid with a layer of minimum $^{1}/_{2}$ inch (1.3 cm) wood fiber, $^{3}/_{4}$ inch (1.9 cm) Perlite or $^{3}/_{8}$ inch (0.95 cm) gypsum cover board in accordance with NRCA recommendations.

Base Ply: Install two plies Type IV or VI glass fiber felts shingle fashion starting from the low point on the roof or strapping with the slope in the roof deck set in solid, minimum 25 lb/100 ft^2 (1.2 kg/m^2) moppings of hot Steep Grade (Type III) or Special Steep (Type IV) asphalt. Plies must have a 11 $^{1}/_{3}$ inches (29 cm) exposure and be installed over minimum 18 inches (46 cm) wide starter or header plies at perimeters and penetrations.

DERBIGUM Membrane: Install the Derbigum membrane by shingling from the low point on the roof or by strapping with the slope of the roof deck, running the Derbigum membrane parallel to the direction of the system base ply. The Derbigum membrane must be set in a solid uniform layer of Permastic applied at a nominal rate of 1$^{1}/_{2}$ - 2 gal/sq (0.6 - 0.8 L/m^2) or adhered by heat welding solidly over the base ply. Stagger the second layer of Derbigum a half sheet from the Derbigum ply below. Adhere the top sheet of Derbigum with Permastic applied at the specified rate listed above or by heat welding. **Permastic MUST NOT be applied to membrane lap and seam areas.** Side laps must be minimum 3 inches (7.6 cm) and offset the side laps of base ply by a minimum 12 inches (30.5 cm). End laps must be a minimum 4 inches (10.2 cm). Side and end laps must be heat welded, rolled with a minimum 20 lb (9 kg) steel roller and have a continuous bead of molten modified bitumen visible at all laps/seams.

PERMASTIC Application: Permastic adhesive can be applied by spray, squeegee or trowel in a uniform layer at the minimum application rates outlined in Section 9.0. System base ply or Derbigum membrane should be set immediately into the Permastic.



0 I 2 X
0 I 2 G

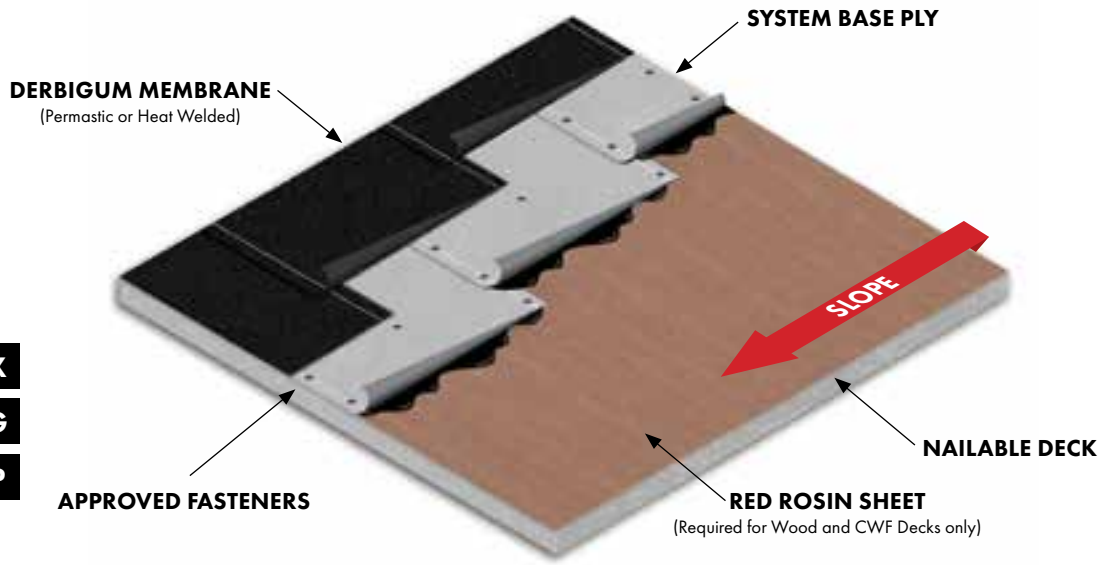
MATERIAL REQUIREMENTS	QUANTITY/100 SF
Roof Insulation	Per Project Requirements
Low Rise Foam Insulation Adhesive, Type III/IV Asphalt, Perlok or Approved Fasteners	Per Project/Code Requirements
Permastic	For application rates refer to Section 9.0
Derbigum GP/XPS or Derbicolor GP/XPS	2 Plies

Slope: Positive. *(Refer to UL & FM Requirements for Fire and Wind ratings.)*

Insulation: Approved insulation boards must be adhered/attached in accordance with stipulations in Section 5.0, General Insulation Recommendations. Insulation installed over steel roof decks must be secured in accordance with the latest edition of FM Loss Prevention Data Sheet 1-29. When adhering base plies in hot asphalt over the cellular plastic foam insulation, the cellular plastic foam insulation must be overlaid with a layer of minimum $^{1}/_{2}$ inch (1.3 cm) wood fiber, $^{3}/_{4}$ inch (1.9 cm) Perlite or $^{3}/_{8}$ inch (0.95 cm) gypsum cover board in accordance with NRCA recommendations.

DERBIGUM Membrane: Install the base ply of Derbigum membrane by shingling from the low point on the roof or by strapping with the slope of the roof deck, in a solid uniform layer of Permastic applied at a nominal rate of 2 - $2^{1}/_{2}$ gal/sq (0.8 - 1.0 L/m^2). Stagger the second Derbigum layer directly center to the base ply below. Adhere the top ply of Derbigum membrane by heat welding solidly over the base ply or by setting into a continuous layer of Permastic applied at a nominal rate of $1^{1}/_{2}$ - 2 gal/sq (0.6 - 0.8 L/m^2). **Permastic MUST NOT be applied to membrane lap and seam areas.** Side laps must be minimum 3 inches (7.6 cm) and offset the side laps of base ply by a minimum 12 inches (30.5 cm). End laps must be a minimum 4 inches (10.2 cm). Side and end laps must be heat welded, rolled with a minimum 20 lb (9 kg) steel roller and have a continuous bead of molten modified bitumen visible at all laps/seams.

PERMASTIC Application: Permastic adhesive can be applied by spray, squeegee or trowel in a uniform layer at the minimum application rates outlined in Section 9.0. System base ply or Derbigum membrane should be set immediately into the Permastic.



1 N 1 X
1 N 1 G
1 N 1 P

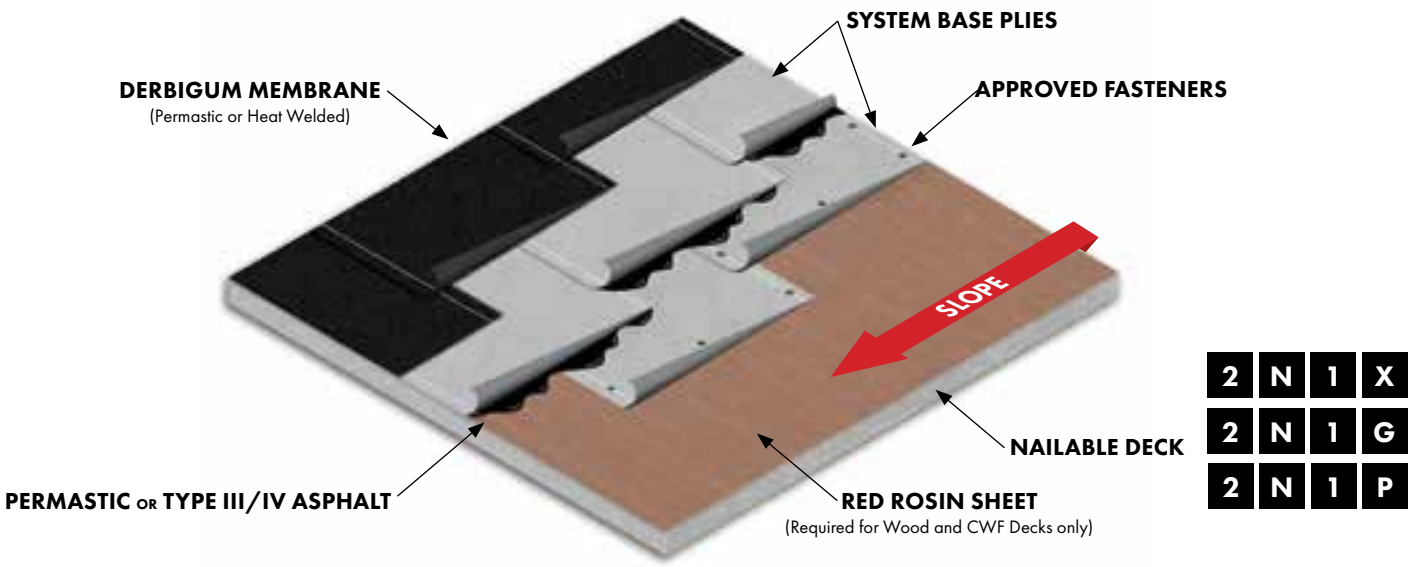
MATERIAL REQUIREMENTS	QUANTITY / 100 SF
Red Rosin Sheet ***(Required for Wood and Cementitious Wood Fiber Decks)***	1 Ply
Approved Base Ply	1 Ply
Perlok or Approved Fasteners	Per Project/Code Requirements
Permastic	For application rates refer to Section 9.0
Derbigum P/GP/XPS or Derbicolor P/GP/XPS	1 Ply

Slope: Positive. *(Refer to UL & FM Requirements for Fire and Wind ratings.)*

Base Sheet/Separator sheet: For Wood and Cementitious Wood Fiber decks, a red rosin sheet is required plus a layer of Derbibase, PRS Modified Base or PRS Glass Base. For LWIC decks use PRS Vented Base, Derbibase or PRS Modified Base. Install the base ply by shingling from the low point on the roof or by strapping with the slope of the roof deck. Side laps must be minimum 3 inches (7.6 cm) and end laps minimum 4 inches (10.2 cm). Secure base sheet to the wood roof deck using minimum 1 inch (2.5 cm) diameter head Simplex-type nails with ring or annular shank installed 6 - 9 inches (15 - 23 cm) on side laps and end laps, and 12 - 18 inches (30 - 46 cm) in two rows staggered longitudinally along the center of the sheet approximately 12 inches (30 cm) from each edge. On LWIC and tectum roof decks consult FM Global Guide for recommended fasteners and patterns. Minimum total fastener quantity must be 75 per 100 ft^2 or in accordance with current recommendations of FM Global.

DERBIGUM Membrane: Install the Derbigum membrane by shingling from the low point on the roof or by strapping with the slope of the roof deck, running the Derbigum membrane parallel to the direction of the system base ply. The Derbigum membrane must be set in a solid uniform layer of Permastic applied at a nominal rate of $1^1/_2$ - 2 gal/sq (0.6 - 0.8 L/m^2) or adhered by heat welding solidly over the base ply. **Permastic MUST NOT be applied to membrane lap and seam areas.** Side laps must be minimum 3 inches (7.6 cm) and offset the side laps of base ply by a minimum 12 inches (30.5 cm). End laps must be a minimum 4 inches (10.2 cm). Side and end laps must be heat welded, rolled with a minimum 20 lb (9 kg) steel roller and have a continuous bead of molten modified bitumen visible at all laps/seams.

PERMASTIC Application: Permastic adhesive can be applied by spray, squeegee or trowel in a uniform layer at the minimum application rates outlined in Section 9.0. System base ply or Derbigum membrane should be set immediately into the Permastic.



MATERIAL REQUIREMENTS	QUANTITY/100 SF
Red Rosin Sheet ***(Required for Wood and Cementitious Wood Fiber Decks)***	1 Ply
Approved Base Ply	1 Ply
Perlok or Approved Fasteners	Per Project/Code Requirements
PRS Glass Ply IV or PRS Glass Ply VI	2 Plies
Type III/IV Asphalt	Per Product Requirements
Derbigum P/GP/XPS or Derbicolor P/GP/XPS	1 Ply

Slope: Positive. *(Refer to UL & FM Requirements for Fire and Wind ratings.)*

Base Sheet/Separator sheet: For Wood and Cementitious Wood Fiber decks, a red rosin sheet is required plus a layer of Derbibase, PRS Modified Base or PRS Glass Base. For LWIC decks use PRS Vented Base, Derbibase or PRS Modified Base. Install the base ply by shingling from the low point on the roof or by strapping with the slope of the roof deck. Side laps must be minimum 3 inches (7.6 cm) and end laps minimum 4 inches (10.2 cm). Secure base sheet to the wood roof deck using minimum 1 inch (2.5 cm) diameter head Simplex-type nails with ring or annular shank installed 6 - 9 inches (15 - 23 cm) on side laps and end laps, and 12 - 18 inches (30 - 46 cm) in two rows staggered longitudinally along the center of the sheet approximately 12 inches (30 cm) from each edge. On LWIC and tectum roof decks consult FM Global Guide for recommended fasteners and patterns. Minimum total fastener quantity must be 75 per 100 ft^2 or in accordance with current recommendations of FM Global.

Base Sheet: Install the membrane system base ply by shingling from the low point on the roof or by strapping with the slope of the roof deck, nominal 25 lb/ just called (1.2 kg/m^2) moppings of hot Steep Grade (Type III) or Special Steep (Type IV) asphalt; or in a solid layer of Permastic applied at a minimum rate of $1\,^1/_2$ - 2 gal/sq (0.6 - 0.8 L/m^2).

DERBIGUM Membrane: Install the Derbigum membrane by shingling from the low point on the roof or by strapping with the slope of the roof deck, running the Derbigum membrane parallel to the direction of the system base ply. The Derbigum membrane must be set in a solid uniform layer of Permastic applied at a nominal rate of $1\,^1/_2$ - 2 gal/sq (0.6 - 0.8 L/m^2) or adhered by heat welding solidly over the base ply. **Permastic MUST NOT be applied to membrane lap and seam areas.** Side laps must be minimum 3 inches (7.6 cm) and offset the side laps of base ply by a minimum 12 inches (30.5 cm). End laps must be a minimum 4 inches (10.2 cm). Side and end laps must be heat welded, rolled with a minimum 20 lb (9 kg) steel roller and have a continuous bead of molten modified bitumen visible at all laps/seams.

PERMASTIC Application: Permastic adhesive can be applied by spray, squeegee or trowel in a uniform layer at the minimum application rates outlined in Section 9.0. System base ply or Derbigum membrane should be set immediately into the Permastic.

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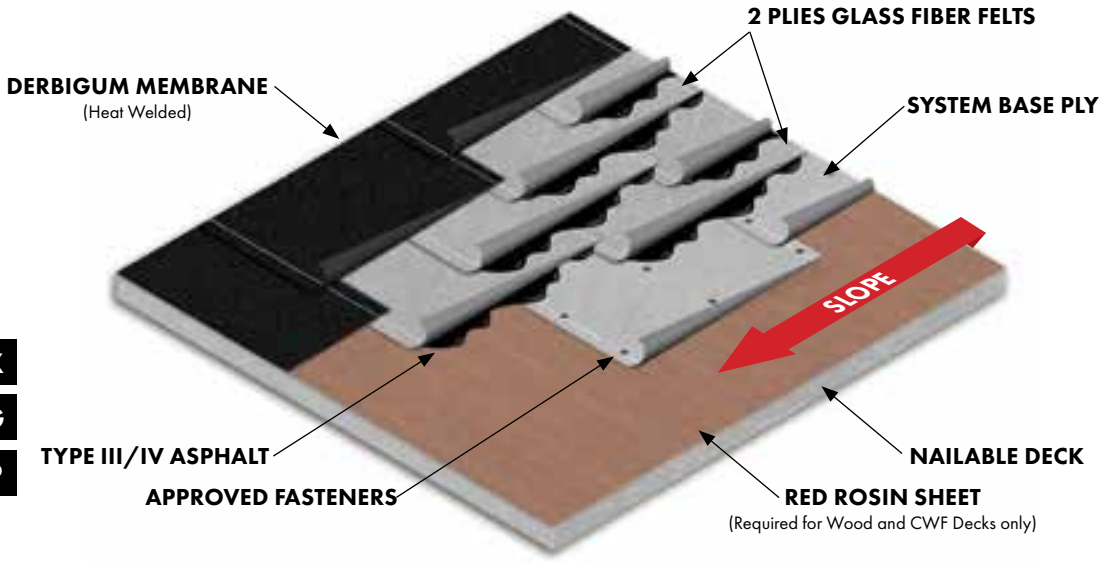


MATERIAL REQUIREMENTS	QUANTITY/100 SF
Red Rosin Sheet ***(Required for Wood and Cementitious Wood Fiber Decks)***	1 Ply
Approved Base Ply	1 Ply
Perlok or Approved Fasteners	Per Project/Code Requirements
PRS Glass Ply IV or PRS Glass Ply VI	2 Plies
Type III/IV Asphalt	Per Product Requirements
Derbigum P/GP/XPS or Derbicolor P/GP/XPS	1 Ply

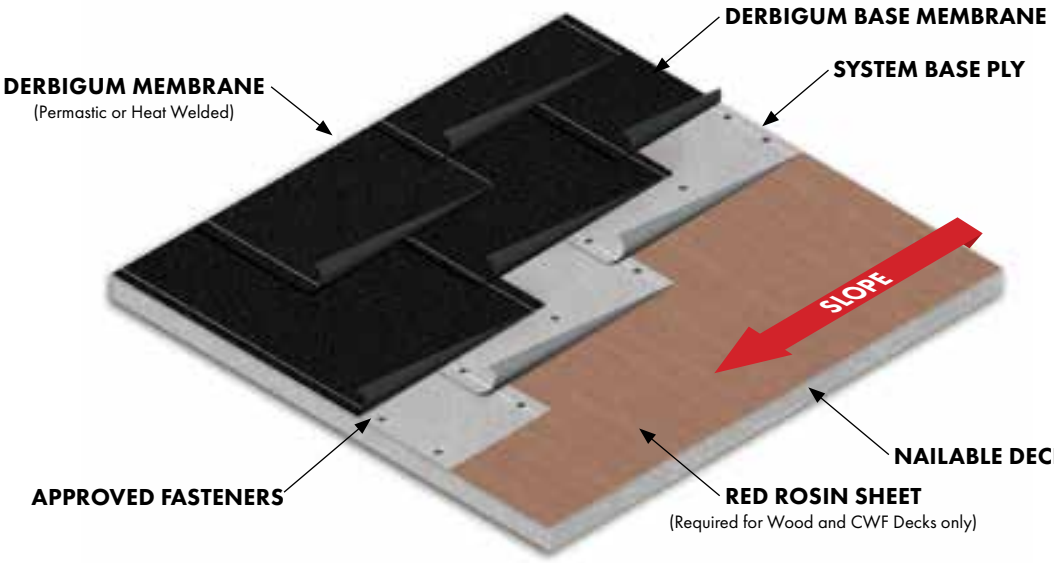
Slope: Positive. *(Refer to UL & FM Requirements for Fire and Wind ratings.)*

Base Sheet/Separator sheet: For Wood and Cementitious Wood Fiber decks, a red rosin sheet is required plus a layer of Derbibase, PRS Modified Base or PRS Glass Base. For LWIC decks use PRS Vented Base, Derbibase or PRS Modified Base. Install the base ply by shingling from the low point on the roof or by strapping with the slope of the roof deck. Side laps must be minimum 3 inches (7.6 cm) and end laps minimum 4 inches (10.2 cm). Secure base sheet to the wood roof deck using minimum 1 inch (2.5 cm) diameter head Simplex-type nails with ring or annular shank installed 6 - 9 inches (15 - 23 cm) on side laps and end laps, and 12 - 18 inches (30 - 46 cm) in two rows staggered longitudinally along the center of the sheet approximately 12 inches (30 cm) from each edge. On LWIC and tectum roof decks consult FM Global Guide for recommended fasteners and patterns. Minimum total fastener quantity must be 75 per 100 ft^2 or in accordance with current recommendations of FM Global.

Base Sheet: Install two plies Type IV or VI glass fiber felts in shingle fashion starting from the low point on the roof or strapping with the slope in the roof deck set in solid, minimum 25 lb/100 ft^2 (1.2 kg/m^2) moppings of hot Steep Grade (Type III) or Special Steep (Type IV) asphalt. Plies must be lapped 17 inches (43 cm)exposure and be installed over minimum 18 inches (46 cm) wide starter or header plies at perimeters and penetrations.

DERBIGUM Membrane: Install the Derbigum membrane by shingling from the low point on the roof or by strapping with the slope of the roof deck, running the Derbigum membrane parallel to the direction of the system base ply. The Derbigum membrane must be set in a solid uniform layer of Permastic applied at a nominal rate of $1^1/_2$ - 2 gal/sq (0.6 - 0.8 L/m^2) or adhered by heat welding solidly over the base ply. **Permastic MUST NOT be applied to membrane lap and seam areas.** Side laps must be minimum 3 inches (7.6 cm) and offset the side laps of base ply by a minimum 12 inches (30.5 cm). End laps must be a minimum 4 inches (10.2 cm). Side and end laps must be heat welded, rolled with a minimum 20 lb (9 kg) steel roller and have a continuous bead of molten modified bitumen visible at all laps/seams.

PERMASTIC Application: Permastic adhesive can be applied by spray, squeegee or trowel in a uniform layer at the minimum application rates outlined in Section 9.0. System base ply or Derbigum membrane should be set immediately into the Permastic.



1 N 2 X
1 N 2 G
1 N 2 P

MATERIAL REQUIREMENTS	QUANTITY/100 SF
Red Rosin Sheet ***(Required for Wood and Cementitious Wood Fiber Decks)***	1 Ply
Approved Base Ply	1 Ply
Perlok or Approved Fasteners	Per Project/Code Requirements
Permastic	For application rates refer to Section 9.0
Derbigum P/GP/XPS or Derbicolor P/GP/XPS	2 Plies

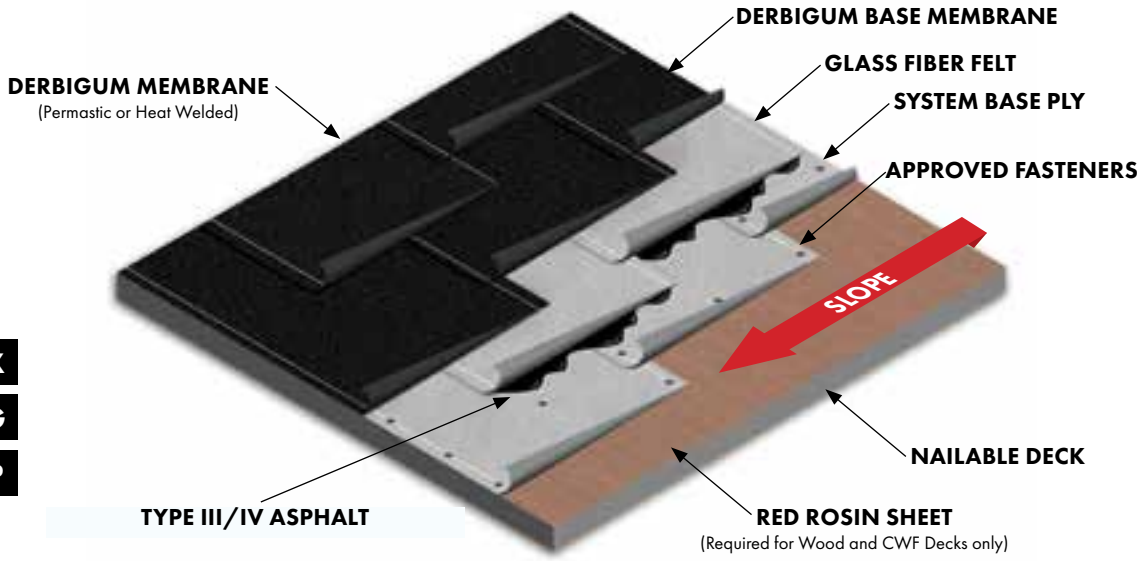
Slope: Positive. *(Refer to UL & FM Requirements for Fire and Wind ratings.)*

Base Sheet/Separator sheet: For Wood and Cementitious Wood Fiber decks, a red rosin sheet is required plus a layer of Derbibase, PRS Modified Base or PRS Glass Base. For LWIC decks use PRS Vented Base, Derbibase or PRS Modified Base. Install the base ply by shingling from the low point on the roof or by strapping with the slope of the roof deck. Side laps must be minimum 3 inches (7.6 cm) and end laps minimum 4 inches (10.2 cm). Secure base sheet to the wood roof deck using minimum 1 inch (2.5 cm) diameter head Simplex-type nails with ring or annular shank installed 6 - 9 inches (15 - 23 cm) on side laps and end laps, and 12 - 18 inches (30 - 46 cm) in two rows staggered longitudinally along the center of the sheet approximately 12 inches (30 cm) from each edge. On LWIC and tectum roof decks consult FM Global Guide for recommended fasteners and patterns. Minimum total fastener quantity must be 75 per 100 ft^2 or in accordance with current recommendations of FM Global.

DERBIGUM Membrane: Install the Derbigum membrane by shingling from the low point on the roof or by strapping with the slope of the roof deck, running the Derbigum membrane parallel to the direction of the system base ply. The Derbigum membrane must be set in a solid uniform layer of Permastic applied at a nominal rate of $1^1/_2$ - 2 gal/sq (0.6 - 0.8 L/m^2) or adhered by heat welding solidly over the base ply. Stagger the second layer of Derbigum a half sheet from the Derbigum ply below. Adhere the top sheet of Derbigum with Permastic applied at the specified rate listed above or by heat welding. **Permastic MUST NOT be applied to membrane lap and seam areas.** Side laps must be minimum 3 inches (7.6 cm) and offset the side laps of base ply by a minimum 12 inches (30.5 cm). End laps must be a minimum 4 inches (10.2 cm). Side and end laps must be heat welded, rolled with a minimum 20 lb (9 kg) steel roller and have a continuous bead of molten modified bitumen visible at all laps/seams.

PERMASTIC Application: Permastic adhesive can be applied by spray, squeegee or trowel in a uniform layer at the minimum application rates outlined in Section 9.0. System base ply or Derbigum membrane should be set immediately into the Permastic.

2 N 2 X
2 N 2 G
2 N 2 P



MATERIAL REQUIREMENTS	QUANTITY/100 SF
Red Rosin Sheet ***(Required for Wood and Cementitious Wood Fiber Decks)***	1 Ply
Approved Base Ply	1 Ply
Perlok or Approved Fasteners	Per Project/Code Requirements
PRS Glass Ply IV or PRS Glass Ply VI	2 Plies
Type III/IV Asphalt	Per Product Requirements
Permastic	For application rates refer to Section 9.0
Derbigum P/GP/XPS or Derbicolor P/GP/XPS	2 Plies

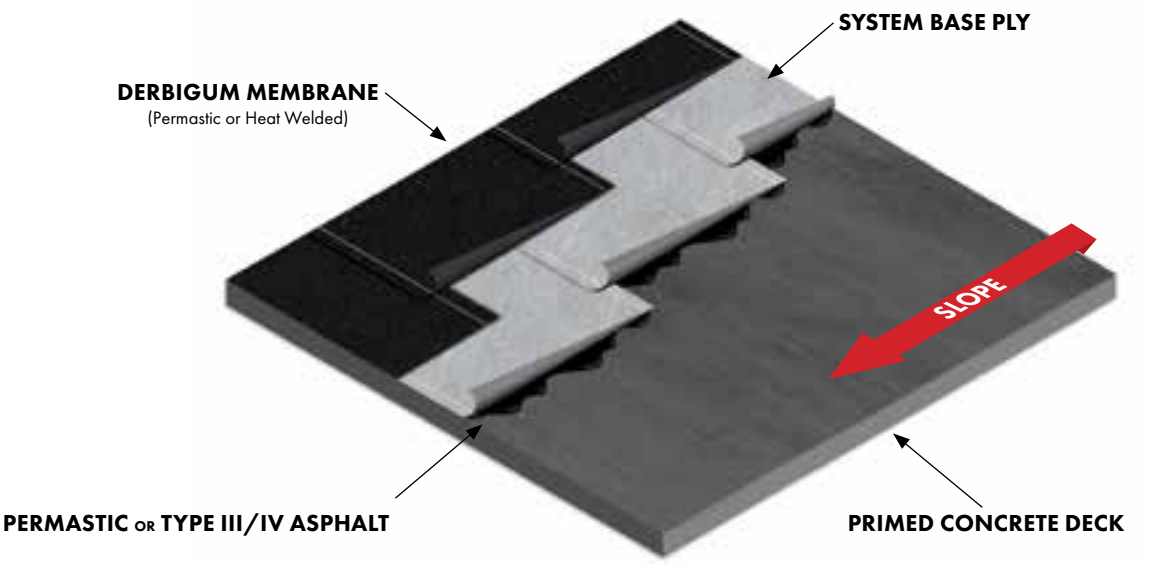
Slope: Positive. *(Refer to UL & FM Requirements for Fire and Wind ratings.)*

Base Sheet/Separator sheet: For Wood and Cementitious Wood Fiber decks, a red rosin sheet is required plus a layer of Derbibase, PRS Modified Base or PRS Glass Base. For LWIC decks use PRS Vented Base, Derbibase or PRS Modified Base. Install the base ply by shingling from the low point on the roof or by strapping with the slope of the roof deck. Side laps must be minimum 3 inches (7.6 cm) and end laps minimum 4 inches (10.2 cm). Secure base sheet to the wood roof deck using minimum 1 inch (2.5 cm) diameter head Simplex-type nails with ring or annular shank installed 6 - 9 inches (15 - 23 cm) on side laps and end laps, and 12 - 18 inches (30 - 46 cm) in two rows staggered longitudinally along the center of the sheet approximately 12 inches (30 cm) from each edge. On LWIC and tectum roof decks consult FM Global Guide for recommended fasteners and patterns. Minimum total fastener quantity must be 75 per 100 ft^2 or in accordance with current recommendations of FM Global.

Base Sheet: Install one ply of Type IV or VI glass fiber felt in shingle fashion starting from the low point on the roof or strapping with the slope in the roof deck set in solid, minimum 25 lb/100 ft^2 (1.2 kg/m^2) moppings of hot Steep Grade (Type III) or Special Steep (Type IV) asphalt. Plies must have a 11 1/3 inches (29 cm) exposure and be installed over minimum 18 inches (46 cm) wide starter or header plies at perimeters and penetrations.

DERBIGUM Membrane: Install the Derbigum membrane by shingling from the low point on the roof or by strapping with the slope of the roof deck, running the Derbigum membrane parallel to the direction of the system base ply. The Derbigum membrane must be set in a solid uniform layer of Permastic applied at a nominal rate of 1 1/2 - 2 gal/sq (0.6 - 0.8 L/m^2) or adhered by heat welding solidly over the base ply. Stagger the second layer of Derbigum a half sheet from the Derbigum ply below. Adhere the top sheet of Derbigum with Permastic applied at the specified rate listed above or by heat welding. **Permastic MUST NOT be applied to membrane lap and seam areas.** Side laps must be minimum 3 inches (7.6 cm) and offset the side laps of base ply by a minimum 12 inches (30.5 cm). End laps must be a minimum 4 inches (10.2 cm). Side and end laps must be heat welded, rolled with a minimum 20 lb (9 kg) steel roller and have a continuous bead of molten modified bitumen visible at all laps/seams.

PERMASTIC Application: Permastic adhesive can be applied by spray, squeegee or trowel in a uniform layer at the minimum application rates outlined in Section 9.0. System base ply or Derbigum membrane should be set immediately into the Permastic.



1 C 1 X
1 C 1 G
1 C 1 P

MATERIAL REQUIREMENTS	QUANTITY/100 SF
Asphalt Primer	Per Product Requirements
Derbigum, Derbibase, Derbibase Ultra, PRS Glass Base or PRS Modified Base	1 Ply
Type III/IV Asphalt ***(Required when using PRS Modified Base and PRS Glass Base)***	Per Product Requirements
Permastic	For application rates refer to Section 9.0
Derbigum P/GP/XPS or Derbicolor P/GP/XPS	1 Ply

Slope: Positive. *(Refer to UL & FM Requirements for Fire and Wind ratings.)*

Primer: Prior to installation, deck surface must be primed with Asphalt primer and allowed to dry. An NRCA "Deck Dryness Test" should be performed before starting work.

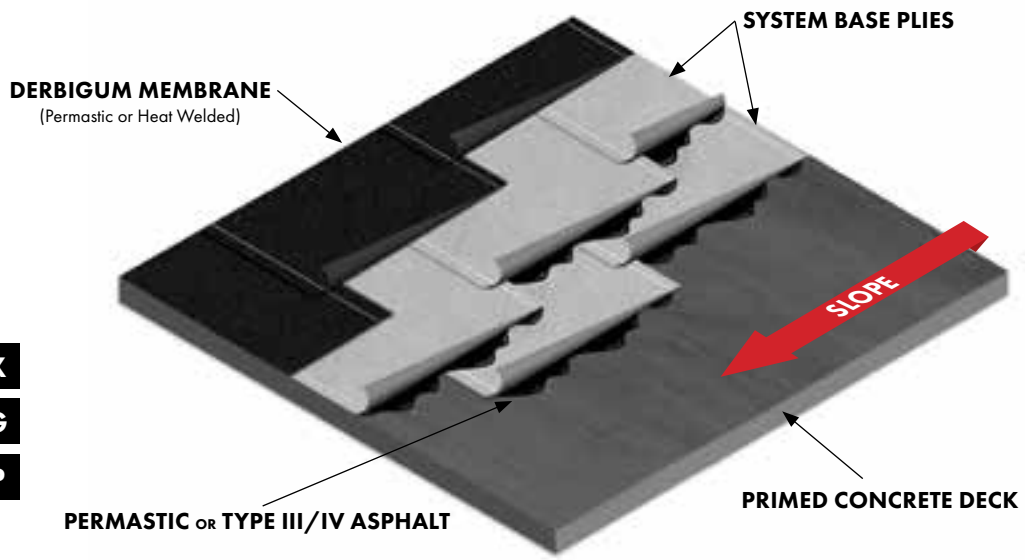
Base Sheet: Install the system base ply by shingling from the low point on the roof or by strapping with the slope of the roof deck. Secure base sheet in a solid layer of Permastic applied at a minimum rate of 2 - 2 $^1/_2$ gal/sq; or set in, minimum 25 lb/100 ft^2 (1.2 kg/m^2) moppings of hot Steep Grade (Type III) or Special Steep (Type IV) asphalt. Side laps must be minimum 3 inches (7.6 cm) and be offset a minimum 12 inches. End laps must be a minimum 4 inches.

PRS Glass Base and PRS Modified Base Sheets must be set in solid, nominal 25 lb/100 ft^2 (1.2 kg/m^2) moppings of hot Steep Grade (Type III) or Special Steep (Type IV) asphalt.

DERBIGUM Membrane: Install the Derbigum membrane by shingling from the low point on the roof or by strapping with the slope of the roof deck, running the Derbigum membrane parallel to the direction of the system base ply. The Derbigum membrane must be set in a solid uniform layer of Permastic applied at a nominal rate of 1$^1/_2$ - 2 gal/sq (0.6 - 0.8 L/m^2) or adhered by heat welding solidly over the base ply. **Permastic MUST NOT be applied to membrane lap and seam areas.** Side laps must be minimum 3 inches (7.6 cm) and offset the side laps of base ply by a minimum 12 inches (30.5 cm). End laps must be a minimum 4 inches (10.2 cm). Side and end laps must be heat welded, rolled with a minimum 20 lb (9 kg) steel roller and have a continuous bead of molten modified bitumen visible at all laps/seams.

PERMASTIC Application: Permastic adhesive can be applied by spray, squeegee or trowel in a uniform layer at the minimum application rates outlined in Section 9.0. System base ply or Derbigum membrane should be set immediately into the Permastic.

2 C 1 X
2 C 1 G
2 C 1 P



MATERIAL REQUIREMENTS	QUANTITY/100 SF
Asphalt Primer	Per Product Requirements
Derbigum, Derbibase, Derbibase Ultra, PRS Glass Base or PRS Modified Base	2 Plies
Type III/IV Asphalt ***(Required when using PRS Modified Base and PRS Glass Base)***	Per Product Requirements
Permastic	For application rates refer to Section 9.0
Derbigum P/GP/XPS or Derbicolor P/GP/XPS	1 Ply

Slope: Positive. *(Refer to UL & FM Requirements for Fire and Wind ratings.)*

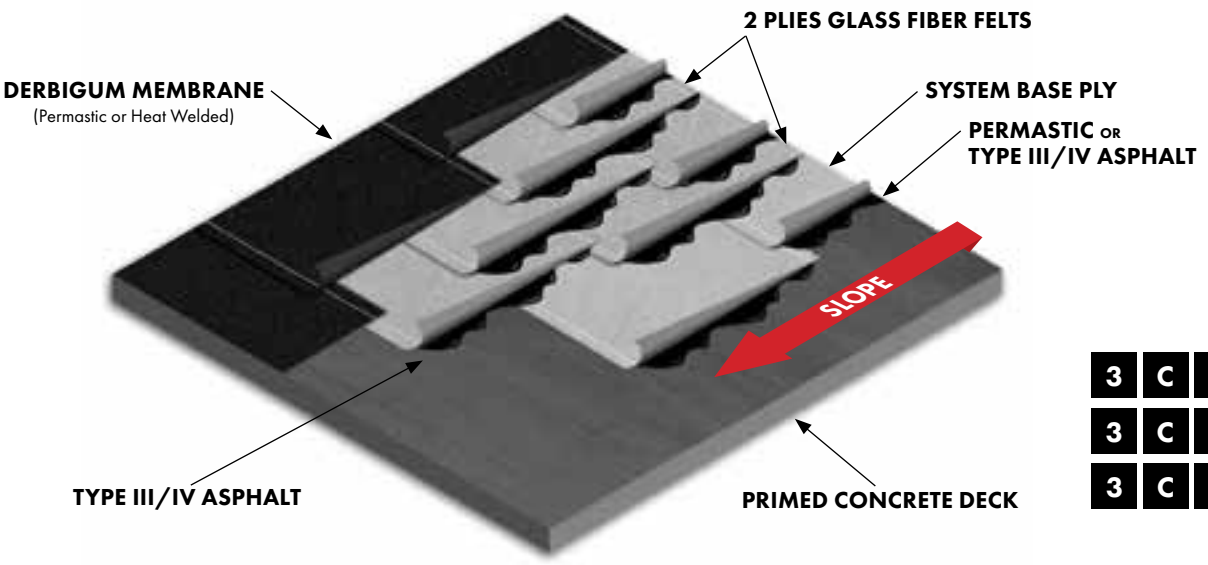
Primer: Prior to installation, deck surface must be primed with Asphalt primer and allowed to dry. An NRCA "Deck Dryness Test" should be performed before starting work.

Base Sheet: Install two layers of system base ply by shingling from the low point on the roof or by strapping with the slope of the roof deck. Secure base sheet in a solid layer of Permastic applied at a minimum rate of 2 - 2 $^1/_2$ gal/sq; or set in, minimum 25 lb/100 ft^2 (1.2 kg/m^2) moppings of hot Steep Grade (Type III) or Special Steep (Type IV) asphalt. Stagger the second ply a half sheet from the base ply below. Adhere the second base sheet using Permastic 1$^1/_2$ - 2 gal/sq (0.6 - 0.8 L/m^2) or Type III or IV Asphalt at specified rates mentioned above. Side laps must be minimum 3 inches (7.6 cm) and be offset a minimum 12 inches. End laps must be a minimum 4 inches.

PRS Glass Base and PRS Modified Base Sheets must be set in solid, nominal 25 lb/100 ft^2 (1.2 kg/m^2) moppings of hot Steep Grade (Type III) or Special Steep (Type IV) asphalt.

DERBIGUM Membrane: Install the Derbigum membrane by shingling from the low point on the roof or by strapping with the slope of the roof deck, running the Derbigum membrane parallel to the direction of the system base ply. The Derbigum membrane must be set in a solid uniform layer of Permastic applied at a nominal rate of 1$^1/_2$ - 2 gal/sq (0.6 - 0.8 L/m^2) or adhered by heat welding solidly over the base ply. **Permastic MUST NOT be applied to membrane lap and seam areas.** Side laps must be minimum 3 inches (7.6 cm) and offset the side laps of base ply by a minimum 12 inches (30.5 cm). End laps must be a minimum 4 inches (10.2 cm). Side and end laps must be heat welded, rolled with a minimum 20 lb (9 kg) steel roller and have a continuous bead of molten modified bitumen visible at all laps/seams.

PERMASTIC Application: Permastic adhesive can be applied by spray, squeegee or trowel in a uniform layer at the minimum application rates outlined in Section 9.0. System base ply or Derbigum membrane should be set immediately into the Permastic.



3 C 1 X
3 C 1 G
3 C 1 P

MATERIAL REQUIREMENTS	QUANTITY/100 SF
Asphalt Primer	Per Product Requirements
Derbigum, Derbibase, Derbibase Ultra, PRS Glass Base or PRS Modified Base	Per Project Requirements
Type III/IV Asphalt ***(Required when using PRS Modified Base and PRS Glass Base)***	Per Product Requirements
PRS Glass Ply IV or PRS Glass Ply VI	2 Plies
Permastic	For application rates refer to Section 9.0
Derbigum P/GP/XPS or Derbicolor P/GP/XPS	1 Ply

Slope: Positive. *(Refer to UL & FM Requirements for Fire and Wind ratings.)*

Primer: Prior to installation, deck surface must be primed with Asphalt primer and allowed to dry. An NRCA "Deck Dryness Test" should be performed before starting work.

Base Sheet/Separator sheet: Install the system base ply by shingling from the low point on the roof or by strapping with the slope of the roof deck. Secure base sheet in a solid layer of Permastic applied at a minimum rate of 2 - 2 $^1/_2$ gal/sq; or set in, minimum 25 lb/100 ft^2 (1.2 kg/m^2) moppings of hot Steep Grade (Type III) or Special Steep (Type IV) asphalt. Side laps must be minimum 3 inches (7.6 cm) and be offset a minimum 12 inches. End laps must be a minimum 4 inches.

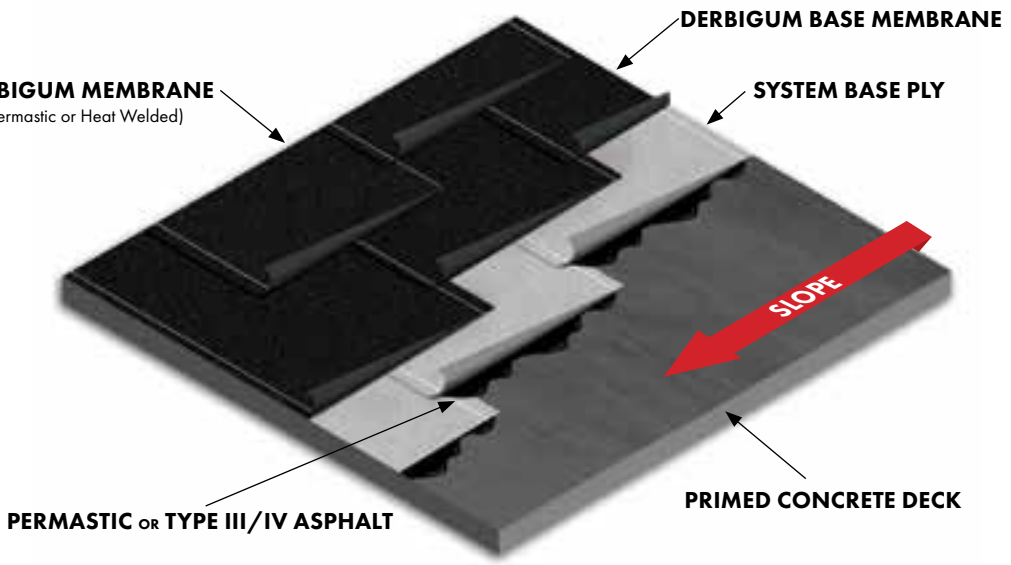
PRS Glass Base and PRS Modified Base Sheets must be set in solid, nominal 25 lb/100 ft^2 (1.2 kg/m^2) moppings of hot Steep Grade (Type III) or Special Steep (Type IV) asphalt.

Base Sheet: Install two plies Type IV or VI glass fiber felts in shingle fashion starting from the low point on the roof or strapping with the slope in the roof deck set in solid, minimum 25 lb/100 ft^2 (1.2 kg/m^2) moppings of hot Steep Grade (Type III) or Special Steep (Type IV) asphalt. Plies must be lapped 17 inches (43 cm) exposure and be installed over minimum 18 inches (46 cm) wide starter or header plies at perimeters and penetrations.

DERBIGUM Membrane: Install the Derbigum membrane by shingling from the low point on the roof or by strapping with the slope of the roof deck, running the Derbigum membrane parallel to the direction of the system base ply. The Derbigum membrane must be set in a solid uniform layer of Permastic applied at a nominal rate of 1$^1/_2$ - 2 gal/sq (0.6 - 0.8 L/m^2) or adhered by heat welding solidly over the base ply. **Permastic MUST NOT be applied to membrane lap and seam areas.** Side laps must be minimum 3 inches (7.6 cm) and offset the side laps of base ply by a minimum 12 inches (30.5 cm). End laps must be a minimum 4 inches (10.2 cm). Side and end laps must be heat welded, rolled with a minimum 20 lb (9 kg) steel roller and have a continuous bead of molten modified bitumen visible at all laps/seams.

PERMASTIC Application: Permastic adhesive can be applied by spray, squeegee or trowel in a uniform layer at the minimum application rates outlined in Section 9.0. System base ply or Derbigum membrane should be set immediately into the Permastic.

2 C 1 X
2 C 1 G
2 C 1 P



MATERIAL REQUIREMENTS	QUANTITY/100 SF
Asphalt Primer	Per Product Requirements
Derbigum, Derbibase, Derbibase Ultra, PRS Glass Base or PRS Modified Base	1 Ply
Type III/IV Asphalt ***(Required when using PRS Modified Base and PRS Glass Base)***	Per Product Requirements
Permastic	For application rates refer to Section 9.0
Derbigum P/GP/XPS or Derbicolor P/GP/XPS	2 Plies

Slope: Positive. *(Refer to UL & FM Requirements for Fire and Wind ratings.)*

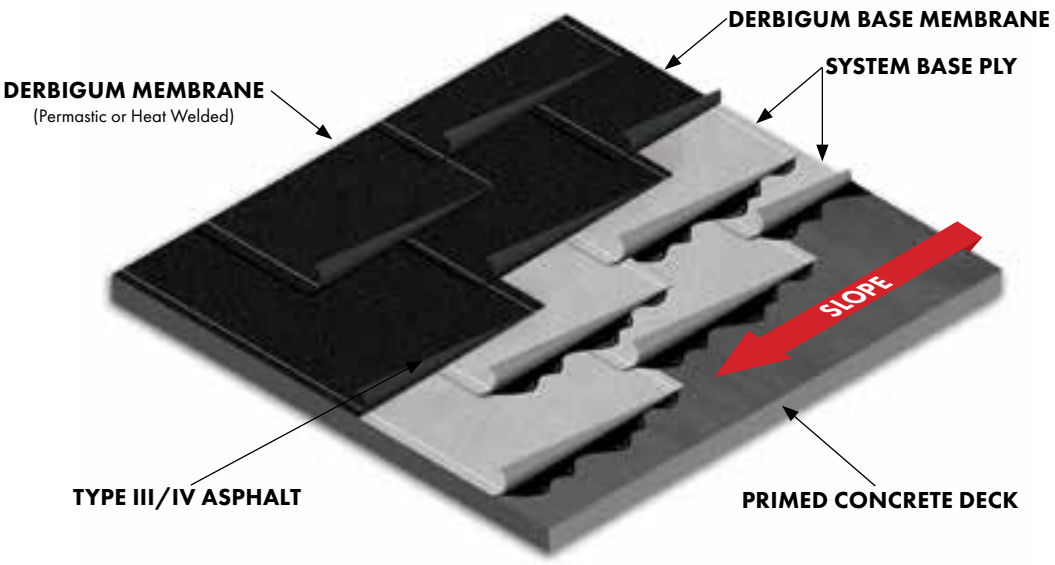
Primer: Prior to installation, deck surface must be primed with Asphalt primer and allowed to dry. An NRCA "Deck Dryness Test" should be performed before starting work.

Base Sheet: Install the system base ply by shingling from the low point on the roof or by strapping with the slope of the roof deck. Secure base sheet in a solid layer of Permastic applied at a minimum rate of 2 - 2 $^1/_2$ gal/sq; or set in, minimum 25 lb/100 ft^2(1.2 kg/m^2) moppings of hot Steep Grade (Type III) or Special Steep (Type IV) asphalt. Side laps must be minimum 3 inches (7.6 cm) and be offset a minimum 12 inches. End laps must be a minimum 4 inches.

PRS Glass Base and PRS Modified Base Sheets must be set in solid, nominal 25 lb/100 ft^2 (1.2 kg/m^2) moppings of hot Steep Grade (Type III) or Special Steep (Type IV) asphalt.

DERBIGUM Membrane: Install the Derbigum membrane by shingling from the low point on the roof or by strapping with the slope of the roof deck, running the Derbigum membrane parallel to the direction of the system base ply. The Derbigum membrane must be set in a solid uniform layer of Permastic applied at a nominal rate of 1$^1/_2$ - 2 gal/sq (0.6 - 0.8 L/m^2) or adhered by heat welding solidly over the base ply. Stagger the second layer of Derbigum a half sheet from the Derbigum ply below. Adhere the top sheet of Derbigum with Permastic applied at the specified rate listed above or by heat welding. **Permastic MUST NOT be applied to membrane lap and seam areas.** Side laps must be minimum 3 inches (7.6 cm) and offset the side laps of base ply by a minimum 12 inches (30.5 cm). End laps must be a minimum 4 inches (10.2 cm). Side and end laps must be heat welded, rolled with a minimum 20 lb (9 kg) steel roller and have a continuous bead of molten modified bitumen visible at all laps/seams.

PERMASTIC Application: Permastic adhesive can be applied by spray, squeegee or trowel in a uniform layer at the minimum application rates outlined in Section 9.0. System base ply or Derbigum membrane should be set immediately into the Permastic.



2	C	2	X
2	C	2	G
2	C	2	P

MATERIAL REQUIREMENTS	QUANTITY/100 SF
Asphalt Primer	Per Product Requirements
Derbigum, Derbibase, Derbibase Ultra, PRS Glass Base or PRS Modified Base	2 Plies
Type III/IV Asphalt ***(Required when using PRS Modified Base and PRS Glass Base)***	Per Product Requirements
Permastic	For application rates refer to Section 9.0
Derbigum P/GP/XPS or Derbicolor P/GP/XPS	2 Plies

Slope: Positive. *(Refer to UL & FM Requirements for Fire and Wind ratings.)*

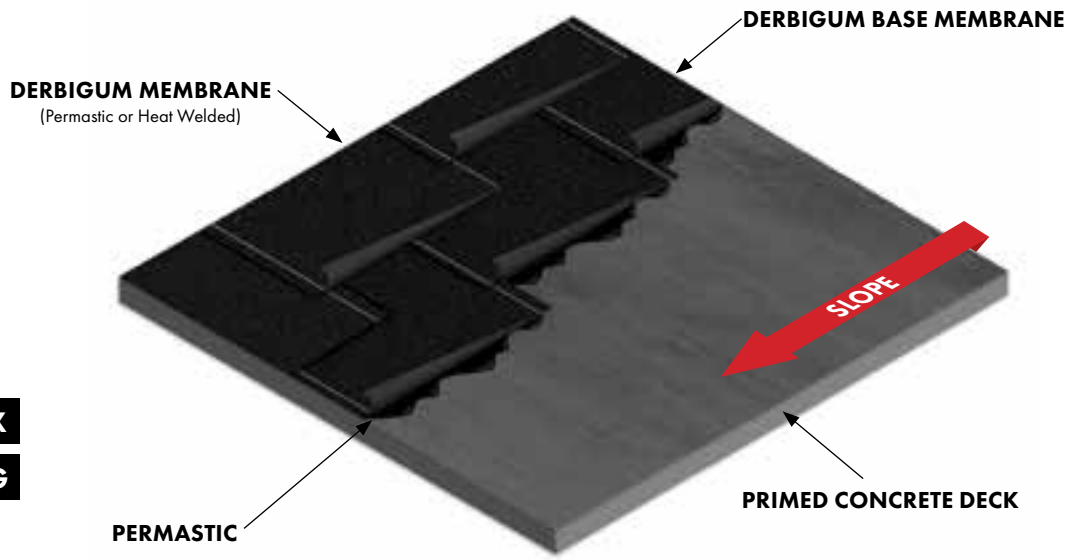
Primer: Prior to installation, deck surface must be primed with Asphalt primer and allowed to dry. An NRCA "Deck Dryness Test" should be performed before starting work.

Base Sheet/Separator sheet: Install the system base ply by shingling from the low point on the roof or by strapping with the slope of the roof deck. Secure base sheet in a solid layer of Permastic applied at a minimum rate of 2 - 2 $^{1}/_{2}$ gal/sq; or set in, minimum 25 lb/100 ft^2 (1.2 kg/m^2) moppings of hot Steep Grade (Type III) or Special Steep (Type IV) asphalt. Stagger the second ply a half sheet from the base ply below. Adhere the second base sheet using Permastic or Type III or IV Asphalt at specified rates mentioned above. Side laps must be minimum 3 inches (7.6 cm) and be offset a minimum 12 inches. End laps must be a minimum 4 inches.

PRS Glass Base and PRS Modified Base Sheets must be set in solid, nominal 25 lb/100 ft^2 (1.2 kg/m^2) moppings of hot Steep Grade (Type III) or Special Steep (Type IV) asphalt.

DERBIGUM Membrane: Install the Derbigum membrane by shingling from the low point on the roof or by strapping with the slope of the roof deck, running the Derbigum membrane parallel to the direction of the system base ply. The Derbigum membrane must be set in a solid uniform layer of Permastic applied at a nominal rate of 1$^{1}/_{2}$ - 2 gal/sq (0.6 - 0.8 L/m^2) or adhered by heat welding solidly over the base ply. Stagger the second layer of Derbigum a half sheet from the Derbigum ply below. Adhere the top sheet of Derbigum with Permastic applied at the specified rate listed above or by heat welding. **Permastic MUST NOT be applied to membrane lap and seam areas.** Side laps must be minimum 3 inches (7.6 cm) and offset the side laps of base ply by a minimum 12 inches (30.5 cm). End laps must be a minimum 4 inches (10.2 cm). Side and end laps must be heat welded, rolled with a minimum 20 lb (9 kg) steel roller and have a continuous bead of molten modified bitumen visible at all laps/seams.

PERMASTIC Application: Permastic adhesive can be applied by spray, squeegee or trowel in a uniform layer at the minimum application rates outlined in Section 9.0. System base ply or Derbigum membrane should be set immediately into the Permastic.



2 C 0 X
2 C 0 G

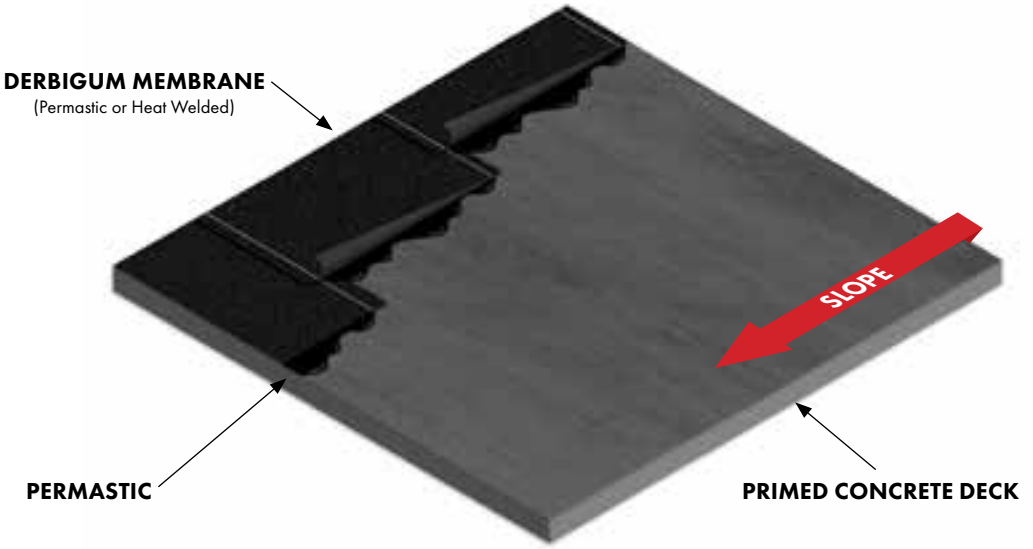
MATERIAL REQUIREMENTS	QUANTITY/100 SF
Asphalt Primer	Per Product Requirements
Permastic	For application rates refer to Section 9.0
Derbigum GP/XPS	2 Plies

Slope: Positive. *(Refer to UL & FM Requirements for Fire and Wind ratings.)*

Primer: Prior to installation, deck surface must be primed with Asphalt primer and allowed to dry. An NRCA "Deck Dryness Test" should be performed before starting work.

DERBIGUM Membrane: Install the base ply of Derbigum membrane by shingling from the low point on the roof or by strapping with the slope of the roof deck, in a solid uniform layer of Permastic applied at a nominal rate of 2 - 2$^1/_2$ gal/sq (0.8 - 1.0 L/m^2). Stagger the second Derbigum layer directly center to the base ply below. Adhere the top ply of Derbigum membrane by heat welding solidly over the base ply or by setting into a continuous layer of Permastic applied at a nominal rate of 1$^1/_2$ - 2 gal/sq (0.6 - 0.8 L/m^2). **Permastic MUST NOT be applied to membrane lap and seam areas.** Side laps must be minimum 3 inches (7.6 cm) and offset the side laps of base ply by a minimum 12 inches (30.5 cm). End laps must be a minimum 4 inches (10.2 cm). Side and end laps must be heat welded, rolled with a minimum 20 lb (9 kg) steel roller and have a continuous bead of molten modified bitumen visible at all laps/seams.

PERMASTIC Application: Permastic adhesive can be applied by spray, squeegee or trowel in a uniform layer at the minimum application rates outlined in Section 9.0. System base ply or Derbigum membrane should be set immediately into the Permastic.



1 C 0 X
1 C 0 G

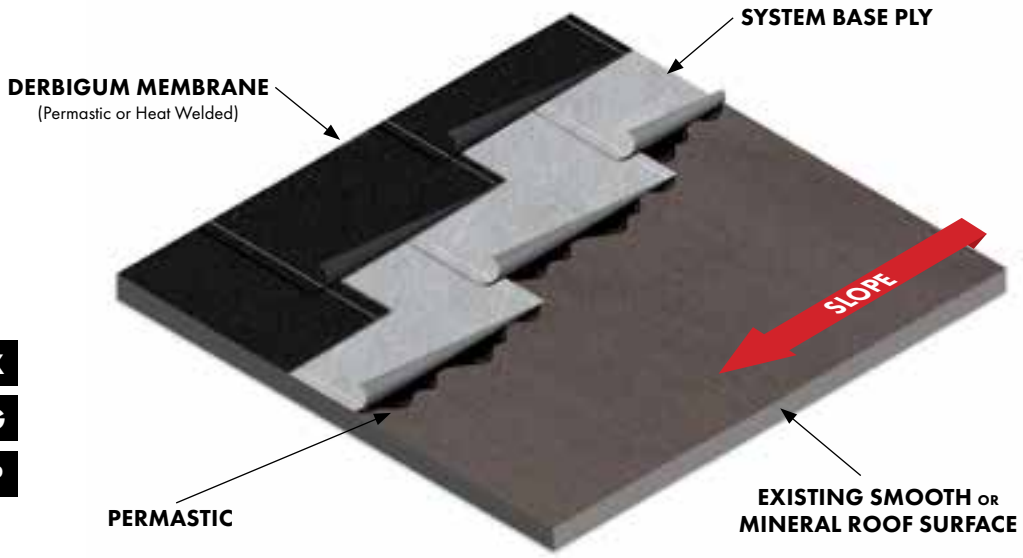
MATERIAL REQUIREMENTS	QUANTITY / 100 SF
Asphalt Primer	Per Product Requirements
Permastic	For application rates refer to Section 9.0
Derbigum GP/XPS	1 Ply

Slope: Positive. *(Refer to UL & FM Requirements for Fire and Wind ratings.)*

Primer: Prior to installation, deck surface must be primed with Asphalt primer and allowed to dry. An NRCA "Deck Dryness Test" should be performed before starting work.

DERBIGUM Membrane: Install the base ply of Derbigum membrane by shingling from the low point on the roof or by strapping with the slope of the roof deck, in a solid uniform layer of Permastic applied at a nominal rate of 2 - $2^1/_2$ gal/sq (0.8 - 1.0 L/m^2). **Permastic MUST NOT be applied to membrane lap and seam areas.** Side laps must be minimum 3 inches (7.6 cm) and offset the side laps of base ply by a minimum 12 inches (30.5 cm). End laps must be a minimum 4 inches (10.2 cm). Side and end laps must be heat welded, rolled with a minimum 20 lb (9 kg) steel roller and have a continuous bead of molten modified bitumen visible at all laps/seams.

PERMASTIC Application: Permastic adhesive can be applied by spray, squeegee or trowel in a uniform layer at the minimum application rates outlined in Section 9.0. System base ply or Derbigum membrane should be set immediately into the Permastic.



1	R	1	X
1	R	1	G
1	R	1	P

MATERIAL REQUIREMENTS	QUANTITY/100 SF
Asphalt Primer	Per Product Requirements
Derbigum, Derbibase or Derbibase Ultra	1 Ply
Permastic	For application rates refer to Section 9.0
Derbigum P/GP/XPS or Derbicolor P/GP/XPS	1 Ply

Slope: Positive. *(Refer to UL & FM Requirements for Fire and Wind ratings.)*

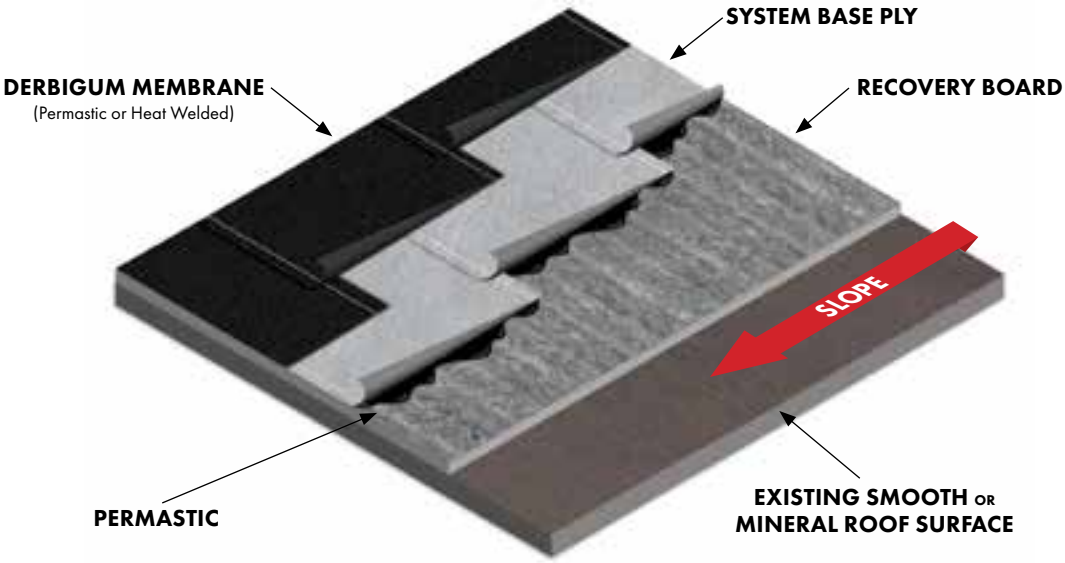
Surface Preparation: DERBIGUM requires the completion of an approved nondestructive evaluation using infrared, capacitance, or nuclear methods/technology. The decision to replace or recover an existing roof is the responsibility of the building owner, specifier or contractor. Replacement should be considered mandatory if the existing roof system is deteriorated or if leaving the roof in place creates potential problems for the performance of the recover system. All existing wet roof insulation must be removed and replaced with new, dry insulation prior to installation of the Derbigum recover roofing system. The prepared existing smooth roof surface must be clean, smooth and primed with asphalt primer. The primer must be allowed to dry prior to application of the Permastic adhesive.

Base Sheet: Install the system base ply by shingling from the low point on the roof or by strapping with the slope of the roof deck. Secure base sheet in a solid layer of Permastic applied at a minimum rate of 2 - 2 $^{1}/_{2}$ gal/sq. Side laps must be minimum 3 inches (7.6 cm) and be offset a minimum 12 inches. End laps must be a minimum 4 inches.

DERBIGUM Membrane: Install the Derbigum membrane by shingling from the low point on the roof or by strapping with the slope of the roof deck, running the Derbigum membrane parallel to the direction of the system base ply. The Derbigum membrane must be set in a solid uniform layer of Permastic applied at a nominal rate of $1^{1}/_{2}$ - 2 gal/sq (0.6 - 0.8 L/m^2) or adhered by heat welding solidly over the base ply. **Permastic MUST NOT be applied to membrane lap and seam areas.** Side laps must be minimum 3 inches (7.6 cm) and offset the side laps of base ply by a minimum 12 inches (30.5 cm). End laps must be a minimum 4 inches (10.2 cm). Side and end laps must be heat welded, rolled with a minimum 20 lb (9 kg) steel roller and have a continuous bead of molten modified bitumen visible at all laps/seams.

On all recover specifications, existing membrane flashings and stripping plies must be removed. Flashing installations must be the same number of plies as the field installation. Refer to Section 1.10 (Recover Recommendations) for recover applications, and 14.5 (Recover Requirements) for guaranty requirements.

PERMASTIC Application: Permastic adhesive can be applied by spray, squeegee or trowel in a uniform layer at the minimum application rates outlined in Section 9.0. System base ply or Derbigum membrane should be set immediately into the Permastic.



1 RC 1 X
1 RC 1 G
1 RC 1 P

MATERIAL REQUIREMENTS	QUANTITY/100 SF
Asphalt Primer	Per Product Requirements
Recovery Board	1 Ply
Perlok or Approved Fasteners	Per Project/Code Requirements
Derbigum, Derbibase or Derbibase Ultra	1 Ply
Permastic	For application rates refer to Section 9.0
Derbigum P/GP/XPS or Derbicolor P/GP/XPS	1 Ply

Slope: Positive. *(Refer to UL & FM Requirements for Fire and Wind ratings.)*

Surface Preparation: DERBIGUM requires the completion of an approved nondestructive evaluation using infrared, capacitance, or nuclear methods/technology. The decision to replace or recover an existing roof is the responsibility of the building owner, specifier or contractor. Replacement should be considered mandatory if the existing roof system is deteriorated or if leaving the roof in place creates potential problems for the performance of the recover system. All existing wet roof insulation must be removed and replaced with new, dry insulation prior to installation of the Derbigum recover roofing system. The prepared existing smooth roof surface must be clean, smooth and primed with asphalt primer. The primer must be allowed to dry prior to application of the Permastic adhesive.

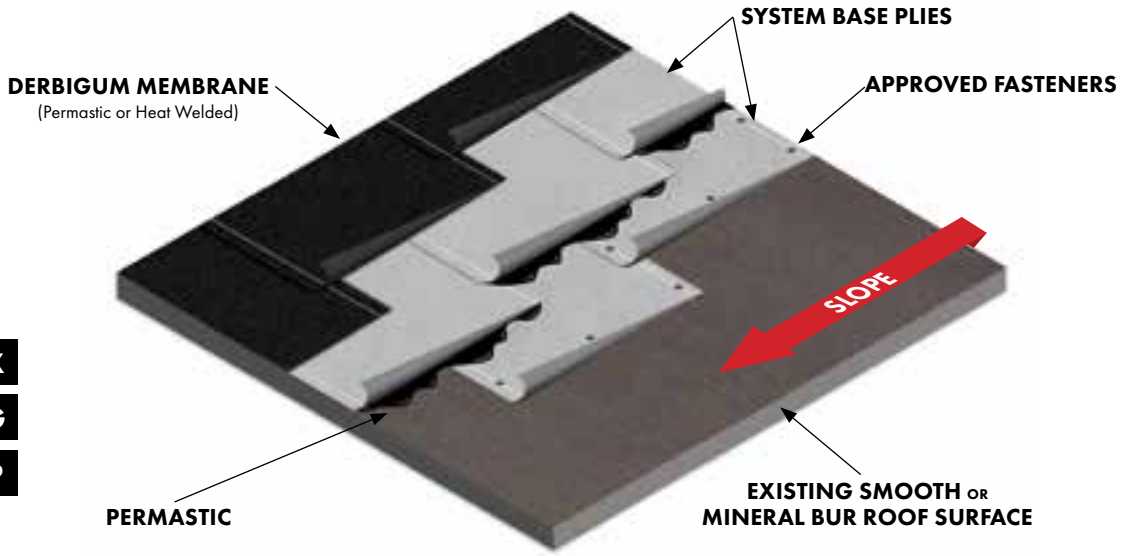
Recovery Board: Mechanically attach the approved cover board using the fastening patterns shown on Page 20. Install fasteners down through the existing decking a minimum of $^{3}/_{4}$ inch.

Base Sheet: Install the system base ply by shingling from the low point on the roof or by strapping with the slope of the roof deck. Secure base sheet in a solid layer of Permastic applied at a minimum rate of 2 - 2 $^{1}/_{2}$ gal/sq. Side laps must be minimum 3 inches (7.6 cm) and be offset a minimum 12 inches. End laps must be a minimum 4 inches.

DERBIGUM Membrane: Install the Derbigum membrane by shingling from the low point on the roof or by strapping with the slope of the roof deck, running the Derbigum membrane parallel to the direction of the system base ply. The Derbigum membrane must be set in a solid uniform layer of Permastic applied at a nominal rate of 1$^{1}/_{2}$ - 2 gal/sq (0.6 - 0.8 L/m^{2}) or adhered by heat welding solidly over the base ply. **Permastic MUST NOT be applied to membrane lap and seam areas.** Side laps must be minimum 3 inches (7.6 cm) and offset the side laps of base ply by a minimum 12 inches (30.5 cm). End laps must be a minimum 4 inches (10.2 cm). Side and end laps must be heat welded, rolled with a minimum 20 lb (9 kg) steel roller and have a continuous bead of molten modified bitumen visible at all laps/seams.

On all recover specifications, existing membrane flashings and stripping plies must be removed. Flashing installations must be the same number of plies as the field installation. Refer to Section 1.10 (Recover Recommendations) for recover applications, and 14.5 (Recover Requirements) for guaranty requirements.

PERMASTIC Application: Permastic adhesive can be applied by spray, squeegee or trowel in a uniform layer at the minimum application rates outlined in Section 9.0. System base ply or Derbigum membrane should be set immediately into the Permastic.



2 R 1 X
2 R 1 G
2 R 1 P

MATERIAL REQUIREMENTS	QUANTITY/100 SF
Asphalt Primer	Per Product Requirements
Derbigum, Derbibase or Derbibase Ultra	2 Plies
Perlok or Approved Fasteners	Per Project/Code Requirements
Permastic	For application rates refer to Section 9.0
Derbigum P/GP/XPS or Derbicolor P/GP/XPS	1 Ply

Slope: Positive. *(Refer to UL & FM Requirements for Fire and Wind ratings.)*

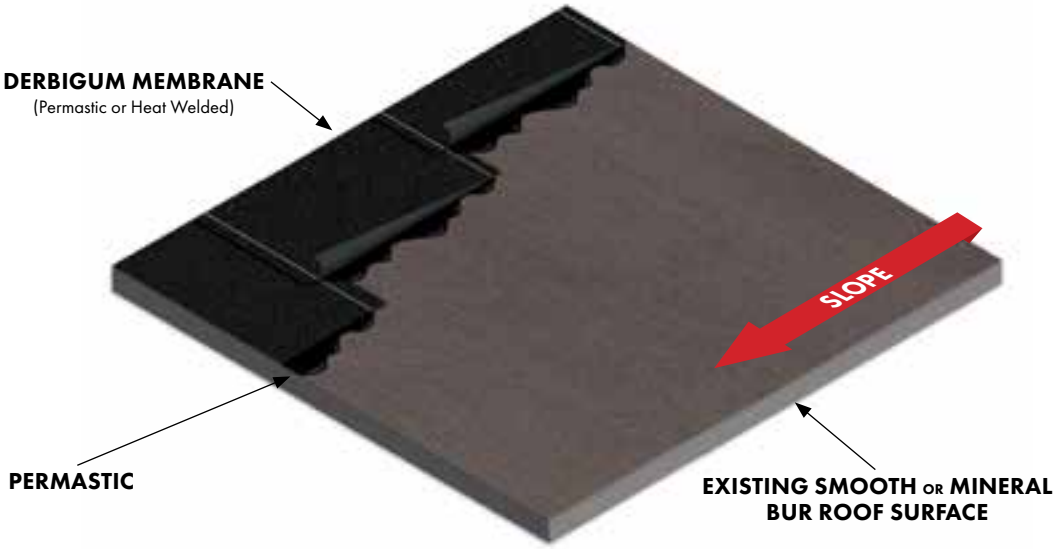
Surface Preparation: DERBIGUM requires the completion of an approved nondestructive evaluation using infrared, capacitance, or nuclear methods/technology. The decision to replace or recover an existing roof is the responsibility of the building owner, specifier or contractor. Replacement should be considered mandatory if the existing roof system is deteriorated or if leaving the roof in place creates potential problems for the performance of the recover system. All existing wet roof insulation must be removed and replaced with new, dry insulation prior to installation of the Derbigum recover roofing system. The prepared existing smooth roof surface must be clean, smooth and primed with asphalt primer. The primer must be allowed to dry prior to application of the Permastic adhesive.

Base Sheet: Install two layers of system base ply by shingling from the low point on the roof or by strapping with the slope of the roof deck and set immediately into the Permastic spread at a minimum rate of 2 - 2 $^1/_2$ gal/sq (0.8 - 1.0 L/m^2) or mechanically attached. Use a minimum 1 inch (2.5 cm) diameter head nails with ring or annular shank installed 6 - 9 inches (15 - 23 cm) on side laps and end laps, and 12 - 18 inches (30 - 46 cm) in two rows staggered longitudinally along the center of the sheet approximately 12 inches (30 cm) from each edge. Minimum total fastener quantity must be seventy-five per 100 SF (9.29 m^2) or in accordance with current recommendations of FM Global. Side laps must be minimum 3 inches (7.6 cm) and be offset a minimum 12 inches. End laps must be a minimum 4 inches.

DERBIGUM Membrane: Install the Derbigum membrane by shingling from the low point on the roof or by strapping with the slope of the roof deck, running the Derbigum membrane parallel to the direction of the system base ply. The Derbigum membrane must be set in a solid uniform layer of Permastic applied at a nominal rate of 1$^1/_2$ - 2 gal/sq (0.6 - 0.8 L/m^2) or adhered by heat welding solidly over the base ply. **Permastic MUST NOT be applied to membrane lap and seam areas.** Side laps must be minimum 3 inches (7.6 cm) and offset the side laps of base ply by a minimum 12 inches (30.5 cm). End laps must be a minimum 4 inches (10.2 cm). Side and end laps must be heat welded, rolled with a minimum 20 lb (9 kg) steel roller and have a continuous bead of molten modified bitumen visible at all laps/seams.

On all recover specifications, existing membrane flashings and stripping plies must be removed. Flashing installations must be the same number of plies as the field installation. Refer to Section 1.10 (Recover Recommendations) for recover applications, and 14.5 (Recover Requirements) for guaranty requirements.

PERMASTIC Application: Permastic adhesive can be applied by spray, squeegee or trowel in a uniform layer at the minimum application rates outlined in Section 9.0. System base ply or Derbigum membrane should be set immediately into the Permastic.



0 R 1 X
0 R 1 G

MATERIAL REQUIREMENTS	QUANTITY/100 SF
Asphalt Primer	Per Product Requirements
Permastic	For application rates refer to Section 9.0
Derbigum GP/XPS or Derbicolor GP/XPS	1 Ply

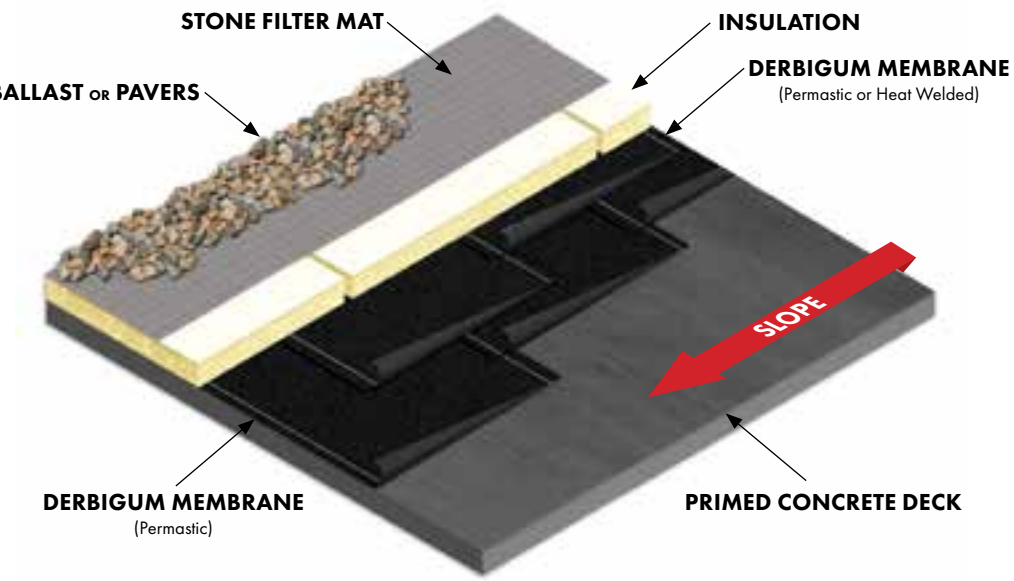
Slope: Positive. *(Refer to UL & FM Requirements for Fire and Wind ratings.)*

Surface Preparation: DERBIGUM requires the completion of an approved nondestructive evaluation using infrared, capacitance, or nuclear methods/technology. The decision to replace or recover an existing roof is the responsibility of the building owner, specifier or contractor. Replacement should be considered mandatory if the existing roof system is deteriorated or if leaving the roof in place creates potential problems for the performance of the recover system. All existing wet roof insulation must be removed and replaced with new, dry insulation prior to installation of the Derbigum recover roofing system. The prepared existing smooth roof surface must be clean, smooth and primed with asphalt primer. The primer must be allowed to dry prior to application of the Permastic adhesive.

DERBIGUM Membrane: Install the Derbigum membrane by shingling from the low point on the roof or by strapping with the slope of the roof deck. The Derbigum membrane must be set in a solid uniform layer of Permastic applied at a nominal rate of $1^1/_2$ - 2 gal/sq (0.6 - 0.8 L/m^2). **Permastic MUST NOT be applied to membrane lap and seam areas.** Side laps must be minimum 3 inches (7.6 cm) and offset the side laps of base ply by a minimum 12 inches (30.5 cm). End laps must be a minimum 4 inches (10.2 cm). Side and end laps must be heat welded, rolled with a minimum 20 lb (9 kg) steel roller and have a continuous bead of molten modified bitumen visible at all laps/seams.

On all recover specifications, existing membrane flashings and stripping plies must be removed. Flashing installations must be the same number of plies as the field installation. Refer to Section 1.10 (Recover Recommendations) for recover applications, and 14.5 (Recover Requirements) for guaranty requirements.

PERMASTIC Application: Permastic adhesive can be applied by spray, squeegee or trowel in a uniform layer at the minimum application rates outlined in Section 9.0. System base ply or Derbigum membrane should be set immediately into the Permastic.



0 C 2 X
0 C 2 G

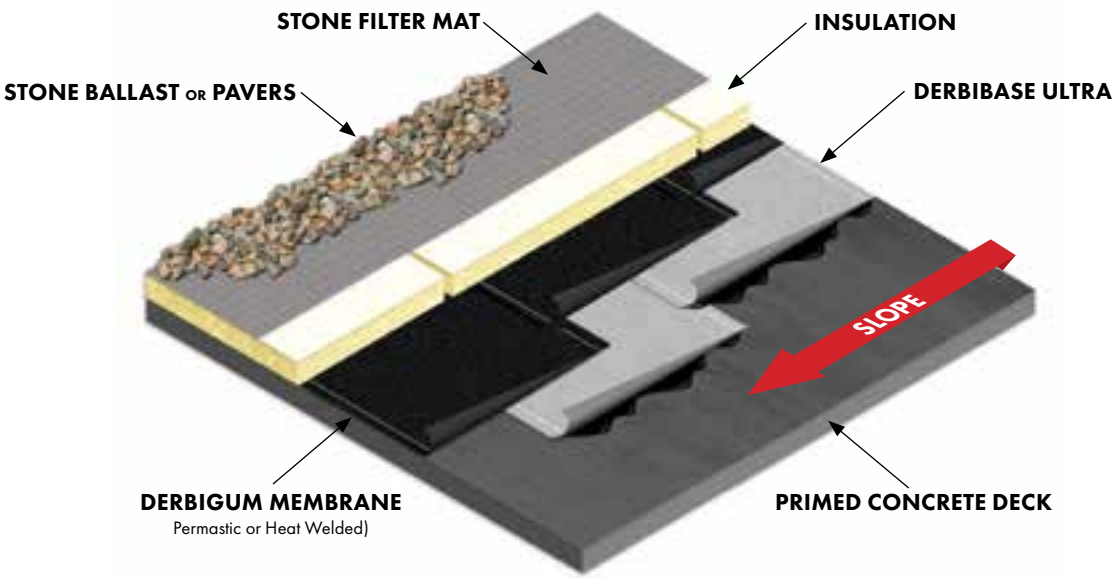
MATERIAL REQUIREMENTS	QUANTITY/100 SF
Asphalt Primer	Per Product Requirements
Derbigum P/GP/XPS or Derbicolor P/GP/XPS	2 Plies
Permastic	For application rates refer to Section 9.0
Roof Insulation	Per Project Requirements
Stone Filter Mat	Per Project Requirements
Aggregate Ballast/Pavers	1000 - 1200 lb (454 - 544 KG)

Slope: Positive. *(Refer to UL & FM Requirements for Fire and Wind ratings.)*

DERBIGUM Membrane: Install the Derbigum membrane by shingling from the low point on the roof or by strapping with the slope of the roof deck. The Derbigum membrane must be set in a solid uniform layer of Permastic applied at a nominal rate of 2 - 2$^{1}/_{2}$ gal/sq (0.8 - 1.0 L/m^{2}). Stagger the second layer of Derbigum a half sheet from the Derbigum ply below. Adhere the second Derbigum membrane by heat welding or with Permastic applied at a rate of 1$^{1}/_{2}$ - 2 gal/sq (0.6 - 0.8 L/m^{2}). **Permastic MUST NOT be applied to membrane lap and seam areas.** Side laps must be minimum 3 inches (7.6 cm) and offset the side laps of base ply by a minimum 12 inches (30.5 cm). End laps must be a minimum 4 inches (10.2 cm). Side and end laps must be heat welded, rolled with a minimum 20 lb (9 kg) steel roller and have a continuous bead of molten modified bitumen visible at all laps/seams.

PERMASTIC Application: Permastic adhesive can be applied by spray, squeegee or trowel in a uniform layer at the minimum application rates outlined in Section 9.0. System base ply or Derbigum membrane should be set immediately into the Permastic.

Insulation: Approved extruded polystyrene insulation boards must be loose laid with joints staggered in one direction in accordance with General Recommendations for Application. Insulation boards must be covered with a poly propylene or polyester non-woven fabric with laps minimum 12 inches (30 cm) inches, followed by application of pavers of No. 4 aggregate ballast at a rate of 10 - 12 lb/ft^{2} (49 - 59 kg/m^{2}).



1 C 1 X
1 C 1 G

MATERIAL REQUIREMENTS	QUANTITY/100 SF
Asphalt Primer	Per Product Requirements
Derbibase Ultra	1 Ply
Permastic	For application rates refer to Section 9.0
Derbigum P/GP/XPS or Derbicolor P/GP/XPS	1 Ply
Roof Insulation	Per Project Requirements
Stone Filter Mat	Per Project Requirements
Aggregate Ballast/Pavers	1000 - 1200 lb (454 - 544 KG)

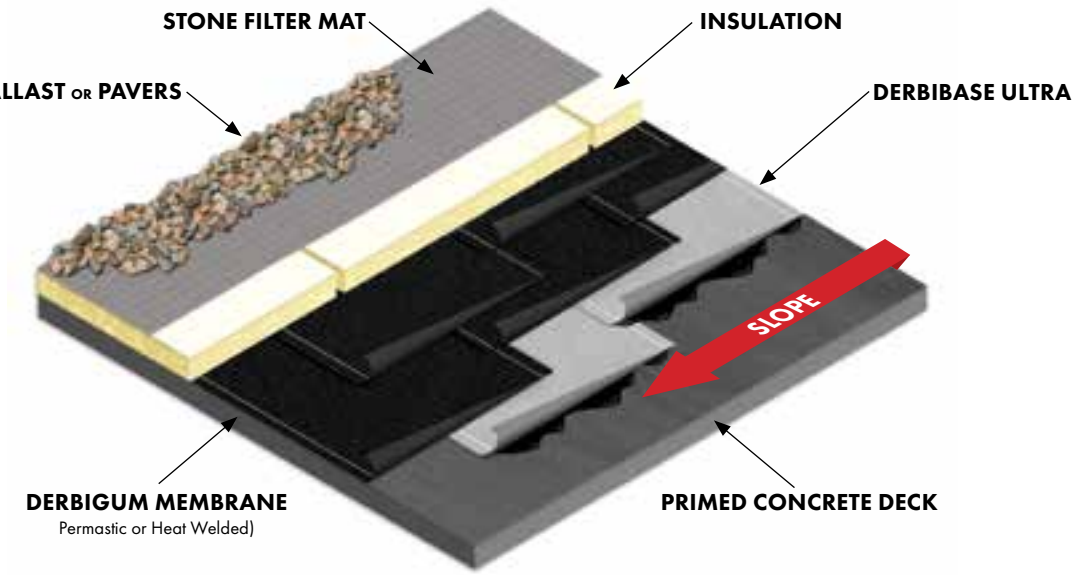
Slope: Positive. *(Refer to UL & FM Requirements for Fire and Wind ratings.)*

Base Sheet: Install the base ply of Derbibase Ultra by shingling from the low point on the roof or by strapping with the slope of the roof deck. Adhere base sheet in a solid uniform layer Permastic applied at a nominal rate of 2 - $2^1/_2$ gal/sq (0.8 - 1.0 L/m^2)

DERBIGUM Membrane: Install the Derbigum membrane by shingling from the low point on the roof or by strapping with the slope of the roof deck. The Derbigum membrane must be set in a solid uniform layer of Permastic applied at a rate of $1^1/_2$ - 2 gal/sq (0.6 - 0.8 L/m^2). **Permastic MUST NOT be applied to membrane lap and seam areas.** Side laps must be minimum 3 inches (7.6 cm) and offset the side laps of base ply by a minimum 12 inches (30.5 cm). End laps must be a minimum 4 inches (10.2 cm). Side and end laps must be heat welded, rolled with a minimum 20 lb (9 kg) steel roller and have a continuous bead of molten modified bitumen visible at all laps/seams.

PERMASTIC Application: Permastic adhesive can be applied by spray, squeegee or trowel in a uniform layer at the minimum application rates outlined in Section 9.0. System base ply or Derbigum membrane should be set immediately into the Permastic.

Insulation: Approved extruded polystyrene insulation boards must be loose laid with joints staggered in one direction in accordance with General Recommendations for Application. Insulation boards must be covered with a poly propylene or polyester non-woven fabric with laps minimum 12 inches (30 cm) inches, followed by application of pavers of No. 4 aggregate ballast at a rate of 10 - 12 lb/ft^2 (49 - 59 kg/m^2).



1 C 2 G
1 C 2 P

MATERIAL REQUIREMENTS	QUANTITY/100 SF
Asphalt Primer	Per Product Requirements
Derbibase Ultra	1 Ply
Permastic	For application rates refer to Section 9.0
Derbigum P/GP/XPS or Derbicolor P/GP/XPS	2 Plies
Roof Insulation	Per Project Requirements
Stone Filter Mat	Per Project Requirements
Aggregate Ballast/Pavers	1000 - 1200 lb (454 - 544 KG)

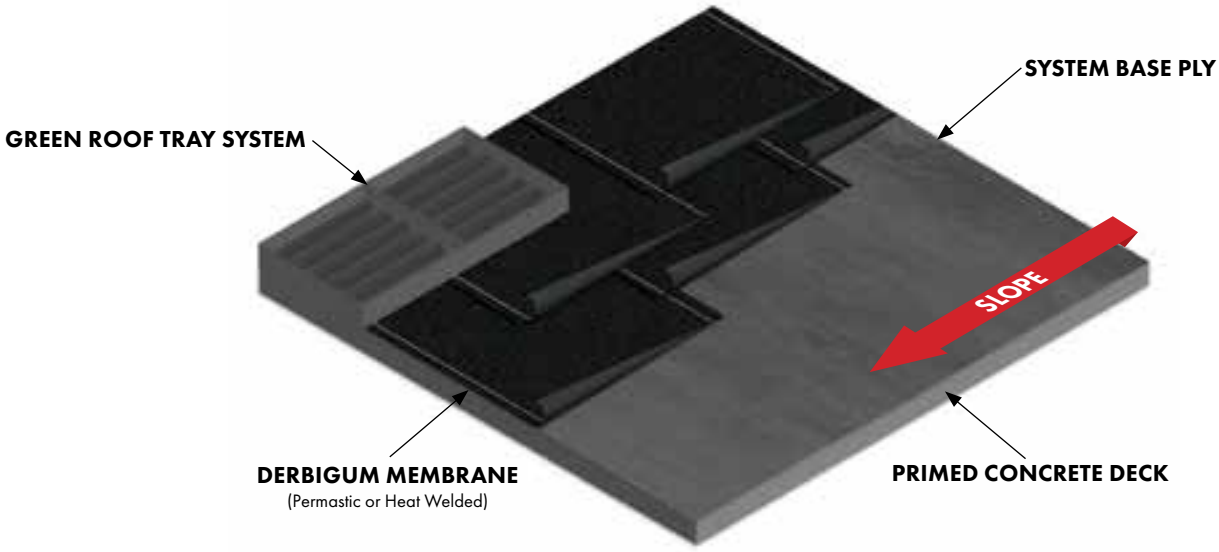
Slope: Positive. *(Refer to UL & FM Requirements for Fire and Wind ratings.)*

Base Sheet: Install the base ply of Derbibase Ultra by shingling from the low point on the roof or by strapping with the slope of the roof deck. Adhere base sheet in a solid uniform layer Permastic applied at a nominal rate of 2 - $2^1/_2$ gal/sq (0.8 - 1.0 L/m^2). Side laps must be minimum 3 inches (7.6 cm) and offset the side laps of base ply by a minimum 12 inches (30.5 cm). End laps must be a minimum 4 inches (10.2 cm).

DERBIGUM Membrane: Install the Derbigum membrane by shingling from the low point on the roof or by strapping with the slope of the roof deck. The Derbigum membrane must be set in a solid uniform layer of Permastic applied at a nominal rate of $1^1/_2$ - 2 gal/sq (0.6 - 0.8 L/m^2). Stagger the second layer of Derbigum a half sheet from the Derbigum ply below. Adhere the second Derbigum membrane by heat welding or with Permastic applied at a rate of $1^1/_2$ - 2 gal/sq (0.6 - 0.8 L/m^2). **Permastic MUST NOT be applied to membrane lap and seam areas.** Side laps must be minimum 3 inches (7.6 cm) and offset the side laps of base ply by a minimum 12 inches (30.5 cm). End laps must be a minimum 4 inches (10.2 cm). Side and end laps must be heat welded, rolled with a minimum 20 lb (9 kg) steel roller and have a continuous bead of molten modified bitumen visible at all laps/seams.

PERMASTIC Application: Permastic adhesive can be applied by spray, squeegee or trowel in a uniform layer at the minimum application rates outlined in Section 9.0. System base ply or DERBIGUM membrane should be set immediately into the Permastic.

Insulation: Approved extruded polystyrene insulation boards must be loose laid with joints staggered in one direction in accordance with General Recommendations for Application. Insulation boards must be covered with a poly propylene or polyester non-woven fabric with laps minimum 12 inches (30 cm) inches, followed by application of pavers of No. 4 aggregate ballast at a rate of 10 - 12 lb/ft^2 (49 - 59 kg/m^2).



0 C 2 X
0 C 2 G

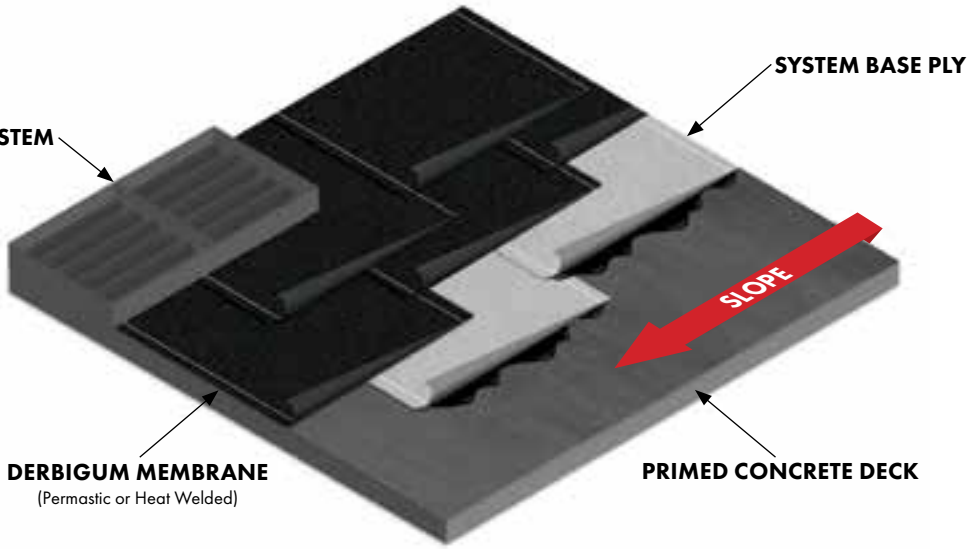
MATERIAL REQUIREMENTS	QUANTITY/100 SF
Asphalt Primer	Per Product Requirements
Permastic	For application rates refer to Section 9.0
Derbigum GP/XPS	2 Plies
Approved Garden Tray System	Per Project Requirements

Slope: Positive. *(Refer to UL & FM Requirements for Fire and Wind ratings.)*

DERBIGUM Membrane: Install the Derbigum membrane by shingling from the low point on the roof or by strapping with the slope of the roof deck. The Derbigum membrane must be set in a solid uniform layer of Permastic applied at a nominal rate of $1^1/_2$ - 2 gal/sq (0.6 - 0.8 L/m^2). Stagger the second layer of Derbigum a half sheet from the Derbigum ply below. Adhere the second Derbigum membrane by heat welding or with Permastic applied at a rate of $1^1/_2$ - 2 gal/sq (0.6 - 0.8 L/m^2). **Permastic MUST NOT be applied to membrane lap and seam areas.** Side laps must be minimum 3 inches (7.6 cm) and offset the side laps of base ply by a minimum 12 inches (30.5 cm). End laps must be a minimum 4 inches (10.2 cm). Side and end laps must be heat welded, rolled with a minimum 20 lb (9 kg) steel roller and have a continuous bead of molten modified bitumen visible at all laps/seams.

PERMASTIC Application: Permastic adhesive can be applied by spray, squeegee or trowel in a uniform layer at the minimum application rates outlined in Section 9.0. System base ply or DERBIGUM membrane should be set immediately into the Permastic..

Approved Overburden or Garden Tray System: Must be approved by Derbigum Technical Services and application procedures must be followed according to the overburden system specification or green/garden tray manufacturer.



1 C 2 X
1 C 2 G

MATERIAL REQUIREMENTS	QUANTITY/100 SF
Asphalt Primer	Per Product Requirements
Derbibase Ultra	1 Ply
Permastic	For application rates refer to Section 9.0
Derbigum GP/XPS	2 Plies
Approved Garden Tray System	Per Project Requirements

Slope: Positive. *(Refer to UL & FM Requirements for Fire and Wind ratings.)*

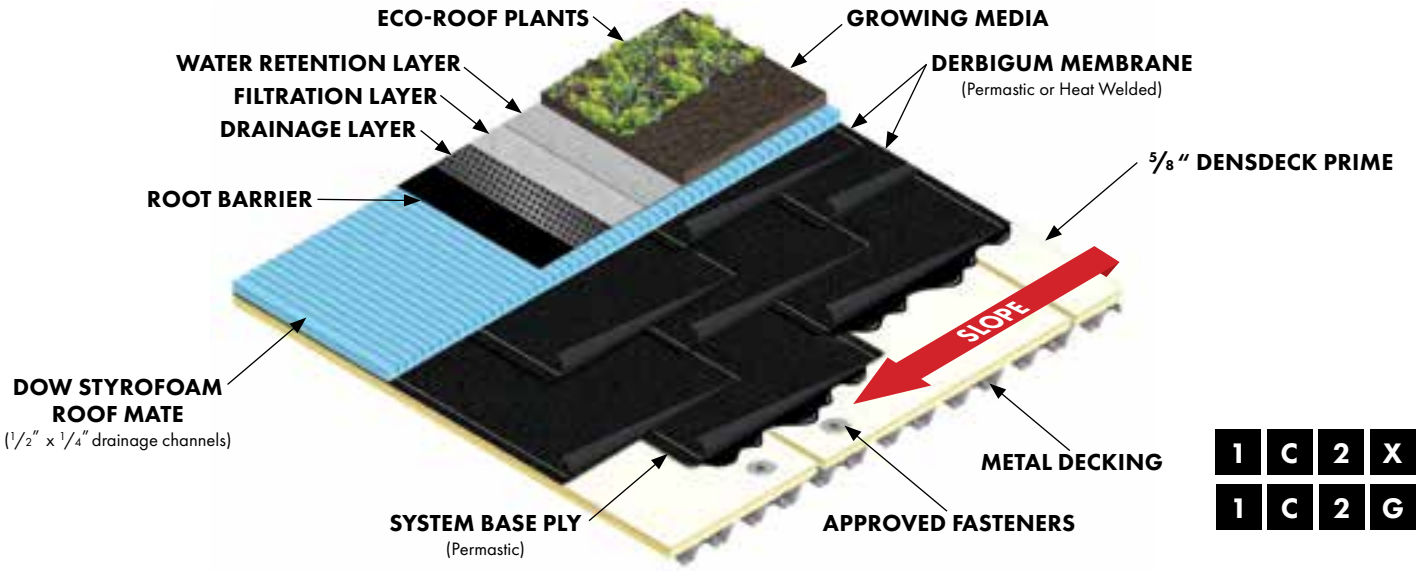
Base Sheet: Install the base ply of Derbibase Ultra by shingling from the low point on the roof or by strapping with the slope of the roof deck. Adhere base sheet in a solid uniform layer Permastic applied at a nominal rate of 2 - $2^1/_2$ gal/sq (0.8 - 1.0 L/m^2). Side laps must be minimum 3 inches (7.6 cm) and offset the side laps of base ply by a minimum 12 inches (30.5 cm). End laps must be a minimum 4 inches (10.2 cm).

DERBIGUM Membrane: Install the Derbigum membrane by shingling from the low point on the roof or by strapping with the slope of the roof deck. The Derbigum membrane must be set in a solid uniform layer of Permastic applied at a nominal rate of $1^1/_2$ - 2 gal/sq (0.6 - 0.8 L/m^2). Stagger the second layer of Derbigum a half sheet from the Derbigum ply below. Adhere the second Derbigum membrane by heat welding or with Permastic applied at a rate of $1^1/_2$ - 2 gal/sq (0.6 - 0.8 L/m^2). **Permastic MUST NOT be applied to membrane lap and seam areas.**

Side laps must be minimum 3 inches (7.6 cm) and offset the side laps of base ply by a minimum 12 inches (30.5 cm). End laps must be a minimum 4 inches (10.2 cm). Side and end laps must be heat welded, rolled with a minimum 20 lb (9 kg) steel roller and have a continuous bead of molten modified bitumen visible at all laps/seams.

PERMASTIC Application: Permastic adhesive can be applied by spray, squeegee or trowel in a uniform layer at the minimum application rates outlined in Section 9.0. System base ply or DERBIGUM membrane should be set immediately into the Permastic.

Insulation: Approved extruded polystyrene insulation boards must be loose laid with joints staggered in one direction in accordance with General Recommendations for Application. Insulation boards must be covered with a poly propylene or polyester non-woven fabric with laps minimum 12 inches (30 cm) inches, followed by application of pavers of No. 4 aggregate ballast at a rate of 10 - 12 lb/ft^2 (49 - 59 kg/m^2).



MATERIAL REQUIREMENTS	QUANTITY/100 SF
5/8 inch DensDeck Prime	Per Product Requirements
Perlok or Approved Fasteners	Per Project/Code Requirements
Derbigum GP	1 Ply
Permastic	For application rates refer to Section 9.0
Derbigum GP/XPS	2 Plies
Approved Green Roof System	Per Project Requirements

Slope: Positive. *(Refer to UL & FM Requirements for Fire and Wind ratings.)*

Base Sheet: Install the base ply of Derbigum by shingling from the low point on the roof or by strapping with the slope of the roof deck. Adhere base sheet in a solid uniform layer Permastic applied at a nominal rate of 2 - 2 1/2 gal/sq (0.8 - 1.0 L/m^2). Side laps must be minimum 3 inches (7.6 cm) and offset the side laps of base ply by a minimum 12 inches (30.5 cm). End laps must be a minimum 4 inches (10.2 cm).

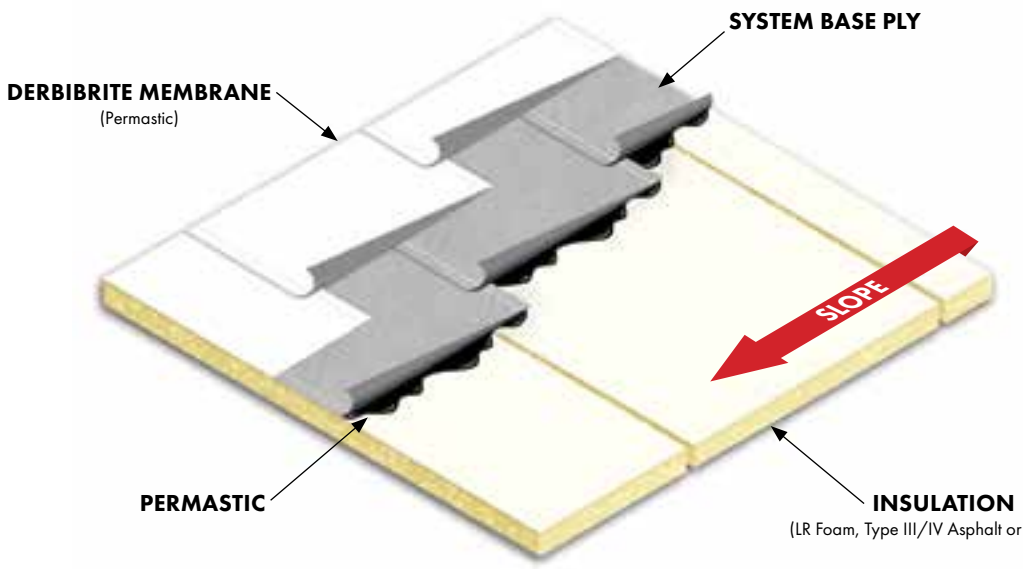
DERBIGUM Membrane: Install the Derbigum membrane by shingling from the low point on the roof or by strapping with the slope of the roof deck. The Derbigum membrane must be set in a solid uniform layer of Permastic applied at a nominal rate of 1 1/2 - 2 gal/sq (0.6 - 0.8 L/m^2). Stagger the second layer of Derbigum a half sheet from the Derbigum ply below. Adhere the second Derbigum membrane by heat welding or with Permastic applied at a rate of 1 1/2 - 2 gal/sq (0.6 - 0.8 L/m^2). **Permastic MUST NOT be applied to membrane lap and seam areas.** Side laps must be minimum 3 inches (7.6 cm) and offset the side laps of base ply by a minimum 12 inches (30.5 cm). End laps must be a minimum 4 inches (10.2 cm). Side and end laps must be heat welded, rolled with a minimum 20 lb (9 kg) steel roller and have a continuous bead of molten modified bitumen visible at all laps/seams.

PERMASTIC Application: Permastic adhesive can be applied by spray, squeegee or trowel in a uniform layer at the minimum application rates outlined in Section 9.0. System base ply or DERBIGUM membrane should be set immediately into the Permastic.

Approved Overburden or Garden Tray System: Must be approved by Derbigum Technical Services and application procedures must be followed according to the overburden system specification or green/garden tray manufacturer.

Substrate	System Base / Membrane	Specification Number*	Guaranty Availability (Years)**
Insulated: New, Replacement, Recover with Approved Insulations	1 Derbibase + 1 Derbibrite	1I1B	10
	1 Derbibase + 1 Derbibrite	1I1B	10, 15, 20
	0 Base Plies + 1 Derbigum + 1 Derbibrite	0IGB	10, 15, 20
Nailable: New, Replacement, Wood, Uninsulated Plywood, LWIC and Cementitious Wood Fiber	1 Base Ply + 1 Derbibase + 1 Derbibrite	2N1B	10, 15, 20
	1 Base Ply + 1 Derbibase Ultra + 1 Derbibrite	2N1B	10, 15, 20
	1 Base Ply + 1 Derbigum + 1 Derbibrite	1NGB	10, 15, 20
Structural Concrete: Uninsulated Non-Nailable	1 Derbibase + 1 Derbibrite	1C1B	10
	1 Derbibase Ultra + 1 Derbibrite	1C1B	10, 15, 20
	0 Base Plies + 1 Derbigum + 1 Derbibrite	0CGB	10, 15, 20
Recover: Over Existing DERBIGUM System	0 Base Plies + 1 Derbibrite	0R1B	10
	1 Base Ply + 1 Derbibrite	1R1B	10, 15
	2 base plies or 1 Derbigum + 1 Derbibrite	1R1B	10, 15, 20
	2 Base Plies + 1 Derbibrite	2R1B	10, 15, 20
Recover: Over Existing Qualified Roof	1 Base Ply + 1 Derbibrite	1R1B	10
	Recover Board + 1 Base Ply + 1 Derbibrite	1RC1B	10,15

* Refer to Specification Number Key on page 39
** See Section 14.0 for specific application requirements.



MATERIAL REQUIREMENTS	QUANTITY / 100 SF
Roof Insulation	Per Project Requirements
Low Rise Foam Insulation Adhesive, Type III/IV Asphalt, Perlok or Approved Fasteners	Per Project/Code Requirements
Derbibase or Derbibase Ultra	1 Ply
Permastic	For application rates refer to Section 9.0
Derbibrite	1 Ply

Slope: Positive. *(Refer to UL & FM Requirements for Fire and Wind ratings.)*

Insulation: Approved insulation boards must be adhered/attached in accordance with stipulations in Section 5.0, General Insulation Recommendations. Insulation installed over steel roof decks must be secured in accordance with the latest edition of FM Loss Prevention Data Sheet 1-29.

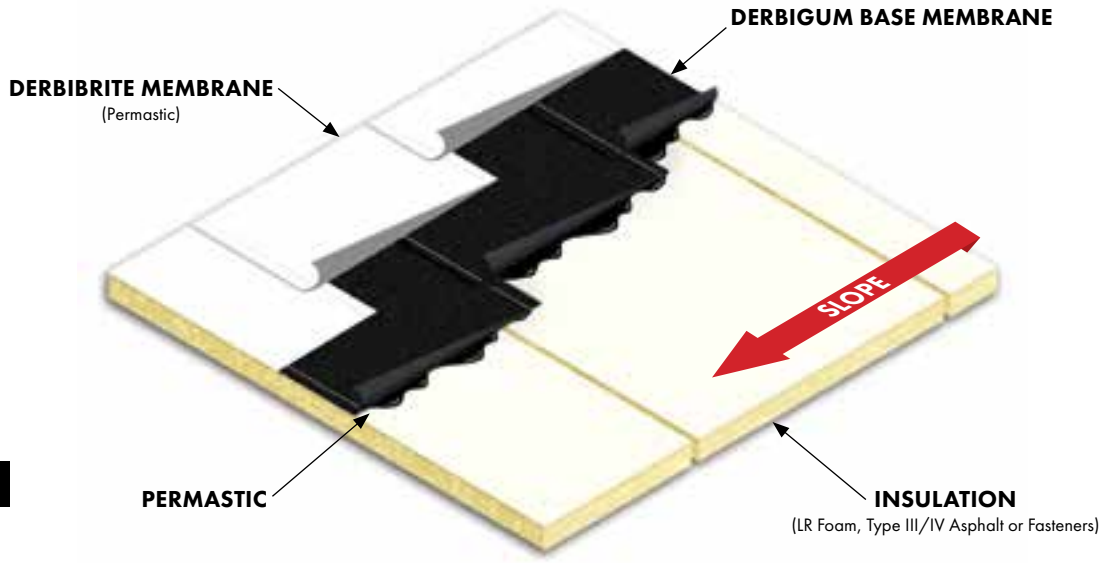
Base Ply: Install the system base ply by shingling from the low point on the roof or by strapping with the slope of the roof deck. Secure base sheet in a solid layer of Permastic applied at a minimum rate of 2 - 2 $^{1}/_{2}$ gal/sq (0.8 - 1.0 L/m^{2}). Side laps must be minimum 3 inches (7.6 cm) and be offset a minimum 12 inches. End laps must be a minimum 4 inches (10.2 cm).

DERBIBRITE Membrane: Prior to installing Derbibrite, remove factory release film (refer to 7.4.1). Install the Derbibrite membrane by shingling from the low point on the roof or by strapping with the slope of the roof deck, running the Derbibrite membrane parallel to the direction of the system base ply. The Derbibrite membrane must be set in a solid uniform layer of Permastic applied at a nominal rate of 1$^{1}/_{2}$ - 2 gal/sq (0.6 - 0.8 L/m^{2}). **Permastic MUST NOT be applied to membrane lap and seam areas.** Side laps must be minimum 3 inches (7.6 cm) and offset the side laps of base ply by a minimum 12 inches (30.5 cm). End laps must be a minimum 4 inches (10.2 cm). Side and end laps must be heat welded, rolled with a minimum 20 lb (9 kg) steel roller and have a continuous bead of molten modified bitumen visible at all laps/seams.

PERMASTIC Application: Permastic adhesive must be applied by spray, squeegee or trowel in a uniform layer at a minimum rate per application rates in Section 9.0, with the system base ply or DERBIGUM membrane set immediately into the Permastic.

DERBIBRITE should be cleaned in the following manner:

- For Permastic spills on Derbibrite, pour mineral spirits directly on the spot, then wipe off with a clean dry cloth. Additional products may be used to clean Permastic spills, check with the DERBIGUM Technical Services Department for recommendations.
- For footprints tracked onto the surface of Derbibrite a granulated laundry detergent or granulated dish soap. Sprinkle onto the affected area, work in with water and rinse.
- Power washing up to a maximum of 1000 psi for general cleaning, with the nozzle distanced from the membrane a minimum of 12 inches, always avoiding the lap areas.



0 I G B

MATERIAL REQUIREMENTS	QUANTITY/100 SF
Roof Insulation	Per Project Requirements
Low Rise Foam Insulation Adhesive, Type III/IV Asphalt, Perlok or Approved Fasteners	Per Project/Code Requirements
Derbigum	1 Ply
Permastic	For application rates refer to Section 9.0
Derbibrite	1 Ply

Slope: Positive. *(Refer to UL & FM Requirements for Fire and Wind ratings.)*

Insulation: Approved insulation boards must be adhered/attached in accordance with stipulations in Section 5.0, General Insulation Recommendations. Insulation installed over steel roof decks must be secured in accordance with the latest edition of FM Loss Prevention Data Sheet 1-29.

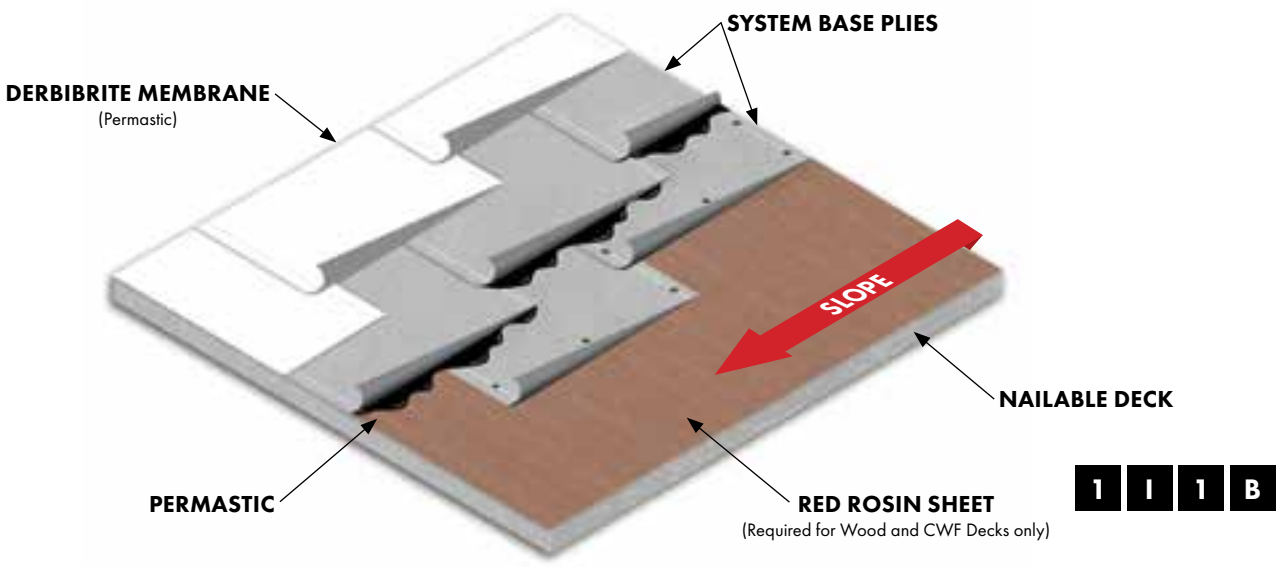
DERBIGUM Membrane: Install the base ply of Derbigum membrane by shingling from the low point on the roof or by strapping with the slope of the roof deck, in a solid uniform layer of Permastic applied at a nominal rate of 2 - $2^1/_2$ gal/sq (0.8 - 1.0 L/m^2).

DERBIBRITE Membrane: Prior to installing Derbibrite, remove factory release film (refer to 7.4.1). Install the Derbibrite membrane by shingling from the low point on the roof or by strapping with the slope of the roof deck, running the Derbibrite membrane parallel to the direction of the system base ply. The Derbibrite membrane must be set in a solid uniform layer of Permastic applied at a nominal rate of $1^1/_2$ - 2 gal/sq (0.6 - 0.8 L/m^2). **Permastic MUST NOT be applied to membrane lap and seam areas.** Side laps must be minimum 3 inches (7.6 cm) and offset the side laps of base ply by a minimum 12 inches (30.5 cm). End laps must be a minimum 4 inches (10.2 cm). Side and end laps must be heat welded, rolled with a minimum 20 lb (9 kg) steel roller and have a continuous bead of molten modified bitumen visible at all laps/seams.

PERMASTIC Application: Permastic adhesive must be applied by spray, squeegee or trowel in a uniform layer at a minimum rate per application rates in Section 9.0, with the system base ply or DERBIGUM membrane set immediately into the Permastic.

DERBIBRITE should be cleaned in the following manner:

- For Permastic spills on Derbibrite, pour mineral spirits directly on the spot, then wipe off with a clean dry cloth. Additional products may be used to clean Permastic spills, check with the DERBIGUM Technical Services Department for recommendations.
- For footprints tracked onto the surface of Derbibrite a granulated laundry detergent or granulated dish soap. Sprinkle onto the affected area, work in with water and rinse.
- Power washing up to a maximum of 1000 psi for general cleaning, with the nozzle distanced from the membrane a minimum of 12 inches, always avoiding the lap areas.



MATERIAL REQUIREMENTS	QUANTITY/100 SF
Red Rosin Sheet ***(Required for Wood and Cementitious Wood Fiber Decks)***	1 Ply
Approved Base Plies	1 Ply
Perlok or Approved Fasteners	Per Project/Code Requirements
Derbibase or Derbibase Ultra	1 Ply
Permastic	Per Product Requirements
Derbibrite	1 Ply

Slope: Positive. *(Refer to UL & FM Requirements for Fire and Wind ratings.)*

Base Sheet/Separator sheet: For Wood and Cementitious Wood Fiber decks a red rosin sheet is required plus a layer of Derbibase, PRS Modified Base or PRS Glass Base. For LWIC decks use PRS Vented Base, Derbibase or PRS Modified Base. Install the base ply by shingling from the low point on the roof or by strapping with the slope of the roof deck. Side laps must be minimum 3 inches (7.6 cm) and end laps minimum 4 inches (10.2 cm). Secure base sheet to the wood roof deck using minimum 1 inch (2.5 cm) diameter head Simplex-type nails with ring or annular shank installed 6 - 9 inches (15 - 23 cm) on side laps and end laps, and 12 - 18 inches (30 - 46 cm) in two rows staggered longitudinally along the center of the sheet approximately 12 inches (30 cm) from each edge. On LWIC and tectum roof decks consult FM Global Guide for recommended fasteners and patterns. Minimum total fastener quantity must be 75 per 100 ft^2 or in accordance with current recommendations of FM Global.

Base Ply: Install a base ply of Derbibase or Derbibase Ultra by shingling from the low point on the roof or by strapping with the slope of the roof deck. Secure base sheet in a solid layer of Permastic applied at a minimum rate of $1^1/_2$ - 2 gal/sq (0.6 - 0.8 L/m^2). Side laps must be minimum 3 inches (7.6 cm) and be offset a minimum 12 inches. End laps must be a minimum 4 inches (10.2 cm).

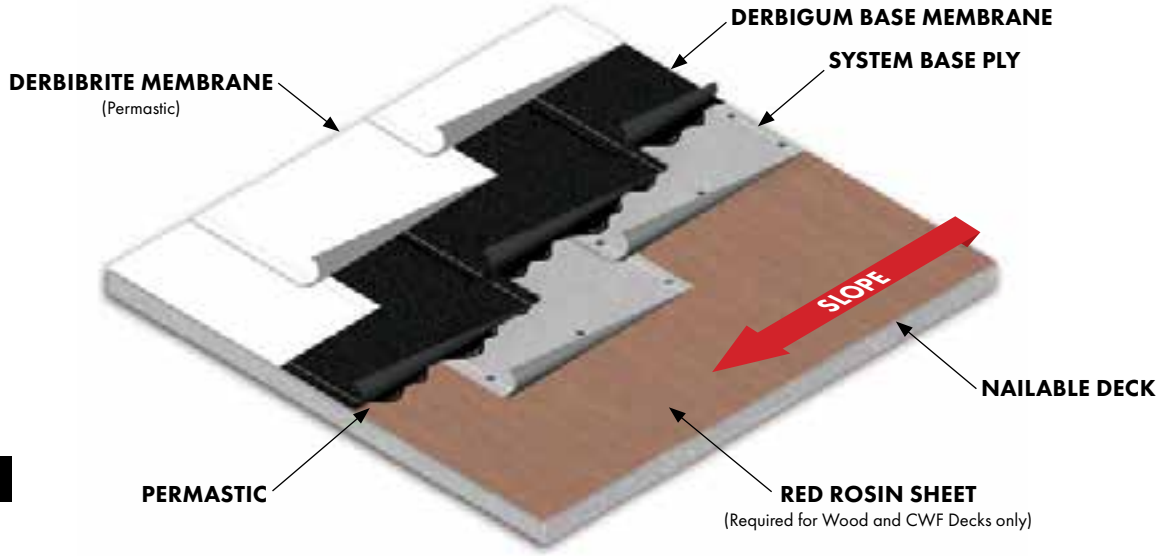
DERBIBRITE Membrane: Prior to installing Derbibrite, remove factory release film (refer to 7.4.1). Install the Derbibrite membrane by shingling from the low point on the roof or by strapping with the slope of the roof deck, running the Derbibrite membrane parallel to the direction of the system base ply. The Derbibrite membrane must be set in a solid uniform layer of Permastic applied at a nominal rate of $1^1/_2$ - 2 gal/sq (0.6 - 0.8 L/m^2). **Permastic MUST NOT be applied to membrane lap and seam areas.** Side laps must be minimum 3 inches (7.6 cm) and offset the side laps of base ply by a minimum 12 inches (30.5 cm). End laps must be a minimum 4 inches (10.2 cm). Side and end laps must be heat welded, rolled with a minimum 20 lb (9 kg) steel roller and have a continuous bead of molten modified bitumen visible at all laps/seams.

PERMASTIC Application: Permastic adhesive must be applied by spray, squeegee or trowel in a uniform layer at a minimum rate per application rates in Section 9.0, with the system base ply or DERBIGUM membrane set immediately into the Permastic.

DERBIBRITE should be cleaned in the following manner:

- For Permastic spills on Derbibrite, pour mineral spirits directly on the spot, then wipe off with a clean dry cloth. Additional products may be used to clean Permastic spills, check with the DERBIGUM Technical Services Department for recommendations.
- For footprints tracked onto the surface of Derbibrite a granulated laundry detergent or granulated dish soap. Sprinkle onto the affected area, work in with water and rinse.
- Power washing up to a maximum of 1000 psi for general cleaning, with the nozzle distanced from the membrane a minimum of 12 inches, always avoiding the lap areas.

DERBIBRITE NAILABLE DECKS (UNINSULATED)



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MATERIAL REQUIREMENTS	QUANTITY/100 SF
Red Rosin Sheet ***(Required for Wood and Cementitious Wood Fiber Decks)***	1 Ply
Approved Base Ply	1 Ply
Perlok or Approved Fasteners	Per Project/Code Requirements
Derbigum	1 Ply
Permastic	Per Product Requirements
Derbibrite	1 Ply

Slope: Positive. *(Refer to UL & FM Requirements for Fire and Wind ratings.)*

Base Sheet/Separator sheet: For Wood and Cementitious Wood Fiber decks a red rosin sheet is required plus a layer of Derbibase, PRS Modified Base or PRS Glass Base. For LWIC decks use PRS Vented Base, Derbibase or PRS Modified Base. Install the base ply by shingling from the low point on the roof or by strapping with the slope of the roof deck. Side laps must be minimum 3 inches (7.6 cm) and end laps minimum 4 inches (10.2 cm). Secure base sheet to the wood roof deck using minimum 1 inch (2.5 cm) diameter head Simplex-type nails with ring or annular shank installed 6 - 9 inches (15 - 23 cm) on side laps and end laps, and 12 - 18 inches (30 - 46 cm) in two rows staggered longitudinally along the center of the sheet approximately 12 inches (30 cm) from each edge. On LWIC and tectum roof decks consult FM Global Guide for recommended fasteners and patterns. Minimum total fastener quantity must be 75 per 100 ft^2 or in accordance with current recommendations of FM Global.

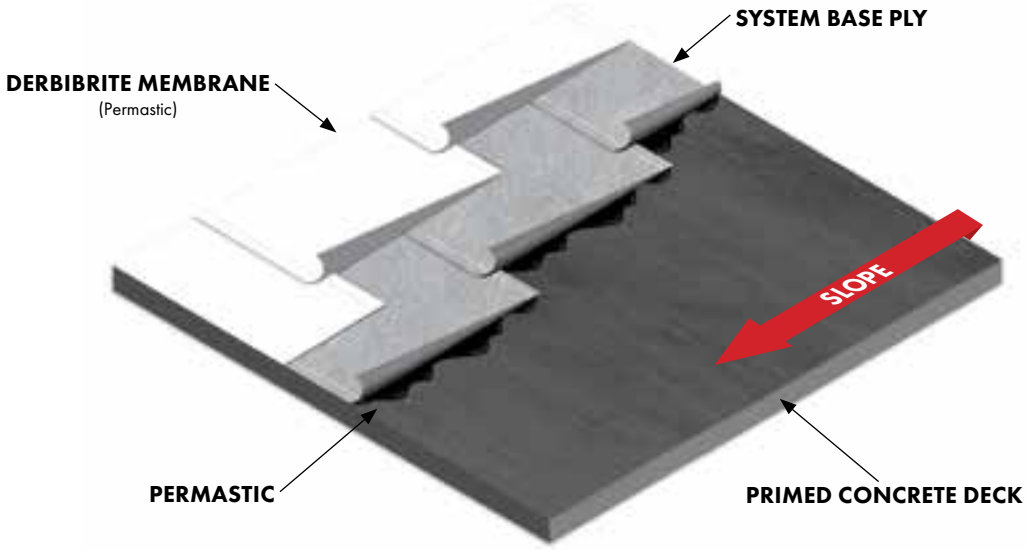
DERBIGUM Membrane: Install the base ply of Derbigum membrane by shingling from the low point on the roof or by strapping with the slope of the roof deck. The Derbigum membrane must be set in a solid uniform layer of Permastic applied at a nominal rate of 2 - $2^1/_2$ gal/sq (0.8 - 1.0 L/m^2). **Permastic MUST NOT be applied to membrane lap and seam areas.** Side laps must be minimum 3 inches (7.6 cm) and offset the side laps of base ply by a minimum 12 inches (30.5 cm). End laps must be a minimum 4 inches (10.2 cm). Side and end laps must be heat welded, rolled with a minimum 20 lb (9 kg) steel roller and have a continuous bead of molten modified bitumen visible at all laps/seams.

DERBIBRITE Membrane: Prior to installing Derbibrite, remove factory release film (refer to 7.4.1). Install the Derbibrite membrane by shingling from the low point on the roof or by strapping with the slope of the roof deck, running the Derbibrite membrane parallel to the direction of the system base ply. The Derbibrite membrane must be set in a solid uniform layer of Permastic applied at a nominal rate of $1^1/_2$ - 2 gal/sq (0.6 - 0.8 L/m^2). **Permastic MUST NOT be applied to membrane lap and seam areas.** Side laps must be minimum 3 inches (7.6 cm) and offset the side laps of base ply by a minimum 12 inches (30.5 cm). End laps must be a minimum 4 inches (10.2 cm). Side and end laps must be heat welded, rolled with a minimum 20 lb (9 kg) steel roller and have a continuous bead of molten modified bitumen visible at all laps/seams.

PERMASTIC Application: Permastic adhesive must be applied by spray, squeegee or trowel in a uniform layer at a minimum rate per application rates in Section 9.0, with the system base ply or DERBIGUM membrane set immediately into the Permastic.

DERBIBRITE should be cleaned in the following manner:

- For Permastic spills on Derbibrite, pour mineral spirits directly on the spot, then wipe off with a clean dry cloth. Additional products may be used to clean Permastic spills, check with the DERBIGUM Technical Services Department for recommendations.
- For footprints tracked onto the surface of Derbibrite a granulated laundry detergent or granulated dish soap. Sprinkle onto the affected area, work in with water and rinse.
- Power washing up to a maximum of 1000 psi for general cleaning, with the nozzle distanced from the membrane a minimum of 12 inches, always avoiding the lap areas.



1 C 1 B

MATERIAL REQUIREMENTS	QUANTITY/100 SF
Asphalt Primer	Per Product Requirements
Derbibase or Derbibase Ultra	1 Ply
Permastic	For application rates refer to Section 9.0
Derbibrite	1 Ply

Slope: Positive. *(Refer to UL & FM Requirements for Fire and Wind ratings.)*

Primer: Prior to installation, deck surface must be primed with Asphalt primer and allowed to dry. An NRCA "Deck Dryness Test" should be performed before starting work.

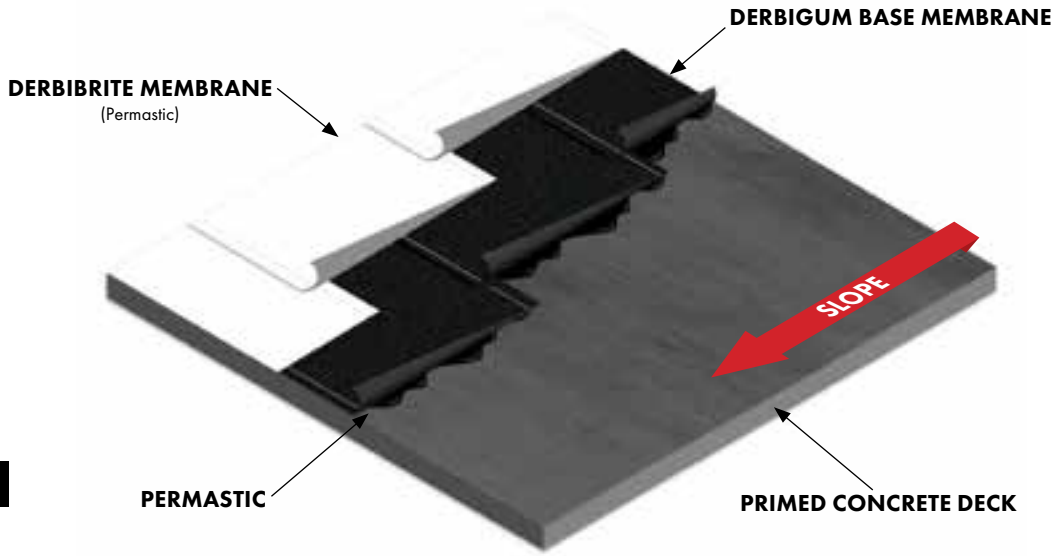
Base Sheet: Install a base ply of Derbibase or Derbibase Ultra by shingling from the low point on the roof or by strapping with the slope of the roof deck. Secure base sheet in a solid layer of Permastic applied at a minimum rate of 2 - 2 $^{1}/_{2}$ gal/sq. Side laps must be minimum 3 inches (7.6 cm) and be offset a minimum 12 inches. End laps must be a minimum 4 inches.

DERBIBRITE Membrane: Prior to installing Derbibrite, remove factory release film (refer to 7.4.1). Install the Derbibrite membrane by shingling from the low point on the roof or by strapping with the slope of the roof deck, running the Derbibrite membrane parallel to the direction of the system base ply. The Derbibrite membrane must be set in a solid uniform layer of Permastic applied at a nominal rate of 1$^{1}/_{2}$ - 2 gal/sq (0.6 - 0.8 L/m^{2}). **Permastic MUST NOT be applied to membrane lap and seam areas.** Side laps must be minimum 3 inches (7.6 cm) and offset the side laps of base ply by a minimum 12 inches (30.5 cm). End laps must be a minimum 4 inches (10.2 cm). Side and end laps must be heat welded, rolled with a minimum 20 lb (9 kg) steel roller and have a continuous bead of molten modified bitumen visible at all laps/seams.

PERMASTIC Application: Permastic adhesive must be applied by spray, squeegee or trowel in a uniform layer at a minimum rate per application rates in Section 9.0, with the system base ply or DERBIGUM membrane set immediately into the Permastic.

DERBIBRITE should be cleaned in the following manner:

- For Permastic spills on Derbibrite, pour mineral spirits directly on the spot, then wipe off with a clean dry cloth. Additional products may be used to clean Permastic spills, check with the DERBIGUM Technical Services Department for recommendations.
- For footprints tracked onto the surface of Derbibrite a granulated laundry detergent or granulated dish soap. Sprinkle onto the affected area, work in with water and rinse.
- Power washing up to a maximum of 1000 psi for general cleaning, with the nozzle distanced from the membrane a minimum of 12 inches, always avoiding the lap areas.



0 C G B

MATERIAL REQUIREMENTS	QUANTITY / 100 SF
Asphalt Primer	Per Product Requirements
Derbigum	1 Ply
Permastic	For application rates refer to Section 9.0
Derbibrite	1 Ply

Slope: Positive. *(Refer to UL & FM Requirements for Fire and Wind ratings.)*

Primer: Prior to installation, deck surface must be primed with Asphalt primer and allowed to dry. An NRCA "Deck Dryness Test" should be performed before starting work.

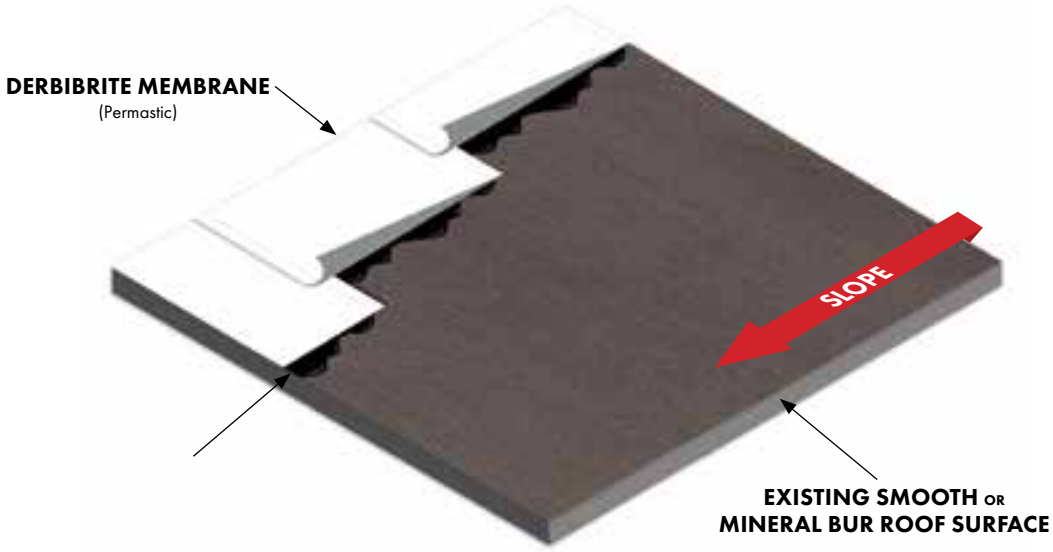
DERBIGUM Membrane: Install the base ply of Derbigum membrane by shingling from the low point on the roof or by strapping with the slope of the roof deck. The Derbigum membrane must be set in a solid uniform layer of Permastic applied at a nominal rate of 2 - 2 1/2 gal/sq (0.8 - 1.0 L/m^2). **Permastic MUST NOT be applied to membrane lap and seam areas.** Side laps must be minimum 3 inches (7.6 cm) and offset the side laps of base ply by a minimum 12 inches (30.5 cm). End laps must be a minimum 4 inches (10.2 cm). Side and end laps must be heat welded, rolled with a minimum 20 lb (9 kg) steel roller and have a continuous bead of molten modified bitumen visible at all laps/seams.

DERBIBRITE Membrane: Prior to installing Derbibrite, remove factory release film (refer to 7.4.1). Install the Derbibrite membrane by shingling from the low point on the roof or by strapping with the slope of the roof deck, running the Derbibrite membrane parallel to the direction of the system base ply. The Derbibrite membrane must be set in a solid uniform layer of Permastic applied at a nominal rate of 1 1/2 - 2 gal/sq (0.6 - 0.8 L/m^2). **Permastic MUST NOT be applied to membrane lap and seam areas.** Side laps must be minimum 3 inches (7.6 cm) and offset the side laps of base ply by a minimum 12 inches (30.5 cm). End laps must be a minimum 4 inches (10.2 cm). Side and end laps must be heat welded, rolled with a minimum 20 lb (9 kg) steel roller and have a continuous bead of molten modified bitumen visible at all laps/seams.

PERMASTIC Application: Permastic adhesive must be applied by spray, squeegee or trowel in a uniform layer at a minimum rate per application rates in Section 9.0, with the system base ply or DERBIGUM membrane set immediately into the Permastic.

DERBIBRITE should be cleaned in the following manner:

- For Permastic spills on Derbibrite, pour mineral spirits directly on the spot, then wipe off with a clean dry cloth. Additional products may be used to clean Permastic spills, check with the DERBIGUM Technical Services Department for recommendations.
- For footprints tracked onto the surface of Derbibrite a granulated laundry detergent or granulated dish soap. Sprinkle onto the affected area, work in with water and rinse.
- Power washing up to a maximum of 1000 psi for general cleaning, with the nozzle distanced from the membrane a minimum of 12 inches, always avoiding the lap areas.



0 R 1 B **PERMA**

MATERIAL REQUIREMENTS	QUANTITY / 100 SF
Asphalt Primer	Per Product Requirements
Permastic	For application rates refer to Section 9.0
Derbibrite	1 Ply

Slope: Positive. *(Refer to UL & FM Requirements for Fire and Wind ratings.)*

Surface Preparation: DERBIGUM requires the completion of an approved nondestructive evaluation using infrared, capacitance, or nuclear methods/technology. The decision to replace or recover an existing roof is the responsibility of the building owner, specifier or contractor. Replacement should be considered mandatory if the existing roof system is deteriorated or if leaving the roof in place creates potential problems for the performance of the recover system. All existing wet roof insulation must be removed and replaced with new, dry insulation prior to installation of the Derbigum recover roofing system. The prepared existing smooth roof surface must be clean, smooth and primed with asphalt primer. The primer must be allowed to dry prior to application of the Permastic adhesive.

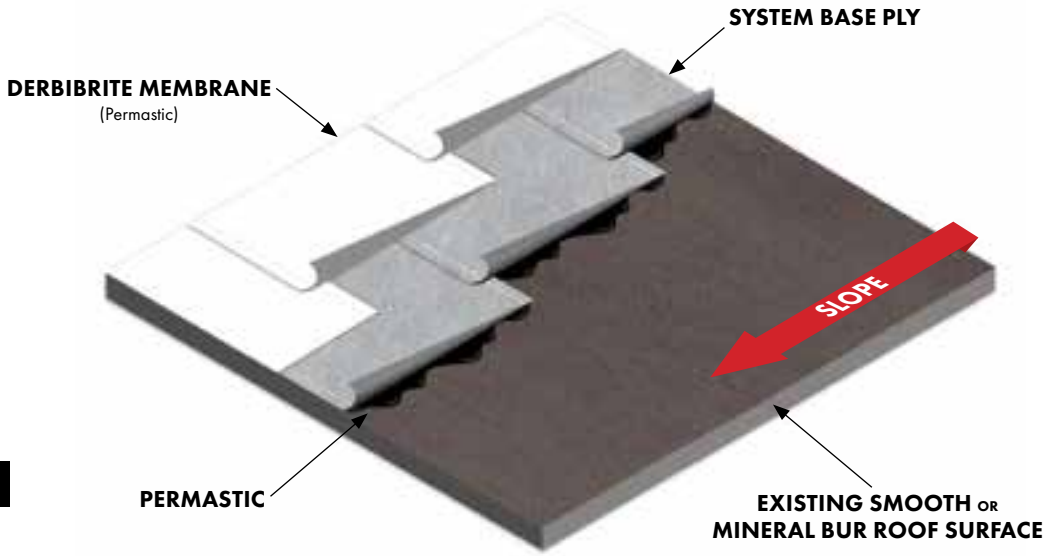
DERBIBRITE Membrane: Prior to installing Derbibrite, remove factory release film (refer to 7.4.1). Install the Derbibrite membrane by shingling from the low point on the roof or by strapping with the slope of the roof deck, running the Derbibrite membrane parallel to the direction of the system base ply. The Derbibrite membrane must be set in a solid uniform layer of Permastic applied at a nominal rate of $1^1/_2$ - 2 gal/sq (0.6 - 0.8 L/m^2). **Permastic MUST NOT be applied to membrane lap and seam areas.** Side laps must be minimum 3 inches (7.6 cm) and offset the side laps of base ply by a minimum 12 inches (30.5 cm). End laps must be a minimum 4 inches (10.2 cm). Side and end laps must be heat welded, rolled with a minimum 20 lb (9 kg) steel roller and have a continuous bead of molten modified bitumen visible at all laps/seams.

On all recover specifications, existing membrane flashings and stripping plies must be removed. Flashing installations must be the same number of plies as the field installation. Refer to Section 1.10 (Recover Recommendations) for recover applications, and 14.5 (Recover Requirements) for guaranty requirements.

PERMASTIC Application: Permastic adhesive must be applied by spray, squeegee or trowel in a uniform layer at a minimum rate per application rates in Section 9.0, with the system base ply or DERBIGUM membrane set immediately into the Permastic.

DERBIBRITE should be cleaned in the following manner:

- For Permastic spills on Derbibrite, pour mineral spirits directly on the spot, then wipe off with a clean dry cloth. Additional products may be used to clean Permastic spills, check with the DERBIGUM Technical Services Department for recommendations.
- For footprints tracked onto the surface of Derbibrite a granulated laundry detergent or granulated dish soap. Sprinkle onto the affected area, work in with water and rinse.
- Power washing up to a maximum of 1000 psi for general cleaning, with the nozzle distanced from the membrane a minimum of 12 inches, always avoiding the lap areas.



1 R 1 B

MATERIAL REQUIREMENTS	QUANTITY/100 SF
Asphalt Primer	Per Product Requirements
Derbigum, Derbibase and Derbibase Ultra	1 Ply
Permastic	For application rates refer to Section 9.0
Derbibrite	1 Ply

Slope: Positive. *(Refer to UL & FM Requirements for Fire and Wind ratings.)*

Surface Preparation: DERBIGUM requires the completion of an approved nondestructive evaluation using infrared, capacitance, or nuclear methods/technology. The decision to replace or recover an existing roof is the responsibility of the building owner, specifier or contractor. Replacement should be considered mandatory if the existing roof system is deteriorated or if leaving the roof in place creates potential problems for the performance of the recover system. All existing wet roof insulation must be removed and replaced with new, dry insulation prior to installation of the Derbigum recover roofing system. The prepared existing smooth roof surface must be clean, smooth and primed with asphalt primer. The primer must be allowed to dry prior to application of the Permastic adhesive.

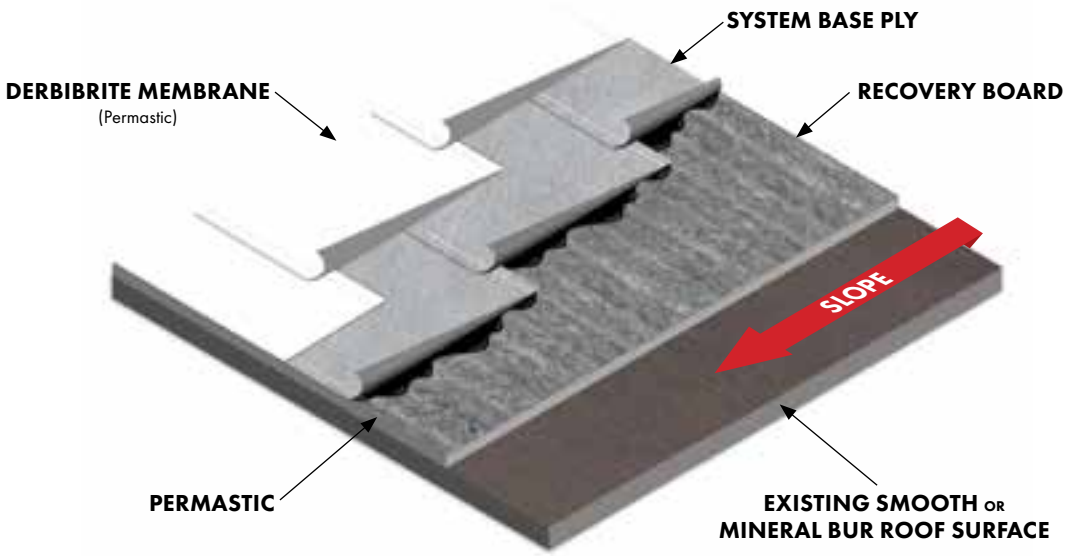
Base Sheet: Install a base ply of Derbigum, Derbibase or Derbibase Ultra by shingling from the low point on the roof or by strapping with the slope of the roof deck. Secure base sheet in a solid layer of Permastic applied at a minimum rate of 2 - 2 $^{1}/_{2}$ gal/sq. Side laps must be minimum 3 inches (7.6 cm) and be offset a minimum 12 inches. End laps must be a minimum 4 inches.

DERBIBRITE Membrane: Prior to installing Derbibrite, remove factory release film (refer to 7.4.1). Install the Derbibrite membrane by shingling from the low point on the roof or by strapping with the slope of the roof deck, running the Derbibrite membrane parallel to the direction of the system base ply. The Derbibrite membrane must be set in a solid uniform layer of Permastic applied at a nominal rate of 1$^{1}/_{2}$ - 2 gal/sq (0.6 - 0.8 L/m^2). **Permastic MUST NOT be applied to membrane lap and seam areas.** Side laps must be minimum 3 inches (7.6 cm) and offset the side laps of base ply by a minimum 12 inches (30.5 cm). End laps must be a minimum 4 inches (10.2 cm). Side and end laps must be heat welded, rolled with a minimum 20 lb (9 kg) steel roller and have a continuous bead of molten modified bitumen visible at all laps/seams.

PERMASTIC Application: Permastic adhesive must be applied by spray, squeegee or trowel in a uniform layer at a minimum rate per application rates in Section 9.0, with the system base ply or DERBIGUM membrane set immediately into the Permastic.

DERBIBRITE should be cleaned in the following manner:

- For Permastic spills on Derbibrite, pour mineral spirits directly on the spot, then wipe off with a clean dry cloth. Additional products may be used to clean Permastic spills, check with the DERBIGUM Technical Services Department for recommendations.
- For footprints tracked onto the surface of Derbibrite a granulated laundry detergent or granulated dish soap. Sprinkle onto the affected area, work in with water and rinse.
- Power washing up to a maximum of 1000 psi for general cleaning, with the nozzle distanced from the membrane a minimum of 12 inches, always avoiding the lap areas.



1 RC 1 B

MATERIAL REQUIREMENTS	QUANTITY/100 SF
Asphalt Primer	Per Product Requirements
Recovery Board	1 Ply
Perlok or Approved Fasteners	Per Project/Code Requirements
Derbigum, Derbibase or Derbibase Ultra	1 Ply
Permastic	For application rates refer to Section 9.0
Derbibrite	1 Ply

Slope: Positive. *(Refer to UL & FM Requirements for Fire and Wind ratings.)*

Surface Preparation: DERBIGUM requires the completion of an approved nondestructive evaluation using infrared, capacitance, or nuclear methods/technology. The decision to replace or recover an existing roof is the responsibility of the building owner, specifier or contractor. Replacement should be considered mandatory if the existing roof system is deteriorated or if leaving the roof in place creates potential problems for the performance of the recover system. All existing wet roof insulation must be removed and replaced with new, dry insulation prior to installation of the Derbigum recover roofing system. The prepared existing smooth roof surface must be clean, smooth and primed with asphalt primer. The primer must be allowed to dry prior to application of the Permastic adhesive.

Recovery Board: Mechanically attach the approved cover board using the fastening patterns shown on Page 20. Install fasteners down through the existing decking a minimum of $^{3}/_{4}$ inch.

Base Sheet: Install a base ply of Derbigum, Derbibase or Derbibase Ultra by shingling from the low point on the roof or by strapping with the slope of the roof deck. Secure base sheet in a solid layer of Permastic applied at a minimum rate of 2 - 2 $^{1}/_{2}$ gal/sq. Side laps must be minimum 3 inches (7.6 cm) and be offset a minimum 12 inches. End laps must be a minimum 4 inches.

DERBIBRITE Membrane: Prior to installing Derbibrite, remove factory release film (refer to 7.4.1). Install the Derbibrite membrane by shingling from the low point on the roof or by strapping with the slope of the roof deck, running the Derbibrite membrane parallel to the direction of the system base ply. The Derbibrite membrane must be set in a solid uniform layer of Permastic applied at a nominal rate of $1^{1}/_{2}$ - 2 gal/sq (0.6 - 0.8 L/m^2). **Permastic MUST NOT be applied to membrane lap and seam areas.** Side laps must be minimum 3 inches (7.6 cm) and offset the side laps of base ply by a minimum 12 inches (30.5 cm). End laps must be a minimum 4 inches (10.2 cm). Side and end laps must be heat welded, rolled with a minimum 20 lb (9 kg) steel roller and have a continuous bead of molten modified bitumen visible at all laps/seams.

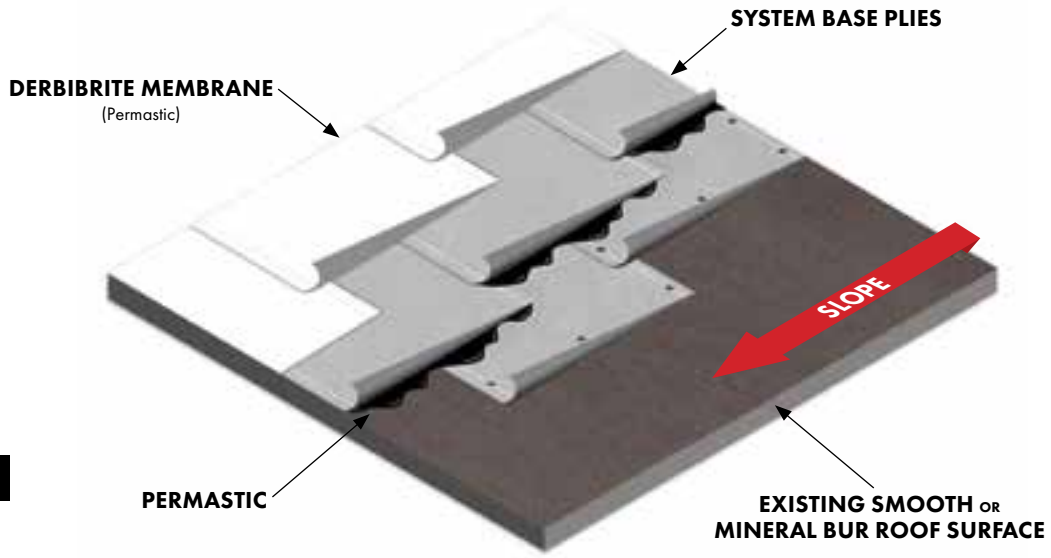
On all recover specifications, existing membrane flashings and stripping plies must be removed. Flashing installations must be the same number of plies as the field installation. Refer to Section 1.10 (Recover Recommendations) for recover applications, and 14.5 (Recover Requirements) for guaranty requirements.

PERMASTIC Application: Permastic adhesive must be applied by spray, squeegee or trowel in a uniform layer at a minimum rate per application rates in Section 9.0, with the system base ply or DERBIGUM membrane set immediately into the Permastic.

DERBIBRITE should be cleaned in the following manner:

- For Permastic spills on Derbibrite, pour mineral spirits directly on the spot, then wipe off with a clean dry cloth. Additional products may be used to clean Permastic spills, check with the DERBIGUM Technical Services Department for recommendations.
- For footprints tracked onto the surface of Derbibrite a granulated laundry detergent or granulated dish soap. Sprinkle onto the affected area, work in with water and rinse.
- Power washing up to a maximum of 1000 psi for general cleaning, with the nozzle distanced from the membrane a minimum of 12 inches, always avoiding the lap areas.

2 R 1 B



MATERIAL REQUIREMENTS	QUANTITY/100 SF
Asphalt Primer	Per Product Requirements
Derbigum, Derbibase, Derbibase Ultra, PRS Glass Base or Modified Glass Base	2 Plies
Perlok or Approved Fasteners	Per Project/Code Requirements
Permastic	For application rates refer to Section 9.0
Derbibrite	1 Ply

Slope: Positive. *(Refer to UL & FM Requirements for Fire and Wind ratings.)*

Surface Preparation: DERBIGUM requires the completion of an approved nondestructive evaluation using infrared, capacitance, or nuclear methods/technology. The decision to replace or recover an existing roof is the responsibility of the building owner, specifier or contractor. Replacement should be considered mandatory if the existing roof system is deteriorated or if leaving the roof in place creates potential problems for the performance of the recover system. All existing wet roof insulation must be removed and replaced with new, dry insulation prior to installation of the Derbigum recover roofing system. The prepared existing smooth roof surface must be clean, smooth and primed with asphalt primer. The primer must be allowed to dry prior to application of the Permastic adhesive.

Base Sheet: Install the membrane system base ply by shingling from the low point on the roof or by strapping with the slope of the roof deck. Secure base sheet in a solid layer of Permastic applied at a minimum rate of 2 - 2 $^{1}/_{2}$ gal/sq. Side laps must be minimum 3 inches (7.6 cm) and be offset a minimum 12 inches. End laps must be a minimum 4 inches.

DERBIBRITE Membrane: Prior to installing Derbibrite, remove factory release film (refer to 7.4.1). Install the Derbibrite membrane by shingling from the low point on the roof or by strapping with the slope of the roof deck, running the Derbibrite membrane parallel to the direction of the system base ply. The Derbibrite membrane must be set in a solid uniform layer of Permastic applied at a nominal rate of 1$^{1}/_{2}$ - 2 gal/sq (0.6 - 0.8 L/m^{2}). **Permastic MUST NOT be applied to membrane lap and seam areas.** Side laps must be minimum 3 inches (7.6 cm) and offset the side laps of base ply by a minimum 12 inches (30.5 cm). End laps must be a minimum 4 inches (10.2 cm). Side and end laps must be heat welded, rolled with a minimum 20 lb (9 kg) steel roller and have a continuous bead of molten modified bitumen visible at all laps/seams.

PERMASTIC Application: Permastic adhesive must be applied by spray, squeegee or trowel in a uniform layer at a minimum rate per application rates in Section 9.0, with the system base ply or DERBIGUM membrane set immediately into the Permastic.

DERBIBRITE should be cleaned in the following manner:

- For Permastic spills on Derbibrite, pour mineral spirits directly on the spot, then wipe off with a clean dry cloth. Additional products may be used to clean Permastic spills, check with the DERBIGUM Technical Services Department for recommendations.
- For footprints tracked onto the surface of Derbibrite a granulated laundry detergent or granulated dish soap. Sprinkle onto the affected area, work in with water and rinse.
- Power washing up to a maximum of 1000 psi for general cleaning, with the nozzle distanced from the membrane a minimum of 12 inches, always avoiding the lap areas.

Substrate	System Base / Membrane	Specification Number*	Guaranty Availability (Years)**
Insulated: Tear-off or Replacement with Approved Insulation	2 Derbibase + 1 Derbigum	2I1G or X	10
	1 Derbibase + 1 Derbibase Ultra + 1 Derbigum	2I1G or X	15
	2 Derbibase Ultra + 1 Derbigum	2I1G or X	20
	1 Derbibase Ultra + 2 Derbigum	1I2G or X	25
	3 Derbigum	0I3G or X	25
Structural Concrete: Uninsulated Non-Nailable	2 Derbibase + 1 Derbigum	2N1B or X	10
	1 Derbibase + 1 Derbibase Ultra + 1 Derbigum	2N1B or X	15
	2 Derbibase Ultra + 1 Derbigum	1NGB or X	20
	1 Derbibase Ultra + 2 Derbigum	1C2G or X	25
	3 Derbigum	0C3G or X	25

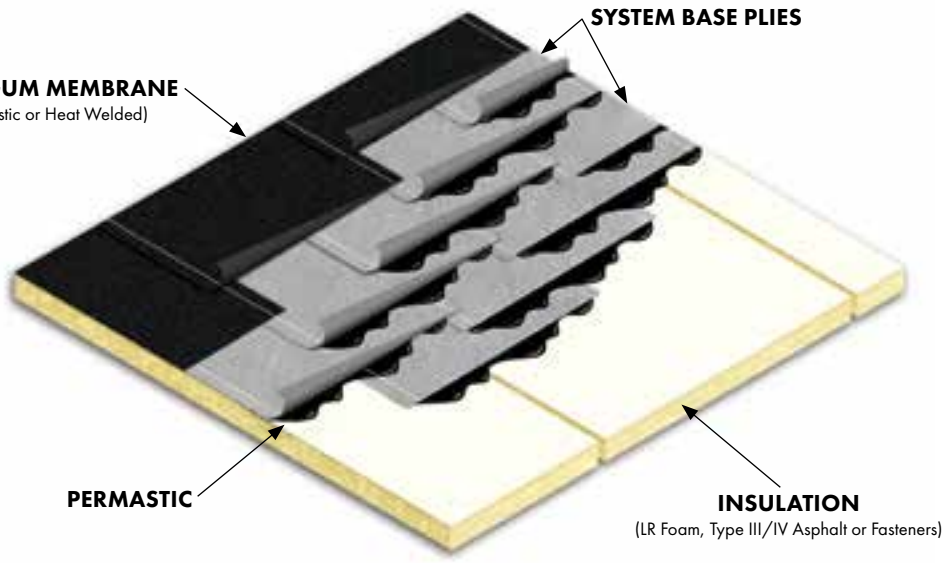
* Refer to Specification Number Key on page 39

** See Section 15.0 for specific application requirements.

When utilizing Derbicolor in DDL Specifications, granular discoloration or granule loss may occur. This condition is considered an aesthetic circumstance and is not covered under the Derbigum Guaranty.

When utilizing Derbigum or Derbicolor in DDL Specifications, blistering or delamination may occur in the areas with prolonged standing water. Regular inspection and maintenance of these areas are recommended.

NOTE: Derbibrite and Derbipure membranes are NOT eligible for DDL Specifications



2 I 1 X
2 I 1 G

MATERIAL REQUIREMENTS	QUANTITY/100 SF
Roof Insulation	Per Product Requirements
Low Rise Foam Insulation Adhesive, Type III/IV Asphalt, Perlok or Approved Fasteners	Per Project/Code Requirements
Approved System Base Ply	2 Plies
Permastic	For application rates refer to Section 9.0
Derbigum GP/XPS or Derbicolor GP/XPS	1 Ply

Insulation: Approved insulation boards must be adhered/attached in accordance with stipulations in Section 5.0, General Insulation Recommendations. Insulation installed over steel roof decks must be secured in accordance with the latest edition of FM Loss Prevention Data Sheet 1-29.

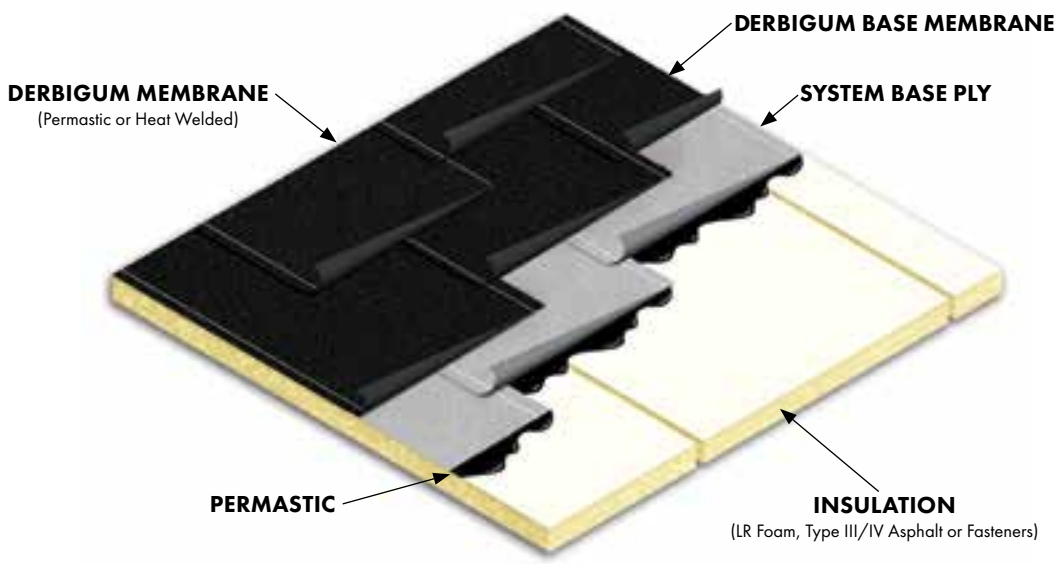
Base Sheet: Install two base plies by shingling from the low point on the roof or by strapping with the slope of the roof deck. Secure base sheet to substrate with a solid layer of Permastic applied at a minimum rate of 2 - 2 $^1/_2$ gal/sq. Lap the second layer of base ply 17 inches (43 cm) to the ply below and set in a solid uniform layer of Permastic applied at a nominal rate of 1$^1/_2$ - 2 gal/sq (0.6 - 0.8 L/m^2). At perimeters and penetrations overlap a minimum 18 inches (46 cm) wide starter or header plies.

DERBIGUM Membrane: Install the Derbigum membrane by shingling from the low point on the roof or by strapping with the slope of the roof deck. The Derbigum membrane must be set in a solid uniform layer of Permastic applied at a nominal rate of 1$^1/_2$ - 2 gal/sq (0.8 - 1.0 L/m^2) or adhered by heat welding solidly over the base ply. **Permastic MUST NOT be applied to membrane lap and seam areas.** Side laps must be minimum 4 inches (7.6 cm) and offset the side laps of base ply by a minimum 12 inches (30.5 cm). End laps must be a minimum 4 inches (10.2 cm). Side and end laps must be heat welded, rolled with a minimum 20 lb (9 kg) steel roller and have a continuous bead of molten modified bitumen visible at all laps/seams.

PERMASTIC Application: Permastic adhesive must be applied by spray, squeegee or trowel in a uniform layer at a minimum rate per application rates in Section 9.0, with the system base ply or Derbigum membrane set immediately into the Permastic.

When utilizing Derbicolor in DDL Specifications, granular discoloration or granule loss may occur. This condition is considered an aesthetic circumstance and is not covered under the Derbigum Guaranty. When utilizing Derbigum or Derbicolor in DDL Specifications, blistering or delamination may occur in the areas with prolonged standing water. Regular inspection and maintenance of these areas are recommended.

NOTE: DERBIGUM requires one layer to be fully torched or heat welded in the system.



2 I 1 X
2 I 1 G

MATERIAL REQUIREMENTS	QUANTITY/100 SF
Roof Insulation	Per Product Requirements
Low Rise Foam Insulation Adhesive, Type III/IV Asphalt, Perlok or Approved Fasteners	Per Project/Code Requirements
Derbibase or Derbibase Ultra	1 Ply
Permastic	For application rates refer to Section 9.0
Derbigum GP/XPS or Derbicolor GP/XPS	2 Plies

Insulation: Approved insulation boards must be adhered/attached in accordance with stipulations in Section 5.0, General Insulation Recommendations. Insulation installed over steel roof decks must be secured in accordance with the latest edition of FM Loss Prevention Data Sheet 1-29.

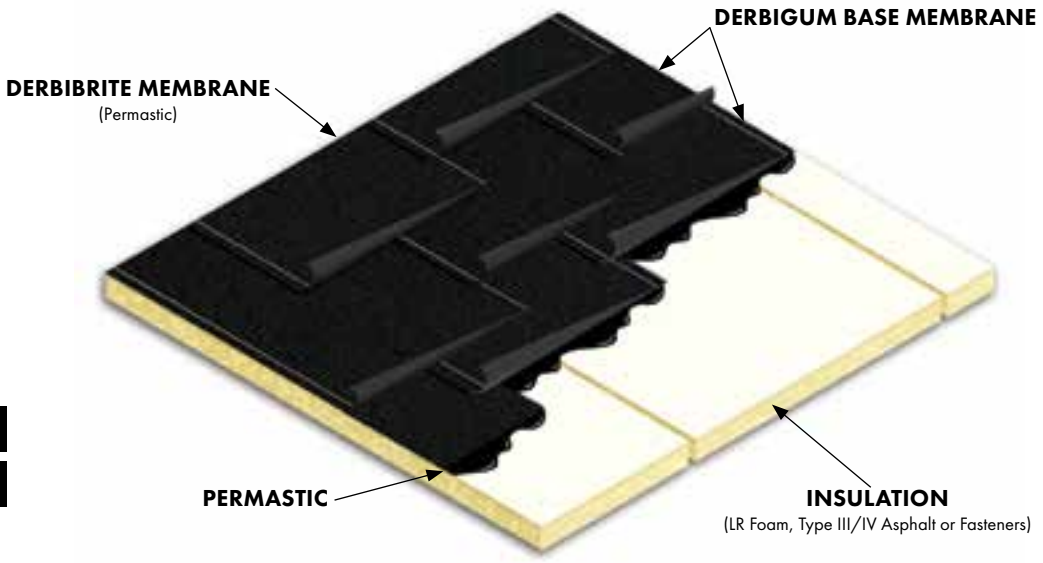
Base Sheet: Install a base ply of Derbibase or Derbibase Ultra by shingling from the low point on the roof or by strapping with the slope of the roof deck. Secure base sheet in a solid layer of Permastic applied at a minimum rate of 2 - 2 $^{1}/_{2}$ gal/sq. Side laps must be minimum 3 inches (7.6 cm) and be offset a minimum 12 inches. End laps must be a minimum 4 inches.

DERBIGUM Membrane: Install 2 plies Derbigum membrane by shingling from the low point on the roof or by strapping with the slope of the roof deck. The Derbigum membrane must be set in a solid uniform layer of Permastic applied at a nominal rate of $1^{1}/_{2}$ - 2 gal/sq (0.8 - 1.0 L/m^{2}) or adhered by heat welding solidly over the base ply. Stagger the second and third layers of Derbigum a half sheet from the ply below. **Permastic MUST NOT be applied to membrane lap and seam areas.** Side laps must be minimum 4 inches (7.6 cm) and offset the side laps of base ply by a minimum 12 inches (30.5 cm). End laps must be a minimum 4 inches (10.2 cm). Side and end laps must be heat welded, rolled with a minimum 20 lb (9 kg) steel roller and have a continuous bead of molten modified bitumen visible at all laps/seams.

PERMASTIC Application: Permastic adhesive must be applied by spray, squeegee or trowel in a uniform layer at a minimum rate per application rates in Section 9.0, with the system base ply or Derbigum membrane set immediately into the Permastic.

When utilizing Derbicolor in DDL Specifications, granular discoloration or granule loss may occur. This condition is considered an aesthetic circumstance and is not covered under the Derbigum Guaranty. When utilizing Derbigum or Derbicolor in DDL Specifications, blistering or delamination may occur in the areas with prolonged standing water. Regular inspection and maintenance of these areas are recommended.

NOTE: DERBIGUM requires one layer to be fully torched or heat welded in the system.



0 I 3 X
0 I 3 G

MATERIAL REQUIREMENTS	QUANTITY/100 SF
Roof Insulation	Per Product Requirements
Low Rise Foam Insulation Adhesive, Type III/IV Asphalt, Perlok or Approved Fasteners	Per Project/Code Requirements
Permastic	For application rates refer to Section 9.0
Derbigum GP/XPS or Derbicolor GP/XPS	3 Plies

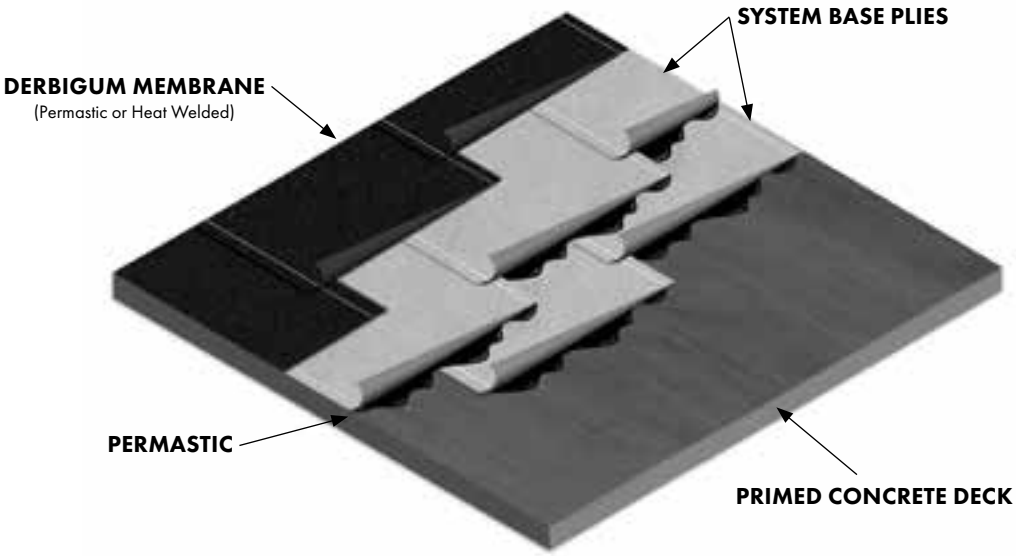
Insulation: Approved insulation boards must be adhered/attached in accordance with stipulations in Section 5.0, General Insulation Recommendations. Insulation installed over steel roof decks must be secured in accordance with the latest edition of FM Loss Prevention Data Sheet 1-29.

DERBIGUM Membrane: Install 3 plies of Derbigum membrane by shingling from the low point on the roof or by strapping with the slope of the roof deck, by setting into a continuous layer of Permastic applied at a minimum rate of 2 - 2 $^{1}/_{2}$ gal/sq to the substrate. Stagger the second and third layers of Derbigum a half sheet from the ply below. Adhere the Derbigum membrane by heat welding or with Permastic applied at a rate of 1$^{1}/_{2}$ - 2 gal/sq (0.6 - 0.8 L/m^{2}).

PERMASTIC Application: Permastic adhesive must be applied by spray, squeegee or trowel in a uniform layer at a minimum rate per application rates in Section 9.0, with the system base ply or Derbigum membrane set immediately into the Permastic.

When utilizing Derbicolor in DDL Specifications, granular discoloration or granule loss may occur. This condition is considered an aesthetic circumstance and is not covered under the Derbigum Guaranty. When utilizing Derbigum or Derbicolor in DDL Specifications, blistering or delamination may occur in the areas with prolonged standing water. Regular inspection and maintenance of these areas are recommended.

NOTE: DERBIGUM requires one layer to be fully torched or heat welded in the system.



2 C 1 X
2 C 1 G

MATERIAL REQUIREMENTS	QUANTITY / 100 SF
Asphalt Primer	Per Product Requirements
Derbigum, Derbibase or Derbibase Ultra	2 Plies
Permastic	For application rates refer to Section 9.0
Derbigum GP/XPS or Derbicolor GP/XPS	1 Ply

Primer: Prior to installation, deck surface must be primed with Asphalt primer and allowed to dry. An NRCA "Deck Dryness Test" should be performed before starting work.

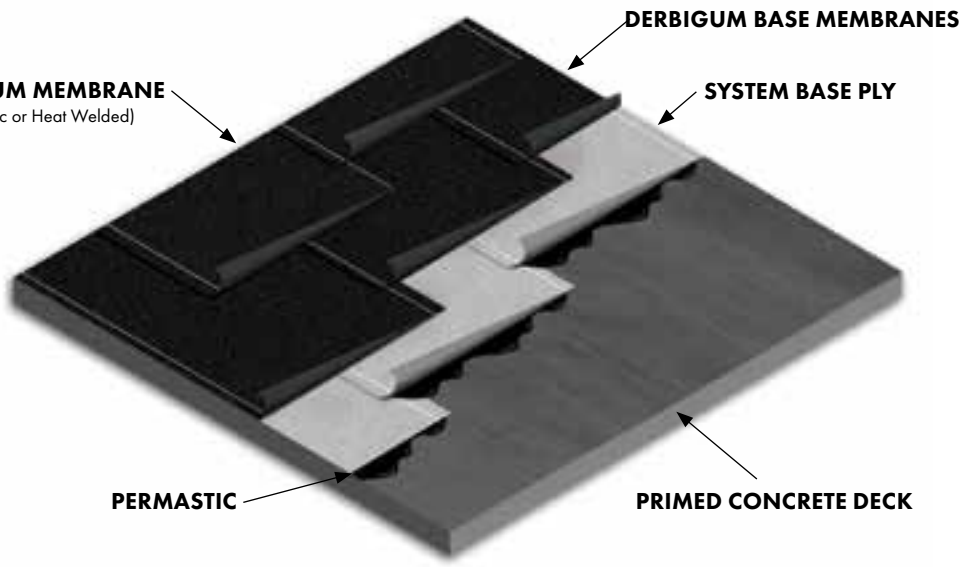
Base Sheet: Install two layers of system base ply by shingling from the low point on the roof or by strapping with the slope of the roof deck. Secure base sheet in a solid layer of Permastic applied at a minimum rate of 2 - 2 $^1/_2$ gal/sq. Stagger the second ply a half sheet from the base ply below. Adhere the second base sheet using Permastic $1^1/_2$ - 2 gal/sq (0.6 - 0.8 L/m^2) or rates mentioned above. Side laps must be minimum 4 inches (7.6 cm) and be offset a minimum 12 inches. End laps must be a minimum 6 inches. All side and end laps must be heat welded.

DERBIGUM Membrane: Install the Derbigum membrane by shingling from the low point on the roof or by strapping with the slope of the roof deck, running the Derbigum membrane parallel to the direction of the system base ply. The Derbigum membrane must be set in a solid uniform layer of Permastic applied at a nominal rate of $1^1/_2$ - 2 gal/sq (0.6 - 0.8 L/m^2) or adhered by heat welding solidly over the base ply. **Permastic MUST NOT be applied to membrane lap and seam areas.** Side laps must be minimum 4 inches (7.6 cm) and offset the side laps of base ply by a minimum 12 inches (30.5 cm). End laps must be a minimum 6 inches (10.2 cm). Side and end laps must be heat welded, rolled with a minimum 20 lb (9 kg) steel roller and have a continuous bead of molten modified bitumen visible at all laps/seams.

PERMASTIC Application: Permastic adhesive can be applied by spray, squeegee or trowel in a uniform layer at the minimum application rates outlined in Section 9.0. System base ply or Derbigum membrane should be set immediately into the Permastic.

When utilizing Derbicolor in DDL Specifications, granular discoloration or granule loss may occur. This condition is considered an aesthetic circumstance and is not covered under the Derbigum Guaranty. When utilizing Derbigum or Derbicolor in DDL Specifications, blistering or delamination may occur in the areas with prolonged standing water. Regular inspection and maintenance of these areas are recommended.

NOTE: DERBIGUM requires one layer to be fully torched or heat welded in the system.



1 C 2 X
1 C 2 G

MATERIAL REQUIREMENTS	QUANTITY/100 SF
Asphalt Primer	Per Product Requirements
Derbigum, Derbibase or Derbibase Ultra	1 Ply
Permastic	For application rates refer to Section 9.0
Derbigum GP/XPS or Derbicolor GP/XPS	2 Plies

Primer: Prior to installation, deck surface must be primed with Asphalt primer and allowed to dry. An NRCA "Deck Dryness Test" should be performed before starting work.

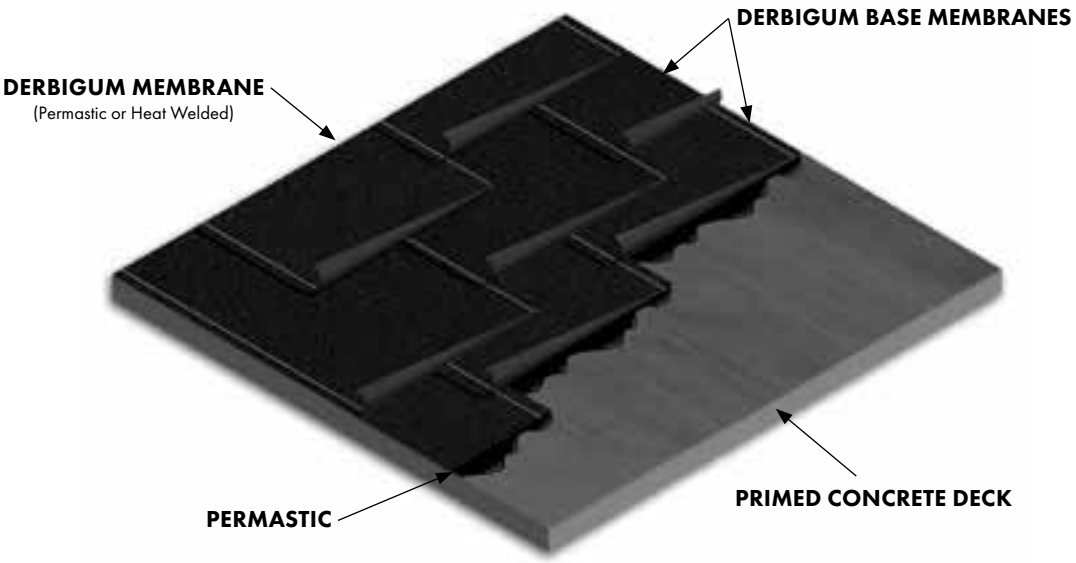
Base Sheet: Install base ply by shingling from the low point on the roof or by strapping with the slope of the roof deck. Secure base sheet in a solid layer of Permastic applied at a minimum rate of 2 - 2 $^{1}/_{2}$ gal/sq. Side laps must be minimum 4 inches (7.6 cm) and be offset a minimum 12 inches. End laps must be a minimum 6 inches.

DERBIGUM Membrane: Install the Derbigum membrane by shingling from the low point on the roof or by strapping with the slope of the roof deck, running the Derbigum membrane parallel to the direction of the system base ply. The Derbigum membrane must be set in a solid uniform layer of Permastic applied at a nominal rate of 1$^{1}/_{2}$ - 2 gal/sq (0.6 - 0.8 L/m^{2}) or adhered by heat welding solidly over the base ply. Stagger the second layer of Derbigum a half sheet from the Derbigum ply below. Adhere the top sheet of Derbigum with Permastic applied at the specified rate listed above or by heat welding. **Permastic MUST NOT be applied to membrane lap and seam areas.** Side laps must be minimum 4 inches (7.6 cm) and offset the side laps of base ply by a minimum 12 inches (30.5 cm). End laps must be a minimum 6 inches (10.2 cm). Side and end laps must be heat welded, rolled with a minimum 20 lb (9 kg) steel roller and have a continuous bead of molten modified bitumen visible at all laps/seams.

PERMASTIC Application: Permastic adhesive can be applied by spray, squeegee or trowel in a uniform layer at the minimum application rates outlined in Section 9.0. System base ply or Derbigum membrane should be set immediately into the Permastic.

When utilizing Derbicolor in DDL Specifications, granular discoloration or granule loss may occur. This condition is considered an aesthetic circumstance and is not covered under the Derbigum Guaranty. When utilizing Derbigum or Derbicolor in DDL Specifications, blistering or delamination may occur in the areas with prolonged standing water. Regular inspection and maintenance of these areas are recommended.

NOTE: DERBIGUM requires one layer to be fully torched or heat welded in the system.



0 C 3 X
0 C 3 G

MATERIAL REQUIREMENTS	QUANTITY/100 SF
Asphalt Primer	Per Product Requirements
Permastic	For application rates refer to Section 9.0
Derbigum GP/XPS or Derbicolor GP/XPS	3 Piles

Primer: Prior to installation, deck surface must be primed with Asphalt primer and allowed to dry. An NRCA "Deck Dryness Test" should be performed before starting work.

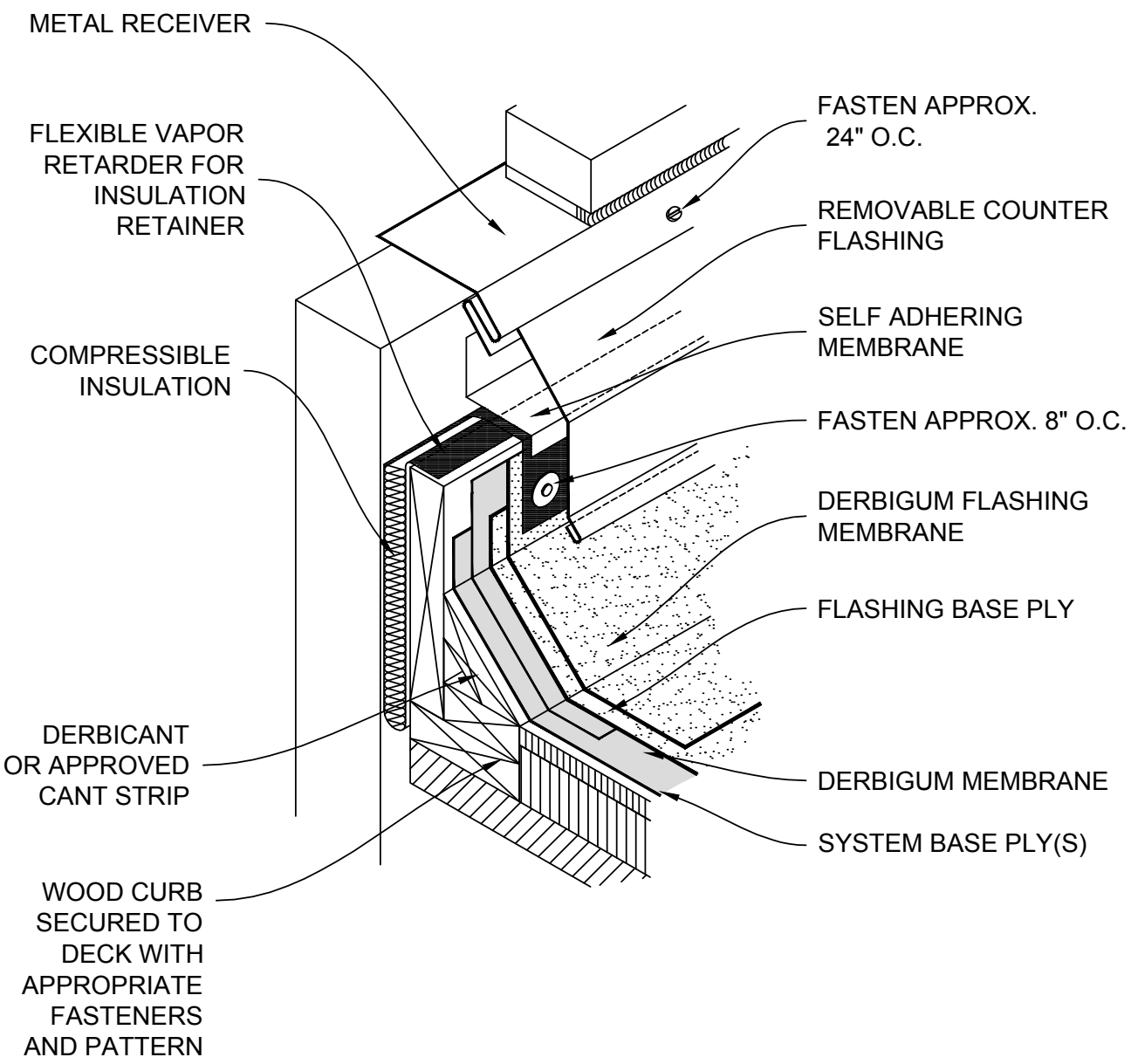
DERBIGUM Membrane: Install 3 plies of Derbigum membrane by shingling from the low point on the roof or by strapping with the slope of the roof deck, by setting into a continuous layer of Permastic applied at a minimum rate of 2 - 2 $^{1}/_{2}$ gal/sq to the substrate. Stagger the second and third layers of Derbigum a half sheet from the ply below. Adhere the Derbigum membrane by heat welding or with Permastic applied at a rate of 1$^{1}/_{2}$ - 2 gal/sq (0.6 - 0.8 L/m^{2}). **Permastic MUST NOT be applied to membrane lap and seam areas.** Side laps must be minimum 4 inches (7.6 cm) and offset the side laps of base ply by a minimum 12 inches (30.5 cm). End laps must be a minimum 6 inches (10.2 cm). Side and end laps must be heat welded, rolled with a minimum 20 lb (9 kg) steel roller and have a continuous bead of molten modified bitumen visible at all laps/seams.

PERMASTIC Application: Permastic adhesive can be applied by spray, squeegee or trowel in a uniform layer at the minimum application rates outlined in Section 9.0. System base ply or Derbigum membrane should be set immediately into the Permastic.

When utilizing Derbicolor in DDL Specifications, granular discoloration or granule loss may occur. This condition is considered an aesthetic circumstance and is not covered under the Derbigum Guaranty. When utilizing Derbigum or Derbicolor in DDL Specifications, blistering or delamination may occur in the areas with prolonged standing water. Regular inspection and maintenance of these areas are recommended.

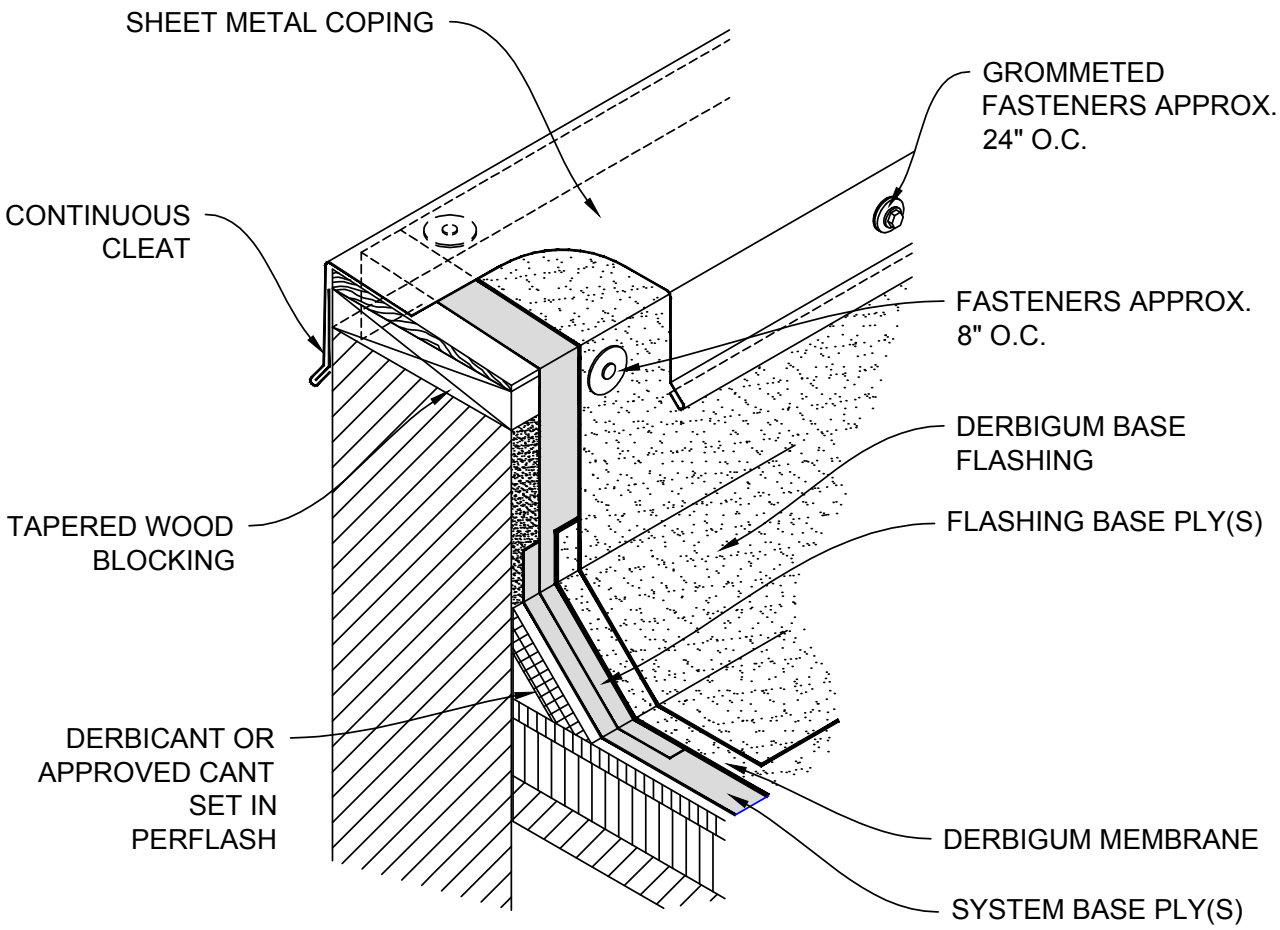
NOTE: DERBIGUM requires one layer to be fully torched or heat welded in the system.

P-1 WALL ISOLATION



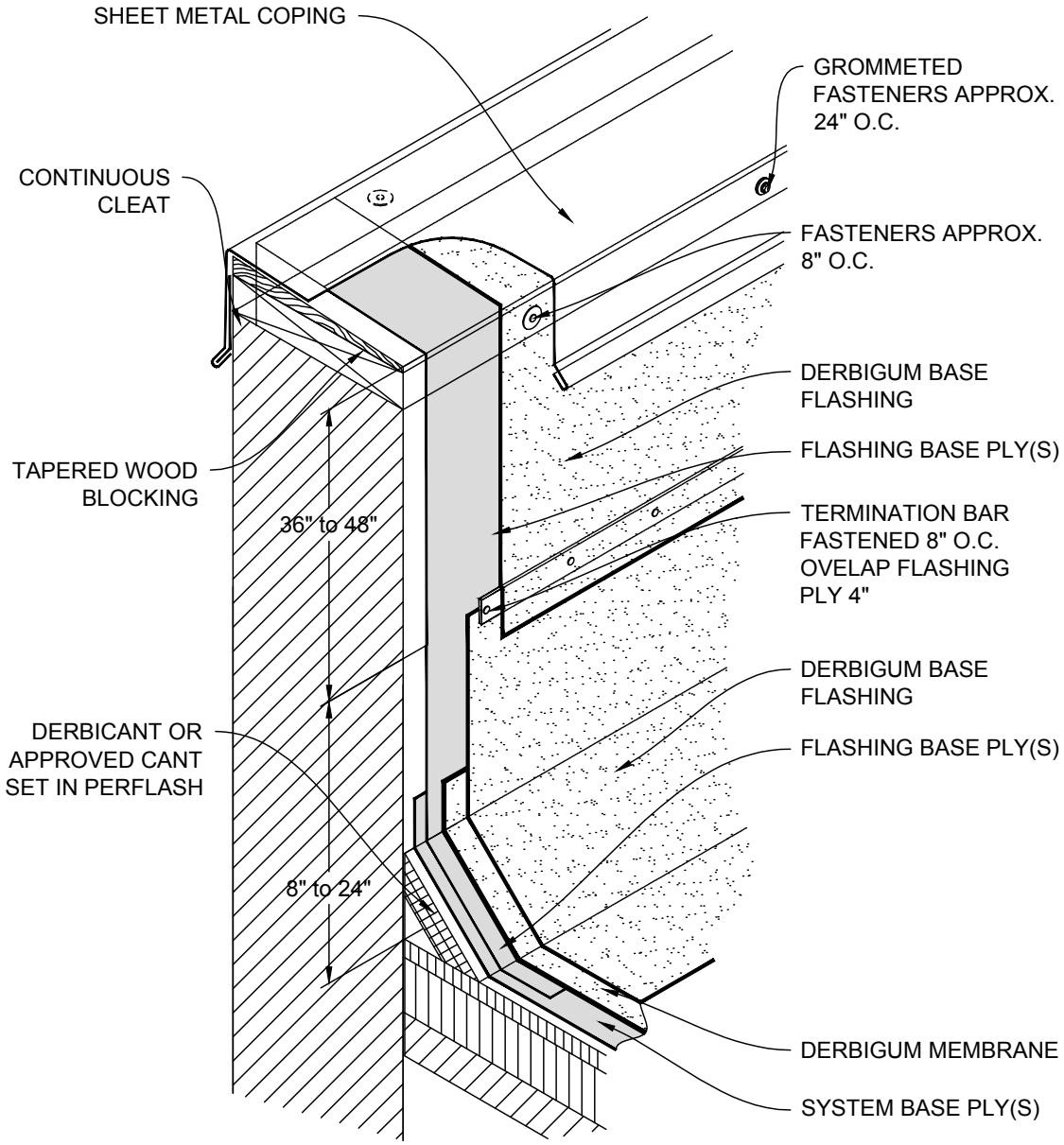
NOTE: This detail allows wall and deck to move independently. It should be used where there is any possibility that differential movement will occur between the deck and vertical surface, such as a penthouse wall. The vertical wood member should be fastened to the deck only. This is one method of joining the two piece flashing system, other methods may be used.

P-2 WALL FLASHING



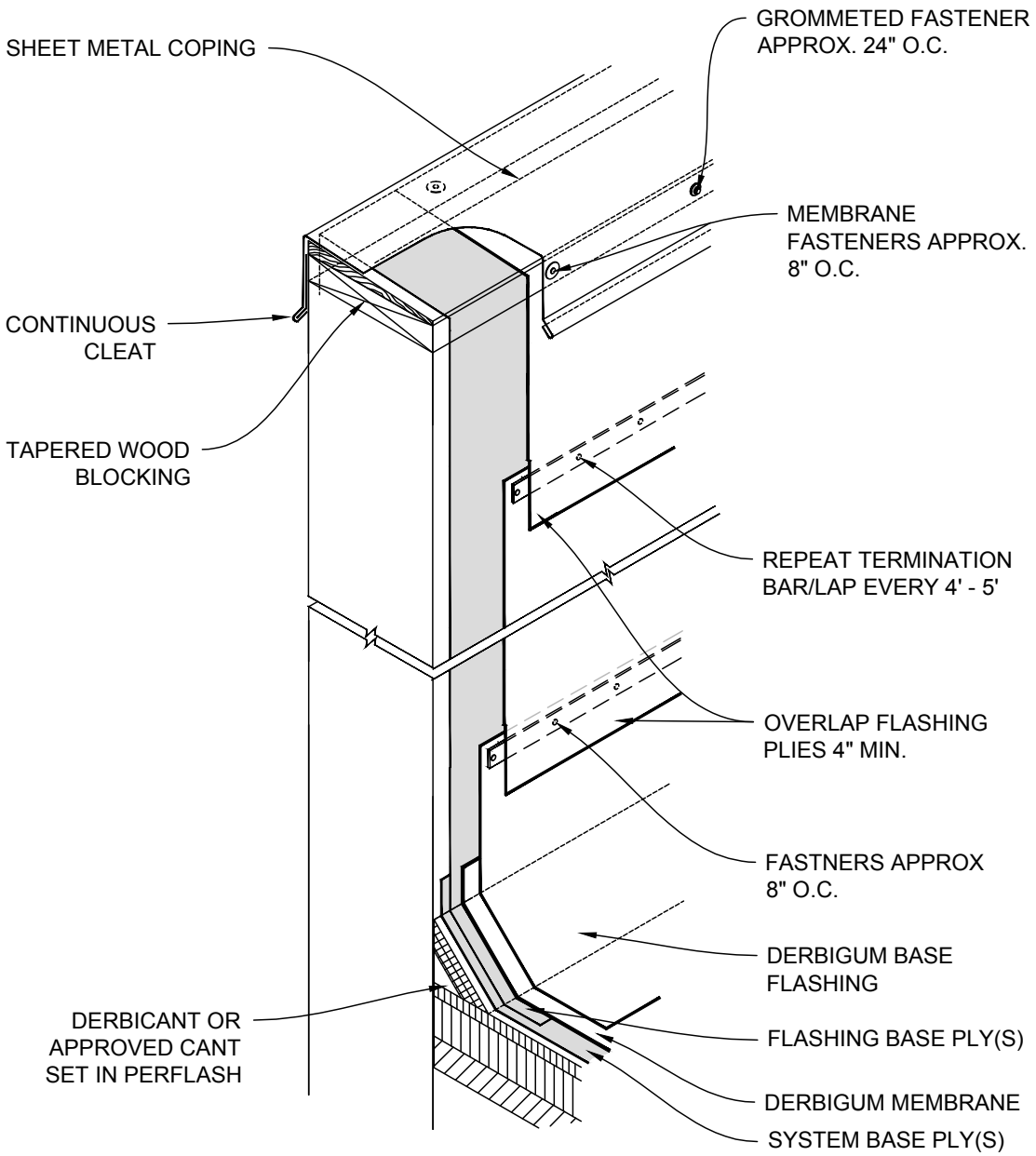
NOTE: This detail should only be used when the deck is supported by the wall.

P-2B HIGH WALL FLASHING



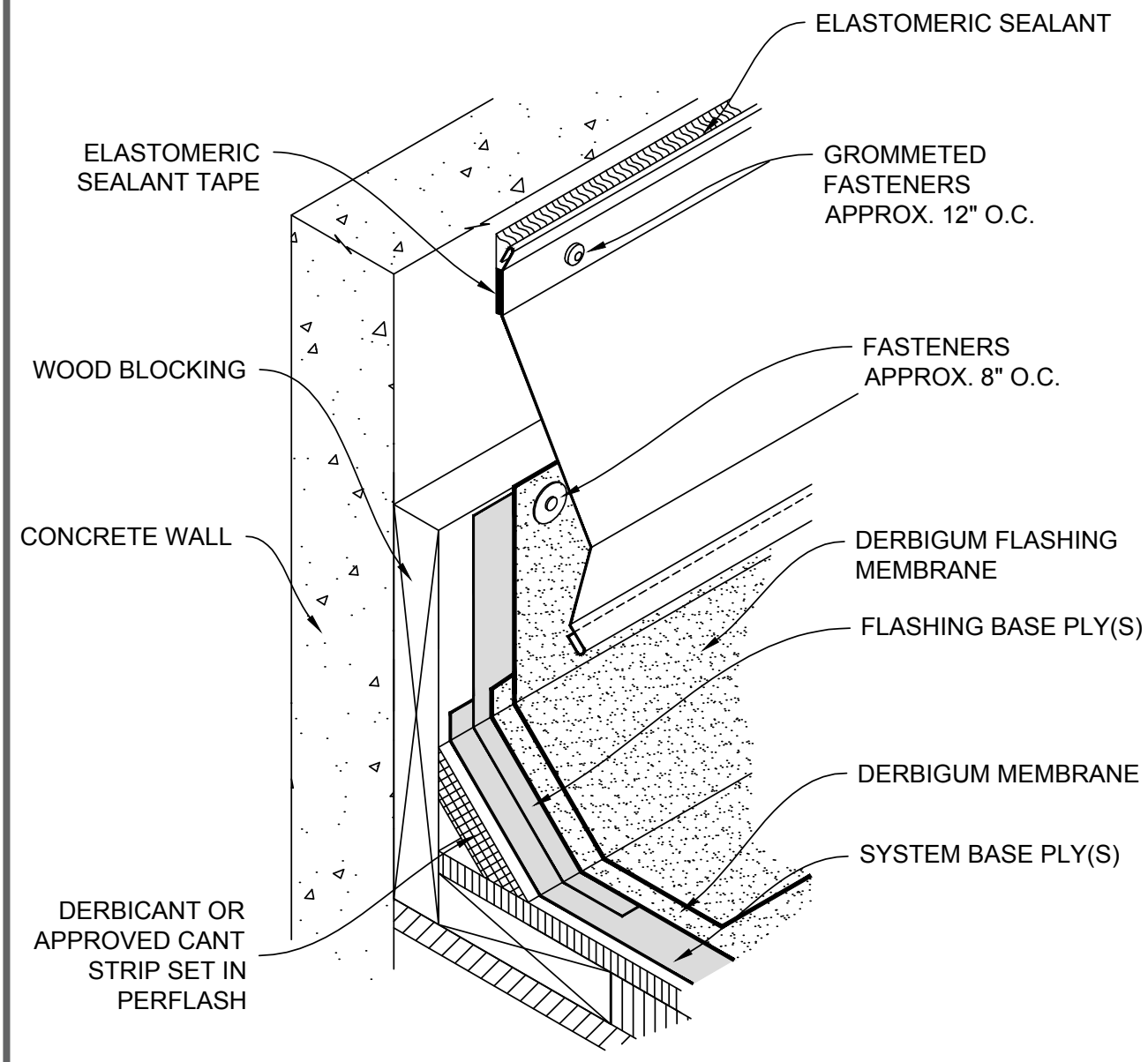
NOTE: This detail should only be used when the deck is supported by the wall.

P-2C HIGH WALL FLASHING



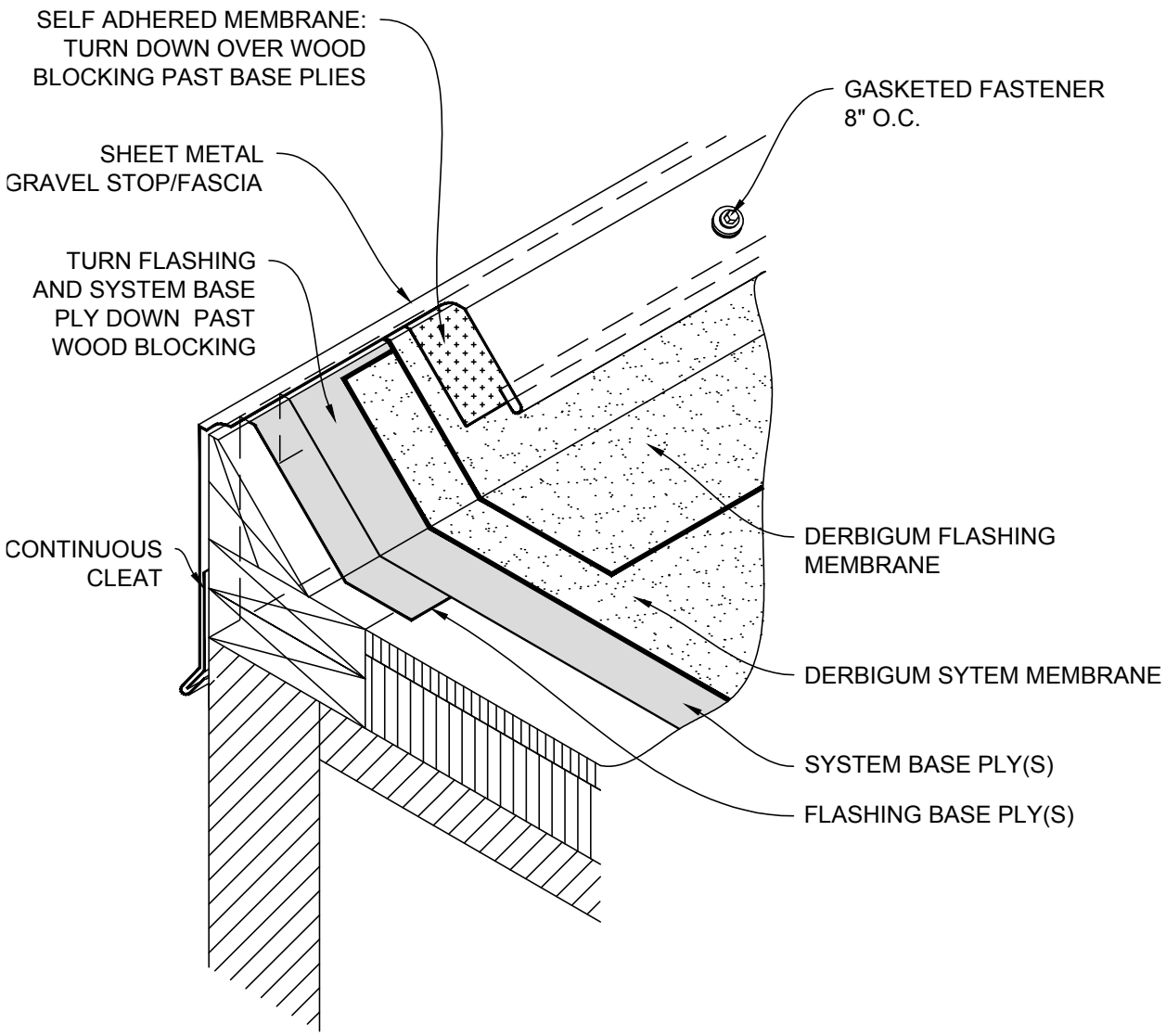
NOTE: This detail should only be used when the deck is supported by the wall.

P-3 WALL/SURFACE MOUNTED COUNTERFLASHING



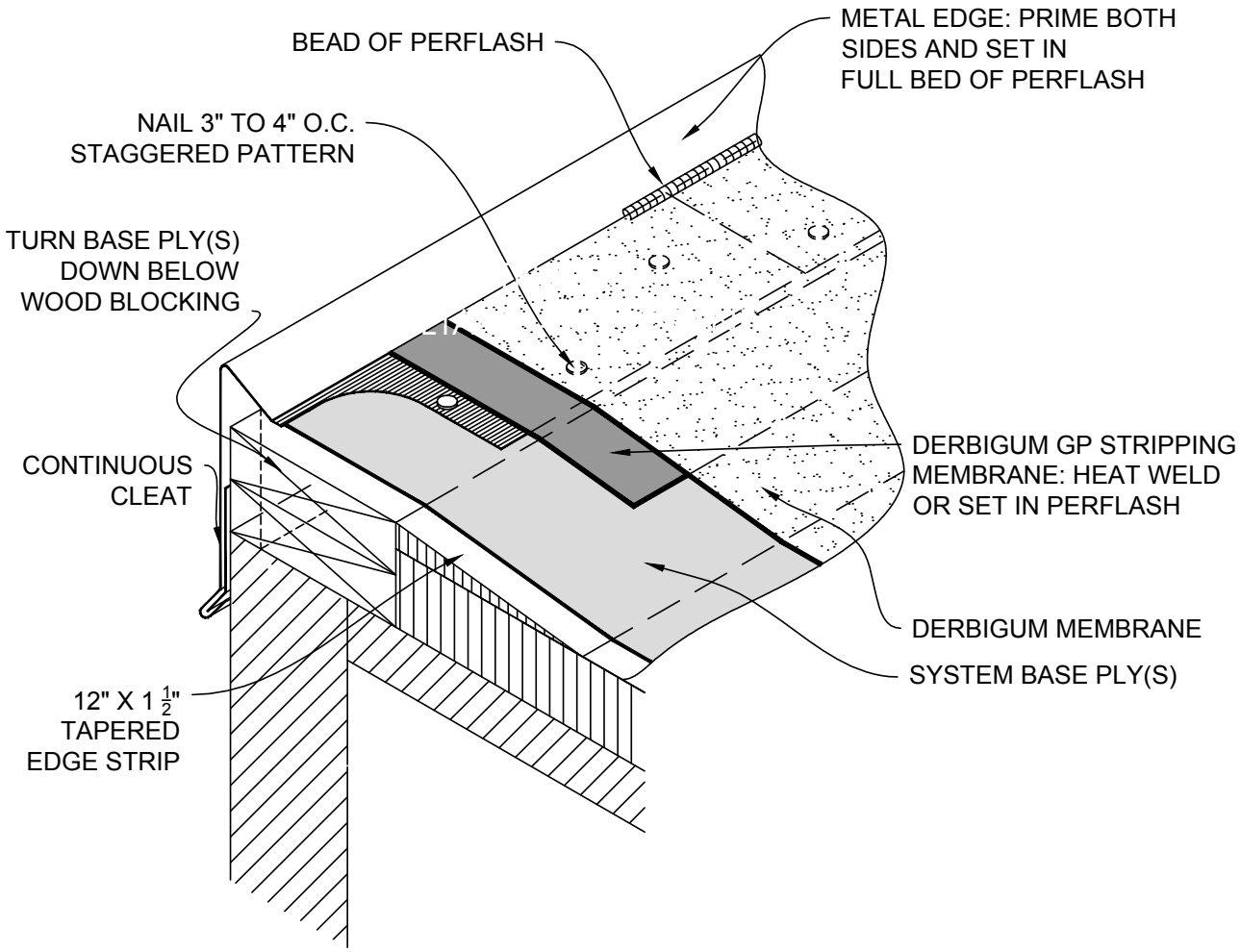
NOTE: Where the deck is supported by and fastened to the concrete deck, vertical wood nailers are required and should be secured to the wall with suitable fasteners.

P-4 RAISED CURB PERIMETER



NOTE: Secure roof edge with fasteners at section center and cover plates. Elastomeric sealant at all fasteners. This detail should be used only where the deck is supported by the outside wall.

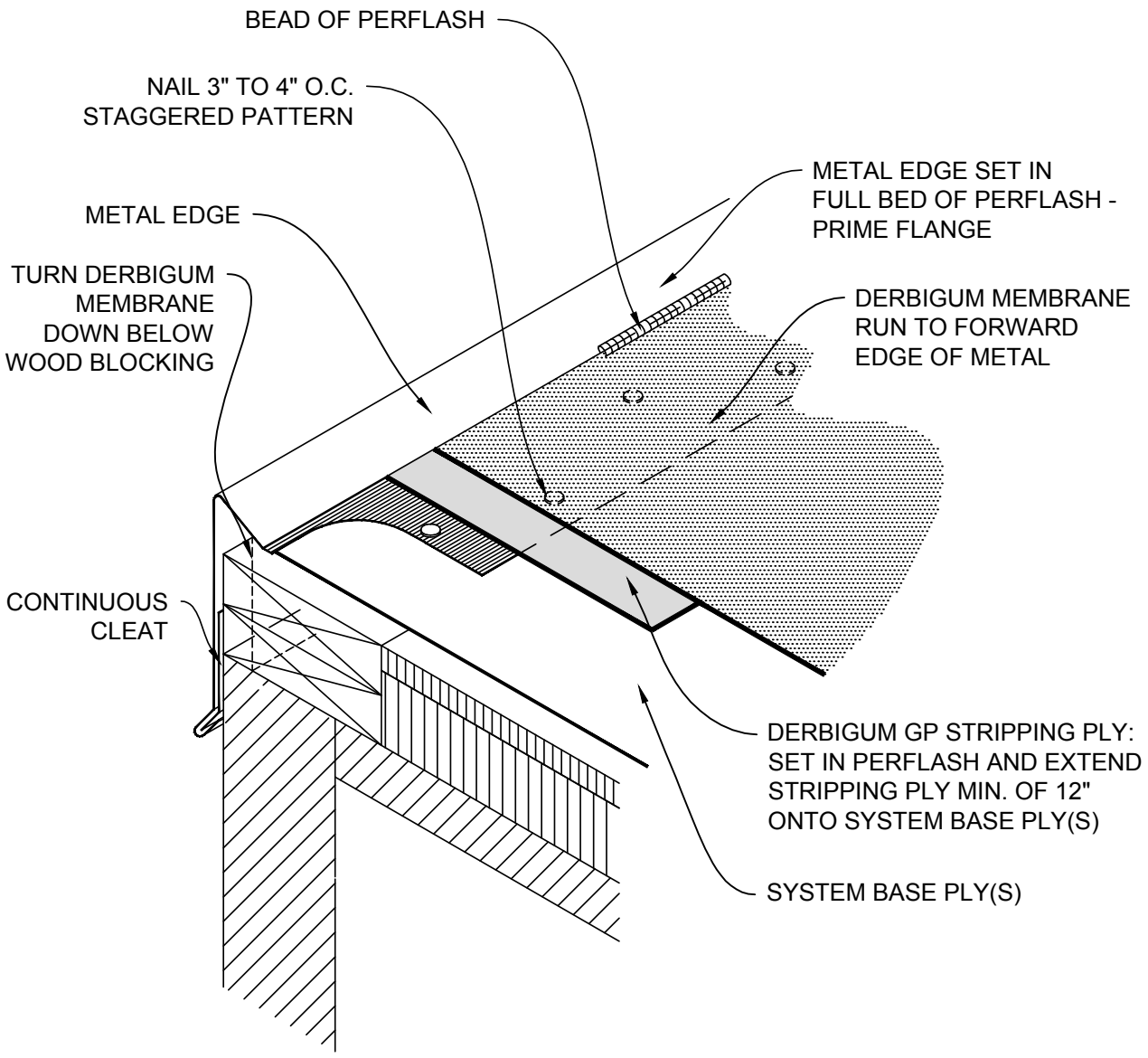
P-5 GRAVEL STOP EDGE (RAISED)



NOTE: This detail should be used with light gauge metals such as 16 oz. copper, 24 gauge galvanized metal or 0.032 aluminum. Frequent nailing is necessary to control thermal movement.

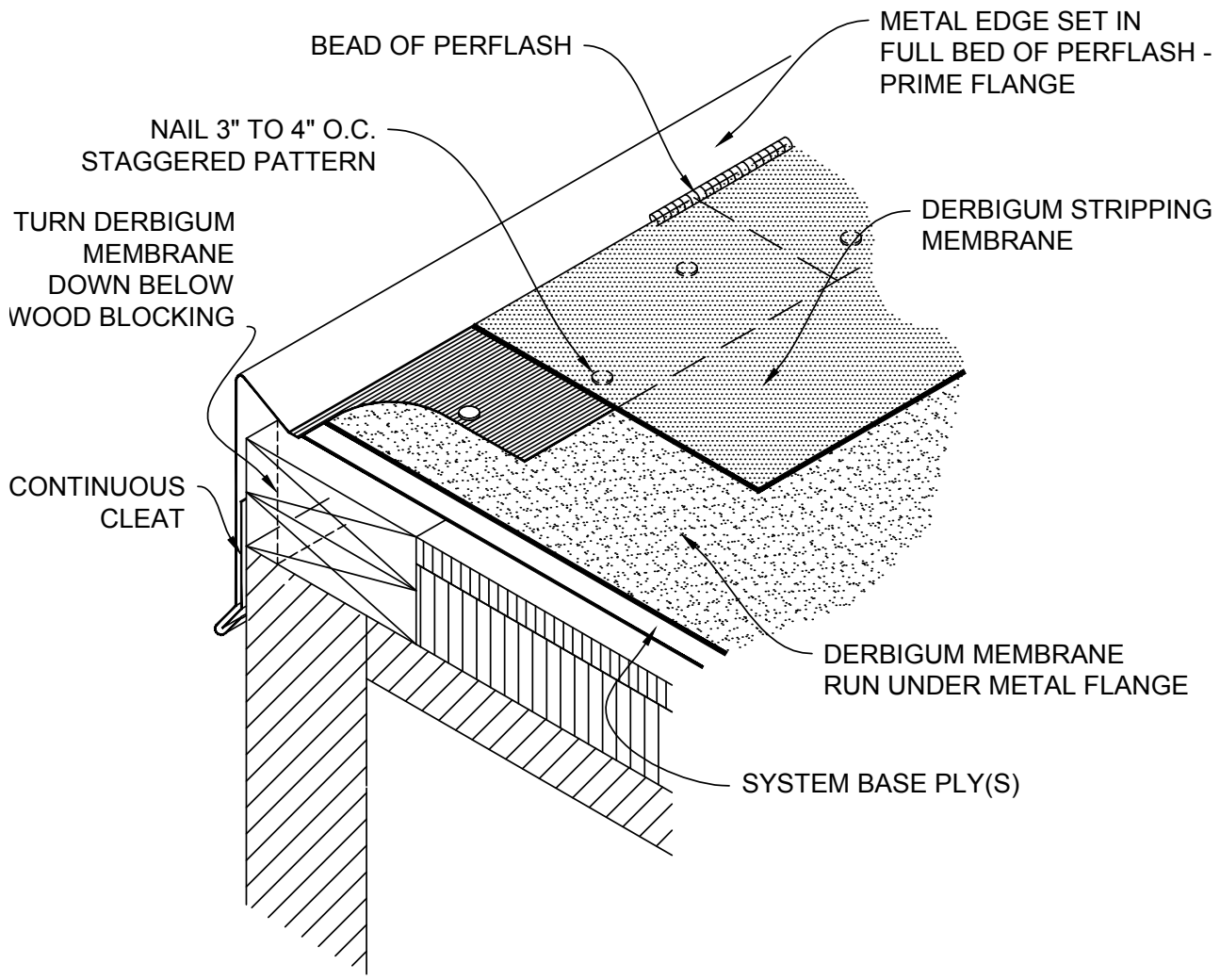
*It is highly recommended that this stripping ply be heat welded and "flopped" into position over primed metal flange.

P-6 GRAVEL STOP EDGE (STRIPPING ON BOTTOM)



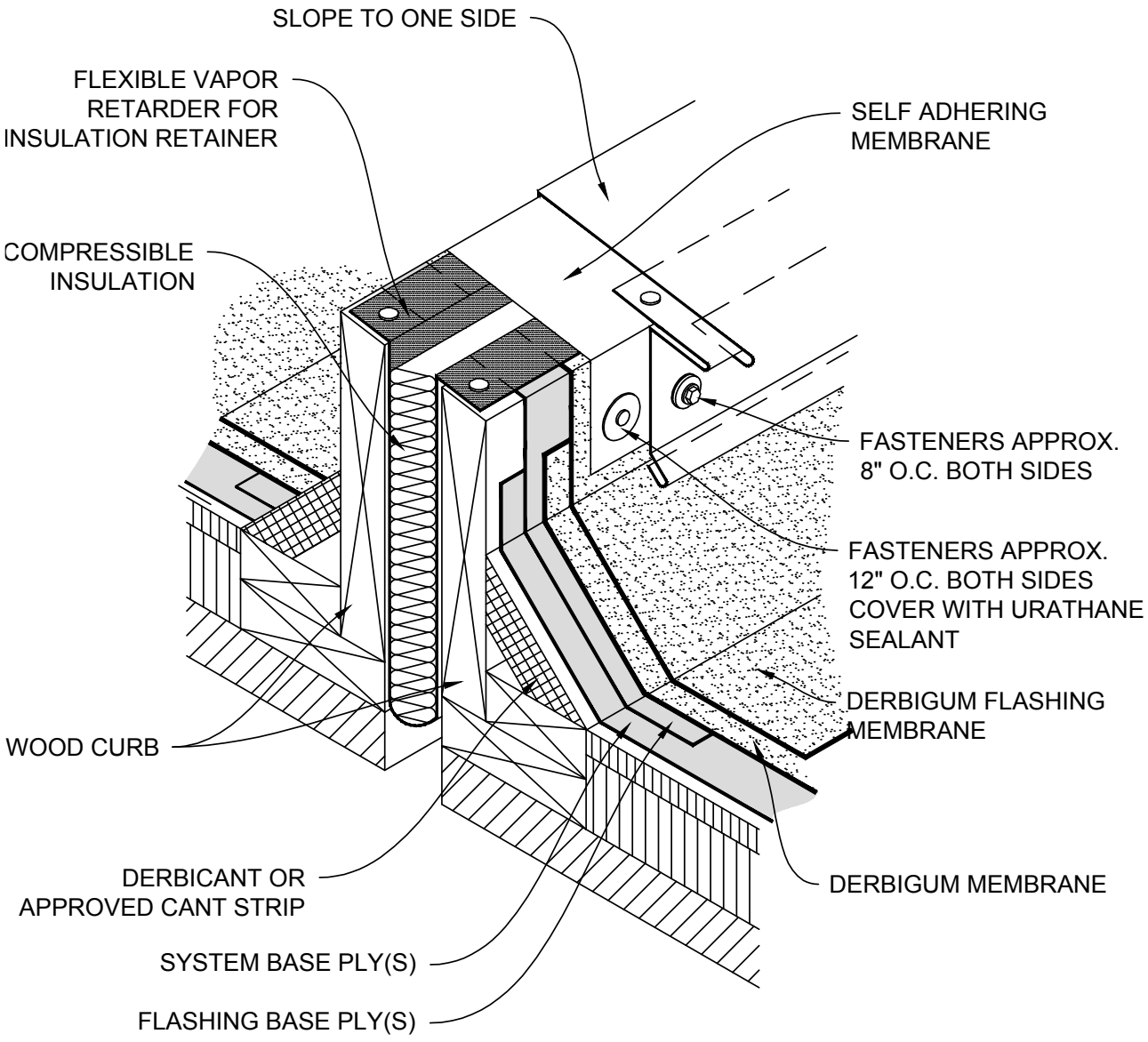
NOTE: This detail should be used with light gauge metals such as 16 oz. copper, 24 gauge galvanized metal or 0.032 aluminum. Frequent nailing is necessary to control thermal movement.

P-7 GRAVEL STOP EDGE (STRIPPING ON TOP)



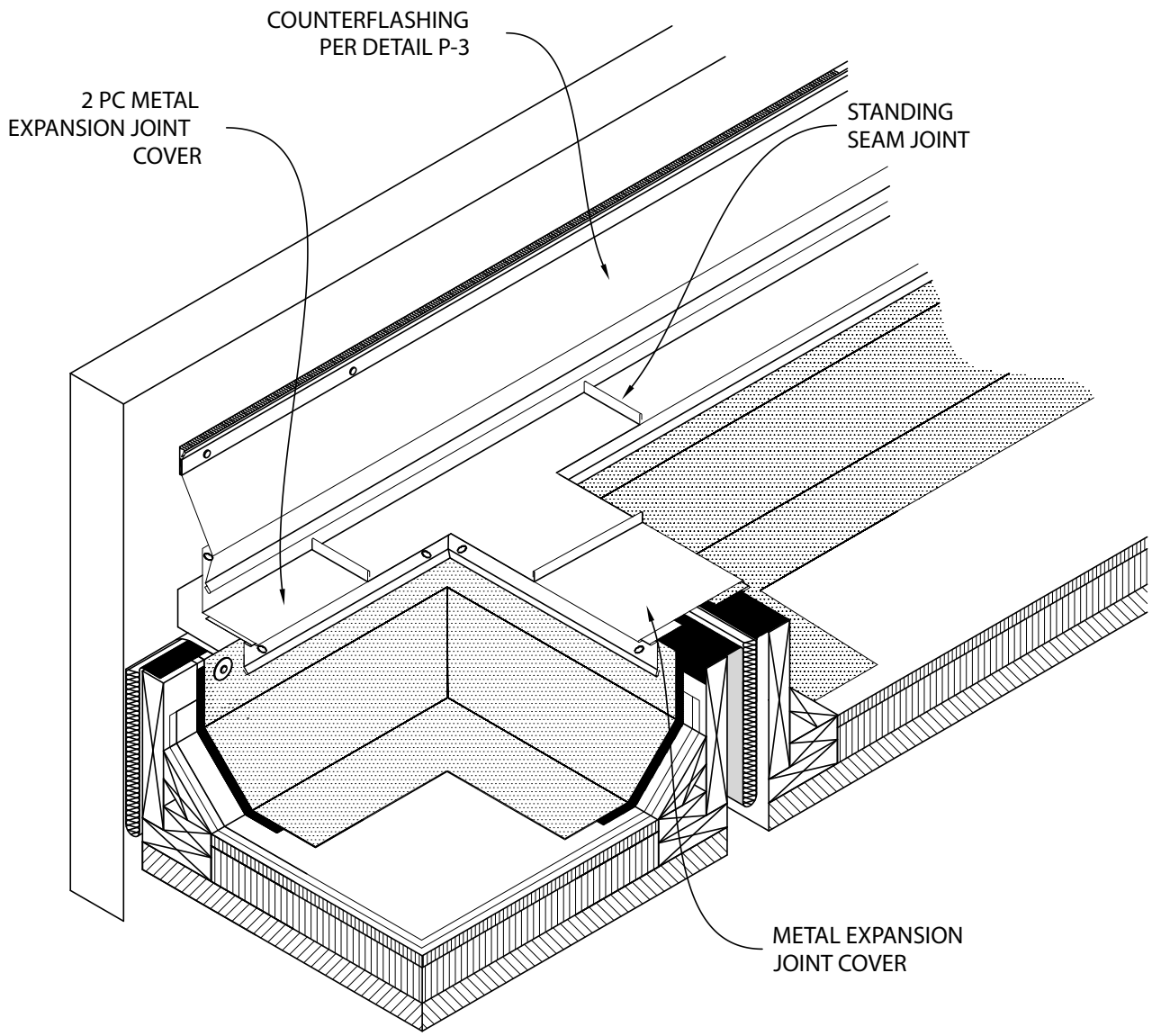
NOTE: This detail should be used with light gauge metals such as 16 oz. copper, 24 gauge galvanized metal or 0.032 aluminum. Frequent nailing is necessary to control thermal movement.

P-8 CURB EXPANSION JOINT

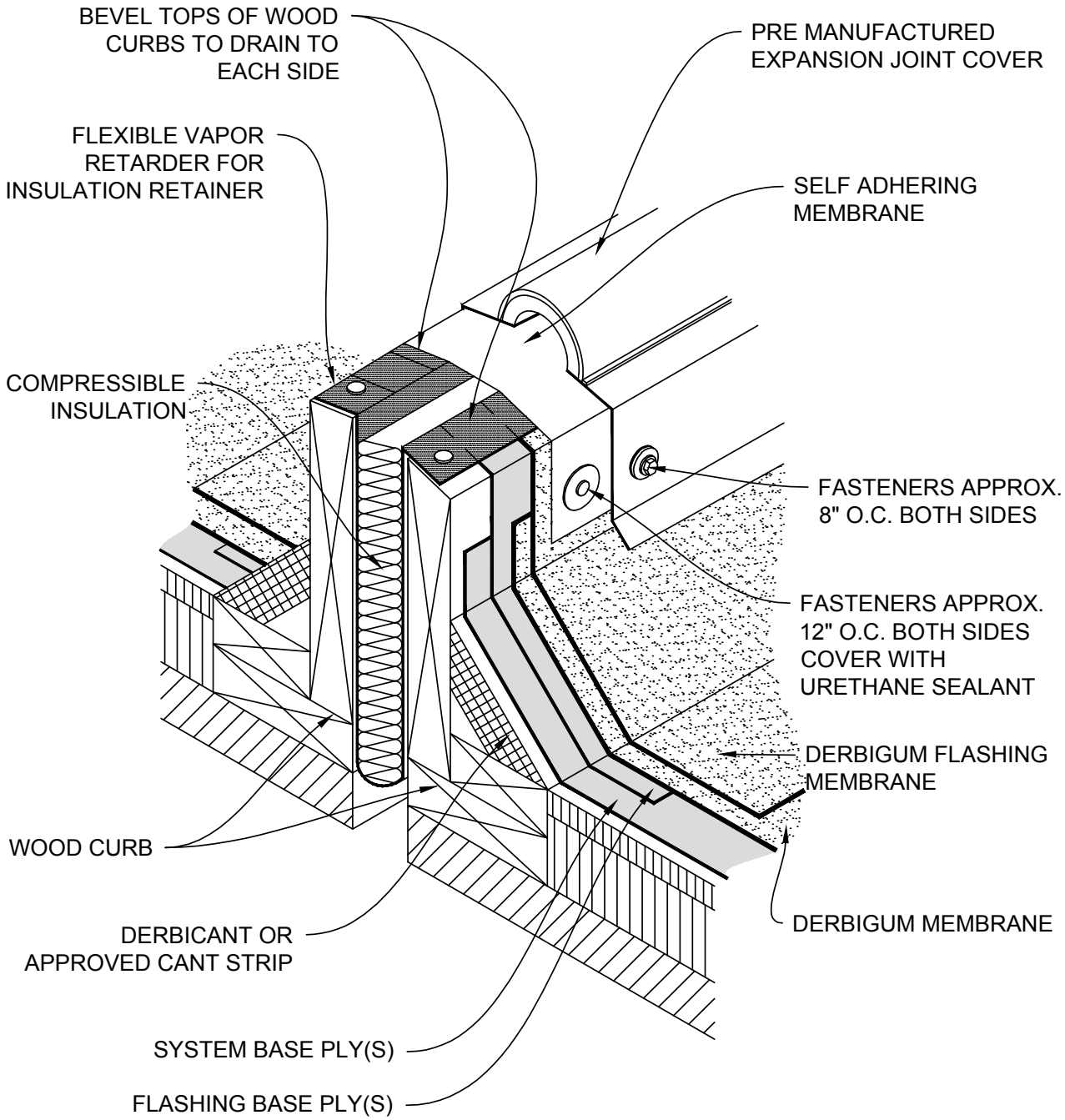


NOTE: This detail allows for building movement in both directions.

P-8B EXPANSION JOINT INTERSECTION

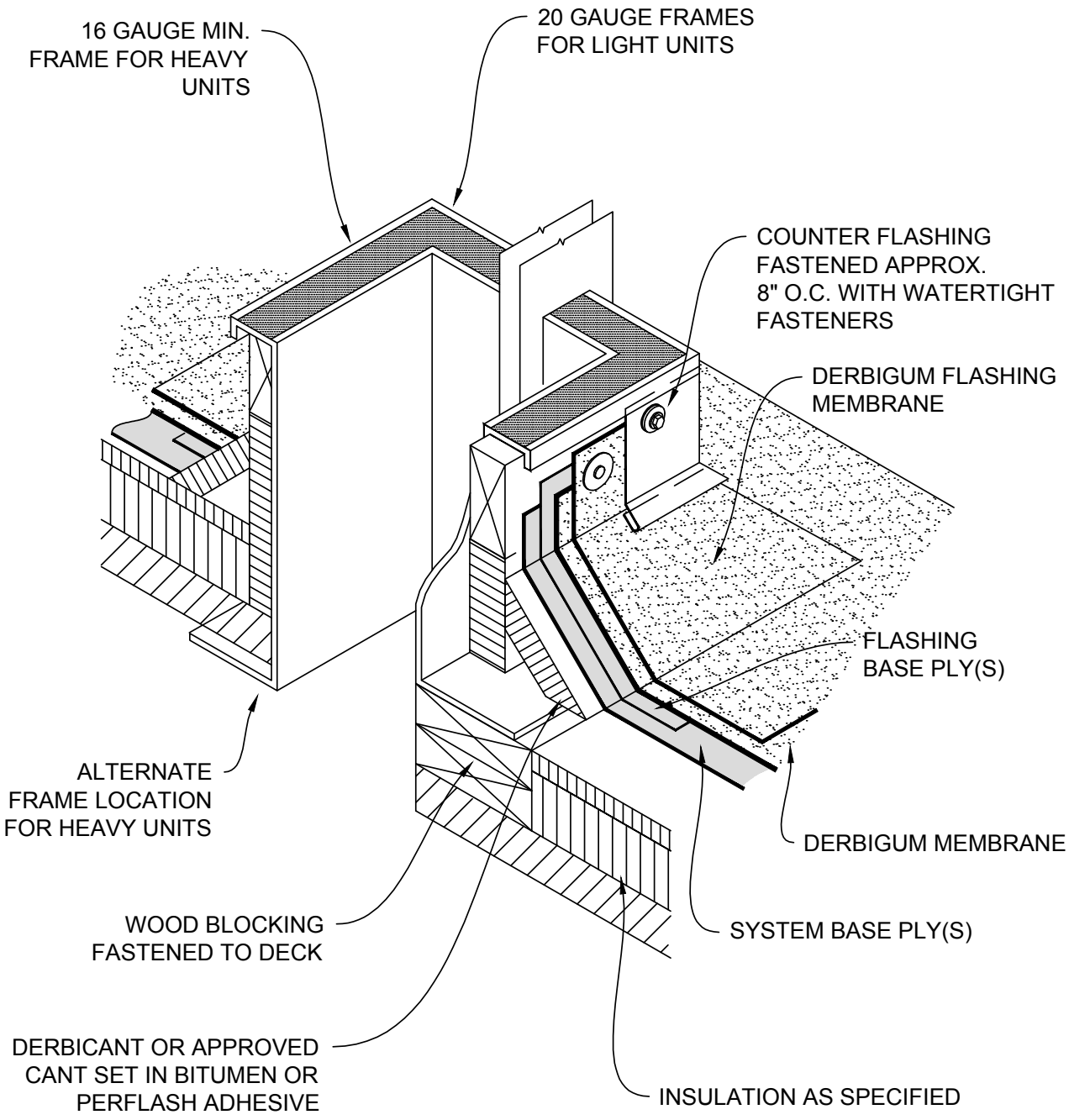


P-9 CURB EXPANSION JOINT

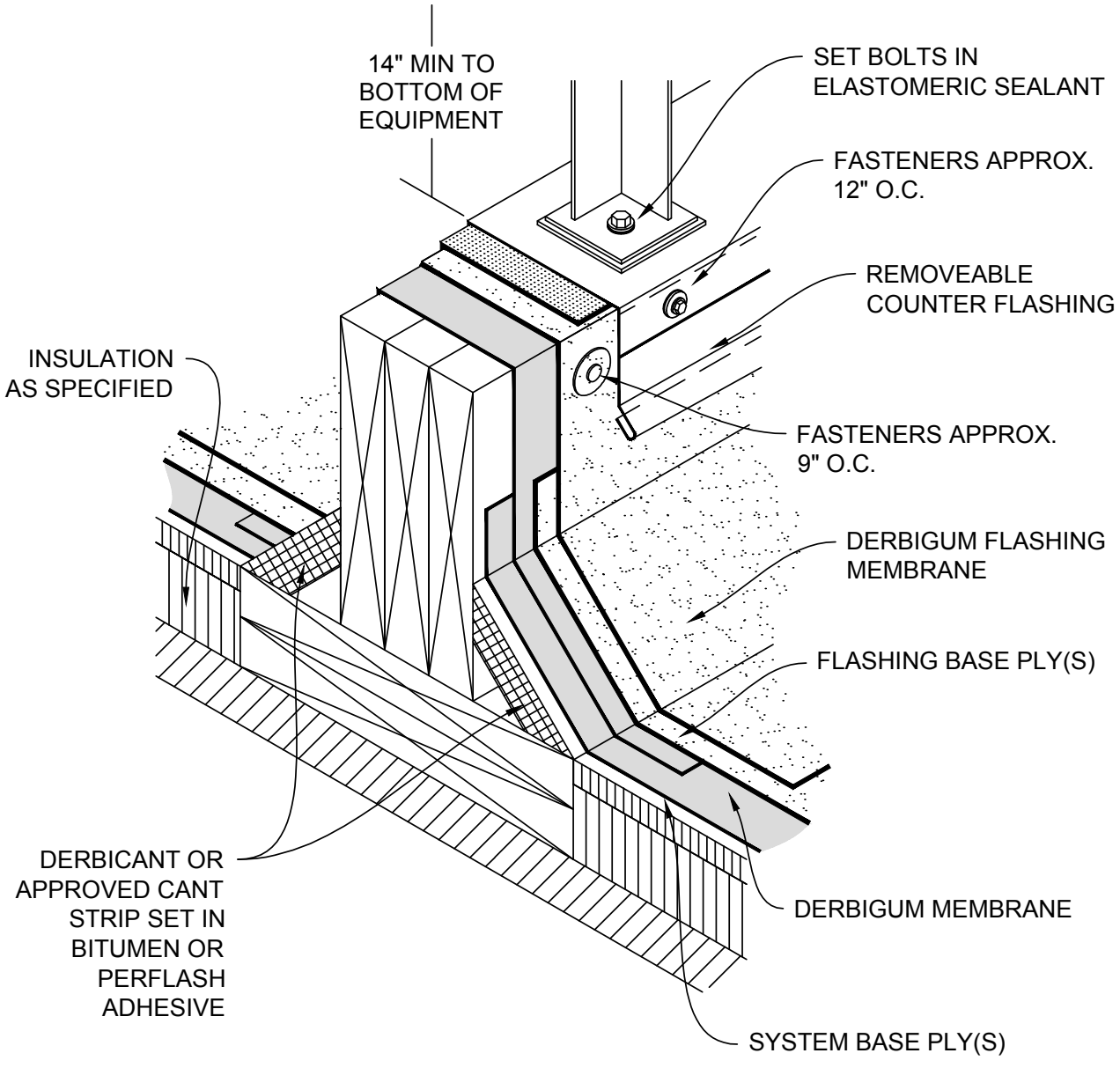


NOTE: This detail allows for building movement in both directions.

P-10 PENETRATION CURB

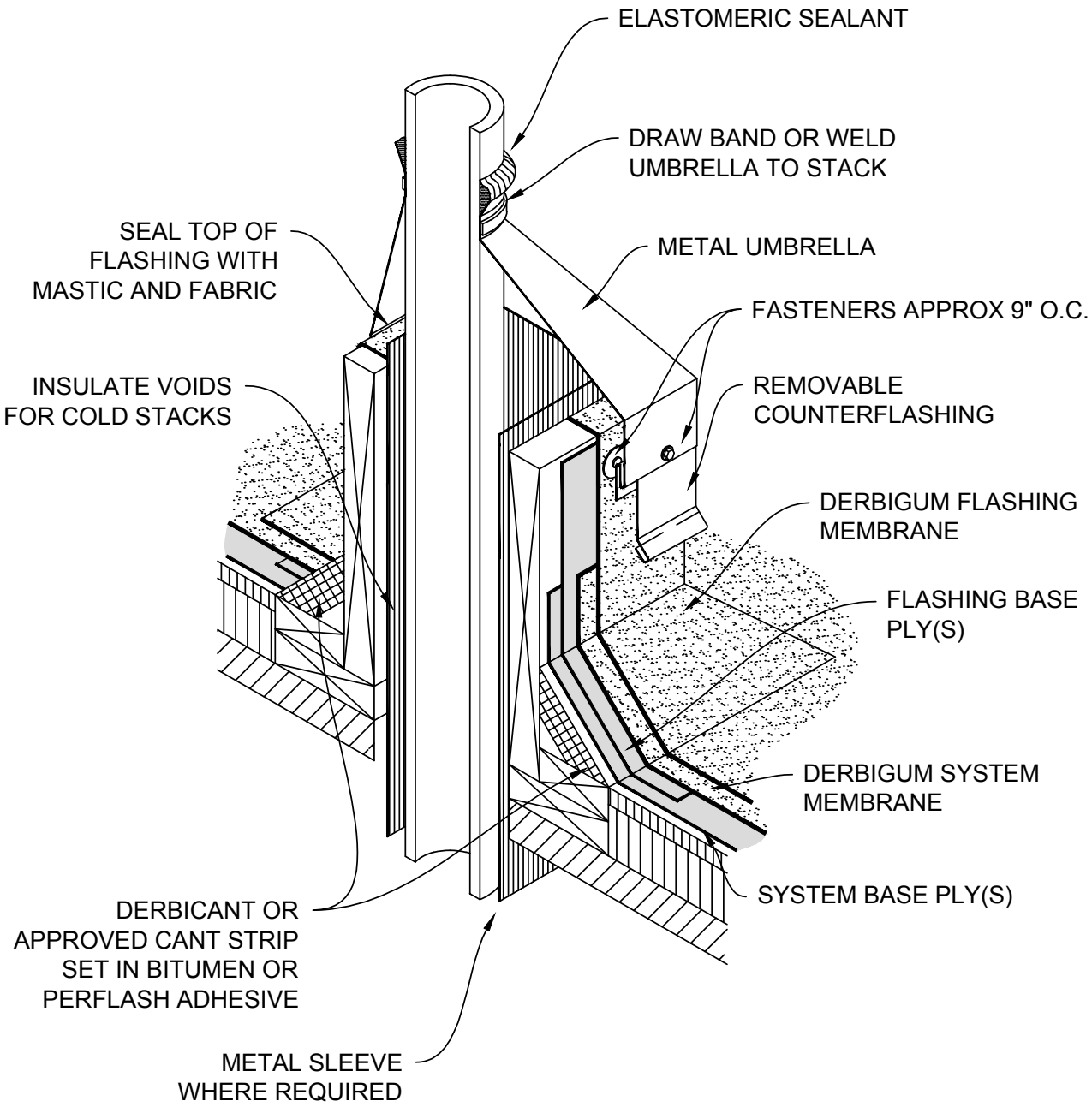


P-11 FLASHED CURB MOUNT

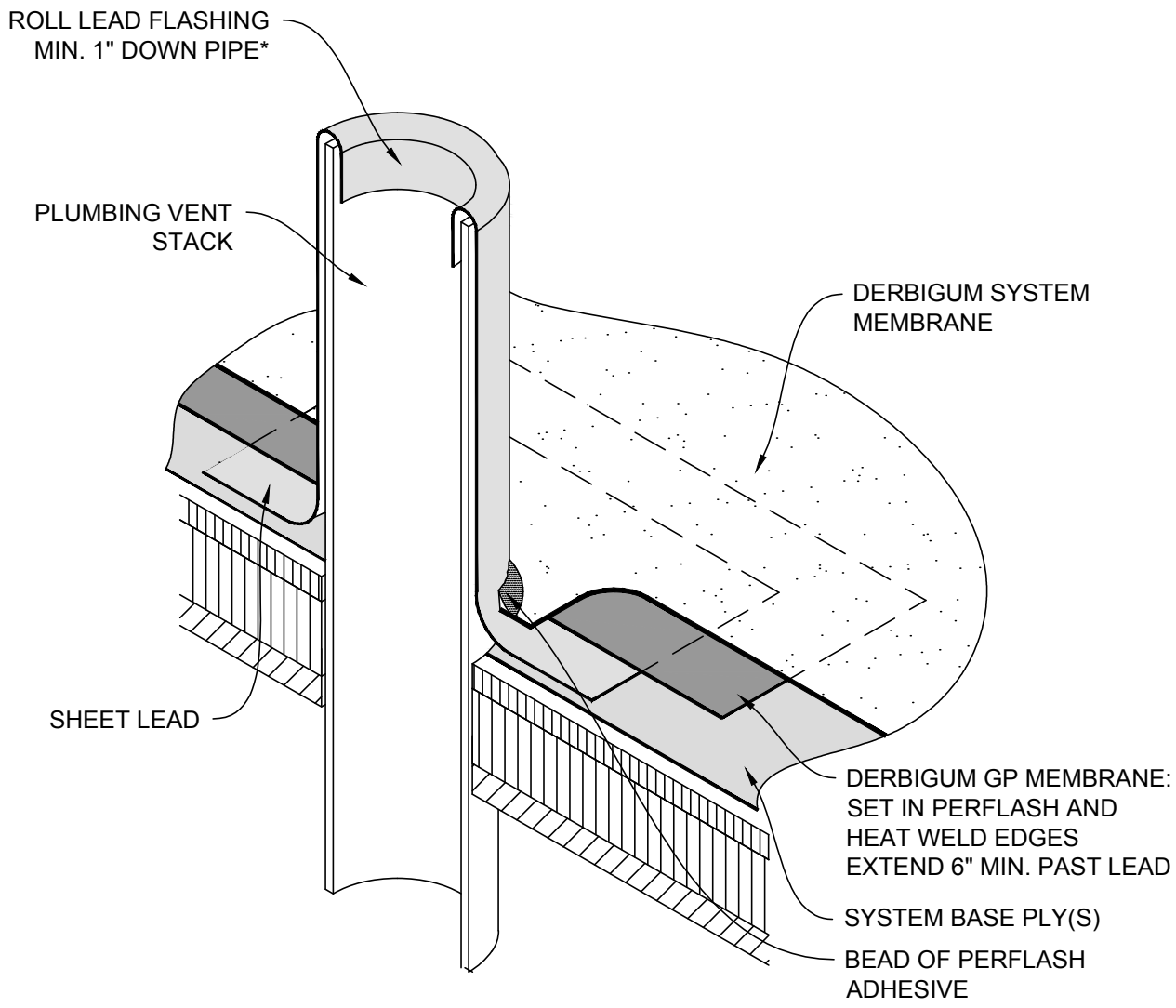


NOTE: This detail allows for roof maintenance around the equipment. The continuous support is preferred in lightweight roof systems because the equipment weight can be spread over more supporting members. Clearance must be provided for removal of roofing and flashing between parallel supports.

P-12 CHIMNEY PENETRATION

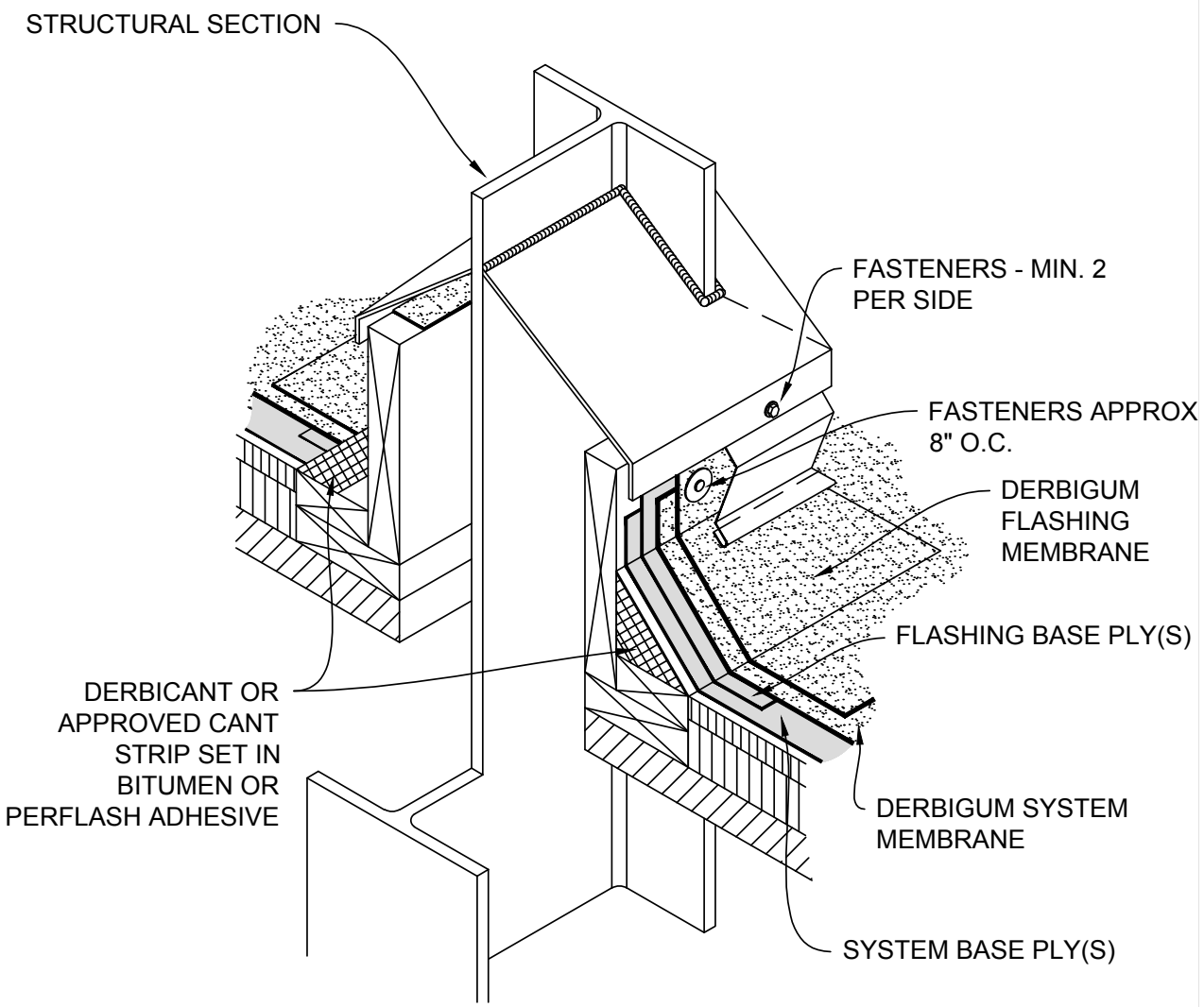


P-13 VENT STACK



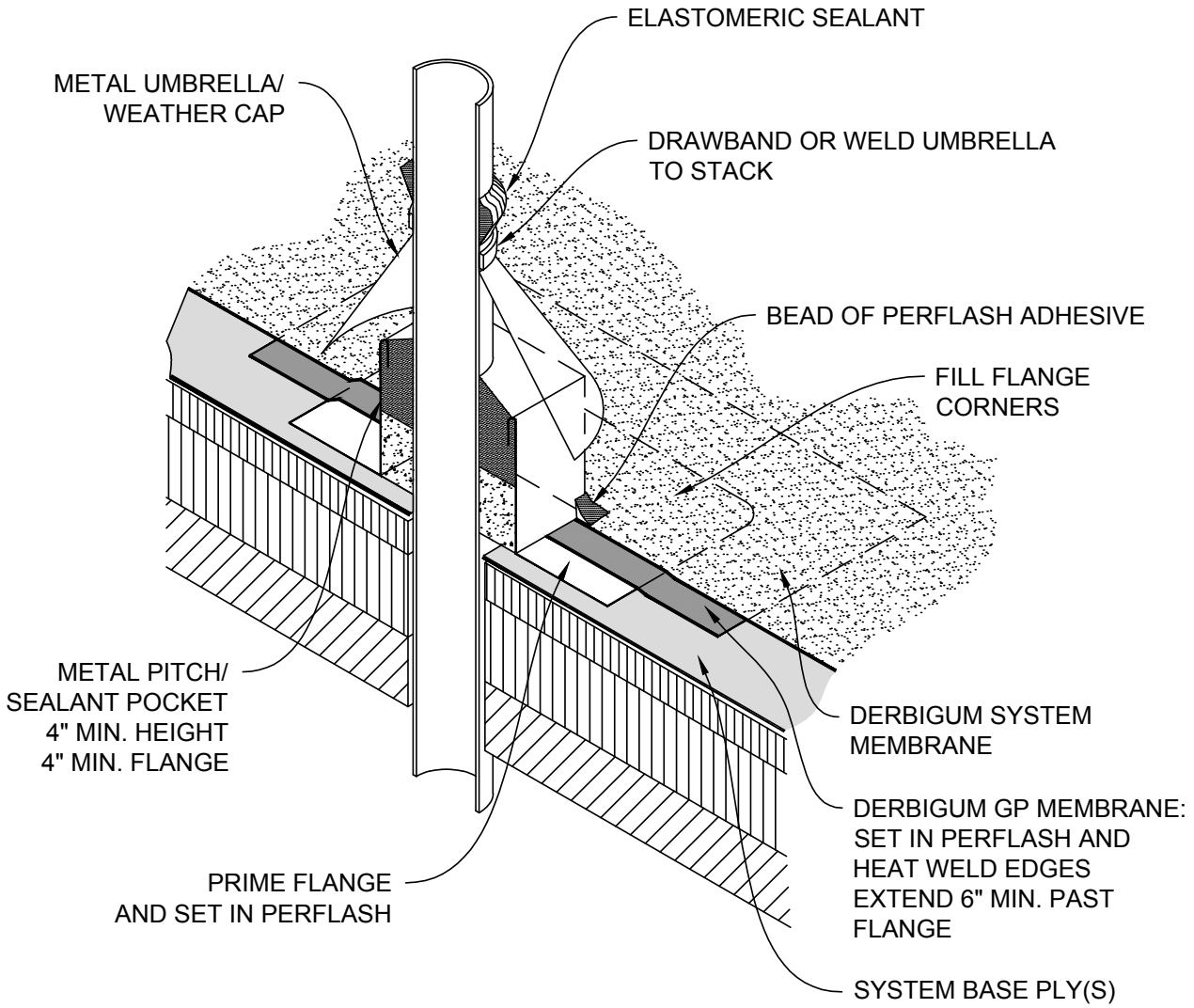
NOTE: Sheet lead minimum of 2 ½ pounds per square foot.
* Base flange of lead to be set in a full bed of Perflash over field membrane with top flange wire brushed and primed.

P-14 COLUMN PENETRATION



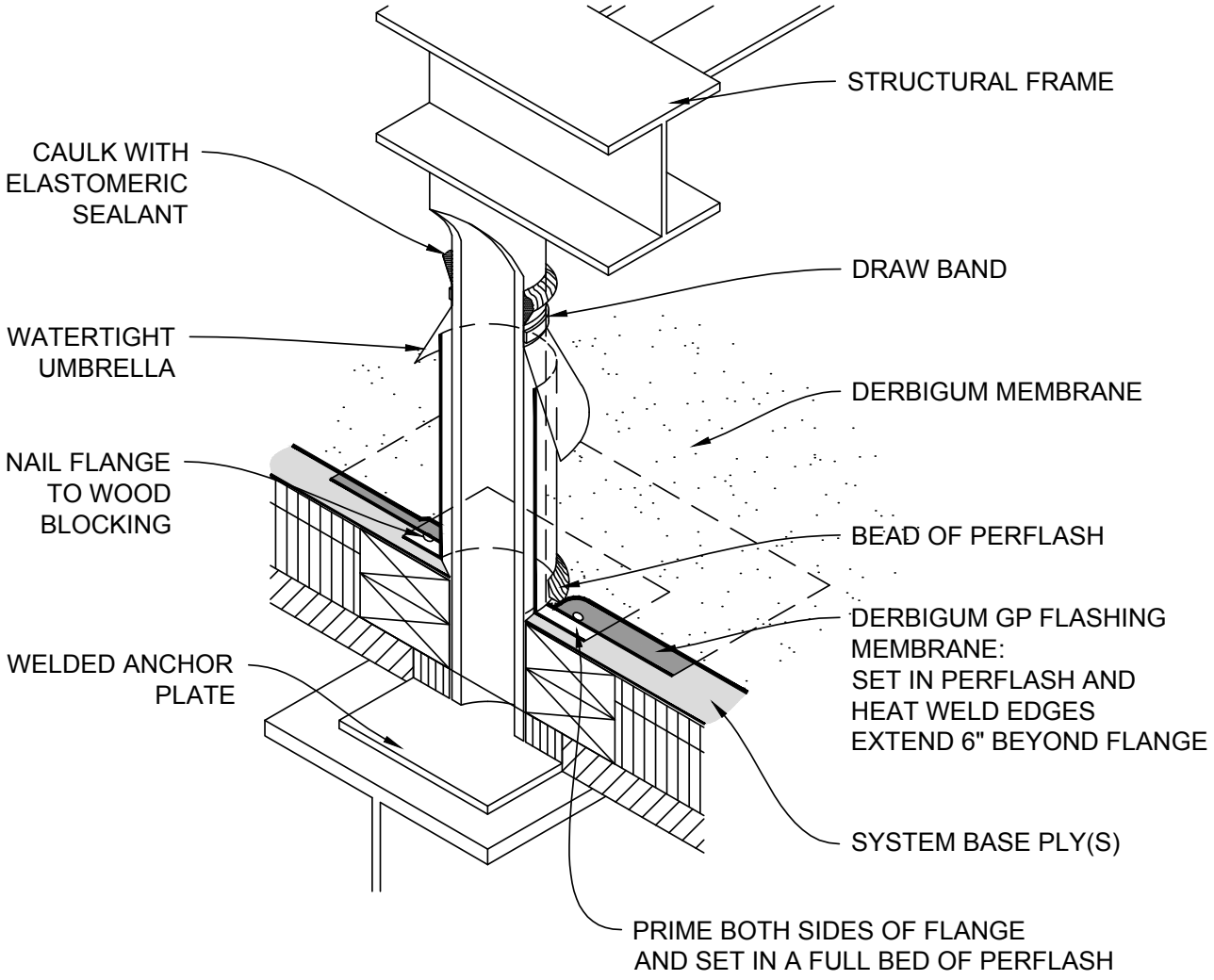
NOTE: This detail illustrates on method to eliminate pitch pockets. The curb system allows for movement in the structural member without disturbing the roofing system.

P-15 PITCH/SEALANT PAN

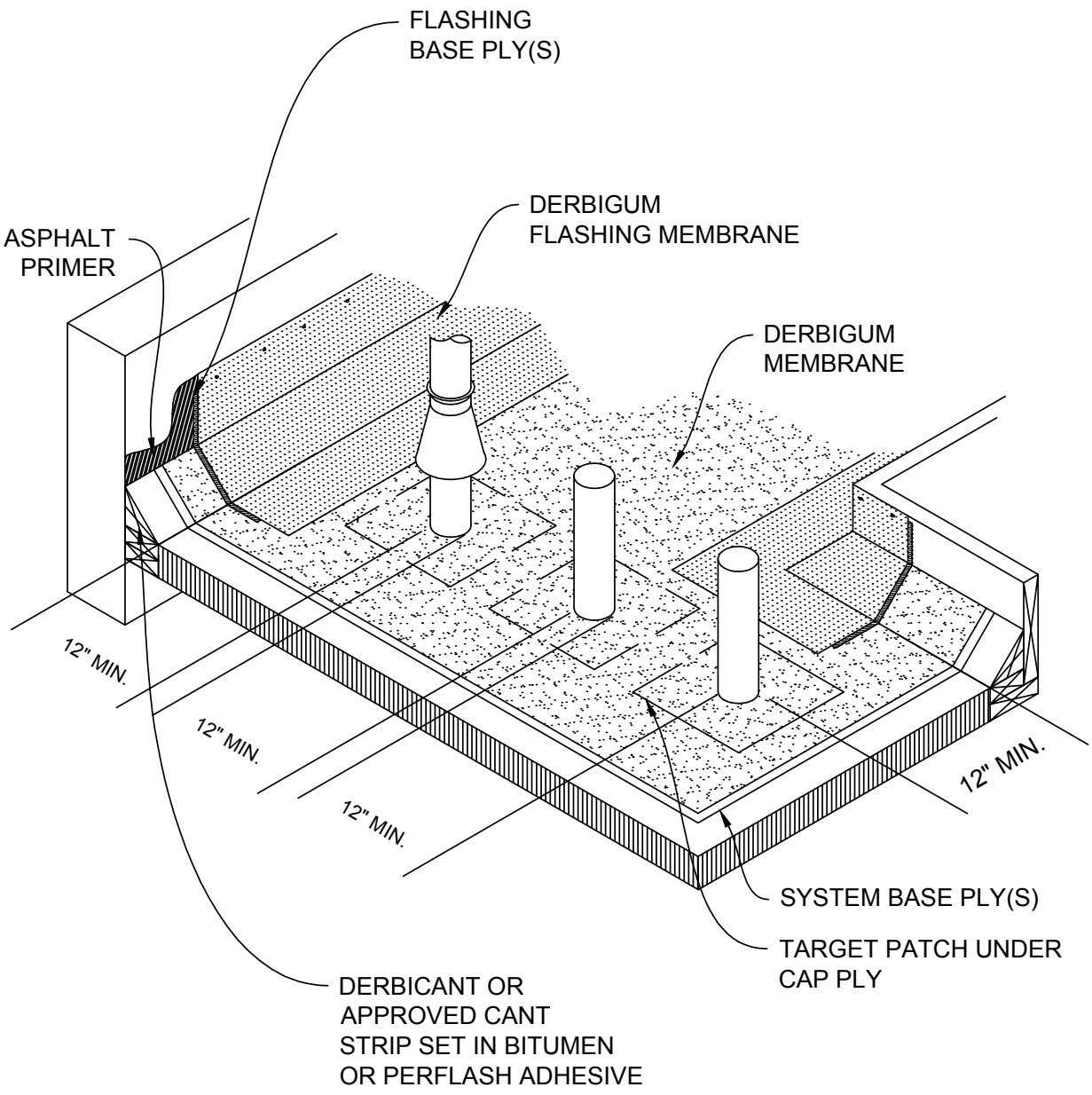


NOTE: Fill pitch/sealant pocket to point of overflow with Perflash, mastic or approved pourable sealer.

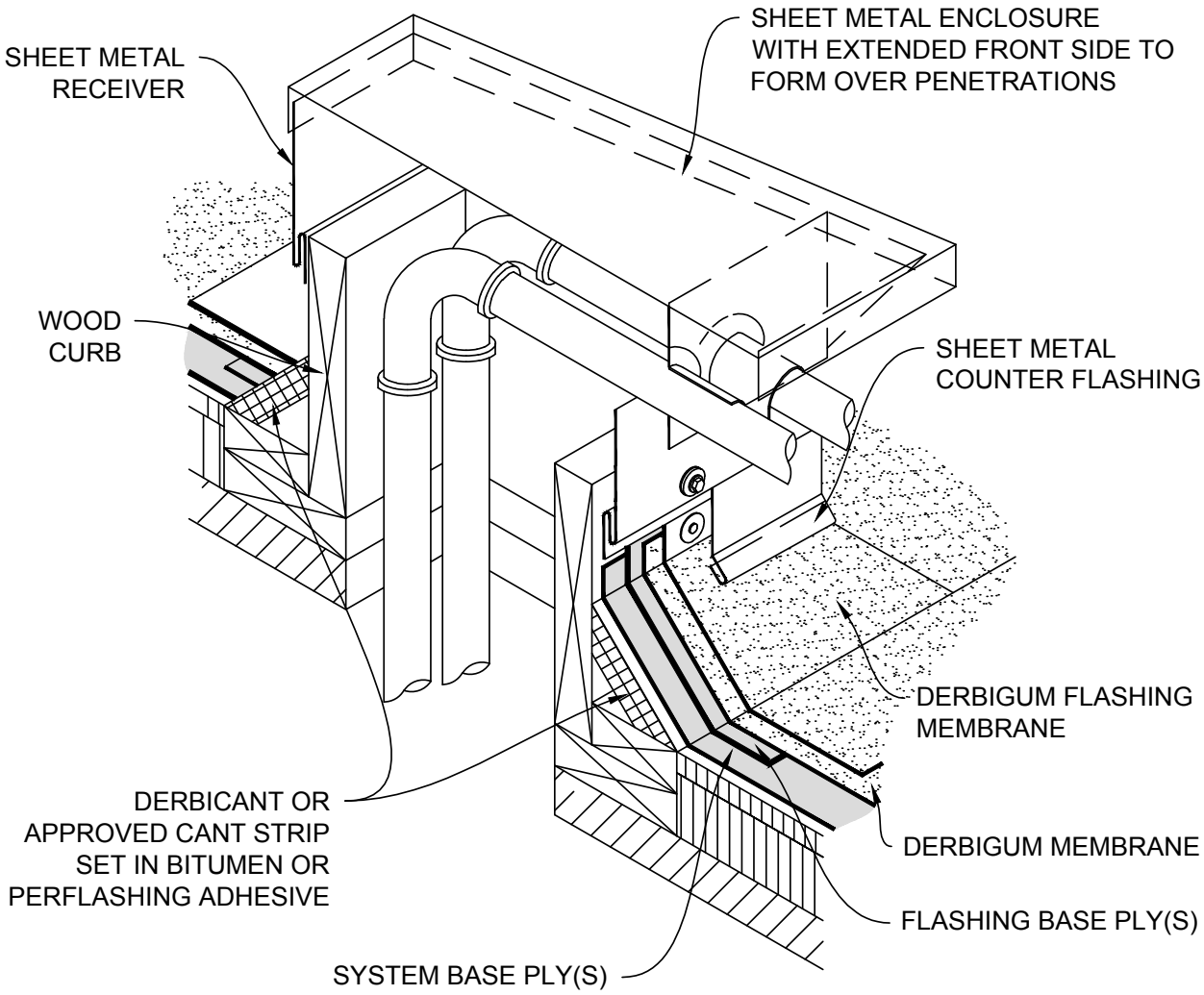
P-16 FRAME - TYPE EQUIPMENT MOUNT



P-17 PENETRATION SPACING MINIMUMS

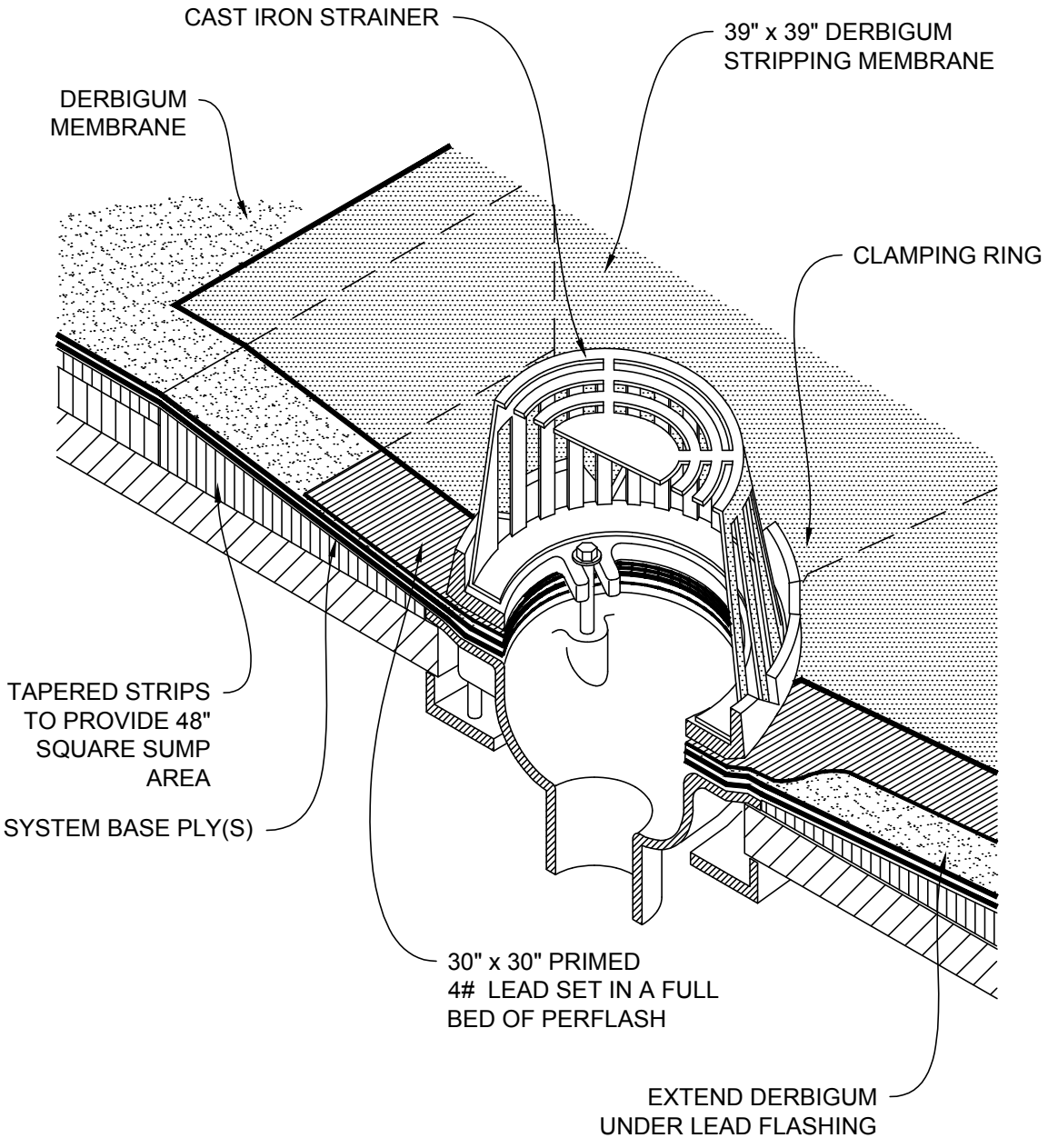


P-18 CONDUIT HOUSING



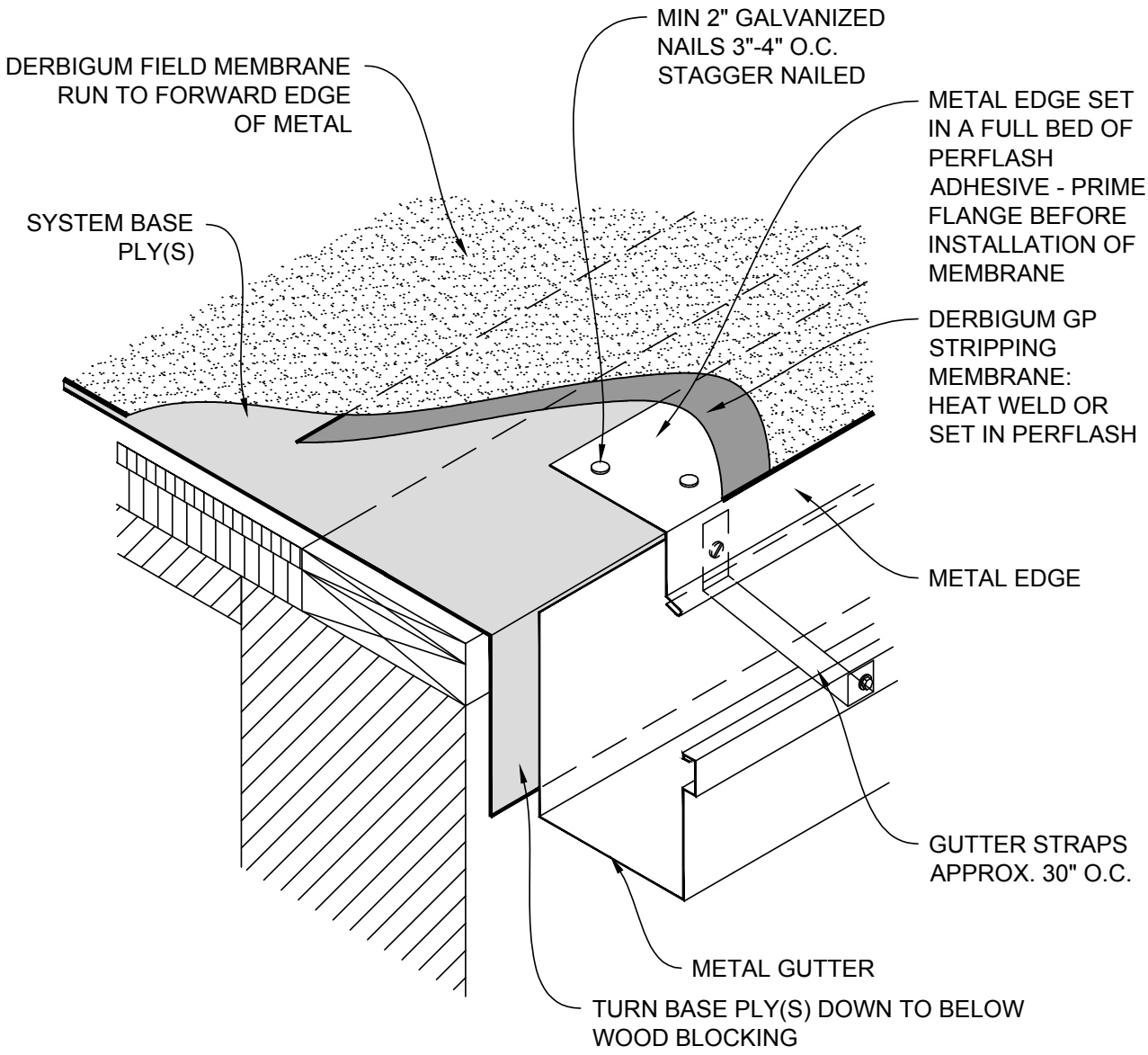
NOTE: This detail can be modified for singular or multiple penetrations. Closure must be fabricated with one side open to fit around penetrations which cannot be interrupted. "Open" side shall be sealed by soldering in place.

P-19 INTERIOR DRAIN



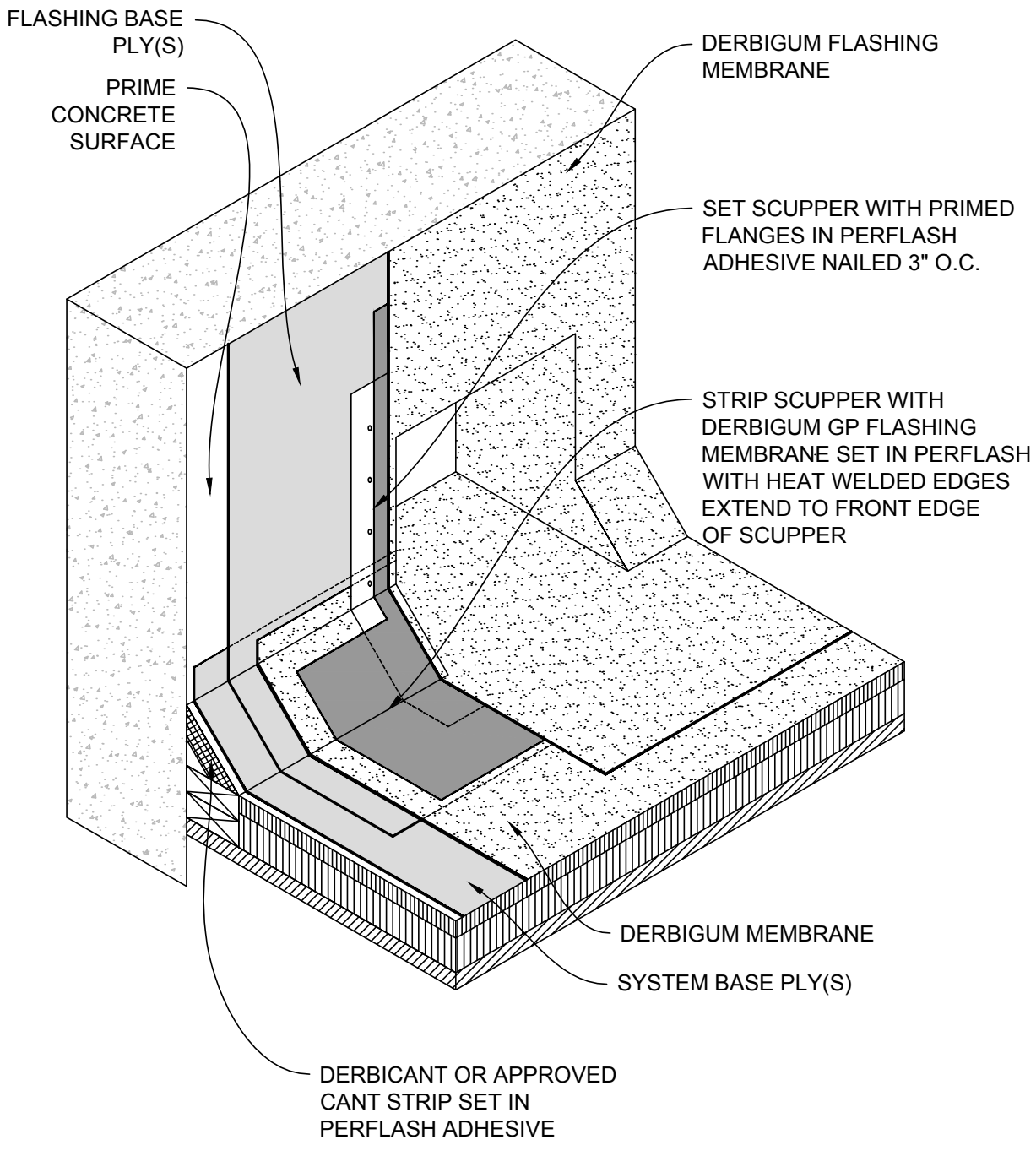
NOTE: Derbibrite is not an approved stripping membrane, please use an alternative Derbigum membrane.

P-20 TWO - PIECE GUTTER

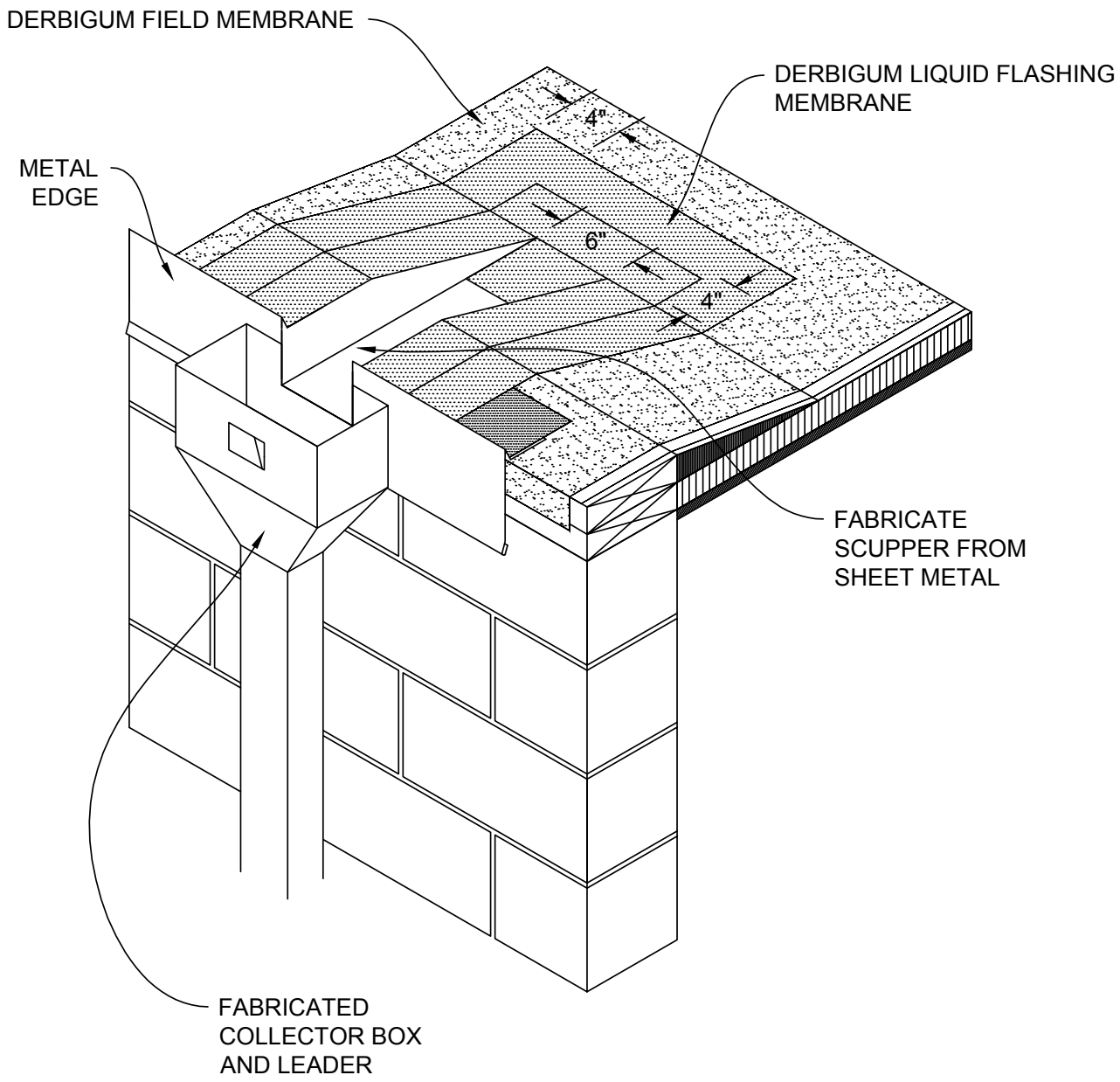


NOTE: This detail should be used where the deck is supported by the outside wall. It is used to relieve standing water along the roof edge. All roof surfaces should be sloped to drain.

P-21 THUR WALL SCUPPER



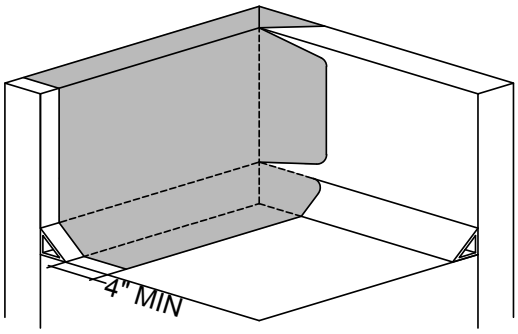
P-22 OPEN SCUPPER

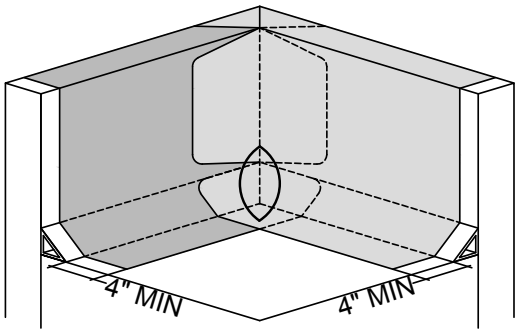


NOTE: Trim insulation to provide positive drainage

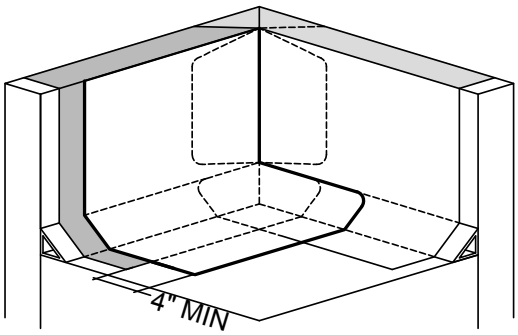
P-30 INSIDE CORNER FLASHING

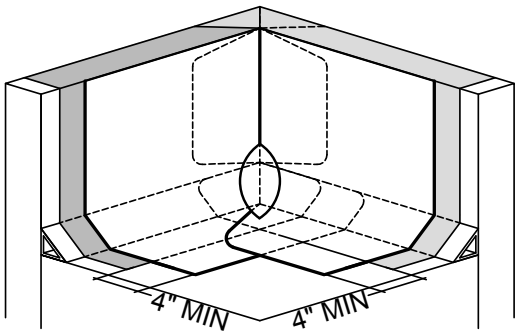
FLASHING BASE PLIES





FLASHING CAP PLIES

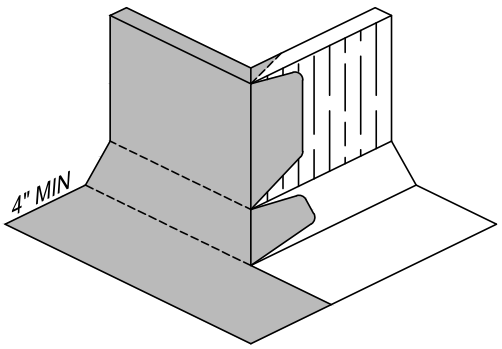


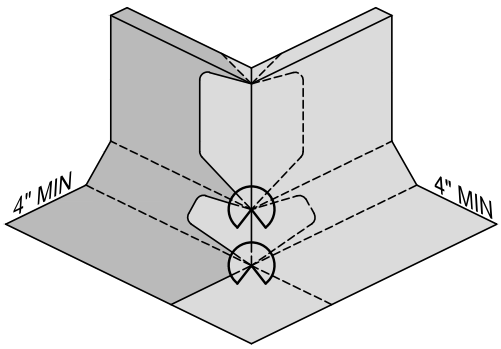


NOTE: Install boots on all cap and base ply base flashing corner as shown

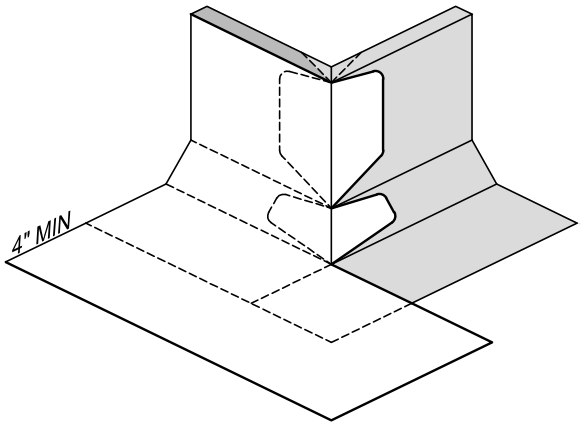
P-31 OUTSIDE CORNER FLASHING

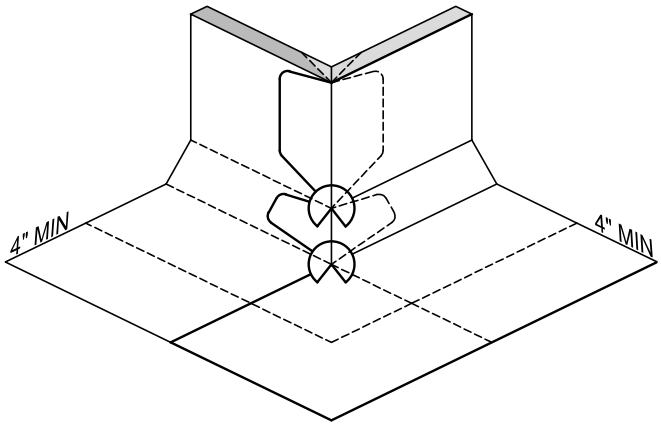
FLASHING BASE PLIES





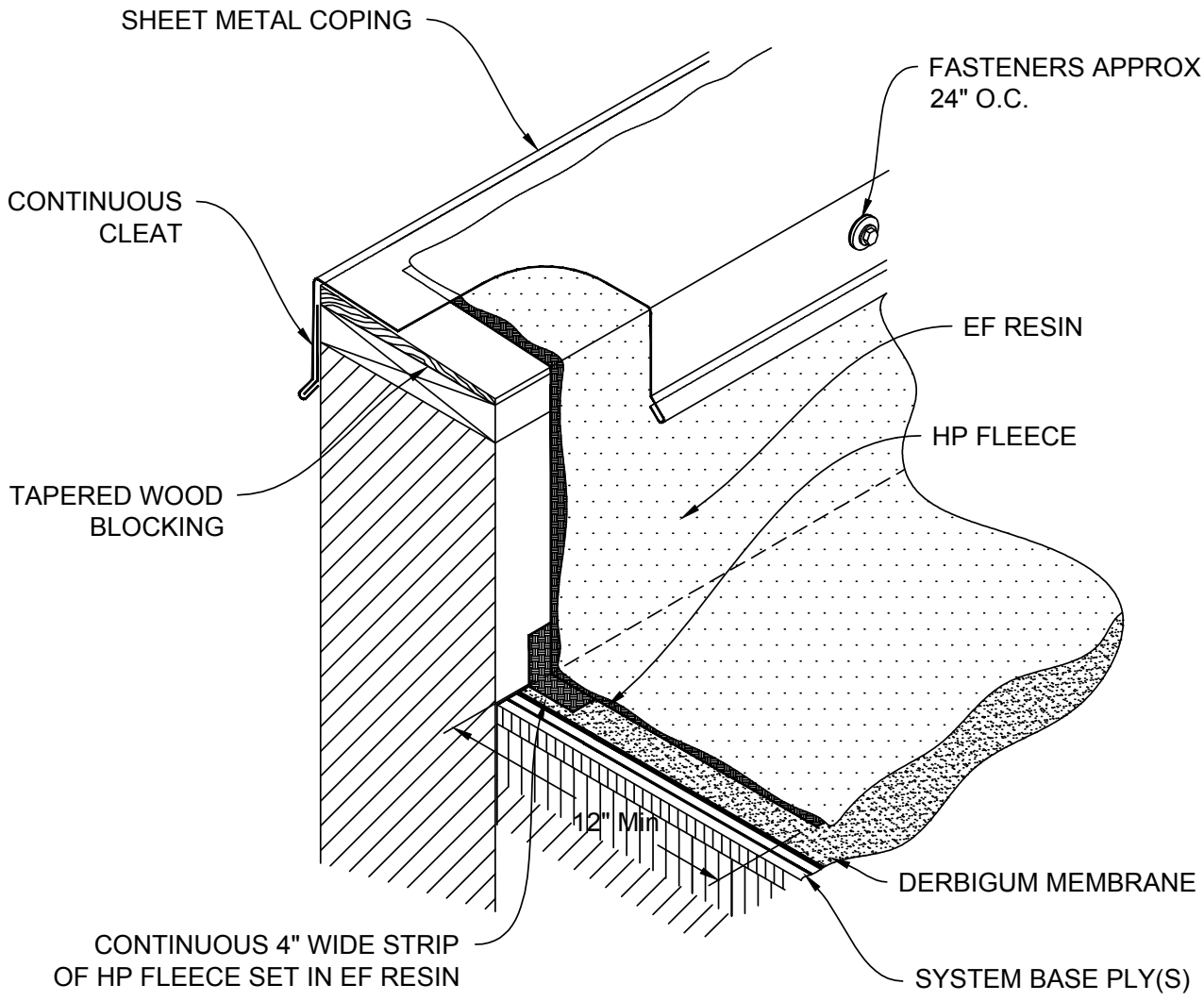
FLASHING CAP PLIES





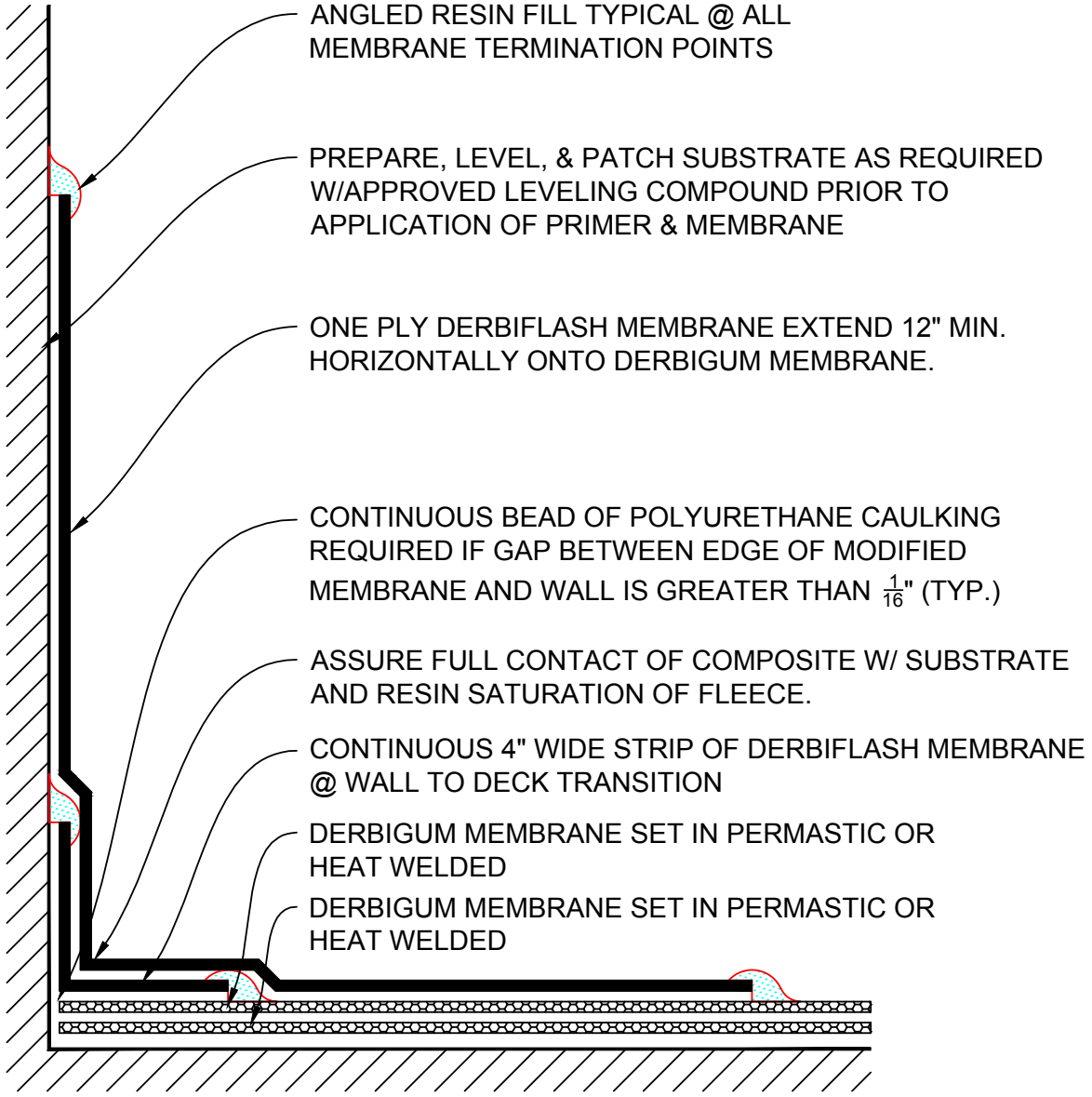
NOTE: Install notched (shown) or bowtie boots on base and cap flashing corners.

P-2L WALL FLASHING WITH COPING

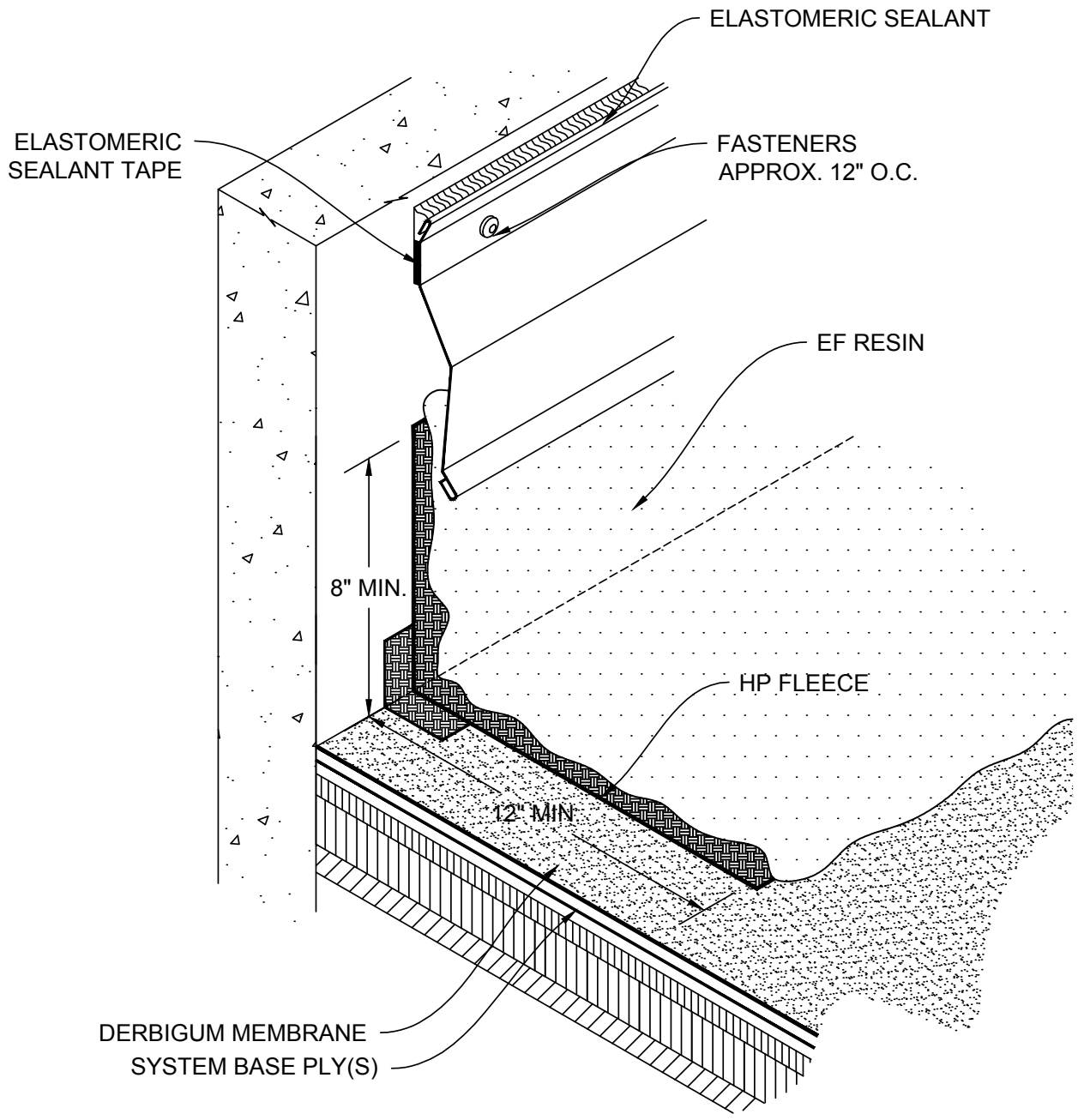


NOTE: This detail should only be used when the deck is supported by the wall.

P-2L1 WALL FLASHING — SELF TERMINATING

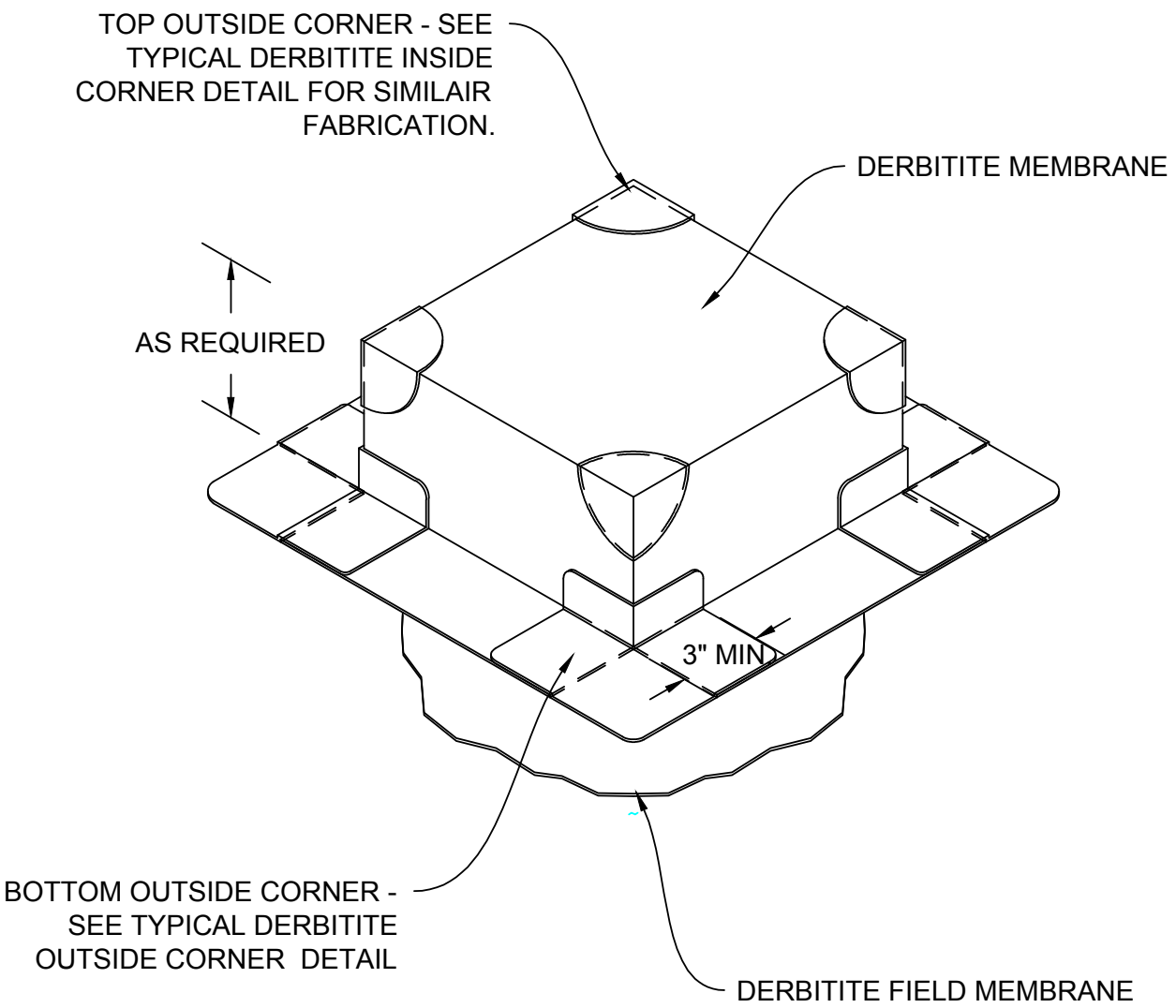


P-3L WALL/SURFACE MOUNTED COUNTERFLASHING

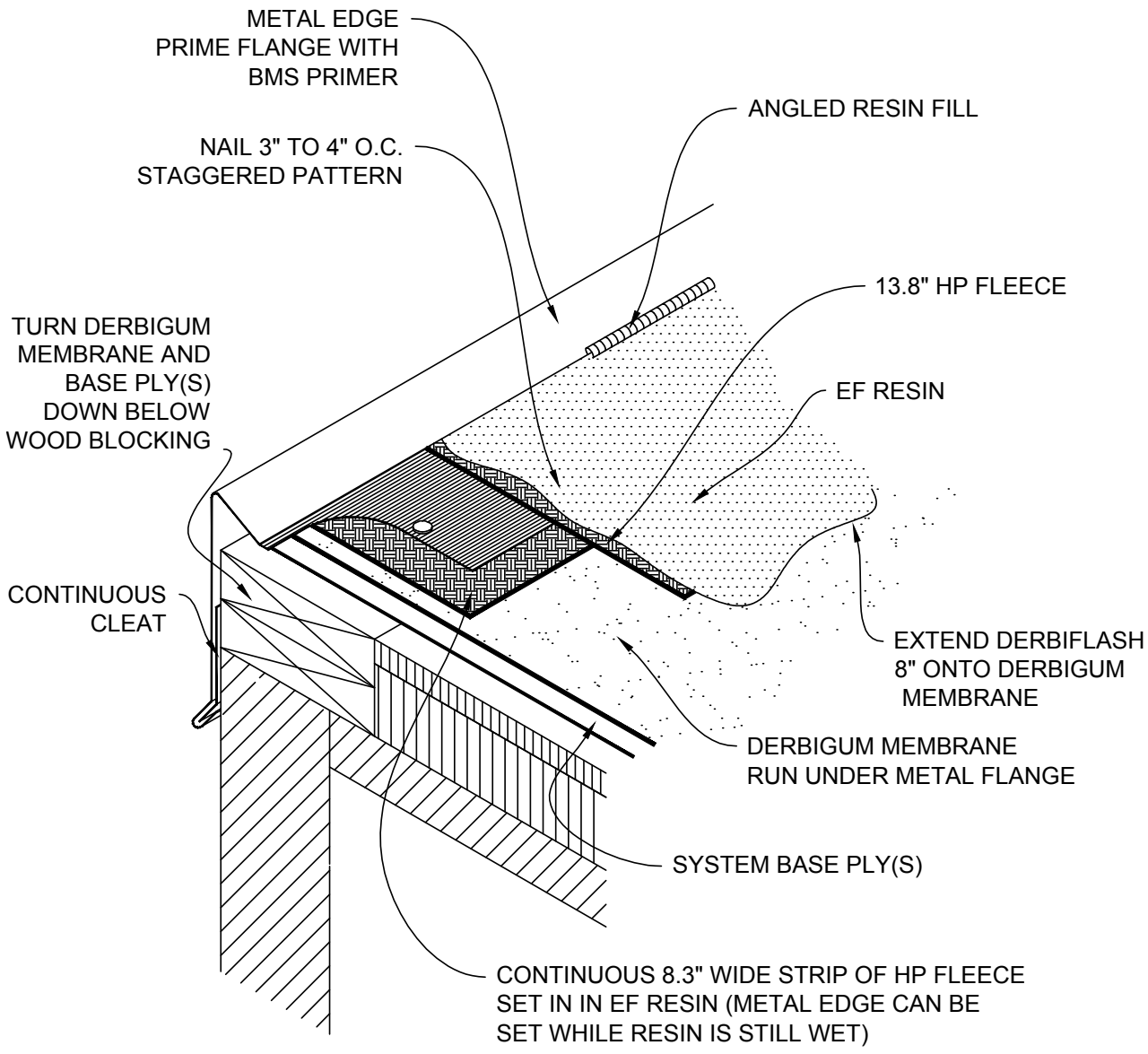


NOTE: Where the deck is supported by and fastened to the concrete deck wall, vertical wood nailers are required and should be secured to the wall with suitable fasteners.

P-5L CURB-PAD ENCAPSULATION FLASHING

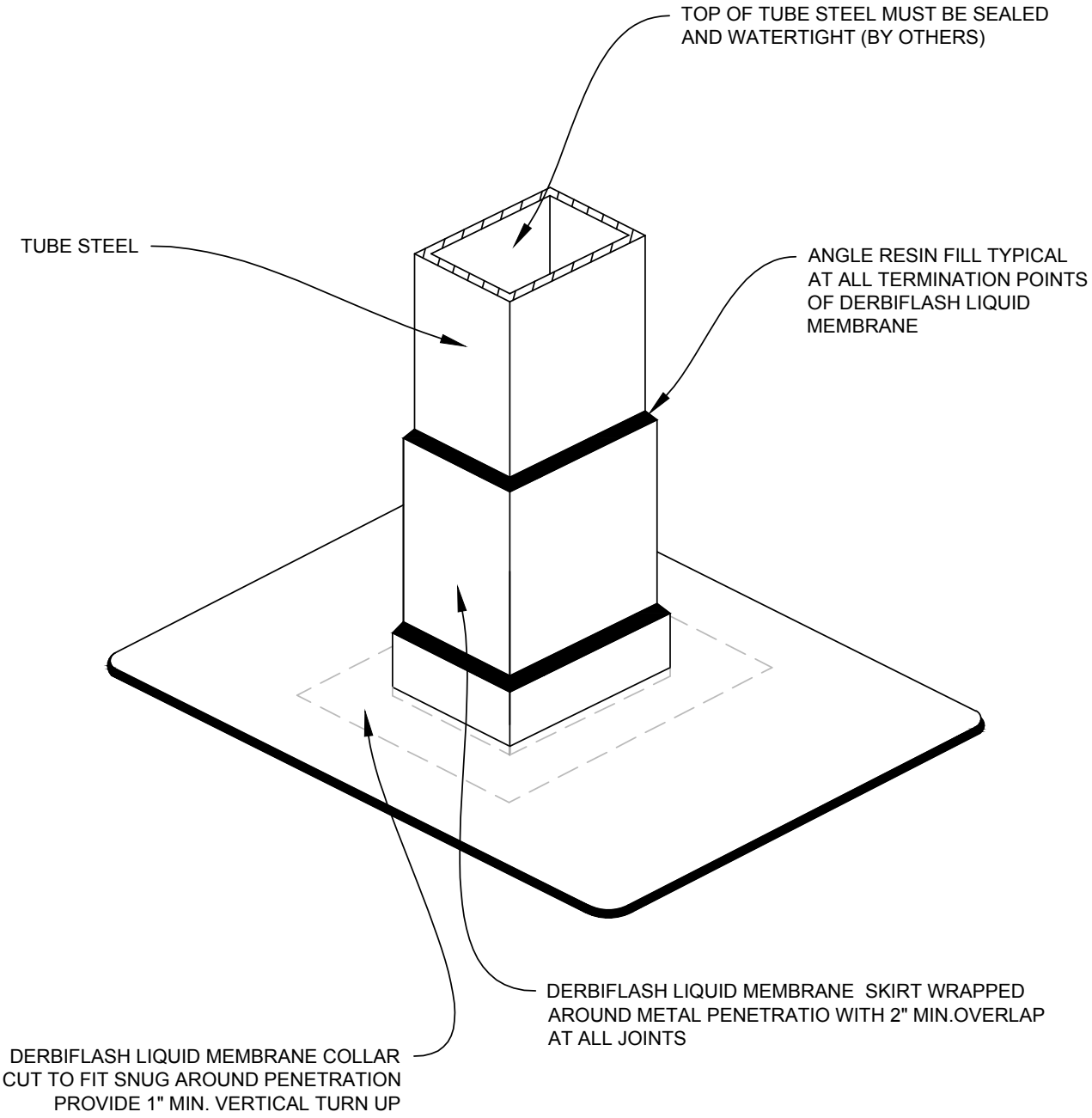


P-7L GRAVEL STOP EDGE

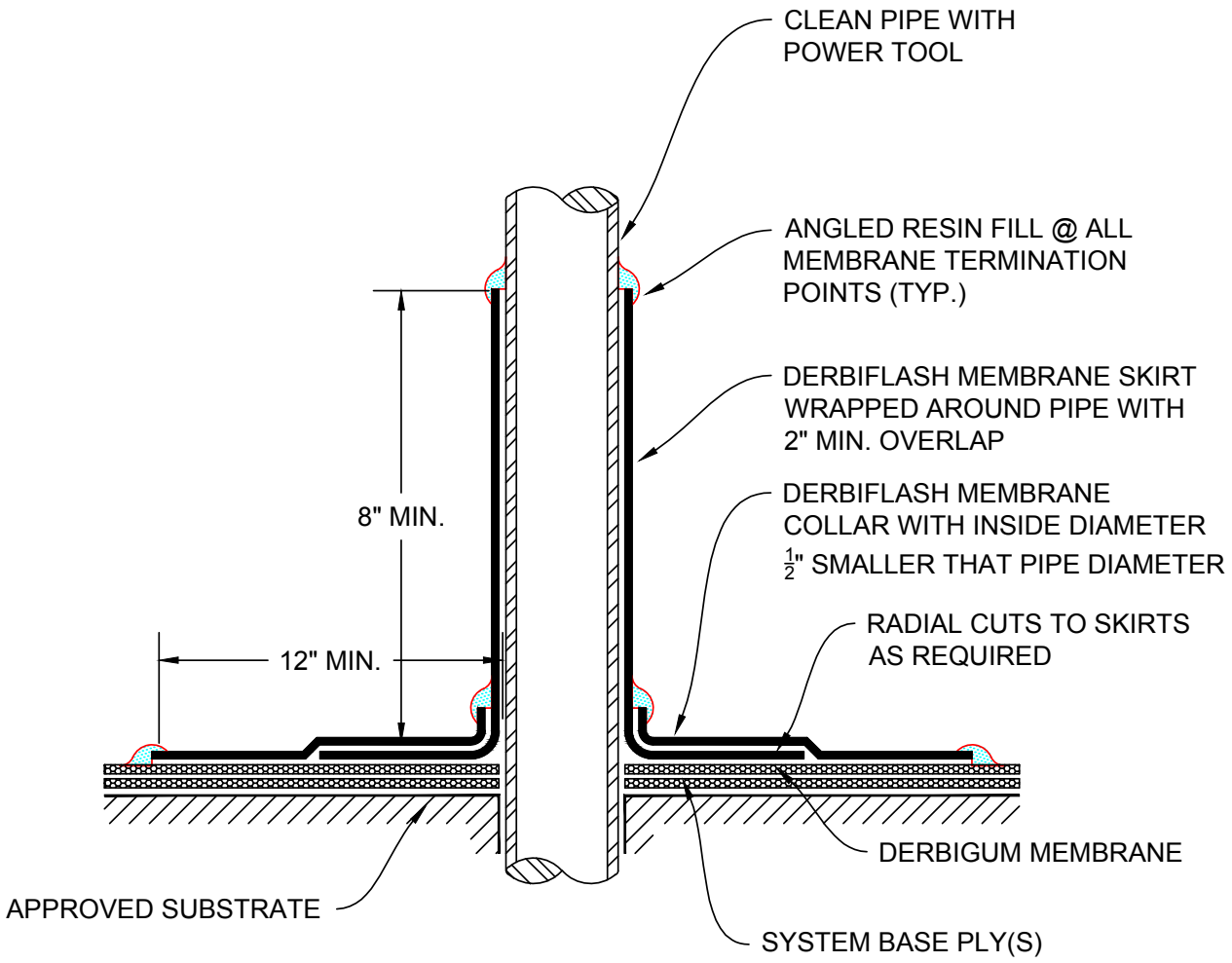


NOTE: This detail should be used with light gauge metals such as 16 oz. copper, 24 gauge galvanized metal or 0.032 aluminum. Frequent nailing is necessary to control thermal movement.

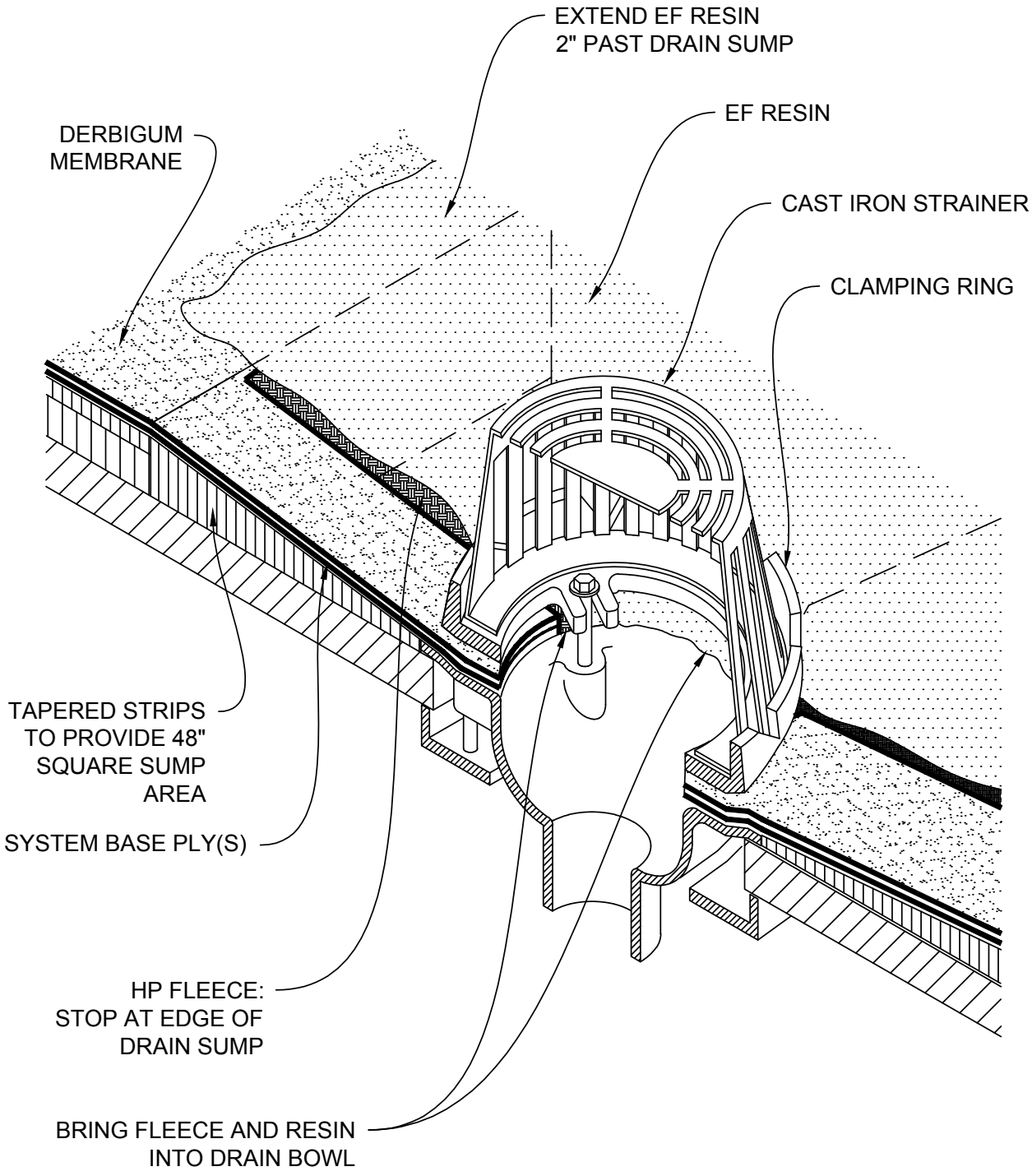
P-10L IRREGULAR PENETRATION TUBE STEEL FLASHING



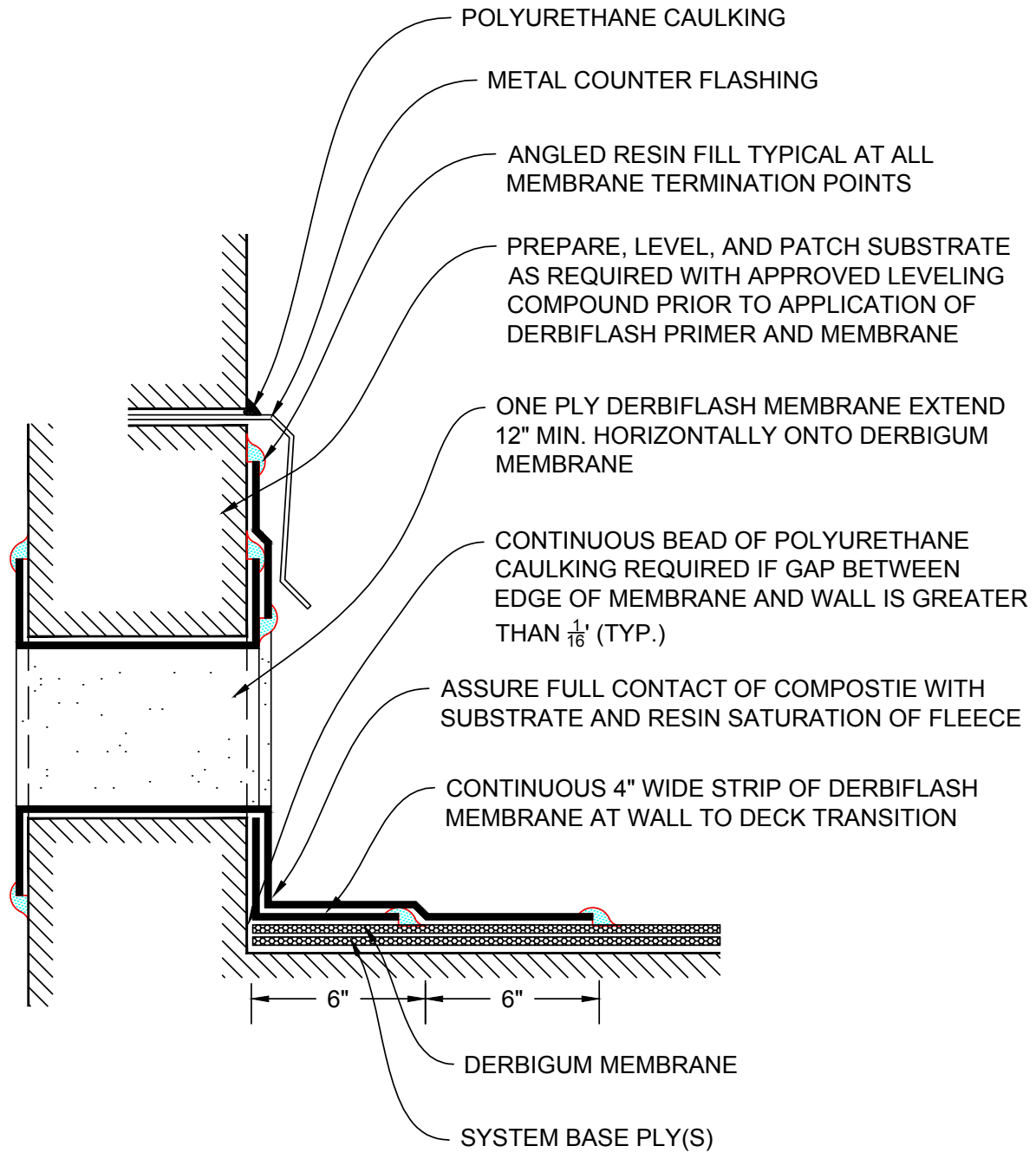
P-15L FIELD FABRICATED PIPE PENETRATION FLASHING



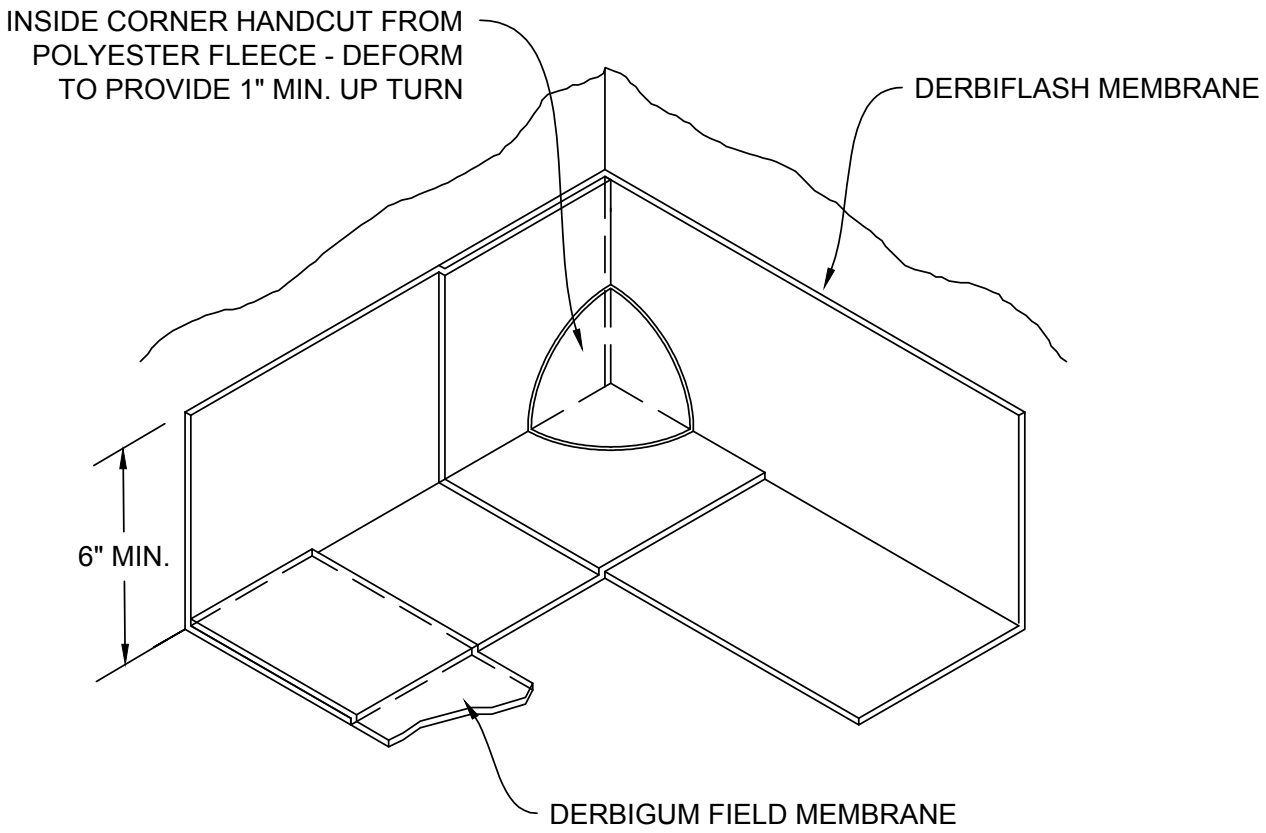
P-19L INTERIOR DRAIN PENETRATION



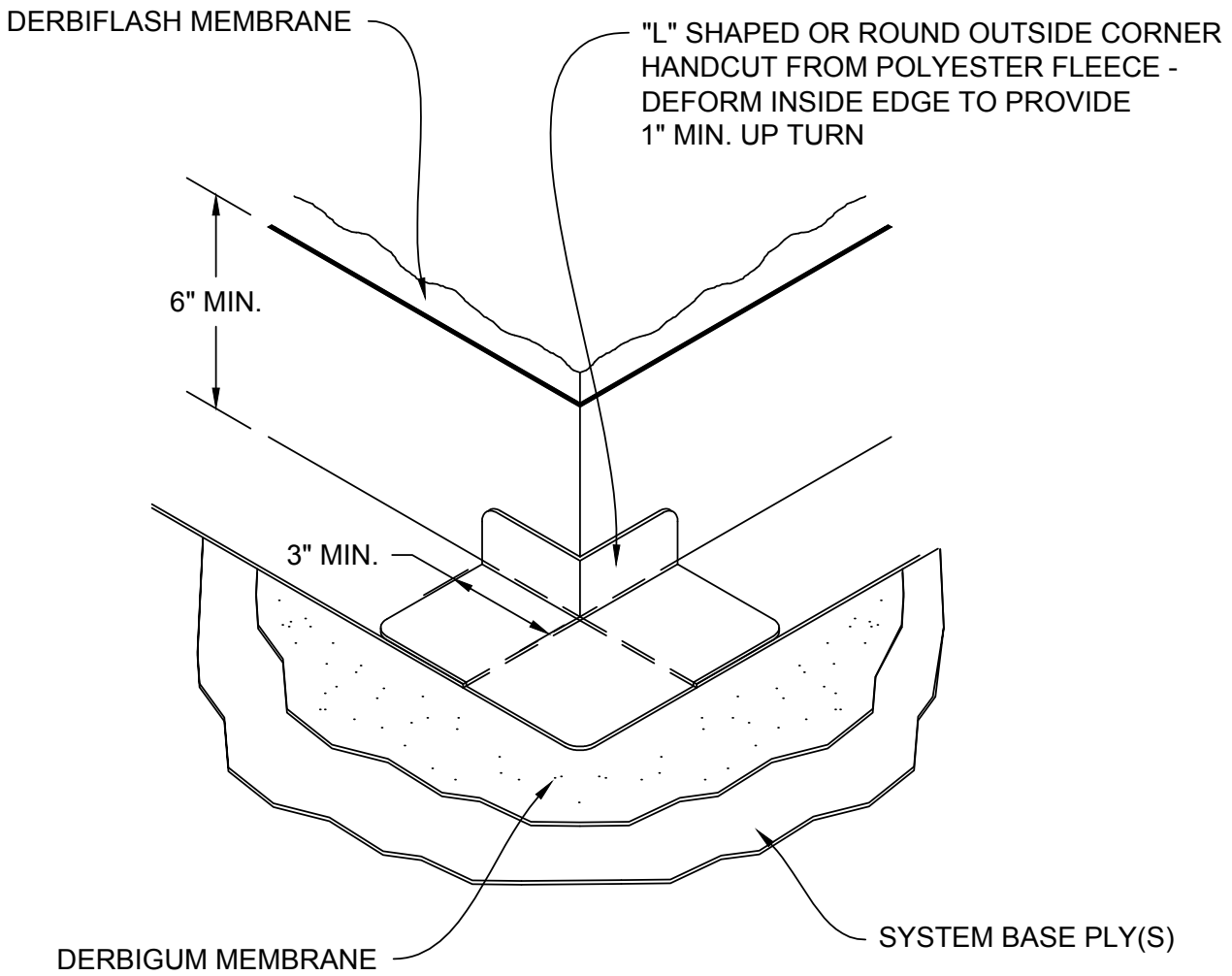
P-21L THUR WALL SCUPPER DETAIL



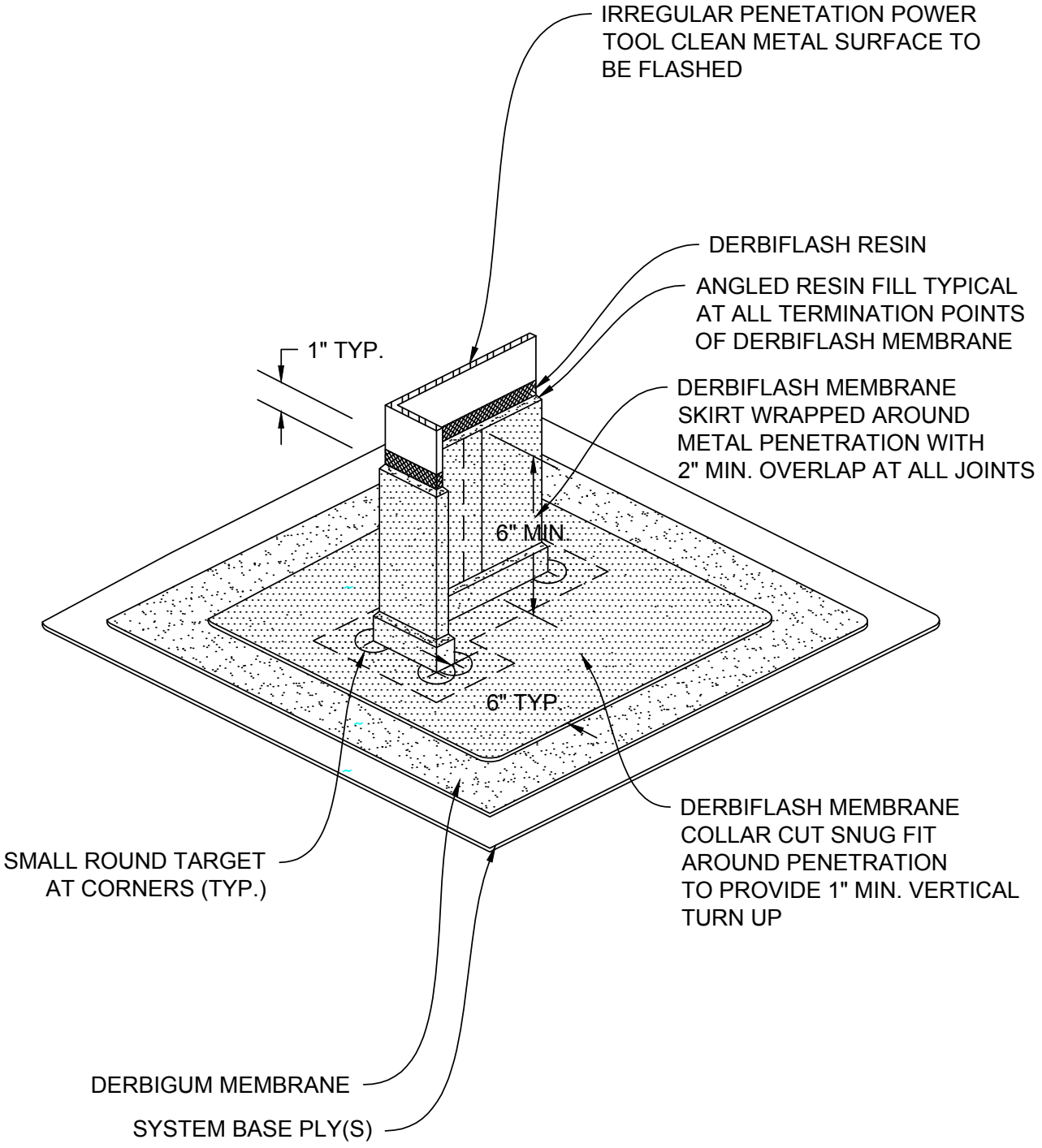
P-23L FIELD FABRICATED INSIDE CORNER



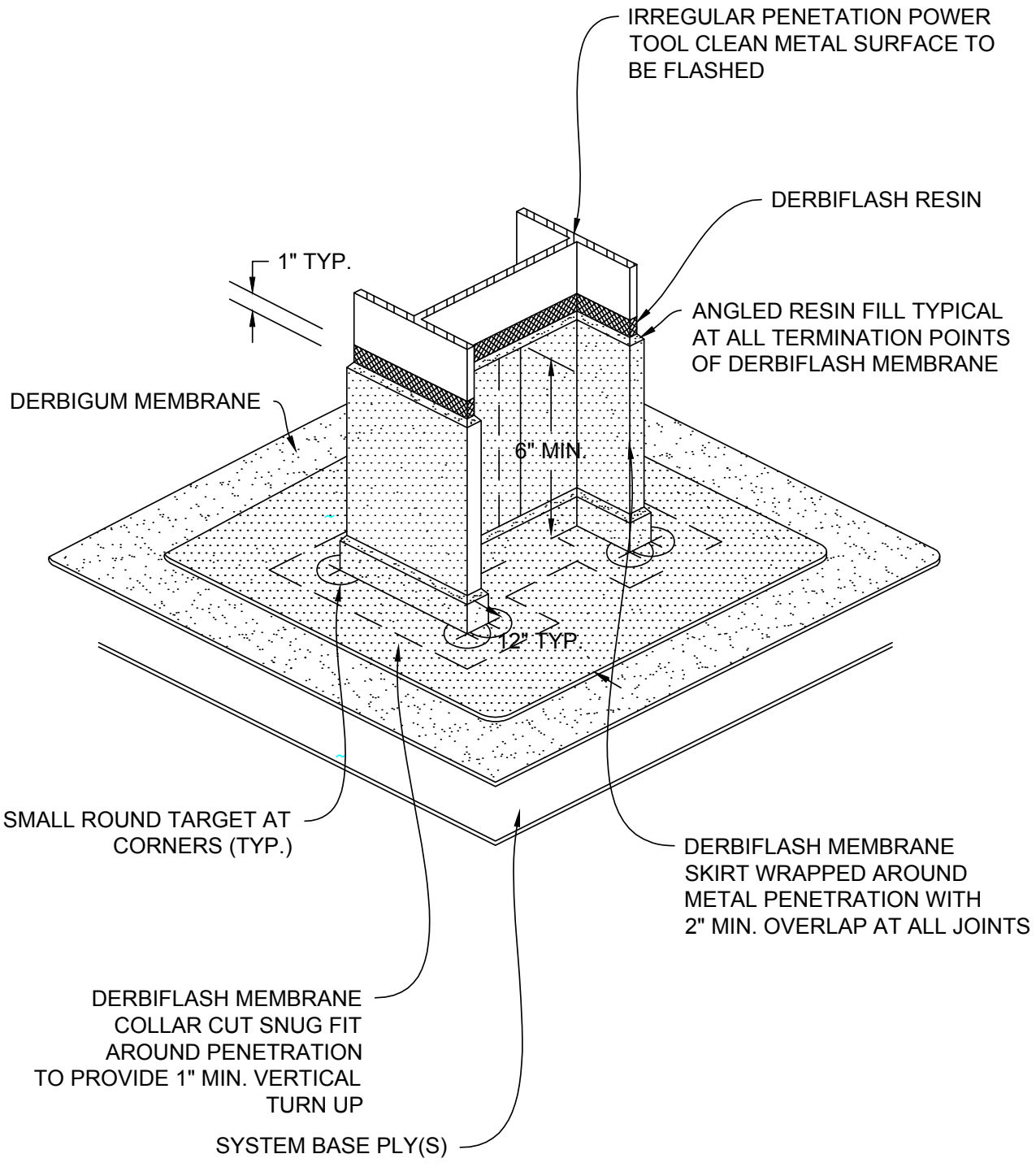
P-24L FIELD FABRICATED OUTSIDE CORNER



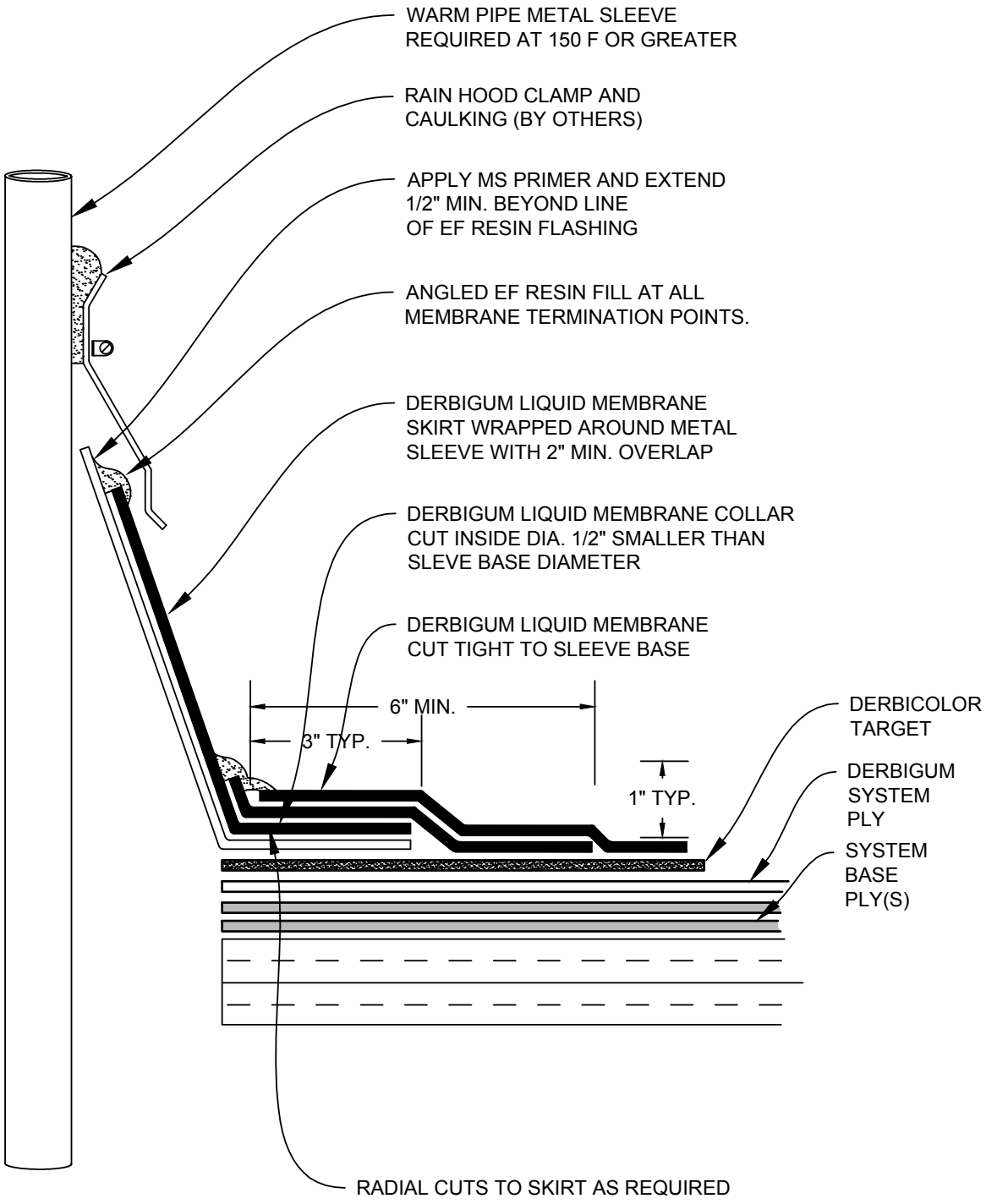
P-25L IRREGULAR PENETRATION ANGLE FLASHING



P-26L WIDE ANGLE FLANGE



P-28L FIELD FABRICATED WARM PIPE PENETRATION FLASHING



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