U.S. PLY, INC.

Modified Bitumen & Built-Up Specification Manual

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Part 1 – Introduction

1.01 - General

A. U.S. Ply, Inc. manufactures and markets a full line of commercial roofing products for a wide range of sloped roofing applications.

B. U.S. Ply, Inc. (formerly known as U.S. Single Ply, Inc.) specializes in the manufacture of polymer modified bitumen membrane and has been producing modified bitumen membranes in the United States since 1985.

C. U.S. Ply, Inc. ("USP") began as U.S. Single Ply, Inc. and became one of the largest private label manufacturers of modified bitumen roofing materials and is one of the oldest modified bitumen membrane manufacturers still producing today.

1.02 - Service

A. U.S. Ply believes success comes through backing quality products with the best service in the industry. Contractors, architects, engineers, distributors, property managers and building owners are invited to contact our Technical Service Assistance Team at (817) 413-0103 and speak to a knowledgeable roofing representative regarding specifications, material application, code approvals, product information and uses.

B. U.S. Ply has a user-friendly website that includes information about the U.S. Ply roofing systems, product line, specifications, technical data and sales information. Visit our website at www.usply.com.

1.03 - Products

A. U. S. Ply modified bitumen membranes are manufactured from exclusive formulas using the highest quality materials available in the market today and are the principle waterproofing components in U.S. Ply roof systems.

B. U.S. Ply offers a variety of premium APP (Atactic Polypropylene) and SBS (Styrene-Butadiene-Styrene) modified bitumen membranes such as DuraWeld® APP torch applied only. DuraFlex® SBS, hot asphalt or cold adhesive applied, DuraFlex® TG SBS, torch applied only, and DuraSTAR® SBS, reflective film hot applied or torch applied modified bitumen membranes to meet or exceed the industry standards for high performance membranes.

C. U.S. Ply begins with prime grades of asphalt which are then modified with either thermoplastic (APP) or elastomeric (SBS) polymers. The result is a modified bitumen compound that demonstrates revolutionary waterproofing characteristics, extreme heat resistance, low temperature flexibility and elongation properties. U.S. Ply then strategically adds reinforcements of fiberglass, polyester or composite fibers in the modified bitumen compound to incorporate additional performance characteristics into the membrane.

D. To compliment the modified bitumen membranes, U.S. Ply offers an extensive line of fiberglass base sheets, interply felts, and cap sheets, under the USP label for Built-up roofing applications and/or hybrid BUR/modified roofing systems.

E. U.S. Ply produces its DuraWeld® APP, DuraFlex® SBS and DuraFlex® TG SBS membranes with a standard granule surfacing for added UV protection and a mineral-textured look, or unsurfaced, ready for application of a wide range of different field applied surfacing materials.

F. U.S. Ply produces its DuraSTAR® SBS membranes with a white reflective film to achieve exceptional Solar Reflectance Index (SRI) values and offers DuraWeld® APP, DuraFlex® SBS and DuraFlex® TG SBS membranes with an **ULTRA WHITE** reflective granule surfacing to achieve exceptional Solar Reflectance Index (SRI) values

1.04 - General Guidelines

A. U.S. Ply membranes should only be applied using the proper combination of vapor barrier/retarder, roof insulation, membrane and membrane protection and should only be applied when the substrate has been properly prepared to receive the appropriate U.S. Ply membrane. The various applications of the U.S. Ply membrane and uses as shown within this manual are designed for a specific purpose and each should be utilized in its respective application.

B. Roofing is a hazardous construction. Workers should be properly trained in a manner to avoid falls, burns, back injuries, heat related afflictions, etc. It is the sole responsibility of the roofing applicator to enforce for safety precautions and to ensure safety at all times. All appropriate OSHA and local codes should be followed in the application of roofing. All personnel involved in roofing should be and equipment should be worn at all times on the job site. There are several publications which addresses numerous safety concerns. Some of them are:

Asphalt Roofing Manufacturer's Association (ARMA)
National Roofing Contractors Association (NRCA)
Roofing Contractor Magazine
Occupational Safety & Health Administration (OSHA)

Part 2 – Policies

2.01 - Statement of Policy

A. This manual contains the latest and best information we have relating to the application of U.S. Ply roofing systems and is based on our years of experience in the commercial roofing industry. They have been prepared and are offered as a general guide to assist architects, roof consultants, engineers, roofing contractors, and owners in the design and application of roofing systems.

B. U.S. Ply does not practice engineering, design or architecture. Neither the issuance of these guidelines, nor the review of any building construction, nor the inspection of roof plans by U.S. Ply representatives shall constitute any warranty by U.S. Ply, Inc. of such plans, specifications, and construction, nor in any way constitute any acceptance by U.S. Ply of same.

C. The design responsibility remains with the architect, roof consultant, engineer, roofing contractor or owner, and construction details illustrated and described herein are furnished solely for guidance purposes and are provided for the consideration of owners, roof consultants, engineers, architects, and/or roofing contractors. These suggestions should not be construed as being all-inclusive, nor should they be considered as a substitute for good roofing application practices.

D. U.S. Ply will under no circumstances accept responsibility for the performance of its products when damage to its products result from such things as improper building design, construction faults, or defects in workmanship or improper storage and handling. U.S. Ply does not manufacture roof decks and is not responsible for their performance.

E. All U.S. Ply products are asbestos free. Under no circumstances shall U.S. Ply have any liability for expenses arising out of or associated with the pre-existing presence of asbestos-containing materials or any other allegedly hazardous substance or material upon the roof to which the new U.S. Ply roofing system is being applied.

F. U.S. Ply membranes are manufactured within customary industry tolerances. The dimensions and specifications indicated in this manual for U.S. Ply membranes are averages.

G. In our continuing effort to improve the quality and performance of our products, U.S. Ply, Inc. periodically makes modifications to its products and application specifications. The Company reserves the right to change or, at its discretion and without prior notice, the physical properties and characteristics of its products and application specifications, warranty terms or policies contained herein. Please contact the U.S. Ply, Inc. Technical Service Department with any specific concerns.

H. The roof membrane system does not include, among other things, roof deck, vapor barrier/retarder, roof insulation not sold by U.S. Ply, metal work, flashing or roof accessories not sold through U.S. Ply.

I. Good workmanship is essential in applying any roof system; therefore, qualified supervision of the application should be exercised. The roofing contractor has the sole responsibility for the quality of the application of the U.S. Ply roof system.

J. Section 4 – General Requirements, including Design and Safety Considerations and Warnings, and Section 5 – Installation Requirements are a part of and must be used in conjunction with all U.S. Ply roof system specifications.

K. U. S. Ply Roof Guarantees are available only when the U.S. Ply membrane is installed in accordance with the terms and conditions set forth in this manual, and by an U.S. Ply, Inc. Certified Roofing Contractor.

L. U.S. Ply, Inc. reserves the right to refuse to make available our Guarantee on projects which are not acceptable to U.S. Ply, Inc. or where job site conditions or procedures used do not comply with U.S. Ply, Inc.'s published requirements.

M. Refer to Section 3, Guarantee Program for additional guarantee requirements.

N. U.S. Ply will not write any letters regarding the installation or application of a roofing system that is not to be covered by a U.S. Ply Guarantee, nor will it write a letter regarding information that is published in this Application and Specification Manual or other U.S. Ply, Inc. product literature.

O. Unless otherwise informed in writing by the U.S. Ply, Inc. Technical Services Manager, only the materials and procedures referenced in this Manual are to be employed in the application of U.S. Ply Roof Systems, including flashing details. The use or misuse of any materials and methods not approved by U.S. Ply, Inc. is in no way the responsibility of the Company.

P. No U.S. Ply, Inc. Guarantee will be valid when the U.S. Ply membrane has been installed over the following:

1. Cold Storage Buildings without proper vapor seals
2. Heated Tanks
3. Structures outside of the U.S.
4. Structures with conduit or piping installed between the roof deck and the roof membrane
5. Thermal insulations not approved by U.S. Ply
6. Structures without positive drainage
7. Lightweight insulation concrete unless venting is provided in accordance with U. S. Ply, Inc. specifications
8. Reroofing over any existing roofing system containing moisture and/or improperly prepared surface
9. Any surface which is not readily accessible for inspection
10. Plywood decks of ½" (13 mm) thickness without continuous solid end blocking
11. Structures with high interior humidity conditions
12. Any substrate or system containing asbestos.

Q. U.S. Ply does not use or maintain a building owner's roof and it is not responsible for its routine maintenance and care. U.S. Ply is not responsible for consequential damages in case of roof system failure. U.S. Ply has no control over a building's contents, type, quantity, positioning or protection.

R. Information contained in this manual is presented in good faith and to the best of U.S. Ply's knowledge, does not infringe upon any patents, foreign or domestic.

S. U.S. Ply reserves the right to change or modify, at its discretion, and without prior notice, any of the information, requirements, specifications or policies contained herein. This manual supersedes all catalogs and previous manuals.

2.02 - Warranty and Limitation of Liability

U.S. PLY, INC. ("SELLER") WARRANTS THAT, AT THE TIME OF DELIVERY, THE U.S. PLY MATERIAL DELIVERED SHALL CONFORM TO SELLER'S SPECIFICATIONS THEREFOR FREE AND CLEAR OF ALL LIENS AND ENCUMBRANCES. **THIS WARRANTY IS EXCLUSIVE AND IS IN LIEU OF ALL OTHER WARRANTIES EXPRESS OR IMPLIED, INCLUDING THE IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR USE OR PURPOSE OR FOR ANY OTHER WARRANTY OF ANY KIND WHATSOEVER, EXPRESS OR IMPLIED, EXCEPT AS SET FORTH IN THE PRECEDING SENTENCE.** IF ANY MATERIAL FAILS TO CONFORM TO THE FOREGOING WARRANTY, SELLER'S SOLE AND EXCLUSIVE REMEDY SHALL BE THE REPLACEMENT OF SUCH NON-CONFORMING MATERIAL, PROVIDED THAT SUCH MATERIAL HAS BEEN HANDLED AND INSTALLED IN ACCORDANCE WITH SELLER'S PUBLISHED HANDLING PROCEDURES AND INSTALLATION SPECIFICATIONS. THIS WARRANTY DOES NOT APPLY TO, AND SELLER SHALL NOT BE LIABLE FOR, LABOR COSTS OR ANY OTHER DAMAGES RESULTING FROM IMPROPER OR FAULTY INSTALLATION OF MATERIAL. THE SELLER SHALL ALSO NOT BE LIABLE FOR LABOR COSTS OR ANY OTHER DAMAGES RESULTING FROM FAILURE OF THE MATERIAL ITSELF. REGARDLESS OF THE THEORY ON WHICH A CLAIM MAY BE MADE INCLUDING, WITHOUT LIMITATION, NEGLIGENCE, CONTRACT, BREACH OF WARRANTY, STRICT LIABILITY IN TORT, MISREPRESENTATION, OR OTHERWISE, WITH RESPECT TO MATERIAL DELIVERED OR FOR FAILURE TO DELIVER ANY MATERIAL, NO CLAIMS OF ANY KIND WHATSOEVER SHALL BE GREATER IN AMOUNT THAN THE PURCHASE PRICE OF THE MATERIAL IN RESPECT OF WHICH DAMAGES ARE CLAIMED. **IN NO EVENT SHALL U.S. PLY BE LIABLE FOR: INCIDENTAL, CONSEQUENTIAL, SPECIAL, INDIRECT OR PUNITIVE DAMAGES**. FAILURE OF BUYER TO GIVE WRITTEN NOTICE OF CLAIM WITHIN SIXTY (60) DAYS AFTER DELIVERY OF MATERIAL SHALL CONSTITUTE A WAIVER BY BUYER OF ALL CLAIMS WITH RESPECT TO SUCH MATERIAL.

Part 1 – U.S. PLY DuraWeld® APP Product Guide

1.01 – DuraWeld® APP Torch Applied Membrane Guide

MEMBRANE	DESCRIPTION	FUNCTION	APPLICATION METHOD	UNIT	NOMINAL SIZE [1]	NOMINAL WEIGHT [1]
DuraWeld® 4S APP	Premium, smooth surfaced APP modified asphalt membrane. Polyester reinforcement. Thickness, 4 mm (160 mils). Meets ASTM D 6222 Type I, Grade S.	APP Cap[2]/APP Interply/APP Base	Torch Welding	Roll	1 Square	88 lb/roll, 40 kg/roll
DuraWeld® 4M APP	Premium, granule surfaced APP modified asphalt membrane. Polyester reinforcement. Thickness 4.3 mm (170 mils). Meets ASTM D 6222 Type I, Grade G. Also available with reflective ULTRA WHITE granule. CRRC rated 0872-0010, Initial Solar Reflectance = 0.83, Initial Emissivity = 0.90, Initial SRI = 104.	APP Cap	Torch Welding	Roll	1 Square	105 lb/roll, 48 kg/roll
DuraWeld® 4MFR APP	Premium, fire-resistant, granule surfaced APP modified asphalt membrane. Polyester reinforcement. Thickness 4.3 mm (170 mils). Meets ASTM D 6222 Type I, Grade G. Also available with reflective ULTRA WHITE granule. CRRC rated 0872-0010, Initial Solar Reflectance = 0.83, Initial Emissivity = 0.90, Initial SRI = 104.	APP Cap	Torch Welding	Roll	1 Square	105 lb/roll, 48 kg/roll

[1] The sizes and weights listed are approximate, and are for unapplied rolls.

[2] When DuraWeld® 4S APP is used as a cap membrane; it must be surfaced with a roof coating for guarantee eligibility.

Part 2 – DURAFLEX® SBS Product Guide

2.01 – DURAFLEX® SBS Mop and Cold Adhesive Applied Membrane Guide

MEMBRANE	DESCRIPTION	FUNCTION	APPLICATION METHOD	UNIT	NOMINAL SIZE [1]	NOMINAL WEIGHT [1]
DURAFLEX® 190 SBS	PPremium, granule surfaced SBS modified asphalt membrane. Polyester reinforcement. Thickness 4.2 mm (166 mils). Meets ASTM D 6164 Type I, Grade G. Also available with reflective ULTRA WHITE granule. CRRC rated 0872-0009, Initial Solar Reflectance = 0.84, Initial Emissivity = 0.90, Initial SRI = 106.	SBS Cap	Hot Asphalt/ Cold Adhesive	Roll	1 Square	105 lb/roll, 48 kg/roll
DURAFLEX® 190FR SBS	Premium, fire-resistant, granule surfaced SBS modified asphalt membrane. Polyester reinforcement. Thickness 4.2 mm (166 mils). Meets ASTM D 6164 Type I, Grade G. Also available with reflective ULTRA WHITE granule. CRRC rated 0872-0009, Initial Solar Reflectance = 0.84, Initial Emissivity = 0.90, Initial SRI = 106.	SBS Cap	Hot Asphalt/ Cold Adhesive	Roll	1 Square	105 lb/roll, 48 kg/roll
DURAFLEX® 250FR SBS	Premium, fire-resistant, granule surfaced SBS modified asphalt membrane. Heavy-duty polyester reinforcement. Thickness 4.5 mm (177 mils). Meets ASTM D 6164 Type II, Grade G. Also available with reflective ULTRA WHITE granule. CRRC rated 0872-0009, Initial Solar Reflectance = 0.84, Initial Emissivity = 0.90, Initial SRI = 106.	SBS Cap	Hot Asphalt/ Cold Adhesive	Roll	1 Square	105 lb/roll, 48 kg/roll
DURAFLEX® G4FR SBS	Premium, fire-resistant, granule surfaced SBS modified asphalt membrane. Fiberglass reinforcement. Thickness 4.2 mm (166 mils). Meets ASTM D 6163 Type I, Grade G. Also available with reflective ULTRA WHITE granule. CRRC rated 0872-0009, Initial Solar Reflectance = 0.84, Initial Emissivity = 0.90, Initial SRI = 106.	SBS Cap	Hot Asphalt/ Cold Adhesive	Roll	1 Square	90 lb/roll, 41 kg/roll

[1] The sizes and weights listed are approximate, and are for unapplied rolls.

2.02 – DURAFLEX® SBS Mop and Cold Adhesive Applied Base and Ply Sheet Guide

MEMBRANE	DESCRIPTION	FUNCTION	APPLICATION METHOD	UNIT	NOMINAL SIZE [1]	NOMINAL WEIGHT [1]
DURAFLEX® 190S SBS	Premium, granule surfaced SBS modified asphalt membrane. Polyester reinforcement. Thickness 4.2 mm (166 mils). Meets ASTM D 6164 Type I, Grade G. Also available with reflective ULTRA WHITE granule. CRRC rated 0872-0009, Initial Solar Reflectance = 0.84, Initial Emissivity = 0.90, Initial SRI = 106.	SBS Cap[2]/ SBS Interply/ SBS Base	Hot Asphalt/ Cold Adhesive	Roll	1 Square	88 lb/roll, 40 kg/roll
DURAFLEX® 60 SBS BASE	Heavy duty glass fiber reinforced base sheet, coated with SBS modified asphalt. Thickness, 2.4 mm (94 mils). Meets ASTM D 6163 Type 1, Grade S	SBS Interply/ SBS Base	Hot Asphalt/ Cold Adhesive	Roll	1.5 Square	94 lb/roll, 43 kg/roll
DURAFLEX® SBS POLYBASE	Smooth surfaced SBS modified asphalt membrane. Polyester reinforcement. Thickness, 2.4 mm (94 mils). Meets ASTM D 6164 Type I, Grade S.	SBS Interply/ SBS Base	Hot Asphalt/ Cold Adhesive	Roll	1.5 Square	98 lb/roll, 44 kg/roll

[1] The sizes and weights listed are approximate, and are for unapplied rolls

2.03– DURAFLEX® SBS Torch Grade Applied Membrane Guide

MEMBRANE	DESCRIPTION	FUNCTION	APPLICATION METHOD	UNIT	NOMINAL SIZE [1]	NOMINAL WEIGHT [1]
DURAFLEX® 190FRTG SBS	Premium, fire-resistant, granule surfaced torch grade, SBS modified asphalt membrane. Polyester reinforcement. Thickness 4.2 mm (166 mils). Meets ASTM D 6164 Type I, Grade G. Also available with reflective ULTRA WHITE granule. CRRC rated 0872-0009, Initial Solar Reflectance = 0.84, Initial Emissivity = 0.90, Initial SRI = 106.	SBS Cap	Torch Welding	Roll	1 Square	105 lb/roll, 48 kg/roll
DURAFLEX® G4FRTG SBS	Premium, fire-resistant, granule surfaced torch grade, SBS modified asphalt membrane. Fiberglass reinforcement. Thickness 4.2 mm (166 mils). Meets ASTM D 6163 Type I, Grade G. Also available with reflective ULTRA WHITE granule. CRRC rated 0872-0009, Initial Solar Reflectance = 0.84, Initial Emissivity = 0.90, Initial SRI = 106.	SBS Cap	Torch Welding	Roll	1 Square	105 lb/roll, 48 kg/roll
DURAFLEX® ALUM SBS	Premium, fire-resistant, aluminum clad surfaced torch grade, SBS modified asphalt membrane. Fiberglass scrim reinforcement. Thickness 3.5 mm (140 mils). Meets ASTM D 6298.	Flashing	Torch Welding	Roll	1 Square	103 lb/roll, 47 kg/roll
DuraFlex® 190TG SBS	Premium, granule surfaced torch grade, SBS modified asphalt membrane. Polyester reinforcement. Thickness 4.2 mm (166 mils). Meets ASTM D 6164 Type I, Grade G.	Flashing	Torch Welding	Roll	1 Square	105 lb/roll, 48 kg/roll

[1] The sizes and weights listed are approximate, and are for unapplied rolls.

2.04 DURAFLEX® SBS Torch Grade Base and Ply Sheet Guide

MEMBRANE	DESCRIPTION	FUNCTION	APPLICATION METHOD	UNIT	NOMINAL SIZE [1]	NOMINAL WEIGHT [1]
DURAFLEX® 60TG SBS BASE	Heavy duty torch grade, glass fiber reinforced base sheet, coated with SBS modified asphalt. Thickness, 2.4 mm (94 mils). Meets ASTM D 6163 Type 1, Grade S	SBS Interply/ SBS Base	Torch Welding	Roll	1.5 Square	95 lb/roll, 43 kg/roll
DURAFLEX® 90TG SBS BASE	Heavy duty, glass fiber reinforced torch grade base sheet, coated with SBS modified asphalt. Thickness 3 mm (120 mils). Meets ASTM D 6163 Type 1, Grade S.	SBS Interply/ SBS Base	Torch Welding	Roll	1 Square	85 lb/roll, 38 kg/roll

[1] The sizes and weights listed are approximate, and are for unapplied rolls.

Part 3 – DURASTAR® SBS Product Guide

3.01 – DURASTAR® SBS Membrane Guide

MEMBRANE	DESCRIPTION	FUNCTION	APPLICATION METHOD	UNIT	NOMINAL SIZE [1]	NOMINAL WEIGHT [1]
DURASTAR®G4 MOP SBS	Premium fire-resistant, white reflective film surfaced, SBS modified asphalt membrane designed for hot asphalt application. Fiberglass reinforcement. Thickness 3.5 mm (140 mils). CRRC rated 0872-0008, Initial Solar Reflectance = 0.86, Initial Emissivity = 0.82, Initial SRI = 107.	Reflective Cap	Mop	Roll	1 Square	100 lb/roll, 45 kg/roll
DURASTAR® G4 TGW SBS	Premium fire-resistant, white reflective film surfaced, SBS modified asphalt membrane designed for torch grade application. Fiberglass reinforcement. Thickness 3.5 mm (140 mils). CRRC rated 0872-0007, Initial Solar Reflectance = 0.86, Initial Emissivity = 0.82, Initial SRI = 107.	Reflective Cap	Torch Welding	Roll	1 Square	100 lb/roll, 45 kg/roll

[1] The sizes and weights listed are approximate, and are for unapplied rolls.

Note: DURASTAR® membranes are limited to Zones A and B only. Refer to zone map in BUR Section 10.

Part 4 – RapidGRIP® SBS Product Guide

4.01 – RapidGRIP® SBS Base and Ply Sheet Guide

MEMBRANE	DESCRIPTION	FUNCTION	APPLICATION METHOD	UNIT	NOMINAL SIZE[1]	NOMINAL WEIGHT[1]
RAPIDGRIP® READI-BASE SA	Premium self-adhesive SBS modified asphalt base sheet. Fiberglass reinforcement. Split back release film on bottom, sand surfacing on top. Thickness: 1.5 mm (60 mils). Meets ASTM D1970 and D6163 Type I, Grade S.	SBS Interply/ SBS Base	Self-Adhesive	Roll	2 Squares	72 lb/roll, 32.7 kg/roll

[1] The sizes and weights listed are approximate, and are for unapplied rolls.

Part 5 – USP® Built Up Product Guide

5.01 – USP® Built-Up Membrane Guide

MEMBRANE	DESCRIPTION	UNIT	NOMINAL SIZE [1]	NOMINAL WEIGHT [1]	STANDARD
USP® Base Sheet	Heavyweight glass fiber reinforced base sheet.	Roll	3 Squares	82 lb/roll, 37.2 kg/roll	ASTM D 4601-03 Type II UL Type G2, FM
USP® NVB (Nailable Venting Base)	Heavyweight glass fiber reinforced base sheet with mineral granules, designed to provide positive venting of trapped gases under the roof membrane. Designed to be mechanically attached to nailable decks.	Roll	1 Square	72 lb/roll, 32.7 kg/roll	ASTM D 4897-03 Type II UL Type G2, FM Approved
USP® Type 4 Glass Ply Sheet	Tough, heavyweight glass fiber reinforced ply sheet designed for use in multiple construction of hot applied roof systems.	Roll	5 Squares	45 lb/roll, 20.4 kg/roll	ASTM D 2178-00 Type IV UL Type G2, FM Approved
USP® Type 6 Premium Glass Ply Sheet	Premium, heavyweight glass fiber reinforced ply sheet for use in multiple construction of hot applied roof systems.	Roll	5 Squares	50 lb/roll, 22.7 kg/roll	ASTM D 2178-00 Type VI UL Type G2, FM Approved
USP® Mineral Cap Sheet	Heavyweight glass fiber reinforced cap sheet designed for use as a hot applied cap sheet in multiple ply hot applied built-up roof systems.	Roll	1 Square	75 lb/roll, 34 kg/roll	ASTM D 3909-03 Type I/II UL Type G2, FM

[1] The sizes and weights listed are approximate, and are for unapplied rolls.

Part 6 – U.S. Ply Accessories Product Guide

6.01 – U.S. Ply Adhesive and Coating Accessories Guide

ACCESSORY	DESCRIPTION	FUNCTION	APPLICATION METHOD	UNIT	NOMINAL SIZE [1]	NOMINAL WEIGHT [1]
USP® #41 Asphalt Primer	Low viscosity penetrating primer used for priming concrete and metal surfaces.	Primer	Brush/Roller	Pail	5 gal (19 L) pail	39 lb/5 gal 17.7 kg/19 L
USP® #421 Non-Fibered Aluminum Roof Coating	High quality, non-fibered, reflective aluminum roof coating for surfacing a wide range of membranes and surfaces.	Roof Coating	Brush/Roller	Pail	5 gal (19 L) pail	47 lb/5 gal 21.3 kg/19
USP® #442 Fibered Aluminum Roof Coating	High quality, fibered, reflective aluminum roof coating for surfacing a wide range of membranes and surfaces.	Roof Coating	Brush/Roller	Pail	5 gal (19 L) pail	45 lb/5 gal 20.4 kg/19 L

USP® #640 Plastic Roof Cement	Superior grade, asbestos free plastic roof cement used for repairing leaks, cracks, splits, holes and bonding metal flashings.	Plastic Cement	Trowel	Pail	5 gal (19 L) pail	42 lb/5 gal 19 kg/19 L
USP® #901 Premium Modified Adhesive	Premium grade modified asphalt adhesive for bonding SafeWeld® APP and DuraFlex® SBS base, interply and cap membranes.	Cold Adhesive	Squeegee/ Spray Applied	Pail	5 gal (19 L) pail	47.5 lb/5 gal 21.5 kg/19 L
USP® #954 Premium Modified Flashing Cement	Premium grade modified cement for bonding SafeWeld® APP and DuraFlex® SBS flashing membranes.	Flashing Cement	Trowel	Pail	5 gal (19 L) pail	49 lb/5 gal 22.2 kg/19 L
USP® ROOFING ASPHALT	ASTM D Type III Steep Asphalt ASTM D Type IV Special Steep Asphalt	Roofing Asphalt	Mop	Carton	100 lb carton	100 lbs 45 kg
USP® MODIFIED ASPHALT 150	Modified Asphalt with 150% elongation meeting ASTM D 312 Type III Asphalt	Roofing Asphalt	Mop	Carton	100 lb carton	100 lbs 45 kg
DURASTAR® SEAM KOTE	A premium, high performance white elastomeric roof coating that is designed to match the DuraSTAR® SBS Membranes. It is ideal for use as a seam coating over the bitumen bleed out and as a touch up coating.	Reflective Coating	Brush/Roller	Pail	5 gal (19 L) pail	62 lb/5 gal 28 kg/19 L
USP® PLY-FLASH (2-Part)	Two-component, cold-applied modified asphalt flashing compound enhanced with polyurethane for use as flashing membrane for a variety of roof details on modified bitumen and BUR roofing systems.	Liquid Flashing Compound	Brush/Trowel	Pail	4 gal (15.1L) pail 2 gal (7.57L) pail	39 lb/4 gal (17.7 kg/15L) 20 lb/2 gal 9.07 kg/7.5L)

6.02 – USP® Accessory Guide

ACCESSORY	DESCRIPTION	FUNCTION	APPLICATION METHOD	UNIT	NOMINAL SIZE [1]	NOMINAL WEIGHT [1]
USP® ROOFING GRANULES	Made from 3M® Classic Roofing Granules and are designed to match the granule surfacing of U.S. Ply membranes such as DuraFlex®, DuraWeld®, SafeWeld®, and USP® TUFFCAP. Available in Black, Brown, Cedar Blend, Dark Brown, Gray, Hickory, Tan, Weathered Wood, and White. Custom colors are available.	Roofing Granules	Hand Sprinkle		Pail/Bag	45 lbs (20.4 kg) pail 25 lbs (11.3 kg) bag

USP® ULTRA WHITE GRANULES	Reflective Ultra White granules are designed to match the granule surfacing of ULTRA WHITE membranes such as DuraFlex® SBS, DuraFlex® TG SBS, and DuraWeld® APP.	Reflective Roofing Granules	Hand Sprinkle	Pail / 5 gal	32 lbs (14.5 kg) pail
USP® APP WALKBOARD USP® SBS WALKBOARD	Heavy duty composite adhered modified bitumen pad consisting of a smooth underside and a granule top side. Available in APP and SBS material. USP® APP WALKBOARDS are designed to be torch applied. USP® SBS WALKBOARDS may be mopped or adhered with USP® 954 Premium Modified Flashing Cement.	Walkway Pad	Fully Adhered	32” x 32” pad	12 lbs each 5.4 kg

6.03 – PLYFAST® Accessory Fasterner Guide

PRODUCT	DESCRIPTION	FUNCTION	UNIT	NOMINAL SIZE
PLYFAST® #12 FASTENER	Fasteners made from corrosion resistant steel and are designed to secure insulation to standard steel (18 ga.–24 ga.) and wood decks.	Insulation/Base Sheet Fastener	1-5/8” – 6” 1000/box 7” – 8” 500/box	Available in lengths from 1-5⁄8-in. to 8-in
PLYFAST® #14 FASTENER	Heavy duty fasteners made from corrosion resistant steel and are designed to secure insulation to standard steel (18 ga.–24 ga.) and structural concrete decks.	Insulation/Base Sheet Fastener	1-1/4” – 6” 1000/box 6” – 8” 500/box 9” – 12” 250/box	Available in lengths from 1-1⁄4-in. to 12-in
PLYFAST® #15 FASTENER	Extra -heavy duty fasteners made from corrosion resistant steel and are designed to secure insulation to standard steel (16 ga.–24 ga.) and structural concrete decks.	Insulation/Base Sheet Fastener	1-1/2” – 4” 1000/box 5” – 8” 500/box 9” – 12” 250/box	Available in lengths from 1-1⁄2-in. to 12-in
PLYFAST® #21 FASTENER	Super extra-heavy duty fasteners made from corrosion resistant steel and are designed to secure insulation to standard steel (16 ga.–24 ga.) and structural concrete decks.	Insulation/Base Sheet Fastener	2” – 6” 500/box 7” – 12” 250/box	Available in lengths from 2-in. to 12-in
PLYFAST® 1.7 BASE PLY FASTENER	1.7” long Split shank corrosion resistant steel base ply fastener with 2.7” diameter plate designed to secure base sheets to lightweight concrete and gypsum substrates.	Base Ply Fastener	1.7” 1000/box	1.7”
PLYFAST® 2X BASE PLY FASTENER	Dual split shank corrosion resistant steel base ply fastener with 2.7” diameter plate designed to secure base sheets to lightweight concrete and gypsum substrates.	Base Ply Fastener	1.7” 1000/box	1.7”

PLYFAST® DOUBLE LOCK NAIL	Factory preassembled fastener with locking staples. Designed to attach base sheets, recovery boards and insulation to lightweight insulating concrete, structural wood fiber and poured gypsum roof decks.	Insulation/Base Sheet Fastener	1.4” - 3.8” 500/box 4.8” 250/Box	Available in lengths from 1.4-in. to 4.8-in
PLYFAST® 3” INSULATION PLATE	Standard Steel Insulation Plate	Insulation Plate	3” 500/box	3”

[1] The sizes and weights listed are approximate.

Part 7 – General Products

7.01 – Asphalt

A. The following asphalt types are acceptable for use in hot applied constructions.

1. Type III Roofing Asphalt: Must meet or exceed the requirements of ASTM D 312 Type III and must be compatible with DuraFlex® SBS membranes, and USP® built-up membranes.

2. Type IV Roofing Asphalt: Must meet or exceed the requirements of ASTM D 312 Type IV and must be compatible with DuraFlex® SBS membranes, and USP® built-up membranes.

3. Modified Roofing Asphalt 150: Must meet or exceed the requirements of ASTM D Type III and must be compatible with DuraFlex® SBS membranes, and USP® built-up membranes.

B. Refer to Section 4, General Requirements for asphalt uses and limitations.

7.02 - Insulation

A. The following insulations are acceptable for use with U.S. Ply modified bitumen roofing systems when manufactured to meet the specifications listed and installed in accordance with the insulation manufacturer’s recommendations.

1. Cellular Foam Glass - ASTM C552/FS HH-1-551E. Must have an overlay of a minimum ½” (13 mm) of perlite or wood fiber.

2. Glass Faced Gypsum Board – ASTM D1177. *The glass faced gypsum cannot be installed in hot asphalt.*

3. Gypsum Fiber Roof Board – ASTM D1278. *USG® SecuRock Roof Board.*

4. Mineral/Stone Wool Board - ASTM C726. Must be high density. *Roxul® TopRock® DD or TopRock® DD Plus.*

5. Perlite - ASTM C728/FS HH-1-529

6. Polyisocyanurate - ASTM C1289/FS HH-1-972, Class 1 or 2. *USP® ISO, USP® Tapered ISO*

7. Wood Fiber Board - ASTM C208/FS LLL-1-535b, Class C. *Structodek® High Density Roofing Fiberboard – Celotex™ Blue Ridge™ Fiberboard*.

B. Not all of the above insulations are compatible with every U.S. Ply membrane nor are all of the above insulations compatible to receive every method of membrane application. Refer to Section 4 - General Requirements and Section 5 – Installation Requirements for applicable conditions.

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SECTION 3 – GUARANTEE PROGRAM

Part 1 – Guarantee & Warranty Information

1.01 - General

A. U.S. Ply offers several types of guarantees and warranties. All guarantees and warranties are “limited” unless they are termed or titled “unlimited”. Any one limitation makes a warranty “limited” in one respect or another. Typically limitations are referred to as “Scope of Coverage” and/or “Exclusions from Coverage”.

B. Limitations are a means to outline what is and what is not covered by the guarantee or warranty, and what particular responsibilities the guarantee holder (owner) may have during the guarantee term.

C. A U.S. Ply Roof Guarantee is not an insurance policy against leaks, a maintenance agreement nor a representation that the roofing materials will not split, crack, tear, wrinkle, buckle or change appearance.

D. The Roof Guarantee requires a building owner to:

1. Perform regular inspections and maintenance during the term of the Guarantee.

2. Keep records of all inspection and maintenance performed.

3. Perform repairs to the roof or other building components identified during inspections by U.S. Ply as being necessary to preserve the integrity of the U.S. Ply Roofing Materials.

E. The Roof Guarantee is cancelled if:

1. There is a violation of those terms and conditions of the guarantee stipulating that the guarantee shall be voided;

2. Any alteration, addition, or repair is made to the roof structure without prior written approval of the Technical Services Manager;

F. The roofing system guarantee period commences on the date the installation of the roof is substantially completed.

G. The Roof Guarantee automatically terminates when the specified time period is attained.

1.02 - U.S. Ply Limited Material Warranty

Limited Material Warranties cover the repair of U.S. Ply roof membranes that cause leaks as a result of manufacturing defects in material for the duration of the warranty period, from the date of purchase, subject to the exclusions and exceptions described in the limited material warranty.

On non-warranted roofs, U.S. Ply acts only as the seller of materials and has no control of the application of materials or the conditions under which they are applied. Under these conditions, U.S. Ply is not responsible for the performance of the roof beyond the obligation to manufacture and ship quality materials which comply with U.S. Ply published specification standards.

On non-warranted roofs, U.S. Ply will accept no responsibility for claims regarding defective materials except as described below. Every claim for defective materials must be made in writing and received by U.S. Ply Inc., ATTN: Technical Services Department, P.O. Box 163980, Fort Worth, Texas 76161 within thirty (30) days of the date that the claimed defect is or should have been discovered.

Because all factors creating abnormal wind conditions on a roof cannot be entirely anticipated by a roofing manufacturer, U.S. Ply is not liable in any event for wind damage.

1.03 - U.S. Ply Limited System Warranty

U.S. Ply System Warranties cover the building owner for all authorized costs of repair or replacement of U.S. Ply materials as necessary to correct leaks covered by the limited roof system warranty.

Eligibility for an U.S. Ply Limited System Warranty is contingent upon U.S. Ply specifications and procedures being followed. This includes payment of a warranty fee (if applicable) prior to installation of the roof system and proper registration of applicable warranty documents.

U.S. Ply recognizes that requirements may vary from normal to special roof situations. All requests for approval of changes in specifications or industry upgrading of the specifications, must be submitted in writing to: U.S. Ply, Attn: Warranty Registration, P.O. Box 163980, Fort Worth, Texas 76161 for written approval and acceptance. In order for the roof system to be eligible for an U.S. Ply Limited System Warranty, no changes shall be allowed without the prior written acceptance by the U.S. Ply Technical Manager.

U.S. Ply will issue an U.S. Ply Limited System Warranty subject to the conditions outlined herein and contained in the warranty. No other types of warrantees, such as letters of certification, bonds, etc., will be issued as a substitute.

1.04 – U.S. Ply System Guarantee

U.S. Ply System Guarantees cover the building owner for all authorized costs of repair or replacement of U.S. Ply materials and USP® roof components as necessary to correct leaks covered by the roof system guarantee.

Typically the guarantee does not include metal flashing such as cap flashing, counterflashing, gravel stops, edging, expansion joints, or any product not furnished or manufactured by U.S. Ply, or damage to the roofing system caused by movement of such non-U.S. Ply roof components or accessories.

Eligibility for an U.S. Ply System Guarantee is contingent upon U.S. Ply specifications and procedures being followed. This includes payment of a guarantee fee prior to installation of the roof system and proper registration of applicable warranty documents.

U.S. Ply recognizes that requirements may vary from normal to special roof situations. All requests for approval of changes in specifications or industry upgrading of the specifications, must be submitted in writing to: U.S. Ply, Attn: Warranty Registration, **P.O. Box 163980, Fort Worth, Texas 76161** for written approval and acceptance. In order for the roof system to be eligible for an U.S. Ply System Guarantee, no changes shall be allowed without the prior written acceptance by the U.S. Ply Technical Manager.

U.S. Ply will issue an U.S. Ply System Guarantee subject to the conditions outlined herein and contained in the guarantee. No other types of guarantees, such as letters of certification, bonds, etc., will be issued as a substitute.

1.05 - Exclusions

U.S. Ply guarantees and limited warranties, even when issued, do not cover and specifically exclude the following conditions or any damage that may arise from:

- Faulty or improper application of said product or products not installed or applied in accordance with the printed product instruction guidelines.
- Natural forces, disasters, or acts of God including, but not limited to windstorms, fires, hail, hurricanes, floods, tornadoes, wind-blown debris, lightning, earthquakes, volcanic activity, atomic radiation, insects or animals.
- Damage resulting from any materials used in conjunction with the U.S. Ply Materials, including but not limited to “Radiant Barriers”.
- Damage to the products caused by inadequate attic/roof sheathing ventilation (Note: Ventilation must meet the FHA and HUD Minimum Property Standards or a minimum of one (1) square foot of net free attic vent area for every 150 feet of attic floor area; or one square foot per every 300 square feet, if vapor barrier is installed on the warm side of the ceiling, or at least one half the ventilation area is provided near the ridge.
- Damage to the materials caused by any deliberate or

negligent act in maintaining the roof or abuse or abnormal use of the roof.

- Failure by the Owner to use reasonable care in maintaining the System, or to follow the "U.S. Ply System Maintenance and Care Program".
- Replacement of products after the first six (6) months after application due to loss of granules.
- Damage due to settlement, distortion, cracking or failure of building components, including, but not limited to, the roof substrate, walls, mortar, HVAC units, etc; vandalism; improper installation of insulation or defects or failure of any material used in any roof base or insulation; infiltration or condensation of moisture in, through or around the walls, copings, building structure, rooftop penetrations or mechanical units or underlying or surrounding materials; defects in workmanship or design; or other materials including, but not limited to metal work, expansion or control joints, walkways, pitch pockets, flashing materials, and any roof top units and equipment; expansion or contraction of any flashing or metal work; applications of roofing materials not in conformity with U.S. Ply installation guidelines at the time of installation; where underlying materials or structures have failed or ceased to conform to U.S. Ply installation guidelines or specifications; chemical attack on the membrane as a result of exposure to chemicals, including but not limited to, aliphatic or aromatic solvents, chlorinated hydrocarbons, oils, or any other corrosive chemical.
- Changes in usage of the building contrary to applicable structure usages over which this limited warranty coverage is extended.
- Damage resulting from any new installations on or through the roofing membrane or flashing or from traffic of any nature on the roof.
- Any repairs or other applications to the roof membrane or base flashing after the date of completion, unless performed in a manner acceptable to and approved by U.S. Ply in writing in advance.
- Any damage occurring more than thirty (30) days after the discovery of a leak by the Owner or its agent, unless U.S. Ply is notified of such leak within thirty (30) days of the discovery.
- Areas of roof which pond water.

1.06 - Exceptions

U.S. Ply will not issue a guarantee or limited warranty of any type for any roof system or material installed on or over the following structures, without prior express written approval by the U.S. Ply Warranty Department prior to application of the roofing materials:

- Cold storage buildings;
- Storage silos;
- Heated tanks;
- Structures outside of the United States;
- Structures with conduit or piping installed between the roof deck and the roof membrane;
- Structures that omit or have an inadequate number and spacing of expansion joints or curbs. Maximum distance allowed between expansion joints is 150 lineal feet (45.72 m);
- When deck materials change direction, different kinds of deck materials abut each other or the building changes direction without an expansion joint;
- Membrane installations over thermal insulations or cover boards not approved by U.S. Ply;
- Roofs without positive drainage;
- Structures where high humidity conditions exist such as, but not limited to, breweries, car washes, canneries, creameries, foundries, food processing, laundries, textile mills, pulp and paper plants, swimming pools, shower rooms, and where similar situations exist;
- Membrane installations over thermal insulations not approved by U.S. Ply;
- Roofing over any substrate not specifically addressed in this manual;
- Lightweight insulation concrete unless venting is provided in accordance with U.S. Ply specifications;
- Reroofing over any existing roofing system containing asbestos or sprayed in place urethane foam;
- Reroofing over any existing roofing system containing moisture and/or improperly prepared surface;
- Any surface which is not readily accessible for inspection;
- Plywood decks or OSB decks less than ½" (13 mm) thickness without continuous solid end blocking;
- Waterproofing applications or any below grade application;

Part 2 – Certified Roofing Contractor Program

2.01 - General

A. U.S. Ply does not install roofing systems, nor do we own roofing contracting companies, or have any interest in companies installing roofing systems. Accordingly, U.S. Ply shall not be responsible for any roofing contractor's workmanship except as specifically covered under the terms and conditions of the U.S. Ply Roofing Guarantee.

B. U.S. Ply specifications and recommendations presume a high standard of workmanship. Specifications are general in nature and are not intended as universal instructions. They represent the best judgment of U.S. Ply based on experience to date, and require the roofing contractor to exercise prudent judgment consistent with the current state of the art and currently accepted good trade practices.

Part 3 – Inspection

3.01 - General

A. U.S. Ply will inspect only those roof installations where a guarantee is to be issued, or where special inspection services have been agreed to be purchased prior to start of roof construction, and the current charge for the guarantee or inspection services has been paid. If an inspection is requested and the job is not ready or the owner's representative is not available, an extra billing will be made at consultation fee rates.

B. U.S. Ply reserves the right to waive inspection of guarantee roofs when, in its opinion, an inspection is not necessary. In such cases, the owner or designer may request a special inspection for which an additional charge may be made.

C. Any inspections made by U.S. Ply are for its own use only and do not constitute a waiver of any of the terms and conditions of the guarantee.

D. Should a U.S. Ply Inspector observe conditions on the job site which do not conform to the requirements of this specification manual for issuance of the U.S. Ply Roof Guarantee, such conditions will be brought to the attention of the Roofing Contractor and the Owner's Representative for corrective action. U.S. Ply at its sole discretion has the right to require corrective action as it deems necessary to conform to the requirements of this specification manual and the requirements for the issuance of the U.S. Ply Roof Guarantee.

E. Inspections are not required by U.S. Ply as a condition for the issuance of the U.S. Ply Limited Material Warranty or the U.S. Ply Limited System Warranty; however, U.S. Ply reserves the right to

inspect any roof where a warranty has been requested or issued.

Part 4 – Roof Maintenance Program

4.01 - General

A. No roof should be expected to last its full life expectancy without proper maintenance. Proper roof maintenance can ensure that the roof will last the full term of the guarantee.

B. In order to ensure that a roof system will continue to perform to its fullest the following 10-point maintenance program should be followed:

1. Maintain a file for all records relating to this roof, including the U.S. Ply guarantee, invoices, inspection reports, repair and maintenance bills, original construction drawings and specifications, etc.

2. Inspect the roof at least twice a year, typically in the spring and fall. The spring inspection is best performed immediately following the end of the winter weather, so that any damages from freeze-thaw cycles, ice and other cold weather conditions can be addressed prior to spring rains. The fall inspection is best performed just before the beginning of winter weather, with any deficiencies addressed prior to ice and snow build up so that cold weather related stresses will not aggravate damaged or weakened conditions. The most common locations for damage and distress are drainage outlets, rooftop equipment, penetrations, and perimeter flashings.

3. Inspect the roof for damage after severe weather conditions such as hailstorms, heavy rains, high winds, lightning storms, etc.

4. Arrange for repairs necessary to correct non-guaranteed conditions affecting the U.S. Ply roof system. These repairs must be promptly performed by a USP® Certified Roofing Contractor. Repairs should be conducted using U.S. Ply materials where applicable and repair methods should be consistent with the type and quality of the guaranteed roof system so that repairs performed will last as long as the roof system.

5. Remove any debris, such as leaves, branches, dirt, rocks, bottles, etc. that have accumulated on the roof. Clean gutters, downspouts, scuppers, and the surrounding roof areas to ensure proper drainage.

6. Examine all metal flashings, counterflashings, expansion joints and pitch pockets for ruse, detachment, deteriorated sealant, and damage. Reattach loose metalwork. Replace sealant as necessary. Prepare and paint any rusted surface.

7. Examine masonry walls and copings for cracks, bad mortar joints, deteriorated sealant, loose masonry/coping stones, and indications of water absorption. Repair all such conditions to prevent water infiltration.

8. Examine rooftop equipment such as air conditioners, ductwork, gooseneck vents, powered ventilators, evaporator coolers, antennas, equipment screens, skylights, satellite dishes, etc. for excessive movement, spillage of coolant, condensate, oil, grease, etc. and damage to sheet metal cabinets and rubber or fabric gaskets that may allow water infiltration. Keep all rooftop equipment in good condition.

9. Examine roof coatings. Recoat any cracked, flaking, blistered or worn areas with a compatible U.S. Ply roof coating.

10. Minimize rooftop traffic. Service personnel should take care to avoid dropping tools, equipment parts, etc. on the roof surface. Service personnel should not make any penetrations of or repairs to the roof system. All work affecting the U. S. Ply roof system must be performed by a USP® Certified Roofing Contractor.

4.02 - Maintenance Agreements

A. U.S. Ply does not enter into any type of maintenance guarantee with the owner of a building. If this service is requested of the roofing manufacturer, it will only be honored by involving the roofing contractor for the length of the maintenance guarantee agreement and must be approved in writing by the U.S. Ply Technical Services Manager.

4.03 - Guarantee Roof Maintenance

A. On all guarantee roof systems, regular documented maintenance inspections must be made at least twice a year, typically fall and spring. Special inspections should be made after unusual weather conditions, i.e. heavy winds, rain, hail, earthquakes, heavy ice and snow.

B. After each inspection, existing and potential problems should be identified and reported to U.S. Ply for recommended remedies and documented repairs at the owner's cost unless they are covered under the terms and conditions of the guarantee.

C. Emergency repairs may be made upon discovery of a leak. If emergency repairs are to be made, the following procedures must be followed:

1. a determination of the cause of the leak must be made;
2. a determination of the repair procedure must be made;
3. a determination of the cost of repairs must be made;
4. U.S. Ply must be contacted immediately, by telephone 817-413-0103 or fax 940-683-3261 with the above listed items.

D. After being given the above listed items, U.S. Ply at its sole discretion may:

1. authorize emergency repairs, the cost of said repairs to be paid by U.S. Ply;
2. authorize emergency repairs, the cost of said repairs to be paid by someone other than U.S. Ply;
3. reject the emergency repair procedure.

All permanent repairs must be made following written instructions from U.S. Ply. Permanent repairs must bring the area up to the original standards as specified by U.S. Ply.

E. The roof should be inspected thoroughly to check the following conditions:

1. any deterioration of membranes or coatings, such as splits, cracks, delaminated laps, or dry cracked caulking. Take special care to avoid stepping on blisters, ridges, or wrinkles.

2. dirt and debris should be carefully removed from the roof. Special care should be taken to check for damage caused by dirt and debris. Dirt will interrupt the flow of water to drains and will support the growth of vegetation. Remove all debris from strainers over roof drains to ensure that the drains are open and there is a free flow of water through the drain.

3. shrubbery and tree limits should be trimmed away from the roof. Keep the roof free from leaves and limb build up.

4. membrane flashing at walls, curbs, around mechanical equipment, skylights, smoke vents, hatches and roof penetrations. Check for differential structure movement, expansion and contraction, or damage by foot traffic.

5. sheet metal flashing must be checked to see if it is loose. Winds may loosen metal flashing, which may in turn puncture the roof membrane.

6. water from roof top units, such as air conditioners, and higher roof areas should be discharging into appropriate drains and/or onto splash blocks, not onto the roof.

7. radio and television antennas, sign-boards, etc., should not be installed on the roof unless provided for in the original design. Any alterations, additions, penetrations, etc., to the roof after the original roof system is installed, will void the roof guarantee unless approved in writing by the U.S. Ply Manager of Technical Services.

8. wall coverings, roof coatings, and metal flashing are not included in the U.S. Ply Roof Guarantee. They are, however, a part of the total roof system and are the sole responsibility of the

owner to maintain.

9. walkways must be provided if regular traffic will be required for maintenance of rooftop equipment or other activities. Additional layers of U.S Ply membrane are recommended as designated walkways.

10. contact with exhausts from vents, such as grease, oil, solvents or other chemicals may damage the membrane. U.S. Ply shall not be liable or responsible for chemical attacks on the membrane. U.S. Ply should be contacted immediately so steps may be taken, if necessary, to protect the membrane against degradation.

11. in the event a leak is covered under the terms and conditions of the U.S. Ply Roof Guarantee, U.S. Ply must be notified immediately in writing.

12. roof coatings are a responsibility of the owner. The roof coating must be maintained, recoated if necessary, to maintain guarantee coverage.

4.04 - Coating Maintenance

All roofs with reflective coating require periodic recoating. Recoating is the responsibility of the owner. The roof coating must be maintained in satisfactory condition to maintain the guarantee coverage.

SECTION 4 – GENERAL REQUIREMENTS

This section supplements the Installation Requirements in Section 5 and is considered part of the U.S. Ply Roof Specification in Sections 6-10 and the Construction Details in Sections 11-17 to the extent they are applicable to the project design and installation.

Part 1 – Design Considerations

1.01 - General

A. U.S. Ply offers a variety of applications such as cold applied, hot aA. This manual is designed to assist and inform the design professional, contractor or owner by providing general and specific recommendations when installing U.S. Ply DuraWeld® APP, DuraFlex® SBS, DuraFlex® SBS TG, DuraSTAR® SBS, RapidGRIP® SBS, and USP® Built-Up membranes and related components that complete the roof system.

B. These recommendations have been prepared, and are offered as a guide, to assist architects, roof consultants, engineers, roofing contractors, and/or building owners who are responsible for the design of the low slope roof systems.

C. U.S. Ply offers a variety of applications such as cold applied, hot asphalt applied and torch applied systems. Always check product labels for proper application methods.

D. The choice of installation method is influenced by specific project conditions including size, height, roof slope, roof deck construction, accessibility, fire/safety/code considerations and site sensitivity and climatic conditions.

E. Not every published specification is suitable for every project condition, therefore; proper consideration must be given before selecting a particular roofing product, specification and/or installation method for each individual project.

F. The installation of an U.S. Ply system must often meet certain regulatory requirements (FMRC, UL, etc.) and the minimum design requirements of U.S. Ply. When conflicts arise, the regulatory requirements generally prevail unless the U.S. Ply product or construction exceeds the requirements of the regulatory code.

G. The roofing contractor is solely responsible for the quality of the application of the roof system.

1.02 – Design and Construction

A. U.S. Ply, as a materials supplier, is not involved in the design or construction of buildings and structures. U.S. Ply will under no circumstances accept responsibility for the performance of its products when damage to its products result from things such as improper building design, construction faults, or defects in workmanship. U.S. Ply does not manufacture roof decks and is not responsible for their performance.

B. U.S. Ply will not write any letters regarding the installation or application of a roofing system that is not to be covered by an U.S. Ply Guarantee, nor will it write a letter regarding information that is published in this Manual or other U.S. Ply product literature.

C. Unless otherwise informed in writing by the U.S. Ply Technical Services Manager, only the materials and procedures referenced in this Manual are to be employed in the application of U.S. Ply roof systems, including flashing details. The use or misuse of any materials and methods not approved by U.S. Ply is in no way the responsibility of the Company.

D. When no Guarantee is purchased, U.S. Ply will not write or sign letters:

1. Stating its representatives have examined plans, details or specifications which are acceptable to receive U.S. Ply materials, or

2. Stating that a roof has been applied according to U.S. Ply specifications or recommendations for a warrantable roof system, or

3. Orally issue any warranty or product warranty other than the published product warranty, or published roof system warranty, or

4. Inspect or comment on the application of the roof.

1.03 - Specifications

A. We recommend that design professionals supplement their specifications of the U.S. Ply roofing systems described in this manual only with specifications outlined in the most recent National Roofing Contractors Association publication. Deviation from known and accepted specifications may lead to problems with the roof system.

B. General and installation recommendations as stated in this Manual shall be considered a part of the specifications and details presented in the publication.

C. Project specifications calling for upgrading U.S. Ply specifications must be approved in writing by U.S. Ply Roofing Technical Manager.

D. U.S. Ply assumes no liability with respect to any supplemental advice, variation from the recommended methods of application or specifications, or any particular roof or roof application unless expressly set forth in writing and signed by the U.S. Ply Technical Manager.

E. U.S. Ply reserves the right to change or modify, at its discretion, and without prior notice, any of the information, requirements, specifications or policies contained herein.

1.04 - Service

U.S. Ply believes in giving the roofing professional what they want and need out of a quality product. For technical assistance please call us at 817-413-0103

U.S. Ply can provide recommendations to architects, engineers and roofing contractors for specifying, detailing, and installing U.S. Ply modified bitumen and built-up roofing systems.

1.05 – Material Handling and Storage

A. U.S. Ply roofing materials leave the factory dry and in good condition.

B. Every effort must be made to ensure the materials are stored to prevent the materials from getting wet.

C. Unload and handle all roofing and construction materials with care.

D. Examine all materials as they are received. Do not use any materials that are damaged, unlabeled or otherwise appear to be unfit for use. Materials must display legible labels, which identify the materials and applicable reference standards. Immediately notify carrier and U.S. Ply or other manufacturer of damaged, wet, or defective materials. U.S. Ply will not accept responsibility for damage to its products due to circumstances and events beyond our control; including damage in transit, storage at distribution or warehouses or on jobsites.

E. Do not expose materials to moisture in any form before, during, or after delivery to the site. Reject delivery of materials that show evidence of contact with moisture.

F. At the job site, no more material should be stored than will be used within two weeks. For periods longer than two weeks, the materials should be properly warehoused, i.e., dry, ventilated, on pallets, etc. No more material should be stored on the roof than can be used within five days. When prolonged inclement weather threatens, i.e., rainy seasons, no more roofing materials should be supplied to the rooftop than can be used within two days.

G. Store roll goods on end with selvage edge up on pallets in a clean, dry, well ventilated protected area. Take care to prevent damage to roll ends or edges. Rolls stored on their sides will flatten and stick together, rolls stored with selvage edge down will crush the edge making them very difficult to apply and seal the edges.

H. Do not double stack modified bitumen products.

I. Remove manufacturer supplied plastic covers from materials provided with such covers. Use “breathable” type covers such as canvas tarpaulins to allow venting and protection from weather and moisture. Cover and protect materials at the end of each day work. Do not remove any protective tarpaulins until immediately before material will be installed.

J. For best results, store all materials in a shaded area at the job site, even if provisions for covering and ventilation have been performed. When no shaded areas exist for storage, it is recommended to place a layer of minimum 1” thick polyisocyanurate insulation over the top of the rolls under the tarpaulins to reduce the heat on the rolls and in order to reduce the possibility of rolls sticking.

K. Should any roofing material become wet or damaged, these materials must not be used; they must be replaced.

L. During cold weather, store membrane rolls, adhesives and coatings in an area heated at a minimum temperature of 55°F (12.6°C) when the ambient temperature and wind chill factor is below 45°F (7.2°C). This will also help reduce the potential of membrane cracking during handling and installation. Install membrane rolls immediately after removal from storage to avoid membrane cooling to below 45°F (7.2°C).

M. Materials should be stored above 55°F (12.8°C), a minimum of 24 hours prior to application.

N. Store RapidGRIP® rolls in original cartons indoors on pallets, protected from the elements above 70°F (21.1°C) for a minimum of 24 hours, prior to application. If stored outside, protect from extreme heat and weather by covering with a light colored breathable opaque tarp to allow venting and protection from weather and moisture. Cover and protect materials at the end of each day’s work. Do not remove any protective tarpaulins until immediately before material will be installed. For best results, store all materials in a shaded area at the job site, even if provisions for covering and ventilation have been performed. When no shaded areas exist for storage, it is recommended to place a layer of minimum 1” thick polyisocyanurate insulation over the top of the cartons under the tarpaulins to reduce the heat on the rolls and in order to reduce the possibility of rolls sticking or experiencing difficulty in removing the poly release film backing. Rolls that are improperly stored or have been warehoused for prolonged periods of time may lose their tack or may experience difficulty removing the poly release film backing.

O. It is recommended that rolls be applied only when the ambient temperatures are above 45°F (7.2°C) for all APP modified bitumen products, 40°F (4°C) for all DuraFlex® SBS modified bitumen products, and 50°F (10.6°C) for RapidGRIP® SA and DuraSTAR® SBS modified bitumen products.

P. For RapidGRIP® SA ambient temperature must be 50°F (10.6°C) or above with a minimum of 2 hours of exposure to direct sunlight. Conditions without exposure to direct sunlight may not allow sufficient thermal heating and may affect adhesion. DO NOT STORE product in direct sunlight or on the rooftop during extremely high temperatures (over 110°F [43.3°C]) or when temperatures will fall below 50°F (10.6°C). If it is necessary to store materials on the rooftop, no more material should be stored on the roof than can be used within a few days. Keep in cartons until ready for use. If product is applied in temperatures above 110°F (43.3°C), it may result in difficulty in removing the poly release film backing from the underside. If this situation should occur, move the product to a shaded area until the product has cooled sufficiently. Once cooled, the poly release film backing can be easily removed. Note: Exposure to excessive heat may cause sagging of compound on vertical surfaces.

Q. If temperature at night is at or below 45°F (7.2°C); do not start installation first thing in the morning. The surface over which the membrane is to be installed must be allowed to warm to a temperature above 55°F (12.6°C). Membrane application to cold substrates may result in an improper bonding.

R. During installation, if surface cracking appears in the membrane, discontinue installation immediately and contact U.S. Ply Technical Services, 817-413-0103.

S. Do not apply roofing materials when the ambient temperature and wind chill factor is below 45°F (7.2°C) unless the following recommendations for application during cold weather are followed:

1. Do not throw rolls of membrane on the deck or storage surface. Sudden impact of the roll can cause cracking of the modified bitumen compound.
2. Roofing materials cannot be applied unless correct asphalt application temperatures can be maintained. Roof membrane application shall not be continued during cold weather unless asphalt temperatures at the point of application can be consistently maintained at the asphalt EVT, or 425°F (218°C), whichever is greater for SBS membranes.
3. Mopped asphalt tends to congeal rapidly and lose its adhesive characteristics in cold weather, so extra care must be taken to set insulation or roofing quickly. Use the minimum insulation board size available.
4. The use of an insulated, two-pipe circulating pumping system for asphalt is recommended for minimizing excessive application of asphalt in cold weather and for reducing use of heating fuel.
5. Do not overheat the bitumen above the Flash Point or above the Finished Blowing Temperature for prolonged periods, to try to offset rapid chilling.
6. Keep the insulation or roofing roll close behind the mop. Mop no farther than 5’ (in front of the roll and broom all glass felts immediately after embedment.
7. Brooming glass felts is critical during cold weather and is mandatory for roofing applications warranted by U.S. Ply.
8. When water in any form is present on the deck, application procedures must be suspended until the deck has dried. Any moisture present at the time the roofing is applied may result in poor adhesion and blistering of the membrane.
9. Discontinue work if proper bitumen application temperatures cannot be consistently maintained or materials cannot be securely attached to their substrate.
10. Do not overheat APP membranes to compensate for cold temperatures. Unroll the membrane slowly to ensure proper flow of the compound. Also adjust amount of heat coming from propane torch accordingly.
11. Do not install cold adhesive in temperatures below 45°F (7.2°C).
12. Do not install coatings in temperatures below 55°F (12.6°C).

T. In the unlikely event that obviously defective or damaged material reaches the job site or damage to the material occurs from improper storage on the job site, it is the responsibility of the roofing contractor not to install this material. U.S. Ply should be notified immediately about material that has apparent manufacturing defects. Installation of defective material can result in additional costs above the cost of supplying replacement material. If the roofing contractor chooses to install material with apparent defects, this added cost is not the responsibility of U.S. Ply.

1.06 - Building Code

A. The architect, contractor, engineer and/or specifier should be familiar with the most current local building and energy codes and design guide requirements affecting the project where installation is to occur. Contractor should obtain any permits necessary before work commences.

B. Many new code requirements are in effect which are reflected in the most current International Building Code (IBC) or Uniform

Building Code (UBC). Such changes include thermal insulation requirements, wind uplift requirements, and changes to ANSI/SPRI ES-1 regarding roof perimeter edges, parapets, wall construction and flashings. Applicable code versions in effect vary from state to state and city to city.

1.07 – Fire Resistance

A. The following are common fire codes and approvals typically used in conjunction with roofing systems:

1. Primary testing is based on ANSI/UL 790, which is similar to and meets all criteria of ASTM E-108. Tests for all decks measure flame spread on exterior surface of roof assembly.
2. Additional testing for combustible decks is also based on ANSI/UL 790. This measures burn-through resistance from exterior through roof system-roof deck assembly.
3. Ratings provided in Underwriters Laboratories Roofing Materials and Systems Directory as “Class A”, “Class B”, and “Class C” assemblies. Class A is the superior rating.
4. Roof deck-roof system assemblies must be constructed in exact accordance with the components listed for each rated assembly. No material substitutions are allowed.
5. UL ratings are required by building codes for most building applications.
6. Testing based on ANSI/UL 253, which is similar to ASTM E-119. This measures burn-through resistance from interior through exterior of ceiling-roof deck-roof system assembly.
7. Ratings provided in Underwriters Laboratories Fire Resistance Directory as “P-Number” assemblies.
8. Ceiling-roof deck-roof system assemblies must be constructed in exact accordance with the components listed for each P-Number assembly. No material substitutions are allowed.
9. Hourly ratings are required by building codes for special building applications, and are usually not specified if not specifically required by code.
10. Testing based on ASTM E-108. Measures flame spread on exterior surface of roof assembly.
11. Ratings provided in Factory Mutual Approval guide, typically as part of a comprehensive roof system approval that also includes wind and hail resistance as other major test criteria.
12. Roof deck-roof system assemblies must be constructed in exact accordance with the components listed for each rated assembly. No material substitutions are allowed.

B. ASTM E-108 Class ratings are required by building codes for most building applications, and are provided as part of an overall roof system approval.

C. Current U.S. Ply listings are found in UL File directory R11662 in the appropriate UL directory to verify roof assembly requirements for specific fire ratings.

1.08 – Wind Resistance

A. Resistance by the roofing system to wind forces is an obvious requirement. Ideally, roofing systems should be capable of resisting the forces generated by the maximum anticipated wind speed for a specific building. It is widely accepted method for specifying wind performance is to require a system rating meeting or exceeding the design pressures calculated in accordance with ASCE-7 or Factory Mutual.

B. In general, additional securement of the roofing insulation and/or membrane can accommodate most requirements. However, each building is unique and certain conditions and factors may require additional design and implementation to meet the necessary uplift design. This responsibility should typically be undertaken by the project architect, design engineer or roofing consultant. For technical assistance please call us at 817-413-0103

Part 2 – Roof Decks

2.01 - General

A. U.S. Ply does not design or manufacture structural roof decks and is not responsible for their selection, design, and/or performance. The responsibility for roof deck system design, including roofing system selection, vapor retarder, thermal insulation, slope and drainage layout and expansion joints, lies with the architect, roof consultant, engineer, owner or contractor and not with the roofing materials manufacturer.

B. Acceptance of the deck for application of the roof system is the responsibility of the architect and/or designer.

C. The minimum roof deck construction and deck surface preparation recommendations which follow are provided as a supplementary guide for the roof deck designer and erector.

D. New or unusual decks and substrates or any deck type not included in this manual must be approved in writing by U.S. Ply Technical Services to achieve a specification eligible to receive an USP® Warranty.

E. Decks must be adequately smooth and level to provide support and maximum contact surface for roofing materials. The surface of the roof deck must be dry (free of moisture in any form), firm, smooth, clean, free of debris, sharp projections and depressions.

F. Remove electrical conduits, bolts, and other small items from the surface of the roof deck as these areas cannot be properly insulated and roofed.

G. All depressions, holes, deformations, etc. shall be made smooth prior to the roofing application.

H. All decks must be properly designed and constructed in accordance with the deck manufacturer’s requirements and specifications, must be installed by applicators approved by deck manufacturer, must be able to support and secure the U.S. Ply Roof System, and must be properly related to the rest of the building.

I. None of the foregoing factors is the responsibility of U.S. Ply which under no circumstances will assume any such responsibility.

J. Complete all openings or projections (all pipes, vents, ducts, stacks and openings, etc.) through the deck prior to roof system installation. No projections shall be constructed through the flashing cant and projections shall be located a minimum 18” (46 cm) from the intersection of the cant and roof deck.

K. Do not install electrical conduit or piping immediately above the roof deck. Roof systems cannot be properly installed and adhered around and/or over conduit.

L. All roof decks shall be designed and constructed:

1. To support maximum loads which may be imposed during and after construction without excessive deflection (1/240 of the span at mid span is the rule for maximum allowable deflection);
2. To provide a minimum ¼” (6 mm) per-foot slope and/or designed so that ponding water dissipates within a 48 hour period.
3. Decks should be designed and constructed to resist wind uplift forces anticipated in the area, and provide satisfactory base to which the roofing can be attached.
4. Interior drains should be sumped below roof level to allow immediate water runoff.
5. Provisions to prevent asphalt drippings must be given

consideration where joints, cracks, or holes occur.

6. On slopes ¾" per foot (6 cm per meter) or greater, provisions must be made for insulation stops and/or back nailing of built-up felts or SBS membranes. Insulation stops and/or backing nailing must be used on slopes greater than 1" (8 cm per meter) when adhered single ply membranes are used;
7. Use with suitable expansion joints to accommodate structural expansion and contraction. Expansion joints must extend through the structural system to be acceptable, and must separate adjoining units, or additions. (See also Expansion Joints, this section).
8. Deck materials must be fastened to supporting members by clips, welding or other mechanical devices to prevent lateral and vertical movement of the elements;
9. To be consistent with applicable trade associations, as well as any code or insurance requirements.

M. The roof decks mentioned in this section are those most widely used in the United States. Many decks are used on a regional basis or are not commonly used. Contact U.S. Ply at 817-413-0103, for deck types or conditions not addressed in this Manual.

N. Refer to Section 5, Part 3 for additional information relative to installation of roof systems over various roof decks.

2.02 - Steel Decks

A. Steel decks should be a minimum 22 gauge (0.8 mm), of configurations specified by the current Steel Deck Institute Manual, and comply with the gauge and span requirements as set forth by the deck manufacturer, and installed in accordance with all other industry standards and current Factory Mutual Loss Prevention Data Sheet 1-28.

B. Steel deck sections must be securely fastened or welded as applicable in accordance with deck manufacturer's requirements to meet specified wind load criteria. All fasteners and welds should be checked before installation of roofing system to ensure functional ability.

C. Wood nailers of equivalent thickness to the roof insulation must be provided at perimeters and projection openings to act as an insulation stop and to provide nail holding capability for the nailing flanges of metal flashing.

D. Rigid roof insulation boards and when applicable the base sheet must be uniformly secured to the steel deck with approved mechanical fasteners. Contact U.S. Ply 817-413-0103 for approval of any other method.

E. When mechanically attaching insulation, steel decks should have a minimum fastener pullout strength of 300 lb (1.8 kN) per fastener. Higher fastener withdrawal resistance values and denser patterns may be necessary to achieve higher uplift ratings. Decks which cannot provide the minimum withdrawal resistance are not suitable to receive a roof system.

2.03 Poured Structural Concrete

A. The deck should be smooth, level and free from moisture or frost. All sharp ridges or irregularities should be leveled prior to application of roofing materials.

B. Fill depression with cement grout or other deck manufacturer approved material. Treat cracks greater than 1/8" (3 mm) in accordance with the deck manufacturer's recommendations.

C. Newly poured decks should be properly cured prior to application of the roofing system. Twenty-eight (28) days is normally required by deck manufacturer for proper curing. Curing agents shall be checked for compatibility with roofing materials.

D. Concrete deck surfaces should be primed with asphalt primer, ASTM D 41, at a rate of 1 gal/square (0.4 L/m^2) to assure proper adhesion of the roofing membrane or roof insulation. Asphalt primer should be allowed to completely dry before beginning installation of the roof system.

E. Sumps should be provided in the casting of the deck at the location of roof drains. When insulation is used, the thickness of roof insulation should be reduced in a tapered profile around the roof drains to provide positive drainage.

F. Decks with broomed or textured finishes are not acceptable if a membrane system is to be applied directly to the roof deck.

G. Wood nailers should be installed into the deck to provide for securement of the roofing membrane flashings at perimeters, penetrations and other deck openings.

H. One way moisture relief vents are recommended over this type of deck.

I. When mechanically attaching insulation, structural concrete roof decks should have a minimum fastener pullout of 300 lb (1.8 kN) per fastener. Higher fastener withdrawal resistance values and denser patterns may be necessary to achieve higher uplift ratings. Decks which cannot provide the minimum withdrawal resistance are not suitable to receive a roof system.

2.04 - Precast Concrete Decks

A. The deck should be smooth, level and free from moisture or frost. All sharp ridges or irregularities should be leveled prior to application of roofing materials.

B. All necessary precautions should be taken to avoid entrapment of moisture under the roofing system. If the deck is wet, then the deck must be allowed to dry.

C. Do not seal joints between slabs; leave open to permit venting and drying of roof fill from below. If joints are sealed make other provisions for venting.

D. All severely deformed panels should be replaced. Fill depression with cement grout or other deck manufacturer approved material. Treat cracks greater than 1/8" (3 mm) in accordance with the deck manufacturer's recommendations

E. Newly poured decks should be properly cured prior to application of the roofing system. Twenty-eight (28) days is normally required by deck manufacturer for proper curing. Curing agents shall be checked for compatibility with roofing materials.

F. Precast concrete deck surfaces should be primed with asphalt primer, ASTM D 41, at a rate of 1 gal/square (0.4 L/m^2) to assure proper adhesion of the roofing membrane or roof insulation. Asphalt primer should be allowed to completely dry before beginning installation of the roof system.

G. If deck is topped with poured gypsum, see also this Section, for general recommendations relative to the use of poured gypsum.

H. If deck is topped with lightweight concrete or cellular concrete, see also this Section, for general recommendations relative to the use of lightweight concrete or cellular concrete.

2.05 - Pre-stressed Concrete

A. This type of deck should not permit ponding water. Offsets between panels should not exceed 1/8".

B. Variations in camber and thickness of pre-stressed concrete members may make securement of the roof system difficult. Grouting at joints has often proven unsatisfactory in attempting to compensate for uneven deck surfaces. Surfaces which are uneven are deemed unacceptable.

C. A minimum 2" (5 cm) fill is recommended to be installed over all pre-stressed concrete decks prior to installation of the roof system and/or insulation.

D. The deck should be smooth, level and free from moisture or frost. All sharp ridges or irregularities should be leveled prior to application of roofing materials.

E. All necessary precautions should be taken to avoid entrapment of moisture under the roofing system. If the deck is wet, then the deck must be allowed to dry.

F. Newly poured decks should be properly cured prior to application of the roofing system. Twenty-eight (28) days is normally required by deck manufacturer for proper curing. Curing agents shall be checked for compatibility with roofing materials.

G. If deck is topped with poured gypsum, see also this Section, for general recommendations relative to the use of poured gypsum.

H. If deck is topped with lightweight concrete or cellular concrete, see also this Section, for general recommendations relative to the use of lightweight concrete or cellular concrete.

2.06 - Lightweight and Cellular Concrete Decks

A. Lightweight insulating concrete decks contain a large percentage of moisture. All necessary precautions must be taken to avoid entrapment of moisture under the roofing system; including but not limited to venting at the bottom and top side of the deck, as well as at the perimeter and all penetrations.

B. The following minimum guidelines are recommended by U.S. Ply when installing a roof system over Lightweight or Cellular Concrete Decks:

1. Lightweight or cellular concrete decks should be installed in strict accordance with the deck manufacturer's requirements and specifications.
2. Lightweight and cellular concrete decks should have a minimum compressive strength of 125 psi (8.79 kg/m^2) and density of 22 pcf (352 kg/m^2). Decks with compressive strengths less than 125 psi are unacceptable.
3. A minimum top surfacing thickness of 2" (5 cm) fill is recommended.
4. During curing or application the lightweight or cellular concrete decks should not be subjected to rain or temperatures that are below 40°F (4.4°C). Lightweight or cellular concrete decks that have been frozen before they are cured are not acceptable to receive a roof system and must be must be replaced.
5. Drying time for decks vary. Follow the deck manufacturer's recommended drying time.
6. Aggregate based lightweight concrete decks require bottom side venting as provided by slotted galvanized steel decks. Solid steel decking and structural concrete decks are not acceptable to receive an aggregate based lightweight insulating concrete mix.
7. Cellular lightweight insulating concrete decks can be installed over non slotted, galvanized steel decking or structural concrete; it does not require a venting substrate.
8. Lightweight or cellular concrete decks must be smooth, and be free from deflections and ridges. Fill depressions with a material approved by the deck manufacturer.

When mechanically attaching insulation through lightweight insulating concrete, into a structural deck, a fastener withdrawal resistance of 300 lb (1.8 kN) per fastener is required.

C. Decks should provide a minimum 40 lbs fastener withdrawal resistance for the selected approved mechanical base ply fastener at the time the roof system is installed. This is based on a design value of 60 psf using a pattern of 9/18/18.

D. Higher fastener withdrawal resistance values and denser patterns may be necessary to achieve uplift ratings greater than 60 psf. Decks which cannot provide the minimum withdrawal resistance are not suitable to receive a roof system.

E. Deck manufacturer and authorized applicator should provide all parties concerned with a letter of certification stating the deck complies with the deck manufacturer's requirements and specifications.

F. Roof vents (one for each 10 squares or 92.9m^2) must be used. Pressure relief vents must be of a one-way design. If roof insulation is used, vent openings should extend through the entire roof system and insulation to the deck or fill surface.

G. Individual lightweight and cellular concrete manufacturer's standards apply when their specifications exceed the referenced U.S. Ply minimum compressive strength and density requirements.

H. Mechanically fasten venting base or inverted cap sheet to newly poured aggregated based lightweight insulating concrete decks prior to installing insulation or roofing membrane. On cellular lightweight concrete decks, a glass base sheet can be used in lieu of a venting base or an inverted cap sheet.

I. On existing lightweight or cellular concrete decks, insulation or a base sheet may be mechanically attached to the deck provided it is dry.

J. Do not attach insulation directly to newly poured lightweight or cellular concrete decks. Do not solid mop the base ply of the roofing system to a lightweight or cellular concrete deck.

2.07 - Poured Gypsum Decks

A. Poured-in-place insulating gypsum decks contain a large percentage of moisture. All necessary precautions must be taken to avoid entrapment of moisture under the roofing system; including but not limited to venting at the bottom and top side of the deck, as well as at the perimeter and all penetrations.

B. The following minimum guidelines are recommended by U.S. Ply when installing a roof system over Poured Gypsum Decks:

1. Gypsum concrete decks must be installed in strict accordance with the deck manufacturer's recommendations and specifications.
2. A minimum top surfacing thickness of 2" (5 cm) fill is recommended.
3. During curing or application the lightweight or cellular concrete decks should not be subjected to rain or temperatures that are below 40°F (4.4°C). Lightweight or cellular concrete decks that have been frozen before they are cured are not acceptable to receive a roof system and must be must be replaced.
4. Drying time for decks vary. Follow the deck manufacturer's recommended drying time.
5. Gypsum concrete decks must be smooth, and be free from deflections and ridges. Fill depressions with a material approved by the deck manufacturer.
6. When attaching insulation to a gypsum roof deck, a fastener pullout of 300 lb (1.8 kN) per PlyFast® Gyptek Fastener is required.
7. Decks should provide a minimum 40 lbs fastener withdrawal resistance for the selected approved mechanical base ply fastener at the time the roof system is installed. This is based on a design value of 60 psf using a pattern of 9/18/18. Higher fastener withdrawal resistance values and denser patterns may be necessary to achieve uplift ratings greater than 60 psf. Decks which cannot provide the minimum withdrawal resistance are not suitable to receive a roof system.

C. Deck manufacturer and authorized applicator should provide all parties concerned with a letter of certification stating the deck complies with the deck manufacturer's requirements and specifications.

D. Roof vents (one for each 10 squares or 92.9m^2) must be used. Pressure relief vents must be of a one-way design. If roof insulation

is used, vent openings should extend through the entire roof system and insulation to the deck or fill surface.

E. Mechanically fasten venting base or inverted cap sheet to newly poured gypsum decks prior to installing insulation or roofing membrane.

F. On existing gypsum decks, insulation or a base sheet may be mechanically attached to the deck provided it is dry.

G. Do not attach insulation directly to newly poured gypsum decks. Do not apply any roofing system by hot asphalt, cold adhesive or torch welding direct to a poured gypsum deck.

2.08 - Wood Plank Decks

A. The following minimum guidelines are recommended by U.S. Ply when installing a roof system over wood decks:

1. Lumber should be a minimum of 4" (10 cm) and a maximum of 8" (20 cm) wide and a minimum of 3/4" (18.7 mm) thick (nominal).
2. Any knotholes or large cracks in excess of ¼" (6 mm) should be covered with strips of sheet metal nailed firmly in place.
3. Lumber boards must be securely fastened to the joists or trusses and must be firmly supported on at each end.

B. When mechanically attaching insulation or base sheets, wood decks are required to have a fastener withdrawal resistance of 300 lb (1.8 kN) per fastener.

C. When nailing a base sheet, wood decks are required to have a fastener withdrawal resistance of 40 lb (0.24 kN) for cap nails per fastener.

D. Higher fastener withdrawal resistance values and denser patterns may be necessary to achieve higher uplift ratings. Decks which cannot provide the minimum withdrawal resistance are not suitable to receive a roof system.

2.09 - Plywood Decks

A. The following minimum guidelines are recommended by U.S. Ply when installing a roof system over Plywood Decks:

1. Each panel of soft plywood shall be identified with APA grade trademarks owned by the American Plywood Association and shall meet the requirements of Product Standard PS-1 for soft plywood construction.
2. All plywood which has any edge or surface permanently exposed to the weather shall be of the exterior type.
3. Install with face grain across supports, except where noted. Suitable edge supports shall be provided where indicated on drawings (or in recommendations of the American Plywood Association) by use of ply clips, tongue and groove panels or lumber blocking between joists.
4. Exterior grade plywood should be used for commercial deck construction.
5. Minimum recommended deck thickness is 15/32" (12 mm), over joists not greater than 24" o.c. (61 cm).
6. Must be installed so that all four sides of each plywood panel bear on and are secured to joists and cross blocking; the plywood must be secured in accordance with the American Plywood Association (APA) recommendations. In the absence of cross-blocking, two-ply clips per 24" max joist spacing, should be used.
7. Wood decks must be kept dry prior to the application of the roofing system. Store on raised skids or platforms, and roofed promptly after installation.
8. Panels must be installed with a 1/8" to 1/4" (3mm - 6mm) gap between panels and must match vertically at joints to within 1/8" (3mm).
9. Knotholes or large cracks in excess of ¼" (6mm) should be covered with securely nailed sheet metal.

B. Only wolmanized lumber should be used for blocking. The use of petroleum treated lumber is not acceptable.

C. When mechanically attaching insulation or base sheets, plywood decks should have a fastener withdrawal resistance of 300 lb (1.8 kN) per fastener.

D. When nailing a base sheet, wood decks are required to have a fastener withdrawal resistance of 40 lb (0.24 kN) for cap nails per fastener.

E. Higher fastener withdrawal resistance values and denser patterns may be necessary to achieve higher uplift ratings. Decks which cannot provide the minimum withdrawal resistance are not suitable to receive a roof system.

F. Preservatives or fire retardants used to treat decking must be compatible with roofing materials.

G. Buildings should be heated gradually after roof system installation is completed.

2.10 - Oriented Strand Board (OSB) – Waferboard

A. The following minimum guidelines are recommended by U.S. Ply when installing a roof system over oriented strand board (OSB) decks:

1. Use only OSB decks with the Structural 1 – APA rating and are a minimum thickness of 7/16" (10.5mm), over joists not greater than 24" o.c. (61 cm).
2. Install with face grain across supports, except where noted. Suitable edge supports shall be provided where indicated on drawings (or in recommendations of the American Plywood Association) by use of ply clips, tongue and groove panels or lumber blocking between joists.
3. Exterior grade plywood should be used for commercial deck construction.
4. Must be installed so that all four sides of each plywood panel bear on and are secured to joists and cross blocking; the plywood must be secured in accordance with the American Plywood Association (APA) recommendations. In the absence of cross-blocking, two-ply clips per 24" max joist spacing, should be used.
5. OSB decks must be kept dry prior to the application of the roofing system. Store on raised skids or platforms, and roofed promptly after installation.
6. Panels must be installed with a 1/8" to 1/4" (3mm - 6mm) gap between panels and must match vertically at joints to within 1/8" (3mm).

B. When mechanically attaching insulation or base sheets, OSB decks should have a fastener withdrawal resistance of 300 lb (1.8 kN) per fastener.

C. When nailing a base sheet, wood decks are required to have a fastener withdrawal resistance of 40 lb (0.24 kN) for cap nails per fastener.

D. Higher fastener withdrawal resistance values and denser patterns may be necessary to achieve higher uplift ratings. Decks which cannot provide the minimum withdrawal resistance are not suitable to receive a roof system.

2.11 - Structural Wood Fiber Decks

A. The following minimum guidelines are recommended by U.S. Ply when installing a roof system over Structural Wood Fiber Decks:

1. Use only structural wood fiber decks that have a minimum 2" (51 mm) thickness.
2. Decks must be a minimum design load as recommended by

the deck manufacturer.

3. Anchor all slabs against uplift and lateral movement.
4. Joints must be level; deck erector must correct any irregularities with a screed coat material as recommended by deck manufacturer.
5. Decks must be smooth, and be free from deflections and ridges. Fill depressions with a material approved by the deck manufacturer.
6. Remove decking which becomes wet or is deformed and replace with new decking.
7. Cover decking with roofing immediately to avoid potential water damage to deck.
8. Do not install decks over high humidity occupancies.

B. When mechanically attaching insulation, structural wood fiber decks should have a fastener withdrawal resistance of 300 lb (1.8 kN) for each fastener.

C. When nailing a base sheet, structural wood fiber decks are required to have a fastener pullout of 40 lb (0.24 kN) for PlyFast® Double Lock Nail per fastener.

D. Higher fastener withdrawal resistance values and denser patterns may be necessary to achieve higher uplift ratings. Decks which cannot provide the minimum withdrawal resistance are not suitable to receive a roof system.

Part 3 – Roof Drainage

3.01 - General

A. Proper and adequate drainage is required and is the responsibility of those involved in the design and construction of the roof substrate and supporting structure. U.S. Ply recommends at least ¼" per ft. slope with proper grading to and placement of outlets. U.S. Ply defines "ponding" as water that does not drain or dissipate from the roof surface within 48 hours after precipitation ends. Ponding can also result from other water sources, including improperly piped air conditioning condensate and steam condensate lines.

B. A roof will drain free of water only as rapidly as drains and leaders will allow.

C. Several structural and roof problems can occur as a result of improper drainage and standing water. Although not an exhaustive list, the following are some typical problems that can occur:

1. Standing water can result in deck deflection and possible structural damage.

2. Water on the roof can promote vegetation, fungi and bacterial growth.

3. In the event of an opening in the roof membrane, standing water can significantly worsen damage to the roof system, the building itself, and interior contents by providing a reservoir of water ready to gravitate through the membrane opening.

D. To prevent premature deterioration of roof membrane and flashing assemblies. The following design elements should be considered:

1. Provide structural slope in the deck assembly.

2. Install a tapered insulation system. For recommendations on tapered roof insulation to provide slope for drainage, contact the U.S. Ply Technical Hotline at: **(817) 413-0103**

3. Install tapered lightweight insulating concrete.

4. Add additional drains.

5. Use crickets, saddles and sumped interior roof drains.

E. When interior roof drains are used, they should be properly located and sufficient in number and size to drain all accumulated water from the surface of the roof in accordance with the local code. Special consideration should be given to the location of the drains and/or scuppers and gutters to insure their usefulness when deflection of the decking may reasonably be expected to occur after its installation.

F. Roof drains designed to lengthen the period of drainage by metering the flow of water to storm sewers and constructing drainage of the roof in conformance with certain codes are at best hazardous to the overall performance of a roofing system. Anything that reduces good, immediate drainage of a roof presents a hazard.

G. The size and locations of drains will vary with the slope of the deck, the roof surface (smooth or gravel), and the intensity of the possible maximum rainfall in the areas in which the building is to be erected. Many roof problems can be traced to improper spacing of drains, insufficient size of drains and leaders, inadequate gutter and valley drainage, and lack of scuppers and overflow drains.

H. Drains should be appropriate size to allow for rapid removal of water according to local codes, maximum expected rainfall and ANSI requirements.

I. Always recess drain heads below roof surface level to allow immediate water runoff. Drains and drain flashing shall be set a minimum of 1" (25 mm) below the roof level and located at least 18" (46 cm) away from all walls. Where the building has parapet walls, it is often necessary to form crickets with a definite high point between proposed drains and a definite low point at the drain location. Tapered insulation should be used at all drain edges to sump drains.

J. Drains should not be less than 3" (2.6 cm) in diameter. When the location of drains has been determined, the actual roof areas draining to each outlet should be computed.

K. Drains should be located to avoid forcing water to flow beyond a sharp turn. Intermediate drains should be located at not over 75 ft. (22.86 m) to 50 ft. (15.24 m) intervals for steep roofs.

L. Outlets should always be provided with suitable strainers to prevent debris from clogging the outlet or leader. Strainers should be made of a corrosion resistant material.

M. Leaders: The cross sectional area of a leader should be uniform for its entire length. Tapered leaders may cause choking or backing up of water flow. The cross sectional area of the leader should be no less than the cross sectional area of the drain outlet.

Provisions should be made to prevent leaders from freezing below the roof line.

N. Overflows are a safety factor and should be installed above every drain/scupper.

When they are eliminated to satisfy architectural requirements, if allowable by local building codes, adequate provisions should be made to increase the size of the drains and leaders. Overflows should be installed in accordance with local building codes and below the counter flashing.

O. Gutters should be larger, never smaller, than the leader. When leaders are spaced more than 50 ft. (15.24 m) apart, the size of the gutter should be increased 1" (25 mm) for every additional 20 ft. (6.10 m) between leaders. When leaders are spaced less than 50 ft. (15.24 m) apart, a gutter the same size as the leader can be used providing the leader is not less than 4" (10 cm).

P. The outside edge of the gutter should be at least ¾" (19 mm) lower than the roof level or eave so that water will not back up or stand on the roof in case the leader becomes clogged.

Q. Uncontrolled roof drainage at the perimeter, over the roof edge, can lead to damage and discoloration of the exterior building wall.

R. Control roof drainage within individual roof areas to accommodate drainage flow.

S. Control roof drainage from higher roof levels by collecting drainage from drip edge conditions in gutters. This allows redirection of drainage towards drain points of lower roof levels. Install splash blocks beneath all downspouts.

Part 4 – Vapor Retarders

4.01 General

A. U.S. Ply does not review or calculate dew point analyses and therefore, does not accept responsibility for damage due to recurrence rate or location of the dew point. Although not all projects require a vapor retarder, a design review should be considered for all projects.

B. The decision to use or not to use a vapor retarder rests with the designer, architect or engineer after careful consideration of design and environmental criteria, including relative interior humidity, interior temperature, type of construction, building occupancy and exterior cold weather temperature variables.

C. The inclusion of an air barrier or vapor retarder may affect the Underwriter Laboratory or Factory Mutual rating including the attachment of the U.S. Ply roof system.

D. A vapor retarder may be necessary when high interior humidity conditions will likely require the use of a vapor retarder except when located in the most southern climates. High interior relative humidity is present in swimming pools, food processing, laundry facilities, paper mills, breweries, foundries and bottling plants. In these cases vapor drive may form a dew point under the roof membrane or in the insulation.

E. In these types of environments the vapor drive can be substantial and the potential exists for moisture accumulation within the roof assembly if an effective vapor retarder is not included in the roof assembly. This movement is reversed in some air-conditioned buildings in humid summer conditions.

F. Vapor retarders are installed to prevent several types of roof assembly failures:

1. Wet insulation becomes a conductor of heat rather than an insulator and reduces insulation R-value.
2. Moisture promotes the deterioration of the roof membrane, insulation, structural decks, and associated building components.
3. Moisture promotes delamination of roof components by freeze/thaw cycling, eventually causing blisters and delamination when vapor pressure results from solar heating.

G. The following is a partial list of situations which can influence the need for a vapor retarder:

1. For projects where there is a significant difference in vapor pressure between building interior and exterior, the volume of water vapor flow is much greater, and control of water vapor transfer into and through a roof system becomes an important consideration. Without adequate control provisions, a vapor retarder, the roof insulation can become saturated with water, with a corresponding reduction in insulation thermal performance. Structural deck damage and/or condensation into the building interior may also occur.
2. Building code requirements.
3. Construction generated moisture, particularly during winter construction.

H. A vapor retarder's effectiveness generally depends upon the following factors:

1. The vapor retarder's perm (permeance) rating which should be as close to zero as possible.
2. Location of the vapor retarder within the system.
3. The integrity of the vapor retarder's seals at perimeters and penetrations.
4. The integrity of the vapor retarder's membrane after other tradesmen finish their projects.

I. Construction roof traffic should be restricted to prevent damage to the vapor retarder. In the event damage does occur, repair the vapor retarder damage with the same roof components and quantities as specified for the vapor retarder installation.

J. There are four generally accepted agencies that may help in determining the need for a vapor retarder. They are:

- National Roofing Contractors Association (NRCA) guidelines
- U. S. Army Corp of Engineering Cold Regions Research and Engineering Laboratory (CRREL) guidelines
- American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE)
- Oak Ridge National Laboratory (ORNL)

K. These generalizations are not intended to substitute for actual vapor flow calculations based upon specific building and climatic conditions.

L. In determining the need for a vapor retarder for most typical conditions, the exterior winter temperature and the interior winter relative humidity are the most critical factors.

M. Temperature information is readily available from the National Weather Service.

N. Relative humidity information is typically available from the building HVAC design professional or the building operations manager. Relative humidity can also be field measured.

O. Vapor retarders are intended to be installed as close to the warm side of the roof assembly as possible. Normally, this places the vapor retarder directly on the structural deck or directly over a minimal layer of insulation. Note: the vapor retarder is not considered a part of the U.S. Ply system.

4.02 - The Case for the Use of a Vapor Retarder:

A. A vapor retarder can protect the long term thermal resistance of insulation sandwiched between the vapor retarder and the membrane.

B. A vapor retarder provides a good safeguard against vapor migration in case a building's use changes from a "dry" use to a "wet" use.

4.03 - The Case Against the Use of a Vapor Retarder:

A. The vapor retarder, together with the roofing membrane, may seal within the roof sandwich entrapped moisture that can eventually destroy the insulation, help split or wrinkle the membrane or, in gaseous form, blister it.

B. In the event of a roof leak through the membrane, the vapor retarder will trap the water in the insulation and release it through punctures, breaks, or poor seals in the vapor retarder that may be some lateral distance from the roof leak, thus making leak discovery more difficult. A large area of insulation may be saturated before the punctured roof membrane can be repaired.

C. A vapor retarder is a disadvantage in summer, when vapor migration is generally downward through the roof (hot, humid air can infiltrate the roofing sandwich through the vents, or through diffusion through the roof membrane; it may condense on the vapor retarder itself).

D. A vapor retarder may be the weakest horizontal shear plane in the roofing sandwich. Failure at the vapor retarder/insulation interface can result in splitting of the membrane. At the least, the vapor retarder introduces an additional component whose shear resistance may be critical to the membrane's integrity

E. Air leakage into the roof system at perimeter and penetrations will significantly reduce the effectiveness of the vapor retarder by allowing moist air to penetrate into the roof assembly where it can condense and cause roof deterioration.

F. A sufficient amount of insulation must be installed over the vapor retarder so as to raise the dew point location above the level of the vapor retarder.

G. Vapor retarders shall be completely sealed at all perimeter and penetration locations.

H. Sealing methods shall be selected in accordance with type of vapor retarder being installed.

Part 5 – Roofing Asphalt

5.01 - General

A. U.S. Ply systems require the use of ASTM D312, Type III or Type IV asphalt for the application of roof insulation, roof tape, base, ply, cap membranes, and surfaced aggregate for slopes as referenced in the table below.

B. Specification and use of low softening point bitumen increases the opportunity for bitumen drippage and membrane slippage. The designer and roofing contractor must take any necessary precautions to prevent damage to the structure or interior due to bitumen drippage.

ASTM D312 Type	Asphalt Softening Point	Maximum Slope
III	185° - 205°F	Up to ½" per foot (4.2 cm/m)
IV	210° - 225°F	Up to 3" per foot (25 cm/m)

5.02 - Asphalt Grades for Standard Built-Up Roofing Felts

Steep or Special Steep grade (Type III or IV) asphalt or SEBS Type III or IV asphalt can be used for base, interply, cap sheet and membrane flashing mopping on slopes ¾" per foot (6.2 cm per meter) and under. Type IV must be used on all slopes greater than ¾" per foot (6.2 cm per meter).

5.03 - Asphalt Grades for SBS Modified Bitumen Membrane/ Felts

Steep or Special Steep grade (Type III or IV) asphalt or SEBS Type III or IV asphalt can be used for SBS base, SBS interply, SBS cap sheet and SBS membrane flashing mopping on slopes ½" per foot (4 cm per meter) and under. Type IV must be used on all slopes greater than ½" per foot (4 cm per meter).

5.04 - Asphalt Identification

A. The Roofing Systems Technical Committee, a joint committee of the Asphalt Roofing Manufacturer's Association (ARMA) and the National Roofing Contractors' Association (NRCA), endorses and recommends the following identification system for mopping grade asphalt:

1. Softening Point (SP): Is the temperature at which a roofing asphalt softens or becomes "viscous", as determined in accordance with ASTM D 36.

2. Flash Point (FP): The temperature at which asphalt will ignite, spontaneously or in the presence of a flame, as determined by ASTM D 92.

3. Equiviscous Temperature (EVT) Range: The temperature at which an asphalt achieves its optimum viscosity for application of a built-up roof is the equiviscous temperature. Asphalt at the point of application should be at the EVT +/- 25°F (-13.9). The EVT for each asphalt shipment should be requested from the asphalt manufacturer. A viscosity of 125 centipose should be achieved for hand mopping, and 75 centipose for mechanical spreaders.

For SBS modified bitumen membranes, the asphalt temperature at the point of application should be at its EVT or 425°F (218.3°C), whichever is greater.

4. The Finished Blowing Temperature (FBT) is the minimum temperature at which the blowing of the asphalt has been completed during its manufacture. Heating the asphalt for an extended period of time above this temperature can result in lowering the softening point of the asphalt as well as changing other characteristics of the asphalt.

Part 6 – Insulation

6.01 - General

A. The function of roof insulation is to provide insulating value and it has economic benefits: increased comfort, smaller heating/cooling equipment requirements, lower operating expenses, and a reduced consumption of expensive fuel supplies. Insulation must also provide a smooth, dry, clean and firmly attached substrate to receive the roof membrane.

B. The selection of insulation type, thickness, and configuration is the responsibility of the architect, engineer, or owner.

U.S. Ply reserves the right to accept or reject any roof insulation as an acceptable substrate for U.S. Ply roof systems. Refer to the U.S. Ply list of approved insulations of those insulations that must be used in U.S. Ply Guaranteed Roofing Systems. A copy of this list is available from U.S. Ply at 817-413-0103

C. The positive attachment of insulation over the substrate to which it is installed is essential. Insulation shall be attached according the requirements of the insulation manufacturer, trade associations, local codes and insurance underwriting agencies.

D. Consult the current Factory Mutual Approval Guide and Factory Mutual Loss Prevention Data Sheet 1-28 and 1-29 for information on insulation attachment requirements.

E. Do not install insulation in hot asphalt directly to a steel deck. The first layer of insulation must be mechanically attached to a steel deck.

F. Install insulation to wood or wood fiber nailable decks by either mechanically fastening the insulation or by nailing a base ply to the deck following nailing recommendations for base plies and then installing insulation in a solid mopping of asphalt.

G. On slopes of ½" (4.2 cm/m) or greater, consult the manufacturer for recommendations regarding the installation of insulation stops.

H. U.S. Ply is not responsible for damage to roofing membranes or flashing from movement or wind uplift due to inadequate attachment of the roof insulation. It is the responsibility of the design professional to determine wind uplift design forces and the means of attaching the roof system to resist those forces.

I. Insulation must be approved by Factory Mutual and Underwriters Laboratories and be manufactured in board form to be used as a roof insulation.

J. The following are minimum restrictions and requirements that apply to the acceptable insulation types, thicknesses, and uses:

1. The minimum allowable thickness of thermal insulation (excluding coverboard), is ½" (13 mm) thickness, and must be able to withstand foot traffic without deforming.

2. When installed over a metal deck, the insulation must be strong enough to span the flutes without breaking under typical rooftop traffic conditions.

3. The maximum allowable thickness for a single layer of insulation is 3" (7.6 cm) unless approved in writing by U.S. Ply.

4. When insulation is installed in two or more layers, the joints MUST be staggered.

6.02 - Acceptable Types

A. Acceptable types of insulation for use as a substrate for U.S. Ply roofing membranes as described in Section 2, Part 7.

Part 7 - Expansion Joints

7.01 - General

A. The function of an expansion joint is to minimize the effect of stresses and movements of building components and to prevent these stresses from adversely affecting the building.

B. The design, location, and use of building expansion joints must be considered at the time of original building design and are the responsibility of the architect, engineer and owner.

C. Although requirements may vary depending on structural and climatic conditions, expansion joints are strongly recommended:

1. Every 200 linear feet (61 m) of building length;
2. Where steel framing, structural steel, or deck materials change direction or elevation;
3. Where separate wings of “L”, “U”, “T”, or similar configurations exist;
4. Where the type of deck material changes, i.e., where precast concrete and steel decks abut;
5. Within the roofing system whenever control, expansion or contraction joints are provided in the deck material or deck system;
6. Where additions are connected to existing buildings;
7. At junctions of canopies, exposed overhangs or loading docks;

D. Expansion joints must be continuous along the break in the structure and not terminated short of the end of the roof deck.

E. Expansion joints should never be bridged with insulation or roofing membrane.

F. Construction ties must be removed in order for expansion joints to function properly.

G. Extend expansion joints at least 8" (20.3 cm) above the roof surface on curbs and use either flexible expansion joint covers or metal caps or covers.

H. Locate expansion joints so that normal drainage flow patterns are not blocked; joints can also be positioned at the high points of the roof so that drainage is away from them.

I. Where possible, position walkways and roof access points to limit roof traffic over expansion joints; provide protective coverings for expansion joints at locations of repeated roof traffic.

J. Area dividers or “control” joints are not considered expansion joints. They can be installed where expansion joints have not been provided for in the original building design or where stresses have developed in the roof system. Contact the U.S. Ply Technical Services for recommendations regarding area dividers.

Part 8 – Cold Adhesive

8.01 - General

A. U.S. Ply has developed substrate and bonding adhesives for use as an all purpose modified bitumen substrate cold process adhesive or as a bonding adhesive for adhering modified bitumen flashings to vertical surfaces, respectively.

B. USP® 901 Premium Modified Adhesive is a premium grade modified asphalt adhesive for bonding DURAFLEX® SBS membranes. USP® 901 Premium Modified Adhesive is VOC compliant, and is cold applied and may be installed using a serrated squeegee or even spray applied with appropriate spray equipment.

C. USP® 954 Premium Modified Flashing Cement is a premium grade modified asphalt flashing cement for bonding DURAFLEX® SBS membranes in flashing conditions and vertical base flashings. USP® 954 Premium Modified Flashing Cement is VOC compliant, and is cold applied using a hand trowel.

8.02 – Cold Adhesive Safety and Precautions

A. USP® 901 Premium Modified Adhesive and USP® 954 Premium Modified Flashing Cement should only be applied when temperatures are above 45°F (7.2°C) and should not be applied on substrates that exceed 140°F (60°C).

B. USP® 901 Premium Modified Adhesive and USP® 954 Premium Modified Flashing Cement may only be used to apply DURAFLEX® SBS, and must never be used with any torch grade product or Single Ply membrane.

C. USP® 901 Premium Modified Adhesive and USP® 954 Premium Modified Flashing Cement must never be used in below grade applications.

D. USP® 901 Premium Modified Adhesive and USP® 954 Premium Modified Flashing Cement products are flammable and should always be kept away from heat, open flame, or any source of ignition. Empty containers must be disposed in posted toxic substance landfills in accordance with local, state and federal regulations.

E. Safety:

1. Skin contact: Wear chemical resistant gloves. Avoid prolonged or repeated skin contact. Wash contacted skin with soap and water;

2. Respiratory: Use with adequate ventilation. NOISH/MESA respirators required if TLV is exceeded. If subjected to inhalation in excess of TLV, remove individual to fresh air, administer oxygen if breathing is difficult. If breathing stopped, give artificial respiration; get emergency medical attention and keep individual warm.

3. Eye contact: Rinse immediately with water thoroughly and seek medical advice.

4. Refer to this Section, Part 14 for minimum safety requirements when installing U.S. Ply roof systems.

Part 9 – Low Rise Foam Adhesive

9.01 - ICP® Polyurethane Foam Insulation Adhesive CR-20

A. A low rise, two-component polyurethane froth adhesive specifically designed to adhere a variety of insulation board stock to various substrates porosity in both new and re-roof applications, including applications that require multiple insulation layers.

B. ICP® CR-20 is dispensed from a proprietary disposable gun and hose assembly from a self-contained, ready to dispense two component polyurethane foam adhesive kit.

C. Polymeric Isocyanate is Component A and is approximately 40 lbs (18.1 kg). Polyol Amines is Component B and is approximately 35 lbs (15.8 kg). Available in regular grade – for use above 40°F; and winter grade – for use 0°F – 40°F (-18°C – 4.4°C).

D. Coverage is approximately 18-20 squares per unit depending on the substrate, insulation types and bead width and pattern.

9.02 - OMG® OlyBond 500® SpotShot Insulation Adhesive

A fast acting, two-component, low rise polyurethane foam adhesive designed to adhere most insulation types to a wide selection of common roof decks and materials. OlyBond® 500 can be used in both new and re-roofing applications, including applications that require multiple insulation layers.

OlyBond® 500 is dispensed in a semi-liquid bead that spreads to several inches before rising ¾” to 1” (19 mm – 25 mm) above the substrate.

Available in regular grade – for use in temperatures above 40°F (4.4°C); and winter grade – for use in temperatures from 0°F – 40°F (-18°C – 4.4°C).

Packaged in 1,500 ml cartridge sets, 4/case. Coverage is approximately 4 – 6 squares/case depending on the substrate porosity and insulation types. Also packaged in or 5 gallon Bag-in-Box sets for use with OMG® OlyBond® PaceCart.

Coverage is approximately 18-20 squares/unit box depending on the substrate porosity, insulation types, bead with and pattern.

Part 10 – Parapet Walls

10.01 - General

A. Most common wall types are suitable substrates for the installation of U.S. Ply membrane flashing.

B. Brick and concrete block: Standard-finish brick and concrete block with standard tooled mortar joints.

C. Split-face block, textured block and brick, and deeply tooled mortar joints require a cementitious parge coating to provide a smooth and even substrate surface.

1. Steel trowel, wood float or removable form finish.

2. Ridges and other irregularities require grinding to provide a smooth and even substrate surface.

D. Wood type construction:

1. Minimum 4 ply, 15⁄32" (12 mm) thickness, exterior grade. Tongue and groove edges or full blocking required.

2. Minimum ½" (13 mm) exterior grade. Tongue and groove edges or full blocking required.

E. Metal construction:

1. Minimum 24 gauge steel or 0.032" (0.8 mm) aluminum.

2. Corrugated panels require an overlay of, 15⁄32" (13 mm) plywood, or moisture resistant gypsum panels.

F. Gypsum panels:

1. Moisture resistant gypsum panels of minimum ½" (13 mm) thickness are acceptable provided the underlying substrate allows adequate securement of flashing at prescribed spacing.

G. Stucco finish and EFIS systems are not acceptable substrates.

Part 11 – Recover and Reroofing

11.01 - General

A. The term “recover”, as referenced in this Installation Guide, is meant as the installation of a new roof system over an existing roof system.

B. The term “reroof”, as referenced in this Guide, is meant as the removal of the existing roof, prior to the installation of a new roof system.

C. Every roofing project has its own unique problems that require assessment on an individual basis. U.S. Ply requires that a thorough investigation of the existing roof system and its support system must be made to determine the cause of roof system failure or deterioration.

D. The determination of whether to tear-off or recover an existing roof system is the responsibility of the architect, engineer or owner.

E. U.S. Ply is not responsible for damage of its roof systems in any way caused by recovering an existing roof system.

F. Due to the complexity of recover and reroofing specification and varying field conditions, contact U.S. Ply 817-413-0103 for requirements when an U.S. Ply Guarantee is required.

G.A recover should be considered only if the following items are addressed and preparation includes:

1. Establishing the history of the old roof system and determining and correcting the cause of any premature roof failures.
2. The existing roof system must be compatible with the proposed new roof assembly. Sprayed in place urethane foam roof systems are not eligible for recover.
3. Determining that the deck is structurally sound to receive a new roof system.
4. Taking test cuts to verify the existing roof construction and condition. Three test cuts should be made for roofs under 100 squares and one test cut per 100 squares above the minimum amount.
5. It is highly recommended that a moisture survey be made to determine the extent of wet insulation and moisture entrapment.
6. All irregularities in the existing membrane and deck system can and are repaired in order to make the membrane ready to receive the new roofing system.
7. Providing for proper drainage of the new roof system to eliminate ponding. Provisions must be made to insure the new roof system has proper drainage, i.e., placement of additional roof drains, use of tapered insulation, use of crickets, etc., as appropriate.
8. The existing membrane surface is in basically sound condition, without excessive quantities of defects such as blisters, ridges, fishmouths, or other irregularities.
9. The existing roof system components are well attached to each other and their substrate.
10. For recover installations, all damaged and/or wet insulation areas must be identified. The affected insulation must be cut out and removed. The removed insulation must be replaced with new insulation of the proper size to fill the space flush with existing surface and obtain a relatively smooth surface to accept the installation of the new roof system.
11. If the old roof is a coal tar BUR, a divorcing layer of roof insulation must be used.
12. The existing detail conditions are readily adaptable to the increased thicknesses imposed by the recover system and comply with U.S. Ply specifications and requirements.
13. The new membrane and any new insulation will cause changes in edge details and the height of perimeter nailers.
14. The existing structure is capable of supporting the new loads imposed by the recover system.
15. All applicable code requirements must be met for recover over an existing roofing system.

H. For recovering over single-ply roof membranes, the existing membrane must be cut into sections no larger than 20’ x 20’ per each section. All flashing must be removed at the perimeter edge, parapet walls, roof drains and roof penetrations and a cover board must be installed to provide a suitable recover substrate.

I. For recover over gravel surfaced built-up roofing, the loose gravel must be removed. The surface must be leveled to prevent the insulation or recover board from bridging.

J. For recover over metal panel roof, contact U.S. Ply Technical Services for prior approval and technical requirements.

K. For tear-off project, all existing roofing and flashings must be removed to provide a sound substrate for the installation of a new roofing system and correct existing design deficiencies.

L. Roof systems having existing vapor retarders must be addressed with our Technical Services at 817-413-0103

M. U.S. Ply does not recommend partial recover or reroofing of a single roof area due to the potential for defects in the portion of the roof system not replaced, to damage or negatively affects the performance of the new membrane. When required by project conditions or budget considerations, U.S. Ply requires full separation of the old and new roof areas by means of a full curb mounted expansion joint or area divider installed to provide a complete

watertight seal or break between areas. Tie-in constructions in which the old and new membranes are adhered directly to each other and stripped in are not acceptable for use in U.S. Ply roof systems.

N. When recovering over an existing roof, the following are minimum procedures that should be followed:

1. On smooth surfaced roofs, including cap sheet roofs, the old roof surface should be level and clean; repair any buckles or ridges that create irregular contours.
2. Remove all wet or damaged roof insulation and membrane.
3. Replace with new insulation and same type and cover with new membrane to complete the repair.
4. If the existing membrane is to be left in place it must be cut into sections no larger than 20' x 20' per each section. All flashing must be removed at the perimeter edge, parapet walls, roof drains and roof penetrations.
5. When additional insulation is used for recover assemblies, mechanical fasteners are required to secure the insulation.
6. Recovering over existing single ply or asphaltic gravel roof systems requires the use of mechanically attached recover insulation.
7. Topside venting is required. Use one-way moisture relief vents installed at the rate of one per 1000 square feet (92.9 m^2) or use perimeter venting.
8. All applicable specification requirements and recommendations listed in this Manual must be followed, i.e. slope, nailing, etc.
9. If the old roof is a coal tar BUR, a divorcing layer of roof insulation must be used.
10. Proper precautions must be taken to ensure that coal tar drippage into the building does not occur. Careful preparation and cleaning of the existing roof surface is required to permit asphalt application of recover insulation. Contact U.S. Ply Technical Services for additional information.

O. It is the responsibility of the owner or its representative (not U.S. Ply) to establish the deck and deck support system's ability to accept and support a recover or reroof system.

P. It is necessary in a recover and reroofing situation that all existing base flashings be removed, so that new base flashings are installed.

Q. The new membrane and any new insulation will cause changes in edge details and the height of perimeter nails and curb flashing heights.

R. All old metal gravel stops, metal counter flashing, lead boots, and pitch pans must be removed and replaced with new metal.

Part 12 - Flashing

12. 01 - General

A. Flashing is used to waterproof the field of the roof anywhere it is interrupted, e.g., at walls, curbs, edges, penetrations, drains, etc. and the juncture of the field of the roof and vertical surfaces.

B. Flashings are the most vulnerable moisture infiltration points on any roof. To avoid failures, proper design, installation, and materials must be used.

Some of the most common flashing failures occur as a result of the following conditions:

1. Improper design of field flashing condition;
2. Omission of nails at the top of a base flashing resulting in slippage of the base flashing membranes;
3. The use of incorrect type nails to secure flashing; minimum $^{15}/_{16}$" (24 mm) diameter heads or the use of minimum 1" (25 mm) diameter tin disks are required with flashing nails.
4. Failure to prime masonry walls prior to installation of the membrane flashing;
5. Standing water at the bottom of membrane base flashing. All flashing should be raised above the water line to facilitate positive drainage at vulnerable flashing juncture areas;
6. Omission of one or more of the required flashing or base plies in membrane flashing system;
7. Excessive height of membrane and base flashing applications. Maximum height of a membrane base flashing should not exceed 24" (61 cm) above the height of the roof surface. Waterproofing masonry or elevation walls above the recommended 24" (61 cm) should be accomplished using the "High Parapet Wall Flashing Detail", in Sections 8 and 9. Such a detail will provide an upper for the metal counter-flashing incorporated into the flashing system;
8. Wrinkling or splitting failure because of a creeping roof system or differential structural movement at wall/deck junctures;
9. Lack of proper maintenance by the building owner. Repairs must be made immediately to base flashing damaged by foot traffic. When the roofing system is installed over a solid deck surface (poured-in-place) or when a vapor retarder is included, punctures or tears in the base flashing allow saturation of roof insulation and will eventually result in deterioration and failure of the roofing system;
10. Incompatible materials used in the construction of roof/flashing (due to chemical reactions or differences in thermal expansion characteristics).

C. Wall flashing can be divided into two categories, non-wall supported roof deck and wall supported roof deck. Non-wall supported roof deck design provides for differential movement between the wall and roof deck. The wall supported roof deck design is structurally constructed without the anticipation of differential movement. U.S. Ply provides details for both situations.

D. General Rules for the Construction of Flashing. Construction of flashing should follow the general procedures outlined below. Refer to "Construction Details".

1. Isolate the structural deck, roofing system and base flashing from vertical walls, projections, etc. This is best accomplished by the use of horizontal and vertical wood nailers installed at perimeters, projections, etc. and through the use of metal counterflashing to divert water over the base flashing.
2. Ensure that water drains immediately away from all flashing.
3. Minimum height of base flashing should be 8" (20.3 cm) above the roof surface level and the maximum height should be 24" (61 cm) above the roof level. Wall coverings above the base flashing [24" (61 cm)] are not a part of the roofing system and are not included in U.S. Ply roofing system guarantees.
4. Install wood blocking as indicated by the project specifications and in accordance with current U.S. Ply Details and Specifications. Blocking is always required at roof edges and at all roof penetrations for mechanically fastened systems. Wood blocking should be secured to the roof deck;
5. Use only modified bituminous membranes that are designated by U.S Ply for use as base and wall flashings.
6. When metal cap or counterflashing cannot be installed on the same day as the membrane base flashing, the top edge of all base flashings must be stripped-in using flashing cement and glass fiber reinforcement. All stripped-in material must be removed prior to torch welding of any membrane.
7. Termination bar may only be used in conjunction with an appropriate counter flashing extending a minimum of 4" (10 cm) below the termination bar.
8. "Through-wall" flashing should be used on all masonry walls. If "through-wall" flashing is not possible, masonry walls must be designed to prevent moisture infiltration.
9. All base flashings must be mechanically fastened at the top

edge of the flashing with 1" (25 mm) round or square metal cap nails or appropriate fastener on a maximum of 8" (20.3 cm) centers for flashings up to 12" (30.5 cm) in height and on 6" (15.2 cm) centers for flashings up to 24" (61 cm) in height. Termination bars may only be used in conjunction with proper counterflashing and the fastener spacing shall not exceed the spacing of cap nails.

10. Apply flashing details after the installation of the roofing membrane, but before the application of any surfacing materials.

11. The use of pitch pockets is not recommended. Pitch pans are maintenance items that can easily become sources of leaks if not maintained or improperly used or installed.

Note: Sheet metal pitch pockets are not covered by U.S. Ply guarantees and are not recommended in 15 and 20 year guarantee systems. USP® Ply-Flash (2-part) Liquid Flashing is recommended in lieu of metal pitch pockets.

12. Due to the differential expansion between metal and asphalt, large metal flanges are undesirable surfaces to flash; such units should be mounted on canted wood curbs at least 8" (20.3 cm) above the level of the roof surface.

13. Metal gravel stop flanges must be primed, properly nailed to a wood nailer, and installed between a stripping ply of modified bitumen membrane and the field of the roof. Where metal gravel stop flanges are flashed to the roof membrane, leaks caused by metal movement are not covered by U.S. Ply guarantees, and are the responsibility of the building owner.

14. Piping and conduit should not run across the roof; where no alternative exists, the piping/conduit should be elevated at least 8" (20.3 cm) above the surface of the roof on properly flashed supports that are secured to the structural roof members. Lightweight piping/conduit, less than 2" (5 cm) in diameter may be set on wood blocks with pads over the finished membrane.

Part 13 - Surfacing

A. There are four types of surfacing used with modified bitumen membranes:

1. Factory applied mineral granules

2. Flood coat and aggregate: use aggregate meeting ASTM D1863. The pour coat of asphalt should meet ASTM D312, Type III or IV. Aggregate that does not meet ASTM D1863 must be approved by U.S. Ply.

3. Aluminum coatings should meet ASTM D2824, Type III.

4. Elastomeric Acrylic Coatings should meet ASTM D6083.

B. There are four types of surfacing used with built-up membranes:

1. Mineral Cap Sheet. See Section 5, Part 12, Item 12.06 for USP® Mineral Cap Sheet application.

2. Aluminum coatings should meet ASTM D2824, Type III.

3. Emulsion coatings should meet ASTM D1227, Type II or III.

See section 5, Part 14, Item 14.02 for liquid coating application.

4. Flood coat and aggregate: use aggregate meeting ASTM D1863. The pour coat of asphalt should meet ASTM D312, Type III or IV. Aggregate that does not meet ASTM D1863 must be approved by U.S. Ply.

See Section 5, Part 14, Item 14.03 for gravel and asphalt application.

C. Walkways for normal rooftop traffic can be constructed from USP® WalkBoard mop or torch grade modified bitumen.

D. Install walkways prior to the application of field surfacing by solidly adhering to the field of the roof. Walkway sections should be spaced no closer than 6" (15.2 cm) gap between each section to allow for drainage.

E. Surface the roof around and between the pads if additional surfacing is applied to the U.S. Ply membrane.

Part 14 – Safety Considerations and Warnings

14.01 - General

Installation of a roof system is a construction process. As with any construction process safety is a key element; therefore, U.S. Ply recommends that all applicable safety standards and good roofing practices be followed. Fire prevention is the applicator's responsibility.

14.02 - Warning

APPLICATION/USE OF THESE PRODUCTS MAY RESULT IN BURNS, AND/OR OTHER PHYSICAL INJURY, SURFACES WHICH COME IN CONTACT WITH THE MOLTEN PRODUCT MAY BECOME INFLAMED. CONTACT WITH MOLTEN ASPHALT MAY CAUSE BURNS.

Statement of Practical Treatment: In case of skin contact with molten bitumen, apply ice or other cold liquid compatible with skin. Get medical attention immediately.

14.03 – General Precautions

A. **READ AND UNDERSTAND U.S. PLY'S SPECIFICATION MANUAL** before starting application. Follow all precautions and direction.

B. **Thoroughly train all personnel in the recommended safety procedures** for use of kettles, asphalt mopping, propane torches, and for application of product.

C. **FIRE PREVENTION INSPECTIONS** should be conducted periodically during installation, with a final inspection being conducted upon completion of that day's work.

D. **WEAR PERSONAL PROTECTIVE GEAR.** Always use approved safety hard hat, goggles, heavy duty gloves, snug fitting clothing (long pants and long sleeved shirt) and boots.

E. **THOROUGHLY TRAIN ALL PERSONNEL ON PREVENTING AND EXTINGUISHING FIRES**.

F. **THOROUGHLY TRAIN ALL PERSONNEL IN FIRST AID PROCEDURES**.

G. **NEVER ALLOW CONTACT** between the heated surface of the product, hot asphalt, open flame and hair, skin or clothing.

H. Always **COMPLY WITH ALL APPLICABLE OSHA SAFETY STANDARDS** and fire codes.

I. **AVOID PHYSICAL CONTACT WITH PRODUCT FOR AT LEAST ONE HOUR** after application to surface.

J. **NEVER APPLY** built-up or modified bitumen products **DIRECTLY OVER EXPOSED CONDUITS OR PIPES LAYING ON THE ROOF DECK**.

K. **USE EXTREME CAUTION** when working around equipment, such as gas lines or HVAC units, which have electrical and/or gas connections.

L. **PROVIDE** in the immediate work area at least one (1) ABC-rated **FIRE EXTINGUISHER** for each torching device.

13.04 - When Torching Devices Are Being Used

NOTE: U.S. Ply recommends that every worker using a torch be properly trained and certified in the use and safety of torch application.

A. LP Gas cylinders should be a type approved by the Department of Transportation for LP Gas usage, equipped with an approved vapor withdrawal valve and pressure gauge. Valve should be protected by metal collar or hood.

B. The regulator shall be UL listed for LP Gas usage with an adjustable pressure range of 0-60 psi. When replacement is necessary, user should ensure replacement regular operates within the same pressure range.

C. Hose shall be UL listed for LP Gas usage with a minimum working pressure rating of 350 psi. Burst strength should be 1750 psi. Hoses should be checked regularly for damage and wear. Hose lengths should not exceed 50'.

D. Torches shall be equipped with a shutoff valve, pressure-release trigger and support stand or legs. Equipment shall be compatible with LP Gas withdrawal system and shall be maintained in good operating condition. Contractor/user should consult equipment manufacturer for specific recommendation on specifications and usage.

E. Inspect all torching equipment, fittings, LP Gas cylinders, valve regulators, hoses, and all connections for damage and leaks. **NEVER USE A FLAME TO CHECK FITTINGS AND OTHER EQUIPMENT**. Use soapy water only to check for leaks.

F. **DO NOT ALLOW TORCHING DEVICES TO COME IN CONTACT WITH FLAMMABLE MATERIALS**. The roofing surface, walls, abutments and all surrounding surfaces must be inspected prior to utilization of the torching device so that necessary precautionary measures may be taken.

G. **KEEP TORCH FLAME MOVING AT ALL TIMES**; failure to do so may result in ignition of surface and/or underlying materials.

H. Avoid prolonged contact with heat sensitive metals such as lead, as overheating of these metal surfaces could ignite underlying flammable surfaces.

I. **NEVER USE PROPANE EXCEPT IN WELL VENTILATED AREAS.**

J. The **MANUFACTURER'S** safety and operating **INSTRUCTIONS PROVIDED WITH THE TORCH SYSTEM MUST BE FOLLOWED STRICTL**Y.

K. **PROPANE TANKS** are pressurized. **DO NOT PUNCTURE.** Do not expose to extreme heat. The tanks must be maintained a minimum safe distance away from the torch flame.

L. **CONTAINERS** which contain or **MAY HAVE CONTAINED FLAMMABLE MATERIAL MUST BE KEPT CLEAR FROM THE TORCH** or other heat source.

M. **ALWAYS USE THE BASE SHEET** as recommended by U.S. Ply Specifications Manual. **FAILURE TO DO SO IS EXTREMELY HAZARDOUS** as the base sheet provides an additional protective covering for underlying combustibles.

N. Cant strips used at the roof/wall abutment must be composed of fire retardant material or protected from direct contract with the torch flame.

O. Application personnel must remain on the job site for a minimum of one (1) hour after completion of installation to inspect for any possible smoldering combustible material. **SINCE FIRES CAN RESULT HOURS AFTER COMPLETION OF WORK, PERIODICAL INSPECTION THEREAFTER MUST BE MADE**; the time and nature of which will vary depending on the size of the job; the nature of the application surface and abents, and local code requirements.

NOTE: U.S. Ply recommends the use of infra-red thermometers, and a thorough inspection of areas where torching equipment has been utilized. Prior to leaving the job site the contractor must be certain that all chance of fire, including smoldering fire, has been eliminated.

P. **NEVER PLACE A HOT TORCHING DEVICE ON THE ROOF SURFACE**, insulation or any other surface or object other than an acceptable stand or holder or fireproof surface.

Q. **NEVER LEAVE A LIGHTED TORCHING DEVICE UNATTENDED.**

R. **NEVER USE A TORCHING DEVICE TO APPLY ANY MATERIAL OTHER THAN APP MODIFIED BITUMINOUS MEMBRANES AND/ OR SBS MODIFIED BITUMINOUS MEMBRANES THAT ARE DESIGNED TO BE TORCH APPLIED.**

S. **ALLOW TORCHING DEVICES TO COOL COMPLETELY** to room temperature before removing from the roof.

SECTION 5 – INSTALLATION REQUIREMENTS

These requirements supplement the General Requirements in Section 4 and is considered part of the U.S. Ply Roof Specification in Sections 6-10 and the Construction Details in Sections 11-17 to the extent they are applicable to the project design and installation.

PART 1 – INSTALLATION REQUIREMENTS

1.01 - General

A. Do not begin work when inclement weather is forecast to occur prior to the anticipated time of completion of the work item.

B. Do not install materials during inclement weather, except for temporary work necessary to protect materials that are already installed. Remove all temporary work before installing permanent materials.

C. Do not install materials when moisture, in any form, is present on the roof deck, or substrate to which the materials are to be applied, or when foaming of hot asphalt or membrane occurs.

D. Protect the building, contents, surrounding area, building occupants and contractor personnel during work. Coordinate all work operations with the building owner and building occupants so that adequate interior protection, as necessary, is provided and disruption to normal building operations is minimized. Provide adequate exterior protection to prevent damage to the building owner's property.

E. Roof system installation should not begin until all roof openings, curbs, pipes, sleeves, ducts, vents or other penetrations through the roof are solidly set, and that all tapered edges and cant strips, reglets, and wood nailers are secure and tight to the building as per this specification manual.

F. Where wheeled or other traffic over the partially completed roofing is unavoidable, provide and use adequate plank or plywood, set over a minimum thickness of rigid board insulation to protect the newly installed roofing.

G. Follow the requirements in Part 6 of this Section, for heated asphalt and application temperature limits.

H. Provide temporary water cut-offs and tie-ins at the end of each workday. Remove all temporary work at the beginning of the next workday.

I. When tearing off an existing membrane, limit removal to the area that will be completely re-roofed that day with the new roofing system.

J. Observe fire and safety precautions as recommended by the Asphalt Roofing Manufacturers Association, the National Roofing Contractors Association, OSHA and this Manual.

K. All work shall be performed in compliance with local code requirements.

L. The beginning of roof system installation signifies the contractor accepts the existing conditions as being in compliance with project requirements and code requirements.

Part 2 – Delivery, Storage and Handling

2.01 – General

A. U.S. Ply roofing materials leave the factory dry and must be stored to prevent the materials from getting wet.

B. Unload and handle all roofing and construction materials with care.

C. Examine all materials as they are received. Do not use any materials that are damaged, unlabeled or otherwise appear to be unfit for use. Materials must display legible labels, which identify the materials and applicable reference standards. Immediately notify carrier and U.S. Ply or other manufacturer of damaged, wet, or defective materials. U.S. Ply will not accept responsibility for damage to its roofing materials after the materials have been released from U.S. Ply manufacturing or warehousing facilities.

D. Do not expose materials to moisture in any form before, during, or after delivery to the site. Reject delivery of materials that show evidence of contact with moisture.

E. At the job site, no more material should be stored than will be used within two weeks. For periods longer than two weeks, the materials should be properly warehoused, i.e., dry, ventilated, on pallets, etc.

No more material should be stored on the roof than can be used within five days. When prolonged inclement weather threatens, i.e., rainy seasons, no more roofing materials should be supplied to the rooftop than can be used within two days. During extremely hot days, roofing materials should be stored in cooler or shaded areas (below 90° F (32° C) to prevent damage and to promote easier application during installation.

F. Store roll goods on end on pallets in a clean, dry, well ventilated protected area. Take care to prevent damage to roll ends or edges. Do not double stack products.

G. Remove manufacturer supplied plastic covers from materials provided with such covers. Use "breathable" type covers such as canvas tarpaulins to allow venting and protection from weather and moisture. Cover and protect materials at the end of each day work. Do not remove any protective tarpaulins until immediately before material will be installed.

H. Thermal insulation products should be properly stored and weighted to avoid weather and wind damage.

I. Store roofing asphalt to prevent leakage and carton deterioration.

J. Store all adhesives, coatings and sealants/caulks to protect from freezing. Frozen material must be discarded and replaced. Properly seal all liquid material containers after use.

K. Materials should be stored above 55°F (12.8°C) a minimum of 24 hours prior to application.

L. Follow the requirements indicated in Part 15 when applying U.S. Ply membranes at temperatures below 45°F (7.2°C).

M. In the unlikely event that obviously defective or damaged material reaches the job site or damage to the material occurs from improper storage on the job site, it is the responsibility of the roofing contractor not to install this material. U.S. Ply should be notified immediately about material that has apparent manufacturing defects. Installation of defective material can result in additional costs above the cost of supplying replacement material. If the roofing contractor chooses to install material with apparent defects, this added cost is not the responsibility of U.S. Ply.

2.02 - RapidGRIP Self-Adhesive Precautions

A. Store RapidGRIP® rolls in original cartons indoors on pallets, protected from the elements above 70°F (21.1°C) for a minimum of 24 hours, prior to application. If stored outside, protect from extreme heat and weather by covering with a light colored breathable opaque tarp to allow venting and protection from weather and moisture. Cover and protect materials at the end of each day's work. Do not remove any protective tarpaulins until immediately before material will be installed. For best results, store all materials in a shaded area at the job site, even if provisions for covering and ventilation have been performed. When no shaded areas exist for storage, it is recommended to place a layer of minimum 1" thick polyisocyanurate insulation over the top of the cartons under the tarpaulins to reduce the heat on the rolls and in order to reduce the possibility of rolls sticking or experiencing difficulty in removing the poly release film backing. Rolls that are improperly stored or have been warehoused for prolonged periods of time may lose their tack or may experience difficulty removing the poly release film backing.

B. Ambient temperature must be 50°F (10.6°C) or above with a minimum of 2 hours of exposure to direct sunlight. Conditions without exposure to direct sunlight may not allow sufficient thermal

heating and may affect adhesion. DO NOT STORE product in direct sunlight or on the rooftop during extremely high temperatures (over 110°F [43.3°C]) or when temperatures will fall below 50°F (10°C). If it is necessary to store materials on the rooftop, no more material should be stored on the roof than can be used within a few days. Keep in cartons until ready for use.

C. Warm weather conditions and exposure to direct sunlight are essential for proper adhesion. The self-adhesive compound will not activate if installed below the recommended temperatures and/or if the material temperature is below 70°F.

D. If product is applied in temperatures above 110°F (43.3°C), it may result in difficulty in removing the poly release film backing from the underside. If this situation should occur, move the product to a shaded area until the product has cooled sufficiently. Once cooled, the poly release film backing can be easily removed. Note: Exposure to excessive heat may cause sagging of compound on vertical surfaces.

Part 3 – Inspection and Preparation of Surfaces

3.01 - General

A. The roofing contractor shall only begin roofing work when the substrates have been prepared as necessary, and are ready and acceptable to have materials installed as specified.

B. If substrate preparation is the responsibility of another installer; notify Architect or appropriate building representative of unsatisfactory preparation before proceeding.

C. If conditions are uncovered or created which would be detrimental to the proper conduct of specified work, immediately notify the building owner and U.S. Ply of these conditions for consultation on acceptable treatments.

D. Clean surfaces thoroughly prior to commencing roof installation.

E. Prepare substrate surfaces thoroughly prior to application of new roofing materials. This is particularly important for recover and reroofing applications. Providing a smooth, even, sound, clean and dry substrate minimizes the likelihood that underlying deficiencies will cause premature deterioration or even failure of the new roofing system.

F. Nailable substrates “N”, as referenced in this manual are without insulation and most commonly pertain to the following deck types: wood, structural wood fiber, gypsum and lightweight or cellular concrete. Existing roof systems, for recover, installed over these deck types are considered nailable substrates.

G. Non-nailable substrates “NN”, as referenced in this manual most commonly pertain to the following deck types: poured, prestressed and precast structural concrete decks. Existing roof systems installed over poured, prestressed and precast structural concrete decks are considered non-nailable substrates.

3.02 - Roof Decks

A. The surface of the roof deck must be dry, firm, smooth, and free of dirt and loose material. Electrical conduits, bolts, and other similar small items must be removed from the surface of the roof deck; such surface irregularities cannot be properly insulated and roofed.

B. It is the responsibility of the roofing contractor, deck contractor, and owner’s representative to determine the suitability of the roof deck surface to receive the roof assembly. The deck must meet U.S. Ply requirements, as described in Section 4, Part 2 of this manual. None of the foregoing factors are the responsibility of U.S. Ply, which under no circumstances will assume such responsibility.

B. Steel Decks:

1. Metal decking to be G-90 galvanized coated 22 gauge or heavier steel panel.

2. Decking shall be installed to provide positive slope and positive drainage of the new USP® Roofing System.

3. Steel deck panels shall be securely anchored to the supporting members either by mechanically fasteners or welding.

4. Spacing of fasteners to be no more than 12” on center. Fastener method to be in accordance with the Steel Deck Institutes Design Manual and Factory Mutual Recommendations.

5. Steel deck panels shall be installed in a straight line and properly aligned.

6. Deck shall be clean and free of moisture or debris.

7. Inspect existing steel decks, remove surface corrosion, repair holes or severely corroded areas, treatment of loose or inadequately secured decking, and replace any irreparable or otherwise defective decking, as applicable.

C. Concrete Decks:

1. Poured or precast concrete decks shall be installed in strict conformance with industry standards, practices and or precast panel manufacturer’s installation requirements minimum compressive strength of 2500 psi.

2. Decking shall be installed to provide positive slope and positive drainage of the new USP® Roofing System.

3. Finished decking shall be properly cured, dry and ready to receive hot asphalt.

4. Deck shall be smooth surfaced. Clean and free of moisture or debris.

5. If conditions require the application of asphalt primer the deck must be primed 24 hours prior to roof system installation with USP® #41 Asphalt Primer or an ASTM D41 compliant cut back asphalt primer.

6. Inspect existing concrete decks, repair cracks and deteriorated deck materials, replace any damaged or deteriorated areas which are irreparable or otherwise defective decking, as applicable.

D. Lightweight or Cellular Concrete and Poured Gypsum Decks:

1. Lightweight Insulating Concrete (LWC) and poured gypsum decks shall be installed in strict conformance with industry standards, practices and or precast panel manufacturer’s installation requirements.

2. The minimum compressive strength of the lightweight concrete shall be no less than 200 psi. The density of the cured gypsum shall be no less than 30 lbs. per cubic foot and a compressive strength of 500 lbs. per square inch.

3. Finished gypsum deck shall be a minimum thickness of 2” not including the formboard.

4. Decking shall be installed to provide positive slope and positive drainage of the new USP® Roofing System.

5. Finished decking shall be properly cured, dry and ready to receive hot asphalt.

6. Deck shall be smooth surfaced. Clean and free of moisture or debris.

7. If installation requires mechanical attachment of anchor sheet or insulation to the deck, then the deck shall be tested to determine the proper the fastener based on the average fastener withdrawal resistance provided by the substrate.

8. An average fastener withdrawal resistance as recommended by the fastener manufacturer must be obtained (40 lbs minimum). Decks which cannot provide the minimum average withdrawal resistance as recommended by the fastener manufacturer are not suitable to receive a roof system.

9. Inspect existing lightweight concrete decks, repair cracks and deteriorated deck materials, replace any damaged or

deteriorated areas which are irreparable or otherwise defective decking, as applicable.

10. One way pressure relief vents must be used when roofing over existing lightweight insulating and poured gypsum decks. Install a minimum 4” (10 cm) diameter one way pressure relief vent every 10 squares (92.9 m²). If roof insulation is specified, vent openings should extend through the entire roof system and insulation to the deck or fill surface.

E. Wood Decks and Oriented Strand Board Decks:

1. When roofing over a wood deck, provisions shall be made for repairs to cracks or holes, treatment of loose, warped or inadequately secured decking, and replacement of deteriorated, irreparable or otherwise defective decking, as applicable.

2. All plywood and wood based panel roof decks shall be rated for structural use as roof sheathing.

3. Plywood shall be a minimum thickness of 15/32” or as required by the building code having jurisdiction.

4. Wood planks shall be minimum thickness of 1” of as required by the building code having jurisdiction.

5. All boards shall be attached to the intermediate supporting members according to the fastening schedule specified for the required uplift loads expected for a particular roof system.

6. Decking shall be installed to provide positive slope and positive drainage of the new USP® Roofing System.

7. End joints of wood panels to be staggered. Wood blocking or clips shall be provided at all wood panel joints between supporting members.

8. Deck surfaces should be smooth and free of splintered wood, ridges, depressions and other irregularities.

F. Structural Wood Fiber Decks

1. When roofing over a structural wood fiber deck, provisions shall be made for repairs to cracks or holes,treatment of loose, warped or inadequately secured decking, and replacement of deteriorated, irreparable or otherwise defective decking, as applicable.

2. Structural wood fiber deck panels shall be designed and installed in strict conformance with industry standards, practices and installation requirements.

3. Joints between adjacent panels greater than 1/4” must be grouted or filled with compatible material as recommended by the panel manufacturer.

4. Deck surface shall be free of fins, ridges, depressions and other irregularities.

5. Decking shall be installed to provide positive slope and positive drainage of the new USP® Roofing System.

6. Adjacent structural wood fiber deck panels shall align vertically to provide a uniform substrate for the USP® Roofing System. Uneven joints of 1/8” or more shall be grouted with the grout feathered to a slope of 1/8” per foot.

7. Deck shall be smooth surfaced. Clean and free of moisture or debris.

G. Perimeter and penetration wood nailers and curbs must be in place as specified.

H. The roof deck must provide positive drainage or tapered insulation must be used to provide slope. Outlets must be placed and installed to remove water promptly and completely from the roof.

Note: U.S. Ply Roof Guarantees do not apply to areas of roofs that pond water.

I. Expansion joints, roof vents, roof drains, etc., must be installed using acceptable industry standards and U.S. Ply specifications.

3.03 - Recover Systems

A. For recover specifications (installation of a new roofing system over an existing system), any additional surface preparation relative to inspection andtreatment of decks in the existing roofing system must be conducted in accordance with good roofing practices. Preparation includes, but is not limited to, removal of existing flashings, replacement of wet/damaged existing roofing materials, removal of loose aggregate, removal of abandoned equipment, supports and penetrations, replacement of damaged decking, etc. The substrate must present a suitable surface to receive and hold the new roofing materials. Also refer to U.S. Ply recommendations on reroofing in the Roof Design section of this manual.

B. Blisters, splits and other membrane defects must be repaired in accordance with good roofing practices to attain a surface which is smooth, dry, clean and free of sharp projections and depressions.

C. If the existing roof is to remain when the new roof membrane is applied, and there is any doubt to the as the adequacy of the attachment of the existing roof membrane, then mechanically fasten through the existing roof to the deck. Stainless steel or corrosive resistant fasteners are recommended when fastening through existing roof systems.

D. If the existing roof membrane is to be left in place it must be cut into sections no larger than 20’ x 20’ per each section. All flashing must be removed at the perimeter edge, parapet walls, roof drains and roof penetrations.

E. A recovery board must be used over the old roof system if an existing roof is single ply system or if adhered gravel is to remain. Power broom, spud if necessary and remove all loose gravel to provide a smooth, level surface. Mechanically fasten the recovery board to the deck.

F. A recovery board must be used over the existing insulation when removing the old roof membrane and leaving the existing insulation. Mechanically fasten the recovery board to the deck.

G. All existing composition and metal flashing must be removed and replaced.

H. All metal counterflashing, metal coping, and other metal work above the roof system must be inspected, and replaced or repaired as necessary to provide a watertight assembly.

I. All metal flashing must be primed where it will come in contact with the U.S. Ply membranes.

J. Inspect roof drains and outlets. Remove existing drain flashings and replace broken or stripped bolts, clamping rings and strainers. Drains must be metal type clamping rings. Plastic drains are not acceptable. All drains, including retrofit or insert drains, must be sumped to promptly remove water from the roof surface.

K. One way pressure relief vents must be used when recovering. Install a minimum 4" (10 cm) diameter one way pressure relief vent every 10 squares (92.9 m²). Cut 4" (10 cm) holes for one way pressure relief vents through the existing roof system to deck.

L. If a vapor barrier exists, contact the U.S. Ply Technical Services at 817-413-0103

M. When reroofing over an existing coal-tar roof system, a minimum 1" (25 mm) recovery board is required over the existing system.

N. All liquid applied coatings or mastics and gravel or granules must be completely removed if the U.S. Ply membrane is to be directly adhered to a smooth surfaced asphalt roof.

O. Contact U.S. Ply at 817-413-0103 for specific requirements on individual projects and recover over single-ply roofing systems.

3.04 - Reroofing - (Tear-off)

A. All old roofing must be removed down to the deck. The deck shall

be cleaned, repaired, and otherwise conditioned to conform to the requirements of a new deck. Refer to the Roof Design section of this manual.

B. All old flashing must be removed and stripped from all walls, curbs, etc.

C. All existing composition and metal flashing must be removed and replaced.

D. All metal counter-flashing, metal coping and other metal work above the roof system must be inspected, and replaced or repaired as necessary to provide a watertight assembly.

E. All metal flashing must be primed where it will come in contact with the U.S. Ply membranes.

F. Prime all masonry, metal and existing asphalt surfaces and substrate with asphalt primer where U.S. Ply membranes are to be adhered.

G. Inspect roof drains and outlets. Remove existing drain flashings and replace broken or stripped bolts, clamping rings and strainers. Drains must be drains with metal type clamping rings. Plastic drains are not acceptable. All drains, including retrofit or insert drains, must be sumped to promptly remove water from the roof surface and meet code requirements. Note: Substrates must be inspected and accepted by the deck contractor, roof contractor or owner as being ready to receive and hold the roof system as specified.

3.05 - Phasing

A. The term “phasing” refers to the practice of applying part of a total hot asphalt applied roof membrane at one time and allowing that part to remain exposed to the weather for a period of time before applying the remaining elements of the roof system. Membranes applied in this manner are subject to early deterioration. Blisters and voids are much more likely to occur in “phased” roof membranes.

B. U.S. Ply does not approve the practice of “phasing”.

C. Whenever it is necessary to put a building in the dry quickly, a temporary roof covering is recommended.

Part 4 – Quality Control of Application

4.01 - General

A. U.S. Ply recognizes the crucial role of workmanship in the construction of a reliable roofing membrane designed to perform for its anticipated service life. Material delivery, storage, and handling, and control over material application procedures are also of great importance.

MODIFIED BITUMEN APPLICATION REJECTION POINT CRITERIA		
CONDITION	**DEFINITION**	**REJECTION POINT**
Unadhered Seams/Laps	Voids between seam laps. Results vary from insufficient heat welding or lack of bonding from insufficient asphalt or even improper application temperature.	APP - Not acceptable if APP compound flow out was not achieved. SBS - Not acceptable if seams are not tightly sealed with asphalt and/or cannot be lifted, filled and sealed with SBS flashing cement.
Excessive Flow-out Seams/Laps	Overheating of torch applied membranes. Too much mopping asphalt used.	APP – Not acceptable if flow out exceeds 1-½". SBS – Not acceptable if flow out exceeds ¾".
Partially Adhered Membrane	Interior portions of membrane sheet are not adhered to substrate.	Not acceptable
Back water laps	Membrane installed against flow of water. Drains against seams.	Not acceptable
Roofing Over Packaging Tape Or Labels	Strip tape or product labels left on insulation or rolls and roofed over.	Reject if voids are formed. Reject if void exceeds ½" width.
Not Applied to Specification	Insufficient number of plies, Non-USP materials, unadhered areas, overheated areas, etc.	Not acceptable

BUILT-UP ROOF APPLICATION REJECTION POINT CRITERIA		
CONDITION	**DEFINITION**	**REJECTION POINT**
Asphalt Voids	Voids between plies with layer of asphalt on lower ply, occurs from use of wet material, wet deck, or lack of bonding	Excess of 1 ½” square in size.
Dry Spots	Voids between plies, no asphalt between the two plies. Results from cold asphalt, non-uniform mopping and manufacturing equipment.	Not acceptable
Overlying Voids	Dry spots, as defined above, directly above underlying void.	Visible
Lightweight	Insufficient asphalt between plies.	Below 20 lb/ply/ square for slope up to 2”. Below 18 lb/ply sq above 2” slope.
Roofing Over Packaging Tape Or Labels	Strip tape or product labels left on insulation or rolls and roofed over.	Reject if voids are formed. Reject if exceeds ½” width.
Strip Mopping	Non-uniform mopping of asphalt. Poor workmanship, malfunctioning equipment and cold asphalt.	Reject any dry voids or stripes.
Not Applied To Specification	Insufficient number of plies, Non-USP materials, fishmouths, dry laps, footprints, etc.	Not acceptable

B. There are recommendations and requirements, which must be considered in the roof sy stem construction process. The following include, but are not limited to:

1. U.S. Ply recommends that contractors develop and present a verifiable in-house contractor quality control program to the building owner, which can be followed during the construction of U.S. Ply roof systems.
2. Visual inspection should be of the following: deck surface;

specified materials being installed; use of proper bitumen type; conditions of the materials being installed; use of the proper and specified number of fasteners (if required); and that the correct number of plies are being used and that the application procedure is correct; and surfacing.

3. Checks of the asphalt weight/per square; roof cutouts; and asphalt temperatures at all phases of application.

4. Careful visual examination of all side, end and T-Laps of each ply of membrane for proper adhesion and bitumen bleed out.

5. Architect, owner and contractor shall monitor progress of work for compliance to project specifications and drawings. Such monitoring minimizes the potential for problems, provides for resolution and correction of errors, provides participants with documentation of work in-place, and allows for inspection of work which cannot be examined by standard tests, such as flashing and sheet metal installations. Architect, owner, and general and roofing contractors are responsible for meeting insurance and/or code requirements.

6. Roofing products and other associated roof system materials shall be installed according to the minimum guidelines set forth in this Manual and to individual project requirements.

C. Contact U.S. Ply, 817-413-0103 for further information about quality control concerns.

Part 5 - Safety Considerations and Warnings

5.01 - General

A. Installation of a roof system is a construction process. As with any construction process, safety is a key element. All applicable safety standards and good roofing practices must be followed. Fire prevention is the applicator's responsibility.

B. **Warning:**

APPLICATION/USE OF THESE PRODUCTS MAY RESULT IN BURNS, AND/OR OTHER PHYSICAL INJURY. SURFACES, WHICH COME IN CONTACT WITH THE MOLTEN PRODUCT, MAY BECOME INFLAMED. CONTACT WITH MOLTEN ASPHALT MAY CAUSE BURNS.

Statement of Practical Treatment: In case of skin contact with molten bitumen, apply ice or other cold liquid compatible with skin. Get medical attention immediately.

C. General Precautions:

• READ AND UNDERSTAND U.S. PLY'S SPECIFICATION MANUAL before starting application. Follow all precautions and direction.

• Thoroughly train all personnel in the recommended safety procedures for use of kettles, asphalt mopping, propane torches, and for application of product.

• FIRE PREVENTION INSPECTIONS should be conducted periodically during installation, with a final inspection being conducted upon completion of that day's work.

• THOROUGHLY TRAIN ALL PERSONNEL ON PREVENTING AND EXTINGUISHING FIRES.

• NEVER ALLOW CONTACT between the heated surface of the product, hot asphalt, open flame and hair, skin or clothing.

• WEAR PERSONAL PROTECTIVE GEAR. Always use approved safety hardhat, goggles, heavy-duty gloves, snug-fitting clothing (long pants and long sleeved shirt), and boots.

• SOLVENT-CONTAINING CEMENTS AND COATINGS ARE COMBUSTIBLE AND SHOULD ALWAYS BE KEPT AWAY FROM HEAT, OPEN FLAME, OR ANY SOURCE OF IGNITION. Empty containers must be disposed in posted toxic substance landfills in accordance with local, state and federal regulations.

• WHEN WORKING WITH SOLVENT CONTAINING CEMENTS AND COATINGS, AVOID DIRECT CONTACT AND INSURE ADEQUATE VENTILATION. Wear appropriate protective equipment. Refer to product MSDS for additional information.

• THOROUGHLY TRAIN ALL PERSONNEL IN FIRST AID PROCEDURES.

• Always COMPLY WITH ALL APPLICABLE OSHA SAFETY STANDARDS and fire codes.

• NEVER APPLY built-up or modified bitumen products DIRECTLY OVER EXPOSED CONDUITS OR PIPES LYING ON THE ROOF DECK.

• Use extreme caution when working around equipment, such as gas lines or HVAC units, which have electrical and/or gas connections.

D. Torch Welding Safety

1. Installation of torch-applied products creates the risk of fire, including smoldering fires. Torch applied products must be applied only by professional roofing applicators trained in proper torch application and safety procedures. Roofing applicators must follow U.S. Ply's current roofing safety requirements, procedures and specifications, which are available from U.S. Ply Technical Services, 817-413-0103

2. Procedures and equipment that will be used must comply with all applicable code requirements. Knowledge of the building construction and HVAC systems must be obtained prior to installation of torch-applied products.

3. Identify all potentially combustible and flammable aspects of the buildings use and design that increase the risk of fire including:

- Deck and under deck composition (materials and accessories)
- Insulation types
- Cants and tapered edge strips
- Parapet wall and curb composition
- Perimeter details
- Adjoining building materials
- Expansion joints
- Wires and electrical conduit pipes
- Natural gas lines
- Chemicals, grease, oil or other condensates/exhausts/spills

4. Restaurant and food service exhaust vents can contain grease. All intake fans should be shut off during application with special care to keep open flame away from openings and vents.

5. Exhaust vents for laundromats in commercial, institutional structures, or residential condominiums, apartments and other multiple tenant occupied dwellings can contain lint and debris.

6. A fiberglass base sheet must be used between the roofing membrane and any combustible materials such as wood. Repair any damaged or torn base sheets before torch welding begins. Combustible materials, substrates and adjoining building surfaces that cannot be removed from torch welding area must be protected. Never apply flame directly to combustible materials or allow the flame to enter into hidden or protected areas that may contain combustible materials such as:

- Air intakes or exhaust openings
- Air coolers and A.C. units
- Lead flashings
- Drains
- Counter-flashings and coping covers
- Collars
- Flashings

5. The installation equipment must be designed for the specific use, and must be in proper working order.

Follow the manufacturer's safety and operating instructions for all torching equipment. Check all fittings and other equipment for

leakage. Never use a flame to check fittings and other equipment. Ventilation must always meet or exceed OSHA or NIOSH requirements.

6. A supervisor trained in torch safety must conduct external and internal fire watches during application and after the torches are shut down. Infrared scanning equipment must be used in the fire watch. The watches shall never be less than one hour and may need to be longer. The watches shall be of sufficient frequency and duration based on:

- Weather
- Building and roof design and composition
- Penetration types and design.

7. One Class ABC fire extinguisher must be kept within 10 feet of every torch operator. In addition, buckets of sand and pails of water are recommended as supplemental fire extinguishing materials. Portable fire extinguishers must be of a size and type required by local codes, however, extinguishers less than a 20 lb. minimum size are not recommended. Fire extinguishers must be checked prior to each day's work to make sure they are full and operable.

The above list is not a complete set of necessary safety requirements, procedures, and specifications. Call U.S. Ply Technical Services for the most current technical literature. In addition, the following steps must be taken by the applicator to prevent fires, since only the applicator is in a position to prevent fires. These steps include, but are not limited to:

- Do not leave propane torches lighted and unattended. Do not place a lighted torch on the deck surface, insulation, membrane, or any other surface or object other than an acceptable torch stand.
- Extinguish the torch when not in use.
- Avoid holding the flame on any one area of the membrane or substrate long enough for heavy smoke to be generated.
- Train all personnel in U.S. Ply recommended application techniques.
- Torch operators must maintain awareness of other personnel in the torch welding area. In tight quarters, only one torch should be used.
- Train all personnel in fire prevention and extinguishing methods.
- Take precautions when working around combustible materials, such as gas lines for HVAC units, and in the presence of solvent-based products. Remove all combustible debris, material wrappers and trash from torch welding area prior to installation. Use caution to prevent burns and train personnel in first aid procedures.
- Comply with all applicable fire regulations regarding the storage and use of propane.

For more information on safety measures, refer to the Asphalt Roofing Manufacturers Association titled Torch “Applied Roofing Do’s and Don’ts” and their video, “A Guide to Safety Torch-On Modified Bitumen”. Asphalt Roofing Manufacturers Association, 4041 Powder Mill Road, Suite #404, Calverton, MD. 20705-3106, (301) 231-9050. Also refer to Factory Mutual Property Loss Prevention Data Sheet 1-33.

Part 6 – Asphalt

6.01 - General

A. Hot asphalt must be handled carefully. See Part 5, this Section – “Safety Consideration and Warnings”.

B. Field experience has demonstrated that proper temperatures in the kettle and at the point of application are essential to obtain a satisfactory roof. Kettle temperatures in excess of those indicated below may result in changes to the asphalt, while temperature below specified minimums can result in lack of adhesion.

C. Do not apply asphalt when the outside temperatures are below 45°F (7.2°C). Unless following Cold Weather Application Precautions and Instructions. Refer to Section 4, Part 9 and this Section, Part 15.

D. The operator of the roofing bitumen kettle shall be fully trained and familiar with its safe operation and have the required safety equipment and clothing for his protection.

E. Under no circumstances shall the roofing bitumen kettle be left unattended while operating.

F. Do not mix different types of asphalt.

G. Take all necessary precautions to avoid asphalt drippage into the interior of a building. U.S. Ply will not be responsible for damage to the structure or interior because of asphalt drippage.

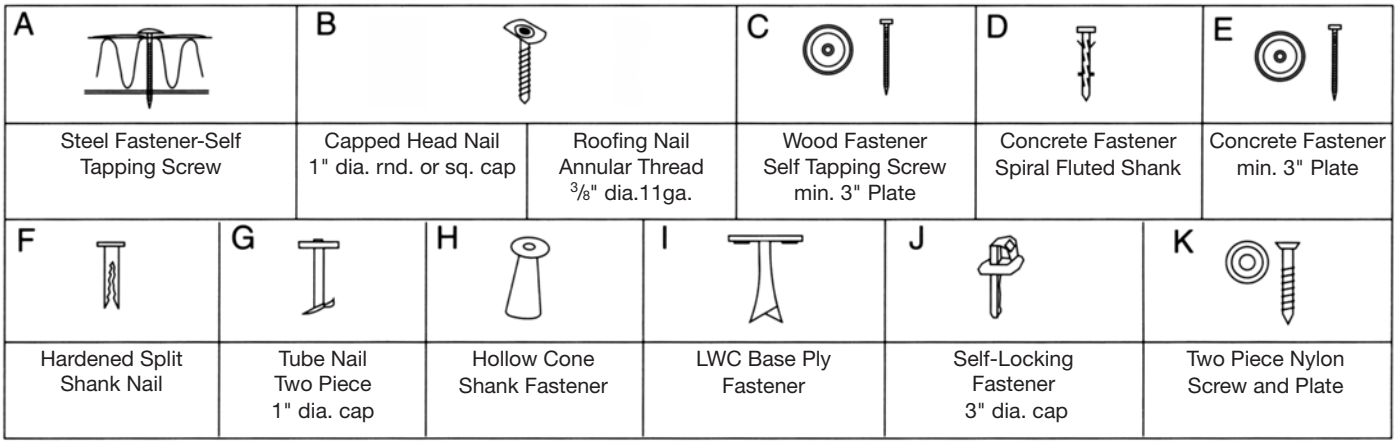
H. Discontinue application of asphalt over any substrate where foaming of asphalt is observed.

I. APP membranes are designed for torch application to approved substrates and underlying base plies and must not be installed in moppings of hot asphalt.

J. References to use of hot asphalt within these specifications refer solely to installation of other roof components such as vapor retarders, roof insulation, underlying base plies, built-up plies, and cap sheets and SBS modified bitumen membranes as applicable and required by U.S. Ply specifications.

6.02 - Asphalt Type

A. Steep or Special Steep grade (Type III or IV) asphalt or SEBS Type III or IV asphalt can be used for base, interply, cap sheet and membrane flashing mopping on slopes ¾" per foot (6.2 cm per meter) and under. Type IV must be used on all slopes greater than ¾" per foot (6.2 cm per meter).



B. Steep or Special Steep grade (Type III or IV) asphalt or SEBS Type III or IV asphalt can be used for SBS base, SBS interply, SBS cap sheet and SBS membrane flashing mopping on slopes ½" per foot (4 cm per meter) and under. Type IV must be used on all slopes greater than ½" per foot (4 cm per meter).

C. Only use asphalt manufactured in the United States or Canada, unless otherwise approved in writing, by a U.S. Ply Technical Services Manager.

6.03 - Asphalt Application Rate

A. Application with hot asphalt requires continuous, uniform interply mopping rates of 25 lbs. ± 20% per 100 square feet of roof area (1.2 kg/m²). Too little asphalt may result in voids, while too much asphalt can result in membrane slippage.

B. When applying non-modified glass base or glass interply sheets, the point of application temperature of the asphalt must be at the Equiviscous Temperature (EVT) with a tolerance of +/- 25°F (13.9°C), at which a viscosity of 125 centistokes is attained. When using mechanical asphalt applicators, the target viscosity should be 75 centistokes.

C. The equiviscous temperature (EVT) for the asphalt can be found on the asphalt cartons or bills of lading.

D. For substrates that absorb asphalt, apply the asphalt in sufficient quantity to assure the level of adhesion specified.

E. Asphalt application shall not commence when the outside temperature is below 45°F (7.2°C) unless cold weather application instructions are followed. See this Section, Part 15

F. In cold weather insulated piping and luggers may be necessary to maintain the required asphalt temperature at the point of application.

6.04 - Asphalt Heating

A. The operator of the roofing bitumen kettle must be fully trained and familiar with its safe operation and have the required safety equipment and clothing for his protection.

B. Never leave the roofing bitumen kettle unattended while operating.

C. Accurate thermometers must be on the job site to check temperatures at the kettle and at point of application.

D. Do not heat the asphalt to the or above its flash point.

E. Do not hold the asphalt at temperatures above the finished blowing temperature for more than 4 hours.

F. Do not keep heated tankers above 325°F (163°C) overnight or weekends.

G. The roofing bitumen kettle must be placed a safe distance from the building. It should be on plywood or a tarp to facilitate easy clean up.

Part 7 – Cold Adhesive

7.01 - General

A. Preparation: Stir well, do not thin. The substrate must be clean, dry, and free of any foreign materials, grease or oil. It is required that the ambient air temperature is above 50°F for the use of adhesives.

B. Do not apply adhesive if there is a possibility of freezing temperatures within 24 hours of installation. Adhesive should not be applied to substrates with temperatures over 140°F.

7.02 - Cold Adhesive Safety and Precautions

A. USP® 901 Premium Modified Adhesive and USP® 954 Premium Modified Flashing Cement must never be used with DuraWeld® APP or DuraFlex® TG SBS modified bitumen products with a burn-off film.

B. Adhesives are not intended to be used in below grade applications.

C. Adhesives are combustible and should always be kept away from heat, open flame, or any source of ignition. Empty containers must be disposed in posted toxic substance landfills in accordance with local, state and federal regulations.

D. Safety:

1. Skin contact: Wear chemical resistant gloves. Avoid prolonged or repeated skin contact. Wash contacted skin with soap and water;

2. Respiratory: Use with adequate ventilation. NOISH/MESA respirators required if TLV is exceeded. If subjected to inhalation in excess of TLV, remove individual to fresh air, administer oxygen if breathing is difficult. If breathing stopped, give artificial respiration; get emergency medical attention and keep individual warm.

3. Eye contact: Rinse immediately with water thoroughly and seek medical advice.

4. Refer to this Section, Part 5 for minimum safety requirements when installing USP roof systems.

7.03 - Cold Adhesive Application Rate

A. Application of the adhesive shall coat the substrate in the following manner:

1. Squeegee: Pour the adhesive on the substrate and spread it, using a 3/16" (5 mm) or maximum ¼" (6 mm) serrated squeegee, applied at the nominal rate of 1-1/2 gal/square (6 L/m²) but not to exceed a maximum rate of 2 gal/square 8 L/m²).

2. Spray: Using equipment that will apply the adhesive at a rate equal to 1-1/2 gal/square (6 L/m²).

B. Allow 5 to 15 minutes for solvents to evaporate from the adhesive. Note: tack time or open time before embedding any sheets into newly applied adhesive will vary, this is only a guide. Tack times depend on such variables as ambient temperatures, humidity, wind and cloud cover).

C. Allow sufficient time after membrane installation for solvent evaporation before heat seaming of laps. Refer to this Section, Part 12 for heat welding of membrane seams.

Part 8 – Fastening

8.01 - General

A. U.S. Ply recommends the use of tools and equipment specifically designed for mechanically fastening roof materials to conform to requirements of the fastener manufacturer.

B. Drive fasteners at an appropriate angle to insure proper thread engagement and specified holding strength. Fasteners that are improperly installed shall be removed or corrected.

C. Do not drive fasteners to the point where the stress plates cup and insulation "dimples". This is indicative of over driving the fastener.

D. Do not drive fasteners to the point where the head of the fastener is left exposed above the stress plate. This is indicative of under driving the fastener.

E. Fasteners must be installed to secure the roof assembly to the structural substrate to provide a recommended minimum wind uplift resistance equal to a minimum 60 psf. Where design requirements, local code, insurance or other regulatory requirements dictate higher wind resistance values, a design professional must advise of fastener type and density.

F. Do not install fasteners into/through wet or deteriorated insulation and/or substrates.

G. Stainless steel fasteners are recommended when fastening through existing roof systems.

H. Be sure to locate and identify electric or any other conduits in or under decks, and/or walls before any drilling is performed.

I. Fastener pullout tests are recommended for all deck types..

J. Fastener pullout tests are necessary for poured lightweight insulating concrete, gypsum and structural wood fiber decks to determine fastener pattern.

K. Metal or plastic stress plates, minimum 3" (7.6 cm) in diameter, are required when mechanically attaching insulation or the base sheet and insulation simultaneously. Metal stress plates must be used for torch or heat weld applications.

L. For additional fastening information, and for FM compliance, refer to Factory Mutual LPDS 1-7, 1-28, 1-29 and 1-49; also refer to the Factory Mutual Approval Guide and U.S. Ply Factory Mutual Approval Reports for supplemental information.

8.02 - Fastener Types

A. For Steel Decks: Carbon steel fastener with corrosion resistant coating, self-tapping drill point, driven through a separate 2" – 3" metal plate. PlyFast® #12, #14, #15 or #21 Fastener.

B. Concrete Decks: Carbon steel fastener with corrosion resistant coating driven through a separate 2" – 3" metal plate. PlyFast® #15, #21, PlyFast® Concrete Spike or PlyFast® Concrete Fluted Nail.

C. For Wood Decks: Carbon steel fastener with corrosion resistant coating, self-tapping drill point driven through a separate 2" – 3" metal plate. PlyFast® #10 or #12 Fastener.

D. For Base Sheet attachment to Wood Decks: Cap Head Nail – 1" (25 mm) diameter round or square cap, smooth shank or annular threaded. Roofing Nail – 3/8" (10 mm) diameter head/11 gauge, smooth shank or annular threaded; must be driven through minimum 1" (25mm) round/square cap plate.

E. For Base Sheet attachment to Gypsum or Lightweight Concrete Decks: Corrosion resistant galvanized (G-90) steel with rectangular dual gripping legs, 1.7" long and a locking 2.7" diameter plate. PlyFast® 1.7 Base Ply Fastener.

F. For Base Sheet attachment to Gypsum or Lightweight Concrete Decks: Corrosion resistant galvanized (G-90) steel tube and locking plate with hooking pins that protrude from tube shaft when driven. PlyFast® Double Lock Nail

G. For Insulation attachment to Gypsum or Structural Wood Fiber Decks: Nylon auger type shaft with a tapered root which uses a specially designed 3" (7.6 cm) diameter plate. PlyFast® GypTek Fastener

H. For Insulation attachment to Gypsum or Structural Wood Fiber Decks: Corrosion resistant carbon steel fastener is designed to secure insulation to gypsum, all structural wood fiber decks and lightweight concrete. Uses a separate minimum 3" (7.6 cm) diameter metal plate. PlyFast® Steel LiteDeck Fastener

I. Metal Insulation Plate – Galvalume® plated metal with a unique, concave circular design with reinforcing ribs, low profile and a 3-inch diameter to assure proper compression to insulation. PlyFast® 3" Metal Plate

J. Metal Membrane Plate – Heavy Duty Galvalume® plated barbed metal with unique, concave circular design with reinforcing ribs, low profile and a 2-inch or greater diameter to assure proper compression to membrane. PlyFast® 2" Barbed Plate, PlyFast® 2.4" Barbed Plate, or PlyFast® 2.75" Barbed Plate.

K. Specialty Fastener Plate: Unique 3" diameter Galvalume plate designed for a selected fastener. PlyFast® 3" GypTek Plate, PlyFast® LiteDek Plate.

L. Masonry Anchor: Stainless steel masonry anchor for termination bars and attaching metal flashings to brick and masonry. PlyFast® Zamac Nailin.

Refer to U.S. Ply list of approved fasteners for those fasteners that must be used in U.S. Ply guaranteed roofing system. A copy of this list is available from U.S. Ply at **(817) 413-0103**

8.03 – Fastening Patterns

A. For Insulation attachment, refer to this section, Part 11, Insulation Mechanically Fastened.

B. For Base Sheet attachment, refer to this section, Part 12, Base Sheets Mechanically Fastened.

Part 9 – Vapor Retarder Installation

9.01 - General

A. The best vapor retarder material cannot be effective in reducing transmission of moisture vapor if it is not properly installed or if it is damaged or punctured during the time of application. Laps and joints must be properly sealed, projections extending through the vapor retarder must be flashed or enveloped at the vapor retarder level to insure integrity of the vapor retarder, and all punctures in the vapor retarder must be repaired prior to installation of the roof insulation. Insulation boards should be installed immediately over the vapor retarder to protect the vapor retarder from punctures or damage caused by subsequent construction traffic.

B. Vapor retarders should be installed over spaces where high interior humidity conditions exists and/or when the ambient January temperature is below 40°F and interior winter relative humidity is greater than 45%.

C. Follow the design professional's recommendation(s) for installing vapor retarders. When a vapor retarder is installed, allow for venting any trapped gases between the vapor retarder and the roof membrane by using perimeter venting or by using one-way vents placed one vent for every 1,000 square feet, venting from the surface of the vapor retarder.

Part 10 – Steep Slope Requirements

10.01 - General

A. SBS Membranes:

When using SBS hot asphalt applied membranes, ASTM D-312, Type IV asphalt must be used on slopes of 1/2 inch per foot (4.2 cm per meter) or greater.

1. Slippage of mop applied roof systems or cold applied roof systems may occur on slopes of 1/2 inch per foot (4.2 cm per meter) or greater.
2. Supplemental fastening is therefore required. If the roof slope is less than 1/2 inch per foot (4.2 cm per meter), supplemental fastening is not required.

B. Built-up Membranes:

When using built-up hot asphalt applied membranes, ASTM D-312, Type IV asphalt must be used on slopes of 3/4 inch per foot (6.2 cm per meter) or greater.

1. Slippage of mop applied roof systems may occur on slopes of 3/4 inch per foot (6.2 cm per meter) or greater.
2. Supplemental fastening is therefore required. If the roof slope is less than 3/4 inch per foot (6.2 cm per meter), supplemental fastening is not required.

C. Use treated wood nailers (insulation stops) at least 3 1/2 inches (8.9 cm) wide and equal in thickness to the insulation. Nailers must be mechanically fastened to the deck installed at right angles to the direction of the slope.

D. On ridges where insulation stops are required, treated wood nailers must be a minimum 3-1/2 inches (9 cm) wide and equal in thickness to the insulation. Nailers shall be secured mechanically to the deck on both sides of the ridge. Where nailers meet, bevel edges to form a flush surface for membrane application.

10.02 - Wood Nailers on Slopes of 1/2" but Less than 2" per Foot

A. When the slope is or 1/2 inch per foot or more but less than 2 inches per foot (6.2 cm but less than 16.7 cm per meter) for SBS membranes or if the slope is 3/4 inch per foot or more but less than 2 inches per foot (4.2 cm but less than 16.7 cm per meter), for built-up membranes, use wood nailers at the eave, at the ridge and at intermediate points of no more that 16 feet (4.9 meters). All dimensions are from inside face to inside face of the wood nailers.

B. Ensure a snug fit with the courses of insulation, but avoid cutting the insulation where possible.

C. For non-insulated nailable decks, back-nail the plies directly to the deck at the intervals listed.

D. For non-insulated, non-nailable decks, set the wood nailers flush with decks and install at the intervals as indicated.

10.03 - Wood Nailers on slopes of 2" to 3" per Foot

A. If slope is 2 inches per foot to 3 inches per foot (16.7 cm to 25.0 cm per meter), use wood nailers at the eave, at the ridge and at intermediate spacing of no more than 8 feet (2.4 m). All dimensions are from inside face to inside face of the wood nailers.

B. Ensure a snug fit with the courses of insulation, but avoid cutting the insulation where possible.

C. For non-insulated nailable decks, back-nail the plies directly to the deck at the intervals listed.

D. For non-insulated, non-nailable decks, set the wood nailers flush with decks and install at the intervals as indicated.

10.04 - Wood Nailers on Slopes Greater than 3" per Foot

A. For roofs with slopes greater than 3 inches per foot (25.0 cm per meter); contact U.S. Ply Technical Services at 817-413-0103

10.05 - Insulation Installation on Slopes

A. If insulation is to be installed, mechanically attach insulation or mop between wood nailers.

10.06 - Membrane Installation

A. Install all plies of base and ply sheets vertically on slopes 3/4 inch per foot (6.2 cm per meter) or more. or more. Install all SBS sheets vertically on slopes ½ inch per foot (4.2 cm per meter) or more. Backnail them into wood nailers or nailable decks approximately 1 inch (2.5 cm) from the leading edge of the sheets. All end laps must be at wood nailers and blind nailed into the wood nailer on 8-inch center (20.3 cm). Use nails with integral metal heads at least 1 inch (25 mm) round or square.

B. At ridges, base plies must extend across opposite sides of ridge, over the nailer and be fastened on 8-inch (20.3 cm) centers. An additional layer of base sheet shall be centered over the ridge overlapping the fasteners at least 6 inches (15.2 cm).

C. Terminate membrane at wood nailer and fasten the top edge of each sheet with screws and 3-inch (7.6 cm) plates on 8-inch (20.3 cm) centers across the top of the sheet. The overlapping sheet must extend at least 9 inches (22.9 cm) past the top of the underlying sheet. All end laps must be staggered to the closest wood nailer, spaced a minimum of 8 feet (2.44 m). On slopes of 2 inches to 3 inches per foot (16.7 to 25 cm per meter), the membrane must be cut into length not to exceed 17 feet (5.18 m). For non-insulated wood decks, terminate and fasten the end of the membrane to the deck with the same fasteners, on the same spacing indicated above.

D. At ridges, cap sheet must extend across opposite sides of ridge over the nailer and be fastened with screws and 3-inch (7.6 cm) plates on 8-inch (20.3 cm) centers. An additional full width ply of cap sheet shall be centered over the ridge to form a ridge cap overlapping the fasteners at least 6 inches (15.2 cm).

Part 11 – Insulation Installation

11.01 - General

A. Do not apply roof insulation and roofing until all other work trades have completed jobs that require them to traverse the deck on foot or with equipment. A vapor retarder (membrane type) coated lightly with asphalt may be applied to protect the inside of the structure before the insulation and final roofing are installed.

Before the application of the insulation, the vapor retarder must be carefully repaired.

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

C. Install insulation boards with staggered board joints in one direction (unless taping joint).

D. Install insulation board snugly. Gap between board joints must not exceed ¼" (6 mm). All gaps in excess of ¼" (6 mm) must be filled with like insulation material.

E. Do not kick insulation boards into place.

F. Install insulation boards per insulation board manufacturer's requirements.

G. Edges of insulation board shall be mitered and filled at ridges and elsewhere to prevent open joints or irregular surfaces. Avoid breaking or crushing of the insulation at the corners.

H. Do not install insulation over old lightweight insulating concrete deck without the use of a vapor retarder. Do not install insulating concrete over new lightweight insulating concrete.

I. Steel decks require mechanical attachment of insulation.

J. Insulation boards must be mechanically fastened or attached with hot asphalt to the deck. Refer to the Roof Design section of this manual. Do not attach with cold adhesive is not acceptable, unless approved in writing by U.S. Ply Technical Services Manager.

K. The insulation must be securely attached to the roof deck. A minimum design resistance of 60 psf for attachment is recommended, but in no case may attachment be less than 8 fasteners per 4’ x 8’ board (1 per 4 sq. ft.) for modified bitumen membrane systems and 11 per 4’ x 8’ board (1 per 3 sq. ft.) for built up membrane systems.

Additional fastener securement is appropriate in the perimeter and corner areas to meet higher wind resistances associated with perimeter wind forces. Also refer to FMRC Approval Guide for FM fastening patterns. Factory Mutual requires fastener density increased in corner areas for FM 1-60, and perimeter, and corner area fastener density increases for FM 1-90 or greater. Refer to FM Loss Prevention Data Sheets 1-7, 1-28, and 1-49.

L. Use only fasteners with a minimum 3 inch (7.6 cm) stress plate when mechanically attaching insulation.

M. Do not attach insulation with nails.

N. A maximum board size of 4’ x 8’ (1.22 m x 2.44 m) may be mechanically attached. A maximum board size of 4’ by 4’ (1.22 m x 1.22 m) is to be used if the insulation is to be adhered in asphalt or adhered with low rise foam adhesive.

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

P. Preservative treated wood insulation stops/nailers, the same thickness as the insulation, shall be attached at outside edges and openings through the deck. Refer to Part 13, Item 13.02, of this Section.

Q. If tapered roof insulation is to be installed all hip and valley panels must be mitered. Laced valleys are not acceptable.

R. Never torch DuraWeld® APP or DuraFlex® TG SBS directly to roof insulation.

11.02 - Nailable Substrates

A. Single layer constructions, or bottom layer in double layer constructions. Mechanically fasten the insulation layer to the deck (refer to Part 8 of this Section for fastener types applicable to the roof deck, and illustration). Install the insulation with joints staggered in one direction, assuring that board sides and ends touch all along their length. If roof tape is specified, roof insulation joints must be run continuous in both directions to facilitate taping.

B. Refer to approved insulation product data sheet for minimum thickness requirement when installing over fluted steel decks. Refer to FMRC Approval Guide for minimum approved thickness when installing over fluted steel decks.

C. Roof insulation shall be laid with edges of the long dimension parallel to flutes. Insulation edges shall terminate on flutes and not unsupported over a channel.

D. For simultaneous attachment of multiple layers of insulation, preliminary fastening of underlying insulation is required. Locate a minimum of one (1) fastener in each corner area of the insulation board.

E. Refer to Insulation fastening patterns in Section 11 of this Manual.

11.03 - Non-Nailable Substrates

A. Poured, prestressed and precast concrete require priming prior to installation of insulation boards.

1. prime the deck with asphalt primer (ASTM D 41) applied at the rate of 1 gal/square (0.41 L/m²) minimum or as required by the primer manufacturer. Hold primer application back 4" (10 cm) from concrete panel joints, cracks or roof openings. Allow the primer adequate time to dry.

B. Use maximum 4' x 4' (1.22 m x 1.22 m) insulation boards when applying insulation in hot asphalt.

C. Install all insulation boards in full and uniform moppings of hot and fluid asphalt applied at the rate of 25 – 30 lb/square (1.2 – 1.5 kg/m²). Install the insulation with the joints staggered in one direction, assuring that board ends and sides touch all along their length. Press each board firmly into place.

D. Poured, prestressed and precast concrete decks do not require priming prior to foam adhesive of insulation boards.

E. Refer to this section, Part 11, Item 11.05, for insulation installation in low rise foam adhesive.

11.04 - Additional Layers of Insulation

A. Install additional insulation layers, maximum 4' x 4' (1.22 m x 1.22 m) board size, in full and uniform moppings of hot asphalt applied at the rate of 25 lbs./square (1.2 kg/m²) ± 20%. Press each board firmly into place. Stagger the joints of each additional layer by as much as possible in relation to the insulation joints in the layer(s) below (minimum 6"(15.2 cm) stagger) to eliminate continuous vertical gaps.

B. As an alternate method to the above, multiple layers of the same non-tapered insulation material may be simultaneously mechanically fastened with approved fasteners and plates through the top layer of insulation to the structural deck. Individual layers of insulation must not exceed 3" (7.6 cm) in thickness without written approval of U.S. Ply Technical Services. U.S. Ply approved perlite or wood fiberboard insulation, minimum ½" (13 mm) thickness or gypsum glass-fiber mat roof board or gypsum fiber roof board minimum ¼" (7.4 mm) thickness, may be installed over one or more layers of approved polyisocyanurate roof insulation simultaneously attached. Stagger and offset all joints of each insulation layer from underlying layers. Fastening pattern and uplift classification for simultaneously attached insulation assemblies is dependent upon the top layer of insulation directly under the fastener plates according to the listed FMRC approval for the specific insulation material, deck type and fastener assembly used. Refer to FMRC Loss Prevention Data Sheet 1-28 and 1-29 for additional requirements and information.

11.05 – Insulation in Low Rise Foam Adhesive

A. Thoroughly train all personnel in the recommended equipment and hose assembly, safety procedures and equipment use for dispensing low rise, two-component adhesives. Follow recommended equipment storage, re-use of unused material, dispensing equipment and disposal procedures. Never commence operation until personnel are familiar with and understand the dispensing equipment and how to properly apply the adhesive.

B. For best results, all surfaces to be bonded must be clean, dry and free from dirt, dust, oil, loose paint, wax or grease, etc. The temperature of the adhesive should be between 70˚-95˚F (21˚-35˚C) and the surfaces being bonded should be at 40˚F (4˚C) or above. Temperatures outside this range may affect bonding range, dispensability and performance of the product.

C. Adhesive Application: To dispense froth foam, point the applicator's nozzle at the surface to be sprayed, holding it approximately 20" from the surface. Squeeze the trigger and move hand at a speed which delivers the desired adhesive pattern. The insulation adhesive is applied in rows placed a maximum of 12" o.c. Note: Denser row spacing may be required to achieve higher uplift results, typically in perimeter and corner locations.

1. A maximum board size of 4' by 4' (1.22 m x 1.22 m) is to be used if the insulation is to be adhered in low rise, two-component insulation adhesive. A maximum board size of 4' x 8' (1.22 m x 2.44 m) is permitted for gypsum roof boards.

2. Insulation boards are to be placed immediately. Follow adhesive manufacturer's specific installation instructions for setting, weighting and walking in boards.

3. The time involved in this process is contingent on the ambient as well as deck surface temperature.

4. After the adhesive has attained its initial bond strength, the boards can be "walked-in" and will be compressed to the deck or substrate exhibiting minimal slippage or movement. The boards should be exposed to minimum traffic for at least 10-20 minutes (depending on temperature) after they have been "walked-in-place" to avoid breaking the freshly formed bond.

D. Membranes can be applied to the insulation once the adhesive has achieved sufficient bond strength to the immediate substrate to which it is adhered. It is recommended that the contractor inspect the installed insulation for proper adhesion and re-adhere any boards and/or corners that are not adequately attached.

E. Boards that will not lay flat due to cupping, warping or crowning or surface irregularities of the substrate, should have weights placed on the boards until the adhesive has achieved adequate adhesion to hold the boards in place. Once adhesive is set, replace any boards which remain cupped or warped.

Part 12 – Membrane System Installation

12.01 - General

A. Substrates must be inspected and accepted by the contractor as suitable to receive and hold roof membrane materials.

B. Start the installation of all membrane plies at the low point or drains, so the flow of water is over or parallel to the ply laps, but never against the laps. Position and align roll prior to application.

C. Chalk lines where necessary to assure proper alignment and headlap of membrane plies.

D. Use half base sheet width as a starter strip in two-ply roof constructions.

E. Installation of all membrane plies, except those that are mechanically fastened, shall result in a visible, uniform flow-out of bitumen at side and end laps.

F. Assure that all membrane plies lay flat and are uniformly secured to their substrate. Wrinkles, fish mouths and similar defects must be

removed and patched.

G. Extend all membrane plies to dimensions necessary to accommodate flashing conditions shown in the Flashing Details of this manual.

H. All lap edges for U.S. Ply cap membranes shall be rolled-in or walked-in immediately after installation. Additional care must be taken to insure complete bonding at T-laps. Lap edges on all membrane sheets should be inspected for full and uniform bonding to the underlying membrane sheet.

I. Stagger all adjacent end laps for all membrane plies a minimum of 18" (45.7 cm). Side laps shall not coincide with underlying plies in multiple layer applications.

J. Prime all masonry, metal and existing asphalt surfaces and substrate with asphalt primer where insulation or U.S. Ply membranes are to be adhered. Primer (ASTM D 41) shall be applied at the rate of 1 gal/square (0.41 L/m²) minimum or as required by primer manufacturer. Allow the primer adequate time to dry.

K. Brooming-in of glass felts is vital to minimize voids and assure complete, uniform attachment.

L.Base sheets such as USP® Base, and USP® NVB (Nailable Venting Base) must be cut into lengths “short enough to be easily handled” and allowed to warm up and relax prior to installation. Appropriate maximum length may vary depending upon temperature conditions. The base sheet must be warmed to a temperature sufficient to allow expansion and relaxation of the asphalt coating, otherwise wrinkles may form. The contractor must evaluate weather conditions to determine maximum functional length and relaxation time to avoid wrinkling. Tension shall be placed on the ends of the base sheet during installation to insure that the sheet lays flat.

M. Occasionally, a roll of felt or membrane will contain a splice that was fabricated as part of the manufacturing process. These splices are marked. Cut out all splices, and treat as an end lap.

N. Back nailing of felts and cap sheets, and the use of ASTM D 312 Type IV asphalt is required on slopes ¾" per foot (6.2 cm per meter) or greater. Refer to Part 10, “Steep Slope Requirements”.

12.02 - Phasing

A. The term “phasing” refers to the practice of applying part of a total hot asphalt applied roof membrane at one time and allowing that part to remain exposed to the weather for a period of time before applying the remaining elements of the roof system. Membranes applied in this manner are subject to early deterioration. Blisters, voids, membrane damage and moisture infiltration are much more likely to occur in “phased” roof membranes.

B. U.S. Ply does not approve the practice of “phasing”.

C. Whenever it is necessary to put a building “in the dry” quickly, a temporary roof covering is recommended; this temporary roof should be removed prior to installation of the roof system.

12.03 - Base Sheets - Mechanically Fastened

A. After allowing the base sheet to relax, keep sheet taut, fastening at center of sheet and working in opposite directions. Push all wrinkles and buckles ahead as fastening proceeds. The following are minimum fastening patterns that may be used when fastening the base ply. For FMRC approved fastening patterns, refer to the current FMRC Approval Guide.

1. Base sheet (no insulation) on decks of wood, plywood, OSB, lightweight concrete, gypsum, or structural wood fiber: Lap the base sheet a minimum of 2” (5 cm), and mechanically fasten with three rows of fasteners. The first row (on the seam) will be 1” (2.5 cm) from the leading edge and on 9” (22.9 cm) centers. Locate the second row of fasteners 12” (30 cm) from the leading edge and on 18” (45.7 cm) centers. The third row of fasteners shall be 24” (60 cm) from the leading edge on 18” (45.7 cm) centers. The centers for the second and third rows should be staggered.

2. Simultaneous fastening base sheets with insulation, with the fasteners having a 3” (7.6 cm) plate: Lap the base sheet a minimum of 2” (5 cm). Screws and plates are then installed in three rows. The first row (on the seam) will be 1-1/2” (3.75 cm) from the leading edge and on 12” (30 cm) centers. Locate the second row of fasteners 12” (30 cm) from the leading edge and on 18” (45.7 cm) centers. The third row of fasteners shall be 24” (60 cm) from the leading edge on 18” (45.7 cm) centers. The centers for the second and third rows should be staggered.

Note: Denser row spacing and/or an increase in rows and fasteners per row may be required to achieve higher uplift results, typically in perimeter and corner locations.

B. When fastening base sheets using screws and plates without insulation, the plate must be of a design that allows it to lie flat on the deck.

C. Refer to Section 11 of this manual for additional fastener patterns. Consult U.S. Ply, 817-413-0103 for Factory Mutual or other code requirements regarding specific fastening patterns as may be applicable.

12.04 - Base/Interply Sheets - Hot Asphalt Application

A. The following applies to all U.S. Ply sheets, which may be used as ply sheets or base sheets (excluding USP® NVB).

1. Foot and machine traffic on freshly applied membranes with asphalt must be kept to a minimum to reduce the possibility of asphalt displacement due to “point applied” pressure. The potential result is the creation of an area where the asphalt quantity may be too light to perform the required waterproofing function.

2. Workmen must stand on the insulation or deck side of the system and avoid traffic on the freshly laid membrane system for a long enough time to allow the asphalt to set up.

3. Do not allow equipment to stand over, or store materials, on the freshly laid membrane. Asphalt dispensing equipment must have balloon tires. Delay any traffic over the freshly laid membrane system for a period of time sufficient to allow the asphalt to set up

B. For slopes under ¾" per foot (6.2 cm per meter), Type III or IV asphalt can be used. Type IV must be used on all slopes ¾" per foot (6.2 cm per meter) and greater.

Note: On all slopes requiring the use of Type IV asphalt, the cap sheet and felts must be backnailed on their end laps. See Part 10, Steep Slope Requirements.

C. Asphalt shall be applied in a uniform layer, without voids, at a rate of 25 lb/square (1.2 kg/m²) ± 20%. See Part 6 “Asphalt”.

D. For mop applications of U.S. Ply membranes, the mopping stroke will be such that the side lap is covered with asphalt last.

E. For substrates that absorb asphalt it is necessary to apply the asphalt in sufficient quantity to assure the level of adhesion specified.

F. Base sheet: Install full width base sheets, lapping 2" (5 cm) on the sides and 4" (10 cm) on ends. Stagger adjacent end laps a minimum of 12" (30.5 cm) apart.

G. One-ply interply application: Install full width interply sheets, lapping 2" (5 cm) on the sides and 4" (10 cm) on ends. Stagger adjacent end laps a minimum of 12" (30.5 cm) apart. Where installed over base sheet, stagger ply sheet side and end laps from underlying plies. Install the felt in full and uniform mopping of hot asphalt applied at the rate of 25 lb/square (1.2 kg/m²) ± 20%.

H. Two-ply interply applications: Install starter strips of 18" (45.7 cm) and 36" (91.4 cm) widths and follow with a second full 36" (91.4 cm) width sheet with a maximum of 17" (43.2 cm) exposure, applied

shingle style. Lap felts 19" (48.3 cm) with a 17" (43.2 cm) exposure and lap 4" (10 cm) on ends. Stagger adjacent end laps a minimum of 12" (30.5 cm). Install the felts in full and uniform mopping of hot asphalt applied at the rate of 25 lb/square (1.2 kg/m²) ± 20%.

I. Three ply interply applications: Install starter strips of 12" (30.5 cm), 24" (61 cm) and 36" (91.4 cm) widths and follow with a second full 36" (91.4 cm) width sheet with a maximum 11-1/3" (28.8 cm) exposure, applied shingle style. Lap sheets 24-2/3" (62.7 cm) with an 11-1/3" (28.8 cm) exposure and lap 4" (10 cm) at ends. Stagger adjacent end laps a minimum of 12" (30.5 cm). Install the felts in full and uniform mopping of hot asphalt applied at the rate of 25 lb/square (1.2 kg/m²) ± 20%.

J. Four-ply interply applications: Install starter strips of 9" (22.9 cm), 18" (45.7 cm), 27" (68.6 cm) and 36" (91.4 cm) widths and follow with a second full 36" (91.4 cm) width sheet with a maximum 8-1/2" (21.6 cm) exposure, applied shingle style. Lap sheets 24-2/3" (62.7 cm) with an 8-1/2" (21.6 cm) exposure and lap 4" (10 cm) at ends. Stagger adjacent end laps a minimum of 12" (30.5 cm).

K. Interply sheets may be applied by a mechanical felt layer, or hand mopping with hot asphalt. Mechanical Felt Layer shall be multiple gate valve type that spreads hot asphalt on the roof surface just ahead of the plies. Equipment shall be clean, in good operating condition and shall hold sufficient asphalt (20 gal or 75.7 L, minimum) to lay an entire roll or ply sheet.

L. Application of uniform layers of interply asphalt is vitally important. Avoid excessively heavy or irregular application of asphalt between ply sheets. Broom plies immediately to insure full contact and proper embedment. Dry laps are not acceptable.

M. Apply asphalt so that a small bead of asphalt shows at the edge of the membrane. Do not allow heavy flows of asphalt to extend beyond the membrane edge. Heavy, irregular surface flows of asphalt will make proper application of cap membrane difficult.

N. In the event a wrinkle or a “fishmouth” forms during the application of the membrane, do not “walk it down” as the memory of the sheet or felt may cause it to reappear. Fishmouths or wrinkles shall be sliced open and patched with hot asphalt and additional membranes. Avoid cutting into the plies below the fishmouth or wrinkle by angling the knife blade to the side. An equal number of plies shall be used to patch the number of cut out ply portions.

12.05 - Base/Interply Sheets - Cold Adhesive

A. The following applies to SafeWeld® APP Base, DuraFlex® SBS base sheets, and USP® base sheets, that may be used as cold applied base or ply sheets (excluding all DuraWeld® APP, all DuraFlex® TG SBS, USP® Type 4, USP® Type 6 and USP® NVB).Foot and machine traffic on freshly applied membranes must be kept to a minimum to reduce the possibility of adhesive displacement due to “point applied” pressure. The potential result is the creation of an area where the adhesive quantity may be too light to perform the required waterproofing or bonding function.

Workmen must stand on the insulation or deck side of the system and avoid traffic on the freshly laid membrane system for a long enough time to allow the adhesive to set up.

Do not allow equipment to stand over, or store materials on, the freshly laid membrane. Dispensing equipment must have balloon tires.

B. Cold Adhesive shall be applied in a uniform layer, without voids, at a rate of 1.5 gal/square ± 20%. See Part 7 “Cold Adhesive”.

C. For English width base sheets: Install full width base sheets, lapping 2” (5 cm) on the sides and 4” (10 cm) on ends. Stagger adjacent end laps a minimum of 12” (30.5 cm) apart. For Metric width base sheets: Install full width sheets, lapping 4” (10 cm) on the sides and 6” (15.2 cm) on the ends. Stagger adjacent end laps a minimum of 18” (45.7 cm) apart.

D. Two-ply interply application: For English width sheets: Install starter strips of 18” (45.7 cm) and 36” (91.4 cm) widths and follow with a second full 36” (91.4 cm) width sheet with a maximum of 17” (43.2 cm) exposure, applied shingle style. Lap sheets 19” (48.3 cm) with a 17” (43.2 cm) exposure and lap 4” (10 cm) on ends. Stagger adjacent end laps a minimum of 12” (30.5 cm) apart. For Metric width sheets: Install one full width sheet lapping 4” (10 cm) on the sides and 6” (15.2 cm) on the ends. Offset the second sheet from the underlying sheet so that the side laps are offset half the distance of the width of the sheet. Lap the second sheet 4” (10 cm) on the sides and 6” on the ends. Stagger adjacent end laps a minimum of 18” (45.7 cm) apart.

E. Starting at the low point or the drains, apply the cold adhesive to the substrate as follows:

1. Pour the adhesive on the substrate and spread, using a serrated edged squeegee, applied at the rate of 1-1/2 gal per square (6 L/m²), or, spray, using equipment that will apply the adhesive at a rate equal to 1-1/2 gal/square (6 L/m²).

2. Apply the adhesive so that the substrate is covered in a pattern slightly larger than the first sheet being applied.

3. End laps and selvage laps of the base sheet being lapped must be coated with adhesive so that a visible bead of adhesive appears. Roll all laps with steel roller to ensure proper adhesion.

4. Allow 5 to 15 minutes for solvents to evaporate from the adhesive (i.e. tack time or open time) before embedding any sheets into newly applied adhesive. (Note: this is only a guide. Tack times depend on such variables as ambient temperatures, humidity, wind, and cloud cover.)

F. Cut base interply sheets into 18'-36' (5.5 - 11 m) length and allow to relax prior to re-rolling and final installation.

G. Apply adhesive so that a small bead shows at the edge of the membrane. Do not allow heavy flows of adhesive to extend beyond the membrane edge.

H. In the event a wrinkle or a “fishmouth” forms during the application of the membrane, do not “walk it down” as the memory of the sheet or felt may cause it to reappear. Fishmouths or wrinkles shall be sliced open and patched with cold adhesive and additional membranes. Avoid cutting into the plies below the fishmouth or wrinkle by angling the knife blade to the side.

12.06 – RapidGRIP® Readi-Base SA Base Sheet Application

A. The surface over which the membrane is to be installed must be clean, smooth, and dry and prepared in accordance with this specification manual.

B. Substrates should be inspected and accepted by the contractor as suitable to receive and hold roof membrane materials. All decks should be designed to attain positive drainage.

C. This is product is for use as the base layer over approved insulation or Nail Base designed for SA membranes in most low-slope roofing applications.

D. Sweep the surface of the insulation boards or anchor sheet to remove any dust, dirt, sand or other bond inhibiting particles that could interfere with adhesion.

E. Refer to Section 5, Part 2, Item 2.02 – RapidGRIP® Self-Adhesive Precautions for storage and temperature limits for application.

F. Roll out membrane and allow the base to relax prior to application. Cut rolls into manageable lengths for best results.

G. Keep the box for storage on the roof to use as a receptacle for discarding release film.

H. Start with a half roll width at low point of roof or drains for maximum offset between base and cap. Roll sheet out and set to align.

I. Fold the membrane back halfway lengthwise to remove the half of the poly release film on the underside from the up slope side of the roll and set in place. Then flip back the other half of the roll and

remove the down slope side of the second half of the release film on the underside of the roll in a smooth continuous process. Note: When removing the poly release film from the underside of the roll, you should intend to simultaneously bond the side lap together.

J. Firmly adhere the membrane by direct contact pressure to the desired substrate. Apply pressure from the center of the sheet outwards towards the membrane sides and ends.

K. Use a weighted field roller to assure maximum contact of the membrane with the substrate working out all air pockets, voids and un-adhered areas that will prevent bonding of membrane to underlying substrate.

L. Continue installing the membrane up slope lapping the side laps 4” (10.1 cm) and 6” (15.2 cm) on the end laps. Stagger all end laps a minimum of 18” (45.7 cm) from one another.

M. Check all joints and laps for full adhesion before the end of each day. If the membrane can be lifted in any area, it is not properly adhered. A seam probing tool can be helpful to check for small voids at laps.

N. At end laps, additional care must be taken to ensure complete bonding at T-laps. Before adhering laps, cut the selvage edges of the upper and lower sheet at opposing diagonal corners at 45° degree angles to prevent a capillary void Corners should be trimmed on a diagonal angle from outside edge to top of the end of the roll. The width of trim should be equal in width to the side lap specified. Apply a bead of USP® 954 Premium SBS Flashing Cement to the angle cut and within the end lap area in a serpentine pattern and spread the adhesive with a trowel along the entire 6” lap width before setting the end lap in place. Trimmed corners should be completely covered by application of succeeding roll course.

O. Note: Warm weather conditions and exposure to direct sunlight are essential for proper adhesion. The self-adhesive compound will not activate if installed below the recommended temperatures and/or if the material temperature is below 70°F. If necessary, a hot air welding device designed for sealing modified bitumen seams and a hand-held seaming roller may be used to seal the side and end laps areas and enhance adhesion prior to the application of the USP® 954 SBS Flashing Cement at end laps.

P. In cooler weather, a torch or hot-air welding device may be used to warm the lap areas and enhance adhesion prior to the application of the USP® 954 Premium SBS Flashing Cement.

Q. Important: If the cap sheet is not to be installed the same day, then supplemental heating to the underside of the sheet may be necessary to activate the adhesive tack and accomplish desired mating to substrate.

R. Use product box for discarding poly release film. After completion of job discard product box.

12.07 – USP® Mineral Cap Sheet Application

A. Cap sheet shall be precut into 12' (3.66 m) lengths [18' (5.49 m) lengths if the temperature is 65°F (18.2°C) or greater] stacked and allowed to relax. Weather conditions, such as temperature, wind, sun, etc., must be given consideration when temperatures are below 50°F (9.9°C), as cracking, wrinkles, non-adhesion, and fishmouths are more likely to occur.

B. Embed cap sheet into a uniform solid mopping of hot asphalt at an optimum rate of 25 lb/square (1.2 kg/m²).

C. Set cap sheet in place with 2" (5 cm) side laps and 6" (15.3 cm) end laps. Adjacent end laps shall be at least 3' (91.4 cm) apart.

D. Tension shall be placed on the ends of the cap sheet as they are placed to insure that the sheet lays fl at in the asphalt. There must be complete adhesion between the cap sheet and the mopping asphalt. Brooming in may be necessary under certain conditions to ensure that the cap sheet adheres solidly to the asphalt. Apply extra pressure to avoid creating open channels, where three or more membranes are lapped.

E. The “fly-in”, “re-roll” or “flop-in” methods may be used to set the cap sheet.

12.08 - DuraWeld® APP Membrane Application

A. Do not install of DuraWeld® APP torch grade membranes without careful review and implementation of all relevant safety and fire watch requirements including materials / combustible substrates review, LP-Gas equipment storage and handling guidelines, worker safety precautions and training. Refer to Part 5, “Safety Considerations and Warnings” for additional recommendations and safety precautions.

B. The surface over which the membrane is to be installed must be clean, smooth, and dry and prepared in accordance with this specification manual. Do not apply DuraWeld® APP membranes directly to a fresh asphalt glaze or flood coat or over base plies with excessive asphalt mopping bleed out at laps.

C. Do not install DuraWeld® APP torch grade membranes over base plies or materials installed with solvent based cold adhesives or mastics.

D. For slopes ¾" per foot (6.2 cm per meter) and over, DuraWeld® APP torch grade membranes should be run vertically, parallel to roof slope and back nailed in accordance with Part 10, “Steep Slope Requirements”. For slopes less than 3/4" per foot (6.2 cm per meter), install cap sheet perpendicular to slope.

E. Cap sheet application: Install full width cap sheets, lapping 3" (7.6 cm) on the sides and 6" (15.2 cm) on ends. Stagger adjacent end laps a minimum of 18" (45.7 cm) apart. All side and end laps must be staggered from underlying plies.

F. Never apply DuraWeld® APP membranes by any method except welding with a propane torch or other equipment specifically designed for application of APP modified bitumen.

G. The coiled membrane must be unrolled approximately 10 ft. (3 meters), aligned, then the propane torch flame applied uniformly across the exposed back surface of the membrane and lap areas until the compound reaches the proper application temperature and exhibits a slight sheen. Be sure that there is complete burn-off of release films where present on the underside of the rolls, membrane selvage edges or both surfaces as applicable. Avoid overheating which may result in damage to or improper adhesion of the membrane. (The flame should be moved from side to side in the shape of an “L”, applying about 75% of the heat to the membrane and 25% to the substrate or underlying plies including the lap area of the previously installed courses.) The membrane is slowly unrolled as heat is applied to ensure proper adhesion. When complete, re-roll the opposite end of the membrane and install in the same manner.

H. A minimum 3/8" (10 mm) asphalt flow-out must be obtained at all seam areas. Dry laps are not acceptable. To ensure the proper 3/8" (10 mm) flow of bitumen at the seam areas, a weighted roller may be used. Roller application should follow behind the torch no more than 4 ft. (1.2 m) nor less than 3 ft. (0.91 m) to be sure that the membrane will be at the proper temperature to produce proper flow. Hand rollers or “walking-in the seam” methods are also acceptable. Check all seams for full and uniform adhesion. Un-adhered seams must be lifted with a heated trowel and resealed by lightly torching the seam area.

I. Matching granules should be broadcast into the modified bitumen bleed out at seams while hot to enhance the finished appearance of the membrane.

J. All end laps must be staggered a minimum of 18" (45.7 cm) so that no adjacent end laps coincide. If end laps fall in line or are not staggered the proper distance, a full width of DuraWeld® APP membrane must be installed over the end laps. End laps, flashing sheets and other seams formed over granule surfaces require pre-heating of the top surface of the underlying granule surface membrane to a point where the granules just begin to sink into, and the modified bitumen compound comes up through the granules to ensure proper seam construction and adhesion.

K. All laps must be parallel or perpendicular to the slope of the roof such water is never against the lap.

L. APP membranes must not be applied during adverse weather or without precautionary measures in temperatures below 45ºF (7.2ºC). Refer Part 15 for additional information on Cold Weather Precautions.

12.09 - DuraFlex® SBS (mop-applied) Membrane Application

A. For slopes less than 1/2" per foot (4.2 cm per meter), Type III or IV asphalt can be used. Type IV must be used on all slopes 1/2" per foot (4.2 cm per meter) and over.

B. Asphalt shall be applied at its EVT temperature or 425ºF (218ºC), whichever is greater, in a uniform layer, without voids, at a rate of 25 lb/square (1.2 kg/m²) ± 20%. See Part 6 “Asphalt".

C. For mop applications of SBS membranes, the mopping stroke will be such that the side lap is covered with asphalt last. A rolling bank (puddle) of mopping asphalt must be maintained across the full width of the roll.

D. Cap sheet application: Install full width cap sheets, lapping 4" (10 cm) on the sides and 6" (15.2 cm) on ends. Stagger adjacent end laps a minimum of 18" (45.7 cm) apart. All side and end laps must be staggered from underlying plies.

E. All laps must be parallel or perpendicular to the slope of the roof such that the flow of water is never against the lap.

F. SBS membranes should not be applied during adverse weather or without precautionary measures in temperatures below 45ºF (7.2ºC). Refer to Part 15, Cold Weather Precautions.

G. Coiled rolls should be unrolled, placed upside down and allowed to “relax" prior to installation. Then reroll to apply.

Care should be taken to ensure that the cap sheet lays flat in the asphalt. There must be complete adhesion between the cap sheet and the mopping asphalt. Brooming in may be necessary under certain conditions to insure that the cap sheet adheres solidly to the asphalt. Apply extra pressure to avoid creating open channels, where three or more membranes are lapped.

H. A minimum 3/8" (10 mm) asphalt flow-out must be obtained at all laps. Dry laps are not acceptable. Check all seams for full and uniform adhesion.

I. Matching granules should be broadcast into the asphalt bleed out at seams while hot to enhance the finished appearance of the membrane.

J. All end laps must be staggered a minimum of 18" (45.7 cm) so that no adjacent end laps coincide. If end laps fall in line or are not staggered the proper distance, a full width of SBS membrane must be installed over the end laps.

12.10 - DuraFlex® SBS (cold-adhesive) Membrane Application

A. For slopes less than 1/2" per foot (4 cm per meter), membrane should be applied shingle style, perpendicular to the slope of the roof deck. On all slopes 1/2" per foot (4 cm per meter) and over membrane should be installed in a strapped fashion or parallel to the slope of the roof.

B. All laps must be parallel or perpendicular to the slope of the roof such that the flow of water is never against the lap.

C. SBS membranes should not be applied during adverse weather or without precautionary measures in temperatures below 45ºF (7.1ºC). Refer Part 15 for additional information on Cold Weather Precautions.

D. Coiled rolls should be unrolled, cut into 12'-18' (3.7-5.5 m) lengths, placed upside down and allowed to “relax" prior to installation. Then reroll to apply.

E. Install full width sheets, lapping 4" (10 cm) on the sides and 6" (15.2 cm) on ends. Stagger adjacent end laps a minimum of 18" (45.7 cm) apart. Where installed over base sheet, stagger sheet side and end laps from underlying plies.

F. Starting at the low point or the drains, apply the cold adhesive to the substrate as follows:

1. Pour the adhesive on the substrate and spread, using a serrated edged squeegee, applied at the rate of 1-1/2 gal per square (6 L/m²), or, spray, using equipment that will apply the adhesive at a rate equal to 1-1/2 gal/square (6 L/m²).

2. Apply the adhesive so that the substrate is coated in a pattern slightly larger than the first sheet being applied:

3. End laps and selvage laps of the SBS being lapped must be coated with adhesive so that a visible bead of adhesive appears. Roll all laps with steel roller to ensure proper adhesion. Alternately, the end laps and side laps of the SBS may be heat welded with a hot air welder; this method of application will provide a watertight lap immediately and may be preferable when inclement weather is threatening.

4. Allow 5 to 15 minutes for solvents to evaporate from the adhesive (i.e. tack time or open time) before embedding any sheets into newly applied adhesive. (Note: this is only a guide. Tack times depend on such variables as ambient temperatures, humidity, wind, and cloud cover.)

G. Be careful to ensure that the SBS membrane lays flat in the cold adhesive. There must be complete adhesion between the sheet and the cold adhesive. Brooming in may be necessary under certain conditions to insure that the cap sheet adheres solidly to the cold adhesive. Apply extra pressure to avoid creating open channels where three or more membranes are lapped.

H. A minimum 3/8" (10 mm) and maximum 1" (2.5 cm) cold adhesive flow-out must be obtained at all seam areas when the side laps are not heat welded. Dry laps are not acceptable. Check all seams for full and uniform adhesion.

I. Matching granules should be broadcast into the adhesive bleed out at seams while tacky to enhance the finished appearance of the membrane.

J. All end laps must be staggered a minimum of 18" (45.7 cm) so that no adjacent end laps coincide. If end laps fall in line or are not staggered the proper distance, a full width of SBS membrane must be installed over the end laps.

12.11 - DuraFlex® SBS (torch applied) Membrane Application

A. Do not install of DuraFlex® SBS torch grade membranes without careful review and implementation of all relevant safety and fire watch requirements including materials / combustible substrates review, LP-Gas equipment storage and handling guidelines, worker safety precautions and training. Refer to Part 5, “Safety Considerations and Warnings” for additional recommendations and safety precautions.

B. The surface over which the membrane is to be installed must be clean, smooth, and dry and prepared in accordance with this specification manual.

C. Do not install DuraFlex® SBS torch grade membranes over base plies or materials installed with solvent based cold adhesives or mastics.

D. For slopes 3/4" per foot (6.2 cm per meter) and over, DuraFlex® SBS torch grade membranes must be run vertically, parallel to roof slope and back nailed in accordance with Part 10, “Steep Slope Requirements”. For slopes less than 3/4" per foot (6.2 cm per meter), install cap sheet perpendicular to slope.

E. Base sheet application: Install full width base sheets, lapping 4" (10 cm) on the sides and 6" (15.2 cm) on ends. Stagger adjacent end laps a minimum of 18" (45.7 cm) apart.

F. Interply sheet application: Install full width base/ interply sheets, lapping 4" (10 cm) on the sides and 6" (15.2 cm) on ends. Stagger

adjacent end laps a minimum of 18" (45.7 cm) apart. All side and end laps must be staggered from underlying plies.

G. Cap sheet application: Install full width cap sheets, lapping 4" (10 cm) on the sides and 6" (15.2 cm) on ends. Stagger adjacent end laps a minimum of 18" (45.7 cm) apart. All side and end laps must be staggered from underlying plies.

H. Never apply DuraFlex® SBS heat weld membranes by any method except welding with a propane torch or other heat welding equipment specifically designed for application of SBS torch grade modified bitumen.

I. SBS torch grade membranes are much more flexible than APP membranes. Overheating of the underside of the membranes will cause excessive softness to the top side. Extreme care should be taken to avoid overheating of the sheet.

J. The coiled membrane must be unrolled and allowed to relax. Re-roll to apply. Unroll approximately 10 ft. (3 meters), align the roll, then the propane torch flame is applied uniformly across the exposed back surface of the membrane and lap areas until the compound reaches the proper application temperature and exhibits a slight sheen. Be sure that there is complete burn-off of release films where present on the underside of the rolls, membrane selvage edges or both surfaces as applicable. Avoid overheating which may result in damage to or improper adhesion of the membrane. (The flame should be moved from side to side in the shape of an “L”, applying about 80% of the heat to the membrane and 20% to the substrate or underlying plies including the lap area of the previously installed courses.) The membrane is unrolled as heat is applied to ensure proper adhesion. When complete, re-roll the opposite end of the membrane and install in the same manner.

K. A minimum 1/4" (6.5 mm) bitumen flow-out must be obtained at all seam areas. Dry laps are not acceptable. To ensure the proper 1/4” (6.5 mm) flow of bitumen at the seam areas, a weighted roller may be used. Roller application should follow behind the torch no more than 4 ft. (1.2 m) nor less than 3 ft. (0.91 m) to be sure that the membrane will be at the proper temperature to produce proper flow. Hand rollers or “walking-in the seam” methods are also acceptable. Check all seams for full and uniform adhesion. Un-adhered seams must be lifted with a heated trowel and resealed by lightly torching the seam area.

L. Matching granules may be broadcast into the modified bitumen bleed out at seams while hot to enhance the finished appearance of the membrane. It is not required for issuance of a U.S. Ply Guarantee.

M. All end laps must be staggered a minimum of 18" (45.7 cm) so that no adjacent end laps coincide. If end laps fall in line or are not staggered the proper distance, a full width of DuraFlex® SBS torch grade membrane must be installed over the end laps. End laps, flashing sheets and other seams formed over granule surfaces require pre-heating of the top surface of the underlying granule surface membrane to a point where the granules just begin to sink into, and the modified bitumen compound comes up through the granules to ensure proper seam construction and adhesion.

N. All laps must be parallel or perpendicular to the slope of the roof such water is never against the lap.

O. Membranes must not be applied during adverse weather or without precautionary measures in temperatures below 45ºF (7.2ºC). Refer Part 15 for additional information on Cold Weather Precautions.

12.12 – DuraSTAR® MOP SBS Membrane Application

A. For slopes less than 1/2" per foot (4.2 cm per meter), Type III or IV asphalt can be used. Type IV must be used on all slopes 1/2" per foot (4.2 cm per meter) and over.

B. Asphalt shall be applied at its EVT temperature or 425ºF (218ºC), whichever is greater, in a uniform layer, without voids, at a rate of 25 lb/square (1.2 kg/m²) ± 20%. See Part 6 “Asphalt".

C. For mop applications of SBS membranes, the mopping stroke will be such that the side lap is covered with asphalt last. A rolling bank (puddle) of mopping asphalt must be maintained across the full width of the roll.

D. Cap sheet application: Install full width cap sheets, lapping 4" (10 cm) on the sides and 6" (15.2 cm) on ends. Stagger adjacent end laps a minimum of 18" (45.7 cm) apart. All side and end laps must be staggered from underlying plies.

E. All laps must be parallel or perpendicular to the slope of the roof such that the flow of water is never against the lap.

F. DuraSTAR® SBS membranes should not be applied during adverse weather or when temperatures below 50ºF (10.7ºC). Refer to Part 15, Cold Weather Precautions.

G. Coiled rolls should be unrolled, placed upside down and allowed to “relax" prior to installation. Then reroll to apply.

Care should be taken to ensure that the cap sheet lays flat in the asphalt. There must be complete adhesion between the cap sheet and the mopping asphalt. Brooming in may be necessary under certain conditions to ensure that the cap sheet adheres solidly to the asphalt. Apply extra pressure to avoid creating open channels, where three or more membranes are lapped.

H. A minimum ¼” (6 mm) asphalt flow-out must be obtained at all seam areas. Dry laps are not acceptable. Check all seams for full and uniform adhesion.

I. To ensure the proper ¼” (6 mm) flow of asphalt bitumen at the seam areas, a silicone or steel seam roller may be used. Roll behind the mopped membrane no more than 3 ft. and no less than 2 ft. to be sure that the membrane will be at the proper temperature to produce proper flow. Hand rollers or “walking in the seam” are also acceptable.

J. Check all seams for full and uniform adhesion. Un-adhered seams must be lifted with a heated trowel and resealed by lightly torching seam or insert a bead of USP® Ply-Flash adhesive into seam area.

K. To properly mate end laps, measure 6” (15.2 cm) at end of installed roll and light score across width with a knife. Heat area to remove the film from the membrane before installing overlapping membrane to the form the end lap. All end laps must be staggered a minimum of 18” (45.7 cm) so that no adjacent end laps coincide. If end laps fall in line or are not staggered the proper distance, a full width of SBS membrane must be installed over the end laps.

L. Matching DuraSTAR® Seam Kote coating may be applied to the asphalt bleed out at seams after 30-days to enhance the finished appearance of the membrane.

M. All end laps must be staggered a minimum of 18" (45.7 cm) so that no adjacent end laps coincide.If end laps fall in line or are not staggered the proper distance, a full width of DuraSTAR® SBS membrane must be installed over the end laps. End laps, flashing sheets and other seams formed over film surfaces require removing any film clad facing from the top side of the underlying membrane if the film clad membrane is to form a lap seam. This is accomplished by scoring the film, heating the film surface and when hot, peeling off the film surface and then heating the membrane to be lapped. Apply pressure on the lap to ensure proper sealing.

12.13 DuraSTAR® TG SBS Membrane Application

A. Do not install of DuraSTAR® SBS torch grade membranes without careful review and implementation of all relevant safety and fire watch requirements including materials / combustible substrates review, LP-Gas equipment storage and handling guidelines, worker safety precautions and training. Refer to Part 5, “Safety Considerations and Warnings” for additional recommendations and safety precautions.

B. The surface over which the membrane is to be installed must be clean, smooth, and dry and prepared in accordance with this specification manual.

C. Do not install DuraSTAR® SBS torch grade membranes over base plies or materials installed with solvent based cold adhesives or mastics.

D. For slopes 3/4" per foot (6.2 cm per meter) and over, DuraSTAR® SBS torch grade membranes must be run vertically, parallel to roof slope and back nailed in accordance with Part 10, "Steep Slope Requirements". For slopes less than 3/4" per foot (6.2 cm per meter), install cap sheet perpendicular to slope.

F. Install full width cap sheets, lapping 4" (10 cm) on the sides and 6" (15.2 cm) on ends. Stagger adjacent end laps a minimum of 18" (45.7 cm) apart. All side and end laps must be staggered from underlying plies.

G. Never apply DuraSTAR® SBS heat weld membranes by any method except welding with a propane torch or other heat welding equipment specifically designed for application of SBS torch grade modified bitumen.

H. SBS torch grade membranes are much more flexible than APP membranes. Overheating of the underside of the membranes will cause excessive softness to the top side. Extreme care should be taken to avoid overheating of the sheet.

I. The coiled membrane must be unrolled and allowed to relax. Reroll to apply. Unroll approximately 10 ft. (3 meters), align the roll, then the propane torch flame is applied uniformly across the exposed back surface of the membrane and lap areas until the compound reaches the proper application temperature and exhibits a slight sheen. Be sure that there is complete burn-off of release films where present on the underside of the rolls, membrane selvage edges or both surfaces as applicable. Avoid overheating which may result in damage to or improper adhesion of the membrane. (The flame should be moved from side to side in the shape of an "L", applying about 80% of the heat to the membrane and 20% to the substrate or underlying plies including the lap area of the previously installed courses.) The membrane is unrolled as heat is applied to ensure proper adhesion. When complete, re-roll the opposite end of the membrane and install in the same manner.

J. A minimum 1/4" (6.5 mm) bitumen flow-out must be obtained at all seam areas. Dry laps are not acceptable.

K. To ensure the proper 1/4" (6.5 mm) flow of bitumen at the seam areas, a silicone or steel seam roller may be used. Roller application should follow behind the torch no more than 4 ft. (1.2 m) nor less than 3 ft. (0.91 m) to be sure that the membrane will be at the proper temperature to produce proper flow. Hand rollers or "walking-in the seam" methods are also acceptable.

L. Check all seams for full and uniform adhesion. Un-adhered seams must be lifted with a heated trowel and resealed by lightly torching the seam or insert a bead of USP® Ply-Flash adhesive into seam area.

M. To properly mate end laps, measure 6" (15.2 cm) at end of installed roll and light score across width with a knife. Heat area to remove the film from the membrane before installing overlapping membrane to the form the end lap. All end laps must be staggered a minimum of 18" (45.7 cm) so that no adjacent end laps coincide. If end laps fall in line or are not staggered the proper distance, a full width of SBS membrane must be installed over the end laps.

N. Matching DuraSTAR® Seam Kote coating may be applied to the asphalt bleed out at seams after 30-days to enhance the finished appearance of the membrane.

O. All end laps must be staggered a minimum of 18" (45.7 cm) so that no adjacent end laps coincide. If end laps fall in line or are not staggered the proper distance, a full width of DuraSTAR® SBS torch grade membrane must be installed over the end laps. End laps, flashing sheets and other seams formed over film surfaces require removing any film clad facing from the top side of the underlying membrane if the film clad membrane is to form a lap seam. This is accomplished by scoring the film, heating the film surface and when hot, peeling off the film surface and then heating the membrane to be lapped. Apply pressure on the lap to ensure proper sealing.

P. All laps must be parallel or perpendicular to the slope of the roof such water is never against the lap.

Part 13 – Flashing

13.01 - General

A. Refer to the construction details in this section, which depict flashing requirements for typically encountered conditions. Install flashing materials as shown in the construction details.

B. Base flashing for roof systems to be guaranteed for 15 or 20 years must be constructed of a minimum two ply modified bitumen flashing or Ply-Flash 2-Part Flashing System.

C. Basic wood blocking anchorage recommendations are found in Factory Mutual Data Sheet 1-49. These recommendations are required for Factory Mutual approved projects.

D. All penetrations should be at least 18" (45.7 cm) from curbs, walls, and edges to provide for proper flashing.

E. Install flashing sheets starting at low points.

F. Where indicated by U.S. Ply construction details, install base sheets and backer plies in Type III or IV hot asphalt. Maintain asphalt at EVT ± 25°F (13.9°C) for all base and ply sheets used in flashing details. Never use solvent based flashing cements, adhesives, mastics and coatings in conjunction with torch grade DuraWeld® APP membranes.

G. DuraWeld® APP torch grade membranes are intended for use with DuraWeld® APP torch grade flashing membranes and should not be mixed with SBS flashing materials. Never use solvent based flashing cements, adhesives, mastics or adhesives to install DuraWeld® APP flashings.

H. DuraFlex® SBS membranes are intended for use with DuraFlex® SBS flashing membranes installed in Type IV asphalt, compatible flashing cement, or DuraFlex® SBS torch grade flashings using torch welding techniques.

I. DuraFlex® SBS membranes may be used with compatible asphalt or flashing cements as flashings for built-up roofing systems.

J. Prime all metal and masonry with asphalt primer and allow to dry before being fully adhered to with flashing sheets.

K. Use only modified bituminous membranes that are designated by U.S. Ply for use as base and wall flashings.

L. Do not use metal base flashing. Damage to the roofing system caused by metal base flashing is not the responsibility of U.S. Ply.

M. Base flashing should extend a minimum of 8" (20.3 cm), and a maximum of 24" (61 cm) above the roofline.

N. Corner membrane flashings, such as "bow ties" for outside corners and "footballs" for inside corners or other membrane reinforcements are required to ensure that base flashing corners are sealed at cant areas. Refer to Flashing Details in sections 12 – 16 as applicable.

Note: Mastic and fabric coursing is not an acceptable alternate for proper flashing and counterflashing details.

13.02 - Cant Strips and Wood Nailers

A. Cant strips:

1. Cant strips must be installed at the intersection of the roof and all walls, parapets, curbs, or transitions approaching 90° that are to be flashed. They shall be approximately 4" (10 cm) in horizontal and 4" (10 cm) in vertical dimension. The face of the cant shall have an incline of not more than 45° with the roof.

2. Wood cants shall be solid and pressure treated for rot resistance. Perlite based cant strips must comply with ASTM C-728. Do not use fiberboard cants for torch grade installations.

Use solid wood cants when mechanical securement to cants is required or when solid wood cants will help stabilize the vertical wood nailers at projections or expansion joint openings.

3. Masonry cants shall be integrally cast to the wall and deck. They shall be finished and prepared with the same care as the deck. The cant shall be constructed so that it provides a vertical offset equal in thickness to the roof insulation.

4. Do not use metal cant or metal curb strips.

5. Cants shall always be installed on top of the roof insulation, or wood nailers.

6. Mechanically fasten cant where applicable. therwise, set in hot asphalt and install as shown in “Flashing Details”, in this section.

7. Neatly fit all joints and miters.

B. Wood Nailers:

1. Wood nailers must be 3 ½" (8.9 cm) minimum width or 1" (25 mm) wider than metal flange and minimum 1" (25 mm) thick and securely fastened to the deck.

2. Wood nailers shall be the same thickness as tapered edge strip or insulation.

3. For roof systems requiring perimeter venting, nailers shall be slotted.

13.03 - Sheet Metal

A. Metal should not be used as a component of base flashing. Because of the high coefficient of expansion of sheet metals and the large temperature changes that can be experienced on a roof, sheet metal or exposed metal components must be isolated from the waterproofing components of the roofing and flashing system as efficiently as possible to prevent the metal from splitting the membranes. U.S. Ply assumes no responsibility for damage to the roofing system caused by the movement of accessory metal.

B. When it is unavoidable to use metal in the roofing system (i.e., lead flange at drains, gravel stops), treated wood nailers and insulation stops, 1" (2.5 cm) wider than the metal flange, should be provided for metal flange securement.

For APP roof systems, set metal flange in softened membranes (torch heated), and secure with fasteners of the same type metal as the flange. The metal flange is then sealed using the applicable construction detail to meet guarantee requirements.

Metal accessories (gravel stops, counter flashing, etc.) should be a minimum 16 oz. (0.56 mm) copper, 24 gauge (0.71 mm) galvanized or stainless steel, 2 1/2 to 4 lb (1.1- 1.8 kg) lead, or 0.032" (0.81 mm) aluminum.

C. Fabricate and install all sheet metal materials as shown in applicable construction in the Flashing Detail Section. Refer to SMACNA (Sheet Metal and Air Conditioning Contractors National Association, Inc.) for guidance on sheet metal treatments not addressed in this Manual.

D. Clean metal and apply asphalt primer to all sheet metal surfaces that will come into contact with asphalt or other bituminous materials; allow the primer adequate time to dry.

E. Use fastener types compatible with the sheet metal type.

1. Copper or lead-coated copper: use copper or bronze fasteners.

2. Lead and galvanized steel: use galvanized or cadmium-plated sheet fasteners.

3. Aluminum: use aluminum fasteners.

4. Stainless steel: use stainless steel fasteners.

F. Metal counter-flashing shall have a minimum 4" (10 cm) face with a drip lip. The bottom edge of the counterflashing shall cover the roofing membrane and/or base flashing by a minimum of 4" (10 cm). Metal counter-flashing used for masonry walls, wooden walls or through wall metal flashings should be two piece designs to allow for installation and later removal. Metal counter-flashings for stucco, EIFS, wood siding or similar materials should be designed to receive and set as a base for those materials, such as “Z” type flashing, while providing for securement of separate metal counter-flashing to cover base flashings. Metal end joints shall be lapped 3" (7.6 cm) or more. Adequate fasteners must be provided to secure against effect of wind forces. Skirt fasteners shall be watertight.

G. Metal termination bars shall be a minimum of 1/10" (3 mm) thick x 1" (2.5 cm) wide with preformed sealant edge lap. Bar should have 1/4" (6 mm) x 3/8" (10 mm) slotted holes on 4" (10 cm) centers to facilitate mechanical anchorage.

Note: Termination bars are not suitable in all base flashing and wall flashing conditions. Termination bars may only be used in conjunction with an appropriate counter-flashing extending a minimum of 4" (10 cm) below the termination bar.

H. Metal flanges for gravel stops, eave strips and pitch pockets to be used in conjunction with roofing shall be primed (both sides). For APP roof systems set metal flanges in softened membranes (torch heated), and nail 4" (10 cm) o.c. to wood nailers or insulation stops. Flanges shall be a minimum of 3 ½" (8.9 cm) wide for gravel stops or eave strips and 4" (10 cm) wide for projections and extensions through the roof. The gravel stop or eave strip riser shall be at least 3/8" (10 mm) high for modified bitumen or smooth surface built-up roofing. Total height of riser should be adjusted to extend just above the finished surface, including gravel surfacing if present. Provision must be made for securing the skirt to the face of the wall. This may be wood nailer strips for masonry and metal construction. In all cases, gravel stop and eave strip nailer should be fastened to the deck or deck system with adequate resistance against wind forces.

Note: Sheet metal pitch pockets are not covered by U.S. Ply guarantees and are not recommended in 15 and 20 year guarantee systems. Liqua-Ply Flashing is recommended in lieu of metal pitch pockets.

I. Stacks shall have metal sleeve flashing a minimum 8" (20.3 cm) high. Pitch pockets for brackets, supports, pad-eyes, etc., shall have a 4" (10 cm) minimum height metal sleeve.

J. On reroofing projects, provisions shall be made for reinstallation of existing sheet metal duct work, equipment, coping metal and counterflashings removed in conjunction with the new work. Also provide for cleaning and repairing of existing defective sheet metal, and replacement of missing and irreparable sheet metal to match existing types. Light gauge sheet metal flashings which are incorporated into the DuraWeld® APP roof system are not suitable for re-use and must be replaced with new material.

K. Conduits and piping such as electrical and gas lines must be set on wood blocking or some other form of support. Wood blocking and supports must be set on doubler pads (an additional layer of the roof membrane).

13.04 - DuraWeld® APP Flashing Membrane Application

A. DuraWeld® APP membranes used for flashing material can only be installed using a propane torch or other equipment intended for heat weldable APP materials.

B. Refer to the construction details in this section

C. Wood curbs and walls must be covered with a layer of approved U.S. Ply base sheet or backer ply of selected two-ply flashing system and fastened 8" (20.3 cm) o.c. in all directions with approved fasteners with minimum 1" diameter or square caps. All vertical laps shall be 4" (10 cm). Base sheet or backer ply must extend out onto field of roof as shown in applicable U.S. Ply construction detail.

D. Backer plies installed over masonry or other non-nailable substrates in hot asphalt must be cut into manageable lengths to ensure adequate adhesion to cant strip and vertical surfaces without excessive voids. All vertical laps shall be 4" (10 cm). Backer ply shall extend out onto field of roof as shown in applicable U.S. Ply construction detail.

E. Base flashing for roof systems to be guaranteed for 15 or 20

years must be constructed of a minimum two ply modified bitumen flashing.

F. Finish ply of selected base flashing detail must be run vertically to maintain selvage edge at all vertical laps.

All vertical laps shall be 3" (7.6 cm). Finish ply shall extend out onto field of roof as shown In applicable DuraWeld® APP construction detail, and must be extended a minimum of 4" (10 cm) beyond edge of prior flashing plies.

G. Torch Method Application:

1. Measure and cut DuraWeld® APP flashing membrane into the required lengths.

2. Apply the propane torch flame uniformly across the back surface of the membrane and lap areas until the compound reaches the proper application temperature and exhibits a slight sheen. Be careful during application to ensure the complete burn-off of release films where present on the underside of the rolls, membrane selvage edges or both surfaces as applicable. Avoid overheating which may result in damage to or improper adhesion of the membrane. (The flame should be moved from side to side in the shape of an "L", applying about 75% of the heat to the membrane and 25% to the substrate or underlying plies including the lap area of the previously installed courses.) The membrane is slowly unrolled as heat is applied to ensure proper adhesion. Immediately nail the top of the flashing as specified in flashing detail to prevent slippage.

3. Membrane flashing sheets may be either back torched and set into position, or rolled and torched into position as the flashing sheet is uncoiled. Flashing sheets must be carefully pressed into place to ensure full adhesion to the substrate and backer plies. Laps must be rolled or pressed to ensure proper seaming with a minimum 3/8" (10 mm) bleed out of bitumen at all seams.

13.05 - DuraFlex® SBS Flashing Membrane Application

A. DuraFlex® SBS mop grade membranes used for flashing material can only be installed using ASTM D-312, Type IV, hot asphalt or trowel grade modified flashing cement. Use only modified bituminous membranes that are designated by U.S. Ply for use as base and wall flashings. SBS torch grade membranes which have a burn off film cannot be installed in hot asphalt or flashing cement. DuraFlex® Alum SBS membrane may be applied using hot asphalt or torch applied using torch methods.

B. Refer to the construction details in this section.

C. Wood curbs and walls must be covered with a layer of approved base sheet or backer ply of selected two-ply flashing system and fastened 8" (20.3 cm) o.c. in all directions with approved fasteners with minimum 1" diameter or square caps. All vertical laps shall be 4" (10 cm). Base sheet or backer ply must extend out onto field of roof as shown in applicable U.S. Ply construction detail.

D. Backer plies installed over masonry or other non-nailable substrates in cold adhesive or hot asphalt must be cut into manageable lengths to ensure adequate adhesion to cant strip and vertical surfaces without excessive voids. All vertical laps shall be 4" (10 cm). Backer ply shall extend out onto field of roof as shown in applicable U.S. Ply construction detail.

E. Base flashing for roof systems to be guaranteed for 15 or 20 years must be constructed of a minimum two ply modified bitumen flashing.

F. Finish ply of selected base flashing detail must be run vertically to maintain selvage edge at all vertical laps.

All vertical laps shall be 4" (10 cm). Finish ply shall extend out onto field of roof as shown in applicable DuraFlex® SBS construction detail, and must be extended a minimum of 4" (10 cm) beyond edge of prior flashing plies.

G. Trowel Grade Adhesive Application:

1. Apply trowel grade adhesive with trowel or wide-edged putty knife at approximately 1/8" (3 mm) thickness in a full and uniform application.

2. Firmly press sheet into adhesive. Immediately nail the top of the flashing as specified in flashing detail to prevent slippage.

H. Hot Asphalt Application:

1. Be careful to ensure the DuraFlex® SBS flashing sheets are set in asphalt when the asphalt is at the proper temperatures (minimum 425°F (218° C.) Back mopping the sheet is recommended, with the sheet being quickly applied to the substrate.

2. Firmly press the sheet onto the substrate. Nail the top of the flashing as specified in the flashing detail.

13.06 – DuraFlex® SBS Flashing Membrane Application for BUR Roofs

A. DuraFlex® SBS mop grade membranes used for flashing material can only be installed using ASTM D-312, Type IV, hot asphalt or SBS trowel grade modified flashing cement. Use only modified bituminous membranes that are designated by U.S. Ply for use as base and wall flashings. SBS torch grade membranes which have a burn off film cannot be installed in hot asphalt or flashing cement. DuraFlex® Alum SBS membrane may be applied using hot asphalt or torch applied using torch methods.

B. Refer to the construction details in this section.

C. Wood curbs and walls must be covered with a layer of approved base sheet or backer ply of selected two-ply flashing system and fastened 8" (20.3 cm) o.c. in all directions with approved fasteners with minimum 1" diameter or square caps. All vertical laps shall be 4" (10 cm). Base sheet or backer ply must extend out onto field of roof as shown in applicable U.S. Ply construction detail.

D. Backer plies installed over masonry or other non-nailable substrates in cold adhesive or hot asphalt must be cut into manageable lengths to ensure adequate adhesion to cant strip and vertical surfaces without excessive voids. All vertical laps shall be 4" (10 cm). Backer ply shall extend out onto field of roof as shown in applicable USP® BUR construction detail.

E. Finish ply of selected base flashing detail must be run vertically to maintain selvage edge at all vertical laps.

All vertical laps shall be 4" (10 cm). Finish ply shall extend out onto field of roof as shown in applicable Ply construction detail, and must be extended a minimum of 4" (10 cm) beyond edge of prior flashing plies.

F. Five, ten and twelve year guarantees require a minimum 2-ply flashing construction consisting of one ply of stripping ply to be same as roof plies and one ply of DuraFlex® 190M SBS for flashing membrane.

G. Fifteen and twenty year guarantees require a minimum 3-ply flashing construction consisting of two plies of stripping ply to be same as roof plies and one ply of DuraFlex® 190M SBS for flashing membrane.

H. Trowel Grade Adhesive Application:

1. Apply trowel grade adhesive with trowel or wide-edged putty knife at approximately 1/8" (3 mm) thickness in a full and uniform application.

2. Firmly press sheet into adhesive. Immediately nail the top of the flashing as specified in flashing detail to prevent slippage.

I. Hot Asphalt Application:

1. Be careful to insure the DuraFlex® SBS flashing sheets are set in asphalt when the asphalt is at the proper temperatures (minimum 425°F (218°C.) Back mopping the sheet is recommended, with the sheet being quickly applied to the substrate.

2. Firmly press the sheet onto the substrate. Nail the top of the flashing as specified in the flashing detail.

13.07 - DuraFlex® SBS (Torch Grade) Flashing Membrane Application

A. DuraFlex® SBS torch grade membranes used for flashing material can only be installed using a propane torch or other equipment intended for heat weldable SBS materials.

B. Refer to the construction details in this section

C. Wood curbs and walls must be covered with a layer of approved U.S. Ply base sheet or backer ply of selected two-ply flashing system and fastened 8" (20.3 cm) o.c. in all directions with approved fasteners with minimum 1" diameter or square caps. All vertical laps shall be 4" (10 cm). Base sheet or backer ply must extend out onto field of roof as shown in applicable U.S. Ply construction detail.

D. Backer plies installed over masonry or other non-nailable substrates in hot asphalt must be cut into manageable lengths to ensure adequate adhesion to cant strip and vertical surfaces without excessive voids. All vertical laps shall be 4" (10 cm). Backer ply shall extend out onto field of roof as shown in applicable DuraFlex® SBS TG construction detail

E. Base flashing for roof systems to be guaranteed for 15 or 20 years must be constructed of a minimum two ply modified bitumen flashing.

F. Finish ply of selected base flashing detail must be run vertically to maintain selvage edge at all vertical laps. All vertical laps shall be 3" (7.6 cm). Finish ply shall extend out onto field of roof as shown in applicable construction details, and must be extended a minimum of 4" (10 cm) beyond edge of prior flashing plies.

G. Torch Method Application:

1. SBS torch grade membranes are much more flexible than APP membranes. Overheating of the underside of the membranes will cause excessive softness to the top side. Extreme care should be taken to avoid overheating of the sheet.

2. Measure and cut DuraFlex® "torch grade" SBS flashing membrane into the required lengths.

3. Apply the propane torch flame uniformly across the back surface of the membrane and lap areas until the compound reaches the proper application temperature and exhibits a slight sheen. Be careful during application to ensure the complete burn-off of release films where present on the underside of the rolls, membrane selvage edges or both surfaces as applicable. Avoid overheating which may result in damage to or improper adhesion of the membrane. (The flame should be moved from side to side in the shape of an "L", applying about 80% of the heat to the membrane and 20% to the substrate or underlying plies including the lap area of the previously installed courses.) The membrane is slowly unrolled as heat is applied to ensure proper adhesion. Immediately nail the top of the flashing as specified in flashing detail to prevent slippage.

4. Membrane flashing sheets may be either back torched and set into position, or rolled and torched into position as the flashing sheet is uncoiled. Flashing sheets must be carefully pressed into place to ensure full adhesion to the substrate and backer plies. Laps must be rolled or pressed to ensure proper seaming with a minimum 1/4" (6.5 mm) bleed out of bitumen at all seams.

H. DuraFlex® Alum SBS membrane used for flashing material may be installed using a propane torch or other equipment intended for heat weldable SBS materials or hot asphalt. For hot asphalt application of DuraFlex® Alum SBS membrane refer in this section 13.06 H. Hot Asphalt Application. Note: DuraFlex® Alum SBS membrane cannot be installed in flashing cement.

1. DuraFlex® Alum SBS membranes are much more flexible than APP membranes. Overheating of the underside of the membranes will cause excessive softness to the top side. Extreme care should be taken to avoid overheating of the sheet or this will result in separation of the aluminum from the membrane.

2. Measure and cut DuraFlex® Alum SBS flashing membrane into the required lengths.

3. Apply the propane torch flame uniformly across the back surface of the membrane and lap areas until the compound reaches the proper application temperature and softens slightly. Avoid overheating which may result in damage to or improper adhesion of the membrane. (The flame should be moved from side to side in the shape of an "L", applying about 80% of the heat to the membrane and 20% to the substrate or underlying plies including the lap area of the previously installed courses.) The membrane is slowly unrolled as heat is applied to ensure proper adhesion. Immediately nail the top of the flashing as specified in flashing detail to prevent slippage.

4. Membrane flashing sheets may be either back torched and set into position, or rolled and torched into position as the flashing sheet is uncoiled. Flashing sheets must be carefully pressed into place to ensure full adhesion to the substrate and backer plies. Laps must be rolled or pressed to ensure proper seaming with a minimum 1/8" (3 mm) bleed out of bitumen at all seams.

5. Remove any metal clad facing from the top side of the underlying membrane if the metal clad membrane is to form a lap seam. This is accomplished by scoring the metal, heating the metal surface and when hot, peeling off the metal surface and then heating the membrane to be lapped. Apply pressure on the lap to ensure proper sealing.

Note: Torch Grade Flashings are not to be used in conjunction with cold applied systems.

13.08 DuraSTAR SBS Flashing Membrane Application

A. DuraSTAR® SBS torch grade membranes used for flashing material can only be installed using a propane torch or other equipment intended for heat weld-able SBS materials.

B. Refer to the construction details in this section

C. Wood curbs and walls must be covered with a layer of approved U.S. Ply base sheet or backer ply of selected two-ply flashing system and fastened 8" (20.3 cm) o.c. in all directions with approved fasteners with minimum 1" diameter or square caps. All vertical laps shall be 4" (10 cm). Base sheet or backer ply must extend out onto field of roof as shown in applicable U.S. Ply construction detail.

D. Backer plies installed over masonry or other non-nailable substrates in hot asphalt must be cut into manageable lengths to ensure adequate adhesion to cant strip and vertical surfaces without excessive voids. All vertical laps shall be 4" (10 cm). Backer ply shall extend out onto field of roof as shown in applicable DuraSTAR® SBS TG construction detail

E. Base flashing for roof systems to be guaranteed for 15 or 20 years must be constructed of a minimum two ply modified bitumen flashing.

F. Finish ply of selected base flashing detail must be run vertically to maintain selvage edge at all vertical laps. All vertical laps shall be 3" (7.6 cm). Finish ply shall extend out onto field of roof as shown in applicable construction details, and must be extended a minimum of 4" (10 cm) beyond edge of prior flashing plies.

G. Torch Method Application:

1. DuraSTAR® SBS membranes are much more flexible than APP membranes. Overheating of the underside of the membranes will cause excessive softness to the top side.

Extreme care should be taken to avoid overheating of the sheet or this will result in separation of the aluminum from the membrane.

2. Measure and cut DuraSTAR® SBS flashing membrane into the required lengths.

3. Apply the propane torch flame uniformly across the back surface of the membrane and lap areas until the compound reaches the proper application temperature and softens slightly. Avoid

overheating which may result in damage to or improper adhesion of the membrane. (The flame should be moved from side to side in the shape of an "L", applying about 80% of the heat to the membrane and 20% to the substrate or underlying plies including the lap area of the previously installed courses.) The membrane is slowly unrolled as heat is applied to ensure proper adhesion. Immediately nail the top of the flashing as specified in flashing detail to prevent slippage.

4. Membrane flashing sheets may be either back torched and set into position, or rolled and torched into position as the flashing sheet is uncoiled. Flashing sheets must be carefully pressed into place to ensure full adhesion to the substrate and backer plies. Laps must be rolled or pressed to ensure proper seaming with a minimum 1/8" (3 mm) bleed out of bitumen at all seams.

5. Remove any film clad facing from the top side of the underlying membrane if the metal clad membrane is to form a lap seam. This is accomplished by scoring the metal, heating the film surface and when hot, peeling off the film surface and then heating the membrane to be lapped. Apply pressure on the lap to ensure proper sealing.

Note: Torch Grade Flashings are not to be used in conjunction with cold applied systems.

13.09 – USP® Ply-Flash 2-Part Flashing System Application

A. USP® PLY-FLASH is a two-component, cold-applied modified asphalt flashing compound which is enhanced with polyurethane for use as flashing membrane for a variety of roof details on modified bitumen and BUR roofing systems.

B. USP® PLY-FLASH (2-part) forms a monolithic, self-flashing and self-adhering reinforced flashing membrane for a variety of flashing applications, including wall flashings, penetrations, and repairs. It is used with USP® PolyForcement Fabric for additional strength for difficult flashing applications. It adheres to modified bitumen, BUR, concrete, brick/masonry, and metal.

C. Always store in cool and dry location. For best results, keep product at 70°F (21°C) or above as cold material can be difficult to mix. Do not store in direct sunlight or in temperatures below 50°F (10°C) or above 90°F (32°C). If stored below recommended temperature, allow material to set at room temperature for 24 hours prior to use. Approximate shelf life is 24-months from manufacture date when left sealed, unmixed and with proper storage.

D. This product is recommended for use at substrate and ambient temperatures between 60°F (16°C) and 90°F (32°C).

E. Utilize a heavy-duty 1/2" (12.7 mm) drill capable of 450 to 900 rpm. Mixing blade should be 8" (203 mm) diameter mud mixer. Important: Never mix by hand. Pre-mix Part A (modified asphalt compound) for 1 minute, to reduce the viscosity of modified asphalt, then slowly add Part B (pre-measured hardener) to Part A (modified asphalt compound) and mix thoroughly for 3 minutes. Be sure to move mixer around to fully mix the entire contents. Do not overmix as that will reduce open time. Mix full kits only.

USP® Ply-Flash mixed Open Times @ 70°F (21°C)

- Pot Life: 45-minutes +/- 15 minutes
- Next Coat: < 5 minutes
- Rainproof: approx. 2 - 4 hours
- Fully Cured: approx. 24 hours

USP® Ply-Flash Coverage Rate (approximate)

- Approximate coverage is 25 square feet per gallon at 60 mil thickness. Ply-Flash has minimal difference in wet vs dry mil shrinkage due to high solids and fast cure time.
- Smooth substrates: 4.0 gal/square
- Fine grained substrates: 5.0 gal/square
- Rough/granule substrates: 6.0 gal/square

See recommendations for specific applications. Yields will vary depending upon system selected and the smoothness and absorbency of substrate.

F. Workers should wear appropriate clothing to protect from accidental skin contact. When mixing or applying this product workers must use butyl rubber or nitrile gloves. Safety glasses with side shields are required for eye protection. Not recommended for us in enclosed spaces, use local exhaust ventilation to maintain worker exposure below TLV. If the airborne concentration poses a health hazard, become irritating or exceeds recommended limits, use a NIOSH approved respirator in accordance with OSHA Respirator Protection requirements under 29 CFR 1910.134. The specific type of respirator will depend on the airborne concentrations. A filtering face piece or dusk mask is not acceptable for use with this product if TLV filtering levels have been exceeded.

G. All substrates must be clean, dry, and free of oil, grease, curing compounds, release agents, laitance, gross irregularities, loose, unsound or foreign material such as moss, algae growth, dirt, ice, snow, water or any other condition that would be detrimental to adhesion of resin to the substrate. Mask perimeter and top edge of the area to be primed and flashed to provide clean lines and prevent over-painting of compounds. Remove and re-apply masking before compound cures and as required between coats. Contact U.S. Ply Technical Department for recommendations regarding specific applications.

H. Flashing Application:

1. Tape off application area and pre-cut USP® PolyForcement to form a finger wrap around all penetrations with an additional target piece to place over the base coat of the Ply-Flash compound.
2. Refer to construction details in applicable flashing membrane section.
3. After mixing Ply-Flash compound apply a base coat to substrate at a rate of 2.0 to 3.0 gallons per 100 ft2 using a brush or notched squeegee. The Ply-Flash compound should be spread evenly onto the surface.
4. Install the USP® PolyForcement and embed directly into the Ply-Flash compound, avoiding any folds and wrinkles. Use a brush or paint spatula to work the Ply-Flash compound into the fabric, saturating from the bottom up, and allow to set for a minute, then apply a second coat of Ply-Flash compound at a rate of 1.5 to 2.0 gallons per 100 ft^2 over the fabric and allowed to cure until solid to touch. Where indicated in flashing details install a target piece of fabric embedded in the second coat of compound. Note the fabric should darken in appearance, with no white spots showing. White spots are indications of unsaturated fabric or lack of adhesion. It is important to correct these faults before the compound cures.
5. Apply an even coat of Ply-Flash compound over top of the in-place fabric at a rate of 0.5 - 1.0 gallons per 100 ft2. Use caution not to spread compound too thin.
6. (Surfacing - Choose one method): (a) Before the compound has cured solid to the touch, embed matching roofing granules to cover compound. (b) Allow compound to cure to receive a separate surface coating application. See individual system specifications for specific guidelines regarding application of topcoats and/or surfacing.

Part 14 – Surfacing

14.01 - General

A. Install all surfacing to provide proper membrane, wind uplift and fire protection as required by U.S. Ply in conjunction with local code, insurance and project requirements.

B. Surfacing weights must be considered when determining the load capacity of the structural support system's ability to handle the

completed roof installation and other expected loads. U.S. Ply is not responsible for determining load capacities, and recommends that a certified professional make any determination relative to load bearing capacity of a structure.

C. U.S. Ply shall not be liable or responsible for ballast and paver surfacing systems.

14.02 – DuraWeld® APP Smooth Membranes

A. DuraWeld® APP Smooth membranes are not covered with factory applied surfacing granules and must receive protective surfacing after completion. The membrane should weather a minimum of 30 days prior to applying any type of surfacing to APP membranes. The membrane must be cleaned and prepared prior to surfacing installation.

B. APP membranes with factory applied granule surfacing does not require additional surfacing materials. Do not use liquid surface coatings over these membranes when new.

See this section, Part 12, Item 12.08 for installation of DuraWeld® APP cap sheet.

14.03 - DuraFlex® SBS Membranes

A. DuraFlex® SBS smooth membranes are not covered with factory applied surfacing granules and are not intended to be left exposed for long time periods and must be protected immediately after installation with either:

1. A DuraFlex® SBS cap membrane which has factory applied surfacing granules.

2. A flood coat of asphalt and embedded with gravel.

3. A liquid surface coating compatible with SBS membranes.

Under no circumstances may the DuraFlex® SBS smooth membranes be unprotected for more than one month.

B. DuraFlex® SBS membranes with factory applied granule surfacing does not require additional surfacing materials. Do not use liquid surface coatings over these membranes when new.

See this section, Part 12, Item 12.09, 12.10, and 12.11 for installation of DuraFlex® SBS cap sheets.

14.04 - Liquid Coatings

A. High quality roof coatings can be used for surfacing of non-granule, smooth surfaced DuraWeld® APP, DuraFlex® SBS, DuraFlex® TG SBS, and USP® smooth built-up roof systems. Selected coating must be compatible with the U.S. Ply membrane. Contact U.S. Ply Technical Services for further information.

B. U.S. Ply assumes no responsibility for the performance or maintenance of the coating or surfacing material.

C. Apply roof coating in accordance with manufacturer's requirements for application over U.S. Ply membranes. Roof coating is a maintenance item that needs to be renewed periodically in accordance with the manufacturer's recommendation.

D. Asphalt and/or emulsion surfacing recommendations for USP® built-up roof systems are as follows:

1. Asphalt Emulsion ("E") may be applied at the rate of 3 gal/square (1.2 L /m²). The amount of material applied should be such that complete coverage is obtained for desirable weathering characteristics, but not excessive quantities to minimize their tendency to "alligator", or separate under thermal contraction.

2. Emulsified Aluminum ("EA") may be applied at the rate of 2 gal/square (0.8 L/m²). Coating applied over heavy surface moppings of asphalt tend to crack and peel as the heavy mass of unreinforced bitumen contracts and "alligators".

3. Fibrated Aluminum ("AL") may be applied at the rate of 1 ½ gal/square (0.6 L/m²). Coating applied over heavy surface moppings of asphalt tend to crack and peel as the heavy mass of unreinforced bitumen contracts and "alligators".

14.05 - Gravel and Asphalt

A. U.S. Ply does not permit gravel surfacing of DuraWeld® APP or DuraFlex® SBS roof membrane systems on slopes greater than 1 inch per foot (8.3 cm per meter) or USP® Built-up roof systems on slopes greater than 3 inches per foot (24 cm per meter).

B. Not less than 400 lb/square (19.5 kg/m²) of gravel or 300 lb/square (14.6 kg/m²) of slag shall be applied in a flood coat of 60 lb/square (2.9 kg/m²) of hot asphalt.

1. Gravel at the time of application shall be hard, durable, opaque and free of clay, loam, sand or other foreign substances and comply with the ASTM D 1863.

C. Asphalt shall conform to the latest revision of ASTM D 312 Type III or IV and may be used on slopes up to 3/4" per foot (8.3 cm per meter). ASTM D 312 Type IV must be used on slopes of 3/4" per foot to 1" per foot (8.3 cm per meter).

D. No more asphalt shall be applied at one time than can be immediately covered with gravel or slag.

14.06 - USP® Mineral Cap Sheet

Note: Specifications using Mineral Cap Sheet are USP® "M" specifications.

See this section, Part 12, Item 12.06 for installation of cap sheet.

14.07 - Emulsion & Aluminum Coatings

A. Emulsion surfacing recommendations for USP® built-up "coldadhesive applied" roof systems are as follows:

1. Apply a uniform coating of USP® Asphalt Emulsion ("E") at a rate of 4 - 5 gal/100 square foot (1.6 - 2 L/m²) to the surface and base flashings and all other areas that are to be aluminized.

2. The amount of material applied should be such that complete coverage is obtained for desirable weatherin characteristics, but not excessive quantities to minimize their tendency to "alligator", or separate under thermal contraction.

3. After the emulsion has thoroughly cured, sweep or pressure blow dust and debris from the roof surface to provide a clean surface.

4. Apply a uniform coating of USP® #442 Fibered Aluminum Roof Coating at a rate of 1.5 - 2 gal/100 square foot (0.6 - 0.8 L/m²) to the roof surface in one coat.

14.08 - Walkways

A. Walkways for normal rooftop traffic can be constructed from USP® WalkBoard mop or torch grade modified bitumen.

B. Install walkways prior to the application of field surfacing by solidly adhering to the field of the roof. Walkway sections should be spaced no closer than 6" (15.2 cm) gap between each section to allow for drainage.

C. Surface the roof around and between the pads if additional surfacing is applied to the U.S. Ply membrane.

Part 15 – Cold Weather Application Precautions

A. In cooler weather, unrolling and relaxing modified bitumen rolls and base sheet rolls prior to installation will reduce the potential for wrinkles to form in the finished roof. The rolls can be cut into shorter lengths for easier handling when rerolling and installing.

B. Special care is required when installing U.S. Ply roof membranes at temperatures below 45°F (7.2°C):

1. The roof substrate must be dry. There must be no ice, dew or water.

2. All membrane rolls, adhesives and coatings must be stored

for at least overnight at a minimum temperature of 55°F (12.8°C) prior to their application. All water-based coatings must be protected from freezing at all times.

3. Remove rolls from the heated storage only as they are being installed. Install membrane rolls immediately after removal from storage to avoid membrane cooling. Modified rolls must be at least 45°F (7.2°C) at time of application.

4. For mop applied SBS membranes, the asphalt temperature at point of application must be maintained at the asphalt's EVT or 425°F (218°C) whichever is greater; with a rolling bank (puddle) of mopping asphalt across the full width of the roll.

5. For mop applied membranes, the asphalt temperature at point of application must be maintained at the asphalt's EVT or 425°F (218°C) whichever is greater; with a rolling bank (puddle) of mopping asphalt across the full width of the roll;

6. For non-modified glass felts, the asphalt temperature at point of application must be maintained at the asphalt's EVT. The use of insulated asphalt handling equipment is recommended in cold weather;

7. Do not over heat the asphalt to try to offset the cold ambient temperature. If the proper asphalt application temperature can not be consistently maintained, roofing must be discontinued. Be aware that cool, windy conditions will cause asphalt heat loss to occur at a rate equivalent to a lower ambient temperatures.

8. Mopping must not precede the roll by more than five feet.

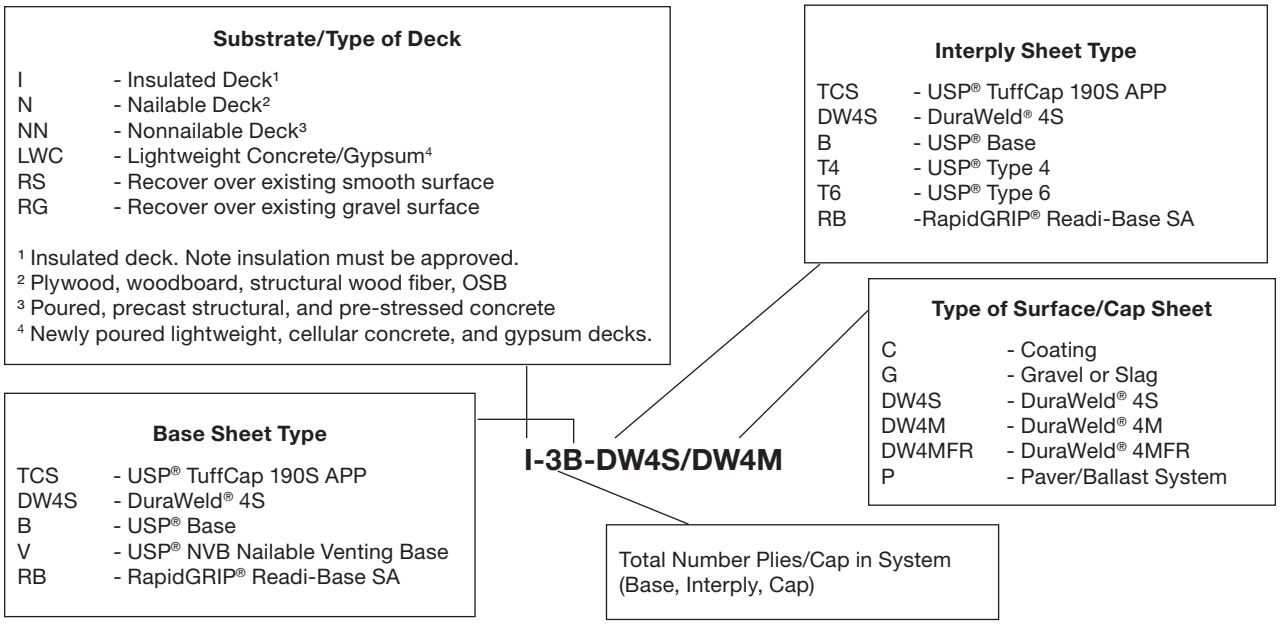
9. If insulation is being set in mopping asphalt, it must be set quickly while the asphalt is still hot and fluid. Use the minimum insulation size available. At no time should boards larger than 4' x 4' (1.22 m x 1.22 m) be set in hot asphalt.

10. In cooler weather, modified adhesives become more viscous and difficult to apply. Be careful to insure that the adhesives are applied at the proper rate.

11. Do not overheat torch applied APP or SBS membranes to compensate for cold ambient temperatures.

SECTION 6 – DURAWELD® APP Torch Applied Specifications

Part 1 – DuraWeld® APP Torch Applied Key to Specification Numbers



Part 2 – DuraWeld® APP Torch Applied Specification Index

2.01 – DuraWeld® APP Torch Applied Ten and Twelve Year Guarantee Specifications

2.02 – DuraWeld® APP Torch Applied Fifteen Year Guarantee Specifications

2.02 – DuraWeld® APP Torch Applied Fifteen Year Guarantee Specifications (continued)

DECK/SUBSTRATE TYPE	*TOTAL NUMBER OF PLIES/CAP IN SYSTEM*	*SPECIFICATION NUMBER*	*SPECIFICATION CONFIGURATION*	*PAGE NUMBER*
INSULATION	2	I-2-TCS/DW4M	TCS APP • DuraWeld® 4M	58
	2	I-2-TCS/DW4MFR	TCS APP • DuraWeld® 4MFR	58
	2	I-2-RB/DW4M	Readi-Base SA • DuraWeld 4M	57
	2	I-2-RB/DW4MFR	Readi-Base SA • DuraWeld 4MFR	57
	3	I-3B-TCS/DW4M	BASE • TCS APP • DuraWeld® 4M	63
	3	I-3B-TCS/DW4MFR	BASE • TCS APP • DuraWeld® 4MFR	63
	3	I-3T4-DW4M	(2) TYPE 4 • DuraWeld® 4M	64
	3	I-3T4-DW4MFR	(2) TYPE 4 • DuraWeld® 4MFR	64
	3	I-3T6-DW4M	(2) TYPE 6 • DuraWeld® 4M	64
	3	I-3T6-DW4MFR	(2) TYPE 6 • DuraWeld® 4MFR	64
	4	I-4T4-DW4M	(3) TYPE 4 • DuraWeld® 4M	67
	4	I-4T4-DW4MFR	(3) TYPE 4 • DuraWeld® 4MFR	67
NON-NAILABLE	2	NN-2-TCS/DW4M	TCS APP • DuraWeld® 4M	65
	2	NN-2-TCS/DW4MFR	TCS APP • DuraWeld® 4MFR	65

2.03 – DuraWeld® APP Torch Applied Twenty Year Guarantee Specifications

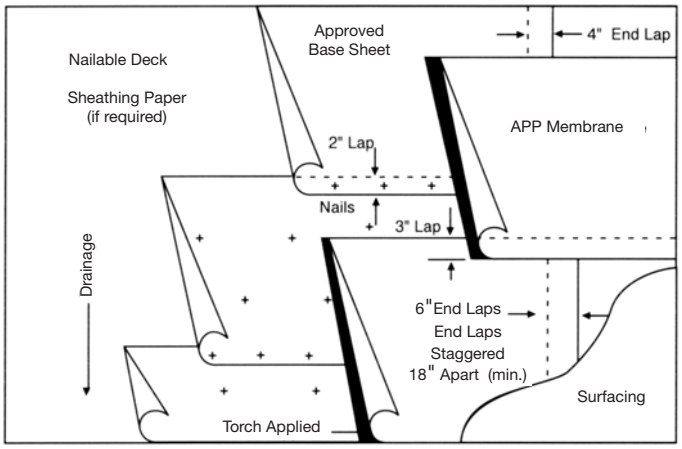
DECK/SUBSTRATE TYPE	*TOTAL NUMBER OF PLIES/CAP IN SYSTEM*	*SPECIFICATION NUMBER*	*SPECIFICATION CONFIGURATION*	*PAGE NUMBER*
NAILABLE	3	N-3B-DW4S/DW4M	BASE • DuraWeld® 4S • DuraWeld® 4M	62
	3	N-3B-DW4S/DW4MFR	BASE • DuraWeld® 4S • DuraWeld® 4MFR	62
	4	N-4BT6-DW4M	BASE • (2) TYPE 6 • DuraWeld® 4M	66
	4	N-4BT6-DW4MFR	BASE • (2) TYPE 6 • DuraWeld® 4MFR	66
LIGHTWEIGHT, CELLULAR, OR GYPSUM	3	LWC-3V-DW4S/DW4M	NVB • DuraWeld® 4S DuraWeld® 4M	62
	3	LWC-3V-DW4S/DW4MFR	NVB • DuraWeld® 4S DuraWeld® 4MFR	62
	4	LWC-4VT6-DW4M	NVB • (2) TYPE 6 • DuraWeld® 4M	66
	4	LWC-4VT6-DW4MFR	NVB • (2) TYPE 6 • DuraWeld® 4MFR	66
INSULATION	2	I-2-DW4S/DW4M	DuraWeld® 4S • DuraWeld® 4M	58
	2	I-2-DW4S/DW4MFR	DuraWeld® 4S • DuraWeld® 4MFR	58
	2	I-2-RB/DW4M	Readi-Base SA • DuraWeld 4M	57
	2	I-2-RB/DW4MFR	Readi-Base SA • DuraWeld 4MFR	57
	3	I-3B-DW4S/DW4M	BASE • DuraWeld® 4S • DuraWeld® 4M	63
	3	I-3B-DW4S/DW4MFR	BASE • DuraWeld® 4S • DuraWeld® 4MFR	63
	4	I-4T6-DW4M	(3) TYPE 6 • DuraWeld® 4M	67
	4	I-4T6-DW4MFR	(3) TYPE 6 • DuraWeld® 4MFR	67
NON-NAILABLE	2	NN-2-DW4S/DW4M	DuraWeld® 4S • DuraWeld® 4M	65
	2	NN-2-DW4S/DW4MFR	DuraWeld® 4S • DuraWeld® 4MFR	65

Part 3 – DuraWeld® APP Torch Applied Recover Specification Index

3.01 – DuraWeld® APP Torch Applied Ten and Twelve Year Guarantee Recover Specifications

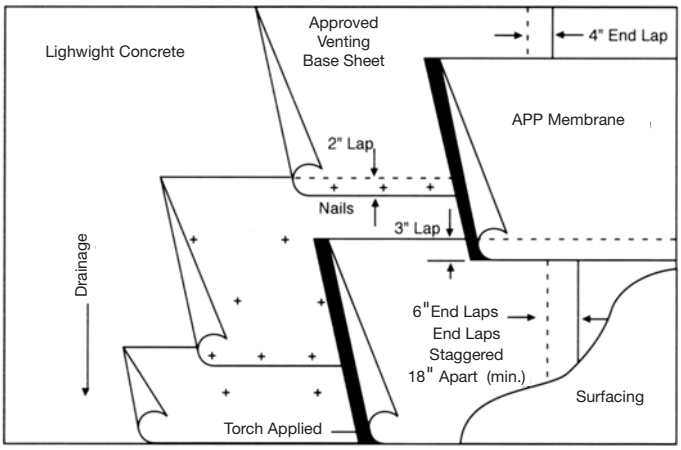
DECK/SUBSTRATE TYPE	*TOTAL NUMBER OF PLIES/CAP IN SYSTEM*	*SPECIFICATION NUMBER*	*SPECIFICATION CONFIGURATION*	*PAGE NUMBER*
RECOVER EXISTING SMOOTH SURFACE ROOF - NO INSULATION	1	RS-1-DW4S-C	DuraWeld® 4S • COATING	68
	1	RS-1-DW4M	DuraWeld® 4M	68
	1	RS-1-DW4MFR	DuraWeld® 4MFR	68
	2	RS-2B-DW4S-C	BASE • DuraWeld® 4S • COATING	68
	2	RS-2B-DW4M	BASE • DuraWeld® 4M	68
	2	RS-2B-DW4MFR	BASE • DuraWeld® 4MFR	68
RECOVER EXISTING GRAVEL SURFACE ROOF -INSULATION	2	RG-I-2B-DW4S-C	INSULATION • BASE • DuraWeld® 4S • COATING	69
	2	RG-I-2B-DW4M	INSULATION • BASE • DuraWeld® 4M	69
	2	RG-I-2B-DW4MFR	INSULATION • BASE • DuraWeld® 4MFR	69

SECTION 6 – DURAWELD® APP Torch Applied Specifications



TWO (2) PLY APP SYSTEM
NAILABLE DECK

Figure 1



TWO (2) PLY APP SYSTEM
LIGHTWEIGHT CONCRETE DECK

Figure 2

GENERAL
Safety: Refer to Section 4, Part 14. DO NOT BEGIN INSTALLATION UNTIL THIS INFORMATION IS READ, UNDERSTOOD AND IMPLEMENTED.

MATERIALS
Material Requirements:

Base Sheet[1]..... 1 ply
DuraWeld® APP Membrane[2]..... 1 ply
Surfacing[3]..... (if applicable)

[1] USP® Base, USP® NVB (Nailable Venting Base) or other U.S. Ply approved base sheets
[2] DuraWeld® 4S (surfacing required), DuraWeld® 4M, DuraWeld® 4MFR
[3] U.S. Ply approved surfacing.

APPLICATION
Refer to Section 4 – General Requirements, and Section 5 - Installation Requirements.

Base Sheet: Mechanically fasten one ply of base sheet over the deck. Lap sheets 2" (5 cm) on side laps and 4" (10 cm) on the end laps. Refer to Section 5, Part 8 – Fastening and Part 12, Item 12.03 – Base Sheets, Mechanically Fastened

Note: USP® Base may be used as a base sheet over newly poured lightweight and gypsum decks under certain conditions. Contact the U.S. Ply Technical Services Department *817-413-0103* for prior approval.

DuraWeld® APP Membrane: Heat weld DuraWeld® APP membrane over the base sheet. Lap membrane 3" (7.5 cm) on side laps, 6" (15 cm) on end laps. Refer to Section 5, Part 12, Item 12.08 – DuraWeld® APP Membrane Application.

Flashing and Accessories: Refer to Section 5, Part 13 – Flashing and Section 12 DuraWeld® Construction Details

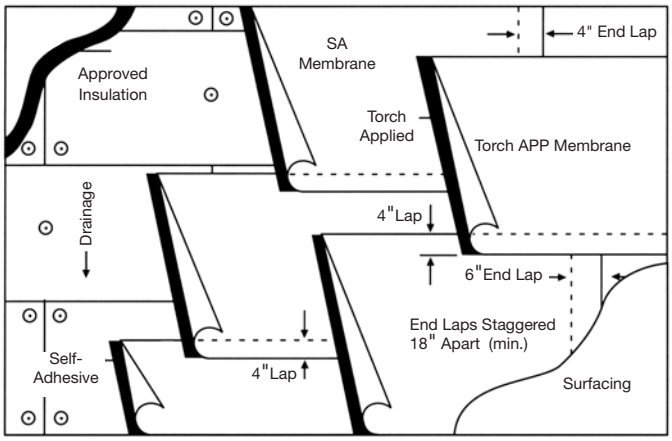
Surfacing: Refer to Section 5, Part 14 – Surfacing.

For additional information on this specification, guarantee requirements, etc. contact U.S. Ply Technical Services 817-413-0103

TEN AND TWELVE YEAR GUARANTEE SPECIFICATIONS

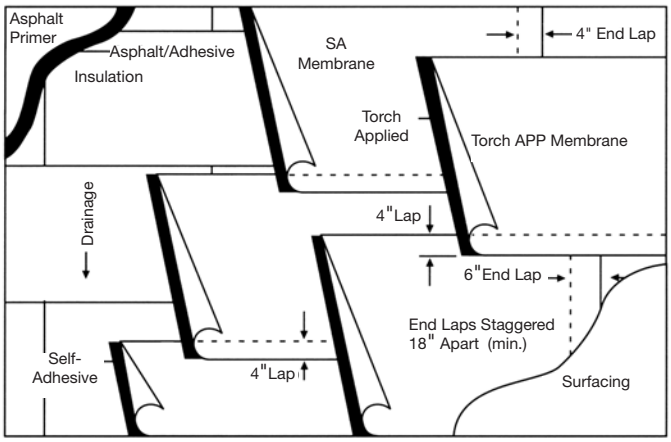
Specification	*Base Sheet*	*Membrane*
N-2B-DW4S-C*	Approved	DuraWeld 4S
N-2B-DW4M	Approved	DuraWeld 4M
N-2B-DW4MFR	Approved	DuraWeld 4MFR
LWC-2V-DW4S-C *	NVB	DuraWeld 4S
LWC-2V-DW4M	NVB	DuraWeld 4M
LWC-2V-DW4MFR	NVB	DuraWeld 4MFR

* Must be surfaced with approved protective coating



TWO (2) PLY MODIFIED SYSTEM
NAILABLE / INSULATION DECK

Figure 1



TWO (2) PLY MODIFIED SYSTEM
NON- NAILABLE / INSULATION DECK

Figure 2

GENERAL

Safety: Refer to Section 4, Part 14. DO NOT BEGIN INSTALLATION UNTIL THIS INFORMATION IS READ, UNDERSTOOD AND IMPLEMENTED.

MATERIALS

Approved Insulation[1] - As required
Gypsum Coverboard is Optional
Mechanical Fasteners[2] or Insulation Adhesive - As required
RapidGRIP® SA Base Sheet[3] – 1 Ply
DuraWeld® APP Membrane[4] – 1 Ply

[4] DuraWeld® 4S (surfacing required), DuraWeld® 4M, DuraWeld® 4MFR

APPLICATION

Refer to Section 4 – General Requirements, and Section 5 – Installation Requirements.

Note: Polyisocyanurate insulation boards may receive Readi-Base self-adhesive membrane directly over board without an overlay of a coverboard.

Insulation Installation Over Nailable Decks (see Figure 1): Mechanically fasten insulation to the deck with the joints staggered in one direction. Refer to Section 5, Parts 8 – Fastening, 11 – Insulation Installation.

Insulation Installation Over Non-Nailable Decks (see Figure 2): Prime the deck with ASTM D 41 asphalt primer applied at the rate of 1 gal/square (0.4 L/m²) minimum. Hold primer back 6" (15 cm) from concrete deck joints. Install insulation over the deck, in a uniform mopping of hot and fluid asphalt applied at the rate of 25 – 30 lb/square (1.2 – 1.5 kg/m²). Install insulation with the joints staggered in one direction, Refer to Section 5, Part 6 – Asphalt and Part 11, Insulation Installation or in compatible insulation adhesive. Install insulation with the joints staggered in one direction. Refer to Section 5, Part 11, Item 11.05, Foam Adhesive Insulation Installation

SA Base Sheet: Install Readi-Base, over approved insulation system, using self- adhesive method with appropriate pressure roller. Lap the sheets at least 4" (10 cm) on sides and 6" (15 cm) on end laps. Refer to Section 5, Part 12, Item 12.06 – RapidGRIP® Readi-Base SA Base Sheet Application. **Note:** Warm weather conditions and exposure to direct sunlight are essential for proper adhesion. The self-adhesive compound will not activate if installed below the recommended temperatures and/or if the material temperature is below 70°F. Important: If the cap sheet is not to be installed the same day, then supplemental heating to the underside of the sheet may be necessary to activate the adhesive tack and accomplish desired mating to substrate.

DuraWeld® APP Membrane: Heat weld DuraWeld® APP membrane over the base sheet. Lap membrane 3" (7.5 cm) on side laps, 6" (15 cm) on end laps. Refer to Section 5, Part 12, Item 12.08 – DuraWeld® APP Membrane Application.

Flashing and Accessories: Refer to Section 5, Part 13 – Flashing, and Section 12 - DuraWeld® APP Construction Details.

Surfacing: Refer to Section 5, Part 14 – Surfacing.

For additional information on this specification, guarantee requirements, etc., contact U.S. Ply Technical Services 817-413-0103.

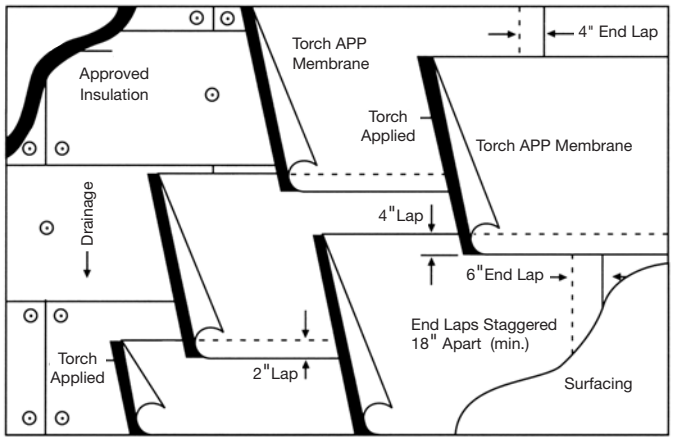
FIFTEEN YEAR GUARANTEE SPECIFICATIONS

Specification	*Base Sheet*	*Membrane*
I-2-RB-DW4M	Readi-Base SA	DuraWeld 4M
I-2-RB-DW4MFR	Readi-Base SA	DuraWeld 4MFR

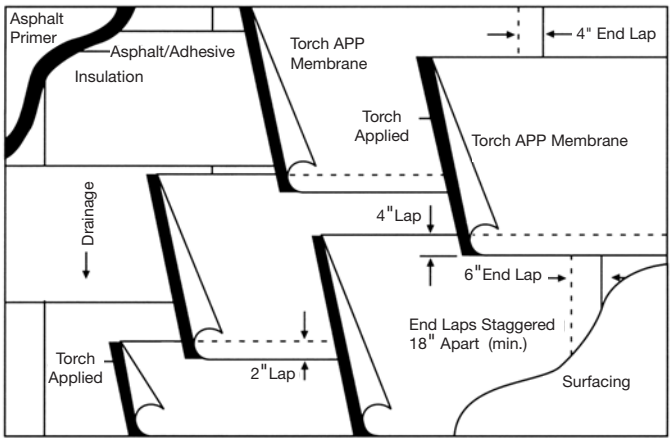
TWENTY YEAR GUARANTEE SPECIFICATIONS

Specification	*Base Sheet*	*Membrane*
I-2-RB-DW4M	Readi-Base SA	DuraWeld 4M
I-2-RB-DW4MFR	Readi-Base SA	DuraWeld 4MFR

SECTION 6 – DURAWELD® APP Torch Applied Specifications



TWO (2) PLY APP SYSTEM
NAILABLE / INSULATION DECK *Figure 1*



TWO (2) PLY APP SYSTEM
NON-NAILABLE DECK/INSULATION *Figure 2*

GENERAL
Safety: Refer to Section 4, Part 14. DO NOT BEGIN INSTALLATION UNTIL THIS INFORMATION IS READ, UNDERSTOOD AND IMPLEMENTED.

MATERIALS
Material Requirements:

Approved Insulation
Approved Coverboard: SecuRock® Board
Roofing Asphalt or Insulation Adhesive (if applicable)
APP Smooth[1].....1 ply
DuraWeld® APP Membrane[2] .....1 ply
Surfacing[3].....(if applicable))

[1] USP® TuffCap 190S APP, or DuraWeld® APP 4S
[2] DuraWeld® 4S (surfacing required), DuraWeld® 4M, DuraWeld® 4MFR
[3] U.S. Ply approved surfacing.

APPLICATION
Refer to Section 4 – General Requirements, and Section 5 - Installation Requirements.

Note: Polyisocyanurate insulation boards, require a minimum ¼" overlay of gypsum fiber roof board prior to torching base.

Insulation Installation Over Nailable Decks (see Figure 1): Mechanically fasten insulation to the deck with the joints staggered in one direction. Refer to Section 5, Parts 8 – Fastening, 11 – Insulation Installation.

Insulation Installation Over Non-Nailable Decks (see Figure 2) Prime the deck with ASTM D 41 asphalt primer applied at the rate of 1 gal/square (0.4 L/m²) minimum. Hold primer back 6" (15 cm) from concrete deck joints. Install insulation over the deck, in a uniform mopping of hot and fluid asphalt applied at the rate of 25 – 30 lb/square (1.2 – 1.5 kg/m²). Install insulation with the joints staggered in one direction, Refer to Section 5, Part 6 – Asphalt and Part 11, Insulation Installation or in compatible insulation adhesive. Install insulation with the joints staggered in one direction. Refer to Section 5, Part 11, Item 11.05, Foam Adhesive Insulation Installation

Torch Applied APP Membrane: Install torch applied APP membrane, over the gypsum coverboard. Lap sheets 3" (7.5 cm) on side laps, 6" (15 cm) on end laps. Refer to Section 5, Part 12, Item 12.07 – DuraWeld® APP Membrane Application.

DuraWeld® APP Membrane: Heat weld DuraWeld® APP membrane over the base sheet. Lap membrane 3" (7.5 cm) on side laps, 6" (15 cm) on end laps. Refer to Section 5, Part 12, Item 12.08 – DuraWeld® APP Membrane Application.

Flashing and Accessories: Refer to Section 5, Part 13 – Flashing, and Section 12 - DuraWeld® APP Construction Details.

Surfacing: Refer to Section 5, Part 14 – Surfacing.

For additional information on this specification, guarantee requirements, etc., contact U.S. Ply Technical Services 817-413-0103.

TEN AND TWELVE YEAR GUARANTEE SPECIFICATIONS

Specification	*Base Sheet*	*Membrane*
I-2-TCS-DW4S-C*	TCS APP	DuraWeld 4S

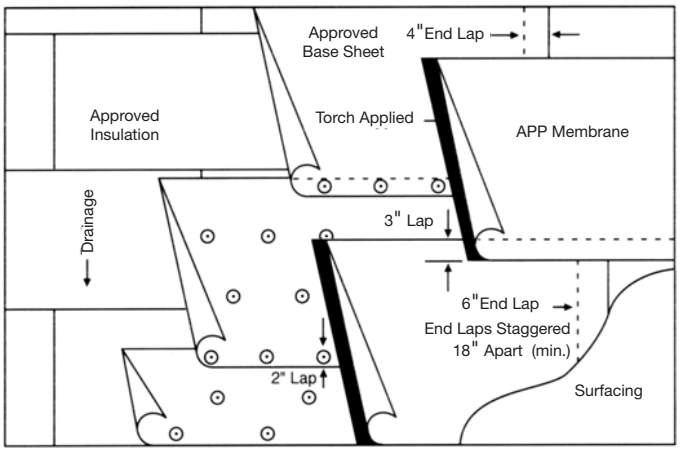
FIFTEEN YEAR GUARANTEE SPECIFICATIONS

Specification	*Base Sheet*	*Membrane*
I-2-TCS-DW4M	TCS APP	DuraWeld 4M
I-2-TCS-DW4MFR	TCS APP	DuraWeld 4MFR

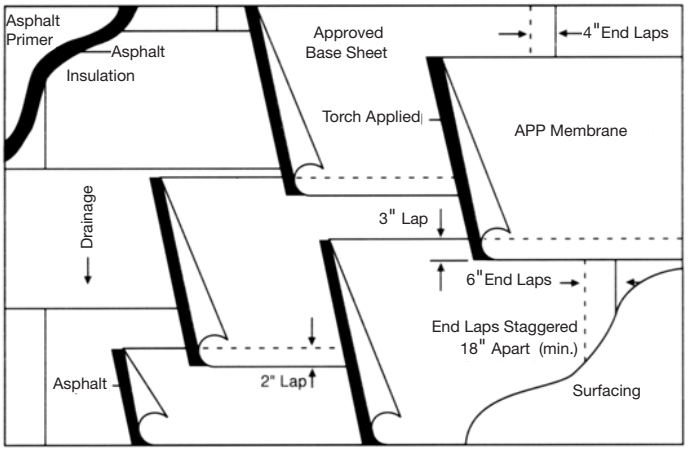
TWENTY YEAR GUARANTEE SPECIFICATIONS

Specification	*Base Sheet*	*Membrane*
I-2-DW4S-DW4M	DW4S	DuraWeld 4M
I-2-DW4S-DW4MFR	DW4S	DuraWeld 4MFR

*Must be surfaced with approved protective surfacing



TWO (2) PLY APP SYSTEM
NAILABLE DECK/INSULATION *Figure 1*
Base sheet may be mopped if insulation is mechanically attached.



TWO (2) PLY APP SYSTEM
NON-NAILABLE DECK/INSULATION *Figure 2*

GENERAL
Safety: Refer to Section 4, Part 14. DO NOT BEGIN INSTALLATION UNTIL THIS INFORMATION IS READ, UNDERSTOOD AND IMPLEMENTED.

MATERIALS
Material Requirements:

Approved Insulation
Base Sheet[1]..... 1 ply
DuraWeld® APP Membrane[2]..... 1 ply
Surfacing[3] ..... (if applicable)

[1] USP® Base, USP® NVB (Nailable Venting Base) or other U.S. Ply approved base sheets
[2] DuraWeld® 4S (surfacing required), DuraWeld® 4M, DuraWeld® 4MFR
[3] U.S. Ply approved surfacing.

APPLICATION
Refer to Section 4 – General Requirements, and Section 5 - Installation Requirements.

Note: Polyisocyanurate insulation boards, require a minimum ½" overlay (wood fiber) insulation prior to mopping base.

Insulation Installation Over Nailable Decks (see Figure 1) see Base Sheet Option 1: Mechanically fasten insulation and base sheet simultaneously, to the deck with the joints staggered in one direction. **Option 2 (not shown):** Mechanically fasten insulation to the deck with the joints staggered in one direction. Refer to Section 5, Parts 8 – Fastening, 11 – Insulation Installation, and 12 – Membrane System Installation.

Insulation Installation Over Non-Nailable Decks (see Figure 2): Prime the deck with ASTM D 41 asphalt primer applied at the rate of 1 gal/square (0.4 L/m²) minimum. Hold primer back 6" (15 cm) from concrete deck joints. Install insulation over the deck, in a uniform mopping of hot and fluid asphalt applied at the rate of 25 – 30 lb/square (1.2 – 1.5 kg/m²). Install insulation with the joints staggered in one direction, (see Base Sheet Option 2). Refer to Section 5, Part 11, Item 11.03 – Non-Nailable Substrates.

Base Sheet Option1: Insulation and Base Sheet are fastened simultaneously. Mechanically fastened one ply of base sheet over the insulation. Lap the base sheet a minimum of 2" (5 cm) on the side lap and 4" (cm) on ends. Screws and plates are then installed in three rows. The first row (on the seam) will be 1-1/2" (3.75 cm) from the leading edge and on 12" (30 cm) centers. Locate the second row of fasteners 12" (30 cm) from the leading edge and on 18" (45.7 cm) centers. The third row of fasteners shall be 24" (60 cm) from the leading edge on 18" (45.7 cm) centers. The centers for the second and third rows should be staggered. Refer to Section 5, Part 8 and Part 12, Item 12.03 - Base Sheets, Mechanically Fastened.

Base Sheet Option 2: Install base sheet, over insulation, in a uniform mopping of hot asphalt applied at the rate of 25 lb/square (1.2 kg/m²). Lap the sheets 2" (5 cm) on side laps and 4" (10 cm) on end laps. Refer to Section 5, Part 12, Item 12.04 – Asphalt Mopping Base/Interply Sheets.

DuraWeld® APP Membrane: Heat weld DuraWeld® APP membrane over the base sheet. Lap membrane 3" (7.5 cm) on side laps, 6" (15 cm) on end laps. Refer to Section 5, Part 12, Item 12.08 – DuraWeld® APP Membrane Application.

Flashing and Accessories: Refer to Section 5, Part 13 – Flashing and Section 12 DuraWeld® Construction Details

Surfacing: Refer to Section 5, Part 14 – Surfacing.

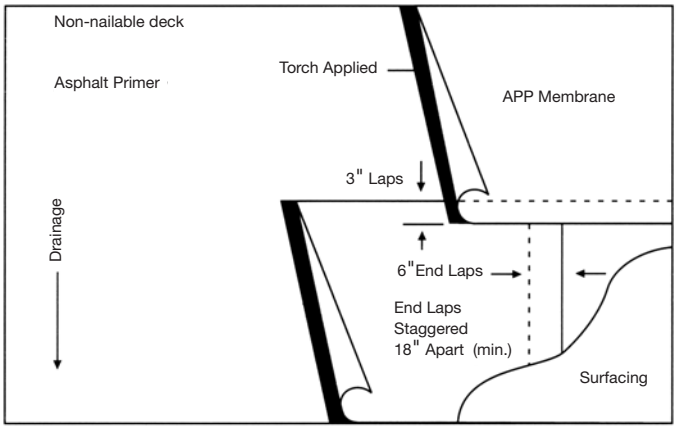
For additional information on this specification, guarantee requirements, etc. contact U.S. Ply Technical Services 817-413-0103.

TEN AND TWELVE YEAR GUARANTEE SPECIFICATIONS

Specification	*Base Sheet*	*Membrane*
I-2B-DW4S-C*	Approved	DuraWeld 4S
I-2B-DW4M	Approved	DuraWeld 4M
I-2B-DW4MFR	Approved	DuraWeld 4MFR

* Must be surfaced with approved protective coating

SECTION 6 – DURAWELD® APP Torch Applied Specifications



ONE (1) PLY APP SYSTEM
NON-NAILABLE DECK

Figure 1

GENERAL

Safety: Refer to Section 4, Part 14. DO NOT BEGIN INSTALLATION UNTIL THIS INFORMATION IS READ, UNDERSTOOD AND IMPLEMENTED.

MATERIALS

Material Requirements:

Primer [1]..... 1 gal/square (0.4 L/m²)
DuraWeld® APP Membrane [2]..... 1 ply
Surfacing [3]..... (if applicable)

[1]Asphalt Primer conforming to ASTM D 41
[2] DuraWeld® 4S (surfacing required), DuraWeld® 4M, DuraWeld® 4MFR
[3] U.S. Ply approved surfacing.

APPLICATION

Refer to Section 4 – General Requirements, and Section 5 - Installation Requirements.

Deck Preparation: Prime the deck with ASTM D 41 asphalt primer applied at the rate of 1 gal/square (0.4 L/m²) minimum. Hold primer back 6" (15 cm) from concrete deck joints.

DuraWeld® Membrane: Heat weld DuraWeld® APP membrane over the primed deck. Lap membrane 3" (7.5 cm) on side laps, 6" (15 cm) on end laps. Refer to Section 5, Part 11, Item 12.08 – DuraWeld® APP Membrane Application.

Flashing and Accessories: Refer to Section 5, Part 13 – Flashing and Section 12 DuraWeld® Construction Details

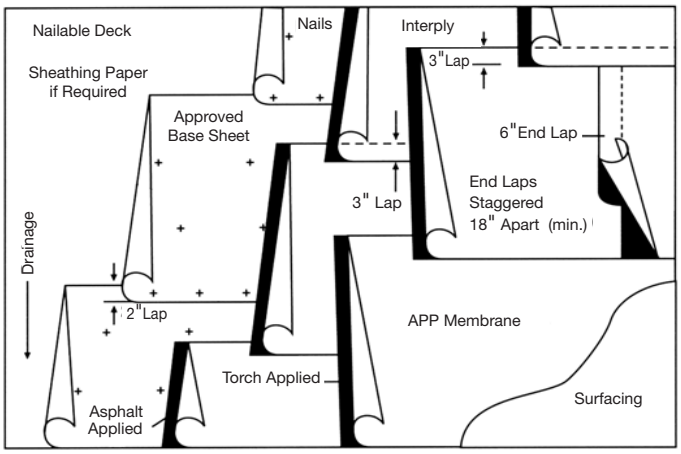
Surfacing: Refer to Section 5, Part 14 – Surfacing.

For additional information on this specification, guarantee requirements, etc. contact U.S. Ply Technical Services 817-413-0103.

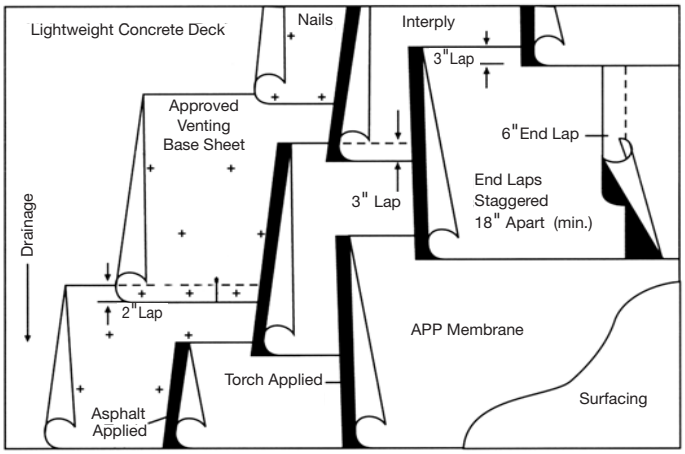
TEN AND TWELVE YEAR GUARANTEE SPECIFICATIONS

Specification	*Membrane*
NN-1-DW4S-C*	DuraWeld 4S
NN-1-DW4M	DuraWeld 4M
NN-1-DW4MFR	DuraWeld 4MFR

*Must be surfaced with approved protective surfacing



THREE (3) PLY APP SYSTEM NAILABLE DECK *Figure 1*



THREE (3) PLY APP SYSTEM LIGHTWEIGHT CONCRETE DECK *Figure 2*

GENERAL

Safety: Refer to Section 4, Part 14. DO NOT BEGIN INSTALLATION UNTIL THIS INFORMATION IS READ, UNDERSTOOD AND IMPLEMENTED.

MATERIALS

Material Requirements:

Base Sheet[1] ..... 1 ply
Interply Membrane[2] ..... 1 ply
DuraWeld® APP Membrane[3] ..... 1 ply
Surfacing[4] ..... (if applicable)

[1] USP® Base, USP® NVB (Nailable Venting Base) or other U.S. Ply approved base sheets
[2]Asphalt Applied Interply: USP® Type 4, USP® Type 6
[3]DuraWeld® 4S (surfacing required), DuraWeld® 4M, DuraWeld® 4MFR
[4] U.S. Ply approved surfacing.

APPLICATION

Refer to Section 4 – General Requirements, and Section 5 - Installation Requirements.

Base Sheet: Mechanically fastened one ply of base sheet over the deck. Lap the base sheet a minimum of 2” (5 cm) on the side laps and 4” (10 cm) on the end laps. Refer to Section 5, Part 8 and Part 12, Item 12.03 - Base Sheets, Mechanically Fastened.

Note: USP® Base may be used as a base sheet over newly poured lightweight and gypsum decks under certain conditions. Contact U.S. Ply Technical Services Department 817-413-0103 for prior approval.

Interply Membrane: (Asphalt Applied) Install asphalt applied interply, in a uniform mopping of hot asphalt applied at a rate of 25 lb/square (1.2 kg/m²). Lap sheet 2" (5 cm) on side laps and 4" (10 cm) on end laps. Refer to Section 5, Part 12, Item 12.04 – Asphalt Mopping Base/ Interply Sheets.

DuraWeld® APP Membrane: Heat weld DuraWeld® APP membrane over the interply sheet. Lap membrane 3" (7.5 cm) on side laps, 6" (15 cm) on end laps. Refer to Section 5, Part 12, Item 12.08 – DuraWeld® APP Membrane Application.

Flashing and Accessories: Refer to Section 5, Part 13 – Flashing and Section 12 DuraWeld® Construction Details

Surfacing: Refer to Section 5, Part 14 – Surfacing.

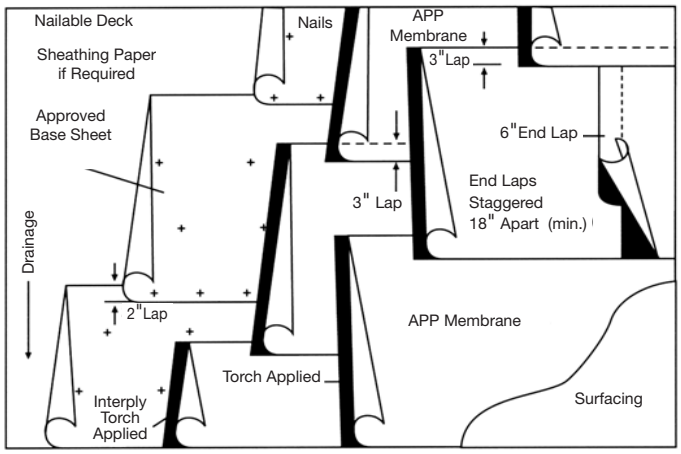
For additional information on this specification, guarantee requirements, etc. contact U.S. Ply Technical Services 817-413-0103.

TEN AND TWELVE YEAR GUARANTEE SPECIFICATIONS

Specification	*Base Sheet*	*Interply*	*Membrane*
N-3BT4-DW4S-C*	Approved	Type 4	DuraWeld 4S
N-3BT4-DW4M	Approved	Type 4	DuraWeld 4M
N-3BT4-DW4MFR	Approved	Type 4	DuraWeld 4MFR
LWC-3VT4-DW4S-C*	NVB	Type 4	DuraWeld 4S
LWC-3VT4-DW4M	NVB	Type 4	DuraWeld 4M
LWC-3VT4-DW4MFR	NVB	Type 4	DuraWeld 4MFR

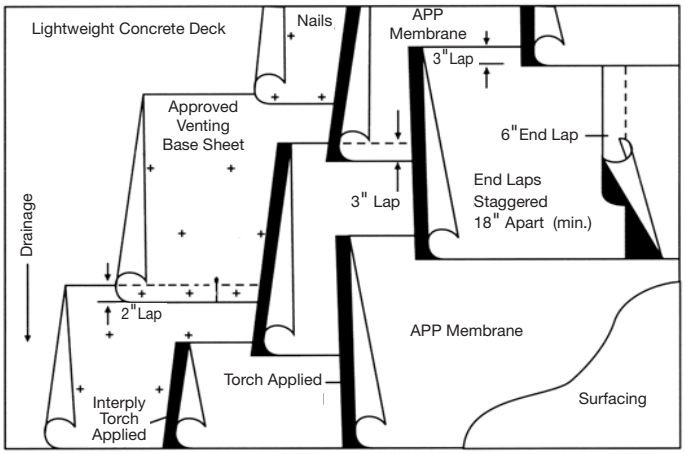
*Must be surfaced with approved protective surfacing

SECTION 6 – DURAWELD® APP Torch Applied Specifications



THREE (3) PLY APP SYSTEM
NAILABLE DECK

Figure 1



THREE (3) PLY APP SYSTEM
LIGHTWEIGHT CONCRETE DECK

Figure 2

GENERAL

Safety: Refer to Section 4, Part 14. DO NOT BEGIN INSTALLATION UNTIL THIS INFORMATION IS READ, UNDERSTOOD AND IMPLEMENTED.

MATERIALS

Material Requirements:

Base Sheet[1] ..... 1 ply
Interply Membrane[2] ..... 1 ply
DuraWeld® APP Membrane[3] ..... 1 ply)

[1] USP® Base, USP® NVB (Nailable Venting Base) or other U.S. Ply approved base sheets
[2] Torch Applied APP Interply: USP® TuffCap 190S APP, DuraWeld® 4S
[3] DuraWeld® 4M, DuraWeld® 4MFR

APPLICATION

Refer to Section 4 – General Requirements, and Section 5 - Installation Requirements.

Base Sheet: Mechanically fastened one ply of base sheet over the deck. Lap the base sheet a minimum of 2" (5 cm) on the side laps and 4" (10 cm) on the end laps. Refer to Section 5, Part 8 and Part 12, Item 12.03 - Base Sheets, Mechanically Fastened.

Note: USP® Base may be used as a base sheet over newly poured lightweight and gypsum decks under certain conditions. Contact U.S. Ply Technical Services Department 817-413-0103 for prior approval.

Interply Membrane: (Torch Applied) Install torch applied interply membrane, over the base sheet. Lap sheets 3" (7.5 cm) on side laps, 6" (15 cm) on end laps. Refer to Section 5, Part 12, Item 12.07 – DuraWeld® APP Membrane Application.

DuraWeld® APP Membrane: Heat weld DuraWeld® APP membrane over the interply sheet. Lap membrane 3" (7.5 cm) on side laps, 6" (15 cm) on end laps. Refer to Section 5, Part 12, Item 12.08 – DuraWeld® APP Membrane Application.

Flashing and Accessories: Refer to Section 5, Part 13 – Flashing and Section 12 DuraWeld® Construction Details

Surfacing: Refer to Section 5, Part 14 – Surfacing.

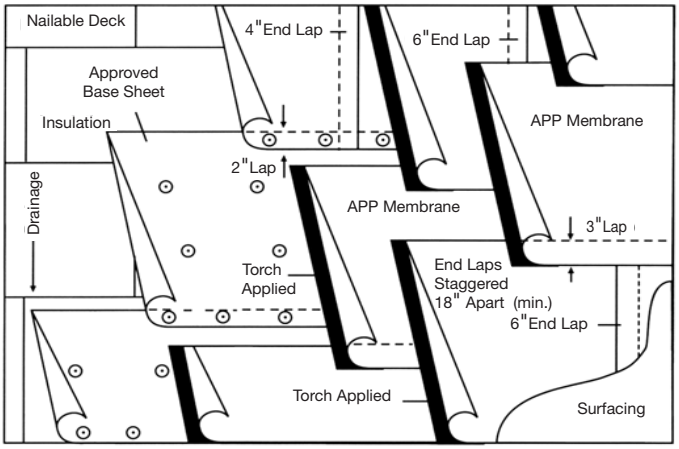
For additional information on this specification, guarantee requirements, etc. contact U.S. Ply Technical Services 817-413-0103.

FIFTEEN YEAR GUARANTEE SPECIFICATIONS

Specification	*Base Sheet*	*Interply*	*Membrane*
N-3B-TCS/DW4M	Approved	TCS	DuraWeld 4M
N-3B-TCS/DW4MFR	Approved	TCS	DuraWeld 4MFR
LWC-3V-TCS/DW4M	NVB	TCS	DuraWeld 4M
LWC-3V-TCS/DW4MFR	NVB	TCS	DuraWeld 4MFR

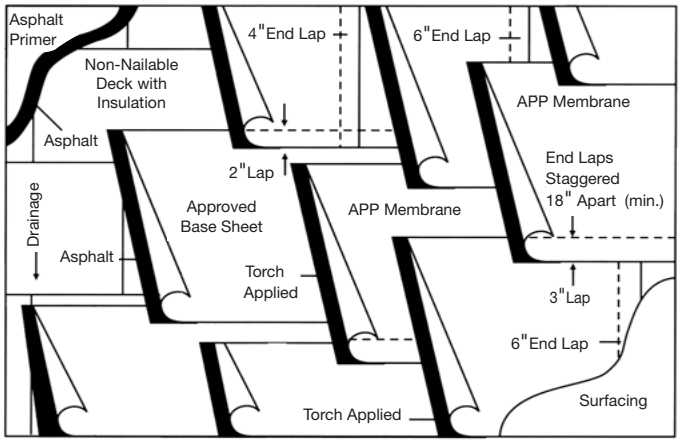
TWENTY YEAR GUARANTEE SPECIFICATIONS

Specification	*Base Sheet*	*Interply*	*Membrane*
N-3B-DW4S/DW4M	Approved	DW4S	DuraWeld 4M
N-3B-DW4S/DW4MFR	Approved	DW4S	DuraWeld 4MFR
LWC-3V-DW4S/DW4M	NVB	DW4S	DuraWeld 4M
LWC-3V-DW4S/DW4MFR	NVB	DW4S	DuraWeld MFR



THREE (3) PLY APP SYSTEM
NAILABLE DECK/INSULATION

Figure 1



THREE (3) PLY APP SYSTEM
NON-NAILABLE DECK/INSULATION

Figure 2

GENERAL

Safety: Refer to Section 4, Part 14. DO NOT BEGIN INSTALLATION UNTIL THIS INFORMATION IS READ, UNDERSTAND AND IMPLEMENTED.

MATERIALS

Material Requirements:

Approved Insulation
Base Sheet[1] ..... 1 ply
Interply Membrane[2] ..... 1 ply
DuraWeld® APP Membrane[3]..... 1 ply

[1] USP® Base, USP® NVB (Nailable Venting Base) or other U.S. Ply approved base sheets
[2] Torch Applied APP Interply: USP® TuffCap 190S APP, DuraWeld® 4S
[3] DuraWeld® 4M, DuraWeld® 4MFR

APPLICATION

Refer to Section 4 – General Requirements, and Section 5 - Installation Requirements.

Note: Polyisocyanurate insulation boards require a minimum ¼" overlay of SecuRock or ½" wood fiber insulation prior to mopping base.

Insulation Installation Over Nailable Decks (see Figure 1) see Base Sheet Option 1: Mechanically fasten insulation and base sheet simultaneously, to the deck with the joints staggered in one direction. **Option 2 (not shown):** Mechanically fasten insulation to the deck with the joints staggered in one direction. Refer to Section 5, Parts 8 – Fastening, 11 – Insulation Installation, and 12 – Membrane System Installation.

Insulation Installation Over Non-Nailable Decks (see Figure 2): Prime the deck with ASTM D 41 asphalt primer applied at the rate of 1 gal/square (0.4 L/m²) minimum. Hold primer back 6" (15 cm) from concrete deck joints. Install insulation over the deck, in a uniform mopping of hot and fluid asphalt applied at the rate of 25 – 30 lb/square (1.2 – 1.5 kg/m²). Install insulation with the joints staggered in one direction, (see Base Sheet Option 2). Refer to Section 5, Part 11, Item 11.03 – Non-Nailable Substrates.

Base Sheet Option 1: Insulation and Base Sheet are fastened simultaneously. Mechanically fastened one ply of base sheet over the insulation. Lap the base sheet a minimum of 2" (5 cm) on the side lap and 4" (cm) on ends. Screws and plates are then installed in three rows. The first row (on the seam) will be 1-1/2" (3.75 cm) from the leading edge and on 12" (30 cm) centers. Locate the second row of fasteners 12" (30 cm) from the leading edge and on 18" (45.7 cm) centers. The third row of fasteners shall be 24" (60 cm) from the leading edge on 18" (45.7 cm) centers. The centers for the second and third rows should be staggered. Refer to Section 5, Part 8 and Part 12, Item 12.03 - Base Sheets, Mechanically Fastened.

Base Sheet Option 2: Install base sheet, over insulation, in a uniform mopping of hot asphalt applied at the rate of 25 lb/square (1.2 kg/m²). Lap the sheets 2" (5 cm) on side laps and 4" (10 cm) on end laps. Refer to Section 5, Part 12, Item 12.04 – Asphalt Mopping Base/Interply Sheets.

Torch Applied Interply Membrane: Install torch applied interply membrane, over the base sheet. Lap sheets 3" (7.5 cm) on side laps, 6" (15 cm) on end laps. Refer to Section 5, Part 12, Item 12.07 – DuraWeld® APP Membrane Application.

DuraWeld® APP Membrane: Heat weld DuraWeld® APP membrane over the base sheet. Lap membrane 3" (7.5 cm) on side laps, 6" (15 cm) on end laps. Refer to Section 5, Part 12, Item 12.08 DuraWeld® APP Membrane Application.

Flashing and Accessories: Refer to Section 5, Part 13 – Flashing and Section 12 DuraWeld® Construction Details

Surfacing: Refer to Section 5, Part 14 – Surfacing.

For additional information on this specification, guarantee requirements, etc. contact U.S. Ply Technical Services 817-413-0103.

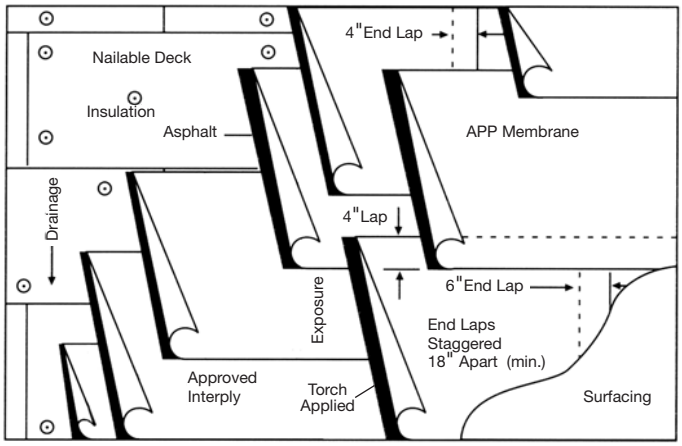
FIFTEEN YEAR GUARANTEE SPECIFICATIONS

Specification	*Base Sheet*	*Interply*	*Membrane*
I-3B-TCS-DW4M	Approved	TCS	DuraWeld 4M
I-3B-TCS-DW4MFR	Approved	TCS	DuraWeld 4MFR

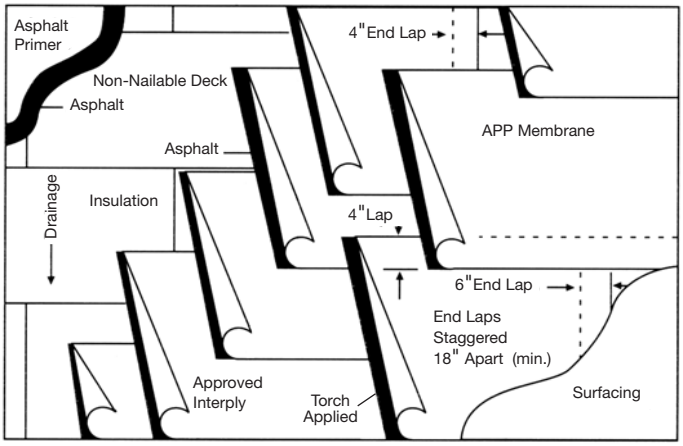
TWENTY YEAR GUARANTEE SPECIFICATIONS

Specification	*Base Sheet*	*Interply*	*Membrane*
I-3B-DW4S-DW4M	Approved	DW4S	DuraWeld 4M
I-3B-DW4S-DW4MFR	Approved	DW4S	DuraWeld 4MFR

SECTION 6 – DURAWELD® APP Torch Applied Specifications



THREE (3) PLY APP SYSTEM
NAILABLE DECK/INSULATION *Figure 1*



THREE (3) PLY APP SYSTEM
NON-NAILABLE DECK/INSULATION *Figure 2*

GENERAL
Safety: Refer to Section 4, Part 14. DO NOT BEGIN INSTALLATION UNTIL THIS INFORMATION IS READ, UNDERSTOOD AND IMPLEMENTED.

MATERIALS
Material Requirements:

Approved Insulation
Asphalt ..... 25 lb (1.2 kg/m²) per ply
Interply Membrane[1] ..... 2 plies
DuraWeld® APP Membrane[2] 1ply
Surfacing[3] ..... (if applicable)

[1] Asphalt Applied Interply: USP® Type 4, USP® Type 6
[2] DuraWeld® 4S (surfacing required), DuraWeld® 4M, DuraWeld® 4MFR
[3] U.S. Ply approved surfacing

APPLICATION
Refer to Section 4 – General Requirements, and Section 5 - Installation Requirements.

Note: Polyisocyanurate insulation boards require a minimum ¼" overlay of SecuRock or ½" wood fiber insulation prior to mopping base.

Insulation Installation Over Nailable Decks (see Figure 1): Mechanically fasten insulation to the deck with the joints staggered in one direction. Refer to Section 5, Parts 8 – Fastening, 11 – Insulation Installation, and 12 – Membrane System Installation.

Insulation Installation Over Non-Nailable Decks (see Figure 2): Prime the deck with ASTM D 41 asphalt primer applied at the rate of 1 gal/square (0.4 L/m²) minimum. Hold primer back 6" (15 cm) from concrete deck joints. Install insulation over the deck, in a uniform mopping of hot and fluid asphalt applied at the rate of 25 – 30 lb/square (1.2 – 1.5 kg/m²). Install insulation with the joints staggered in one direction, refer to Section 5, Part 11, Item 11.03 – Non-Nailable Substrates.

Interply: Install starter strips of 18"(45.7 cm) and 36" (91.4 cm) widths and follow with a second full 36"(91.4 cm) width sheet with a maximum of 17" (43.2 cm) exposure, applied shingle fashion. Lap felts 19" (48.3 cm) with a 17" (43.2 cm) exposure and lap 4" (10 cm) at ends. Stagger adjacent end laps a minimum of 18" (45.7 cm) Install the felts in full and uniform moppings of hot and fluid hot asphalt applied at the rate of 25 lb/square (1.2 kg/m²) per ply. Refer to Section 5, Part 12, Item 12.04 – Asphalt Mopping Base/Interply Sheets.

DuraWeld® APP Membrane: Heat weld DuraWeld® APP membrane over the top ply sheet. Lap membrane 3" (7.5 cm) on side laps, 6" (15 cm) on end laps. Refer to Section 5, Part 12, Item 12.08 – DuraWeld® APP Membrane Application.

Flashing and Accessories: Refer to Section 5, Part 13 – Flashing and Section 12 DuraWeld® Construction Details

Surfacing: Refer to Section 5, Part 14 – Surfacing.

For additional information on this specification, guarantee requirements, etc, contact U.S. Ply Technical Services 817-413-0103.

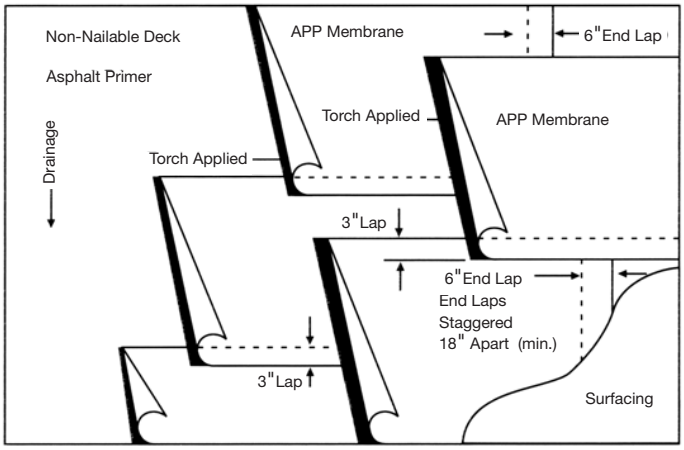
TEN AND TWELVE YEAR GUARANTEE SPECIFICATIONS

Specification	*Interply*	*Membrane*
I-3T4-DW4S-C*	(2) Type 4	DuraWeld 4S

FIFTEEN YEAR GUARANTEE SPECIFICATIONS

Specification	*Interply*	*Membrane*
I-3T4-DW4M	(2) Type 4	DuraWeld 4M
I-3T4-DW4MFR	(2) Type 4	DuraWeld 4MFR
I-3T6-DW4M	(2) Type 6	DuraWeld 4M
I-3T6-DW4MFR	(2) Type 6	DuraWeld 4MFR

*Must be surfaced with approved protective surfacing



TWO (2) PLY APP SYSTEM
NON-NAILABLE DECK

Figure 1

GENERAL

Safety: Refer to Section 4, Part 14. DO NOT BEGIN INSTALLATION UNTIL THIS INFORMATION IS READ, UNDERSTOOD AND IMPLEMENTED.

MATERIALS

Material Requirements:

Base Sheet[1] ..... 1 ply
DuraWeld® APP Membrane[2] ..... 1 ply
Surfacing[3] ..... (if applicable)

[1] Torch Applied APP Base: USP® TuffCap 190S APP, DuraWeld® 4S
[2] DuraWeld® 4S (surfacing required), DuraWeld® 4M, DuraWeld® 4MFR
[3] U.S. Ply approved surfacing

APPLICATION

Refer to Section 4 – General Requirements, and Section 5 - Installation Requirements.

Deck Preparation: Prime the deck with ASTM D 41 asphalt primer applied at the rate of 1 gal/square (0.4 L/m²) minimum. Hold primer back 6" (15 cm) from concrete deck joints.

Base Sheet – Torch Applied Membrane: Heat weld DuraWeld® APP membrane over the primed deck. Lap membrane 3" (7.5 cm) on side laps, 6" (15 cm) on end laps. Refer to Section 5, Part 11, Item 12.07 – DuraWeld® APP Membrane Application.

DuraWeld® Membrane: Heat weld DuraWeld® APP membrane over the APP base membrane. Lap membrane 3" (7.5 cm) on side laps, 6" (15 cm) on end laps. Refer to Section 5, Part 11, Item 12.08 – DuraWeld® APP Membrane Application.

Flashing and Accessories: Refer to Section 5, Part 13 – Flashing and Section 12 DuraWeld® Construction Details

Surfacing: Refer to Section 5, Part 14 – Surfacing.

For additional information on this specification, guarantee requirements, etc. contact U.S. Ply Technical Services 817-413-0103.

TEN AND TWELVE YEAR GUARANTEE SPECIFICATIONS

Specification	*Base Sheet*	*Membrane*
NN-2-TCS/DW4S-C*	TCS	DuraWeld 4S

FIFTEEN YEAR GUARANTEE SPECIFICATIONS

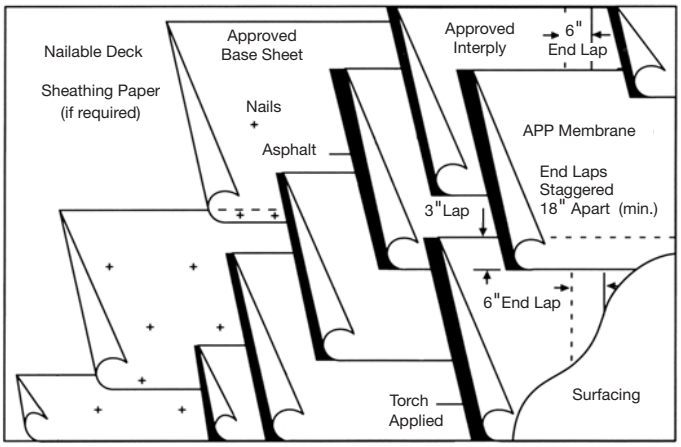
Specification	*Base Sheet*	*Membrane*
NN-2-TCS/DW4M	TCS	DuraWeld 4M
NN-2-TCS/DW4MFR	TCS	DuraWeld 4MFR

TWENTY YEAR GUARANTEE SPECIFICATIONS

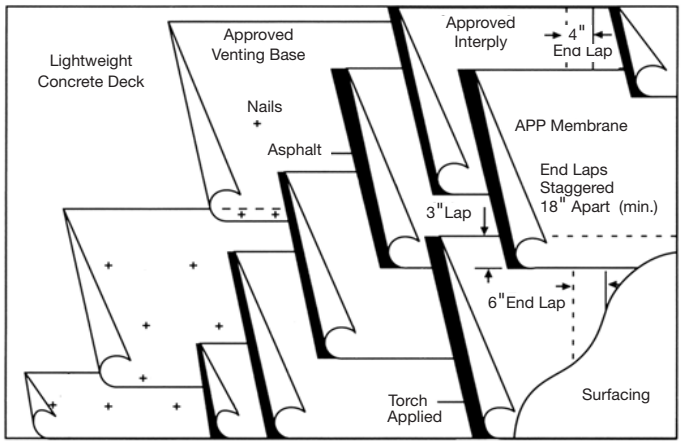
Specification	*Base Sheet*	*Membrane*
NN-2-DW4S/DW4M	DW4S	DuraWeld 4M
NN-2-DW4S/DW4MFR	DW4S	DuraWeld 4MFR

* Must be surfaced with approved protective coating

SECTION 6 – DURAWELD® APP Torch Applied Specifications



FOUR (4) PLY APP SYSTEM NAILABLE DECK *Figure 1*



FOUR (4) PLY APP SYSTEM NON-NAILABLE DECK *Figure 2*

GENERAL
Safety: Refer to Section 4, Part 14. DO NOT BEGIN INSTALLATION UNTIL THIS INFORMATION IS READ, UNDERSTOOD AND IMPLEMENTED.

MATERIALS
Material Requirements:

Roofing Asphalt ..... 25 lb (1.2 kg/m²) per ply
Base Sheet[1]..... 1 ply
Interply Membrane[2] ..... 2 plies
DuraWeld® APP Membrane[3]..... 1ply
Surfacing[4]..... (if applicable)

[1] USP® Base, USP® NVB (Nailable Venting Base) or other U.S. Ply approved base sheets
[2]Asphalt Applied Interply: USP® Type 4, USP® Type 6
[3]DuraWeld® 4S (surfacing required), DuraWeld® 4M, DuraWeld® 4MFR
[4] U.S. Ply approved surfacing.

APPLICATION
Refer to Section 4 – General Requirements, and Section 5 - Installation Requirements.

Base Sheet: Mechanically fastened one ply of base sheet over the deck. Lap the base sheet a minimum of 2" (5 cm) on the side laps and 4" (10 cm) on the end laps. Refer to Section 5, Part 8 and Part 12, Item 12.03 - Base Sheets, Mechanically Fastened.

Note: USP® Base may be used as a base sheet over newly poured lightweight and gypsum decks under certain conditions. Contact the U.S. Ply Technical Services Department 817-413-0103. for prior approval.

Interply: Install starter strips of 18"(45.7 cm) and 36" (91.4 cm) widths and follow with a second full 36"(91.4 cm) width sheet with a maximum of 17" (43.2 cm) exposure, applied shingle fashion. Lap felts 19" (48.3 cm) with a 17" (43.2 cm) exposure and lap 4" (10 cm) at ends. Stagger adjacent end laps a minimum of 18" (45.7 cm) Install the felts in full and uniform moppings of hot and fluid hot asphalt applied at the rate of 25 lb/square (1.2 kg/m²) per ply. Refer to Section 5, Part 12, Item 12.04 – Asphalt Mopping Base/Interply Sheets.

DuraWeld® Membrane: Heat weld DuraWeld® APP membrane over the top ply sheet. Lap membrane 3" (7.5 cm) on side laps, 6" (15 cm) on end laps. Refer to Section 5, Part 12, Item 12.08 – DuraWeld® APP Membrane Application.

Flashing and Accessories: Refer to Section 5, Part 13 – Flashing and Section 12 DuraWeld® Construction Details

Surfacing: Refer to Section 5, Part 14 – Surfacing.

For additional information on this specification, guarantee requirements, etc. contact U.S. Ply Technical Services 817-413-0103.

TEN AND TWELVE YEAR GUARANTEE SPECIFICATIONS

Specification	*Base Sheet*	*Interply*	*Membrane*
N-4BT4-DW4S-C*	Approved	(2) Type 4	DuraWeld 4S
LWC-4VT4-DW4S-C*	NVB	(2) Type 4	DuraWeld 4S

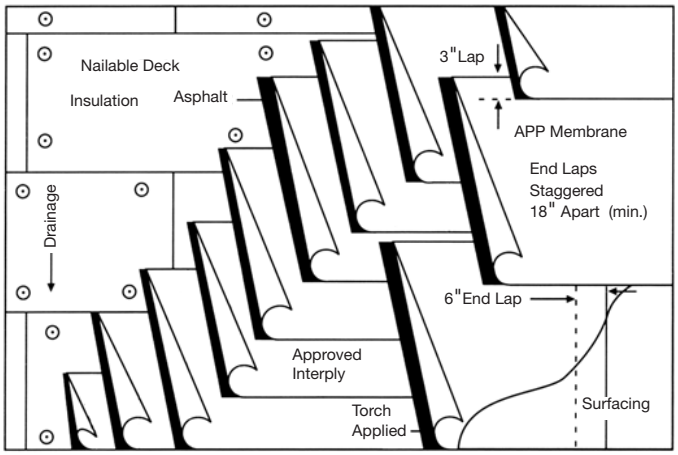
FIFTEEN YEAR GUARANTEE SPECIFICATIONS

Specification	*Base Sheet*	*Interply*	*Membrane*
N-4BT4-DW4M	Approved	(2) Type 4	DuraWeld 4M
N-4BT4-DW4MFR	Approved	(2) Type 4	DuraWeld 4MFR
LWC-4VT4-DW4M	NVB	(2) Type 4	DuraWeld 4M
LWC-4VT4-DW4MFR	NVB	(2) Type 4	DuraWeld 4MFR

TWENTY YEAR GUARANTEE SPECIFICATIONS

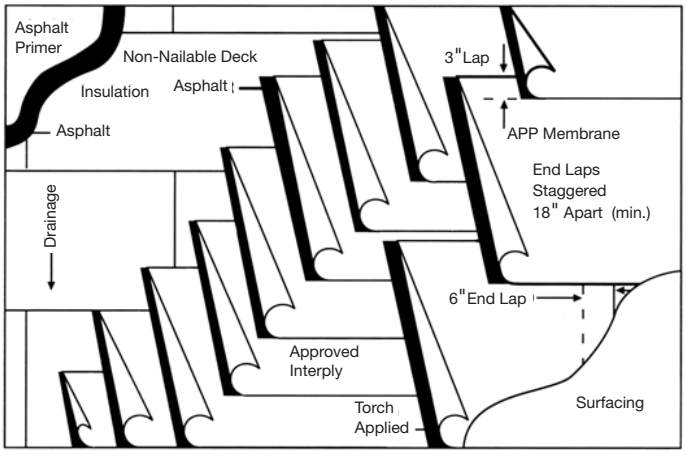
Specification	*Base Sheet*	*Interply*	*Membrane*
N-4BT6-DW4M	Approved	(2) Type 6	DuraWeld 4M
N-4BT6-DW4MFR	Approved	(2) Type 6	DuraWeld 4MFR
LWC-4VT6-DW4M	NVB	(2) Type 6	DuraWeld 4M
LWC-4VT6-DW4MFR	NVB	(2) Type 6	DuraWeld 4MFR

* Must be surfaced with approved protective coating



FOUR (4) PLY APP SYSTEM
NAILABLE DECK/INSULATION

Figure 1



FOUR (4) PLY APP SYSTEM
NON-NAILABLE DECK/INSULATION

Figure 2

GENERAL
Safety: Refer to Section 4, Part 14. DO NOT BEGIN INSTALLATION UNTIL THIS INFORMATION IS READ, UNDERSTOOD AND IMPLEMENTED.

MATERIALS

Material Requirements:

Approved Insulation
Roofing Asphalt ..... 25lb (1.2 kg/m²) per ply
Interply Membrane[1] ..... 3 plies
DuraWeld® APP Membrane[2]..... 1ply
Surfacing[3] ..... (if applicable)

[1] Asphalt Applied Interply: USP® Type 4, USP® Type 6
[2] DuraWeld® 4S (surfacing required), DuraWeld® 4M, DuraWeld® 4MFR
[3] U.S. Ply approved surfacing

APPLICATION
Refer to Section 4 – General Requirements, and Section 5 - Installation Requirements.

Note: Polyisocyanurate insulation boards require a minimum ¼" overlay of SecuRock or ½" wood fiber insulation prior to mopping base.

Insulation Installation Over Nailable Decks (see Figure 1): Mechanically fasten insulation to the deck with the joints staggered in one direction. Refer to Section 5, Parts 8 – Fastening, 11 – Insulation Installation, and 12 – Membrane System Installation.

Insulation Installation Over Non-Nailable Decks (see Figure 2): Prime the deck with ASTM D 41 asphalt primer applied at the rate of 1 gal/square (0.4 L/m²) minimum. Hold primer back 6" (15 cm) from concrete deck joints. Install insulation over the deck, in a uniform mopping of hot and fluid asphalt applied at the rate of 25 – 30 lb/square (1.2 – 1.5 kg/m²). Install insulation with the joints staggered in one direction, refer to Section 5, Part 11, Item 11.03 – Non-Nailable Substrates.

Interply: Install starter strips of 12" (30.5 cm), 24" (61 cm) and 36" (91.4 cm) widths and follow with a second full 36" (91.4 cm) width sheet with a maximum of 11-1/3" (28.8 cm) exposure, applied shingle fashion. Lap felts 24-2/3" (62.7 cm) with a 11-1/3" (28.8 cm) exposure and lap 4" (10 cm) at ends. Stagger adjacent end laps a minimum of 18" (45.7 cm). Install the felts in full and uniform moppings of hot and fluid hot asphalt applied at the rate of 25 lb/square (1.2 kg/m²) per ply. Refer to Section 5, Part 12, Item 12.04 – Asphalt Mopping Base/ Interply Sheets.

DuraWeld® APP Membrane: Heat weld DuraWeld® APP membrane over the top ply sheet. Lap membrane 3" (7.5 cm) on side laps, 6" (15 cm) on end laps. Refer to Section 5, Part 12, Item 12.08 – DuraWeld® APP Membrane Application.

Flashing and Accessories: Refer to Section 5, Part 13 – Flashing and Section 12 DuraWeld® Construction Details

Surfacing: Refer to Section 5, Part 14 – Surfacing.

For additional information on this specification, guarantee requirements, etc., contact U.S. Ply, Inc. Technical Services 817-413-0103.

TEN AND TWELVE YEAR GUARANTEE SPECIFICATIONS

Specification	*Interply*	*Membrane*
I-4T4-DW4S-C*	(3) Type 4	DuraWeld 4S

FIFTEEN YEAR GUARANTEE SPECIFICATIONS

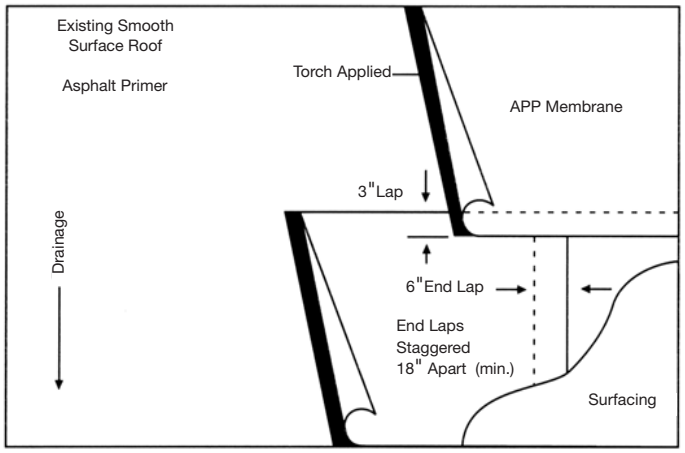
Specification	*Interply*	*Membrane*
I-4T4-DW4M	(3) Type 4	DuraWeld 4M
I-4T4-DW4MFR	(3) Type 4	DuraWeld MFR

TWENTY YEAR GUARANTEE SPECIFICATIONS

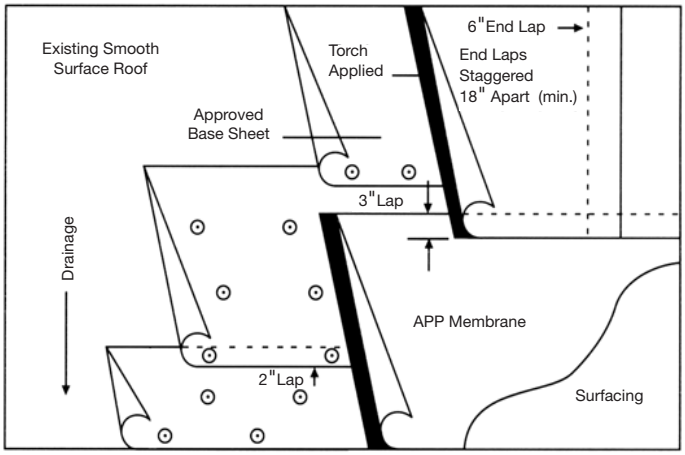
Specification	*Interply*	*Membrane*
I-4T6-DW4M	(3) Type 6	DuraWeld 4M
I-4T6-DW4MFR	(3) Type 6	DuraWeld 4MFR

* Must be surfaced with approved protective coating

SECTION 6 – DURAWELD® APP Torch Applied Specifications



ONE (1) PLY APP SYSTEM
EXISTING SMOOTH SURFACE ROOF *Figure 1*



TWO (2) PLY APP SYSTEM
EXISTING SMOOTH SURFACE ROOF *Figure 2*

GENERAL
Safety: Refer to Section 4, Part 14. DO NOT BEGIN INSTALLATION UNTIL THIS INFORMATION IS READ, UNDERSTOOD AND IMPLEMENTED.

MATERIALS
Material Requirements:

Base Sheet[1] (if required) ..... 1 ply
DuraWeld® APP Membrane[2] ..... 1 ply
Surfacing[3] ..... (if applicable)

[1] USP® Base, USP® NVB (Nailable Venting Base) or other U.S. Ply approved base sheets
[2] DuraWeld® 4S (surfacing required), DuraWeld® 4M, DuraWeld® 4MFR
[3] U.S. Ply approved surfacing

APPLICATION
Refer to Section 4 – General Requirements, and Section 5 - Installation Requirements.

Existing Surface Preparation: Refer to Section 4, Part 9 – Recover and Reroofing; Section 5, Part 3 – Inspection and Preparation of Surfaces, and Part 8 – Fastening.

Prime the existing smooth surface asphalt roof with ASTM D 41 asphalt primer applied at the rate of 1 gal/square (0.4 L/m²) minimum.

NOTE: If the existing smooth surfaced asphalt roof does not present a suitable substrate for direct application of the DuraWeld® APP Membrane or its adequacy of attachment to the roof deck is in question, then mechanically fasten a base sheet over the existing roof system prior to installation of the DuraWeld® APP Membrane (see Figure 2):

Base Sheet (if used): Mechanically fasten one ply of base sheet over the existing roof to the deck. Lap sheets 2" (5 cm) on side laps and 4" (10 cm) on the end laps. Refer to Section 5, Part 8 and Part 12, Item 12.03 – Mechanical Attachment of Base Sheets.

DuraWeld® APP Membrane: Heat weld DuraWeld® APP membrane over the smooth surfaced asphalt roof or base sheet (if used). Lap membrane 3" (7.5 cm) on side laps, 6" (15 cm) on end laps. Refer to Section 5, Part 12, Item 12.08 – DuraWeld® APP Membrane Application.

Flashing and Accessories: Refer to Section 5, Part 13 – Flashing and Section 12 DuraWeld® Construction Details

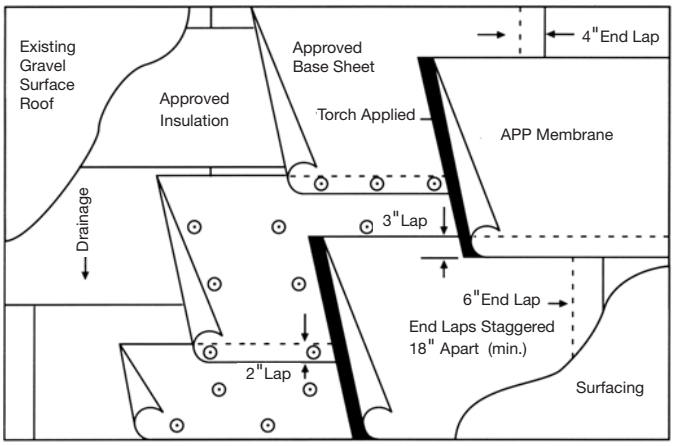
Surfacing: Refer to Section 5, Part 14 – Surfacing.

For additional information on this specification, guarantee requirements, etc. contact U.S. Ply Technical 817-413-0103.

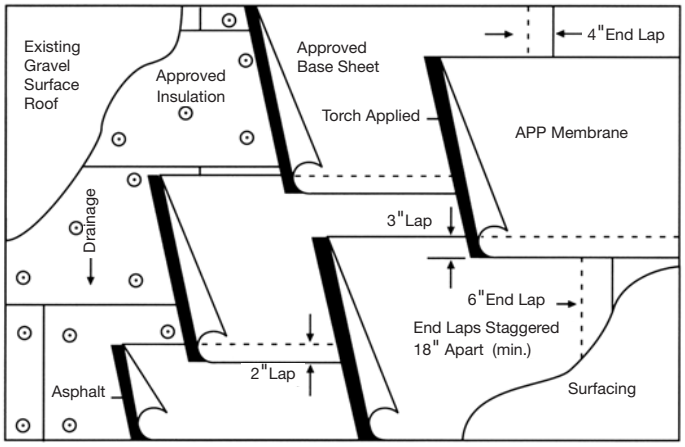
TEN AND TWELVE YEAR GUARANTEE SPECIFICATIONS

Specification	*Base Sheet (if used)*	*Membrane*
RS-1-DW4S-C*	None	DuraWeld 4S
RS-1-DW4M	None	DuraWeld 4M
RS-1-DW4MFR	None	DuraWeld 4MFR
RS-2B-DW4S-C*	Approved	DuraWeld 4S
RS-2B-DW4M	Approved	DuraWeld 4M
RS-2B-DW4MFR	Approved	DuraWeld 4MFR

* Must be surfaced with approved protective coating



TWO (2) PLY APP SYSTEM
EXISTING GRAVEL SURFACED ROOF *Figure 1*



TWO (2) PLY APP SYSTEM
EXISTING GRAVEL SURFACED ROOF *Figure 2*

GENERAL

Safety: Refer to Section 4, Part 14. DO NOT BEGIN INSTALLATION UNTIL THIS INFORMATION IS READ, UNDERSTOOD AND IMPLEMENTED.

MATERIALS

Material Requirements:

Approved Insulation
Base Sheet[1] (if required) ..... 1 ply
DuraWeld® APP Membrane[2] ..... 1 ply
Surfacing[3] ..... (if applicable)

[1] USP® Base, USP® NVB (Nailable Venting Base) or other U.S. Ply approved base sheets
[2] DuraWeld® 4S (surfacing required), DuraWeld® 4M, DuraWeld® 4MFR
[3] U.S. Ply approved surfacing

APPLICATION

Refer to Section 4 – General Requirements, and Section 5 - Installation Requirements.

Existing Gravel Roof Surface Preparation: Refer to Section 4, Part 9 – Recover and Reroofing; Section 5, Part 3 – Inspection and Preparation of Surfaces, and Part 8 – Fastening.

Insulation Over Existing Gravel Surface Roof (see Figure 1) see Base Sheet Option 1: Mechanically fasten insulation and base sheet simultaneously, through the properly prepared existing gravel surfaced roof to the deck with the joints staggered in one direction. **Option 2 (see Figure 2):** Mechanically fasten insulation through the existing gravel surfaced roof to the deck with the joints staggered in one direction. Refer to Section 5, Parts 8 – Fastening, 11 – Insulation Installation, and 12 – Membrane System Installation.

Base Sheet Option 1 (see Figure 1): Insulation and Base Sheet are fastened simultaneously. Mechanically fastened one ply of base sheet over the insulation, through the existing roof to the deck. Lap the base sheet a minimum of 2” (5 cm) on the side lap and 4” (cm) on ends. Screws and plates are then installed in three rows. The first row (on the seam) will be 1-1/2” (3.75 cm) from the leading edge and on 12” (30 cm) centers. Locate the second row of fasteners 12” (30 cm) from the leading edge and on 18” (45.7 cm) centers. The third row of fasteners shall be 24” (60 cm) from the leading edge on 18” (45.7 cm) centers. The centers for the second and third rows should be staggered. Refer to Section 5, Part 8 and Part 12, Item 12.03 - Base Sheets, Mechanically Fastened. **Base Sheet Option 2** (see Figure 2): Install base sheet, over insulation, in a uniform mopping of hot asphalt applied at the rate of 25 lb/square (1.2 kg/m²). Lap the sheets 2" (5 cm) on side laps and 4" (10 cm) on end laps. Refer to Section 5, Part 12, Item 12.04 – Asphalt Mopping Base/Interply Sheets.

DuraWeld® APP Membrane: Heat weld DuraWeld® APP membrane over the base sheet. Lap membrane 3" (7.5 cm) on side laps, 6" (15 cm) on end laps. Refer to Section 5, Part 12, Item 12.08 – DuraWeld® APP Membrane Application.

Flashing and Accessories: Refer to Section 5, Part 13 – Flashing and Section 12 DuraWeld® Construction Details

Surfacing: Refer to Section 5, Part 14 – Surfacing.

*For additional information on this specification, guarantee requirements, etc, contact U.S. Ply Technical Services **817-413-0103.***

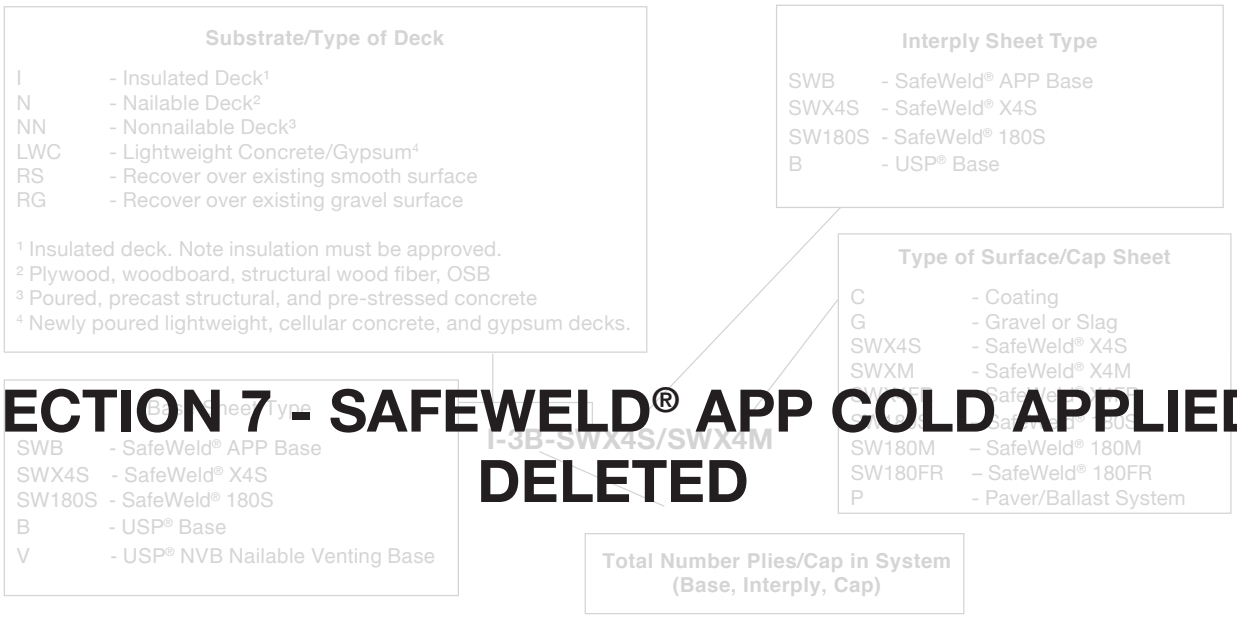
TEN AND TWELVE YEAR GUARANTEE SPECIFICATION

Specification	*Base Sheet*	*Membrane*
RG-I-2B-DW4S-C*	Approved	DuraWeld 4S
RG-I-2B-DW4M	Approved	DuraWeld 4M
RG-I-2B-DW4MFR	Approved	DuraWeld MFR

* Must be surfaced with approved protective coating

SECTION 7 – SAFEWELD® APP Cold Applied Specifications

Part 1 – SAFEWELD® APP Cold Applied Key to Specification Numbers



SECTION 7 - SAFEWELD® APP COLD APPLIED DELETED

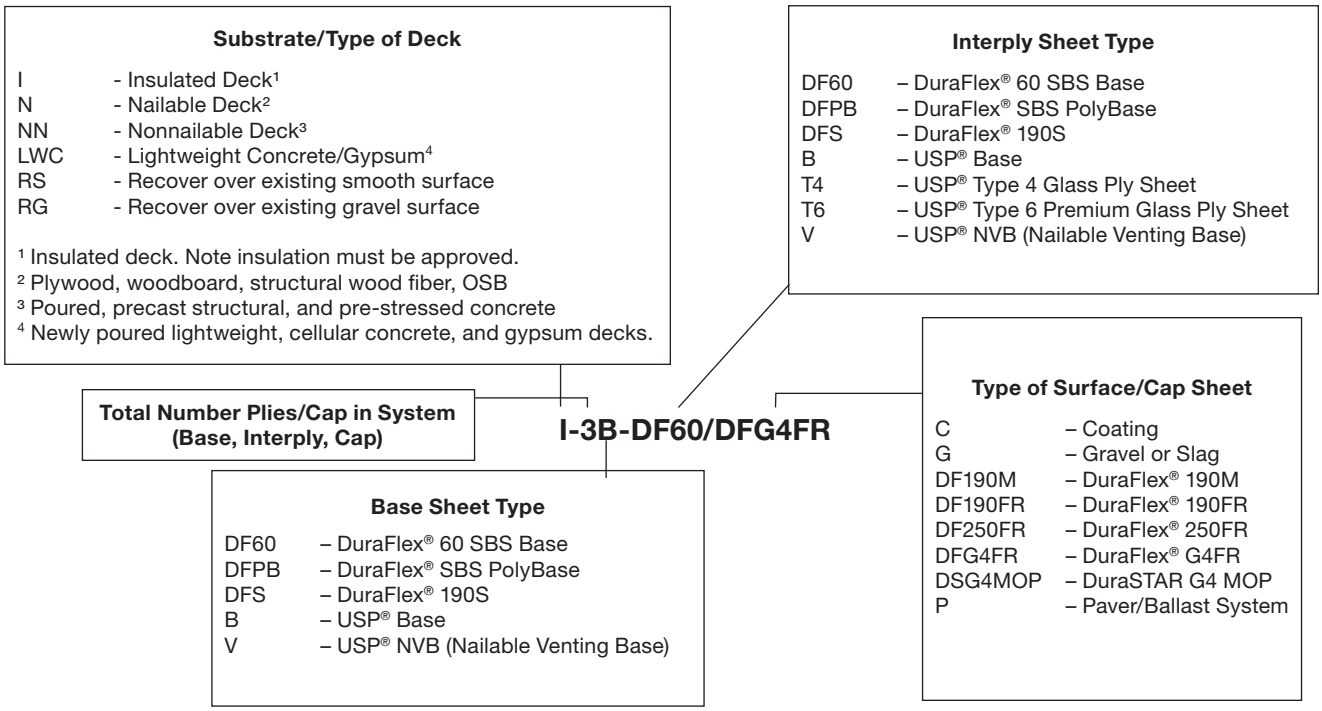
Part 2 – SAFEWELD® APP Cold Applied Specification Index

2.01 – SAFEWELD® APP Cold Applied Ten and Twelve Year Guarantee Specifications

2.02 – SAFEWELD® APP Cold Applied Fifteen Year Guarantee Specifications

SECTION 8 – DURAFLEX® SBS Mop Applied Specifications

Part 1 – DURAFLEX® SBS Mop Applied Key to Specification Numbers



Part 2 – DURAFLEX® SBS Mop Applied Specification Index

2.01 – DURAFLEX® SBS Mop Applied Ten Year Guarantee Specifications

DECK/ SUBSTRATE TYPE	*TOTAL NUMBER OF PLIES/CAP IN SYSTEM*	*SPECIFICATION NUMBER*	*SPECIFICATION CONFIGURATION*	*PAGE NUMBER*
NAILABLE	2	I-2B-DFG4FR	BASE • DURAFLEX G4FR	75
LIGHTWEIGHT, CELLULAR OR GYPSUM	2	LWC-2V-DFG4FR	NVB • DURAFLEX G4FR	75
INSULATION	2	I-2B-DFG4FR	BASE • DURAFLEX G4FR	76

2.02 – DURAFLEX® SBS Mop Applied Twelve Year Guarantee Specifications

DECK/ SUBSTRATE TYPE	*TOTAL NUMBER OF PLIES/CAP IN SYSTEM*	*SPECIFICATION NUMBER*	*SPECIFICATION CONFIGURATION*	*PAGE NUMBER*
NAILABLE	2	N-2B-DF190M	BASE • DURAFLEX 190M	75
	2	N-2B-DF190FR	BASE • DURAFLEX 190FR	75
	2	N-2B-DF250FR	BASE • DURAFLEX 250FR	75
LIGHTWEIGHT, CELLULAR, OR GYPSUM	2	LWC-2V-DF190M	NVB • DURAFLEX 190M	75
	2	LWC-2V-DF190FR	NVB • DURAFLEX 190FR	75
	2	LWC-2V-DF250FR	NVB • DURAFLEX 250FR	75
INSULATION	2	I-2B-DF190M	BASE • DURAFLEX 190M	76
	2	I-2B-DF190FR	BASE • DURAFLEX 190FR	76
	2	I-2B-DF250FR	BASE • DURAFLEX 250FR	76

* Must be surfaced with approved protective coating
** Must be surfaced with flood coat of asphalt and gravel

2.03 – DURAFLEX® SBS Mop Applied Fifteen Year Guarantee Specifications

DECK/SUBSTRATE TYPE	*TOTAL NUMBER OF PLIES/CAP IN SYSTEM*	*SPECIFICATION NUMBER*	*SPECIFICATION CONFIGURATION*	*PAGE NUMBER*
NAILABLE	3	N-3B-DF60-DF190M	BASE • DURAFLEX 60 • DURAFLEX 190M	79
	3	N-3B-DF60-DF190FR	BASE • DURAFLEX 60 • DURAFLEX 190FR	79
	3	N-3B-DF60-DF250FR	BASE • DURAFLEX 60 • DURAFLEX 250FR	79
	3	N-3B-DF60-DFG4FR	BASE • DURAFLEX 60 • DURAFLEX G4FR	79
	3	N-3B-DF60-DSG4MOP	BASE • DURAFLEX 60 • DURASTAR G4 MOP	79
	3	N-3B-DFPB-DF190M	BASE • DURAFLEX POLYBASE • DURAFLEX 190M	79
	3	N-3B-DFPB-DF190FR	BASE • DURAFLEX POLYBASE • DURAFLEX 190FR	79
	3	N-3B-DFPB-DF250FR	BASE • DURAFLEX POLYBASE • DURAFLEX 250FR	79
	3	N-3B-DFPB-DFG4FR	BASE • DURAFLEX POLYBASE • DURAFLEX G4FR	79
	4	N-4BT4-DF190M	BASE • (2) TYPE 4 • DURAFLEX 190M	85
	4	N-4BT4-DF190FR	BASE • (2) TYPE 4 • DURAFLEX 190FR	85
	4	N-4BT4-DF250FR	BASE • (2) TYPE 4 • DURAFLEX 250FR	85
	4	N-4BT4-DFG4FR	BASE • (2) TYPE 4 • DURAFLEX G4FR	85

* Must be surfaced with approved protective coating
** Must be surfaced with flood coat of asphalt and gravel

LIGHTWEIGHT, CELLULAR, OR GYPSUM	3	LWC-3V-DF60-DF190M	NVB • DURAFLEX 60 • DURAFLEX 190M	81
	3	LWC-3V-DF60-DF190FR	NVB • DURAFLEX 60 • DURAFLEX 190FR	81
	3	LWC-3V-DF60-DF250FR	NVB • DURAFLEX 60 • DURAFLEX 250FR	81
	3	LWC-3V-DF60-DFG4FR	NVB • DURAFLEX 60 • DURAFLEX G4FR	81
	3	LWC-3V-DF60-DSG4MOP	NVB • DURAFLEX 60 • DURASTAR G4 MOP	81
	3	LWC-3V-DFPB-DF190M	NVB • DURAFLEX POLYBASE • DURAFLEX 190M	81
	3	LWC-3V-DFPB-DF190FR	NVB • DURAFLEX POLYBASE • DURAFLEX 190FR	81
	4	LWC-4VT4-DF190M	NVB • (2) TYPE 4 • DURAFLEX 190M	85
	4	LWC-4VT4-DF190FR	NVB • (2) TYPE 4 • DURAFLEX 190FR	85
	4	LWC-4VT4-DF250FR	NVB • (2) TYPE 4 • DURAFLEX 250FR	85
	4	LWC-4VT4-DFG4FR	NVB • (2) TYPE 4 • DURAFLEX G4FR	85

INSULATION	2	I-2-DF60-DF190M	DURAFLEX 60 • DURAFLEX 190M	85
	2	I-2-DF60-DF190FR	DURAFLEX 60 • DURAFLEX 190FR	85
	2	I-2-DFPB-DF250FR	DURAFLEX POLYBASE • DURAFLEX 250FR	85
	2	I-2-DFPB-DFG4FR	DURAFLEX POLYBASE • DURAFLEX G4FR	85
	2	I-2-DF60-DSG4MOP	DURAFLEX 60 • DURASTAR G4 MOP	85
	2	I-2-DFPB-DF190M	DURAFLEX POLYBASE • DURAFLEX 190M	85
	2	I-2-DFPB-DF190FR	DURAFLEX POLYBASE • DURAFLEX 190FR	85
	2	I-2-DFPB-DF250FR	DURAFLEX POLYBASE • DURAFLEX 250FR	85
	2	I-2-DFPB-DFG4FR	DURAFLEX POLYBASE • DURAFLEX G4FR	85
	3	I-3T4-DF190M	(2) TYPE 4 • DURAFLEX 190M	84
	3	I-3T4-DF190FR	(2) TYPE 4 • DURAFLEX 190FR	84
	3	I-3T4-DF250FR	(2) TYPE 4 • DURAFLEX 250FR	84
	3	I-3T4-DFG4FR	(2) TYPE 4 • DURAFLEX G4FR	84

* Must be surfaced with approved protective coating
** Must be surfaced with flood coat of asphalt and gravel

2.04 – DURAFLEX® SBS Twenty Year Mop Applied Guarantee Specifications

DECK/SUBSTRATE TYPE	*TOTAL NUMBER OF PLIES/CAP IN SYSTEM*	*SPECIFICATION NUMBER*	*SPECIFICATION CONFIGURATION*	*PAGE NUMBER*
NAILABLE				
	3	N-3B-DFS-DF190M	BASE • DURAFLEX 190S • DURAFLEX 190M	80
	3	N-3B-DFS-DF190FR	BASE • DURAFLEX 190S • DURAFLEX 190FR	80
	3	N-3B-DFS-DF250FR	BASE • DURAFLEX 190S • DURAFLEX 250FR	80
	4	N-4B-T6-DF190M	BASE • (2) TYPE 6 • DURAFLEX 190M	85
	4	N-4B-T6-DF190FR	BASE • (2) TYPE 6 • DURAFLEX 190FR	85
	4	N-4B-T6-DF250FR	BASE • (2) TYPE 6 • DURAFLEX 250FR	85
	4	N-4B-T6-DFG4FR	BASE • (2) TYPE 6 • DURAFLEX G4FR	85
	4	N-4B-T6-DSG4MOP	BASE • (2) TYPE 6 • DURASTAR G4MOP	85
	5	N-5B-T6-DF190M	BASE • (3) TYPE 6 • DURAFLEX 190M	88
	5	N-5B-T6-DF190FR	BASE • (3) TYPE 6 • DURAFLEX 190FR	88
	5	N-5B-T6-DF250FR	BASE • (3) TYPE 6 • DURAFLEX 250FR	88
	5	N-5B-T6-DFG4FR	BASE • (3) TYPE 6 • DURAFLEX G4FR	88
	5	N-5B-T6-DSG4MOP	BASE • (3) TYPE 6 • DURASTAR G4MOP	88
LIGHTWEIGHT, CELLULAR, OR GYPSUM	3	LWC-3V-DFS-DF190M	NVB • DURAFLEX 190S • DURAFLEX 190M	82
	3	LWC-3V-DFS-DF190FR	NVB • DURAFLEX 190S • DURAFLEX 190FR	82
	3	LWC-3V-DFS-DF250FR	NVB • DURAFLEX 190S • DURAFLEX 250FR	82
	4	LWC-4VT6-DF190M	NVB • (2) TYPE 6 • DURAFLEX 190M	86
	4	LWC-4VT6-DF190FR	NVB • (2) TYPE 6 • DURAFLEX 190FR	86
	4	LWC-4VT6-DF250FR	NVB • (2) TYPE 6 • DURAFLEX 250FR	86
	4	LWC-4VT6-DFG4FR	NVB • (2) TYPE 6 • DURAFLEX G4FR	86
	4	LWC-4BT6-DSG4MOP	NVB • (2) TYPE 6 • DURASTAR G4MOP	86
	5	LWC-5VT6-DF190M	NVB • (3) TYPE 6 • DURAFLEX 190M	88
	5	LWC-5VT6-DF190FR	NVB • (3) TYPE 6 • DURAFLEX 190FR	88
	5	LWC-5VT6-DF250FR	NVB • (3) TYPE 6 • DURAFLEX 250FR	88
	5	LWC-5VT6-DFG4FR	NVB • (3) TYPE 6 • DURAFLEX G4FR	88
	5	LWC-5BT6-DSG4MOP	NVB • (3) TYPE 6 • DURASTAR G4MOP	88
INSULATION				
	2	I-2-DFS-DF190M	DURAFLEX 190S • DURAFLEX 190M	78
	2	I-2-DFS-DF190FR	DURAFLEX 190S • DURAFLEX 190FR	78
	2	I-2-DFS-DF250FR	DURAFLEX 190S • DURAFLEX 250FR	78
	3	I-3-DF60-DF190M	(2) DURAFLEX 60 • DURAFLEX 190M	83
	3	I-3-DF60-DF190FR	(2) DURAFLEX 60 • DURAFLEX 190FR	83
	3	I-3-DF60-DF250FR	(2) DURAFLEX 60 • DURAFLEX 250FR	83
	3	I-3-DF60-DFG4FR	(2) DURAFLEX 60 • DURAFLEX G4FR	83
	3	I-3-DF60-DSG4MOP	(2) DURAFLEX 60 • DURASTAR G4MOP	83
	3	I-3-DFPB-DF190M	(2) DURAFLEX POLYBASE • DURAFLEX 190M	83
	3	I-3-DFPB-DF190FR	(2) DURAFLEX POLYBASE • DURAFLEX 190FR	83
	3	I-3-DFPB-DF250FR	(2) DURAFLEX POLYBASE • DURAFLEX 250FR	83
	3	I-3-DFPB-DFG4FR	(2) DURAFLEX POLYBASE • DURAFLEX G4FR	83
	4	I-4T6-DF190M	(3) TYPE 6 • DURAFLEX 190M	87
	4	I-4T6-DF190FR	(3) TYPE 6 • DURAFLEX 190FR	87
	4	I-4T6-DF250FR	(3) TYPE 6 • DURAFLEX 250FR	87
	4	I-4T6-DFG4FR	(3) TYPE 6 • DURAFLEX G4FR	87
	4	I-4T6-DSG4MOP	(3) TYPE 6 • DURASTAR G4MOP	87

* Must be surfaced with approved protective coating

** Must be surfaced with flood coat of asphalt and gravel

SECTION 8 – DURAFLEX® SBS MOP/COLD APPLIED SPECIFICATIONS

Part 3 – DURAFLEX® SBS Mop Applied/Recover Specification Index

3.01 – DURAFLEX® SBS Ten Year Guarantee Mop Applied/Recover Specifications

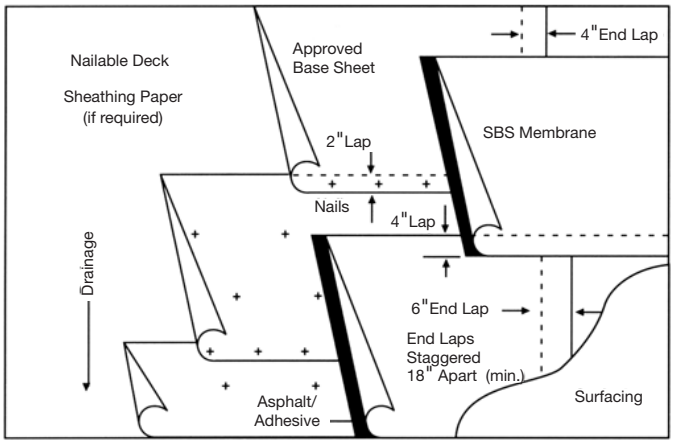
DECK/SUBSTRATE TYPE	*TOTAL NUMBER OF PLIES/CAP IN SYSTEM*	*SPECIFICATION NUMBER*	*SPECIFICATION CONFIGURATION*	*PAGE NUMBER*
RECOVER EXISTING SMOOTH SURFACE ROOF	2	RS-2B-DFG4FR	BASE • DURAFLEXG4FR	89
RECOVER EXISTING GRAVEL SURFACE ROOF	2	RG-I-2B-DFG4FR	INSULATION • BASE • DURAFLEX G4FR	90

* Must be surfaced with approved protective coating
** Must be surfaced with flood coat of asphalt and gravel

3.02 – DURAFLEX® SBS Twelve Year Guarantee Mop Applied/Recover Specifications

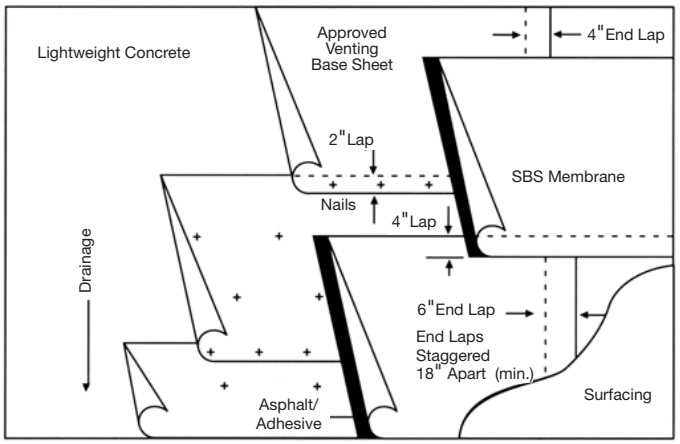
DECK/SUBSTRATE TYPE	*TOTAL NUMBER OF PLIES/CAP IN SYSTEM*	*SPECIFICATION NUMBER*	*SPECIFICATION CONFIGURATION*	*PAGE NUMBER*
RECOVER EXISTING SMOOTH SURFACE ROOF	2	RS-2B-DF190M	BASE • DURAFLEX 190M	89
	2	RS-2B-DF190FR	BASE • DURAFLEX 190FR	89
	2	RS-2B-DF250FR	BASE • DURAFLEX 250FR	89
RECOVER EXISTING GRAVEL SURFACE ROOF	2	RG-I-2B-DF190M	INSULATION • BASE • DURAFLEX 190M	90
	2	RG-I-2B-DF190FR	INSULATION • BASE • DURAFLEX 190FR	90
	2	RG-I-2B-DF250FR	INSULATION • BASE • DURAFLEX 250FR	90

* Must be surfaced with approved protective coating
** Must be surfaced with flood coat of asphalt and gravel



TWO (2) PLY SBS SYSTEM
NAILABLE DECK

Figure 1



TWO (2) PLY SBS SYSTEM
LIGHTWEIGHT CONCRETE DECK

Figure 2

GENERAL

Safety: Refer to Section 4, Part 14. DO NOT BEGIN INSTALLATION UNTIL THIS INFORMATION IS READ, UNDERSTOOD AND IMPLEMENTED.

MATERIALS

Material Requirements:

Asphalt or Cold Adhesive ..... (if applicable)
Base Sheet[1] ..... 1 ply
DuraFlex® SBS Membrane[2] ..... 1 ply

[1] USP® Base or USP® NVB (Nailable Venting Base) or other U.S. Ply approved base sheets.

[2] DuraFlex® 190M, DuraFlex® 190FR, DuraFlex® 250FR, or DuraFlex® G4FR

APPLICATION

Refer to Section 4 - General Requirements, and Section 5 - Installation Requirements.

Base Sheet: Mechanically fasten one ply of base sheet over the deck. Lap sheets 2" (5 cm) on side laps and 4" (10 cm) on the end laps. Refer to Section 5, Part 8 and Part 12, Item 12.03 – Mechanical Attachment of Base Sheets.

Note: USP® Base may be used as a base sheet over newly poured lightweight and gypsum decks under certain conditions. Contact the U.S. Ply Technical Services Department 817-413-0103 for prior approval.

DuraFlex® Membrane Option 1: Install DuraFlex® SBS membrane over the base sheet, in a uniform mopping of hot asphalt applied at a rate of 25 lb/square (1.2 kg/m²). Lap membrane 4" (10 cm) on side laps, 6" (15 cm) on end laps. Refer to Section 5, Part 6 – Asphalt, and Part 12, Item 12.09 DuraFlex® SBS (mop applied) Membrane Application. **Option 2:** Install DuraFlex® SBS membrane over the base sheet, using USP® 901 Premium Modified Adhesive. Lap membrane 4" (10 cm) on side laps, 6" (15 cm) on end laps. Refer to Section 5, Part 7 – Cold Adhesive, and Part 12, Item 12.10 DuraFlex® SBS (cold applied) Membrane Application.

Flashing and Accessories: Refer to Section 5, Part 13 – Flashing and Section 14 DuraFlex® Construction Details. **Surfacing:** *Refer to Section 5, Part 14 – Surfacing.*

For additional information on this specification, guarantee requirements, etc. contact U.S. Ply Technical Services at (817) 413-0103

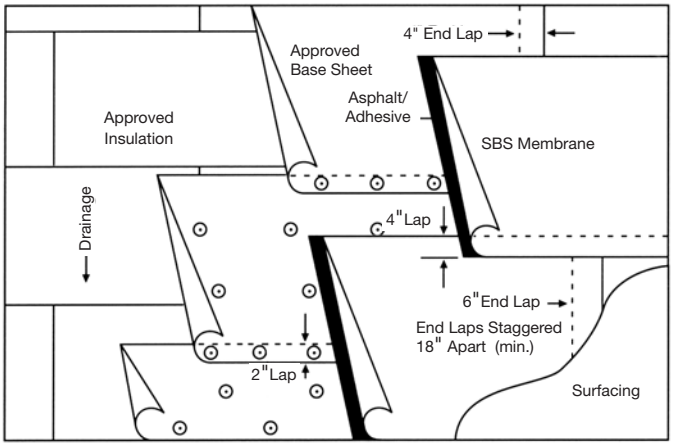
TEN YEAR GUARANTEE SPECIFICATIONS

Specification	*Base Sheet*	*Membrane*
N-2B-DFG4FR	Approved	DuraFlex G4FR
LWC-2V-DFG4FR	NVB	DuraFlex G4FR

TWELVE YEAR GUARANTEE SPECIFICATIONS

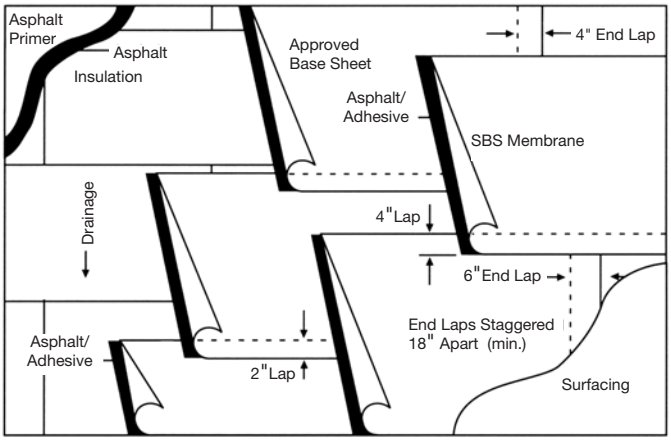
Specification	*Base Sheet*	*Membrane*
N-2B-DF190M	Approved	DuraFlex 190M
N-2B-DF190FR	Approved	DuraFlex 190FR
N-2B-DF250FR	Approved	DuraFlex 250FR
LWC-2V-DF190M	NVB	DuraFlex 190M
LWC-2V-DF190FR	NVB	DuraFlex 190FR
LWC-2V-DF250FR	NVB	DuraFlex 250FR

SECTION 8 – DURAFLEX® SBS MOP/COLD APPLIED SPECIFICATIONS



TWO (2) PLY SBS SYSTEM
NAILABLE DECK/INSULATION
Base sheet may be mopped if insulation is mechanically attached.

Figure 1



TWO (2) PLY SBS SYSTEM
NON-NAILABLE DECK/INSULATION
Base sheet must be mopped to insulation.

Figure 2

GENERAL
Safety: Refer to Section 4, Part 14. DO NOT BEGIN INSTALLATION UNTIL THIS INFORMATION IS READ, UNDERSTOOD AND IMPLEMENTED.

MATERIALS
Material Requirements:

Approved Insulation
Roofing Asphalt or Cold Adhesive .....(if applicable)
Base Sheet[1] .....1 ply
DuraFlex® SBS Membrane[2] .....1 ply

[1] USP® Base or other U.S. Ply approved base sheets.
[2] DuraFlex® 190M, DuraFlex® 190FR, DuraFlex® 250FR, or DuraFlex® G4FR

APPLICATION
Refer to Section 4 – General Requirements, and Section 5 - Installation Requirements.

Note: Polyisocyanurate insulation boards require a minimum ¼" overlay of SecuRock or ½" wood fiber insulation prior to mopping base.

Insulation Installation Over Nailable Decks (see Figure 1) see Base Sheet Option 1: Mechanically fasten insulation and base sheet simultaneously, to the deck with the joints staggered in one direction. **Option 2 (not shown):** Mechanically fasten insulation to the deck with the joints staggered in one direction. Refer to Section 5, Parts 8 – Fastening, 11 – Insulation Installation, and 12 – Membrane System Installation.

Insulation Installation Over Non-Nailable Decks (see Figure 2): Prime the deck with ASTM D41 asphalt primer applied at a rate of 1 gal/square (0.4 L/m²). Hold primer back 6" (15 cm) from concrete deck joints. Install insulation over the deck in a uniform mopping of hot and fluid asphalt applied at the rate of 25 – 30 lbs/square (1.2 – 1.5 kg/m²) see Base Sheet Option 2. Refer to Section 5, 6 – Asphalt and Part 11, Item 11.03 – Non-Nailable Substrates or install insulation over the deck in compatible insulation adhesive. Install insulation with joints staggered in one direction. See Base Sheet Option 3. Refer to Section 5, Part 11, Item 11.05, Foam Adhesive Insulation Installation.

Base Sheet Option1: Insulation and Base Sheet are fastened simultaneously. Mechanically fastened one ply of base sheet over the insulation. Lap the base sheet a minimum of 2" (5 cm) on the side lap and 4" (cm) on ends. Screws and plates are then installed in three rows. The first row (on the seam) will be 1-1/2" (3.75 cm) from the leading edge and on 12" (30 cm) centers. Locate the second row of fasteners 12" (30 cm) from the leading edge and on 18" (45.7 cm) centers. The third row of fasteners shall be 24" (60 cm) from the leading edge on 18" (45.7 cm) centers. The centers for the second and third rows should be staggered. Refer to Section 5, Part 8 and Part 12, Item 12.03 - Base Sheets, Mechanically Fastened.

Base Sheet Option 2: Install base sheet, over insulation, in a uniform mopping of hot and fluid asphalt applied at the rate of 25 lbs/square (1.2 kg/m²). Lap the sheets a minimum of 2" (5 cm) on side laps and 4" (10 cm) on end laps. Refer to Section 5, Part 6 – Asphalt and Part 12, Item 12.04 – Asphalt Mopping Base/ Interply Sheets.

Base Sheet Option 3: Install base sheet, over insulation, in a uniform application of USP® 901 Premium Modified Adhesive applied at the rate of 1.5 – 2 gallons per 100 ft² (0.6 – 0.8 L/m²). Lap the sheets a minimum of 2" (5 cm) on the side laps and 4" (10 cm) on the end laps. Refer to Section 5, Part 7 – Cold Adhesive and Part 12, Item 12.05 Base/Interply Sheets Cold Adhesive Application.

DuraFlex® Membrane Application Option 1: Install DuraFlex® SBS membrane over the base sheet, in a uniform mopping of hot and fluid asphalt applied at the rate of 25 lbs/square (1.2 kg/m²). Lap the membrane a minimum of 4" (10 cm) on side laps and 6" (15 cm) on end laps. Refer to Section 5, Part 6 – Asphalt and Part 12, Item 12.09 DuraFlex® SBS (mop applied) Membrane Application. **Option 2:** Install DuraFlex® SBS membrane over the base sheet, using USP® 901 Premium Modified Adhesive. Lap the membrane a minimum of 4" (10 cm) on side laps and 6" (15 cm) on end laps. Refer to Section 5, Part 7 – Cold Adhesive, and Part 12, Item 12.10 DuraFlex® SBS (cold applied) Membrane Application.

Flashing and Accessories: Refer to Section 5, Part 13 – Flashing and Section 14 DuraFlex® Construction Details.

Surfacing: Refer to Section 5, Part 14 – Surfacing.

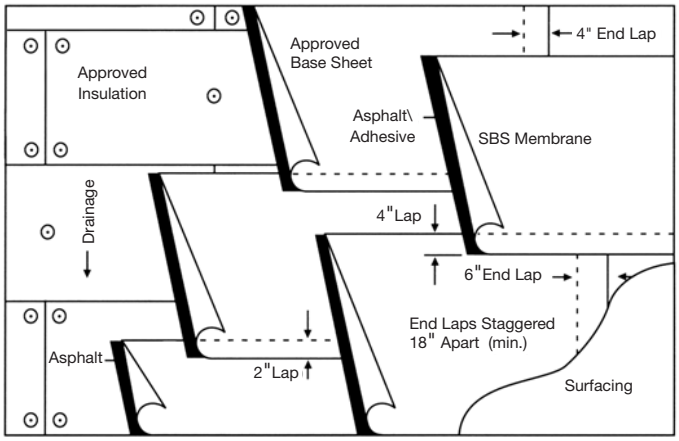
For additional information on this specification, guarantee requirements, etc. contact U.S. Ply Technical Services (817) 413-0103

TEN YEAR GUARANTEE SPECIFICATIONS

Specification	*Base Sheet*	*Membrane*
I-2B-DFG4FR	Approved	DuraFlex G4FR

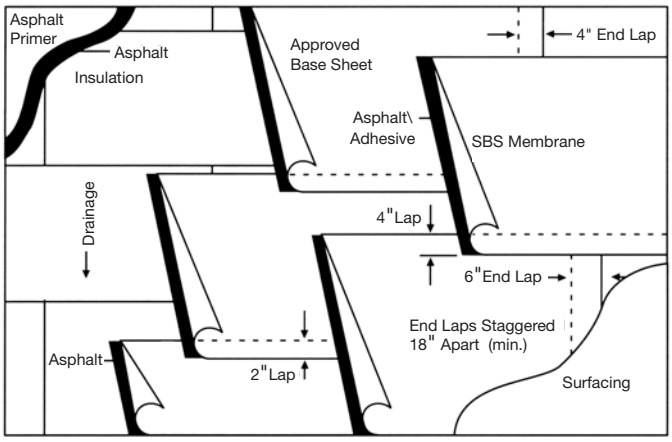
TWELVE YEAR GUARANTEE SPECIFICATIONS

Specification	*Base Sheet*	*Membrane*
I-2B-DF190M	Approved	DuraFlex 190M
I-2B-DF190FR	Approved	DuraFlex 190FR
I-2B-DF250FR	Approved	DuraFlex 250FR



TWO (2) PLY SBS SYSTEM
NAILABLE DECK/INSULATION
Base sheet must be mopped to insulation.

Figure 1



TWO (2) PLY SBS SYSTEM
NON-NAILABLE DECK/INSULATION
Base sheet must be mopped to insulation.

Figure 2

GENERAL

Safety: Refer to Section 4, Part 14. DO NOT BEGIN INSTALLATION UNTIL THIS INFORMATION IS READ, UNDERSTOOD AND IMPLEMENTED.

MATERIALS

Material Requirements:

Approved Insulation
Roofing Asphalt or Cold Adhesive . (if applicable)
Base Sheet[1] ..... 1 ply
DuraFlex® SBS Membrane[2]..... 1 ply

[1] DuraFlex® 60, DuraFlex® SBS PolyBase, DuraFlex® 190S
[2] DuraFlex® 190M, DuraFlex® 190FR, DuraFlex® 250FR, DuraFlex® G4FR, DuraSTAR G4MOP

APPLICATION

Refer to Section 4 – General Requirements, and Section 5 - Installation Requirements.

Note: Polyisocyanurate insulation boards require a minimum ¼" overlay of SecuRock or ½" wood fiber insulation prior to mopping base.

Insulation Installation Over Nailable Decks (see Figure 1): Mechanically fasten insulation to the deck with the joints staggered in one direction. Refer to Section 5, Part 8 – Fastening and Part 11 – Insulation Installation.

Insulation Installation Over Non-Nailable Decks (see Figure 2): Prime the deck with ASTM D41 asphalt primer applied at a rate of 1 gal/square (0.4 L/m²). Hold primer back 6" (15 cm) from concrete deck joints. Install insulation over the deck in a uniform mopping of hot and fluid asphalt applied at the rate of 25 – 30 lbs/square (1.2 – 1.5 kg/m²) see Base Sheet Option 1. Refer to Section 5, 6 – Asphalt and Part 11, Item 11.03 – Non-Nailable Substrates or install insulation over the deck in compatible insulation adhesive. Install insulation with joints staggered in one direction. See Base Sheet Option 2. Refer to Section 5, Part 11, Item 11.05, Foam Adhesive Insulation Installation.

Base Sheet Option1: Install base sheet, over insulation, in a uniform mopping of hot and fluid asphalt applied at the rate of 25 lbs/square (1.2 kg/m²). Lap the sheets a minimum of 2" (5 cm) on side laps and 4" (10 cm) on end laps. Refer to Section 5, Part 6 – Asphalt and Part 12, Item 12.04 – Asphalt Mopping Base/Interply Sheets.

Base Sheet Option 2: Install base sheet, over insulation, in a uniform application of USP® 901 Premium Modified Adhesive applied at the rate of 1.5 – 2 gallons per 100 ft² (0.6 – 0.8 L/m²). Lap the sheets a minimum of 4" (10 cm) on the side laps and 6" (15 cm) on the end laps. Refer to Section 5, Part 7 – Cold Adhesive and Part 12, Item 12.05 Base/Interply Sheets Cold Adhesive Application.

DuraFlex® Membrane Application Option 1: Install DuraFlex® SBS or DuraSTAR® SBS membrane over the base sheet, in a uniform mopping of hot and fluid asphalt applied at the rate of 25 lbs/square (1.2 kg/m²). Lap the membrane a minimum of 4" (10 cm) on side laps and 6" (15 cm) on end laps. Refer to Section 5, Part 6 – Asphalt and Part 12, Item 12.09 DuraFlex® SBS (mop applied) Membrane Application. Refer to Section 5, Part 12, Item 12.12 DuraSTAR® SBS (mop applied) Membrane Application.

Option 2: Install DuraFlex® SBS membrane over the base sheet, using USP® 901 Premium Modified Adhesive. Lap the membrane a minimum of 4" (10 cm) on side laps and 6" (15 cm) on end laps. Refer to Section 5, Part 7 – Cold Adhesive, and Part 12, Item 12.10 DuraFlex® SBS (cold applied) Membrane Application.

Flashing and Accessories: Refer to Section 5, Part 13 – Flashing and Section 14 DuraFlex® Construction Details.

Surfacing: Refer to Section 5, Part 14 – Surfacing.

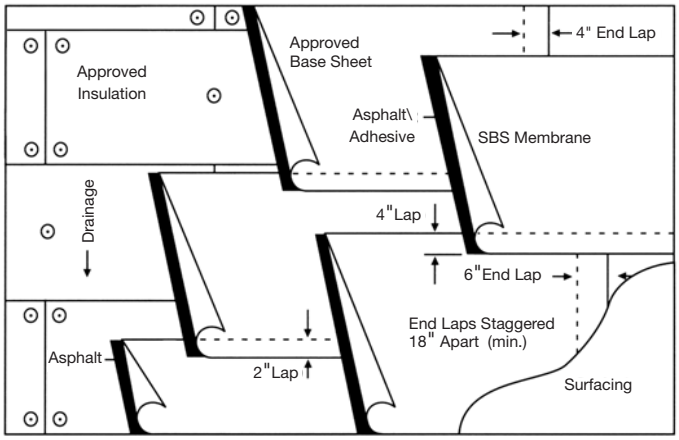
For additional information on this specification, guarantee requirements, etc. contact U.S. Ply Technical Services at (817) 413-0103

FIFTEEN YEAR GUARANTEE SPECIFICATIONS

Specification	*Base Sheet*	*Membrane*
I-2-DF60-DF190M	DuraFlex 60	DuraFlex 190M
I-2-DF60-DF190FR	DuraFlex 60	DuraFlex 190FR
I-2-DF60-DF250FR	DuraFlex 60	DuraFlex 250FR
I-2-DF60-DFG4FR	DuraFlex 60	DuraFlex G4FR
I-2-DFPB-DF190M	DuraFlex PolyBase	DuraFlex 190M
I-2-DFPB-DF190FR	DuraFlex PolyBase	DuraFlex 190FR
I-2-DFPB-DF250FR	DuraFlex PolyBase	DuraFlex 250FR
I-2-DFPB-DFG4FR	DuraFlex PolyBase	DuraFlex G4FR
I-2-DF60-DSG4MOP	DuraFlex 60	DuraSTAR G4MOP

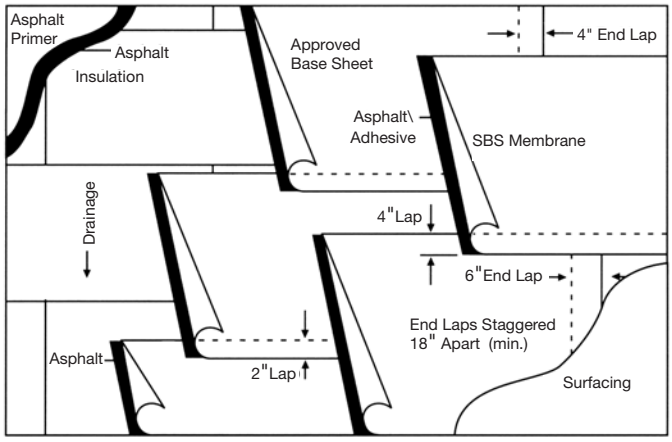
Note: All of the above specifications require the base to be mopped with hot asphalt to the insulation or cold adhesive if applicable to approved insulation.

SECTION 8 – DURAFLEX® SBS MOP/COLD APPLIED SPECIFICATIONS



TWO (2) PLY SBS SYSTEM
NAILABLE DECK/INSULATION
Base sheet must be mopped to insulation.

Figure 1



TWO (2) PLY SBS SYSTEM
NON-NAILABLE DECK/INSULATION
Base sheet must be mopped to insulation.

Figure 2

GENERAL

Safety: Refer to Section 4, Part 14. DO NOT BEGIN INSTALLATION UNTIL THIS INFORMATION IS READ, UNDERSTOOD AND IMPLEMENTED.

MATERIALS

Material Requirements:

Approved Insulation
Roofing Asphalt or Cold Adhesive . (if applicable)
Base Sheet[1] ..... 1 ply
DuraFlex® SBS Membrane[2]..... 1 ply

[1] DuraFlex® 60, DuraFlex® SBS PolyBase, DuraFlex® 190S
[2] DuraFlex® 190M, DuraFlex® 190FR, DuraFlex® 250FR, or DuraFlex® G4FR

APPLICATION

Refer to Section 4 – General Requirements, and Section 5 - Installation Requirements.

Note: Polyisocyanurate insulation boards require a minimum ¼" overlay of SecuRock or ½" wood fiber insulation prior to mopping base.

Insulation Installation Over Nailable Decks (see Figure 1): Mechanically fasten insulation to the deck with the joints staggered in one direction. Refer to Section 5, Part 8 – Fastening and Part 11 – Insulation Installation.

Insulation Installation Over Non-Nailable Decks (see Figure 2): Prime the deck with ASTM D41 asphalt primer applied at a rate of 1 gal/square (0.4 L/m²). Hold primer back 6" (15 cm) from concrete deck joints. Install insulation over the deck in a uniform mopping of hot and fluid asphalt applied at the rate of 25 – 30 lbs/square (1.2 – 1.5 kg/m²) see Base Sheet Option 1. Refer to Section 5, 6 – Asphalt and Part 11, Item 11.03 – Non-Nailable Substrates or install insulation over the deck in compatible insulation adhesive. Install insulation with joints staggered in one direction. See Base Sheet Option 2. Refer to Section 5, Part 11, Item 11.05, Foam Adhesive Insulation Installation.

Base Sheet Option1: Install base sheet, over insulation, in a uniform mopping of hot and fluid asphalt applied at the rate of 25 lbs/square (1.2 kg/m²). Lap the sheets a minimum of 2" (5 cm) on side laps and 4" (10 cm) on end laps. Refer to Section 5, Part 6 – Asphalt and Part 12, Item 12.04 – Asphalt Mopping Base/Interply Sheets.

Base Sheet Option 2: Install base sheet, over insulation, in a uniform application of USP® 901 Premium Modified Adhesive applied at the rate of 1.5 – 2 gallons per 100 ft² (0.6 – 0.8 L/m²). Lap the sheets a minimum of 4" (10 cm) on the side laps and 6" (15 cm) on the end laps. Refer to Section 5, Part 7 – Cold Adhesive and Part 12, Item 12.05 Base/Interply Sheets Cold Adhesive Application.

DuraFlex® Membrane Application Option 1: Install DuraFlex® SBS membrane over the base sheet, in a uniform mopping of hot and fluid asphalt applied at the rate of 25 lbs/square (1.2 kg/m²). Lap the membrane a minimum of 4" (10 cm) on side laps and 6" (15 cm) on end laps. Refer to Section 5, Part 6 – Asphalt and Part 12, Item 12.09 DuraFlex® SBS (mop applied) Membrane Application.

Option 2: Install DuraFlex® SBS membrane over the base sheet, using USP® 901 Premium Modified Adhesive. Lap the membrane a minimum of 4" (10 cm) on side laps and 6" (15 cm) on end laps. Refer to Section 5, Part 7 – Cold Adhesive, and Part 12, Item 12.10 DuraFlex® SBS (cold applied) Membrane Application.

Flashing and Accessories: Refer to Section 5, Part 13 – Flashing and Section 14 DuraFlex® Construction Details.

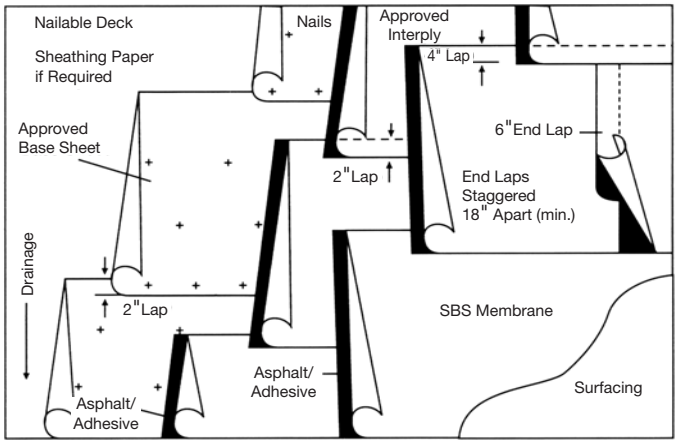
Surfacing: Refer to Section 5, Part 14 – Surfacing.

For additional information on this specification, guarantee requirements, etc. contact U.S. Ply Technical Services at (817) 413-0103.

FIFTEEN & TWENTY YEAR GUARANTEE SPECIFICATIONS

Specification	*Base Sheet*	*Membrane*
I-2-DFS-DF190M	DuraFlex 190S	DuraFlex 190M
I-2-DFS-DF190FR	DuraFlex 190S	DuraFlex 190FR
I-2-DFS-DF250FR	DuraFlex 190S	DuraFlex 250FR

Note: All of the above specifications require the base to be mopped with hot asphalt to the insulation or cold adhesive if applicable to approved insulation.



THREE (3) PLY SBS SYSTEM
NAILABLE DECK

Figure 1

GENERAL

Safety: Refer to Section 4, Part 14. DO NOT BEGIN INSTALLATION UNTIL THIS INFORMATION IS READ, UNDERSTOOD AND IMPLEMENTED.

MATERIALS

Material Requirements:
Roofing Asphalt or Cold Adhesive . (if applicable)
Base Sheet[1] ..... 1 ply
SBS Interply[2] ..... 1 ply
DuraFlex® SBS Membrane[3] ..... 1 ply

[2] SBS Interply: DuraFlex® 60, DuraFlex® SBS PolyBase, DuraFlex® 190S.
[3]DuraFlex® 190M, DuraFlex® 190FR, DuraFlex 250FR, DuraFlex® G4FR, or DuraSTAR G4MOP.

APPLICATION

Refer to Section 4 – General Requirements, and Section 5 - Installation Requirements.

Base Sheet: Mechanically fastened one ply of base sheet over the deck. Lap the base sheet a minimum of 2" (5 cm) on the side laps and 4" (10 cm) on the end laps. Refer to Section 5, Part 8 and Part 12, Item 12.03 - Base Sheets, Mechanically Fastened.

SBS Interply (Mop Applied Option): Install asphalt applied interply over the base sheet, in a uniform mopping of hot and fluid asphalt applied at the rate of 25 lbs/square (1.2 kg/m²). Lap the sheet a minimum of 4" (10 cm) on side laps and 6" (15 cm) on end laps. Refer to Section 5, Part 6 – Asphalt and Part 12, Item 12.04 – Asphalt Mopping Base/Interply Sheets.

SBS Interply (Cold Applied Option): Install cold adhesive applied interply over the base sheet, in a uniform application of USP® 901 Premium Modified Adhesive applied at the rate of 1.5 – 2 gallons per 100 ft² (0.6 – 0.8 L/m²). Lap the sheet a minimum of 4" (10 cm) on the side laps and 6" (15 cm) on the end laps. Refer to Section 5, Part 7 – Cold Adhesive and Part 12, Item 12.05 Base/Interply Sheets Cold Adhesive Application.

DuraFlex® Membrane Application Option 1: Install DuraFlex® SBS or DuraSTAR® SBS membrane over the base sheet, in a uniform mopping of hot and fluid asphalt applied at the rate of 25 lbs/square (1.2 kg/m²). Lap the membrane a minimum of 4" (10 cm) on side laps and 6" (15 cm) on end laps. Refer to Section 5, Part 6 – Asphalt and Part 12, Item 12.09 DuraFlex® SBS (mop applied) Membrane Application. Refer to Section 5, Part 12, Item 12.12 DuraSTAR® SBS (mop applied) Membrane Application.

Option 2: Install DuraFlex® SBS membrane over the base sheet, using USP® 901 Premium Modified Adhesive. Lap the membrane a minimum of 4" (10 cm) on side laps and 6" (15 cm) on end laps. Refer to Section 5, Part 7 – Cold Adhesive, and Part 12, Item 12.10 DuraFlex® SBS (cold applied) Membrane Application.

Flashing and Accessories: Refer to Section 5, Part 13 – Flashing and Section 14 DuraFlex® Construction Details.

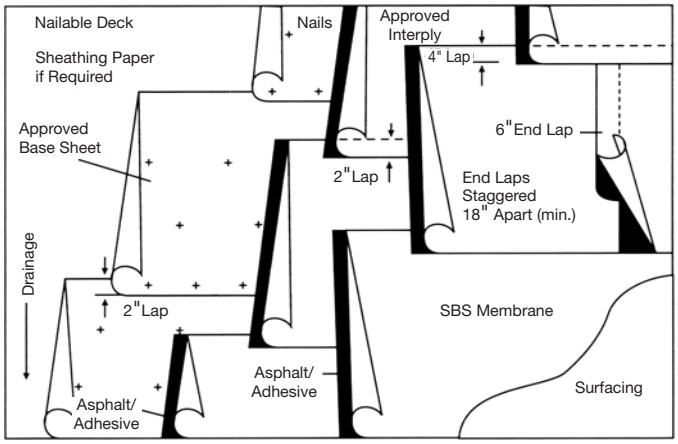
Surfacing: Refer to Section 5, Part 14 – Surfacing.

For additional information on this specification, guarantee requirements, etc. contact U.S. Ply Technical Services at (817) 413-0103

FIFTEEN YEAR GUARANTEE SPECIFICATIONS

Specification	*Base Sheet*	*Interply*	*Membrane*
N-3B-DF60-DF190M	Approved	DuraFlex 60	DuraFlex 190M
N-3B-DF60-DF190FR	Approved	DuraFlex 60	DuraFlex 190FR
N-3B-DF60-DF250FR	Approved	DuraFlex 60	DuraFlex 250FR
N-3B-DF60-DFG4FR	Approved	DuraFlex 60	DuraFlex G4FR
N-3B-DF60-DSG4MOP	Approved	DuraFlex 60	DuraSTAR G4MOP
N-3B-DFPB-DF190M	Approved	DuraFlex PolyBase	DuraFlex 190M
N-3B-DFPB-DF190FR	Approved	DuraFlex PolyBase	DuraFlex 190FR
N-3B-DFPB-DF250FR	Approved	DuraFlex PolyBase	DuraFlex 250FR
N-3B-DFPB-DFG4FR	Approved	DuraFlex PolyBase	DuraFlex G4FR

SECTION 8 – DURAFLEX® SBS MOP/COLD APPLIED SPECIFICATIONS



THREE (3) PLY SBS SYSTEM NAILABLE DECK

Figure 1

GENERAL

Safety: Refer to Section 4, Part 14. DO NOT BEGIN INSTALLATION UNTIL THIS INFORMATION IS READ, UNDERSTOOD AND IMPLEMENTED.

MATERIALS

Material Requirements:
Roofing Asphalt or Cold Adhesive . (if applicable)
Base Sheet[1] ..... 1 ply
SBS Interply[2] ..... 1 ply
DuraFlex® SBS Membrane[3] ..... 1 ply

[1] USP® Base or USP® NVB (Nailable Venting Base) or other U.S. Ply approved base sheets.
[2] SBS Interply: DuraFlex® 60, DuraFlex® SBS PolyBase, DuraFlex® 190S,
[3]DuraFlex® 190M, DuraFlex® 190FR, DuraFlex® 250FR, or DuraFlex® G4FR

APPLICATION

Refer to Section 4 – General Requirements, and Section 5 - Installation Requirements.

Base Sheet: Mechanically fastened one ply of base sheet over the deck. Lap the base sheet a minimum of 2” (5 cm) on the side laps and 4” (10 cm) on the end laps. Refer to Section 5, Part 8 and Part 12, Item 12.03 - Base Sheets, Mechanically Fastened.

SBS Interply (Mop Applied Option): Install asphalt applied interply over the base sheet, in a uniform mopping of hot and fluid asphalt applied at the rate of 25 lbs/square (1.2 kg/m²). Lap the sheet a minimum of 4” (10 cm) on side laps and 6” (15 cm) on end laps. Refer to Section 5, Part 6 – Asphalt and Part 12, Item 12.04 – Asphalt Mopping Base/Interply Sheets.

SBS Interply (Cold Applied Option): Install cold adhesive applied interply over the base sheet, in a uniform application of USP® 901 Premium Modified Adhesive applied at the rate of 1.5 – 2 gallons per 100 ft² (0.6 – 0.8 L/m²). Lap the sheet a minimum of 4” (10 cm) on the side laps and 6” (15 cm) on the end laps. Refer to Section 5, Part 7 – Cold Adhesive and Part 12, Item 12.05 Base/Interply Sheets Cold Adhesive Application.

DuraFlex® Membrane Application Option 1: Install DuraFlex® SBS membrane over the base sheet, in a uniform mopping of hot and fluid asphalt applied at the rate of 25 lbs/square (1.2 kg/m²). Lap the membrane a minimum of 4” (10 cm) on side laps and 6” (15 cm) on end laps. Refer to Section 5, Part 6 – Asphalt and Part 12, Item 12.09 DuraFlex® SBS (mop applied) Membrane Application.

Option 2: Install DuraFlex® SBS membrane over the base sheet, using USP® 901 Premium Modified Adhesive. Lap the membrane a minimum of 4” (10 cm) on side laps and 6” (15 cm) on end laps. Refer to Section 5, Part 7 – Cold Adhesive, and Part 12, Item 12.10 DuraFlex® SBS (cold applied) Membrane Application.

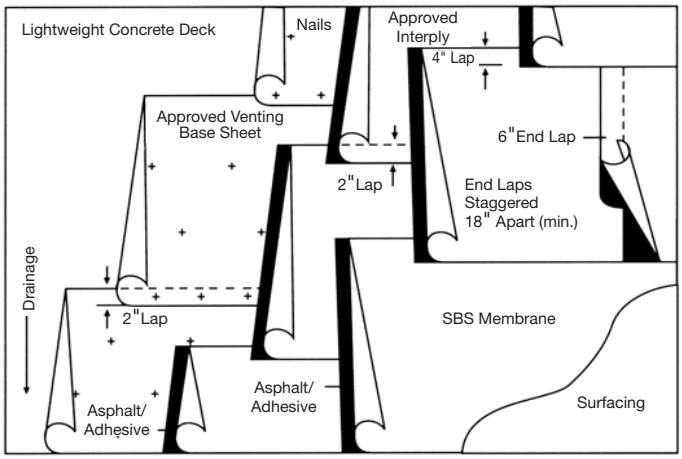
Flashing and Accessories: Refer to Section 5, Part 13 – Flashing and Section 14 DuraFlex® Construction Details.

Surfacing: Refer to Section 5, Part 14 – Surfacing.

For additional information on this specification, guarantee requirements, etc. contact U.S. Ply Technical Services at (817) 413-0103.

TWENTY YEAR GUARANTEE SPECIFICATIONS

Specification	Base Sheet	Interply	Membrane
N-3B-DFS-DF190M	Approved	DuraFlex 190S	DuraFlex 190M
N-3B-DFS-DF190FR	Approved	DuraFlex 190S	DuraFlex 190FR
N-3B-DFS-DF250FR	Approved	DuraFlex 190S	DuraFlex 250FR



THREE (3) PLY SBS SYSTEM
LIGHTWEIGHT CONCRETE DECK

Figure 1

GENERAL

Safety: Refer to Section 4, Part 14. DO NOT BEGIN INSTALLATION UNTIL THIS INFORMATION IS READ, UNDERSTOOD AND IMPLEMENTED.

MATERIALS

Material Requirements:

Roofing Asphalt or Cold Adhesive ...(if applicable)
Base Sheet[1] .....1 ply
SBS Interply[2].....1 ply
DuraFlex® SBS Membrane[3].....1 ply

[1] USP® Base or USP® NVB (Nailable Venting Base) or other U.S. Ply approved base sheets.
[2] SBS Interply: DuraFlex® 60, DuraFlex® SBS PolyBase, DuraFlex® 190S,
[3] DuraFlex® 190M, DuraFlex® 190FR, DuraFlex® 250FR, or DuraFlex® G4FR or DuraSTAR G4MOP

APPLICATION

Refer to Section 4 – General Requirements, and Section 5 - Installation Requirements.

Base Sheet: Mechanically fastened one ply of base sheet over the deck. Lap the base sheet a minimum of 2" (5 cm) on the side laps and 4" (10 cm) on the end laps. Refer to Section 5, Part 8 and Part 12, Item 12.03 - Base Sheets, Mechanically Fastened.

SBS Interply (Mop Applied Option): Install asphalt applied interply over the base sheet, in a uniform mopping of hot and fluid asphalt applied at the rate of 25 lbs/square (1.2 kg/m²). Lap the sheet a minimum of 4" (10 cm) on side laps and 6" (15 cm) on end laps. Refer to Section 5, Part 6 – Asphalt and Part 12, Item 12.04 – Asphalt Mopping Base/Interply Sheets.

SBS Interply (Cold Applied Option): Install cold adhesive applied interply over the base sheet, in a uniform application of USP® 901 Premium Modified Adhesive applied at the rate of 1.5 – 2 gallons per 100 ft² (0.6 – 0.8 L/m²). Lap the sheet a minimum of 4" (10 cm) on the side laps and 6" (15 cm) on the end laps. Refer to Section 5, Part 7 – Cold Adhesive and Part 12, Item 12.05 Base/Interply Sheets Cold Adhesive Application.

DuraFlex® Membrane Option 1: Install DuraFlex® SBS membrane over the base sheet, in a uniform mopping of hot asphalt applied at a rate of 25 lb/square (1.2 kg/m²). Lap membrane 4" (10 cm) on side laps, 6" (15 cm) on end laps. Refer to Section 5, Part 6 – Asphalt, and Part 12, Item 12.09 DuraFlex® SBS (mop applied) Membrane Application.

Option 2: Install DuraFlex® SBS membrane over the base sheet, using USP® 901 Premium Modified Adhesive. Lap membrane 4" (10 cm) on side laps, 6" (15 cm) on end laps. Refer to Section 5, Part 7 – Cold Adhesive, and Part 12, Item 12.10 DuraFlex® SBS (cold applied) Membrane Application.

Flashing and Accessories: Refer to Section 5, Part 13 – Flashing and Section 14 DuraFlex® Construction Details.

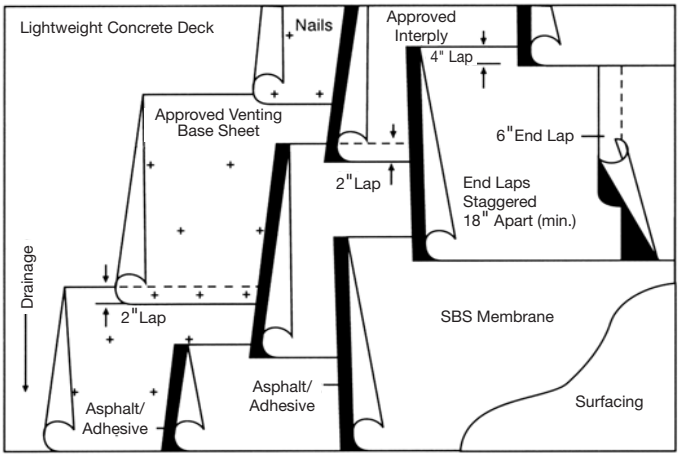
Surfacing: Refer to Section 5, Part 14 – Surfacing.

For additional information on this specification, guarantee requirements, etc. contact U.S. Ply Technical Services at (817) 413-0103

FIFTEEN YEAR GUARANTEE SPECIFICATIONS

Specification	*Base Sheet*	*Interply*	*Membrane*
LWC-3V-DF60-DF190M	NVB	DuraFlex 60	DuraFlex 190M
LWC-3V-DF60-DF190FR	NVB	DuraFlex 60	DuraFlex 190FR
LWC-3V-DF60-DF250FR	NVB	DuraFlex 60	DuraFlex 250FR
LWC-3V-DF60-DFG4FR	NVB	DuraFlex 60	DuraFlex G4FR
LWC-3V-DF60-DSG4MOP	NVB	DuraFlex 60	DuraSTAR G4MOP
LWC-3V-DFPB-DF190M	NVB	DuraFlex PolyBase	DuraFlex 190M
LWC-3V-DFPB-DF190FR	NVB	DuraFlex PolyBase	DuraFlex 190FR
LWC-3V-DFPB-DF250FR	NVB	DuraFlex PolyBase	DuraFlex 250FR
LWC-3V-DFPB-DFG4FR	NVB	DuraFlex PolyBase	DuraFlex G4FR

SECTION 8 – DURAFLEX® SBS MOP/COLD APPLIED SPECIFICATIONS



THREE (3) PLY SBS SYSTEM
LIGHTWEIGHT CONCRETE DECK

Figure 1

GENERAL

Safety: Refer to Section 4, Part 14. DO NOT BEGIN INSTALLATION UNTIL THIS INFORMATION IS READ, UNDERSTOOD AND IMPLEMENTED.

MATERIALS

Material Requirements:

Roofing Asphalt or Cold Adhesive . (if applicable)
Base Sheet[1] ..... 1 ply
SBS Interply[2] ..... 1 ply
DuraFlex® SBS Membrane[3] ..... 1 ply

[1] USP® Base or USP® NVB (Nailable Venting Base) or other U.S. Ply approved base sheets.
[2] SBS Interply: DuraFlex® 60, DuraFlex® SBS PolyBase, DuraFlex® 190S,
[3] DuraFlex® 190M, DuraFlex® 190FR, DuraFlex 250FR, DuraFlex® G4FR, or DuraSTAR G4MOP.

APPLICATION

Refer to Section 4 – General Requirements, and Section 5 - Installation Requirements.

Base Sheet: Mechanically fastened one ply of base sheet over the deck. Lap the base sheet a minimum of 2” (5 cm) on the side laps and 4” (10 cm) on the end laps. Refer to Section 5, Part 8 and Part 12, Item 12.03 - Base Sheets, Mechanically Fastened.

SBS Interply (Mop Applied Option): Install asphalt applied interply over the base sheet, in a uniform mopping of hot and fluid asphalt applied at the rate of 25 lbs/square (1.2 kg/m²). Lap the sheet a minimum of 4” (10 cm) on side laps and 6” (15 cm) on end laps. Refer to Section 5, Part 6 – Asphalt and Part 12, Item 12.04 – Asphalt Mopping Base/Interply Sheets.

SBS Interply (Cold Applied Option): Install cold adhesive applied interply over the base sheet, in a uniform application of USP® 901 Premium Modified Adhesive applied at the rate of 1.5 – 2 gallons per 100 ft² (0.6 – 0.8 L/m²). Lap the sheet a minimum of 4” (10 cm) on the side laps and 6” (15 cm) on the end laps. Refer to Section 5, Part 7 – Cold Adhesive and Part 12, Item 12.05 Base/Interply Sheets Cold Adhesive Application.

DuraFlex® Membrane Option 1: Install DuraFlex® SBS or DuraSTAR® SBS membrane over the base sheet, in a uniform mopping of hot and fluid asphalt applied at the rate of 25 lbs/square (1.2 kg/m²). Lap the membrane a minimum of 4” (10 cm) on side laps and 6” (15 cm) on end laps. Refer to Section 5, Part 6 – Asphalt and Part 12, Item 12.09 DuraFlex® SBS (mop applied) Membrane Application. Refer to Section 5, Part 12, Item 12.12 DuraSTAR® SBS (mop applied) Membrane Application.

Option 2: Install DuraFlex® SBS membrane over the base sheet, using USP® 901 Premium Modified Adhesive. Lap membrane 4" (10 cm) on side laps, 6" (15 cm) on end laps. Refer to Section 5, Part 7 – Cold Adhesive, and Part 12, Item 12.10 DuraFlex® SBS (cold applied) Membrane Application.

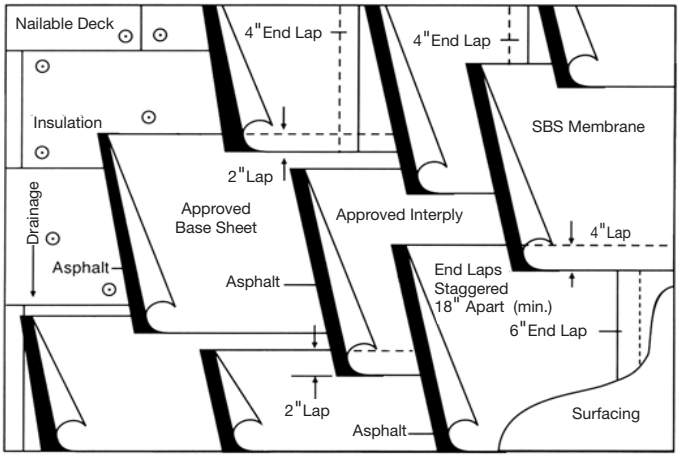
Flashing and Accessories: Refer to Section 5, Part 13 – Flashing and Section 14 DuraFlex® Construction Details.

Surfacing: Refer to Section 5, Part 14 – Surfacing.

For additional information on this specification, guarantee requirements, etc. contact U.S. Ply Technical Services at (817) 413-0103.

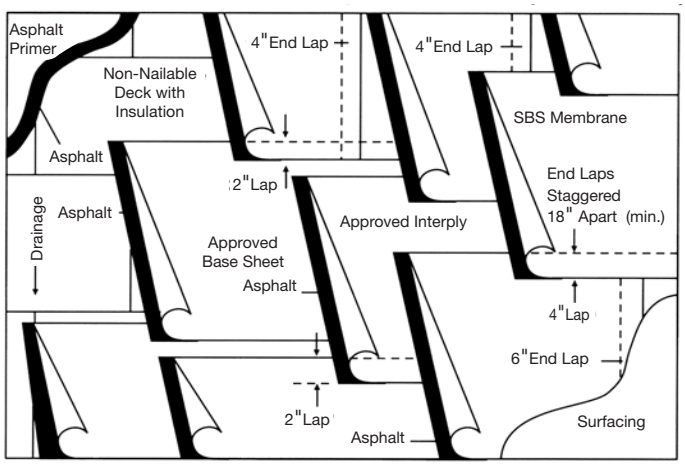
FIFTEEN & TWENTY YEAR GUARANTEE SPECIFICATIONS

Specification	*Base Sheet*	*Interply*	*Membrane*
LWC-3V-DFS-DF190M	NVB	DuraFlex 190S	DuraFlex 190M
LWC-3V-DFS-DF190FR	NVB	DuraFlex 190S	DuraFlex 190FR
LWC-3V-DFS-DF250FR	NVB	DuraFlex 190S	DuraFlex 250FR



THREE (3) PLY SBS SYSTEM
NAILABLE DECK/INSULATION

Figure 1



THREE (3) PLY SBS SYSTEM
NAILABLE DECK/INSULATION

Figure 2

GENERAL

Safety: Refer to Section 4, Part 14. DO NOT BEGIN INSTALLATION UNTIL THIS INFORMATION IS READ, UNDERSTOOD AND IMPLEMENTED.

MATERIALS

Material Requirements:

Approved Insulation
Roofing Asphalt or Cold Adhesive (if applicable)
Base Sheet[1] ..... 1 ply
SBS Interply[2] ..... 1 ply
DuraFlex® SBS Membrane[3] ..... 1 ply

[1] DuraFlex® 60 or DuraFlex® SBS PolyBase, or DuraFlex® 190S.
[2] DuraFlex® 60 or DuraFlex® SBS PolyBase, or DuraFlex® 190S.
[3] DuraFlex® 190M, DuraFlex® 190FR, DuraFlex 250FR, DuraFlex® G4FR, or DuraSTAR G4MOP.

APPLICATION

Refer to Section 4 – General Requirements, and Section 5 - Installation Requirements.

Note: Polyisocyanurate insulation boards require a minimum ¼" overlay of SecuRock or ½" wood fiber insulation prior to mopping base.

Insulation Installation Over Nailable Decks (see Figure 1): Mechanically fasten insulation to the deck with the joints staggered in one direction. Refer to Section 5, Part 8 – Fastening and Part 11 – Insulation Installation.

Insulation Installation Over Non-Nailable Decks (see Figure 2): Prime the deck with ASTM D41 asphalt primer applied at a rate of 1 gal/square (0.4 L/m²). Hold primer back 6" (15 cm) from concrete deck joints. Install insulation over the deck in a uniform mopping of hot and fluid asphalt applied at the rate of 25 – 30 lbs/square (1.2 – 1.5 kg/m²) see Base Sheet Option 1. Refer to Section 5, 6 – Asphalt and Part 11, Item 11.03 – Non-Nailable Substrates or install insulation over the deck in compatible insulation adhesive. Install insulation with joints staggered in one direction. See Base Sheet Option 2. Refer to Section 5, Part 11, Item 11.05, Foam Adhesive Insulation Installation.

Base Sheet Option1: Install base sheet, over insulation, in a uniform mopping of hot and fluid asphalt applied at the rate of 25 lbs/square (1.2 kg/m²). Lap the sheets a minimum of 4" (10 cm) on side laps and 6" (15 cm) on end laps. Refer to Section 5, Part 6 – Asphalt and Part 12, Item 12.04 – Asphalt Mopping Base/Interply Sheets.

Base Sheet Option 2: Install base sheet, over insulation, in a uniform application of USP® 901 Premium Modified Adhesive applied at the rate of 1.5 – 2 gallons per 100 ft² (0.6 – 0.8 L/m²). Lap the sheets a minimum of 4" (10 cm) on the side laps and 6" (15 cm) on the end laps. Refer to Section 5, Part 7 – Cold Adhesive and Part 12, Item 12.05 Base/Interply Sheets Cold Adhesive Application.

SBS Interply (Mop Applied Option): Install asphalt applied interply over the base sheet, in a uniform mopping of hot and fluid asphalt applied at the rate of 25 lbs/square (1.2 kg/m²). Lap the sheet a minimum of 4" (10 cm) on side laps and 6" (15 cm) on end laps. Refer to Section 5, Part 6 – Asphalt and Part 12, Item 12.04 – Asphalt Mopping Base/Interply Sheets.

SBS Interply (Cold Applied Option): Install cold adhesive applied interply over the base sheet, in a uniform application of USP® 901 Premium Modified Adhesive applied at the rate of 1.5 – 2 gallons per 100 ft² (0.6 – 0.8 L/m²). Lap the sheet a minimum of 4" (10 cm) on the side laps and 6" (15 cm) on the end laps. Refer to Section 5, Part 7 – Cold Adhesive and Part 12, Item 12.05 Base/Interply Sheets Cold Adhesive Application.

DuraFlex® Membrane Application Option 1: Install DuraFlex® SBS or DuraSTAR® SBS membrane over the base sheet, in a uniform mopping of hot and fluid asphalt applied at the rate of 25 lbs/square (1.2 kg/m²). Lap the membrane a minimum of 4" (10 cm) on side laps and 6" (15 cm) on end laps. Refer to Section 5, Part 6 – Asphalt and Part 12, Item 12.09 DuraFlex® SBS (mop applied) Membrane Application. Refer to Section 5, Part 12, Item 12.12 DuraSTAR® SBS (mop applied) Membrane Application.

Option 2: Install DuraFlex® SBS membrane over the base sheet, using USP® 901 Premium Modified Adhesive. Lap the membrane a minimum of 4" (10 cm) on side laps and 6" (15 cm) on end laps. Refer to Section 5, Part 7 – Cold Adhesive, and Part 12, Item 12.10 DuraFlex® SBS (cold applied) Membrane Application.

Flashing and Accessories: Refer to Section 5, Part 13 – Flashing and Section 14 DuraFlex® Construction Details.

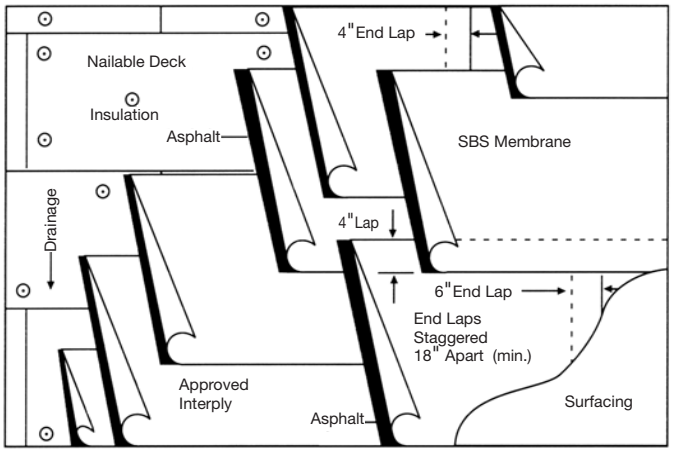
Surfacing: Refer to Section 5, Part 14 – Surfacing.

For additional information on this specification, guarantee requirements, etc. contact U.S. Ply Technical Services at (817) 413-0103.

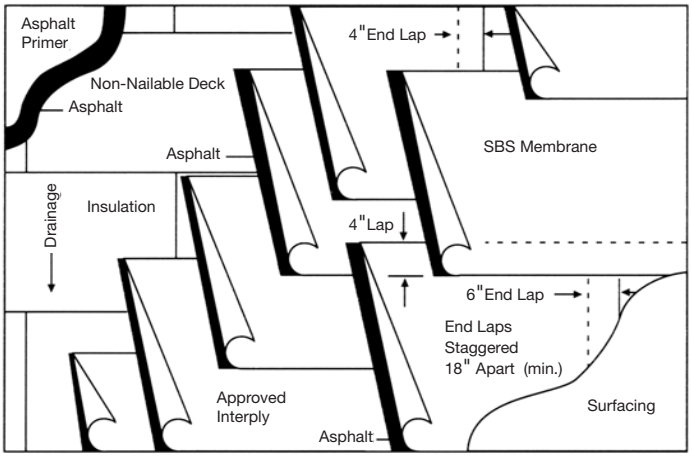
TWENTY YEAR GUARANTEE SPECIFICATIONS

Specification	*Base Sheet*	*Interply*	*Membrane*
I-3-DF60-DF190M	DuraFlex 60	DuraFlex 60	DuraFlex 190M
I-3-DF60-DF190FR	DuraFlex 60	DuraFlex 60	DuraFlex 190FR
I-3-DF60-DF250FR	DuraFlex 60	DuraFlex 60	DuraFlex 250FR
I-3-DF60-DFG4FR	DuraFlex 60	DuraFlex 60	DuraFlex G4FR
I-3-DF60-DSG4MOP	DuraFlex 60	DuraFlex 60	DuraSTAR G4MOP
I-3-DFPB-DF190M	DuraFlex PolyBase	DuraFlex PolyBase	DuraFlex 190M
I-3-DFPB-DF190FR	DuraFlex PolyBase	DuraFlex PolyBase	DuraFlex 190FR
I-3-DFPB-DF250FR	DuraFlex PolyBase	DuraFlex PolyBase	DuraFlex 250FR
I-3-DFPB-DFG4FR	DuraFlex PolyBase	DuraFlex PolyBase	DuraFlex G4FR

SECTION 8 – DURAFLEX® SBS MOP/COLD APPLIED SPECIFICATIONS



THREE (3) PLY SBS SYSTEM
NAILABLE DECK/INSULATION *Figure 1*



THREE (3) PLY SBS SYSTEM
NON-NAILABLE DECK/INSULATION *Figure 2*

GENERAL
Safety: Refer to Section 4, Part 14. DO NOT BEGIN INSTALLATION UNTIL THIS INFORMATION IS READ, UNDERSTOOD AND IMPLEMENTED.

MATERIALS
Material Requirements:

Approved Insulation
Roofing Asphalt ..... 25 lb (1.2 kg/m²) per ply
Interply [1] ..... 2 plies
DuraFlex® SBS Membrane[2]..... 1ply

[1] USP® Type 4 or USP® Type 6
[2] DuraFlex® 190M, DuraFlex® 190FR, DuraFlex® 250FR, DuraFlex® G4FR, or DuraSTAR G4 MOP

APPLICATION
Refer to Section 4 – General Requirements, and Section 5 - Installation Requirements.

Note: Polyisocyanurate insulation boards require a minimum ¼" overlay of SecuRock or ½" wood fiber insulation prior to mopping base.

Insulation Installation Over Nailable Decks (see Figure 1): Mechanically fasten insulation to the deck with the joints staggered in one direction. Refer to Section 5, Part 8 – Fastening and Part 11 – Insulation Installation.

Insulation Installation Over Non-Nailable Decks (see Figure 2): Prime the deck with ASTM D41 asphalt primer applied at a rate of 1 gal/square (0.4 L/m²). Hold primer back 6" (15 cm) from concrete deck joints. Install insulation over the deck in a uniform mopping of hot and fluid asphalt applied at the rate of 25 – 30 lbs/square (1.2 – 1.5 kg/m²) Refer to Section 5, Part 6 – Asphalt and Part 11, Item 11.03 – Non-Nailable Substrates or install insulation over the deck in compatible insulation adhesive. Install insulation with joints staggered in one direction. Refer to Section 5, Part 11, Item 11.05, Foam Adhesive Insulation Installation.

Interply: Install starter strips of 18" (45.7 cm) and 36" (91.4 cm) widths and follow with a second full 36" (91.4 cm) width sheet with a maximum of 17" (43.2 cm) exposure, applied shingle fashion. Lap felts 19" (48.3 cm) with a 17" (43.2 cm) exposure and lap 4"(10 cm) at ends. Stagger adjacent end laps a minimum of 18" (45.7 cm). Install the felts in full and uniform moppings of hot and fluid hot asphalt applied at the rate of 25 lb/square (1.2 kg/m²) per ply. Refer to Section 5, Part 12, Item 12.04 – Asphalt Mopping Base/Interply Sheets.

DuraFlex® Membrane Application: Install DuraFlex® SBS or DuraSTAR® SBS membrane over the base sheet, in a uniform mopping of hot and fluid asphalt applied at the rate of 25 lbs/square (1.2 kg/m²). Lap the membrane a minimum of 4" (10 cm) on side laps and 6" (15 cm) on end laps. Refer to Section 5, Part 6 – Asphalt and Part 12, Item 12.09 DuraFlex® SBS (mop applied) Membrane Application. Refer to Section 5, Part 12, Item 12.12 DuraSTAR® SBS (mop applied) Membrane Application.

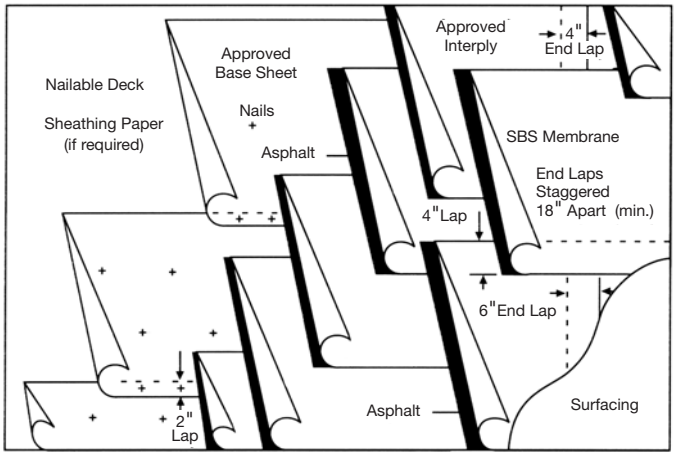
Flashing and Accessories: Refer to Section 5, Part 13 – Flashing and Section 14 DuraFlex® Construction Details.

Surfacing: Refer to Section 5, Part 14 – Surfacing.

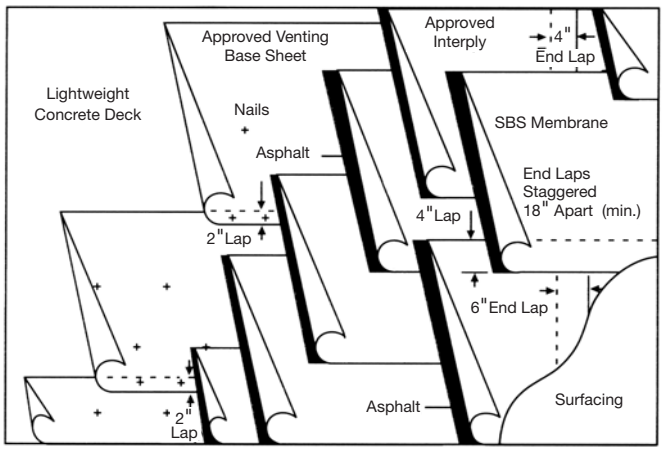
For additional information on this specification, guarantee requirements, etc. contact U.S. Ply Technical Services at (817) 413-0103

FIFTEEN YEAR GUARANTEE SPECIFICATIONS

Specification	*Interply*	*Membrane*
I-3T4-DF190M	(2) Type 4	DuraFlex 190M
I-3T4-DF190FR	(2) Type 4	DuraFlex 190FR
I-3T4-DF250FR	(2) Type 4	DuraFlex 250FR
I-3T4-DFG4FR	(2) Type 4	DuraFlex G4FR
I-3T6-DF190M	(2) Type 6	DuraFlex 190M
I-3T6-DF190FR	(2) Type 6	DuraFlex 190FR
I-3T6-DF250FR	(2) Type 6	DuraFlex 250FR
I-3T6-DFG4FR	(2) Type 6	DuraFlex G4FR
I-3T6-DSG4MOP	(2) Type 6	DuraSTAR G4MOP



FOUR (4) PLY SBS SYSTEM
NAILABLE DECK



FOUR (4) PLY SBS SYSTEM
LIGHTWEIGHT CONCRETE DECK

GENERAL

Safety: Refer to Section 4, Part 14. DO NOT BEGIN INSTALLATION UNTIL THIS INFORMATION IS READ, UNDERSTOOD AND IMPLEMENTED.

MATERIALS

Material Requirements:

Base Sheet[1] ..... 1 ply
Interply[2] ..... 2 plies
DuraFlex® SBS Membrane[3] ..... 1 ply

[1] USP® Base or USP® NVB (Nailable Venting Base) or other U.S. Ply approved base sheets.
[2] Interply: USP® Type 4 or USP® Type 6
[3] DuraFlex® 190M, DuraFlex® 190FR, DuraFlex® 250FR, or DuraFlex® G4FR

APPLICATION

Refer to Section 4 – General Requirements, and Section 5 – Installation Requirements.

Base Sheet: Mechanically fastened one ply of base sheet over the deck. Lap the base sheet a minimum of 2" (5 cm) on the side laps and 4" (10 cm) on the end laps. Refer to Section 5, Part 8 and Part 12, Item 12.03 - Base Sheets, Mechanically Fastened.

Note: USP® Base may be used as a base sheet over newly poured lightweight and gypsum decks under certain conditions. Contact the U.S. Ply Technical Services Department at (817) 413-0103 for prior approval.

Interply: Install starter strips of 18" (45.7 cm) and 36" (91.4 cm) widths and follow with a second full 36" (91.4 cm) width sheet with a maximum of 17" (43.2 cm) exposure, applied shingle fashion. Lap felts 19" (48.3 cm) with a 17" (43.2 cm)exposure and lap 4" (10 cm) at ends. Stagger adjacent end laps a minimum of 18" (45.7 cm). Install the felts in full and uniform moppings of hot and fluid hot asphalt applied at the rate of 25 lb/square (1.2 kg/m²) per ply. Refer to Section 5, Part 6 – Asphalt and Part 12, Item 12.04 – Asphalt Mopping Base/Interply Sheets.

DuraFlex® Membrane: DuraFlex® Membrane Application Option 1: Install DuraFlex® SBS membrane over the base sheet, in a uniform mopping of hot and fluid asphalt applied at the rate of 25 lbs/square (1.2 kg/m²). Lap the membrane a minimum of 4" (10 cm) on side laps and 6" (15 cm) on end laps. Refer to Section 5, Part 6 – Asphalt and Part 12, Item 12.09 DuraFlex® SBS (mop applied) Membrane Application.

Option 2: Install DuraFlex® SBS membrane over the base sheet, using USP® 901 Premium Modified Adhesive. Lap the membrane a minimum of 4" (10 cm) on side laps and 6" (15 cm) on end laps. Refer to Section 5, Part 7 – Cold Adhesive, and Part 12, Item 12.10 DuraFlex® SBS (cold applied) Membrane Application.

Flashing and Accessories: Refer to Section 5, Part 13 – Flashing and Section 14 DuraFlex® Construction Details.

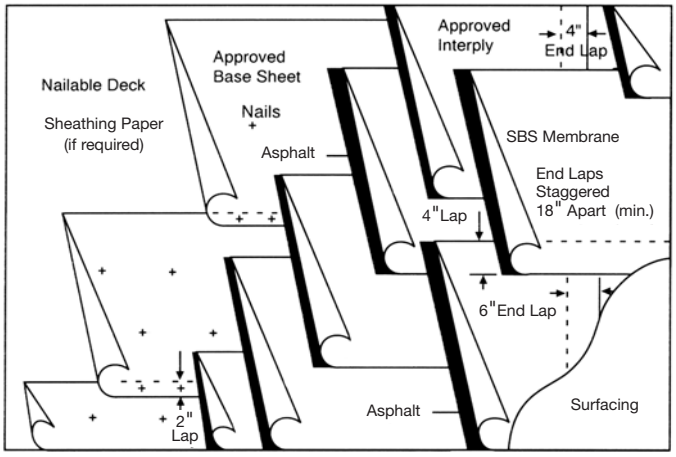
Surfacing: Refer to Section 5, Part 14 – Surfacing.

For additional information on this specification, guarantee requirements, etc. contact U.S. Ply Technical Services at (817) 413-0103.

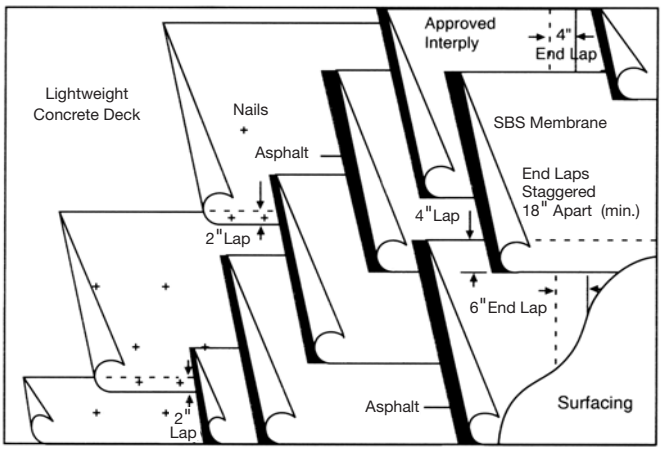
FIFTEEN YEAR GUARANTEE SPECIFICATIONS

Specification	*Base Sheet*	*Interply*	*Membrane*
N-4BT4-DF190M	Approved	(2) Type 4	DuraFlex 190M
N-4BT4-DF190FR	Approved	(2) Type 4	DuraFlex 190FR
N-4BT4-DF250FR	Approved	(2) Type 4	DuraFlex 250FR
N-4BT4-DFG4FR	Approved	(2) Type 4	DuraFlex G4FR
LWC-4VT4-DF190M	NVB	(2) Type 4	DuraFlex 190M
LWC-4VT4-DF190FR	NVB	(2) Type 4	DuraFlex 190FR
LWC-4VT4-DF250FR	NVB	(2) Type 4	DuraFlex 250FR
LWC-4VT4-DFG4FR	NVB	(2) Type 4	DuraFlex G4FR

SECTION 8 – DURAFLEX® SBS MOP/COLD APPLIED SPECIFICATIONS



FOUR (4) PLY SBS SYSTEM
NAILABLE DECK



FOUR (4) PLY SBS SYSTEM
LIGHTWEIGHT CONCRETE DECK

GENERAL
Safety: Refer to Section 4, Part 14. DO NOT BEGIN INSTALLATION UNTIL THIS INFORMATION IS READ, UNDERSTOOD AND IMPLEMENTED.

MATERIALS
Material Requirements:

Base Sheet[1] ..... 1 ply
Interply[2] ..... 2 plies
DuraFlex® SBS Membrane[3] ..... 1 ply

[1] USP® Base or USP® NVB (Nailable Venting Base) or other U.S. Ply approved base sheets.
[2] Interply: USP® Type 4 or USP® Type 6
[3] DuraFlex® 190M, DuraFlex® 190FR, DuraFlex® 250FR, DuraFlex® G4FR, or DuraSTAR G4MOP

APPLICATION
Refer to Section 4 - General Requirements, and Section 5 - Installation Requirements.

Base Sheet: Mechanically fastened one ply of base sheet over the deck. Lap the base sheet a minimum of 2" (5 cm) on the side laps and 4" (10 cm) on the end laps. Refer to Section 5, Part 8 and Part 12, Item 12.03 - Base Sheets, Mechanically Fastened.

Note: USP® Base may be used as a base sheet over newly poured lightweight and gypsum decks under certain conditions. Contact the U.S. Ply Technical Services Department at (817) 413-0103 at (817) 413-0103 for prior approval.

Interply: Install starter strips of 18" (45.7 cm) and 36" (91.4 cm) widths and follow with a second full 36" (91.4 cm) width sheet with a maximum of 17" (43.2 cm) exposure, applied shingle fashion. Lap felts 19" (48.3 cm) with a 17" (43.2 cm)exposure and lap 4" (10 cm) at ends. Stagger adjacent end laps a minimum of 18" (45.7 cm). Install the felts in full and uniform moppings of hot and fluid hot asphalt applied at the rate of 25 lb/square (1.2 kg/m²) per ply. Refer to Section 5, Part 6 – Asphalt and Part 12, Item 12.04 – Asphalt Mopping Base/Interply Sheets.

DuraFlex® Membrane Application Option 1: Install DuraFlex® SBS or DuraSTAR® SBS membrane over the base sheet, in a uniform mopping of hot and fluid asphalt applied at the rate of 25 lbs/square (1.2 kg/m²). Lap the membrane a minimum of 4" (10 cm) on side laps and 6" (15 cm) on end laps. Refer to Section 5, Part 6 – Asphalt and Part 12, Item 12.09 DuraFlex® SBS (mop applied) Membrane Application. Refer to Section 5, Part 12, Item 12.12 DuraSTAR® SBS (mop applied) Membrane Application.

Option 2: Install DuraFlex® SBS membrane over the base sheet, using USP® 901 Premium Modified Adhesive. Lap the membrane a minimum of 4" (10 cm) on side laps and 6" (15 cm) on end laps. Refer to Section 5, Part 7 – Cold Adhesive, and Part 12, Item 12.10 DuraFlex® SBS (cold applied) Membrane Application.

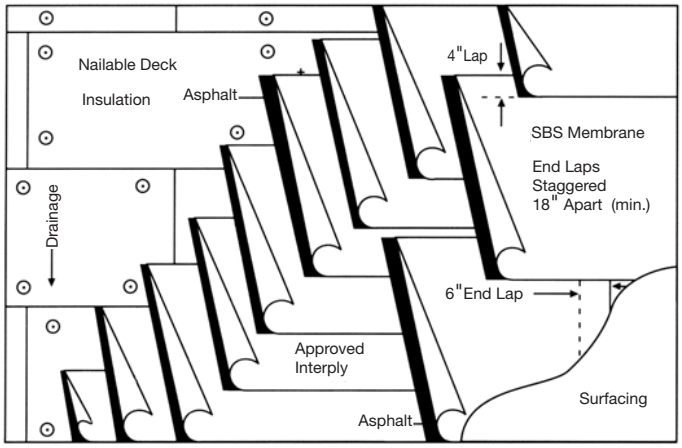
Flashing and Accessories: Refer to Section 5, Part 13 – Flashing and Section 14 DuraFlex® Construction Details.

Surfacing: Refer to Section 5, Part 14 – Surfacing.

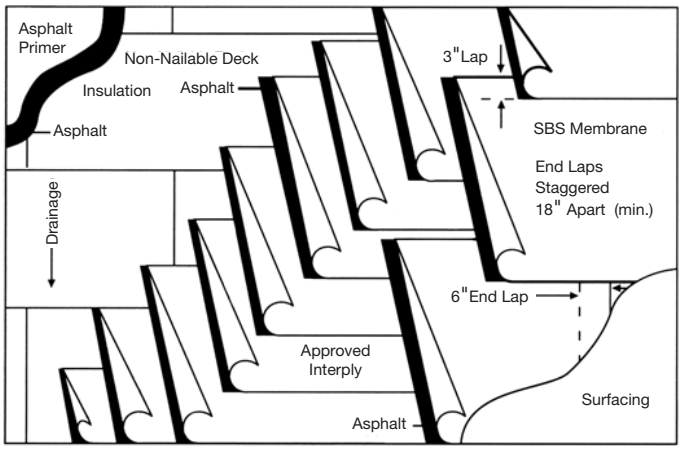
For additional information on this specification, guarantee requirements, etc. contact U.S. Ply Technical Services at (817) 413-0103

TWENTY YEAR GUARANTEE SPECIFICATIONS

Specification	*Base Sheet*	*Interply*	*Membrane*
N-4BT6-DF190M	Approved	(2) Type 6	DuraFlex 190M
N-4BT6-DF190FR	Approved	(2) Type 6	DuraFlex 190FR
N-4BT6-DF250FR	Approved	(2) Type 6	DuraFlex 250FR
N-4BT6-DFG4FR	Approved	(2) Type 6	DuraFlex G4FR
N-4BT6-DSG4MOP	Approved	(2) Type 6	DuraSTAR G4MOP
LWC-4VT6-DF190M	NVB	(2) Type 6	DuraFlex 190M
LWC-4VT6-DF190FR	NVB	(2) Type 6	DuraFlex 190FR
LWC-4VT6-DF250FR	NVB	(2) Type 6	DuraFlex 250FR
LWC-4VT6-DFG4FR	NVB	(2) Type 6	DuraFlex G4FR
LWC-4VT6-DSG4MOP	NVB	(2) Type 6	DuraSTAR G4MOP



FOUR (4) PLY SBS SYSTEM
NAILABLE DECK/INSULATION *Figure 1*



FOUR (4) PLY SBS SYSTEM
NON-NAILABLE DECK/INSULATION *Figure 2*

GENERAL
Safety: Refer to Section 4, Part 14. DO NOT BEGIN INSTALLATION UNTIL THIS INFORMATION IS READ, UNDERSTOOD AND IMPLEMENTED.

MATERIALS
Material Requirements:

Approved Insulation
Roofing Asphalt ..... 25 lb (1.2 kg/m²) per ply
Interply[1] ..... 3 plies
DuraFlex® SBS Membrane[2] ..... 1 ply

[1] Interply: USP® Type 4 or USP® Type 6
[2] DuraFlex® 190M, DuraFlex® 190FR, DuraFlex® 250FR, DuraFlex® G4FR, or DuraSTAR G4MOP

APPLICATION
Refer to Section 4 – General Requirements, and Section 5 - Installation Requirements.

Note: Polyisocyanurate insulation boards require a minimum ¼" overlay of SecuRock or ½" wood fiber insulation prior to mopping base.

Insulation Installation Over Nailable Decks (see Figure 1): Mechanically fasten insulation to the deck with the joints staggered in one direction. Refer to Section 5, Part 8 – Fastening and Part 11 – Insulation Installation.

Insulation Installation Over Non-Nailable Decks (see Figure 2): Prime the deck with ASTM D41 asphalt primer applied at a rate of 1 gal/square (0.4 L/m²). Hold primer back 6" (15 cm) from concrete deck joints. Install insulation over the deck in a uniform mopping of hot and fluid asphalt applied at the rate of 25 – 30 lbs/square (1.2 – 1.5 kg/m²) Refer to Section 5, Part 6 – Asphalt and Part 11, Item 11.03 – Non-Nailable Substrates or install insulation over the deck in compatible insulation adhesive. Install insulation with joints staggered in one direction. Refer to Section 5, Part 11, Item 11.05, Foam Adhesive Insulation Installation.

DuraFlex® Membrane Application: Install DuraFlex® SBS or DuraSTAR® SBS membrane over the base sheet, in a uniform mopping of hot and fluid asphalt applied at the rate of 25 lbs/square (1.2 kg/m²). Lap the membrane a minimum of 4" (10 cm) on side laps and 6" (15 cm) on end laps. Refer to Section 5, Part 6 – Asphalt and Part 12, Item 12.09 DuraFlex® SBS (mop applied) Membrane Application. Refer to Section 5, Part 12, Item 12.12 DuraSTAR® SBS (mop applied) Membrane Application.

Flashing and Accessories: Refer to Section 5, Part 13 – Flashing and Section 14 DuraFlex® Construction Details.

Surfacing: Refer to Section 5, Part 14 – Surfacing.

For additional information on this specification, guarantee requirements, etc. contact U.S. Ply Technical Services ***at (817) 413-0103***

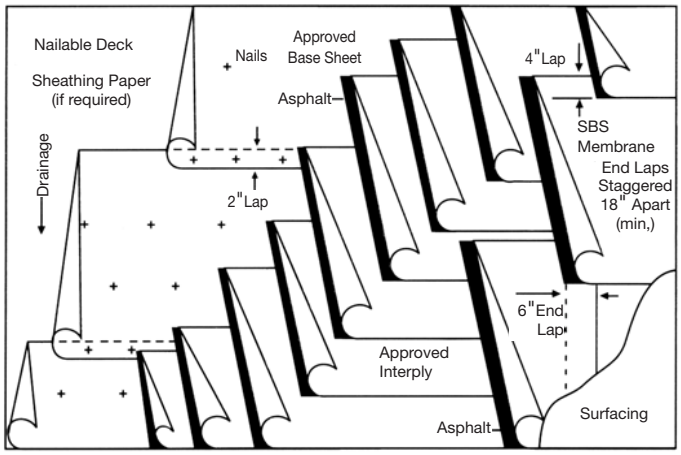
FIFTEEN YEAR GUARANTEE SPECIFICATIONS

Specification	*Interply*	*Membrane*
I-4T4-DF190M	(3) Type 4	DuraFlex 190M
I-4T4-DF190FR	(3) Type 4	DuraFlex 190FR
I-4T4-DF250FR	(3) Type 4	DuraFlex 250FR
I-4T4-DFG4FR	(3) Type 4	DuraFlex G4FR

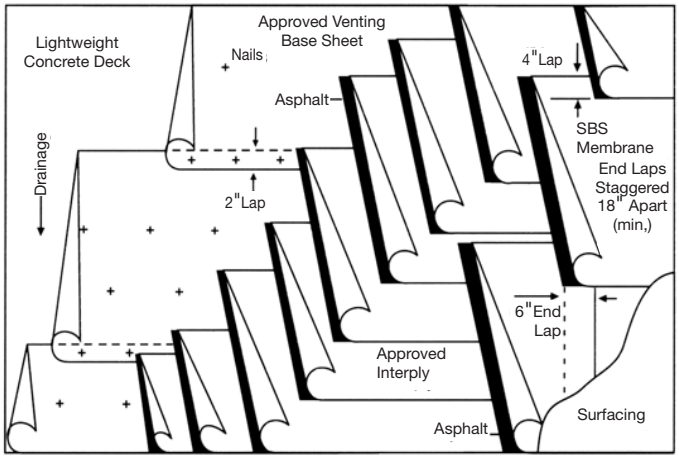
TWENTY YEAR GUARANTEE SPECIFICATIONS

Specification	*Interply*	*Membrane*
I-4T6-DF190M	(3) Type 6	DuraFlex 190M
I-4T6-DF190FR	(3) Type 6	DuraFlex 190FR
I-4T6-DF250FR	(3) Type 6	DuraFlex 250FR
I-4T6-DFG4FR	(3) Type 6	DuraFlex G4FR
I-4T6-DSG4MOP	(3) Type 6	DuraSTAR G4MOP

SECTION 8 – DURAFLEX® SBS MOP/COLD APPLIED SPECIFICATIONS



FIVE (5) PLY SBS SYSTEM
NAILABLE DECK *Figure 1*



FIVE (5) PLY SBS SYSTEM
LIGHTWEIGHT CONCRETE DECK *Figure 2*

GENERAL

Safety: Refer to Section 4, Part 14. DO NOT BEGIN INSTALLATION UNTIL THIS INFORMATION IS READ, UNDERSTOOD AND IMPLEMENTED.

MATERIALS

Material Requirements:

Base Sheet[1] ..... 1 ply
Interply[2] ..... 3 plies
DuraFlex® SBS Membrane[3] ..... 1 ply

[1] USP® Base or USP® NVB (Nailable Venting Base) or other U.S. Ply approved base sheets.
[2] Interply: USP® Type 4 or USP® Type 6
[3] DuraFlex® 190M, DuraFlex® 190FR, DuraFlex® 250FR, DuraFlex® G4FR, or DuraSTAR G4 MOP

APPLICATION

Refer to Section 4 - General Requirements, and Section 5 - Installation Requirements.

Base Sheet: Mechanically fastened one ply of base sheet over the deck. Lap the base sheet a minimum of 2" (5 cm) on the side laps and 4" (10 cm) on the end laps. Refer to Section 5, Part 8 and Part 12, Item 12.03 - Base Sheets, Mechanically Fastened.

Note: USP® Base may be used as a base sheet over newly poured lightweight and gypsum decks under certain conditions. Contact the U.S. Ply Technical Services Department at (817) 413-0103 for prior approval.

Interply: Install starter strips of 12" (30.5 cm), 24" (61 cm) and 36" (91.4 cm) widths and follow with a second full 36" (91.4 cm) width sheet with a maximum of 11- 1/3" (28.8 cm) exposure, applied shingle fashion. Lap felts 24-2/3" (62.7 cm) with a 11- 1/3" (28.8 cm) exposure and lap 4" (10 cm) at ends. Stagger adjacent end laps a minimum of 18" (45.7 cm). Install the felts in full and uniform moppings of hot and fluid hot asphalt applied at the rate of 25 lb/square (1.2 kg/m²) per ply. Refer to Section 5, Part 6 – Asphalt and Part 12, Item 12.04 – Asphalt Mopping Base/Interply Sheets.

DuraFlex® Membrane: Install DuraFlex® SBS or DuraSTAR® SBS membrane over the base sheet, in a uniform mopping of hot and fluid asphalt applied at the rate of 25 lbs/square (1.2 kg/m²). Lap the membrane a minimum of 4" (10 cm) on side laps and 6" (15 cm) on end laps. Refer to Section 5, Part 6 – Asphalt and Part 12, Item 12.09 DuraFlex® SBS (mop applied) Membrane Application. Refer to Section 5, Part 12, Item 12.12 DuraSTAR® SBS (mop applied) Membrane Application.

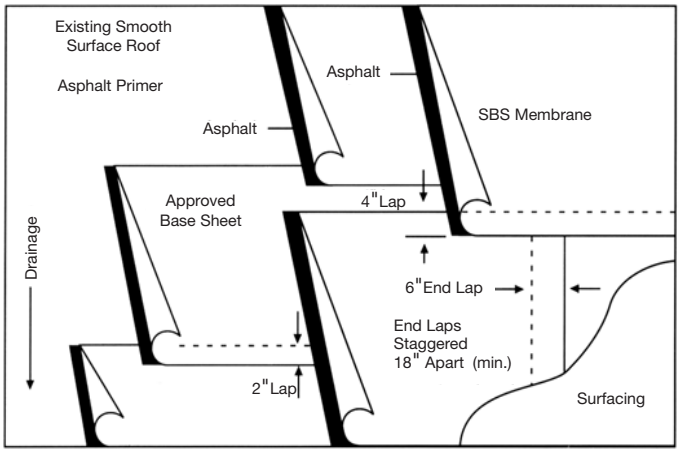
Flashing and Accessories: Refer to Section 5, Part 13 – Flashing and Section 14 DuraFlex® Construction Details.

Surfacing: Refer to Section 5, Part 14 – Surfacing.

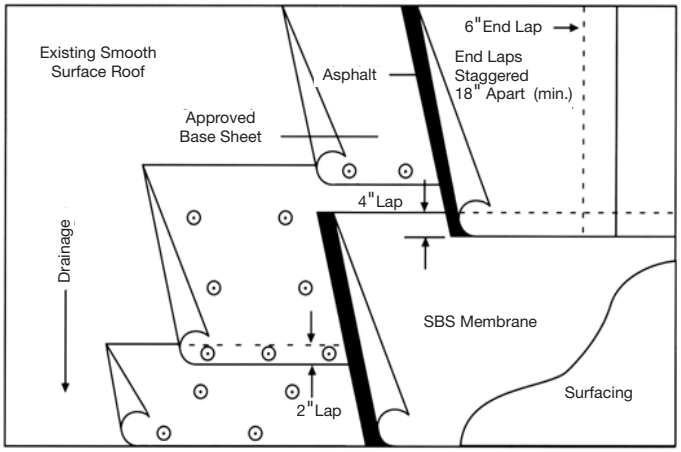
For additional information on this specification, guarantee requirements, etc. contact U.S. Ply Technical Services at (817) 413-0103.

TWENTY YEAR GUARANTEE SPECIFICATIONS

Specification	*Base Sheet*	*Interply*	*Membrane*
N-5BT6-DF190M	Approved	(3) Type 6	DuraFlex 190M
N-5BT6-DF190FR	Approved	(3) Type 6	DuraFlex 190FR
N-5BT6-DF250FR	Approved	(3) Type 6	DuraFlex 250FR
N-5BT6-DFG4FR	Approved	(3) Type 6	DuraFlex G4FR
N-5BT6-DSG4MOP	Approved	(3) Type 6	DuraSTAR G4MOP
LWC-5VT6-DF190M	NVB	(3) Type 6	DuraFlex 190M
LWC-5VT6-DF190FR	NVB	(3) Type 6	DuraFlex 190FR
LWC-5VT6-DF250FR	NVB	(3) Type 6	DuraFlex 250FR
LWC-5VT6-DFG4FR	NVB	(2) Type 6	DuraFlex G4FR
LWC-5VT6-DSG4MOP	NVB	(3) Type 6	DuraSTAR G4MOP



TWO (2) PLY SBS SYSTEM
EXISTING SMOOTH SURFACE ROOF *Figure 1*



TWO (2) PLY SBS SYSTEM
EXISTING SMOOTH SURFACE ROOF *Figure 2*

GENERAL

Safety: Refer to Section 4, Part 14. DO NOT BEGIN INSTALLATION UNTIL THIS INFORMATION IS READ, UNDERSTOOD AND IMPLEMENTED.

MATERIALS

Material Requirements:

Roofing Asphalt
Base Sheet[1] ..... 1 ply
DuraFlex® SBS Membrane[2] ..... 1 ply

[1] USP® Base or USP® NVB (Nailable Venting Base) or other U.S. Ply approved base sheets.

[2] DuraFlex® 190M, DuraFlex® 190FR, DuraFlex® 250FR, or DuraFlex® G4FR

APPLICATION

Refer to Section 4 – General Requirements, and Section 5 - Installation Requirements.

Existing Surface Preparation: Refer to Section 4, Part 10 – Recover and Reroofing; Section 5 Part 3 – Inspection and Preparation of Surfaces, and Part 8 – Fastening.

NOTE: If the base sheet is to be mopped, prime the existing smooth surface asphalt roof with ASTM D 41 asphalt primer applied at the rate of 1 gal/square (0.4 L/m²) minimum. If the existing smooth surfaced asphalt roof does not present a suitable substrate for direct application of the base sheet or its adequacy of attachment to the roof deck is in question, then mechanically fasten the base sheet over the existing roof system prior to installation of the DuraFlex® SBS Membrane (see Figure 2).

Base Sheet Option 1: Install base sheet over the properly prepared existing smooth surface asphalt roof, in a uniform mopping of hot asphalt applied at a rate of 25 lb/square (1.2 kg/m²). Lap the sheet a minimum of 2" (5 cm) on side laps, and 4" (10 cm) on the end laps. Refer to Section 5, Part 6 – Asphalt and Part 12, Item 12.04 – Asphalt Mopping Base/Interply Sheets.

Option 2: Install base sheet, over the properly prepared existing smooth surface asphalt roof, in a uniform application of USP® 901 Premium Modified Adhesive applied at the rate of 1.5 – 2 gallons per 100 ft² (0.6 – 0.8 L/m²). Lap the sheets a minimum of 2" (5 cm) on the side laps and 4" (10 cm) on the end laps. Refer to Section 5, Part 7 – Cold Adhesive and Part 12, Item 12.05 Base/Interply Sheets Cold Adhesive Application.

Option 3 (see Figure 2): Mechanically fasten one ply of base sheet over the existing roof to the deck. Lap sheet a minimum of 2" (5 cm) on side laps and 4" (10 cm) on the end laps. Refer to Section 5, Part 8 – Fastening and Part 12, Item 12.03 – Base Sheets, Mechanically Fastened.

DuraFlex® Membrane Application Option 1: Install DuraFlex® SBS membrane……Refer to Section 5, Part 6 – Asphalt, and Part 12, Item 12.09 DuraFlex® SBS (mop applied) Membrane Application. Option 2: Install DuraFlex® SBS membrane over the base sheet, using USP® 901 Premium Modified Adhesive. Lap the membrane a minimum of 4" (10 cm) on side laps and 6" (15 cm) on end laps. Refer to Section 5, Part 7 – Cold Adhesive, and Part 12, Item 12.10 DuraFlex® SBS (cold applied) Membrane Application.

Flashing and Accessories: Refer to Section 5, Part 13 – Flashing and Section 14 DuraFlex® Construction Details.

Surfacing: Refer to Section 5, Part 14 – Surfacing.

For additional information on this specification, guarantee requirements, etc, contact U.S. Ply Technical Services at (817) 413-0103.

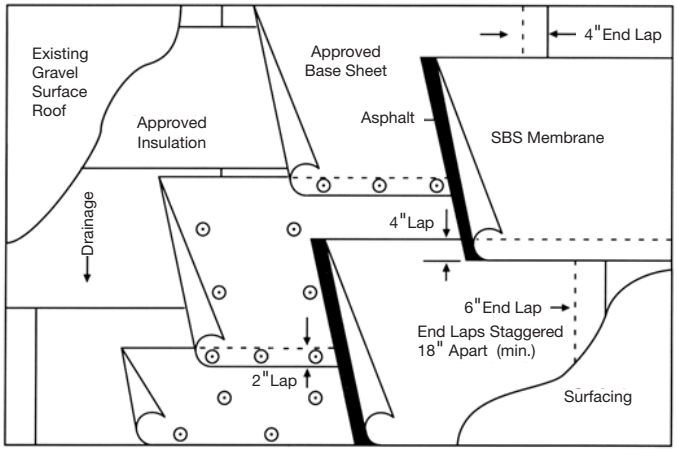
TEN YEAR GUARANTEE SPECIFICATIONS

Specification	*Base Sheet*	*Membrane*
RS-2B-DFG4FR	Approved	DuraFlex G4FR

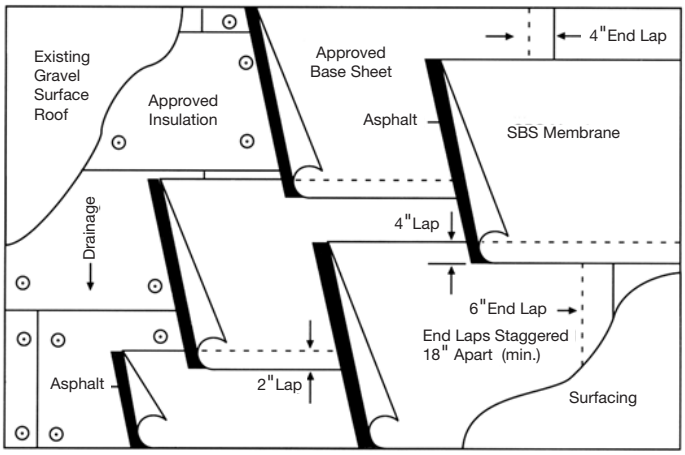
TWELVE YEAR GUARANTEE SPECIFICATIONS

Specification	*Base Sheet*	*Membrane*
RS-2B-DF190M	Approved	DuraFlex 190M
RS-2B-DF190FR	Approved	DuraFlex 190FR
RS-2B-DF250FR	Approved	DuraFlex 250FR

SECTION 8 – DURAFLEX® SBS MOP/COLD APPLIED SPECIFICATIONS



TWO (2) PLY SBS SYSTEM
EXISTING GRAVEL SURFACE ROOF/INSULATION *Figure 1*



TWO (2) PLY SBS SYSTEM
EXISTING GRAVEL SURFACE ROOF/INSULATION *Figure 1*

GENERAL

Safety: Refer to Section 4, Part 14. DO NOT BEGIN INSTALLATION UNTIL THIS INFORMATION IS READ, UNDERSTOOD AND IMPLEMENTED.

MATERIALS

Material Requirements:

Approved Insulation
Roofing Asphalt or Cold Adhesive (if applicable)
Base Sheet[1] ..... 1 ply
DuraFlex® SBS Membrane[2] ..... 1 ply

[1] USP® Base or other U.S. Ply approved base sheets.
[2] DuraFlex® 190M, DuraFlex® 190FR, DuraFlex® 250FR, or DuraFlex® G4FR

Note: Polyisocyanurate insulation boards require a minimum ¼" overlay of SecuRock or ½" wood fiber insulation prior to mopping base.

APPLICATION

Refer to Section 4 – General Requirements, and Section 5 - Installation Requirements.

Existing Gravel Roof Surface Preparation: Refer to Section 4, Part 10 – Recover and Reroofing; Section 5, Part 3 – Inspection and Preparation of Surfaces, and Part 6 – Fastening.

Insulation Over Existing Gravel Surface Roof (see Figure 1) see Base Sheet Option 1: Mechanically fasten insulation and base sheet simultaneously, through the properly prepared existing gravel surfaced roof to the deck with the joints staggered in one direction. **Option 2 (see Figure 2):** Mechanically fasten insulation through the existing gravel surfaced roof to the deck with the joints staggered in one direction. Refer to Section 5, Parts 8 – Fastening, 11 – Insulation Installation, and 12 – Membrane System Installation.

Base Sheet Option1: Insulation and Base Sheet are fastened simultaneously. Mechanically fastened one ply of base sheet over the insulation to the deck. Lap the base sheet a minimum of 2" (5 cm) on the side lap and 4" (cm) on ends. Screws and plates are then installed in three rows. The first row (on the seam) will be 1-1/2" (3.75 cm) from the leading edge and on 12" (30 cm) centers. Locate the second row of fasteners 12" (30 cm) from the leading edge and on 18" (45.7 cm) centers. The third row of fasteners shall be 24" (60 cm) from the leading edge on 18" (45.7 cm) centers. The centers for the second and third rows should be staggered. Refer to Section 5, Part 8 and Part 12, Item 12.03 - Base Sheets, Mechanically Fastened.

Base Sheet Option 2: Install base sheet, over insulation, in a uniform mopping of hot and fluid asphalt applied at the rate of 25 lbs/square (1.2 kg/m²). Lap the sheets a minimum of 2" (5 cm) on side laps and 4" (10 cm) on end laps. Refer to Section 5, Part 6 – Asphalt and Part 12, Item 12.04 – Asphalt Mopping Base/Interply Sheets.

Base Sheet Option 3: Install base sheet, over insulation, in a uniform application of USP® 901 Premium Modified Adhesive applied at the rate of 1.5 – 2 gallons per 100 ft² (0.6 – 0.8 L/m²). Lap the sheets a minimum of 2" (5 cm) on the side laps and 4" (10 cm) on the end laps. Refer to Section 5, Part 7 – Cold Adhesive and Part 12, Item 12.05 Base/Interply Sheets Cold Adhesive Application.

DuraFlex® Membrane Application Option 1: Install DuraFlex® SBS membrane over the base sheet, in a uniform mopping of hot and fluid asphalt applied at the rate of 25 lbs/square (1.2 kg/m²). Lap the membrane a minimum of 4" (10 cm) on side laps and 6" (15 cm) on end laps. Refer to Section 5, Part 6 – Asphalt and Part 12, Item 12.09 DuraFlex® SBS (mop applied) Membrane Application.

Option 2: Install DuraFlex® SBS membrane over the base sheet, using USP® 901 Premium Modified Adhesive. Lap the membrane a minimum of 4" (10 cm) on side laps and 6" (15 cm) on end laps. Refer to Section 5, Part 7 – Cold Adhesive, and Part 12, Item 12.10 DuraFlex® SBS (cold applied) Membrane Application**.**

Flashing and Accessories: Refer to Section 5, Part 13 – Flashing and Section 14 DuraFlex® Construction Details**.**

Surfacing: Refer to Section 5, Part 14 – Surfacing.

For additional information on this specification, guarantee requirements, etc. contact U.S. Ply Technical Services at (817) 413-0103.

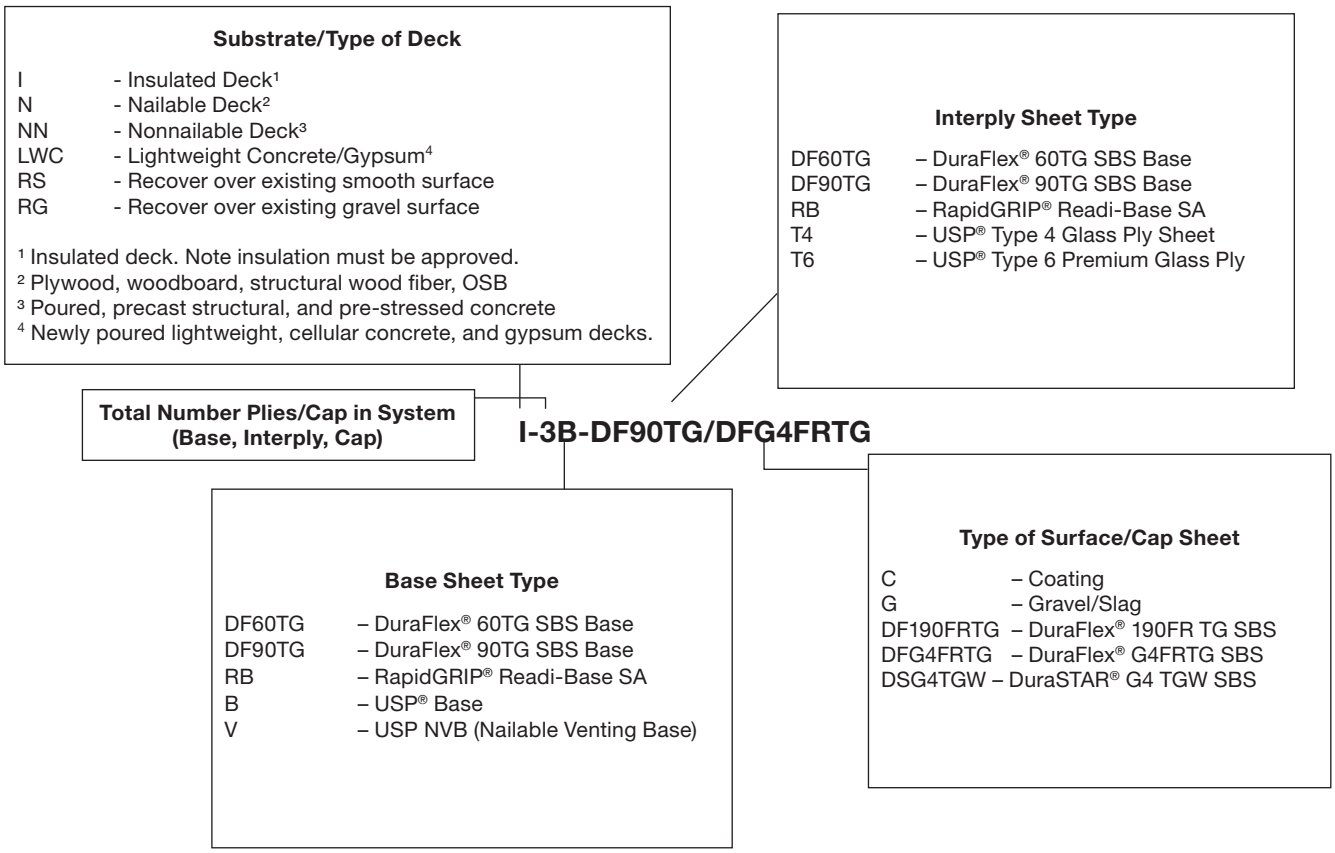
TEN YEAR GUARANTEE SPECIFICATIONS

Specification	*Base Sheet*	*Membrane*
RG-I-2B-DFG4FR	Approved	DuraFlex G4FR

TWELVE YEAR GUARANTEE SPECIFICATIONS

Specification	*Base Sheet*	*Membrane*
RG-I-2B-DF190M	Approved	DuraFlex 190M
RG-I-2B-DF190FR	Approved	DuraFlex 190FR
RG-I-2B-DF250FR	Approved	DuraFlex 250FR

Part 1 – DURAFLEX® SBS Torch Applied Key to Specification Numbers



Part 2 – DURAFLEX® SBS Torch Applied Specification Index

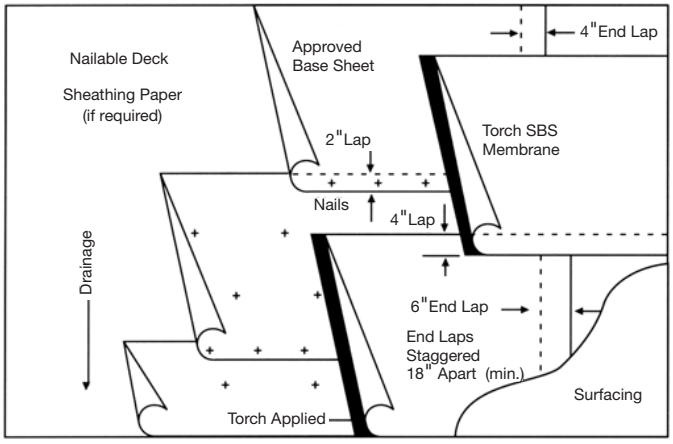
2.01 – DURAFLEX® SBS Torch Applied Ten and Twelve Year Guarantee Specifications (continued)

2.02 – DURAFLEX® SBS Torch Applied Fifteen Year Guarantee Specifications

DECK/ SUBSTRATE TYPE	*TOTAL NUMBER OF PLIES/CAP IN SYSTEM*	*SPECIFICATION NUMBER*	*SPECIFICATION CONFIGURATION*	*PAGE NUMBER*
NAILABLE	3	N-3B-DF60TG-DF190FRTG	BASE • DF60TG • DURAFLEX 190FRTG	96
	3	N-3B-DF60TG-DFG4FRTG	BASE • DF60TG • DURAFLEX G4FRTG	96
	3	N-3B-DF60TG-DSG4TGW	BASE • DF60TG • DURASTAR G4TGW	96
LIGHTWEIGHT, CELLULAR, OR GYPSUM	3	LWC-3B-DF60TG-DF190FRTG	NVB • DF60TG • DURAFLEX 190FRTG	96
	3	LWC-3B-DF60TG-DFG4FRTG	NVB • DF60TG • DURAFLEX G4FRTG	96
	3	LWC-3V-DF60TG-DSG4TGW	NVB • DF60TG • DURASTAR G4TGW	96
INSULATION				
	2	I-2-DF60TG-DF190FRTG*	DF60TG • DURAFLEX 190FRTG	95
	2	I-2-DF60TG-DFG4FRTG	DF60TG • DURAFLEX G4FRTG	95
	2	I-2-DF60TG-DSG4TGW	DF60TG • DURASTAR G4TGW	95

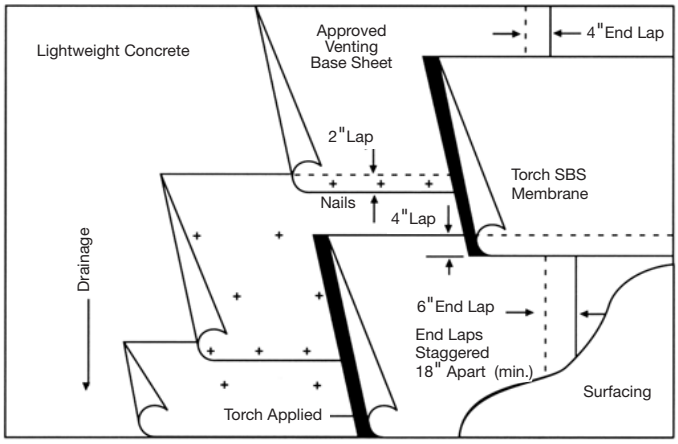
2.03 – DURAFLEX® SBS Torch Applied Twenty Year Guarantee Specifications

DECK/SUBSTRATE TYPE	*TOTAL NUMBER OF PLIES/CAP IN SYSTEM*	*SPECIFICATION NUMBER*	*SPECIFICATION CONFIGURATION*	*PAGE NUMBER*
NAILABLE	3	N-3B-DF90TG-DSG4TGW	BASE • DF90TG • DURASTAR G4TGW	96
	3	N-3B-DF90TG-DF190FRTG	BASE • DF90TG • DURAFLEX 190FRTG	96
	3	N-3B-DF90TG-DFG4FRTG	BASE • DF90TG • DURAFLEX G4FRTG	96
LIGHTWEIGHT, CELLULAR, OR GYPSUM	3	LWC-3V-DF90TG-DF190FRTG	NVB • DF90TG • DURAFLEX 190FRTG	96
	3	LWC-3V-DF90TG-DFG4FRTG	NVB • DF90TG • DURAFLEX G4FRTG	96
	3	LWC-3V-DF90TG-DSG4TGW	NVB • DF90TG • DURASTAR G4TGW	96
INSULATION				
	2	I-2-DF90TG-DF190FRTG	DF90TG • DURAFLEX 190FRTG	95
	2	I-2-DF90TG-DFG4FRTG	DF90TG • DURAFLEX G4FRTG	95
	2	I-2-DF90TG-DSG4TGW	DF90TG • DURASTAR G4TGW	95
	2	I-2-RB-DF190FRTG	READIBASE • DURAFLEX 190FRTG	95
	2	I-2-RB-DFG4FRTG	READIBASE • DURAFLEX G4FRTG	95
	2	I-2-RB-DSG4TGW	READIBASE • DURASTAR G4TGW	95
	4	I-4T6-DF190FRTG	(3) TYPE 6 • DURAFLEX 190FRTG	97
	4	I-4T6-DFG4FRTG	(3) TYPE 6 • DURAFLEX G4FRTG	97
	4	I-4T6-DSG4TGW	(3) TYPE 6 • DURASTAR G4TGW	97



TWO (2) PLY TORCH SBS SYSTEM
NAILABLE DECK

Figure 1



TWO (2) PLY TORCH SBS SYSTEM
LIGHTWEIGHT CONCRETE DECK

Figure 2

GENERAL

Safety: Refer to Section 4, Part 14. DO NOT BEGIN INSTALLATION UNTIL THIS INFORMATION IS READ, UNDERSTOOD AND IMPLEMENTED.

MATERIALS

Material Requirements:

Base Sheet[1] ..... 1 ply
DuraFlex® TG BS Membrane[2] ..... 1 ply

[1] USP® Base or USP® NVB (Nailable Venting Base) or other U.S. Ply approved base sheets.
[2]DuraFlex® 190 FRTG, DuraFlex® G4FRTG

APPLICATION

Refer to Section 4 – General Requirements, and Section 5 - Installation Requirements.

Base Sheet: Mechanically fasten one ply of base sheet over the deck. Lap sheets a minimum of 2" (5 cm) on side laps and 4" (10 cm) on the end laps. Refer to Section 5, Part 8 – Fastening and Part 12, Item 12.03 - Base Sheets, Mechanically Fastened.

Note: USP® Base may be used as a base sheet over newly poured lightweight and gypsum decks under certain conditions. Contact the U.S. Ply Technical Services Department at (817) 413-0103 for prior approval.

DuraFlex® TG SBS Membrane: Heat-weld DuraFlex® TG SBS membrane over the base sheet. Lap membrane a minimum of 4" (10 cm) on side laps and 6" (15 cm) on end laps. Refer to Section 5, Part 12, Item 12.11 – DuraFlex® SBS Torch Applied Membrane Application**.**

Flashing and Accessories: Refer to Section 5, Part 13 – Flashing, and Section 15 DuraFlex® TG SBS Construction Details

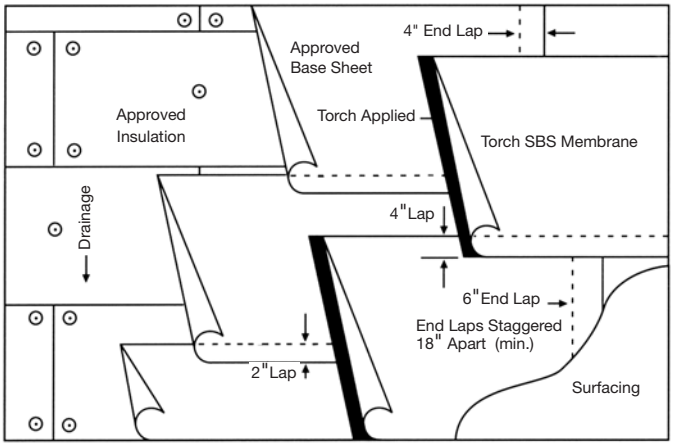
Surfacing: Refer to Section 5, Part 14 – Surfacing.

For additional information on this specification, guarantee requirements, etc. contact U.S. Ply Technical Services at (817) 413-0103.

TEN AND TWELVE YEAR GUARANTEE SPECIFICATIONS

Specification	*Base Sheet*	*Membrane*
N-2B-DF190FRTG	Approved	DuraFlex 190FRTG
N-2B-DFG4FRTG	Approved	DuraFlex G4FRTG
LWC-2V-DF190FRTG	NVB	DuraFlex 190FRTG
LWC-2V-DFG4FRTG	NVB	DuraFlex G4FRTG

SECTION 9 – DURAFLEX® SBS Torch Applied Specifications



TWO (2) PLY TORCH SBS SYSTEM
NAILABLE DECK/INSULATION

Figure 1

GENERAL

Safety: Refer to Section 4, Part 14. DO NOT BEGIN INSTALLATION UNTIL THIS INFORMATION IS READ, UNDERSTAND AND IMPLEMENTED.

MATERIALS

Material Requirements:

Approved Insulation
Roofing Asphalt or Insulation Adhesive (if applicable)
Base Sheet[1] .....1 ply
DuraFlex® SBS Membrane[2] .....1 ply

[1] USP® Base or other U.S. Ply approved base sheets.
[2]DuraFlex® 190 FRTG, DuraFlex® G4FRTG

APPLICATION

Refer to Section 4 – General Requirements, and Section 5 - Installation Requirements.

Insulation Installation Over Nailable Decks: Mechanically fasten insulation and base sheet simultaneously, to the deck with the joints staggered in one direction. Refer to Section 5, Part 8 – Fastening and Part 11 – Insulation Installation.

Base Sheet: Insulation and Base Sheet are fastened simultaneously. Mechanically fastened one ply of base sheet over the insulation. Lap the base sheet a minimum of 2" (5 cm) on the side lap and 4" (cm) on ends. Screws and plates are then installed in three rows. The first row (on the seam) will be 1-1/2" (3.75 cm) from the leading edge and on 12" (30 cm) centers. Locate the second row of fasteners 12" (30 cm) from the leading edge and on 18" (45.7 cm) centers. The third row of fasteners shall be 24" (60 cm) from the leading edge on 18" (45.7 cm) centers. The centers for the second and third rows should be staggered. Refer to Section 5, Part 8 and Part 12, Item 12.03 - Base Sheets, Mechanically Fastened.

DuraFlex® TG SBS Membrane: Heat-weld DuraFlex® TG SBS membrane over the base sheet. Lap membrane a minimum of 4" (10 cm) on side laps and 6" (15 cm) on end laps. Refer to Section 5, Part 12, Item 12.11 – DuraFlex® SBS Torch Applied Membrane Application.

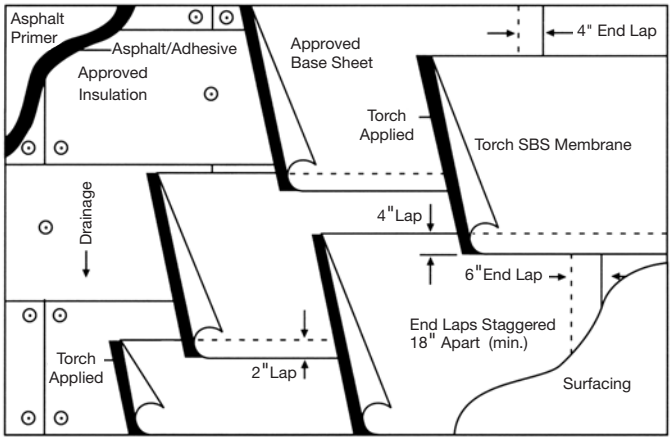
Flashing and Accessories: Refer to Section 5, Part 13 – Flashing, and Section 15 DuraFlex® TG SBS Construction Details.

Surfacing: Refer to Section 5, Part 14 – Surfacing.

For additional information on this specification, guarantee requirements, etc. contact U.S. Ply Technical Services at (817) 413-0103.

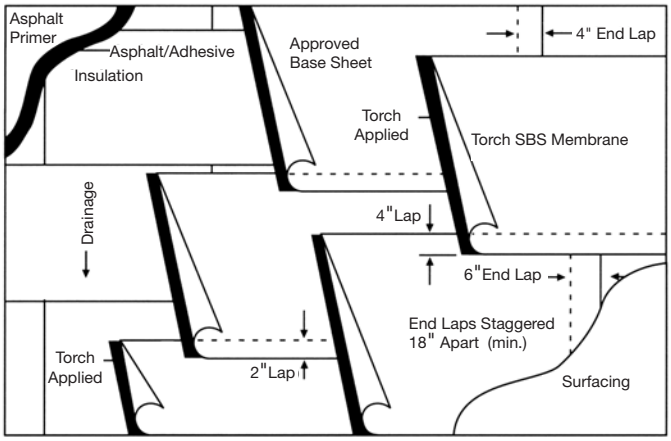
TEN AND TWELVE YEAR GUARANTEE SPECIFICATIONS

Specification	*Base Sheet*	*Membrane*
I-2B-DF190FRTG	Approved	DuraFlex 190FRTG
I-2B-DFG4FRTG	Approved	DuraFlex G4FRTG



TWO (2) PLY TORCH GRADE SBS SYSTEM NAILABLE DECK/INSULATION

Figure 1



TWO (2) PLY TORCH GRADE SBS SYSTEM NON-NAILABLE DECK/INSULATION

Figure 2

GENERAL

Safety: Refer to Section 4, Part 14. DO NOT BEGIN INSTALLATION UNTIL THIS INFORMATION IS READ, UNDERSTOOD AND IMPLEMENTED.

MATERIALS

Material Requirements:

Approved Insulation
Approved Coverboard: SecuRock® Board
Insulation Adhesive ..... (if applicable)
SBS Base Sheet[1] ..... 1 ply
DuraFlex® TG SBS Membrane[2] ..... 1 ply

[1] DuraFlex® 60TG, DuraFlex® 90TG, or RapidGRIP® Readi-Base SA.
[2] DuraFlex® 190FR TG, DuraFlex® G4FRTG, or DuraSTAR G4 TGW.

APPLICATION

Refer to Section 4 – General Requirements, and Section 5 - Installation Requirements.

Note: Polyisocyanurate insulation boards, require a minimum ¼" overlay with approved primed glass faced gypsum board.

Insulation Installation Over Nailable Decks: Mechanically fasten insulation to the deck with the joints staggered in one direction. Refer to Section 5, Part 8 – Fastening and Part 11 – Insulation Installation.

Insulation Installation Over Non-Nailable Decks (see Figure 2): Install insulation over the deck in compatible insulation adhesive. Install insulation with joints staggered in one direction. Refer to Section 5, Part 11, Item 11.05, Foam Adhesive Insulation Installation.

TG SBS Base Sheet: Heat-weld DuraFlex® TG SBS base sheet over the approved coverboard. Lap membrane a minimum of

4” (10 cm) on side laps and 6” (15 cm) on end laps. Refer to Section 5, Part 12, Item 12.11 – DuraFlex® SBS Torch Applied Membrane. Refer to Section 5, Part 12, Item 12.13 – DuraSTAR® SBS Torch Applied Membrane

Application.

SA Base Sheet: Install Readi-Base, over approved insulation system, using self- adhesive method with appropriate pressure roller. Lap the sheets at least 4” (10 cm) on sides and 6” (15 cm) on end laps. Refer to Section 5, Part 12, Item 12.06 – RapidGRIP® Readi-Base SA Base Sheet Application. Note: Warm weather conditions and exposure to direct sunlight are essential for proper adhesion. The self-adhesive compound will not activate if installed below the recommended temperatures and/or if the material temperature is below 70°F. Important: If the cap sheet is not to be installed the same day, then supplemental heating to the underside of the sheet may be necessary to activate the adhesive tack and accomplish desired mating to substrate.

DuraFlex® TG SBS Membrane: Heat-weld DuraFlex® TG SBS base sheet over the approved coverboard. Lap membrane a minimum of 4” (10 cm) on side laps and 6” (15 cm) on end laps. Refer to Section 5, Part 12, Item 12.11 – DuraFlex® SBS Torch Applied Membrane. Refer to Section 5, Part 12, Item 12.13 – DuraSTAR® SBS Torch Applied Membrane

Application.

Flashing and Accessories: Refer to Section 5, Part 13 – Flashing, and Section 15 DuraFlex® TG SBS Construction Details.

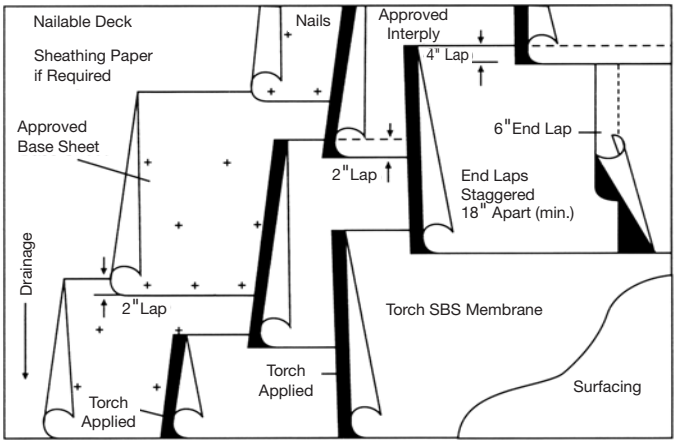
Surfacing: Refer to Section 5, Part 14 – Surfacing.

For additional information on this specification, guarantee requirements, etc. contact U.S. Ply Technical Services at (817) 413-0103.

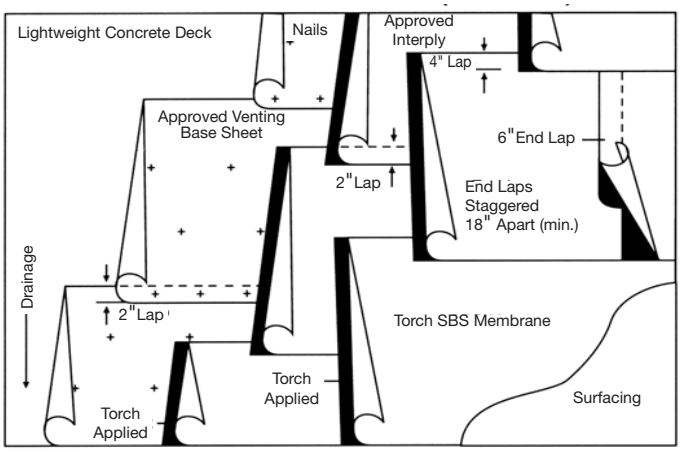
FIFTEEN AND TWENTY YEAR GUARANTEE SPECIFICATIONS

Specification	*Base Sheet*	*Membrane*
I-2-DF60TG-DF190FRTG	DuraFlex 60TG	DuraFlex 190FRTG
I-2-DF60TG-DFG4FRTG	DuraFlex 60TG	DuraFlex G4FRTG
I-2-DF60TG-DSG4TGW	DuraFlex 60TG	DuraSTAR G4TGW
I-2-DF90TG-DF190FRTG	DuraFlex 90TG	DuraFlex 190FRTG
I-2-DF90TG-DFG4FRTG	DuraFlex 90TG	DuraFlex G4FRTG
I-2-DF90TG-DSG4TGW	DuraFlex 90TG	DuraSTAR G4TGW
I-2-RB-DF190FRTG	Readi-Base SA	DuraFlex 190FRTG
I-2-RB-DFG4FRTG	Readi-Base SA	DuraFlex G4FRTG
I-2-RB-DSG4TGW	Readi-Base SA	DuraSTAR G4TGW

SECTION 9 – DURAFLEX® SBS Torch Applied Specifications



THREE (3) TORCH PLY SBS SYSTEM NAILABLE DECK *Figure 1*



THREE (3) PLY TORCH SBS SYSTEM LIGHTWEIGHT CONCRETE DECK *Figure 2*

GENERAL
Safety: Refer to Section 4, Part 14. DO NOT BEGIN INSTALLATION UNTIL THIS INFORMATION IS READ, UNDERSTOOD AND IMPLEMENTED.

MATERIALS
Material Requirements:

Base Sheet[1] ..... 1 ply
DuraFlex® TG SBS Interply[2]..... 1 ply
DuraFlex® TG SBS Membrane[3] ..... 1 ply

[1] USP® Base or USP® NVB (Nailable Venting Base) or other U.S. Ply approved base sheets.
[2] DuraFlex® 60TG or DuraFlex® 90TG
[3] DuraFlex® 190FR TG, DuraFlex® G4FRTG, or DuraSTAR G4TGW.

APPLICATION
Refer to Section 4 – General Requirements, and Section 5 - Installation Requirements.

Base Sheet: Mechanically fasten one ply of base sheet over the deck. Lap sheets a minimum of 2" (5 cm) on side laps and 4" (10 cm) on the end laps. Refer to Section 5, Part 8 – Fastening and Part 12, Item 12.03 - Base Sheets, Mechanically Fastened.

Note: USP® Base may be used as a base sheet over newly poured lightweight and gypsum decks under certain conditions. Contact U.S. Ply Technical Services Department **(817) 413-0103** for prior approval.

Torch Grade SBS Base Sheet: Heat-weld DuraFlex® TG SBS base sheet over the base sheet. Lap membrane a minimum of 4" (10 cm) on side laps and 6" (15 cm) on end laps. Refer to Section 5, Part 12, Item 12.11 – DuraFlex® SBS Torch Applied Membrane Application.

DuraFlex® TG SBS Membrane: Heat-weld DuraFlex® TG SBSmembrane over the base sheet. Lap membrane a minimum of 4"(10 cm) on side laps and 6" (15 cm) on end laps. Refer to Section 5, Part 12, Item 12.11 – DuraFlex® SBS Torch Applied Membrane Application. Refer to Section 5, Part 12, Item 12.13 – DuraSTAR® SBS Torch Applied Membrane

Application.

Flashing and Accessories: Refer to Section 5, Part 13 – Flashing, and Section 15 DuraFlex® TG SBS Construction Details.

Surfacing: Refer to Section 5, Part 14 – Surfacing.

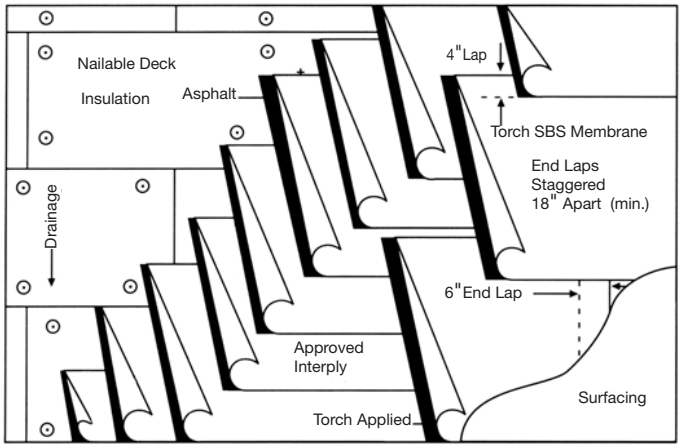
For additional information on this specification, guarantee requirements, etc. contact U.S. Ply Technical Services ***at (817) 413-0103***

FIFTEEN YEAR GUARANTEE SPECIFICATIONS

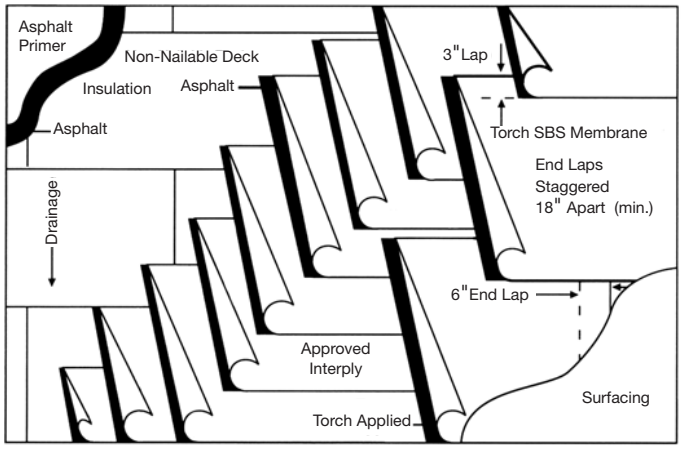
Specification	*Base Sheet*	*Interply*	*Membrane*
N-3B-DF60TG-DF190FRTG	Approved	DuraFlex 60TG	DuraFlex 190FRTG
N-3B-DF60TG-DFG4FRTG	Approved	DuraFlex 60TG	DuraFlex G4FRTG
N-3B-DF60TG-DSG4TGW	Approved	DuraFlex 60TG	DuraSTAR G4TGW
LWC-3V-DF60TG-DF190FRTG	NVB	DuraFlex 60TG	DuraFlex 190FRTG
LWC-3V-DF60TG-DFG4FRTG	NVB	DuraFlex 60TG	DuraFlex G4FRTG
LWC-3V-DF60TG-DSG4TGW	NVB	DuraFlex 60TG	DuraSTAR G4TGW

TWENTY YEAR GUARANTEE SPECIFICATIONS

Specification	*Base Sheet*	*Interply*	*Membrane*
N-3B-DF90TG-DF190FRTG	Approved	DuraFlex 90TG	DuraFlex 190FRTG
N-3B-DF90TG-DFG4FRTG	Approved	DuraFlex 90TG	DuraFlex G4FRTG
N-3B-DF90TG-DSG4TGW	Approved	DuraFlex 90TG	DuraSTAR G4TGW
N-3B-DF190STG-DF190FRTG	Approved	DuraFlex 190STG	DuraFlex 190FRTG
N-3B-DF190STG-DFG4FRTG	Approved	DuraFlex 190STG	DuraFlex G4FRTG
LWC-3V-DF90TG-DF190FRTG	NVB	DuraFlex 90TG	DuraFlex 190FRTG
LWC-3V-DF90TG-DFG4FRTG	NVB	DuraFlex 90TG	DuraFlex G4FRTG
LWC-3V-DF90TG-DSG4TGW	NVB	DuraFlex 90TG	DuraSTAR G4TGW
LWC-3V-DF190STG-DF190FRTG	NVB	DuraFlex 190STG	DuraFlex 190FRTG
LWC-3V-DF190STG-DFG4FRTG	NVB	DuraFlex 190STG	DuraFlex G4FRTG



FOUR (4) PLY TORCH SBS SYSTEM
NAILABLE DECK/INSULATION *Figure 1*



FOUR (4) TORCH PLY SBS SYSTEM
NON-NAILABLE DECK/INSULATION *Figure 2*

GENERAL

Safety: Refer to Section 4, Part 14. DO NOT BEGIN INSTALLATION UNTIL THIS INFORMATION IS READ, UNDERSTOOD AND IMPLEMENTED.

MATERIALS

Material Requirements:

Approved Insulation
Roofing Asphalt or Insulation Adhesive (if applicable)
Interply Membrane[1]..... 3 ply
DuraFlex® TG SBS Membrane[2] ..... 1 ply

[1] Interply: USP® Type 4 or USP® Type 6
[2] DuraFlex® 190FR TG, DuraFlex® G4FRTG, or DuraSTAR G4TGW.
.

APPLICATION

Refer to Section 4 – General Requirements, and Section 5 - Installation Requirements.

Note: Polyisocyanurate insulation boards, require a minimum ½" overlay (wood fiber) insulation prior to mopping base.

Insulation Installation Over Nailable Decks: Mechanically fasten insulation to the deck with the joints staggered in one direction. Refer to Section 5, Part 8 – Fastening and Part 11 – Insulation Installation.

Insulation Installation Over Non-Nailable Decks (see Figure 2): Prime the deck with ASTM D41 asphalt primer applied at a rate of 1 gal/square (0.4 L/m²). Hold primer back 6" (15 cm) from concrete deck joints. Install insulation over the deck in a uniform mopping of hot and fluid asphalt applied at the rate of 25 – 30 lbs/square (1.2 – 1.5 kg/m²). Refer to Section 5, 6 – Asphalt and Part 11, Item 11.03 – Non-Nailable Substrates or install insulation over the deck in compatible insulation adhesive. Install insulation with joints staggered in one direction. Refer to Section 5, Part 11, Item 11.05, Foam Adhesive Insulation Installation.

Interply: Install starter strips of 12", 24" and 36" widths and follow with a second full 36" width sheet with a maximum of 11⅓" exposure, applied shingle fashion. Lap felts 24⅔" with a 11⅓" exposure and lap 4" at ends. Stagger adjacent end laps a minimum of 18". Install the felts in full and uniform moppings of hot and fluid hot asphalt applied at the rate of 25 lb/square (1.2 kg/m²) per ply. Refer to Section 5, Part 6 – Asphalt and Part 12, Item 12.04 – Asphalt Mopping Base/Interply Sheets.

DuraFlex® TG SBS Membrane: Heat-weld DuraFlex® TG SBS membrane over the base sheet. Lap membrane a minimum of 4" (10 cm) on side laps and 6" (15 cm) on end laps. Refer to Section 5, Part 12, Item 12.11 – DuraFlex® SBS Torch Applied Membrane Application. Refer to Section 5, Part 12, Item 12.13 – DuraSTAR® SBS Torch Applied Membrane

Application.

Flashing and Accessories: Refer to Section 5, Part 13 – Flashing, and Section 15 DuraFlex® TG SBS Construction Details.

Surfacing: Refer to Section 5, Part 14 – Surfacing.

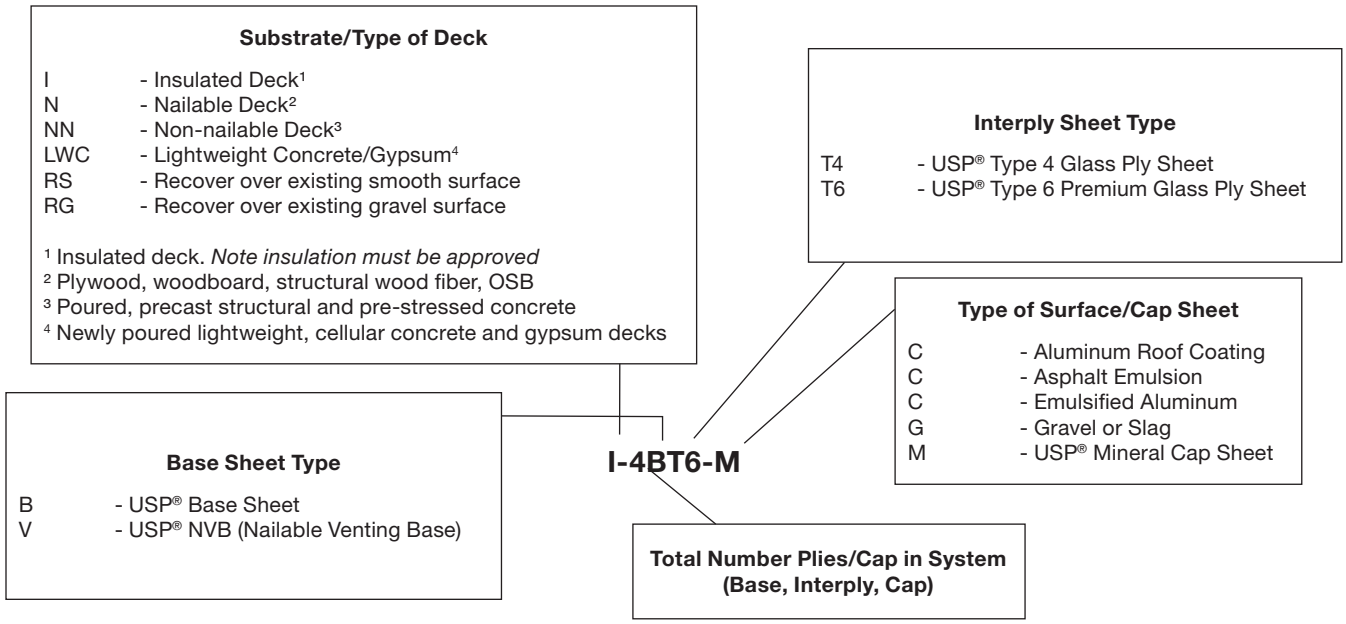
For additional information on this specification, guarantee requirements, etc. contact U.S. Ply Technical Services ***at (817) 413-0103***

TWENTY YEAR GUARANTEE SPECIFICATIONS

Specification	*Interply*	*Membrane*
I-4T6-DF190FRTG	(3) Type 6	DuraFlex 190FRTG
I-4T6-DFG4FRTG	(3) Type 6	DuraFlex G4FRTG
I-4T6-DSG4TGW	(3) Type 6	DuraSTAR G4TGW

SECTION 10 – USP® Built-Up Specifications

Part 1 – USP® Built-Up Roofing Key to Specification Numbers



Part 2 – USP® Built-Up Roofing Specification Index

2.01 – USP® Built-Up Roof Five and Ten Year Guarantee Specifications

DECK/SUBSTRATE TYPE	*SURFACING*	*SPECIFICATION NUMBER*	*ZONE*	*SPECIFICATION CONFIGURATION*	*PAGE NUMBER*
INSULATION	COATING	I-3T4-C*	ALL	INSULATION • (3) TYPE 4 • COATING	102
	COATING	I-3T6-C*	ALL	INSULATION • (3) TYPE 6 • COATING	102
	GRAVEL	I-3T4-G**	ALL	INSULATION • (3) TYPE 4 • GRAVEL	102
	GRAVEL	I-3T6-G**	ALL	INSULATION • (3) TYPE 6 • GRAVEL	102

2.02 – USP® Built-Up Roof Ten and Twelve Year Guarantee Specifications

DECK/SUBSTRATE TYPE	*SURFACING*	*SPECIFICATION NUMBER*	*ZONE*	*SPECIFICATION CONFIGURATION*	*PAGE NUMBER*
INSULATION	COATING	I-4T4-C*	ALL	INSULATION • (4) TYPE 4 • COATING	103
	COATING	I-4BT4-C*	ALL	INSULATION • BASE • (3) TYPE 4 • COATING	105
	COATING	I-5BT4-C*	ALL	INSULATION • BASE • (4) TYPE 4 • COATING	108
	GRAVEL	I-4T4-G**	ALL	INSULATION • (4) TYPE 4 • GRAVEL	103
	GRAVEL	I-4BT4-G**	ALL	INSULATION • BASE • (3) TYPE 4 • GRAVEL	105
	GRAVEL	I-5BT4-G**	ALL	INSULATION • BASE • (4) TYPE 4 • GRAVEL	108
	MINERAL	I-4T4-M	ALL	INSULATION • (3) TYPE 4 • MINERAL CAP	103
	MINERAL	I-5T4-M	ALL	INSULATION • (4) TYPE 4 • MINERAL CAP	107
	MINERAL	I-4BT4-M	ALL	INSULATION • BASE • (2) TYPE 4 • MINERAL CAP	106
	MINERAL	I-5BT4-M	ALL	INSULATION • BASE • (3) TYPE 4 • MINERAL CAP	109
NAILABLE	COATING	N-4BT4-C*	ALL	BASE • (3) TYPE 4 • COATING	110
	COATING	N-4BT6-C*	ALL	BASE • (3) TYPE 6 • COATING	110
	COATING	N-5BT4-C*	ALL	BASE • (4) TYPE 4 • COATING	111
	GRAVEL	N-4BT4-G**	ALL	BASE • (3) TYPE 4 • GRAVEL	110
	GRAVEL	N-4BT6-G**	ALL	BASE • (3) TYPE 6 • GRAVEL	110
	GRAVEL	N-5BT4-G**	ALL	BASE • (4) TYPE 4 • GRAVEL	111
	MINERAL	N-4BT4-M	A&B	BASE • (2) TYPE 4 • MINERAL CAP	112
	MINERAL	N-4BT6-M	ALL	BASE • (2) TYPE 6 • MINERAL CAP	112
	MINERAL	N-5BT4-M	ALL	BASE • (3) TYPE 4 • MINERAL CAP	113

(continued on next page)

2.02 – USP® Built-Up Roof Ten and Twelve Year Guarantee Specifications *(Continued)*

DECK/SUBSTRATE TYPE	*SURFACING*	*SPECIFICATION NUMBER*	*ZONE*	*SPECIFICATION CONFIGURATION*	*PAGE NUMBER*
LIGHTWEIGHT, CELLULAR, OR GYPSUM	COATING	LWC-4VT4-C*	ALL	NVB • (3) TYPE 4 • COATING	110
	COATING	LWC-4VT6-C*	ALL	NVB • (3) TYPE 6 • COATING	110
	COATING	LWC-5VT4-C*	ALL	NVB • (4) TYPE 4 • COATING	111
	COATING	LWC-5VT6-C*	ALL	NVB • (4) TYPE 6 • COATING	111
	GRAVEL	LWC-4VT4-G**	ALL	NVB • (3) TYPE 4 • GRAVEL	110
	GRAVEL	LWC-4VT6-G**	ALL	NVB • (3) TYPE 6 • GRAVEL	110
	GRAVEL	LWC-5VT4-G**	ALL	NVB • (4) TYPE 4 • GRAVEL	111
	GRAVEL	LWC-5VT6-G**	ALL	NVB • (4) TYPE 6 • GRAVEL	111
	MINERAL	LWC-4VT4-M	A&B	NVB • (2) TYPE 4 • MINERAL CAP	112
	MINERAL	LWC-4VT6-M	ALL	NVB • (2) TYPE 6 • MINERAL CAP	112
	MINERAL	LWC-5VT4-M	ALL	NVB • (3) TYPE 4 • MINERAL CAP	113
	MINERAL	LWC-5VT6-M	ALL	NVB • (3) TYPE 6 • MINERAL CAP	113

**C – Must be surfaced with approved protective coating.*
***G – Must be surfaced with flood coat of asphalt and gravel.*

2.03 – USP® Built-Up Roof Fifteen Year Guarantee Specifications

DECK/SUBSTRATE TYPE	*SURFACING*	*SPECIFICATION NUMBER*	*ZONE*	*SPECIFICATION CONFIGURATION*	*PAGE NUMBER*
INSULATION	MINERAL	I-4BT6-M	ALL	INSULATION • BASE • (2) TYPE 6 • MINERAL CAP	106
	MINERAL	I-5T4-M	A&B	INSULATION • BASE • (3) TYPE 4 • MINERAL CAP	109
	MINERAL	I-5BT4-M	A&B	INSULATION • (4) TYPE 4 • MINERAL CAP	107

2.04 – USP® Built-Up Roof Fifteen and Twenty Year Guarantee Specifications

DECK/SUBSTRATE TYPE	*SURFACING*	*SPECIFICATION NUMBER*	*ZONE*	*SPECIFICATION CONFIGURATION*	*PAGE NUMBER*
INSULATION	COATING	I-4T6-C*	ALL	INSULATION • (4) TYPE 6 • COATING	103
	COATING	I-4BT6-C*	ALL	INSULATION • BASE • (3) TYPE 6 • COATING	105
	COATING	I-5BT4-C*	ALL	INSULATION • BASE • (4) TYPE 4 • COATING	108
	COATING	I-5BT6-C*	ALL	INSULATION • BASE • (4) TYPE 6 • COATING	108
	GRAVEL	I-4T6-G**	ALL	INSULATION • (4) TYPE 6 • GRAVEL	103
	GRAVEL	I-4BT6-G**	ALL	INSULATION • BASE • (3) TYPE 6 • GRAVEL	105
	GRAVEL	I-5BT4-G**	ALL	INSULATION • BASE • (4) TYPE 4 • GRAVEL	108
	GRAVEL	I-5BT6-G**	ALL	INSULATION • BASE • (4) TYPE 6 • GRAVEL	108
	MINERAL	I-4T6-M	A&B	INSULATION • (3) TYPE 6 • MINERAL CAP	104
	MINERAL	I-5T6-M	ALL	INSULATION • (4) TYPE 6 • MINERAL CAP	107
	MINERAL	I-5BT6-M	ALL	INSULATION • BASE • (3) TYPE 6 • MINERAL CAP	109
NAILABLE	COATING	N-4BT6-C*	ALL	BASE • (3) TYPE 6 • COATING	110
	GRAVEL	N-4BT6-G**	ALL	BASE • (3) TYPE 6 • GRAVEL	110
	COATING	N-5BT6-C *	ALL	BASE • (4) TYPE 6 • COATING	111
	GRAVEL	N-5BT6-G**	ALL	BASE • (4) TYPE 6 • GRAVEL	111
	MINERAL	N-4BT6-M	A&B	BASE • (2) TYPE 6 • MINERAL CAP	112
	MINERAL	N-5BT6-M	ALL	BASE • (3) TYPE 6 • MINERAL CAP	112
LIGHTWEIGHT, CELLLUALR, OR CYPSUM	COATING	LWC-4VT6-C*	ALL	NVB • (3) TYPE 6 • COATING	110
	GRAVEL	LWC-4VT6-G**	ALL	NVB • (3) TYPE 6 • GRAVEL	110
	COATING	LWC-5VT6-C *	ALL	NVB • (4) TYPE 6 • COATING	111
	GRAVEL	LWC-5VT6-G**	ALL	NVB • (4) TYPE 6 • GRAVEL	111
	MINERAL	LWC-4VT6-M	A&B	NVB • (2) TYPE 6 • MINERAL CAP	112
	MINERAL	LWC-5VT6-M	ALL	NVB • (3) TYPE 6 • MINERAL CAP	112

**C – Must be surfaced with approved protective coating.*
***G – Must be surfaced with flood coat of asphalt and gravel.*

Part 3 - USP® Climatic Zone

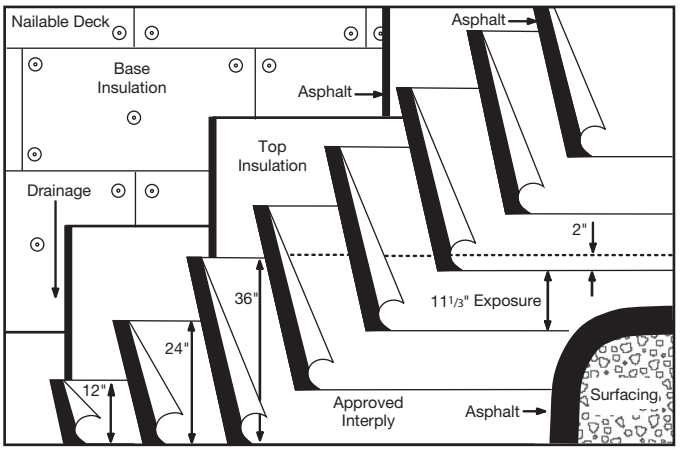
Zone A – Mild Climate Area. Covers western part of California, Oregon, Washington, southern Arizona and Hawaii.

Zone B – Moderate Climate Area. Covers South and Southeast part of United States, extending to the northern boundary of Oklahoma and eastward to North Carolina. Includes southern part of New Mexico and Virginia.

Zone C – Extreme Climate Area. Covers all areas not defined or shown in Zones A and B.

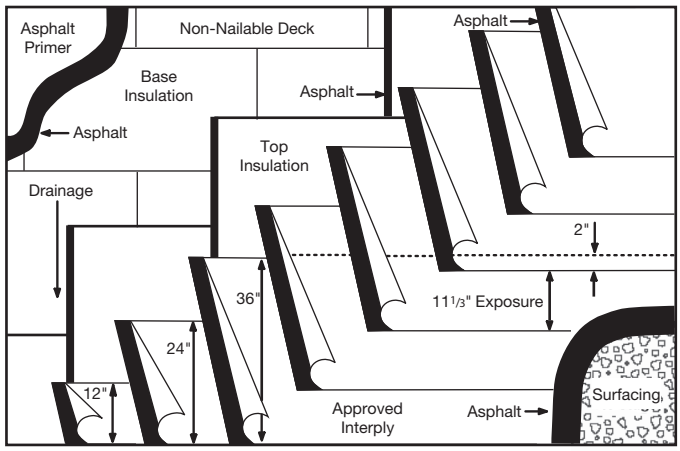
Part 4 - Built-Up Roof Systems Cross Reference Chart

DECK TYPE	SURFACING	U.S. PLY	GAF	INTEC	MANVILLE	TAMKO
INSULATED	COATING	I-3T4-C I-3T6-C I-4T4-C I-4T6-C I-4BT4-C I-4BT6-C I-5BT4-C I-5BT6-C	I-0-3-C I-0-3-C/P6 I-0-4-C I-0-4-C/P6 I-B-4-C I-B-4-C/P6 I-B-5-C I-B-5-C/P6	ALN-3TP-RI ALN-3UP-RI ALN-4TP-RI ALN-4UP-RI ALN-B4TP-RI ALN-B4UP-RI ALN-B5TP-RI ALN-B5UP-RI	3GIS 3GIS 4GIS 4GIS 4GIS 4GIS 5GIS 5GIS	 604 605 505
	GRAVEL	I-3T4-G I-3T6-G I-4T4-G I-4T6-G I-4BT4-G I-4BT6-G I-5BT4-G I-5BT6-G	I-0-3-G I-03-G/P6 I-0-4-G I-0-4-G/P6 I-B-4-G I-B-4-G/P6 I-B-5-G I-B-5G/P6	G-3TP-RI G-3UP-RI G-4TP-RI G-4UP-RI G-B4TP-RI G-B4UP-RI G-B5TP-RI G-B5UP-RI	3GIG 3GIG 4GIG 4GIG 4GIG 4GIG 5GIG 5GIG	 601 603 503
	MINERAL	I-4T4-M I-4T6-M I-4BT4-M I-4BT6-M I-5T4-M I-5T6-M I-5BT4-M I-5BT4-M	I-4T4-M I-4T6-M I-4BT4-M I-4BT6-M I-5T4-M I-5T6-M I-5BT4-M I-5BT6-M	M-4TP-RI M-4UP-RI M-4BTP-RI M-4BUP-RI M-5TP-RI M-5UP-RI M-5BTP-RI M-5BUP-RI	4GIC 4GIC 4GIC 4GIC 5GIC 5GIC 5GIC 5GIC	 602 502
NAILABLE	COATING	N-4BT4-C N-4BT6-C N-5BT4-C N-5BT6-C	N-B-4-C N-B-4-C/P6 N-B-5-C N-B-5-C/P6	ALN-B4TP-N ALN-B4UP-N ALN-B5TP-N ALN-B5UP-N	4GNS 4GNS 5GNS 5GNS	 616 516
	GRAVEL	N-4BT4-G N-4BT6-G N-5BT4-G N-5BT6-G	N-B-4-G N-B-4-G/P6 N-B-5-G N-B-5-G/P6	G-B4TP-N G-B4UP-N G-B5TP-N G-B5UP-N	4GNG 4GNG 5GNG 5GNG	614 514
	MINERAL	N-4BT4-M N-4BT6-M N-5BT4-M N-5BT6-M	N-B-4-M N-B-4-M/P6 N-B-5-M N-B-5-M/P6	M-B4TP-N M-B4UP-N M-B5TP-N M-B5UP-N	4GNC 4GNC 5GNC 5GNC	 612 512
LIGHTWEIGHT	COATING	LWC-4VT4-C LWC-4VT6-C LWC-5VT4-C LWV-5VT6-C	N-B-4-C N-B-4-C/P6 N-B-5-C N-B-5-C/P6	ALN-P4TP-LWC ALN-P4UP-LWC ALN-P5TP-LWC ALN-P5UP-LWC	4GLS 4GLS 5GLS 5GLS	 616 516
	GRAVEL	LWC-4VT4-G LWC-4VT6-G LWC-5VT4-G LWC-5VT6-G	N-B-4-G N-B-4-G/P6 N-B-5-G N-B-5-G/P6	G-P4TP-LWC G-P4UP-LWC G-P5TP-LWC G-P5UP-LWC	4GLG 4GLG 5GLG 5GLG	614 514
	MINERAL	LWC-4VT4-M LWC-4VT6-M LWC-5VT4-M LWC-5VT6-M	N-B-4-M N-B-4-M/P6 N-B-5-M N-B-5-M/P6	M-P4TP-LWC M-P4UP-LWC M-P5TP-LWC M-P5UP-LWC	4GLC 4GLC 5GLC 5GLC	 612 512



THREE (3) PLY BUR SYSTEM
NAILABLE DECK/INSULATION

Figure 1



THREE (3) PLY BUR SYSTEM
NON-NAILABLE DECK/INSULATION

Figure 2

GENERAL

Safety: Refer to Section 4, Part 13. DO NOT BEGIN INSTALLATION UNTIL THIS INFORMATION IS READ, UNDERSTOOD AND IMPLEMENTED.

MATERIALS

Material Requirements:

Approved Insulation
Roofing Asphalt ..... 25 lb. (1.2 kg/m²) per ply
Interply Sheet[1]..... 3 plies
Surfacing[2]..... (as specified)

[1] USP® Type 4, USP® Type 6, or other U.S. Ply approved interply sheets.
[2] U.S. Ply approved surfacing.

APPLICATION

Refer to Section 4 – General Requirements, and Section 5 - Installation Requirements.

Note: Polyisocyanurate insulation boards require a minimum ¼" overlay of SecuRock or ½" wood fiber insulation prior to mopping base.

Insulation Installation Over Nailable Decks (see Figure 1): Mechanically fasten insulation to the deck with the joints staggered in one direction. Refer to Section 5, Parts 8 – Fastening, 11 – Insulation Installation, and 12 – Membrane System Installation.

Insulation Installation Over Non-Nailable Decks (see Figure 2): Prime the deck with ASTM D 41 asphalt primer applied at the rate of 1 gal/square (0.4 L/m²) minimum. Hold primer back 6" (15 cm) from concrete deck joints. Install insulation over the deck, in a uniform mopping of hot and fluid asphalt applied at the rate of 25 – 30 lb/square (1.2 – 1.5 kg/m²). Install insulation with the joints staggered in one direction. Refer to Section 5, Part 11 – Insulation Installation and Item 11.03 – Non-Nailable Substrates.

Valleys & Waterways: Prior to the application of the roofing plies, install a full 36" (91.4 cm) width ply sheet extending at least 8" (20.1 cm) up the incline and out of the valley. Sheet shall be set in a full and uniform mopping of hot and fluid asphalt applied at the rate of 25 lb/square (1.2 kg/m²) per ply.

Interply: Install starter strips of 12" (30.5 cm), 24" (61 cm) and 36" (91.4 cm) widths and follow with a second full 36" (91.4 cm) width sheet with a maximum of 11 1/3" (28.8 cm) exposure, applied shingle fashion. Lap felts 24 2/3" (62.7 cm) with a 11 1/3" (28.8 cm) exposure and lap 4" (10 cm) at ends. Stagger adjacent end laps a minimum of 12" (30.5 cm). Install the felts in full and uniform moppings of hot and fluid hot asphalt applied at the rate of 25 lb/square (1.2 kg/m²) per ply. Refer to Section 5, Part 6 – Asphalt and Part 12, Item 12.04 – Asphalt Mopping Base/Interply Sheets.

Flashing and Accessories: Refer to Section 5, Part 13 – Flashing and Section 16 USP® BUR Construction Details.

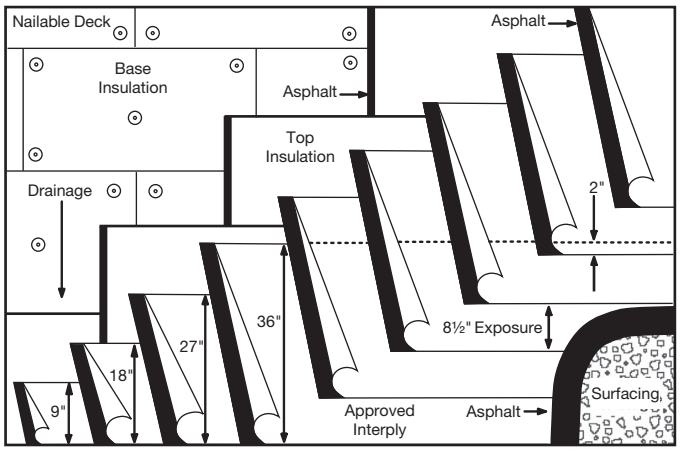
Surfacing: Refer to Section 5, Part 14 – Surfacing.

For additional information on this specification, guarantee requirements, etc. contact U.S. Ply Technical Services ***at (817) 413-0103***

FIVE AND TEN YEAR GUARANTEE SPECIFICATIONS

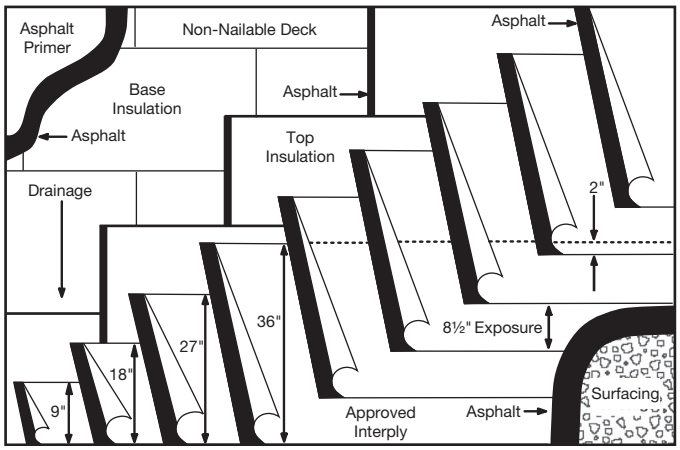
Specification	*Interply*	*Surfacing**
I-3T4-C	(3) Type 4	Coating
I-3T6-C	(3) Type 6	Coating
I-3T4-G	(3) Type 4	Flood & Gravel
I-3T6-G	(3) Type 6	Flood & Gravel

*C - Must be surfaced with approved protective coating
*G - Must be surfaced with flood coat of asphalt and gravel



FOUR (4) PLY BUR SYSTEM
NAILABLE DECK/INSULATION

Figure 1



FOUR (4) PLY BUR SYSTEM
NON-NAILABLE DECK/INSULATION

Figure 2

GENERAL

Safety: Refer to Section 4, Part 13. DO NOT BEGIN INSTALLATION UNTIL THIS INFORMATION IS READ, UNDERSTOOD AND IMPLEMENTED.

MATERIALS

Material Requirements:

Approved Insulation
Roofing Asphalt ..... 25 lb. (1.2 kg/m²) per ply
Interply Sheet[1]..... 4 plies
Surfacing[2]..... (as specified)

[1] USP® Type 4, USP® Type 6, or other U.S. Ply approved interply sheets.
[2] U.S. Ply approved surfacing.

APPLICATION

Refer to Section 4 – General Requirements, and Section 5 - Installation Requirements.

Note: Polyisocyanurate insulation boards require a minimum ¼" overlay of SecuRock or ½" wood fiber insulation prior to mopping base.

Insulation Installation Over Nailable Decks (see Figure 1): Mechanically fasten insulation to the deck with the joints staggered in one direction. Refer to Section 5, Parts 8 – Fastening, 11 – Insulation Installation, and 12 – Membrane System Installation.

Insulation Installation Over Non-Nailable Decks (see Figure 2): Prime the deck with ASTM D 41 asphalt primer applied at the rate of 1 gal/square (0.4 L/m²) minimum. Hold primer back 6" (15 cm) from concrete deck joints. Install insulation over the deck, in a uniform mopping of hot and fluid asphalt applied at the rate of 25 – 30 lb/square (1.2 – 1.5 kg/m²). Install insulation with the joints staggered in one direction. Refer to Section 5, Part 11 – Insulation Installation and Item 11.03 – Non-Nailable Substrates.

Valleys & Waterways: Prior to the application of the roofing plies, install a full 36" (91.4 cm) width ply sheet extending at least 8" (20.1 cm) up the incline and out of the valley. Sheet shall be set in a full and uniform mopping of hot and fluid asphalt applied at the rate of 25 lb/square (1.2 kg/m²) per ply.

Interply: Install starter strips of 9" (22.9 cm), 18" (45.7 cm), 27" (68.6 cm) and 36" (91.4 cm) widths and follow with a second full 36" (91.4 cm) width sheet with a maximum 8½" (21.6 cm) exposure, applied shingle style. Lap sheets 24 2/3" (62.7 cm) with an 8½" (21.6 cm) exposure and lap 4" (10 cm) at ends. Stagger adjacent end laps a minimum of 12" (30.5 cm). Install the felts in full and uniform moppings of hot and fluid hot asphalt applied at the rate of 25 lb/square (1.2 kg/m²) per ply. Refer to Section 5, Part 6 – Asphalt and Part 12, Item 12.04 – Asphalt Mopping Base/Interply Sheets.

Flashing and Accessories: Refer to Section 5, Part 13 – Flashing and Section 16 USP® BUR Construction Details..

Surfacing: Refer to Section 5, Part 14 – Surfacing.

For additional information on this specification, guarantee requirements, etc. contact U.S. Ply Technical Services ***at (817) 413-0103***

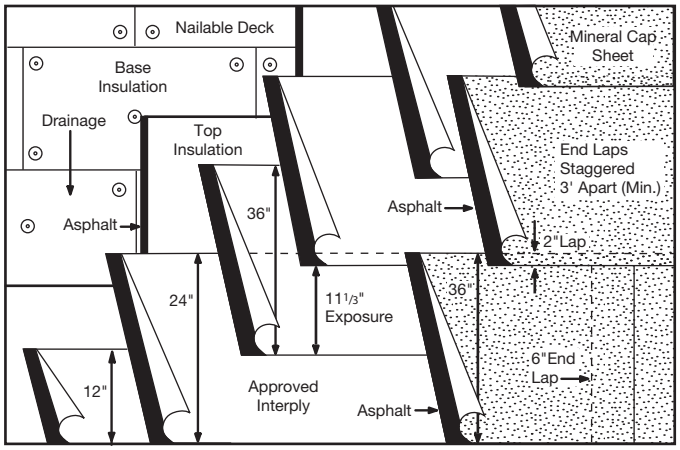
TEN AND TWELVE YEAR GUARANTEE SPECIFICATIONS

Specification	*Interply*	*Surfacing**
I-4T4-C	(4) Type 4	Coating
I-4T4-G	(4) Type 4	Flood & Gravel

FIFTEEN AND TWENTY YEAR GUARANTEE SPECIFICATIONS

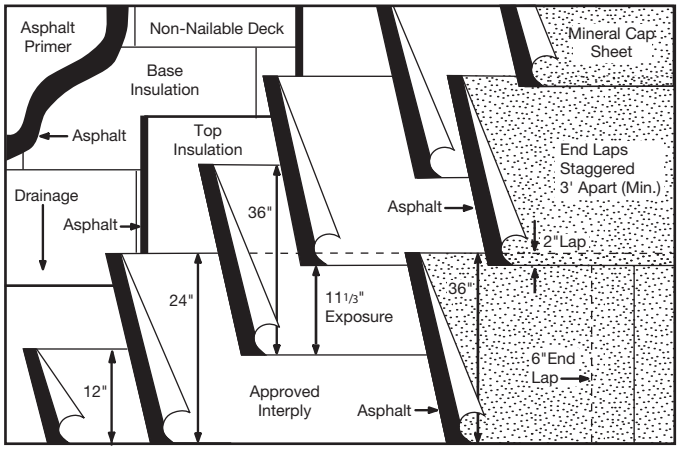
Specification	*Interply*	*Surfacing**
I-4T6-C	(4) Type 6	Coating
I-4T6-G	(4) Type 6	Flood & Gravel

*C - Must be surfaced with approved protective coating
*G - Must be surfaced with flood coat of asphalt and gravel



FOUR (4) PLY BUR SYSTEM
NAILABLE DECK/INSULATION

Figure 1



FOUR (4) PLY BUR SYSTEM
NON-NAILABLE DECK/INSULATION

Figure 1

GENERAL

Safety: Refer to Section 4, Part 13. DO NOT BEGIN INSTALLATION UNTIL THIS INFORMATION IS READ, UNDERSTOOD AND IMPLEMENTED.

MATERIALS

Material Requirements:

Approved Insulation
Roofing Asphalt ..... 25 lb. (1.2 kg/m²) per ply
Interply Sheet[1]..... 3 plies
Cap Sheet[2] ..... 1 ply

[1] USP® Type 4, USP® Type 6, or other U.S. Ply approved interply sheets.
[2] USP® Mineral Cap Sheet

APPLICATION

Refer to Section 4 – General Requirements, and Section 5 - Installation Requirements.

Note: Polyisocyanurate insulation boards require a minimum ¼" overlay of SecuRock or ½" wood fiber insulation prior to mopping base.

Insulation Installation Over Nailable Decks (see Figure 1): Mechanically fasten insulation to the deck with the joints staggered in one direction. Refer to Section 5, Parts 8 – Fastening, 11 – Insulation Installation, and 12 – Membrane System Installation.

Insulation Installation Over Non-Nailable Decks (see Figure 2): Prime the deck with ASTM D 41 asphalt primer applied at the rate of 1 gal/square (0.4 L/m²) minimum. Hold primer back 6" (15 cm) from concrete deck joints. Install insulation over the deck, in a uniform mopping of hot and fluid asphalt applied at the rate of 25 – 30 lb/square (1.2 – 1.5 kg/m²). Install insulation with the joints staggered in one direction. Refer to Section 5, Part 11 – Insulation Installation and Item 11.03 – Non-Nailable Substrates.

Valleys & Waterways: Prior to the application of the roofing plies, install a full 36" (91.4 cm) width ply sheet extending at least 8" (20.1 cm) up the incline and out of the valley. Sheet shall be set in a full and uniform mopping of hot and fluid asphalt applied at the rate of 25 lb/square (1.2 kg/m²) per ply.

Interply: Install starter strips of 12" (30.5 cm), 24" (61 cm) and 36" (91.4 cm) widths and follow with a second full 36" (91.4 cm) width sheet with a maximum of 11 1/3" (28.8 cm) exposure, applied shingle fashion. Lap felts 24 2/3" (62.7 cm) with a 11 1/3" (28.8 cm) exposure and lap 4" (10 cm) at ends. Stagger adjacent end laps a minimum of 12" (30.5 cm). Install the felts in full and uniform moppings of hot and fluid hot asphalt applied at the rate of 25 lb/square (1.2 kg/m²) per ply. Refer to Section 5, Part 6 – Asphalt and Part 12, Item 12.04 – Asphalt Mopping Base/Interply Sheets.

Mineral Cap: Install one layer of USP® Mineral Cap over the top ply sheet, in a uniform mopping of hot asphalt applied at a rate of 25 lb/square (1.2 kg/m²). Lap membrane 2" (5 cm) on side laps, 6" (15 cm) on end laps. Adjacent end laps shall be at least 3' (91.4 cm) apart. Refer to Section 5, Part 7 – Asphalt, and Part 12, Item 12.06 – USP® Mineral Cap Sheet Application.

Flashing and Accessories: Refer to Section 5, Part 13 – Flashing and Section 16 USP® BUR Construction Details.

Surfacing: Refer to Section 5, Part 14 – Surfacing.

For additional information on this specification, guarantee requirements, etc. contact U.S. Ply Technical Services at (817) 413-0103

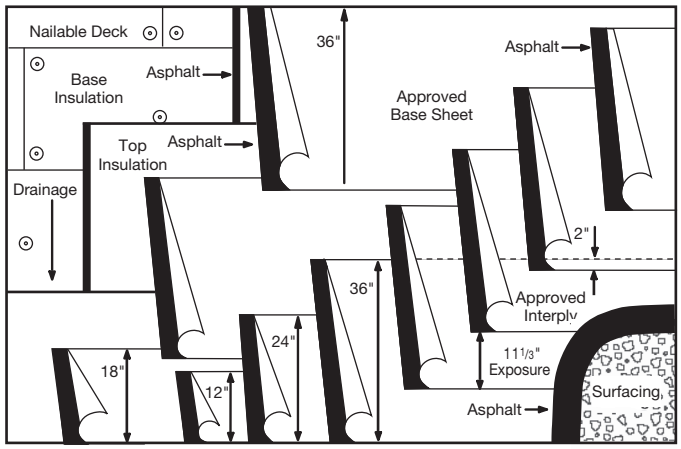
TEN AND TWELVE YEAR GUARANTEE SPECIFICATIONS

Specification	*Interply*	*Surfacing*
I-4T4-M	(3) Type 4	USP® Mineral Cap
I-4T6-M	(3) Type 6	USP® Mineral Cap

FIFTEEN AND TWENTY YEAR GUARANTEE SPECIFICATIONS

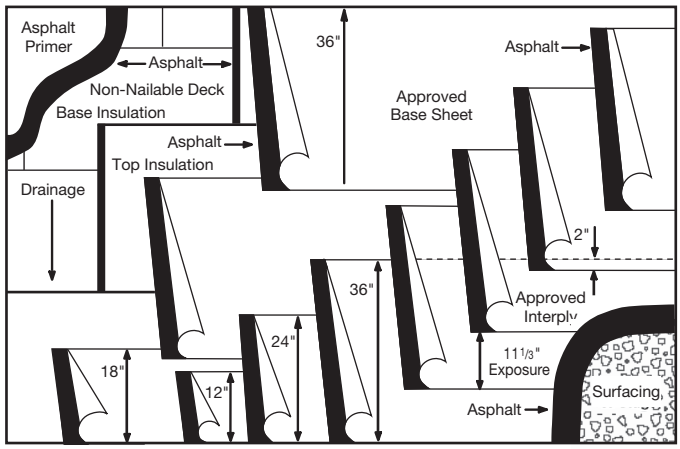
Specification	*Interply*	*Surfacing*
I-4T6-M*	(3) Type 6	USP® Mineral Cap

*I-4T6-M is eligible for a 15 and 20 Year Guarantee in Zones A & B only.



FOUR (4) PLY BUR SYSTEM
NAILABLE DECK/INSULATION

Figure 1



FOUR (4) PLY BUR SYSTEM
NON-NAILABLE DECK/INSULATION

Figure 1

GENERAL

Safety: Refer to Section 4, Part 13. DO NOT BEGIN INSTALLATION UNTIL THIS INFORMATION IS READ, UNDERSTOOD AND IMPLEMENTED.

MATERIALS

Material Requirements:

Approved Insulation
Roofing Asphalt ..... 25 lb. (1.2 kg/m²) per ply
Base Sheet[1]..... 1 ply
Interply[2]..... 3 plies
Surfacing[3]..... (as specified)

[1] USP® Base or other U.S. Ply approved base sheets.
[2] USP® Type 4, USP® Type 6, or other U.S. Ply approved interply sheets.
[3] U.S. Ply approved surfacing

APPLICATION

Refer to Section 4 – General Requirements, and Section 5 - Installation Requirements.

Note: Polyisocyanurate insulation boards require a minimum ¼" overlay of SecuRock or ½" wood fiber insulation prior to mopping base.

Insulation Installation Over Nailable Decks (see Figure 1): Mechanically fasten insulation to the deck with the joints staggered in one direction. Refer to Section 5, Parts 8 – Fastening, 11 – Insulation Installation, and 12 – Membrane System Installation.

Insulation Installation Over Non-Nailable Decks (see Figure 2): Prime the deck with ASTM D 41 asphalt primer applied at the rate of 1 gal/square (0.4 L/m²) minimum. Hold primer back 6" (15 cm) from concrete deck joints. Install insulation over the deck, in a uniform mopping of hot and fluid asphalt applied at the rate of 25 – 30 lb/square (1.2 – 1.5 kg/m²). Install insulation with the joints staggered in one direction. Refer to Section 5, Part 11 – Insulation Installation and Item 11.03 – Non-Nailable Substrates.

Base Sheet: Install base sheet, over insulation, in a uniform mopping of hot asphalt applied at the rate of 25 lb/square (1.2 kg/m²). Lap the sheets 2" (5 cm) on side laps and 4" (10 cm) on end laps. Refer to Section 5, Part 12, Item 12.04 – Asphalt Mopping Base/Interply Sheets.

Valleys & Waterways: Prior to the application of the roofing plies, install a full 36" (91.4 cm) width ply sheet extending at least 8" (20.1 cm) up the incline and out of the valley. Sheet shall be set in a full and uniform mopping of hot and fluid asphalt applied at the rate of 25 lb/square (1.2 kg/m²) per ply.

Interply: Install starter strips of 12" (30.5 cm), 24" (61 cm) and 36" (91.4 cm) widths and follow with a second full 36" (91.4 cm) width sheet with a maximum of 11 1/3" (28.8 cm) exposure, applied shingle fashion. Lap felts 24 2/3" (62.7 cm) with a 11 1/3" (28.8 cm) exposure and lap 4" (10 cm) at ends. Stagger adjacent end laps a minimum of 12" (30.5 cm). Install the felts in full and uniform moppings of hot and fluid hot asphalt applied at the rate of 25 lb/square (1.2 kg/m²) per ply. Refer to Section 5, Part 6 – Asphalt and Part 12, Item 12.04 – Asphalt Mopping Base/Interply Sheets.

Flashing and Accessories: Refer to Section 5, Part 13 – Flashing and Section 16 USP® BUR Construction Details.

Surfacing: Refer to Section 5, Part 14 – Surfacing.

For additional information on this specification, guarantee requirements, etc. contact U.S. Ply Technical Services ***at (817) 413-0103***

TEN AND TWELVE YEAR GUARANTEE SPECIFICATIONS

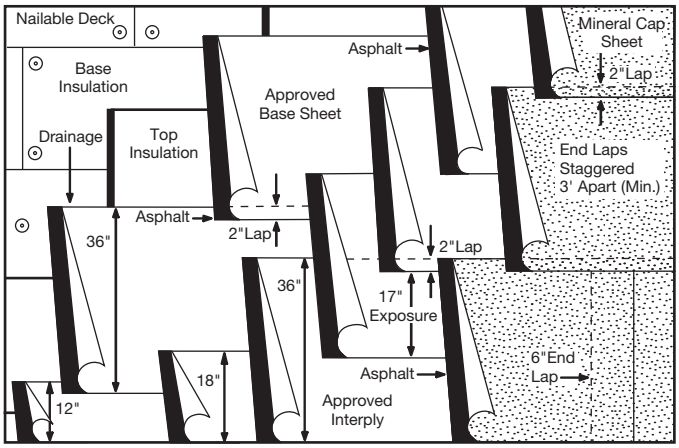
Specification	*Base Sheet*	*Interply*	*Surfacing**
I-4BT4-C	Approved	(3) Type 4	Coating
I-4BT4-G	Approved	(3) Type 4	Flood & Gravel

FIFTEEN AND TWENTY YEAR GUARANTEE SPECIFICATIONS

Specification	*Base Sheet*	*Interply*	*Surfacing*
I-4BT6-C	Approved	(3) Type 6	Coating
I-4BT6-G	Approved	(3) Type 6	Flood & Gravel

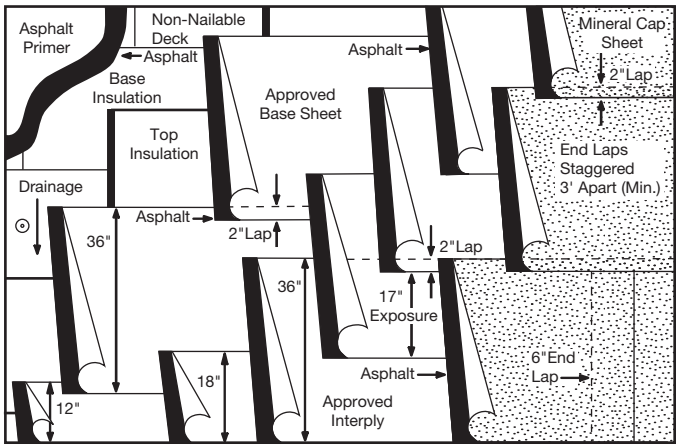
*C - Must be surfaced with approved protective coating
*G - Must be surfaced with flood coat of asphalt and gravel

SECTION 10 – USP® Built-Up Specifications



FOUR (4) PLY BUR SYSTEM
NAILABLE DECK/INSULATION

Figure 1



FOUR (4) PLY BUR SYSTEM
NON-NAILABLE DECK/INSULATION

Figure 1

GENERAL

Safety: Refer to Section 4, Part 13. DO NOT BEGIN INSTALLATION UNTIL THIS INFORMATION IS READ, UNDERSTOOD AND IMPLEMENTED.

MATERIALS

Material Requirements:

Approved Insulation
Roofing Asphalt ..... 25 lb. (1.2 kg/m²) per ply
Base Sheet[1]..... 1 ply
Interply[2] ..... 2 plies
Cap Sheet[3] ..... 1 ply

[1] USP® Base or other U.S. Ply approved base sheets.
[2] USP® Type 4, USP® Type 6, or other U.S. Ply approved interply sheets.
[3] USP® Mineral Cap Sheet

APPLICATION

Refer to Section 4 – General Requirements, and Section 5 - Installation Requirements.

Note: Polyisocyanurate insulation boards require a minimum ¼" overlay of SecuRock or ½" wood fiber insulation prior to mopping base.

Insulation Installation Over Nailable Decks (see Figure 1): Mechanically fasten insulation to the deck with the joints staggered in one direction. Refer to Section 5, Parts 8 – Fastening, 11 – Insulation Installation, and 12 – Membrane System Installation.

Insulation Installation Over Non-Nailable Decks (see Figure 2): Prime the deck with ASTM D 41 asphalt primer applied at the rate of 1 gal/square (0.4 L/m²) minimum. Hold primer back 6" (15 cm) from concrete deck joints. Install insulation over the deck, in a uniform mopping of hot and fluid asphalt applied at the rate of 25 – 30 lb/square (1.2 – 1.5 kg/m²). Install insulation with the joints staggered in one direction. Refer to Section 5, Part 11 – Insulation Installation and Item 11.03 – Non-Nailable Substrates.

Base Sheet: Install base sheet, over insulation, in a uniform mopping of hot asphalt applied at the rate of 25 lb/square (1.2 kg/m²). Lap the sheets 2" (5 cm) on side laps and 4" (10 cm) on end laps. Refer to Section 5, Part 12, Item 12.04 – Asphalt Mopping Base/Interply Sheets.

Valleys & Waterways: Prior to the application of the roofing plies, install a full 36" (91.4 cm) width ply sheet extending at least 8" (20.1 cm) up the incline and out of the valley. Sheet shall be set in a full and uniform mopping of hot and fluid asphalt applied at the rate of 25 lb/square (1.2 kg/m²) per ply.

Interply: Install starter strips of 18" (45.7 cm) and 36" (91.4 cm) widths and follow with a second full 36" (91.4 cm) width sheet with a maximum 17" (43.2 cm) exposure, applied shingle style. Lap sheets 19" (48.3 cm) with a 17" (43.2 cm) exposure and lap 4" (10 cm) at ends. Stagger adjacent end laps a minimum of 12" (30.5 cm). Install the felts in full and uniform moppings of hot and fluid hot asphalt applied at the rate of 25 lb/square (1.2 kg/m²) per ply. Refer to Section 5, Part 6 – Asphalt and Part 12, Item 12.04 – Asphalt Mopping Base/Interply Sheets.

Mineral Cap: Install one layer of USP® Mineral Cap over the top ply sheet, in a uniform mopping of hot asphalt applied at a rate of 25 lb/square (1.2 kg/m²). Lap membrane 2" (5 cm) on side laps, 6" (15 cm) on end laps. Adjacent end laps shall be at least 3' (91.4 cm) apart. Refer to Section 5, Part 7 – Asphalt, and Part 12, Item 12.06 – USP® Mineral Cap Sheet Application.

Flashing and Accessories: Refer to Section 5, Part 13 – Flashing and Section 16 USP® BUR Construction Details.

Surfacing: Refer to Section 5, Part 14 – Surfacing..

For additional information on this specification, guarantee requirements, etc. contact U.S. Ply Technical Services ***at (817) 413-0103***

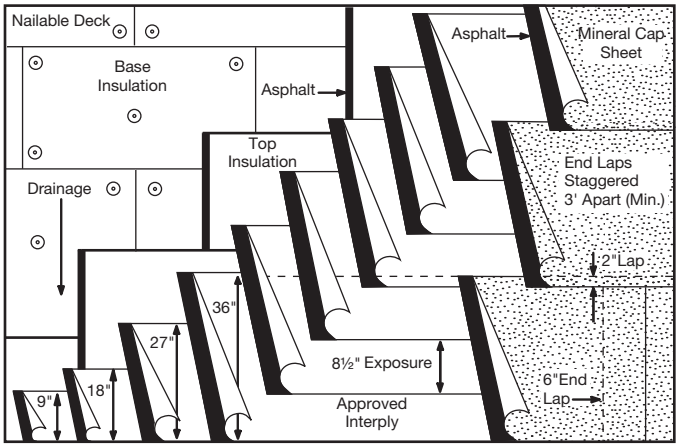
TEN AND TWELVE YEAR GUARANTEE SPECIFICATIONS

Specification	*Base Sheet*	*Interply*	*Surfacing*
I-4BT4-M*	Approved	(2) Type 4	USP® Mineral Cap

FIFTEEN YEAR GUARANTEE SPECIFICATIONS

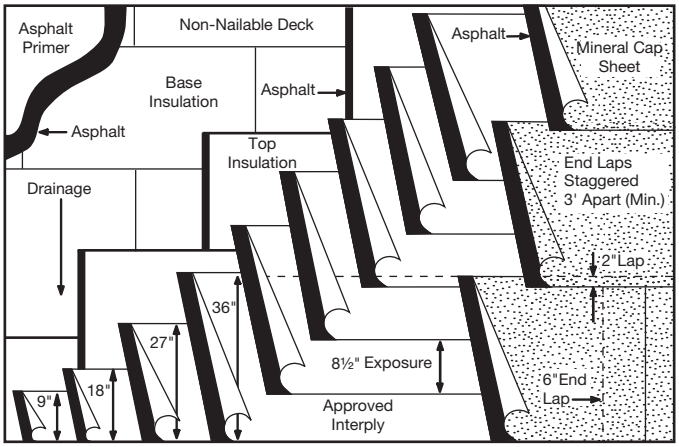
Specification	*Base Sheet*	*Interply*	*Surfacing*
I-4BT6-M	Approved	(2) Type 6	USP® Mineral Cap

*I-4BT4-M is eligible for a 10 & 12 Year Guarantee in Zones A & B only.



FIVE (5) PLY BUR SYSTEM
NAILABLE DECK/INSULATION

Figure 1



FIVE (5) PLY BUR SYSTEM
NON-NAILABLE DECK/INSULATION

Figure 2

GENERAL

Safety: Refer to Section 4, Part 13. DO NOT BEGIN INSTALLATION UNTIL THIS INFORMATION IS READ, UNDERSTOOD AND IMPLEMENTED.

MATERIALS

Material Requirements:

Approved Insulation
Roofing Asphalt ..... 25 lb. (1.2 kg/m²) per ply
Interply[1] ..... 4 plies
Cap Sheet[2] ..... 1 ply

[1] USP® Type 4, USP® Type 6, or other U.S. Ply approved base sheets.
[2] USP® Mineral Cap Sheet

APPLICATION

Refer to Section 4 – General Requirements, and Section 5 - Installation Requirements.

Note: Polyisocyanurate insulation boards require a minimum ¼" overlay of SecuRock or ½" wood fiber insulation prior to mopping base.

Insulation Installation Over Nailable Decks (see Figure 1): Mechanically fasten insulation to the deck with the joints staggered in one direction. Refer to Section 5, Parts 8 – Fastening, 11 – Insulation Installation, and 12 – Membrane System Installation.

Insulation Installation Over Non-Nailable Decks (see Figure 2): Prime the deck with ASTM D 41 asphalt primer applied at the rate of 1 gal/square (0.4 L/m²) minimum. Hold primer back 6" (15 cm) from concrete deck joints. Install insulation over the deck, in a uniform mopping of hot and fluid asphalt applied at the rate of 25 – 30 lb/square (1.2 – 1.5 kg/m²). Install insulation with the joints staggered in one direction. Refer to Section 5, Part 11 – Insulation Installation and Item 11.03 – Non-Nailable Substrates.

Valleys & Waterways: Prior to the application of the roofing plies, install a full 36" (91.4 cm) width ply sheet extending at least 8" (20.1 cm) up the incline and out of the valley. Sheet shall be set in a full and uniform mopping of hot and fluid asphalt applied at the rate of 25 lb/square (1.2 kg/m²) per ply.

Interply: Install starter strips of 9" (22.9 cm), 18" (45.7 cm), 27" (68.6 cm) and 36" (91.4 cm) widths and follow with a second full 36" (91.4 cm) width sheet with a maximum 8½" (21.6 cm) exposure, applied shingle style. Lap sheets 24 2/3" (62.7 cm) with an 8½" (21.6 cm) exposure and lap 4" (10 cm) at ends. Stagger adjacent end laps a minimum of 12" (30.5 cm). Install the felts in full and uniform moppings of hot and fluid hot asphalt applied at the rate of 25 lb/square (1.2 kg/m²) per ply. Refer to Section 5, Part 6 – Asphalt and Part 12, Item 12.04 – Asphalt Mopping Base/Interply Sheets.

Mineral Cap: Install one layer of USP® Mineral Cap over the top ply sheet, in a uniform mopping of hot asphalt applied at a rate of 25 lb/square (1.2 kg/m²). Lap membrane 2" (5 cm) on side laps, 6" (15 cm) on end laps. Adjacent end laps shall be at least 3' (91.4 cm) apart. Refer to Section 5, Part 7 – Asphalt, and Part 12, Item 12.06 – USP® Mineral Cap Sheet Application.

Flashing and Accessories: Refer to Section 5, Part 13 – Flashing and Section 16 USP® BUR Construction Details.

Surfacing: Refer to Section 5, Part 14 – Surfacing.

For additional information on this specification, guarantee requirements, etc. contact U.S. Ply Technical Services ***at (817) 413-0103***

TEN AND TWELVE YEAR GUARANTEE SPECIFICATIONS

Specification	*Interply*	*Surfacing**
I-5T4-M	(4) Type 4	USP® Mineral Cap

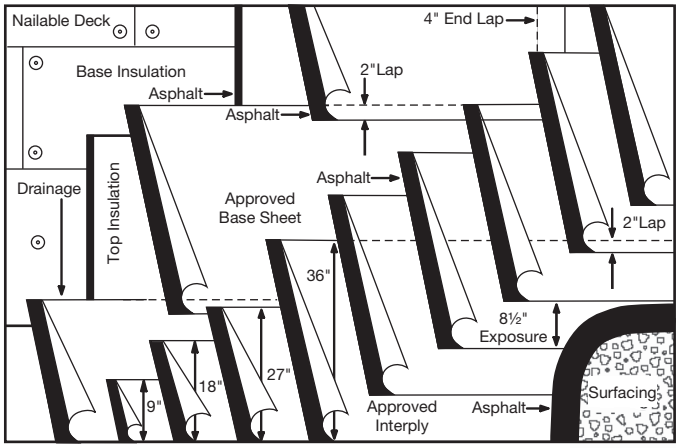
FIFTEEN YEAR GUARANTEE SPECIFICATIONS

Specification	*Interply*	*Surfacing**
I-5T4-M*	(4) Type 4	USP® Mineral Cap

TWENTY YEAR GUARANTEE SPECIFICATIONS

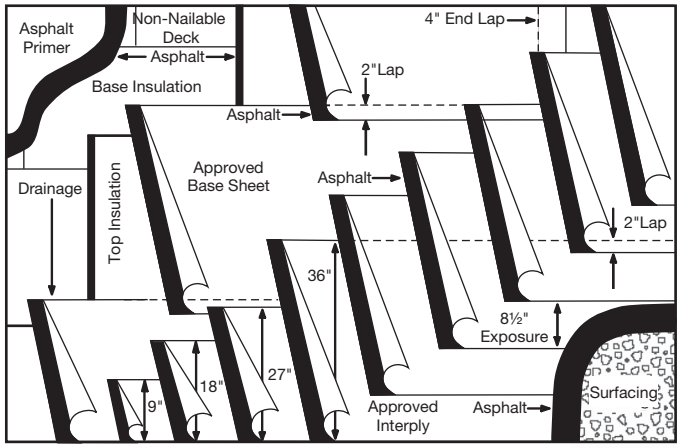
Specification	*Interply*	*Surfacing**
I-5T6-M	(4) Type 6	USP® Mineral Cap

*I-5T4-M is eligible for a 15 Year Guarantee in Zones A & B only.



FIVE (5) PLY BUR SYSTEM
NAILABLE DECK/INSULATION

Figure 1



FIVE (5) PLY BUR SYSTEM
NON-NAILABLE DECK/INSULATION

Figure 2

GENERAL

Safety: Refer to Section 4, Part 13. DO NOT BEGIN INSTALLATION UNTIL THIS INFORMATION IS READ, UNDERSTOOD AND IMPLEMENTED.

MATERIALS

Material Requirements:

Approved Insulation
Roofing Asphalt ..... 25 lb. (1.2 kg/m²) per ply
Base Sheet[1]..... 1 ply
Interply[2] ..... 4 plies
Surfacing[3]..... (as specified)

[1] USP® Base or other U.S. Ply approved base sheets.
[2] USP® Type 4, USP® Type 6, or other U.S. Ply approved interply sheets.
[3] U.S. Ply approved surfacing

APPLICATION

Refer to Section 4 – General Requirements, and Section 5 - Installation Requirements.

Note: Polyisocyanurate insulation boards require a minimum ¼" overlay of SecuRock or ½" wood fiber insulation prior to mopping base**.**

Insulation Installation Over Nailable Decks (see Figure 1): Mechanically fasten insulation to the deck with the joints staggered in one direction. Refer to Section 5, Parts 8 – Fastening, 11 – Insulation Installation, and 12 – Membrane System Installation.

Insulation Installation Over Non-Nailable Decks (see Figure 2): Prime the deck with ASTM D 41 asphalt primer applied at the rate of 1 gal/square (0.4 L/m²) minimum. Hold primer back 6" (15 cm) from concrete deck joints. Install insulation over the deck, in a uniform mopping of hot and fluid asphalt applied at the rate of 25 – 30 lb/square (1.2 – 1.5 kg/m²). Install insulation with the joints staggered in one direction. Refer to Section 5, Part 11 – Insulation Installation and Item 11.03 – Non-Nailable Substrates.

Base Sheet: Install base sheet, over insulation, in a uniform mopping of hot asphalt applied at the rate of 25 lb/square (1.2 kg/m²). Lap the sheets 2" (5 cm) on side laps and 4" (10 cm) on end laps. Refer to Section 5, Part 12, Item 12.04 – Asphalt Mopping Base/Interply Sheets.

Valleys & Waterways: Prior to the application of the roofing plies, install a full 36" (91.4 cm) width ply sheet extending at least 8" (20.1 cm) up the incline and out of the valley. Sheet shall be set in a full and uniform mopping of hot and fluid asphalt applied at the rate of 25 lb/square (1.2 kg/m²) per ply.

Interply: Install starter strips of 9" (22.9 cm), 18" (45.7 cm), 27" (68.6 cm) and 36" (91.4 cm) widths and follow with a second full 36" (91.4 cm) width sheet with a maximum 8½" (21.6 cm) exposure, applied shingle style. Lap sheets 24⅔" (62.7 cm) with an 8½" (21.6 cm) exposure and lap 4" (10 cm) at ends. Stagger adjacent end laps a minimum of 12" (30.5 cm). Install the felts in full and uniform moppings of hot and fluid hot asphalt applied at the rate of 25 lb/square (1.2 kg/m²) per ply. Refer to Section 5, Part 6 – Asphalt and Part 12, Item 12.04 – Asphalt Mopping Base/Interply Sheets.

Flashing and Accessories: Refer to Section 5, Part 13 – Flashing and Section 16 USP® BUR Construction Details.

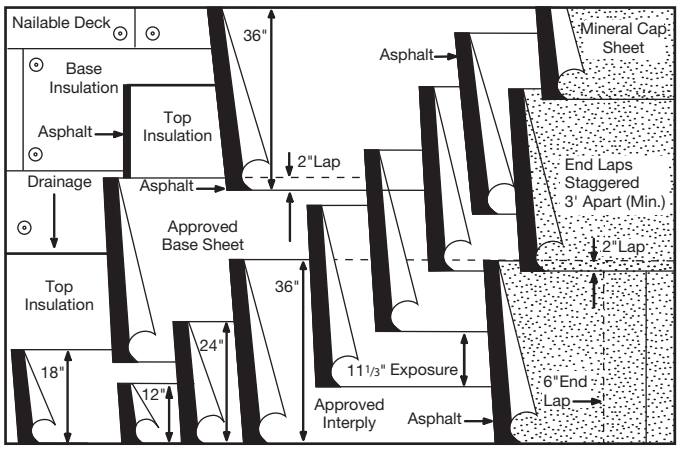
Surfacing: Refer to Section 5, Part 14 – Surfacing.

For additional information on this specification, guarantee requirements, etc. contact U.S. Ply Technical Services ***at (817) 413-0103***

TWENTY YEAR GUARANTEE SPECIFICATIONS

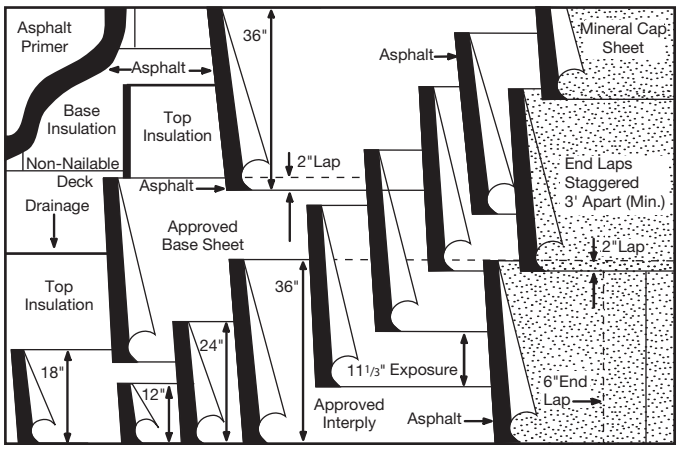
Specification	*Base Sheet*	*Interply*	*Surfacing**
I-5BT4-C	Approved	(4) Type 4	Coating
I-5BT6-C	Approved	(4) Type 6	Coating
I-5BT4-G	Approved	(4) Type 4	Flood & Gravel
I-5BT6-G	Approved	(4) Type 6	Flood & Gravel

*C - Must be surfaced with approved protective coating
*G - Must be surfaced with flood coat of asphalt and gravel



FIVE (5) PLY BUR SYSTEM
NAILABLE DECK/INSULATION

Figure 1



FIVE (5) PLY BUR SYSTEM
NON-NAILABLE DECK/INSULATION

Figure 2

GENERAL

Safety: Refer to Section 4, Part 13. DO NOT BEGIN INSTALLATION UNTIL THIS INFORMATION IS READ, UNDERSTOOD AND IMPLEMENTED.

MATERIALS

Material Requirements:

Approved Insulation
Roofing Asphalt ..... 25 lb. (1.2 kg/m²) per ply
Base Sheet[1]..... 1 ply
Interply[2] ..... 2 plies
Cap Sheet[3] ..... 1 ply

[1] USP® Base or other U.S. Ply approved base sheets.
[2] USP® Type 4, USP® Type 6, or other U.S. Ply approved interply sheets.
[3] USP® Mineral Cap Sheet

APPLICATION

Refer to Section 4 – General Requirements, and Section 5 - Installation Requirements.

Note: Polyisocyanurate insulation boards require a minimum ¼" overlay of SecuRock or ½" wood fiber insulation prior to mopping base.

Insulation Installation Over Nailable Decks (see Figure 1): Mechanically fasten insulation to the deck with the joints staggered in one direction. Refer to Section 5, Parts 8 – Fastening, 11 – Insulation Installation, and 12 – Membrane System Installation.

Insulation Installation Over Non-Nailable Decks (see Figure 2): Prime the deck with ASTM D 41 asphalt primer applied at the rate of 1 gal/square (0.4 L/m²) minimum. Hold primer back 6" (15 cm) from concrete deck joints. Install insulation over the deck, in a uniform mopping of hot and fluid asphalt applied at the rate of 25 – 30 lb/square (1.2 – 1.5 kg/m²). Install insulation with the joints staggered in one direction. Refer to Section 5, Part 11 – Insulation Installation and Item 11.03 – Non-Nailable Substrates.

Base Sheet: Install base sheet, over insulation, in a uniform mopping of hot asphalt applied at the rate of 25 lb/square (1.2 kg/m²). Lap the sheets 2" (5 cm) on side laps and 4" (10 cm) on end laps. Refer to Section 5, Part 12, Item 12.04 – Asphalt Mopping Base/Interply Sheets.

Valleys & Waterways: Prior to the application of the roofing plies, install a full 36" (91.4 cm) width ply sheet extending at least 8" (20.1 cm) up the incline and out of the valley. Sheet shall be set in a full and uniform mopping of hot and fluid asphalt applied at the rate of 25 lb/square (1.2 kg/m²) per ply.

Interply: Install starter strips of 12" (30.5 cm), 24" (61 cm) and 36" (91.4 cm) widths and follow with a second full 36" (91.4 cm) width sheet with a maximum of 11 1/3" (28.8 cm) exposure, applied shingle fashion. Lap felts 24 2/3" (62.7 cm) with a 11 1/3" (28.8 cm) exposure and lap 4" (10 cm) at ends. Stagger adjacent end laps a minimum of 12" (30.5 cm). Install the felts in full and uniform moppings of hot and fluid hot asphalt applied at the rate of 25 lb/square (1.2 kg/m²) per ply. Refer to Section 5, Part 6 – Asphalt and Part 12, Item 12.04 – Asphalt Mopping Base/Interply Sheets.

Mineral Cap: Install one layer of USP® Mineral Cap over the top ply sheet, in a uniform mopping of hot asphalt applied at a rate of 25 lb/square (1.2 kg/m²). Lap membrane 2" (5 cm) on side laps, 6" (15 cm) on end laps. Adjacent end laps shall be at least 3' (91.4 cm) apart. Refer to Section 5, Part 7 – Asphalt, and Part 12, Item 12.06 – USP® Mineral Cap Sheet Application.

Flashing and Accessories: Refer to Section 5, Part 13 – Flashing and Section 16 USP® BUR Construction Details.

Surfacing: Refer to Section 5, Part 14 – Surfacing.

For additional information on this specification, guarantee requirements, etc. contact U.S. Ply Technical Services ***at (817) 413-0103***

TEN AND TWELVE YEAR GUARANTEE SPECIFICATIONS

Specification	*Base Sheet*	*Interply*	*Surfacing*
I-5BT4-M	Approved	(3) Type 4	USP® Mineral Cap

FIFTEEN YEAR GUARANTEE SPECIFICATIONS

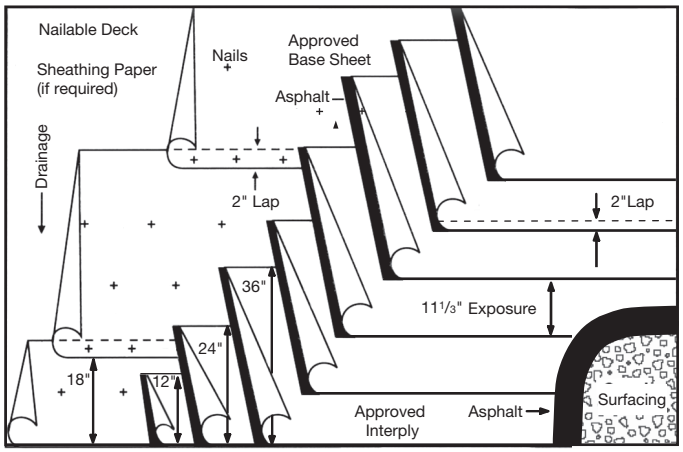
Specification	*Base Sheet*	*Interply*	*Surfacing*
I-5BT4-M*	Approved	(3) Type 4	USP® Mineral Cap

TWENTY YEAR GUARANTEE SPECIFICATIONS

Specification	*Base Sheet*	*Interply*	*Surfacing*
I-5BT6-M	Approved	(3) Type 6	USP® Mineral Cap

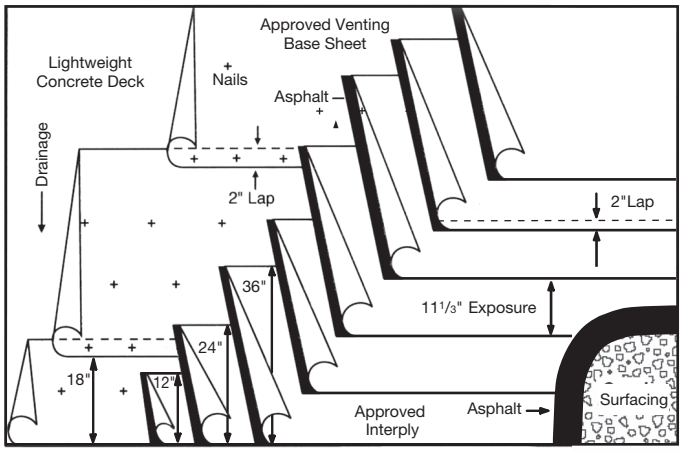
*I-5BT4-M is eligible for a 15 Year Guarantee in Zones A & B only.

SECTION 10 – USP® Built-Up Specifications



FOUR (4) PLY BUR SYSTEM
NAILABLE DECK

Figure 1



FOUR (4) PLY BUR SYSTEM
LIGHTWEIGHT CONCRETE DECK

Figure 2

GENERAL

Safety: Refer to Section 4, Part 13. DO NOT BEGIN INSTALLATION UNTIL THIS INFORMATION IS READ, UNDERSTOOD AND IMPLEMENTED.

MATERIALS

Material Requirements:

Roofing Asphalt ..... 25 lb. (1.2 kg/m²) per ply
Base Sheet[1]..... 1 ply
Interply[2] ..... 3 plies
Surfacing[3]..... (as specified)

[1] USP® Base, USP® NVB Nailable Venting Base or other U.S. Ply approved base sheets.

[2] USP® Type 4, USP® Type 6, or other U.S. Ply approved interply sheets.

[3] U.S. Ply approved surfacing.

APPLICATION

Refer to Section 4 – General Requirements, and Section 5 - Installation Requirements.

Base Sheet: Mechanically fasten one ply of base sheet over the deck. Lap sheets 2" (5 cm) on side laps and 4" (10 cm) on the end laps. Refer to Section 5, Part 8 and Part 12, Item 12.03 – Mechanical Attachment of Base Sheets.

Note: Polyisocyanurate insulation boards require a minimum ¼" overlay of SecuRock or ½" wood fiber insulation prior to mopping base.

Valleys & Waterways: Prior to the application of the roofing plies, install a full 36" (91.4 cm) width ply sheet extending at least 8" (20.1 cm) up the incline and out of the valley. Sheet shall be set in a full and uniform mopping of hot and fluid asphalt applied at the rate of 25 lb/square (1.2 kg/m²) per ply.

Interply: Install starter strips of 12" (30.5 cm), 24" (61 cm) and 36" (91.4 cm) widths and follow with a second full 36" (91.4 cm) width sheet with a maximum of 11 1/3" (28.8 cm) exposure, applied shingle fashion. Lap felts 24 2/3" (62.7 cm) with a 11 1/3" (28.8 cm) exposure and lap 4" (10 cm) at ends. Stagger adjacent end laps a minimum of 12" (30.5 cm). Install the felts in full and uniform moppings of hot and fluid hot asphalt applied at the rate of 25 lb/square (1.2 kg/m²) per ply. Refer to Section 5, Part 6 – Asphalt and Part 12, Item 12.04 – Asphalt Mopping Base/Interply Sheets.

Flashing and Accessories: Refer to Section 5, Part 13 – Flashing and Section 16 USP® BUR Construction Details.

Surfacing: Refer to Section 5, Part 14 – Surfacing.

For additional information on this specification, guarantee requirements, etc. contact U.S. Ply Technical Services ***at (817) 413-0103***

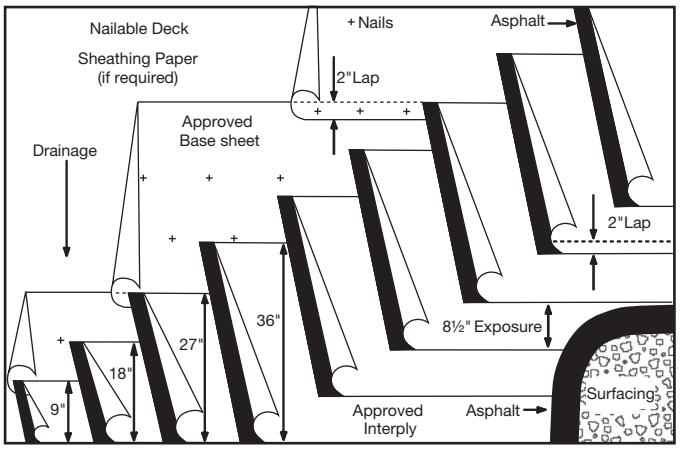
TEN AND TWELVE YEAR GUARANTEE SPECIFICATIONS

Specification	*Base Sheet*	*Interply*	*Surfacing***
N-4BT4-C	Approved	(3) Type 4	Coating
LWC-4VT4-C	NVB	(3) Type 4	Coating
N-4BT4-G	Approved	(3) Type 4	Flood & Gravel
LWC-4VT4-G	NVB	(3) Type 4	Flood & Gravel
N-4BT6-C	Approved	(3) Type 6	Coating
LWC-4VT6-C	NVB	(3) Type 6	Coating
N-4BT6-G	Approved	(3) Type 6	Flood & Gravel
LWC-4VT6-G	NVB	(3) Type 6	Flood & Gravel

FIFTEEN AND TWENTY GUARANTEE SPECIFICATIONS

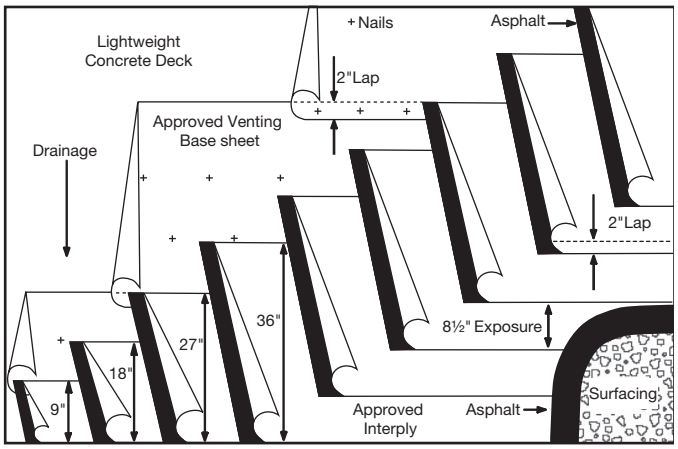
Specification	*Base Sheet*	*Interply*	*Surfacing***
N-4BT6-C*	Approved	(3) Type 6	Coating
LWC-4VT6-C*	NVB	(3) Type 6	Coating
N-4BT6-G*	Approved	(3) Type 6	Flood & Gravel
LWC-4VT6-G*	NVB	(3) Type 6	Flood & Gravel

* Eligible for a 15 & 20 Year Gurarantee in Zones A & B only
**C - Must be surfaced with approved protective coating
**G - Must be surfaced with flood coat of asphalt and gravel



FIVE (5) PLY BUR SYSTEM
NAILABLE DECK

Figure 1



FIVE (5) PLY BUR SYSTEM
LIGHTWEIGHT CONCRETE DECK

Figure 2

GENERAL

Safety: Refer to Section 4, Part 13. DO NOT BEGIN INSTALLATION UNTIL THIS INFORMATION IS READ, UNDERSTOOD AND IMPLEMENTED.

MATERIALS

Material Requirements:

Roofing Asphalt ..... 25 lb. (1.2 kg/m²) per ply
Base Sheet[1]..... 1 ply
Interply[2] ..... 4 plies
Surfacing[3]..... (as specified)

[1] USP® Base, USP® NVB Nailable Venting Base or other U.S. Ply approved base sheets.

[2] USP® Type 4, USP® Type 6, or other U.S. Ply approved interply sheets.

[3] U.S. Ply approved surfacing.

APPLICATION

Refer to Section 4 – General Requirements, and Section 5 - Installation Requirements.

Base Sheet: Mechanically fasten one ply of base sheet over the deck. Lap sheets 2” (5 cm) on side laps and 4” (10 cm) on the end laps. Refer to Section 5, Part 8 and Part 12, Item 12.03 – Mechanical Attachment of Base Sheets.

Note: Polyisocyanurate insulation boards require a minimum ¼” overlay of SecuRock or ½” wood fiber insulation prior to mopping base.

Valleys & Waterways: Prior to the application of the roofing plies, install a full 36” (91.4 cm) width ply sheet extending at least 8” (20.1 cm) up the incline and out of the valley. Sheet shall be set in a full and uniform mopping of hot and fluid asphalt applied at the rate of 25 lb/square (1.2 kg/m²) per ply.

Interply: Install starter strips of 9” (22.9 cm), 18” (45.7 cm), 27” (68.6 cm) and 36” (91.4 cm) widths and follow with a second full 36” (91.4 cm) width sheet with a maximum 8½” (21.6 cm) exposure, applied shingle style. Lap sheets 24 2/3” (62.7 cm) with an 8½” (21.6 cm) exposure and lap 4” (10 cm) at ends. Stagger adjacent end laps a minimum of 12” (30.5 cm). Install the felts in full and uniform moppings of hot and fluid hot asphalt applied at the rate of 25 lb/square (1.2 kg/m²) per ply. Refer to Section 5, Part 6 – Asphalt and Part 12, Item 12.04 – Asphalt Mopping Base/Interply Sheets.

Flashing and Accessories: Refer to Section 5, Part 13 – Flashing and Section 16 USP® BUR Construction Details.

Surfacing: Refer to Section 5, Part 14 – Surfacing.

For additional information on this specification, guarantee requirements, etc. contact U.S. Ply Technical Services ***(817) 413-0103***

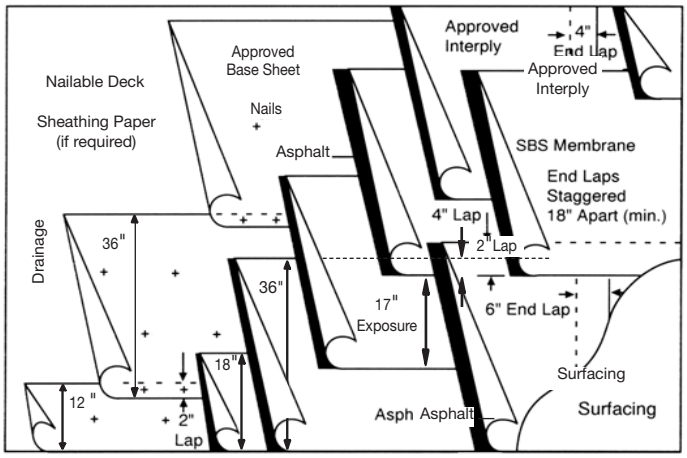
TEN AND TWELVE YEAR GUARANTEE SPECIFICATIONS

Specification	*Base Sheet*	*Interply*	*Surfacing**
N-5BT4-C	Approved	(4) Type 4	Coating
LWC-5VT4-C	NVB	(4) Type 4	Coating
N-5BT4-G	Approved	(4) Type 4	Flood & Gravel
LWC-5VT4-G	NVB	(4) Type 4	Flood & Gravel

FIFTEEN AND TWENTY GUARANTEE SPECIFICATIONS

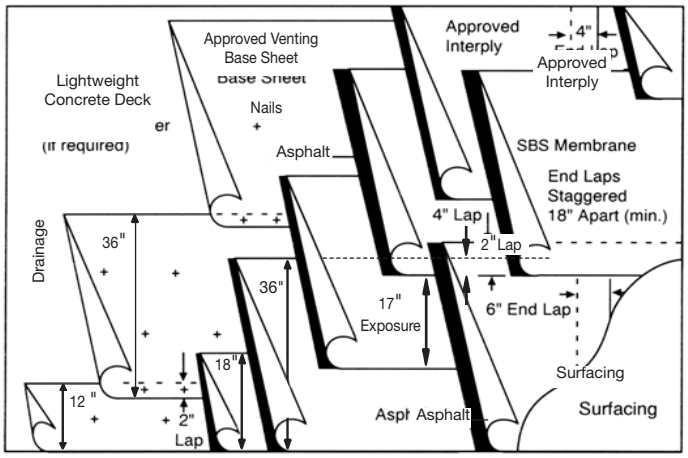
Specification	*Base Sheet*	*Interply*	*Surfacing**
N-5BT6-C	Approved	(4) Type 6	Coating
LWC-5VT6-C	NVB	(4) Type 6	Coating
N-5BT6-G	Approved	(4) Type 6	Flood & Gravel
LWC-5VT6-G	NVB	(4) Type 6	Flood & Gravel

*C - Must be surfaced with approved protective coating
*G - Must be surfaced with flood coat of asphalt and gravel



FOUR (4) PLY BUR SYSTEM
NAILABLE DECK

Figure 1



FOUR (4) PLY BUR SYSTEM
LIGHTWEIGHT CONCRETE DECK

Figure 2

GENERAL

Safety: Refer to Section 4, Part 13. DO NOT BEGIN INSTALLATION UNTIL THIS INFORMATION IS READ, UNDERSTOOD AND IMPLEMENTED.

MATERIALS

Material Requirements:

Roofing Asphalt ..... 25 lb. (1.2 kg/m²) per ply
Base Sheet[1]..... 1 ply
Interply[2] ..... 2 plies
Cap Sheet[3] ..... 1 ply

[1] USP® Base, USP® NVB Nailable Venting Base or other U.S. Ply approved base sheets.
[2] USP® Type 4, USP® Type 6, or other U.S. Ply approved interply sheets.
[3] USP® Mineral Cap Sheet

APPLICATION

Refer to Section 4 – General Requirements, and Section 5 - Installation Requirements.

Base Sheet: Mechanically fasten one ply of base sheet over the deck. Lap sheets 2" (5 cm) on side laps and 4" (10 cm) on the end laps. Refer to Section 5, Part 8 and Part 12, Item 12.03 – Mechanical Attachment of Base Sheets.

Note: Polyisocyanurate insulation boards require a minimum ¼" overlay of SecuRock or ½" wood fiber insulation prior to mopping base.

Valleys & Waterways: Prior to the application of the roofing plies, install a full 36" (91.4 cm) width ply sheet extending at least 8" (20.1 cm) up the incline and out of the valley. Sheet shall be set in a full and uniform mopping of hot and fluid asphalt applied at the rate of 25 lb/square (1.2 kg/m²) per ply.

Interply: Install starter strips of 18" (45.7 cm) and 36" (91.4 cm) widths and follow with a second full 36" (91.4 cm) width sheet with a maximum 17" (43.2 cm) exposure, applied shingle style. Lap sheets 19" (48.3 cm) with a 17" (43.2 cm) exposure and lap 4" (10 cm) at ends. Stagger adjacent end laps a minimum of 12" (30.5 cm). Install the felts in full and uniform moppings of hot and fluid hot asphalt applied at the rate of 25 lb/square (1.2 kg/m²) per ply. Refer to Section 5, Part 6 – Asphalt and Part 12, Item 12.04 – Asphalt Mopping Base/Interply Sheets.

Mineral Cap: Install one layer of USP® Mineral Cap over the top ply sheet, in a uniform mopping of hot asphalt applied at a rate of 25 lb/square (1.2 kg/m²). Lap membrane 2" (5 cm) on side laps, 6" (15 cm) on end laps. Adjacent end laps shall be at least 3' (91.4 cm) apart. Refer to Section 5, Part 7 – Asphalt, and Part 12, Item 12.06 – USP® Mineral Cap Sheet Application.

Flashing and Accessories: Refer to Section 5, Part 13 – Flashing and Section 16 USP® BUR Construction Details.

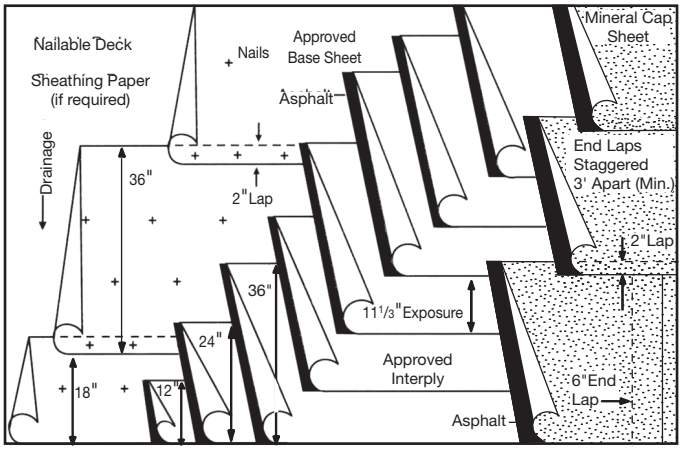
Surfacing: Refer to Section 5, Part 14 – Surfacing.

For additional information on this specification, guarantee requirements, etc., contact U.S. Ply, Inc. Technical Services ***at (817) 413-0103***

TEN AND TWELVE YEAR GUARANTEE SPECIFICATIONS

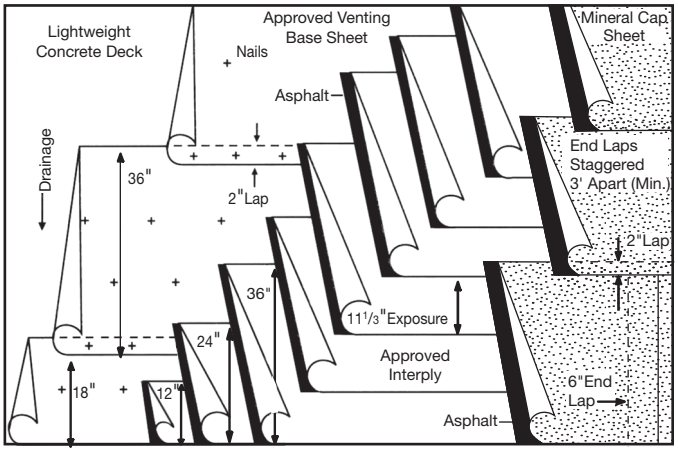
Specification	*Base Sheet*	*Interply*	*Surfacing*
N-4BT4-M*	NVB	(2) Type 4	USP® Mineral Cap
LWC-4VT4-M*	NVB	(2) Type 4	USP® Mineral Cap
N-4BT6-M	NVB	(2) Type 4	USP® Mineral Cap
LWC-4VT6-M	NVB	(2) Type 4	USP® Mineral Cap

*Eligible for a 10 & 12 Year Guarantee in Zones A & B only



FIVE (5) PLY BUR SYSTEM
NAILABLE DECK

Figure 1



FIVE (5) PLY BUR SYSTEM
LIGHTWEIGHT CONCRETE DECK

Figure 2

GENERAL

Safety: Refer to Section 4, Part 13. DO NOT BEGIN INSTALLATION UNTIL THIS INFORMATION IS READ, UNDERSTOOD AND IMPLEMENTED.

MATERIALS

Material Requirements:

Roofing Asphalt ..... 25 lb. (1.2 kg/m²) per ply
Base Sheet[1] ..... 1 ply
Interply[2] ..... 3 plies
Cap Sheet[3] ..... 1 ply

[1] USP® Base, USP® NVB Nailable Venting Base or other U.S. Ply approved base sheets.
[2] USP® Type 4, USP® Type 6, or other U.S. Ply approved interply sheets.
[3] USP® Mineral Cap Sheet

APPLICATION

Refer to Section 4 – General Requirements, and Section 5 - Installation Requirements.

Base Sheet: Mechanically fasten one ply of base sheet over the deck. Lap sheets 2" (5 cm) on side laps and 4" (10 cm) on the end laps. Refer to Section 5, Part 8 and Part 12, Item 12.03 – Mechanical Attachment of Base Sheets.

Note: Polyisocyanurate insulation boards require a minimum ¼" overlay of SecuRock or ½" wood fiber insulation prior to mopping base.

Valleys & Waterways: Prior to the application of the roofing plies, install a full 36" (91.4 cm) width ply sheet extending at least 8" (20.1 cm) up the incline and out of the valley. Sheet shall be set in a full and uniform mopping of hot and fluid asphalt applied at the rate of 25 lb/square (1.2 kg/m²) per ply.

Interply: Install starter strips of 12" (30.5 cm), 24" (61 cm) and 36" (91.4 cm) widths and follow with a second full 36" (91.4 cm) width sheet with a maximum of 11 1/3" (28.8 cm) exposure, applied shingle fashion. Lap felts 24 2/3" (62.7 cm) with a 11 1/3" (28.8 cm) exposure and lap 4" (10 cm) at ends. Stagger adjacent end laps a minimum of 12" (30.5 cm). Install the felts in full and uniform moppings of hot and fluid hot asphalt applied at the rate of 25 lb/square (1.2 kg/m²) per ply. Refer to Section 5, Part 6 – Asphalt and Part 12, Item 12.04 – Asphalt Mopping Base/Interply Sheets.

Mineral Cap: Install one layer of USP® Mineral Cap over the top ply sheet, in a uniform mopping of hot asphalt applied at a rate of 25 lb/square (1.2 kg/m²). Lap membrane 2" (5 cm) on side laps, 6" (15 cm) on end laps. Adjacent end laps shall be at least 3' (91.4 cm) apart. Refer to Section 5, Part 7 – Asphalt, and Part 12, Item 12.06 – USP® Mineral Cap Sheet Application.

Flashing and Accessories: Refer to Section 5, Part 13 – Flashing and Section 16 USP® BUR Construction Details.

For additional information on this specification, guarantee requirements, etc. contact U.S. Ply Technical Services ***at (817) 413-0103***

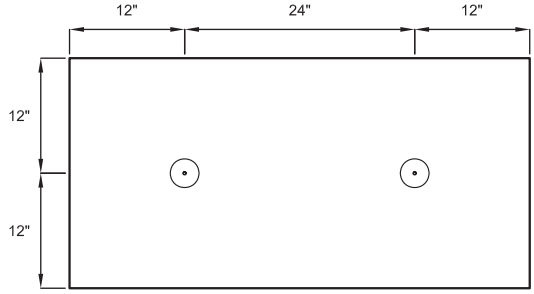
TEN AND TWELVE YEAR GUARANTEE SPECIFICATIONS

Specification	*Base Sheet*	*Interply*	*Surfacing*
N-5BT4-M	Approved	(3) Type 4	USP® Mineral Cap
LWC-5VT4-M	NVB	(3) Type 4	USP® Mineral Cap
N-5BT6-M	Approved	(3) Type 6	USP® Mineral Cap
LWC-5VT6-M	NVB	(3) Type 6	USP® Mineral Cap

FIFTEEN AND TWENTY YEAR GUARANTEE SPECIFICATIONS

Specification	*Base Sheet*	*Interply*	*Surfacing*
N-5BT6-M	Approved	(3) Type 6	USP® Mineral Cap
LWC-5VT6-M	NVB	(3) Type 6	USP® Mineral Cap

FP24-01_2 FASTENERS PER 2' X 4' BOARD



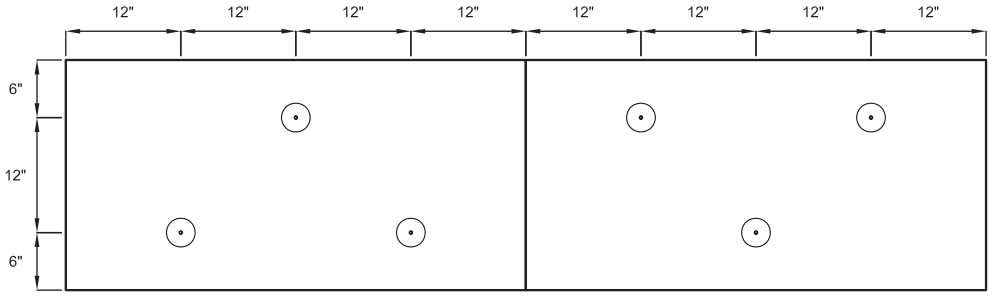
NOTES:

1. FASTENING PATTERN AND BOARD SELECTION, INCLUDING TYPE, SIZE AND THICKNESS, ARE TO BE USED IN CONJUNCTION WITH U.S. PLY GENERAL REQUIREMENTS, INSTALLATION REQUIREMENTS AND APPLICABLE U.S. PLY APPROVED FASTENERS.
2. UNLESS OTHERWISE STATED, FASTENER DENSITIES ARE DETERMINED EITHER BY APPLICABLE APPROVAL RATINGS, PROJECT SPECIFICATION, DESIGN VELOCITY PRESSURES IN ACCORDANCE WITH CURRENT EDITION OF ASCE 7 OR THE AUTHORITY HAVING JURISDICTION (AHJ).

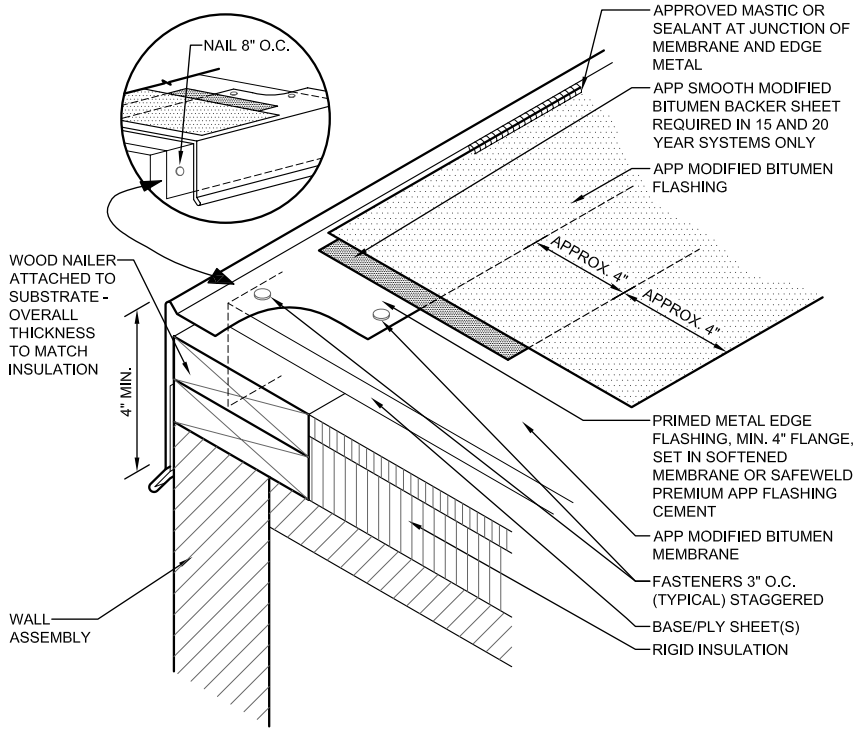
FP24-02_3 FASTENERS PER 2' X 4' BOARD

NOTES:

1. FASTENING PATTERN AND BOARD SELECTION, INCLUDING TYPE, SIZE AND THICKNESS, ARE TO BE USED IN CONJUNCTION WITH U.S. PLY GENERAL REQUIREMENTS, INSTALLATION REQUIREMENTS AND APPLICABLE U.S. PLY APPROVED FASTENERS.
2. UNLESS OTHERWISE STATED, FASTENER DENSITIES ARE DETERMINED EITHER BY APPLICABLE APPROVAL RATINGS, PROJECT SPECIFICATION, DESIGN VELOCITY PRESSURES IN ACCORDANCE WITH CURRENT EDITION OF ASCE 7 OR THE AUTHORITY HAVING JURISDICTION (AHJ).



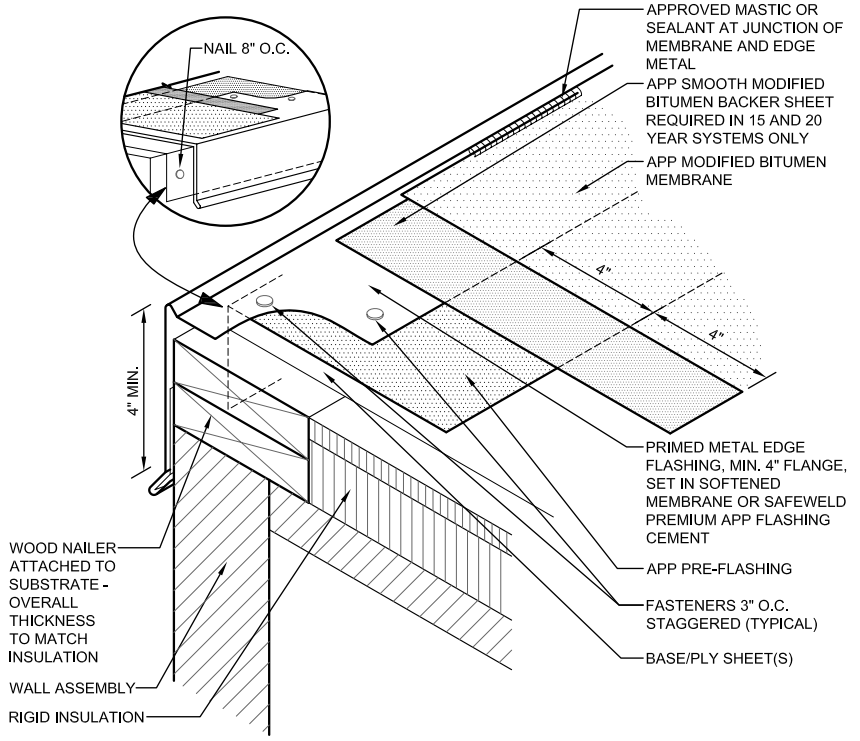
DW-1 – APP PERIMETER FLASHING DETAIL



NOTES:

1. BASE/PLY SHEET(S) AND MEMBRANE TURNED OVER EDGE AND EXTENDED BELOW BLOCKING OR A MINIMUM OF 1 ½" (38 MM), WHICHEVER IS GREATER.
2. 15 & 20 YEAR DETAIL: APP SMOOTH MODIFIED BITUMEN BACKER SHEET AND APP GRANULE SURFACED MODIFIED BITUMEN MEMBRANE ARE APPLIED OVER METAL FLANGE.
3. APPROVED MASTIC OR SEALANTS ARE SAFEWELD PREMIUM APP FLASHING CEMENT, PLYLINK CONSTRUCTION ADHESIVE/SEALANT, OR LIQUA-PLY FLASHING.

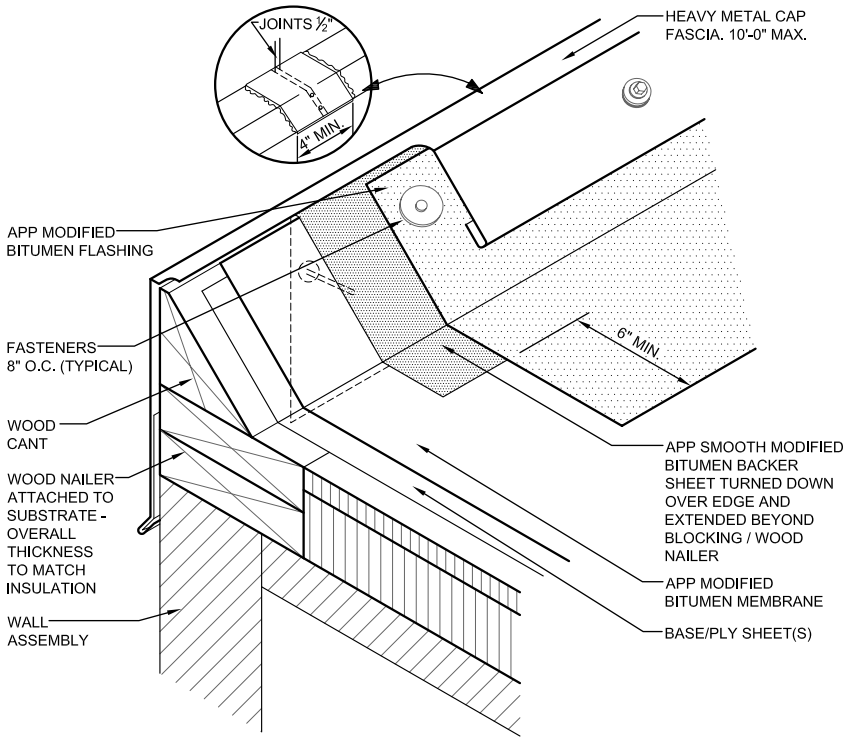
DW-2 – APP PERIMETER FLASHING DETAIL (GRANULATED)



NOTES:

1. BASE/PLY SHEET(S) AND APP PRE-FLASHING TURNED OVER EDGE AND EXTENDED BELOW BLOCKING OR A MINIMUM OF 1 ½" (38 MM), WHICHEVER IS GREATER.
2. 15 & 20 YEAR DETAIL: APP SMOOTH MODIFIED BITUMEN BACKER SHEET AND APP GRANULE SURFACED MODIFIED BITUMEN MEMBRANE ARE APPLIED OVER METAL FLANGE.
3. APPROVED MASTIC OR SEALANTS ARE SAFEWELD PREMIUM APP FLASHING CEMENT, PLYLINK CONSTRUCTION ADHESIVE/SEALANT, OR LIQUA-PLY FLASHING.

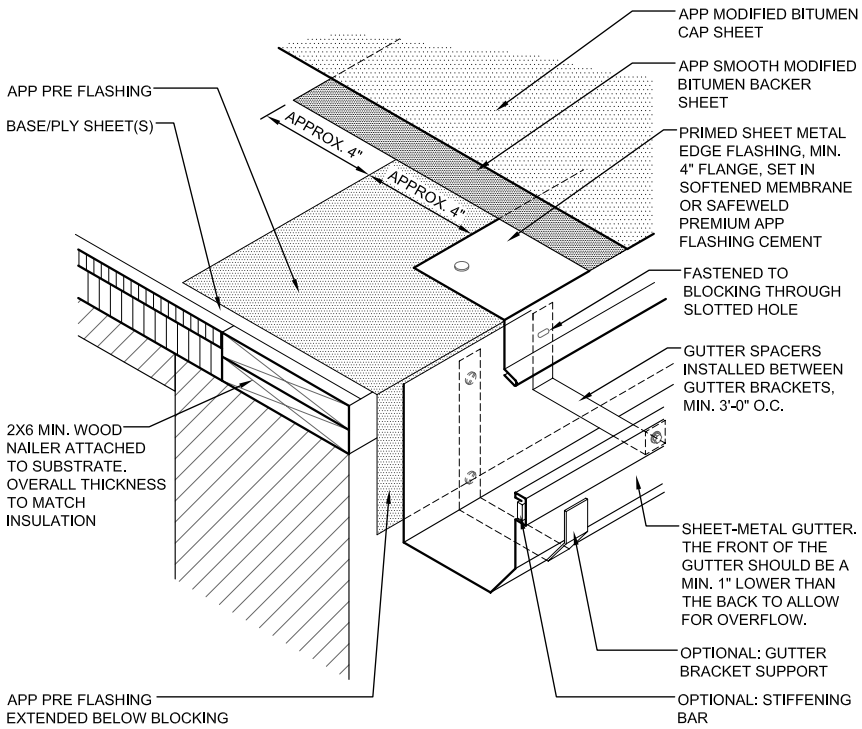
DW-03_APP PERIMETER CURB FLASHING DETAIL



NOTES:

1. FASTENERS SHALL BE PLACED IN EACH SECTION OF CAP FASCIA IN ACCORDANCE WITH SMACNA REQUIREMENTS AND WIND LOAD REQUIREMENTS.
2. COVER PLATE SHALL BE EMBEDDED IN PLYLINK HP SEALANT OR OTHER APPROVED SEALANT. TWO FASTENERS SHALL BE PLACED AT THE CENTER OF EACH SECTION OF CAP FASCIA AND COVER PLATE. SEAL FASTENERS WITH PLYLINK HP SEALANT OR OTHER APPROVED SEALANT.

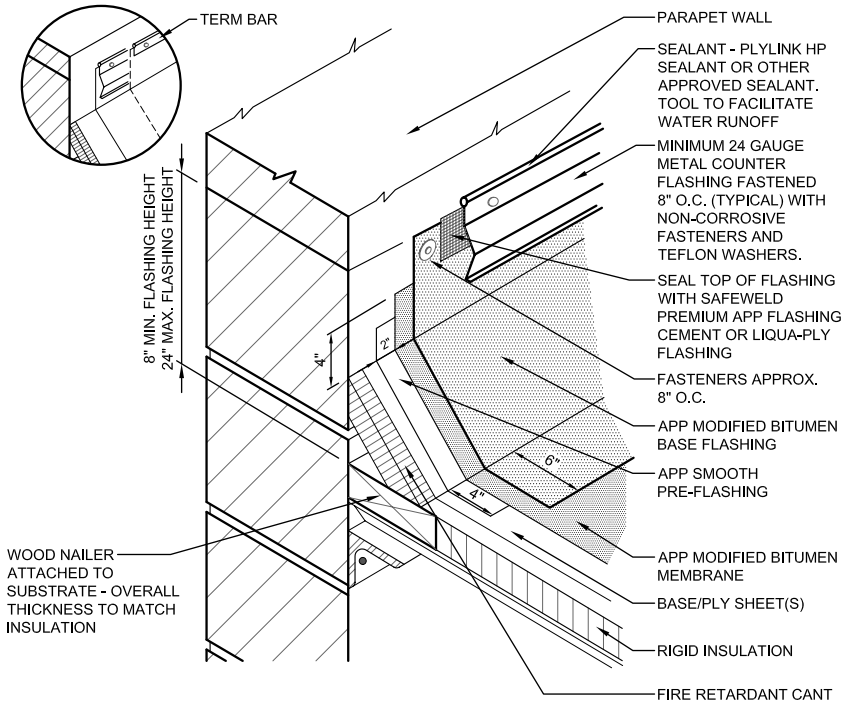
DW-04_APP GUTTER FLASHING DETAIL



NOTES:

1. BASE/PLY SHEET(S) TURNED OVER EDGE PRIOR TO GUTTER INSTALLATION A MINIMUM OF 1 ½" (38 MM) OR THICKNESS OF NAILER, WHICHEVER IS GREATER.
2. APP PRE-FLASHING TURNED OVER EDGE PRIOR TO GUTTER A MINIMUM OF 1 ½" OR THICKNESS OF NAILER, WHICHEVER IS GREATER.
3. IF GUTTER IS EXISTING, TURN APP PRE-FLASHING OVER EDGE INTO GUTTER A MINIMUM OF 1 ½" OR BELOW THICKNESS OF NAILER, WHICHEVER IS GREATER.

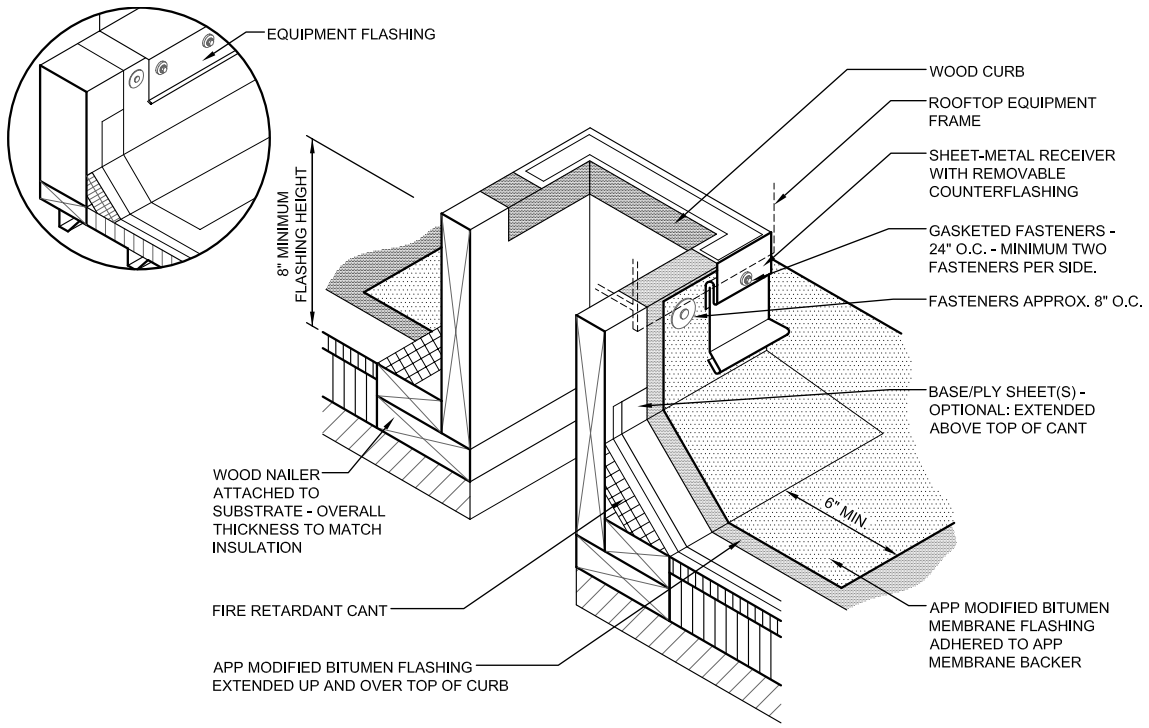
DW-05_APP COUNTER FLASHING DETAIL



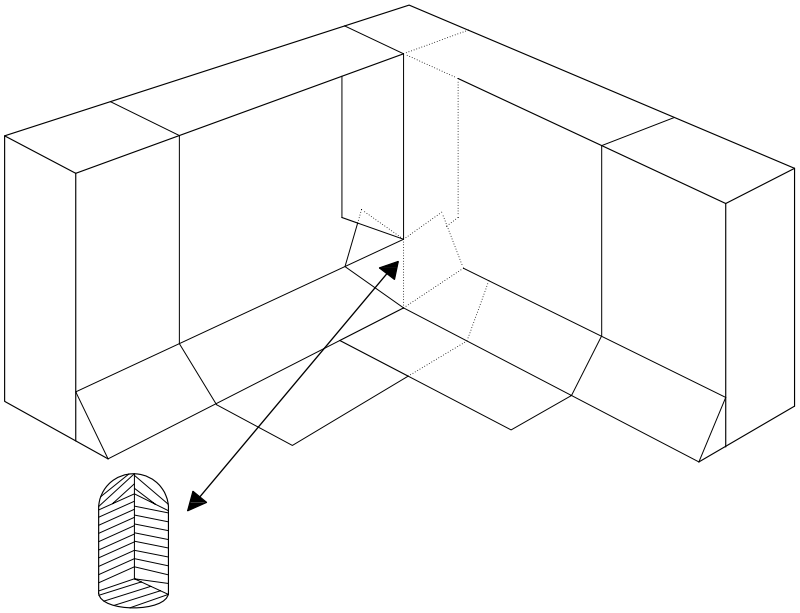
NOTES:

1. WHEN PARAPET WALL EXCEEDS 24" IN HEIGHT, REFER TO DURAWELD™ APP HIGH WALL FLASHING DETAIL.
2. MASONRY WALLS TO BE PRIMED PRIOR TO FLASHING. WOOD WALLS REQUIRE BASE SHEET NAILED TO WALL 8" O.C. ALONG TOP AND LAPS, ONE PER S.F. FIELD.
3. TERM BAR SHALL BE MINIMUM 1" WIDE EXTRUDED ALUMINUM, FASTENED 8" O.C. (TYPICAL) WITH NON-CORROSIVE FASTENERS AND TEFLON WASHERS.
4. TERM BAR, IN LIEU OF COUNTER FLASHING, IS NOT ACCEPTABLE FOR 15 AND 20 YEAR SYSTEMS.

DW-06_APP EQUIPMENT CURB FLASHING DETAIL



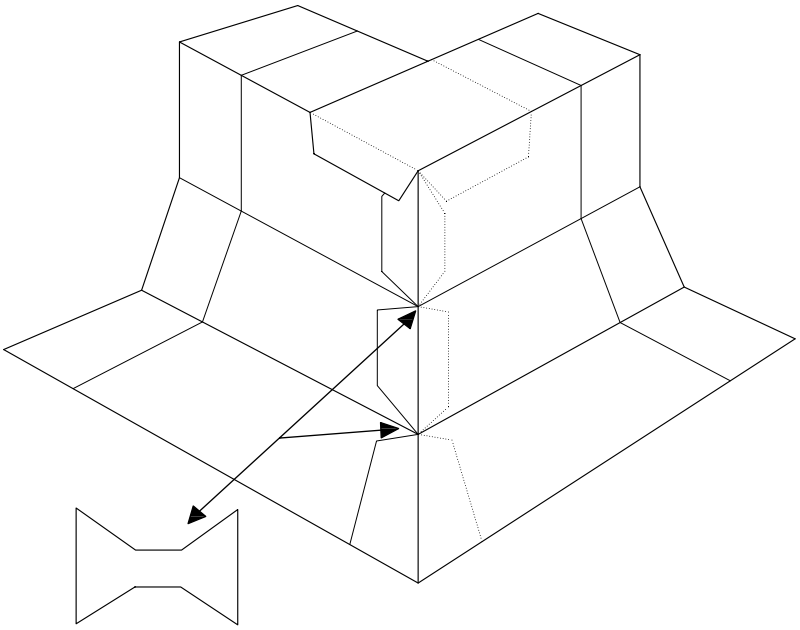
DW-07_APP INSIDE CORNER FLASHING DETAIL



NOTES:

1. MAKE FIELD CUTS AT TOP AND BOTTOM OF CANT TO PROPERLY FOLD.
2. INSTALL APP CORNER MEMBRANE FLASHING OVER CUTS MADE IN APP MODIFIED BITUMEN FLASHING.

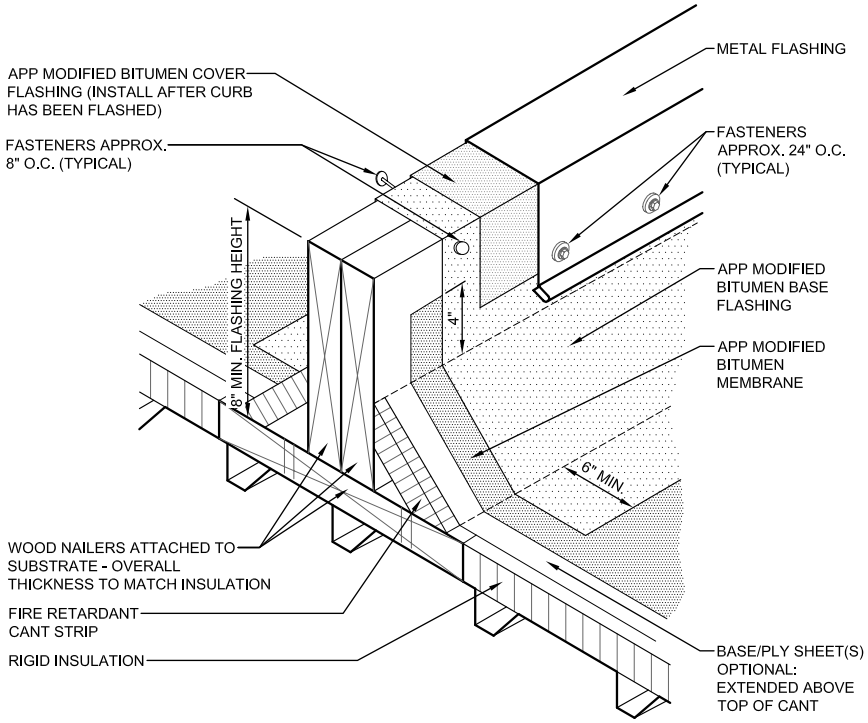
DW-08_APP OUTSIDE CORNER FLASHING DETAIL



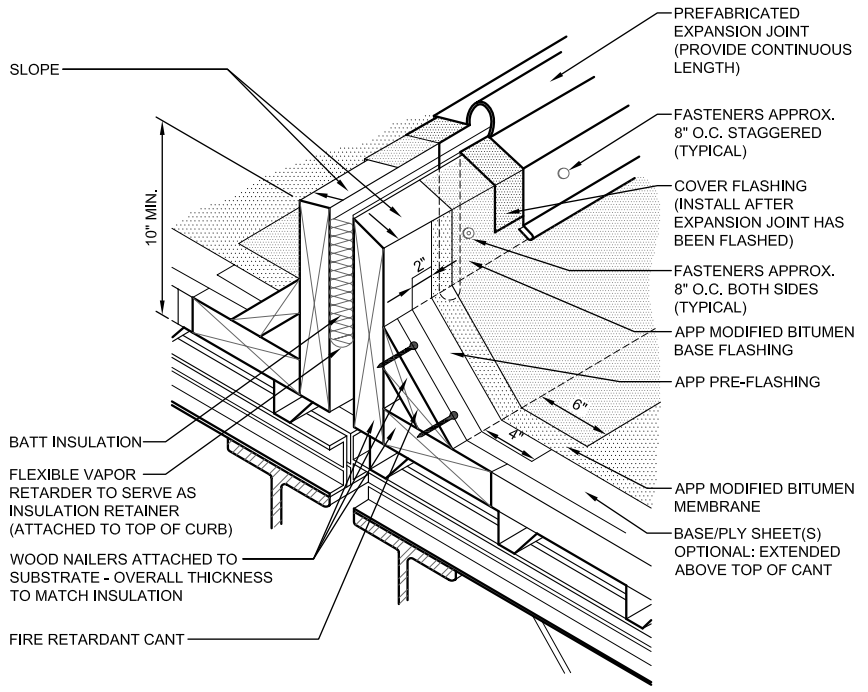
NOTES:

1. MAKE FIELD CUTS AT TOP AND BOTTOM OF CANT TO PROPERLY FOLD.
2. INSTALL APP CORNER MEMBRANE FLASHING OVER CUTS MADE IN APP MODIFIED BITUMEN FLASHING.
3. 3 COURSING WITH PLASTIC ROOF CEMENT IS NOT AN ACCEPTABLE ALTERNATIVE.

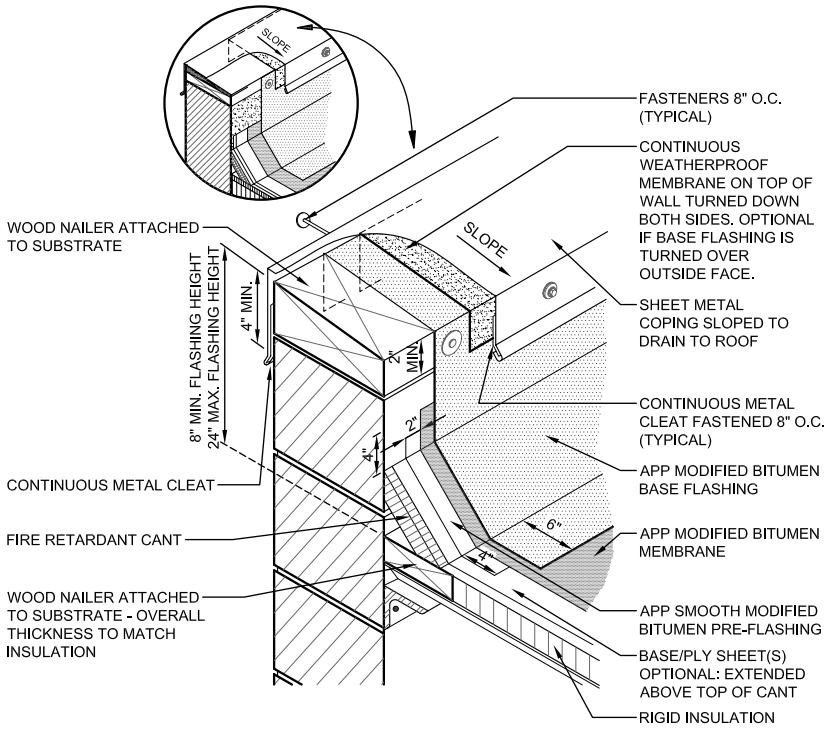
DW-09_APP CURB DIVIDER FLASHING DETAIL



DW-10_APP EXPANSION JOINT CURB FLASHING DETAIL



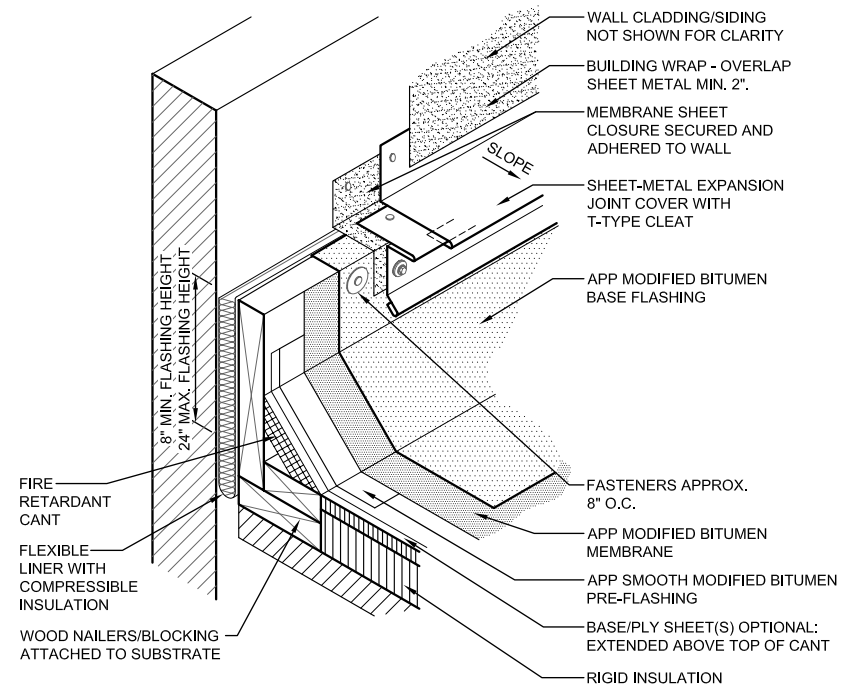
DW-11 – APP SUPPORTED WALL FLASHING DETAIL



NOTES:

1. WHEN PARAPET WALL EXCEEDS 24" IN HEIGHT, REFER TO DURAWELD™ APP HIGH WALL FLASHING DETAIL.
2. MASONRY WALLS TO BE PRIMED AS REQUIRED PRIOR TO FLASHING. WOOD WALLS REQUIRE BASE SHEET NAILED TO WALL 8" O.C. ALONG TOP AND LAPS, ONE PER S.F. FIELD.
3. APP MODIFIED BITUMEN BASE FLASHING TURNED OVER EDGE AND EXTENDED BELOW BLOCKING OR A MINIMUM OF 1 ½" (38 MM), WHICHEVER IS GREATER.
4. CONTINUOUS WEATHERPROOF MEMBRANE ON TOP OF WALL TURNED DOWN BOTH SIDES. OPTIONAL IF BASE FLASHING IS TURNED OVER OUTSIDE FACE. REFER TO DETAIL INSET.
5. FASTEN APP MODIFIED BITUMEN BASE FLASHING WITH FASTENERS APPROX. 8" O.C. REFER TO DETAIL INSET.

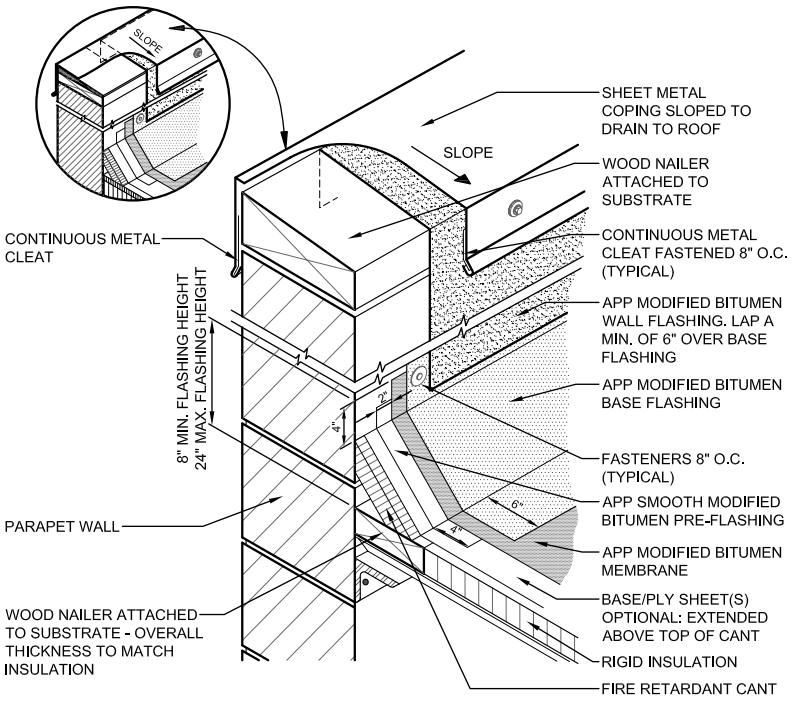
DW-12 – APP NON-SUPPORTED WALL FLASHING DETAIL



NOTES:

1. MASONRY WALLS TO BE PRIMED PRIOR TO FLASHING. WOOD WALLS REQUIRE BASE SHEET NAILED TO WALL 8" O.C. ALONG TOP AND LAPS, ONE PER S.F. FIELD.
2. FOR TILT WALLS, BASE FLASHINGS SHALL BE SEPARATED FROM WALL BY WOOD NAILERS/BLOCKING ATTACHED TO SUBSTRATE ONLY.

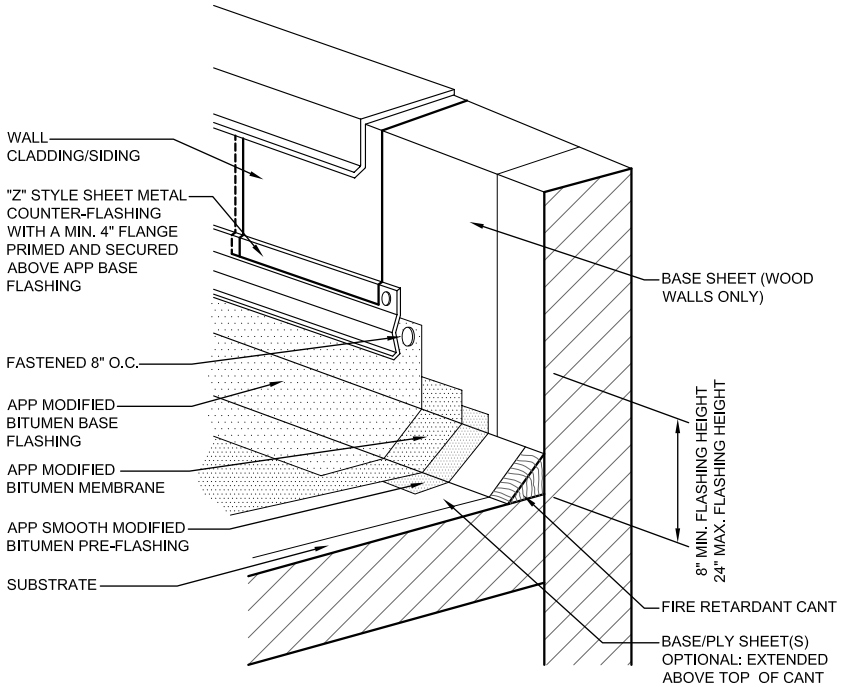
DW-13 – APP HIGH WALL FLASHING DETAIL



NOTES:

1. MASONRY WALLS TO BE PRIMED AS REQUIRED PRIOR TO FLASHING. WOOD WALLS REQUIRE BASE SHEET NAILED TO WALL 8" O.C. ALONG TOP AND LAPS, ONE PER S.F. FIELD.
2. APP MODIFIED BITUMEN WALL FLASHING TURNED OVER EDGE AND EXTENDED BELOW BLOCKING OR A MINIMUM OF 1 ½" (38 MM), WHICHEVER IS GREATER.
3. CONTINUOUS WEATHERPROOF MEMBRANE ON TOP OF WALL TURNED DOWN BOTH SIDES. OPTIONAL IF BASE FLASHING IS TURNED OVER OUTSIDE FACE. REFER TO DETAIL INSET.
4. FASTENED APP MODIFIED BITUMEN BASE FLASHING WITH FASTENERS APPROX. 8" O.C. REFER TO DETAIL INSET.

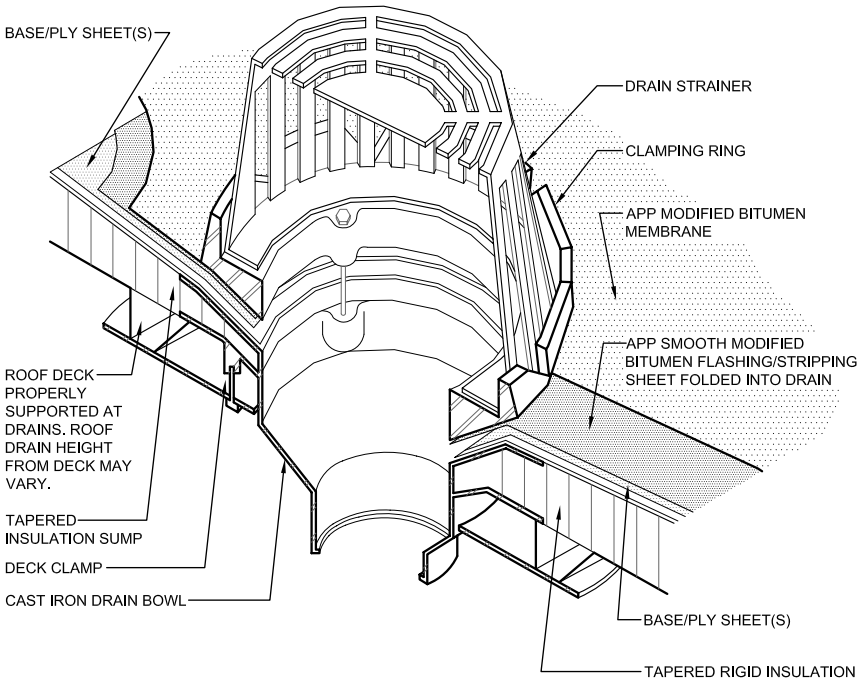
DW-14 – APP HIGH WALL (2-PIECE) FLASHING DETAIL



NOTES:

1. MASONRY WALLS TO BE PRIMED AS REQUIRED PRIOR TO FLASHING. WOOD WALLS REQUIRE BASE SHEET NAILED TO WALL 8" O.C. ALONG TOP AND LAPS, ONE PER S.F. FIELD.

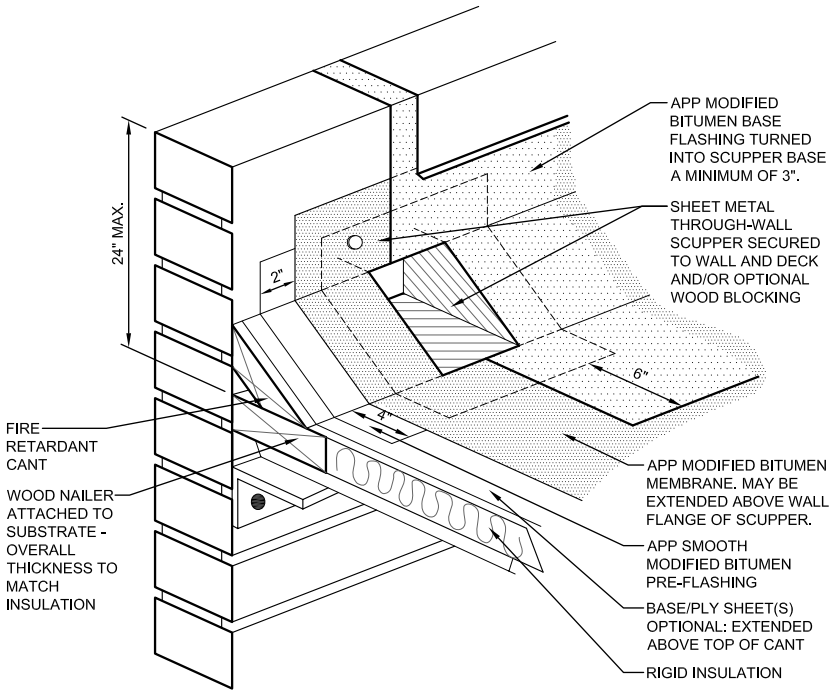
DW-15 – APP ROOF DRAIN FLASHING DETAIL



NOTES:

1. PRIME DRAIN FLANGE PRIOR TO APPLYING MEMBRANE.
2. MEMBRANE AND FLASHING MUST EXTEND UNDER CLAMPING RING.
3. PLASTIC ROOF DRAINS CANNOT BE USED.

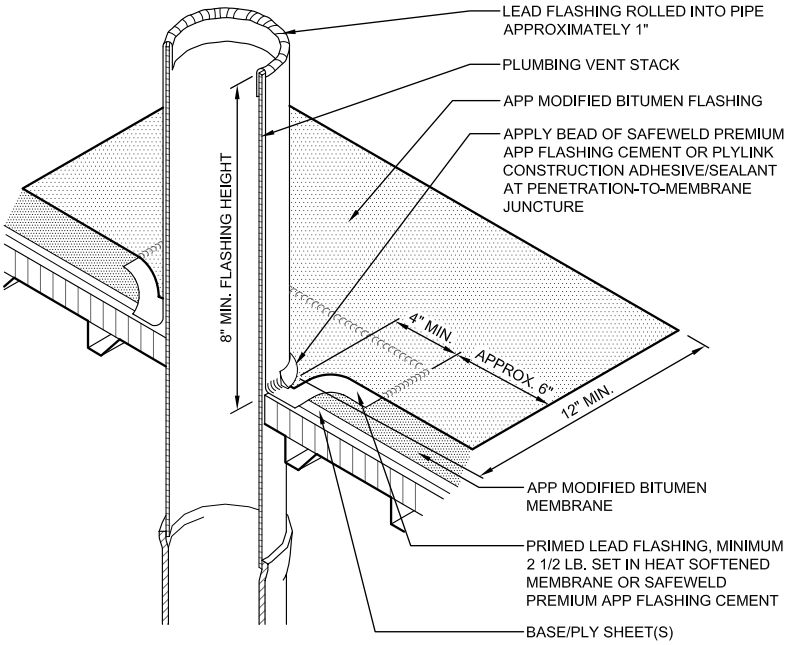
DW-16 – APP ROOF SCUPPER FLASHING DETAIL



NOTES:

1. SEE DURAWELD™ APP HIGH WALL FLASHING DETAIL FOR WALL FLASHING ABOVE 24".
2. SET SCUPPER FLANGES IN SAFEWELD PREMIUM APP FLASHING CEMENT - PRIME FLANGE BEFORE STRIPPING.
3. APPLY A BEAD OF SAFEWELD APP FLASHING CEMENT, LIQUA-PLY FLASHING OR PLYLINK CONSTRUCTION ADHESIVE/SEALANT TO THE MEMBRANE TERMINATION INSIDE SCUPPER AND AT SCUPPER OPENING CORNERS.

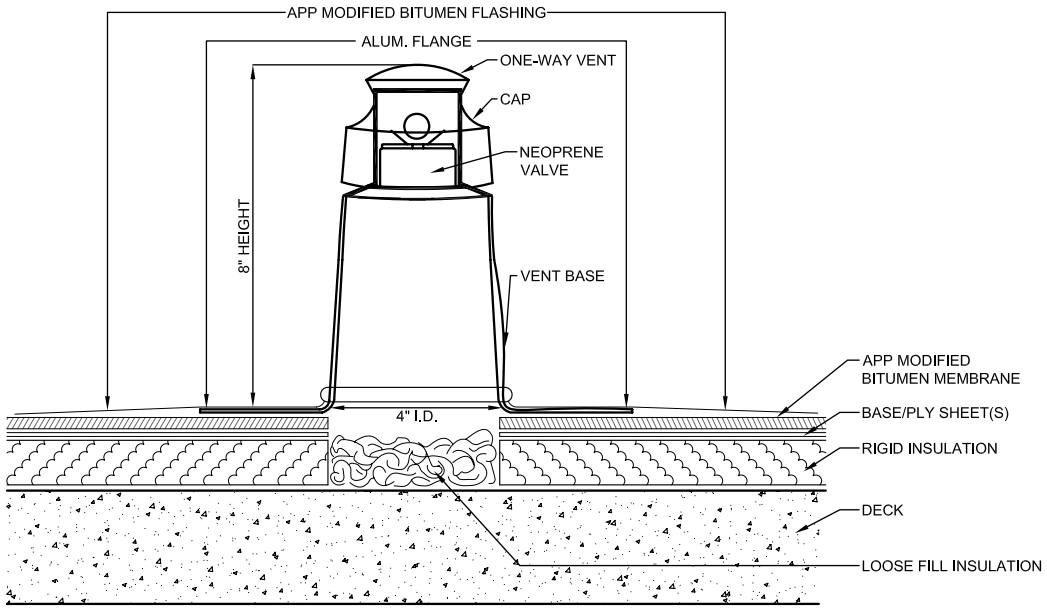
DW-17 – APP VENT STACK FLASHING DETAIL



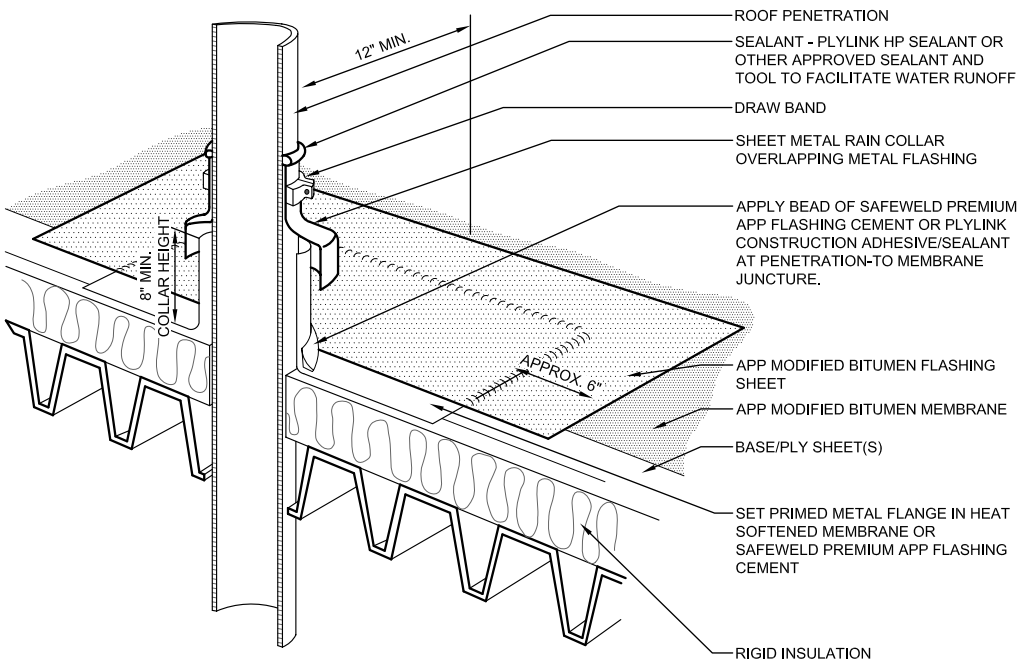
NOTES:

1. FOR PIPES UNDER 8" IN HEIGHT, A TUBOS PIPE INSERT MAY BE APPLIED TO REACH PROPER HEIGHT.

DW-18 – APP ONE-WAY RELIEF VENT FLASHING DETAIL

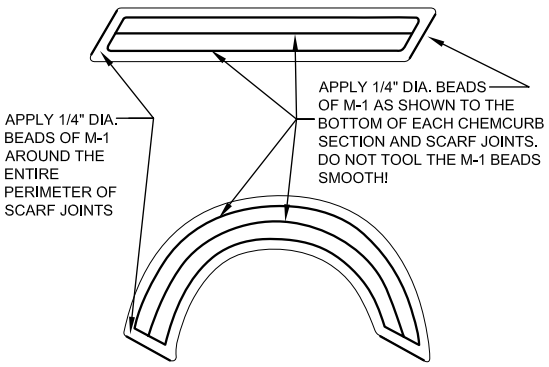


DW-19 – APP ROOF PENETRATION FLASHING DETAIL

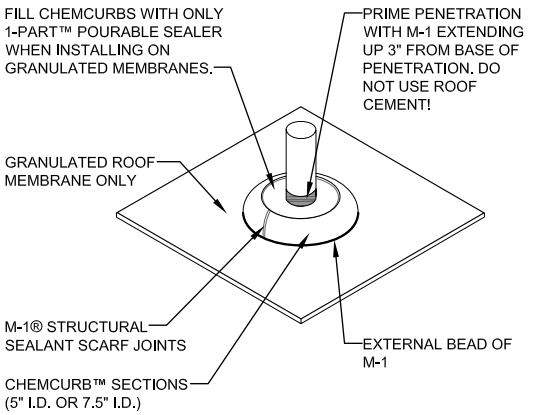


DW-20 – CHEMCURB® ROOF PENETRATION FLASHING DETAIL

M-1 APPLICATION TO THE BOTTOM AND SCARF JOINTS OF CHEMCURB SECTIONS

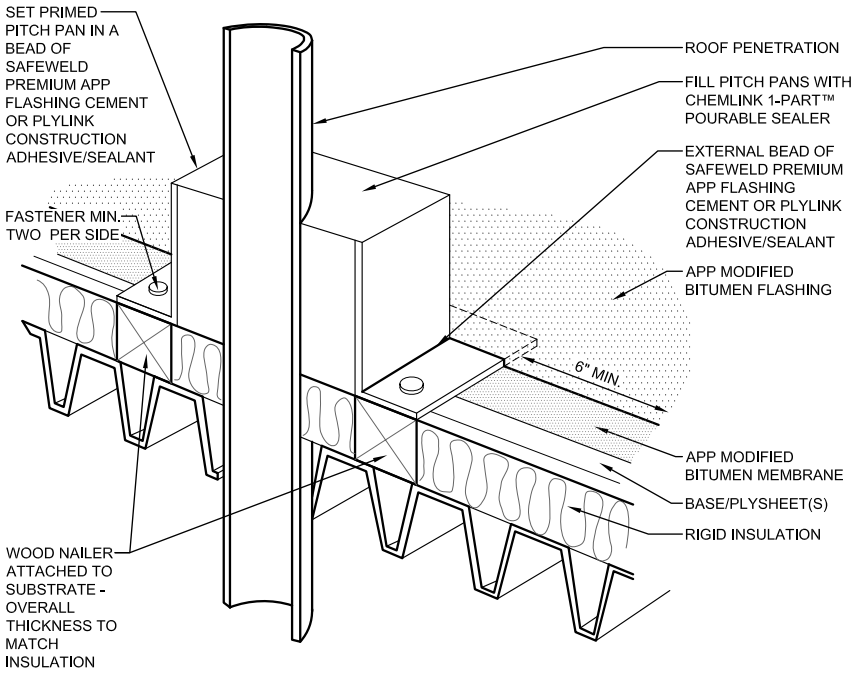


STANDARD CHEMCURB DETAIL



A MINIMUM 1" SPACE IS REQUIRED BETWEEN ALL PENETRATIONS AND THE INTERIOR WALL OF ALL CHEMCURBS.

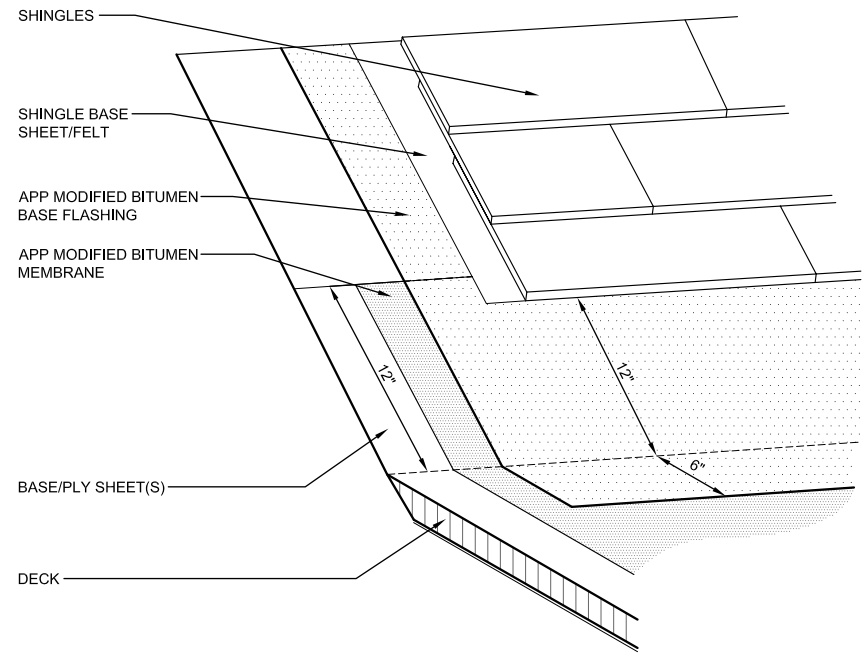
DW-21 – APP PITCH PAN FLASHING DETAIL



NOTES:

1. REFER TO CHEMCURB™ ROOF PENETRATION DETAIL FOR 15 AND 20 YEAR SYSTEMS.
2. PIPE PENETRATION AND BASE OF PENETRATION MUST BE CLEAN AND FREE OF DIRT AND MASTIC BEFORE APPLYING POURABLE SEALER.
3. CLEAN AND PRIME PENETRATION WITH M-1 EXTENDING 2" ABOVE TOP OF PAN.
4. CLEAN AND PRIME INSIDE TOP 2" OF PAN WITH M-1.

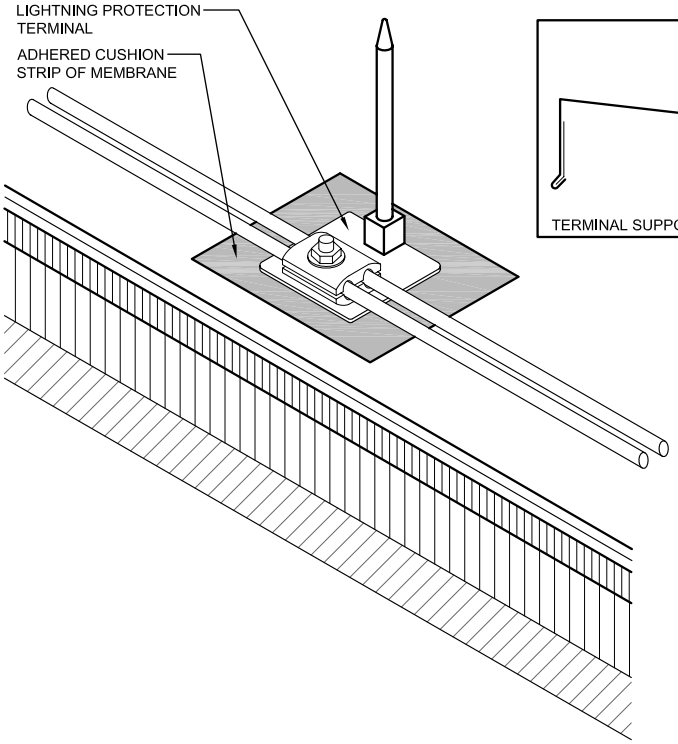
DW-22 – APP FLAT/SHINGLE FLASHING DETAIL

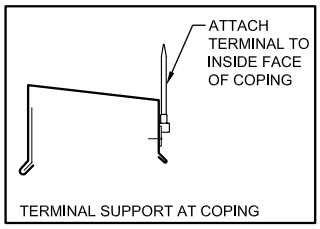


NOTES:

1. BASE/PLY SHEET(S) AND APP MODIFIED BASE FLASHING MUST BE EXTENDED UP TO A MINIMUM OF 3 COURSES OF SHINGLES.

DW-23_LIGHTNING PROTECTION TERMINAL DETAIL

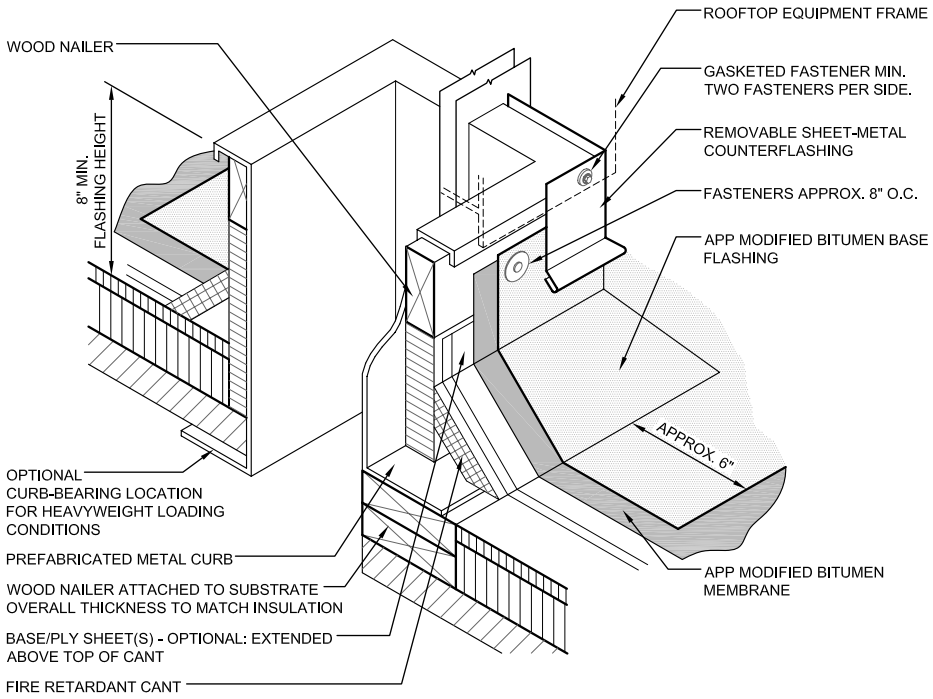




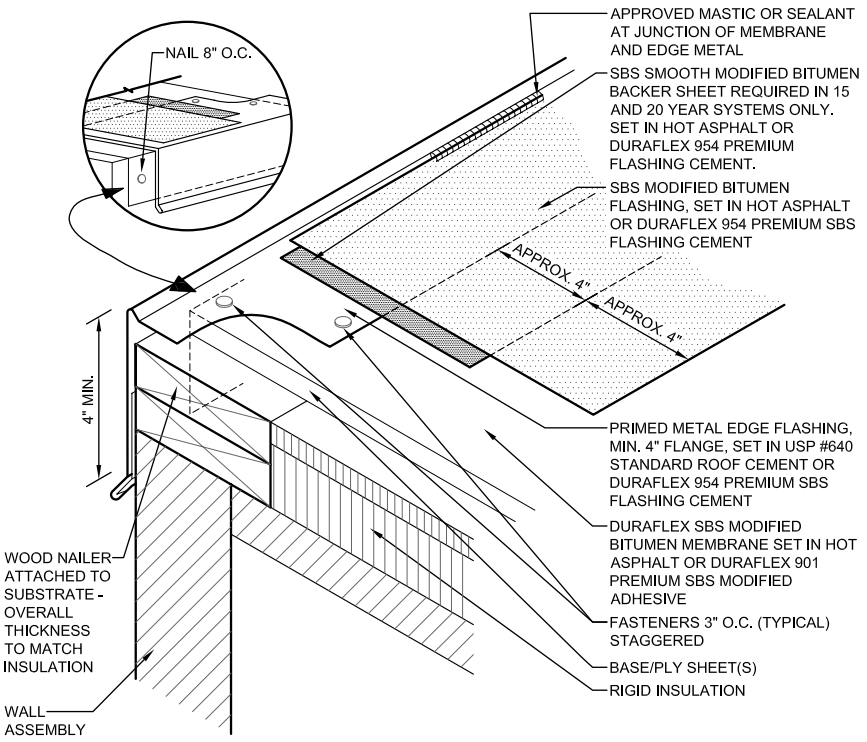
NOTES:

1. THIS DETAIL IS APPLICABLE FOR MOP, COLD OR TORCH-APPLIED FLASHING SYSTEMS.
2. DETAIL DEPICTS THE WEATHERPROOFING PROTECTION AND DOES NOT REPRESENT LIGHTNING PROTECTION DESIGN.
3. FOR ROOF SYSTEMS WITH FACTORY-APPLIED GRANULE SURFACING, PROPERLY PREPARE CAP SHEET TO RECEIVE FLASHING.

DW-24_BASE FLASHING AT PREFABRICATED CURB DETAIL



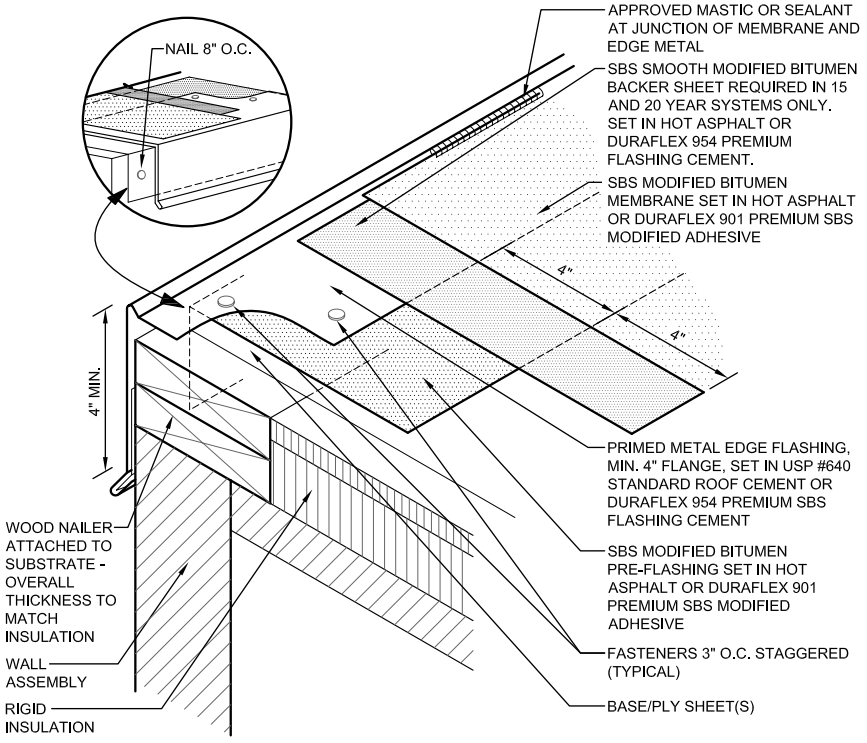
DF-01_SBS PERIMETER FLASHING DETAIL



NOTES:

1. BASE/PLY SHEET(S) AND MEMBRANE TURNED OVER EDGE AND EXTENDED BELOW BLOCKING OR A MINIMUM OF 1 ½" (38 MM), WHICHEVER IS GREATER.
2. 15 & 20 YEAR DETAIL: SBS SMOOTH MODIFIED BITUMEN BACKER SHEET AND SBS GRANULE SURFACED MODIFIED BITUMEN MEMBRANE ARE APPLIED OVER METAL FLANGE.
3. APPROVED MASTIC OR SEALANTS ARE DURAFLEX 954 PREMIUM SBS FLASHING CEMENT, PLYLINK CONSTRUCTION ADHESIVE/SEALANT, OR LIQUA-PLY FLASHING.
4. DURAFLEX ALUM MAY BE USED FOR FLASHING MATERIAL IN LIEU OF HOT ASPHALT APPLIED SBS FLASHING MEMBRANE. DURAFLEX ALUM MAY ONLY BE APPLIED WITH HOT ASPHALT OR USING THE HEAT WELDING METHOD OR PLYLINK FLASH-N-PATCH. DO NOT USE SOLVENT BASED ADHESIVES TO INSTALL DURAFLEX ALUM.

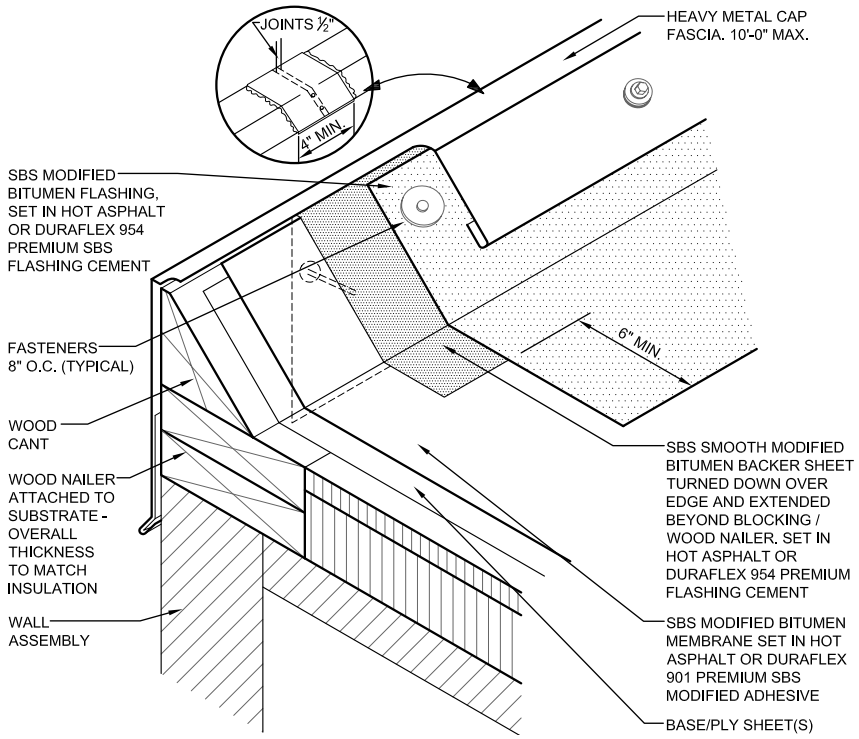
DF-02_SBS PERIMETER FLASHING DETAIL (GRANULATED)



NOTES:

1. BASE/PLY SHEET(S) TURNED OVER EDGE AND EXTENDED BELOW BLOCKING OR A MINIMUM OF 1 ½" (38 MM), WHICHEVER IS GREATER.
2. 15 & 20 YEAR DETAIL: SBS SMOOTH MODIFIED BITUMEN BACKER SHEET AND SBS GRANULE SURFACED MODIFIED BITUMEN MEMBRANE ARE APPLIED OVER METAL FLANGE.
3. APPROVED MASTIC OR SEALANTS ARE DURAFLEX 954 PREMIUM SBS FLASHING CEMENT, PLYLINK CONSTRUCTION ADHESIVE/SEALANT, OR LIQUA-PLY FLASHING.
4. DURAFLEX ALUM MAY BE USED FOR FLASHING MATERIAL IN LIEU OF HOT ASPHALT APPLIED SBS FLASHING MEMBRANE. DURAFLEX ALUM MAY ONLY BE APPLIED WITH HOT ASPHALT OR USING THE HEAT WELDING METHOD OR PLYLINK FLASH-N-PATCH. DO NOT USE SOLVENT BASED ADHESIVES TO INSTALL DURAFLEX ALUM.

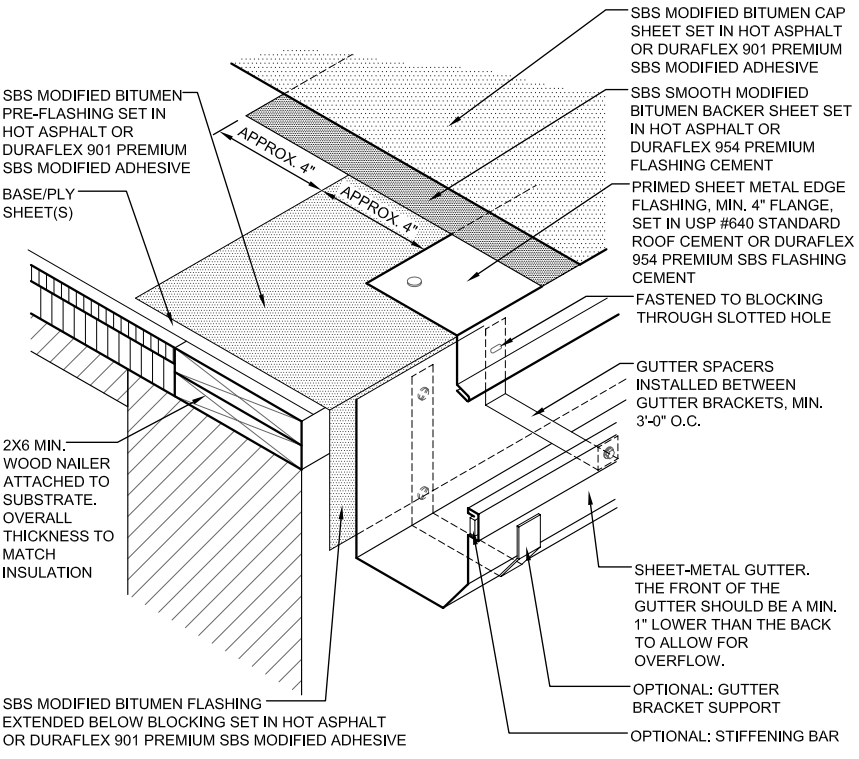
DF-03_SBS PERIMETER CURB FLASHING DETAIL



NOTES:

1. FASTENERS SHALL BE PLACED IN EACH SECTION OF CAP FASCIA IN ACCORDANCE WITH SMACNA REQUIREMENTS AND WIND LOAD REQUIREMENTS.
2. COVER PLATE SHALL BE EMBEDDED IN PLYLINK HP SEALANT OR OTHER APPROVED SEALANT. TWO FASTENERS SHALL BE PLACED AT THE CENTER OF EACH SECTION OF CAP FASCIA AND COVER PLATE. SEAL FASTENERS WITH PLYLINK HP SEALANT OR OTHER APPROVED SEALANT.
3. DURAFLEX ALUM MAY BE USED FOR FLASHING MATERIAL IN LIEU OF HOT ASPHALT APPLIED SBS FLASHING MEMBRANE. DURAFLEX ALUM MAY ONLY BE APPLIED WITH HOT ASPHALT OR USING THE HEAT WELDING METHOD OR PLYLINK FLASH-N-PATCH. DO NOT USE SOLVENT BASED ADHESIVES TO INSTALL DURAFLEX ALUM.

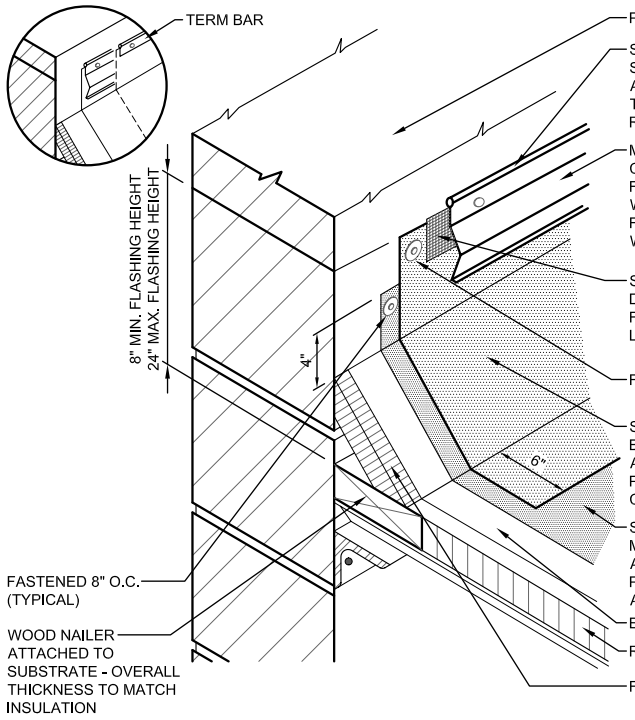
DF-04_SBS GUTTER FLASHING DETAIL



NOTES:

1. BASE/PLY SHEET(S) TURNED OVER EDGE PRIOR TO GUTTER INSTALLATION A MINIMUM OF 1 ½" (38 MM) OR THICKNESS OF NAILER, WHICHEVER IS GREATER.
2. SBS MODIFIED BITUMEN FLASHING TURNED OVER EDGE PRIOR TO GUTTER A MINIMUM OF 1 ½" OR THICKNESS OF NAILER, WHICHEVER IS GREATER.
3. IF GUTTER IS EXISTING, TURN SBS MODIFIED BITUMEN FLASHING OVER EDGE INTO GUTTER A MINIMUM OF 1 ½" OR BELOW THICKNESS OF NAILER, WHICHEVER IS GREATER.
4. DURAFLEX ALUM MAY BE USED FOR FLASHING MATERIAL IN LIEU OF HOT ASPHALT APPLIED SBS FLASHING MEMBRANE. DURAFLEX ALUM MAY ONLY BE APPLIED WITH HOT ASPHALT OR USING THE HEAT WELDING METHOD OR PLYLINK FLASH-N-PATCH. DO NOT USE SOLVENT BASED ADHESIVES TO INSTALL DURAFLEX ALUM.

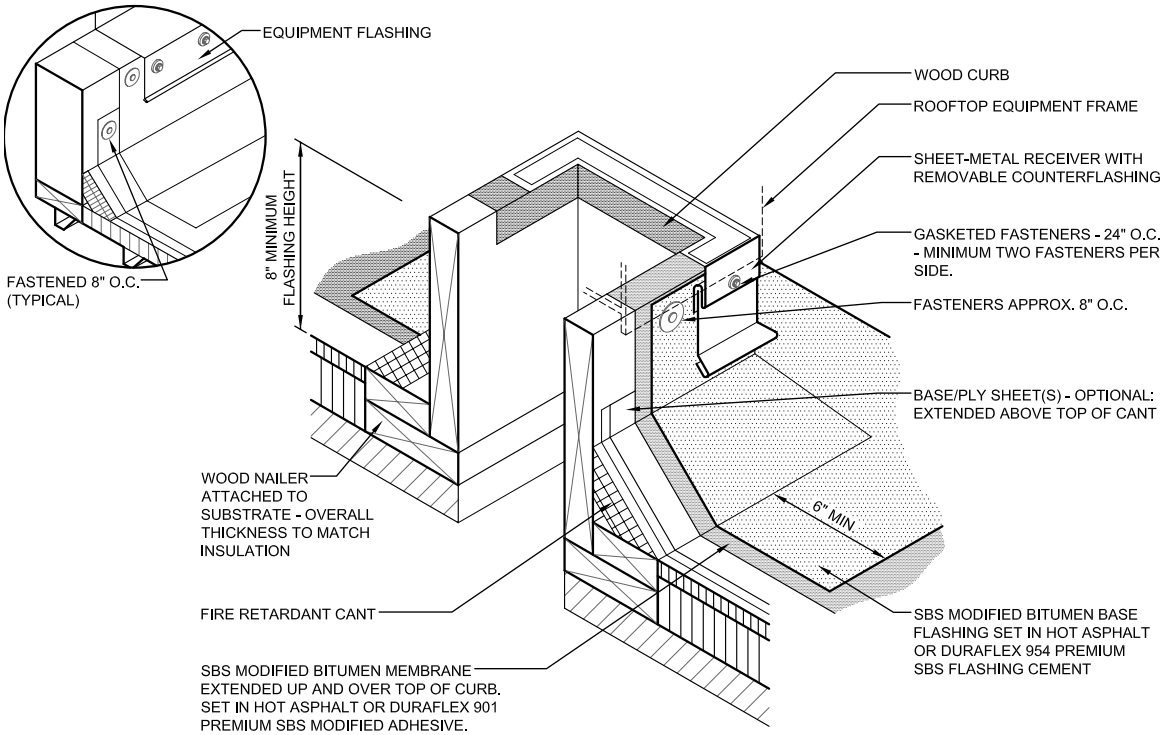
DF-05_SBS COUNTER FLASHING DETAIL



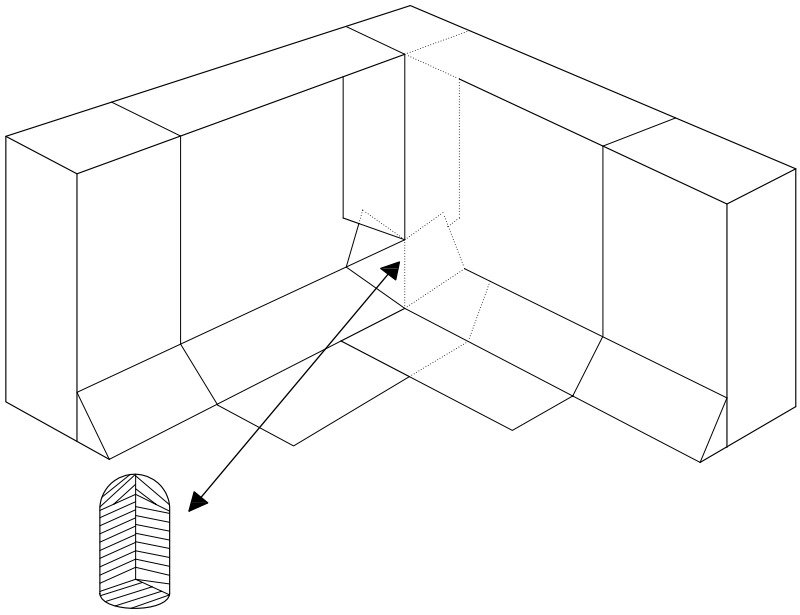
NOTES:

1. WHEN PARAPET WALL EXCEEDS 24" IN HEIGHT, REFER TO DURAFLEX SBS HIGH WALL FLASHING DETAIL.
2. MASONRY WALLS TO BE PRIMED PRIOR TO FLASHING. WOOD WALLS REQUIRE BASE SHEET NAILED TO WALL 8" O.C. ALONG TOP AND LAPS, ONE PER S.F. FIELD.
3. TERM BAR SHALL BE MINIMUM 1" WIDE EXTRUDED ALUMINUM, FASTENED 8" O.C. (TYPICAL) WITH NON-CORROSIVE FASTENERS AND TEFLON WASHERS.
4. TERM BAR, IN LIEU OF COUNTER FLASHING, IS NOT ACCEPTABLE FOR 15 AND 20 YEAR SYSTEMS.
5. DURAFLEX ALUM MAY BE USED FOR FLASHING MATERIAL IN LIEU OF HOT ASPHALT APPLIED SBS FLASHING MEMBRANE. DURAFLEX ALUM MAY ONLY BE APPLIED WITH HOT ASPHALT OR USING THE HEAT WELDING METHOD OR PLYLINK FLASH-N-PATCH. DO NOT USE SOLVENT BASED ADHESIVES TO INSTALL DURAFLEX ALUM.

DF-06_SBS EQUIPMENT CURB FLASHING DETAIL



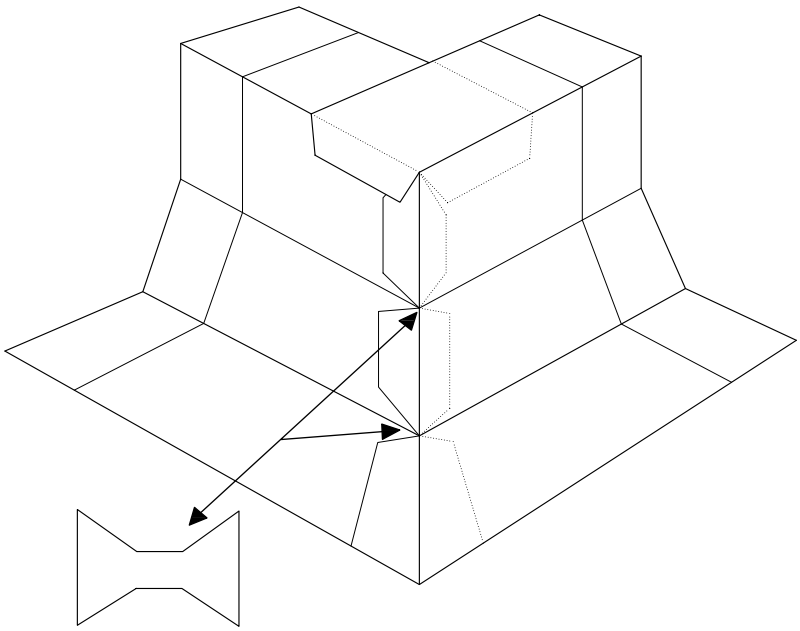
DF-07_SBS INSIDE CORNER FLASHING DETAIL



NOTES:

1. MAKE FIELD CUTS AT TOP AND BOTTOM OF CANT TO PROPERLY FOLD.
2. INSTALL SBS CORNER MEMBRANE FLASHING OVER CUTS MADE IN SBS MODIFIED BITUMEN FLASHING.
3. DURAFLEX ALUM MAY BE USED FOR FLASHING MATERIAL IN LIEU OF HOT ASPHALT APPLIED SBS FLASHING MEMBRANE. DURAFLEX ALUM MAY ONLY BE APPLIED WITH HOT ASPHALT OR USING THE HEAT WELDING METHOD OR PLYLINK FLASH-N-PATCH. DO NOT USE SOLVENT BASED ADHESIVES TO INSTALL DURAFLEX ALUM.
4. WHEN DURAFLEX ALUM IS USED FOR BASE FLASHING MATERIAL IN LIEU OF HOT ASPHALT APPLIED SBS BASE FLASHING, THE CORNERS SHALL BE MITERED. THE CORNERS SHALL BE OVERLAPPED AND CORNER PATCHED WITH SBS MEMBRANE PRIOR TO THE INSTALLATION OF THE DURAFLEX ALUM.

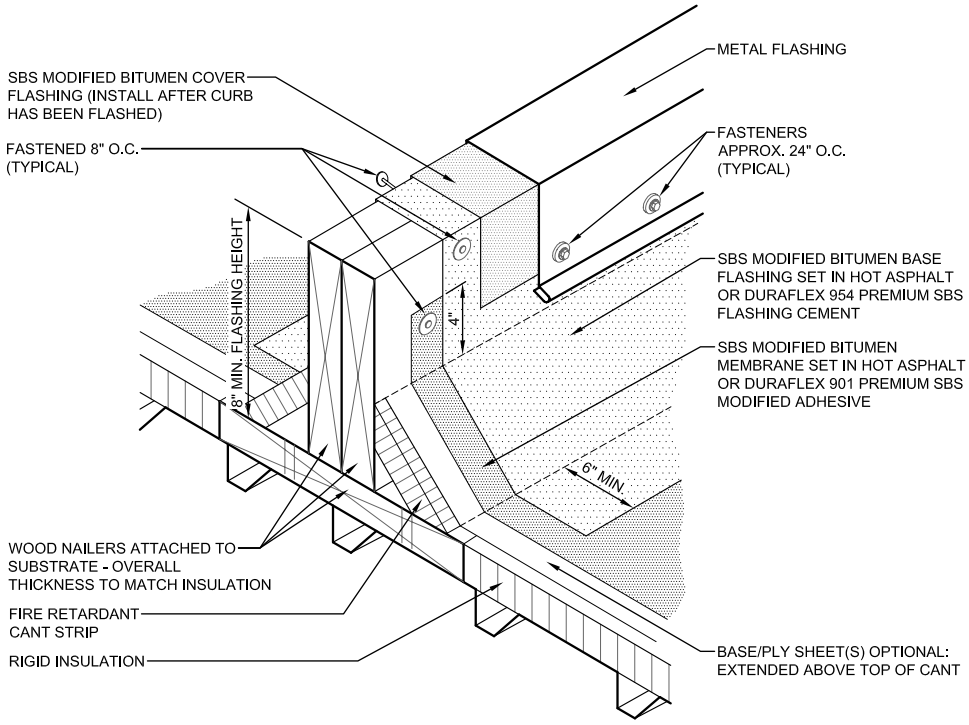
DF-08_SBS OUTSIDE CORNER FLASHING DETAIL



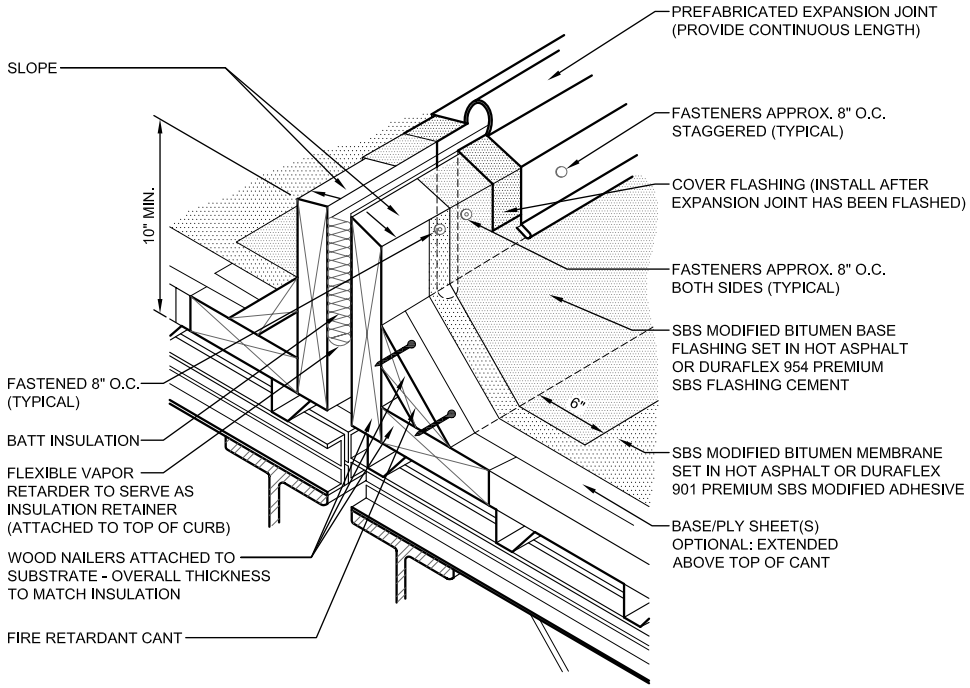
NOTES:

1. MAKE FIELD CUTS AT TOP AND BOTTOM OF CANT TO PROPERLY FOLD.
2. INSTALL SBS CORNER MEMBRANE FLASHING OVER CUTS MADE IN SBS MODIFIED BITUMEN FLASHING.
3. 3 COURSING WITH PLASTIC ROOF CEMENT IS NOT AN ACCEPTABLE ALTERNATIVE.
4. DURAFLEX ALUM MAY BE USED FOR FLASHING MATERIAL IN LIEU OF HOT ASPHALT APPLIED SBS FLASHING MEMBRANE. DURAFLEX ALUM MAY ONLY BE APPLIED WITH HOT ASPHALT OR USING THE HEAT WELDING METHOD OR PLYLINK FLASH-N-PATCH. DO NOT USE SOLVENT BASED ADHESIVES TO INSTALL DURAFLEX ALUM.
5. WHEN DURAFLEX ALUM IS USED FOR BASE FLASHING MATERIAL IN LIEU OF HOT ASPHALT APPLIED SBS BASE FLASHING, THE CORNERS SHALL BE MITERED. THE CORNERS SHALL BE OVERLAPPED AND CORNER PATCHED WITH SBS MEMBRANE PRIOR TO THE INSTALLATION OF THE DURAFLEX ALUM.

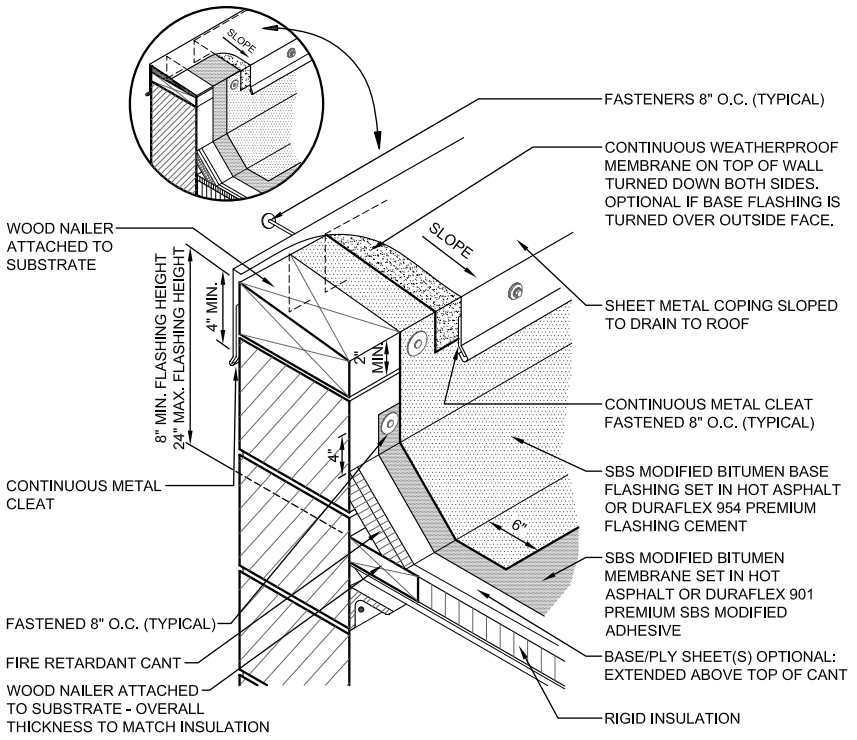
DF-09_SBS CURB DIVIDER FLASHING DETAIL



DF-10_SBS EXPANSION JOINT CURB FLASHING DETAIL



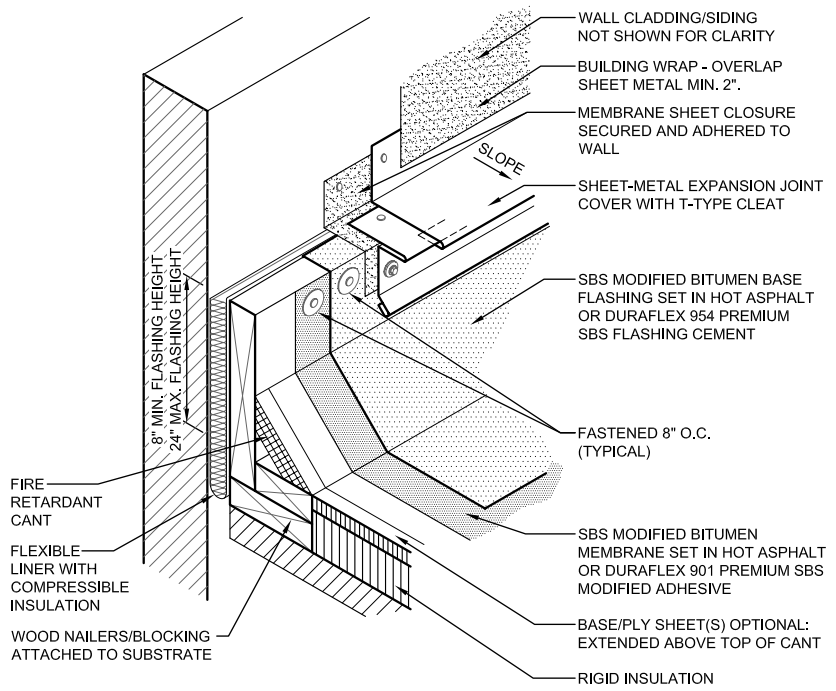
DF-11_SBS SUPPORTED WALL FLASHING DETAIL



NOTES:

1. WHEN PARAPET WALL EXCEEDS 24" IN HEIGHT, REFER TO DURAFLEX SBS HIGH WALL FLASHING DETAIL.
2. MASONRY WALLS TO BE PRIMED AS REQUIRED PRIOR TO FLASHING. WOOD WALLS REQUIRE BASE SHEET NAILED TO WALL 8" O.C. ALONG TOP AND LAPS, ONE PER S.F. FIELD.
3. SBS MODIFIED BITUMEN BASE FLASHING TURNED OVER EDGE AND EXTENDED BELOW BLOCKING OR A MINIMUM OF 1 ½" (38 MM), WHICHEVER IS GREATER.
4. CONTINUOUS WEATHERPROOF MEMBRANE ON TOP OF WALL TURNED DOWN BOTH SIDES. OPTIONAL IF BASE FLASHING IS TURNED OVER OUTSIDE FACE. REFER TO DETAIL INSET.
5. FASTEN SBS MODIFIED BITUMEN BASE FLASHING WITH FASTENERS APPROX. 8" O.C. REFER TO DETAIL INSET.
6. DURAFLEX ALUM MAY BE USED FOR FLASHING MATERIAL IN LIEU OF HOT ASPHALT APPLIED SBS FLASHING MEMBRANE. DURAFLEX ALUM MAY ONLY BE APPLIED WITH HOT ASPHALT OR USING THE HEAT WELDING METHOD OR PLYLINK FLASH-N-PATCH. DO NOT USE SOLVENT BASED ADHESIVES TO INSTALL DURAFLEX ALUM.

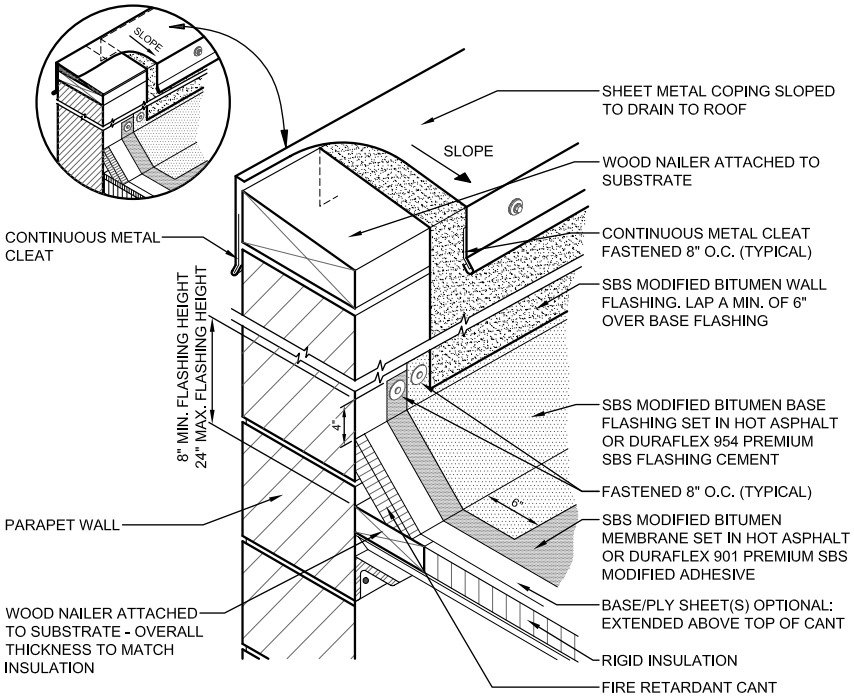
DF-12_SBS NON SUPPORTED WALL FLASHING DETAIL



NOTES:

1. MASONRY WALLS TO BE PRIMED PRIOR TO FLASHING. WOOD WALLS REQUIRE BASE SHEET NAILED TO WALL 8" O.C. ALONG TOP AND LAPS, ONE PER S.F. FIELD.
2. FOR TILT WALLS, BASE FLASHINGS SHALL BE SEPARATED FROM WALL BY WOOD NAILERS/BLOCKING ATTACHED TO SUBSTRATE ONLY.
3. DURAFLEX ALUM MAY BE USED FOR FLASHING MATERIAL IN LIEU OF HOT ASPHALT APPLIED SBS FLASHING MEMBRANE. DURAFLEX ALUM MAY ONLY BE APPLIED WITH HOT ASPHALT OR USING THE HEAT WELDING METHOD OR PLYLINK FLASH-N-PATCH. DO NOT USE SOLVENT BASED ADHESIVES TO INSTALL DURAFLEX ALUM.

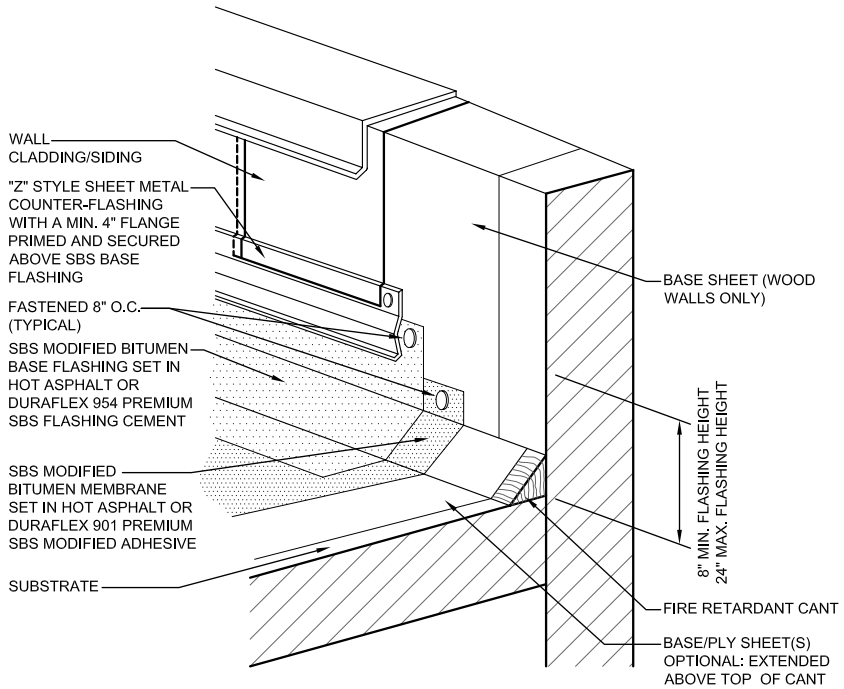
DF-13_SBS HIGH WALL FLASHING DETAIL



NOTES:

1. MASONRY WALLS TO BE PRIMED AS REQUIRED PRIOR TO FLASHING. WOOD WALLS REQUIRE BASE SHEET NAILED TO WALL 8" O.C. ALONG TOP AND LAPS, ONE PER S.F. FIELD.
2. SBS MODIFIED BITUMEN WALL FLASHING TURNED OVER EDGE AND EXTENDED BELOW BLOCKING OR A MINIMUM OF 1 ½" (38 MM), WHICHEVER IS GREATER.
3. CONTINUOUS WEATHERPROOF MEMBRANE ON TOP OF WALL TURNED DOWN BOTH SIDES. OPTIONAL IF BASE FLASHING IS TURNED OVER OUTSIDE FACE. REFER TO DETAIL INSET.
4. FASTENED SBS MODIFIED BITUMEN BASE FLASHING WITH FASTENERS APPROX. 8" O.C. REFER TO DETAIL INSET.
5. DURAFLEX ALUM MAY BE USED FOR FLASHING MATERIAL IN LIEU OF HOT ASPHALT APPLIED SBS FLASHING MEMBRANE. DURAFLEX ALUM MAY ONLY BE APPLIED WITH HOT ASPHALT OR USING THE HEAT WELDING METHOD OR PLYLINK FLASH-N-PATCH. DO NOT USE SOLVENT BASED ADHESIVES TO INSTALL DURAFLEX ALUM.

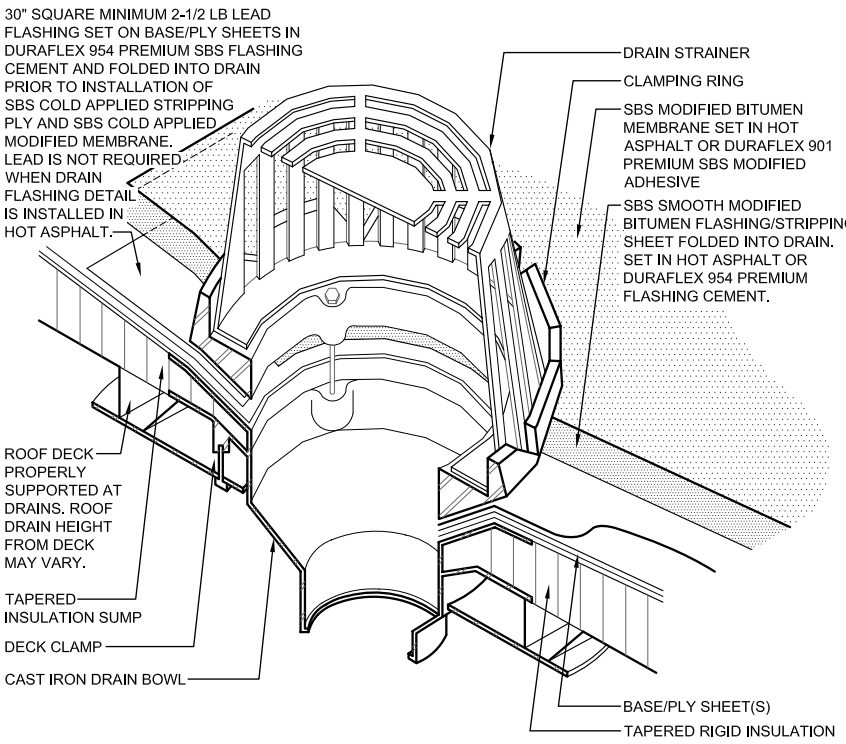
DF-14_SBS HIGH WALL 2-PIECE FLASHING DETAIL



NOTES:

1. MASONRY WALLS TO BE PRIMED AS REQUIRED PRIOR TO FLASHING. WOOD WALLS REQUIRE BASE SHEET NAILED TO WALL 8" O.C. ALONG TOP AND LAPS, ONE PER S.F. FIELD.
2. DURAFLEX ALUM MAY BE USED FOR FLASHING MATERIAL IN LIEU OF HOT ASPHALT APPLIED SBS FLASHING MEMBRANE. DURAFLEX ALUM MAY ONLY BE APPLIED WITH HOT ASPHALT OR USING THE HEAT WELDING METHOD OR PLYLINK FLASH-N-PATCH. DO NOT USE SOLVENT BASED ADHESIVES TO INSTALL DURAFLEX ALUM.

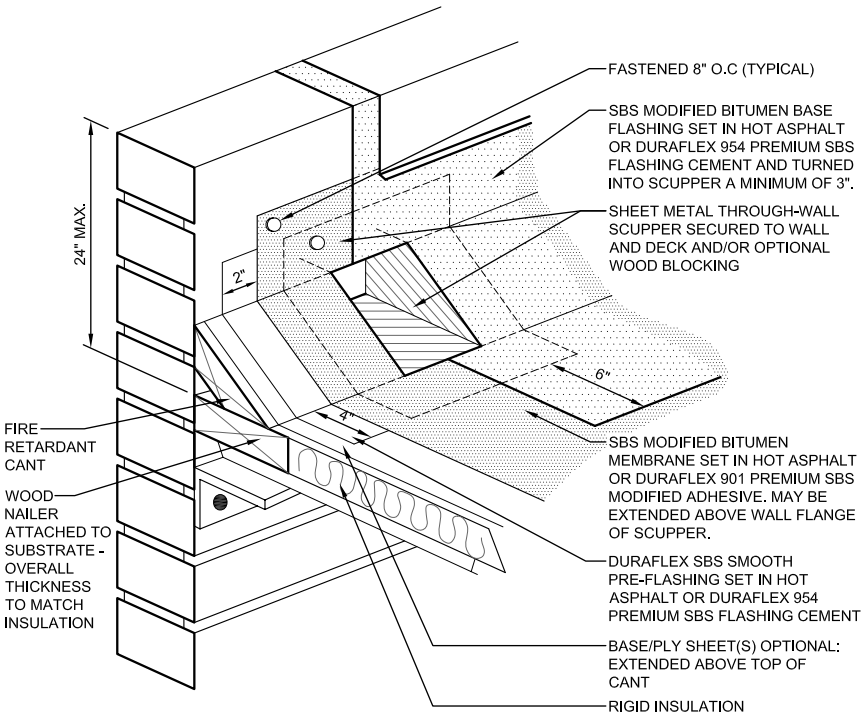
DF-15_SBS ROOF DRAIN FLASHING DETAIL



NOTES:

1. PRIME DRAIN FLANGE PRIOR TO APPLYING MEMBRANE.
2. MEMBRANE AND FLASHING MUST EXTEND UNDER CLAMPING RING.
3. PLASTIC ROOF DRAINS CANNOT BE USED.
4. DURAFLEX ALUM MAY BE USED FOR FLASHING MATERIAL IN LIEU OF HOT ASPHALT APPLIED SBS FLASHING MEMBRANE. DURAFLEX ALUM MAY ONLY BE APPLIED WITH HOT ASPHALT OR USING THE HEAT WELDING METHOD OR PLYLINK FLASH-N-PATCH. DO NOT USE SOLVENT BASED ADHESIVES TO INSTALL DURAFLEX ALUM.

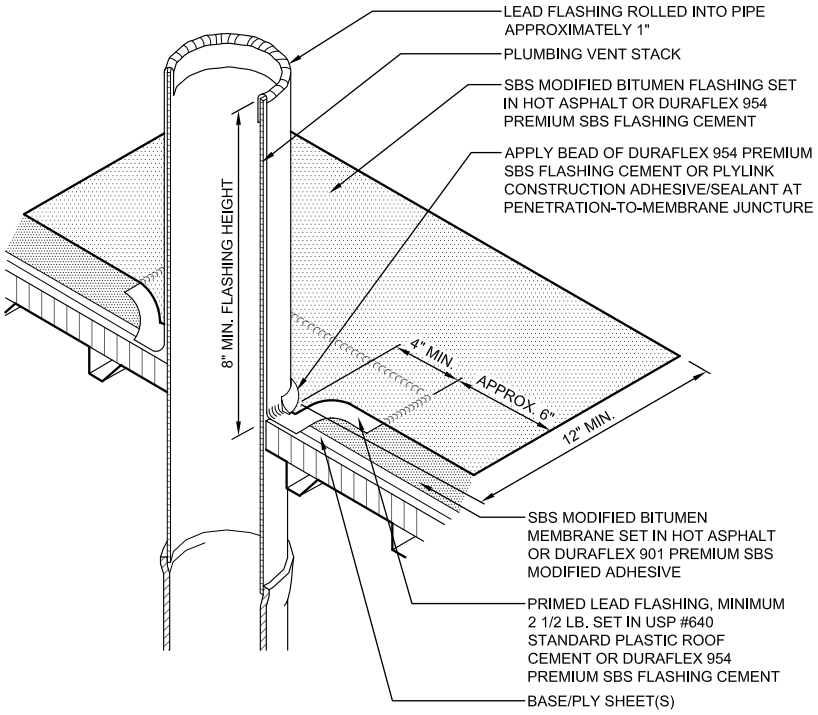
DF-16_SBS ROOF SCUPPER FLASHING DETAIL



NOTES:

1. SEE DURAFLEX SBS HIGH WALL FLASHING DETAIL FOR WALL FLASHING ABOVE 24".
2. SET SCUPPER FLANGES IN DURAFLEX 954 PREMIUM SBS FLASHING CEMENT - PRIME FLANGE BEFORE STRIPPING.
3. APPLY A BEAD OF DURAFLEX 954 PREMIUM SBS FLASHING CEMENT, LIQUA-PLY FLASHING OR PLYLINK CONSTRUCTION ADHESIVE/SEALANT TO THE MEMBRANE TERMINATION INSIDE SCUPPER AND AT SCUPPER OPENING CORNERS.
4. DURAFLEX ALUM MAY BE USED FOR FLASHING MATERIAL IN LIEU OF HOT ASPHALT APPLIED SBS FLASHING MEMBRANE. DURAFLEX ALUM MAY ONLY BE APPLIED WITH HOT ASPHALT OR USING THE HEAT WELDING METHOD OR PLYLINK FLASH-N-PATCH. DO NOT USE SOLVENT BASED ADHESIVES TO INSTALL DURAFLEX ALUM.

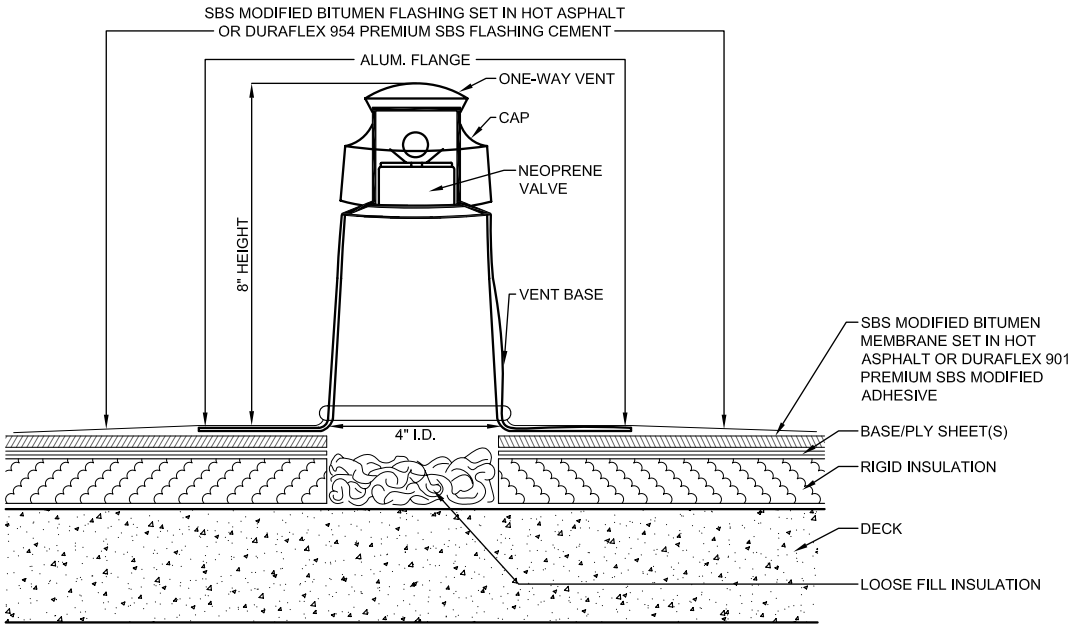
DF-17_SBS VENT STACK FLASHING DETAIL



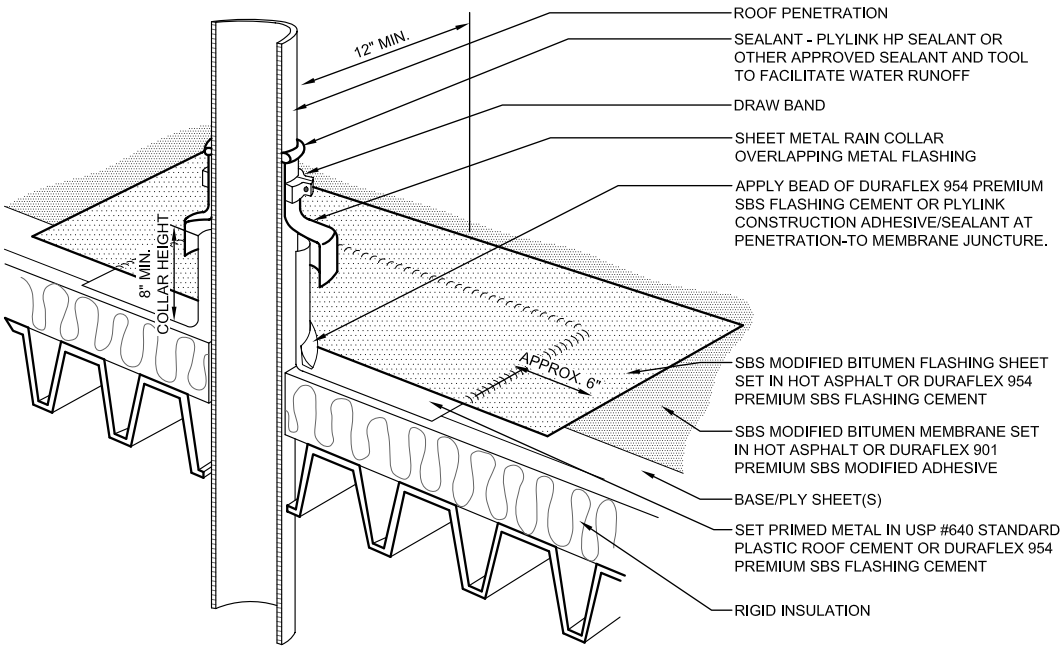
NOTES:

1. FOR PIPES UNDER 8" IN HEIGHT, A TUBOS PIPE INSERT MAY BE APPLIED TO REACH PROPER HEIGHT.
2. DURAFLEX ALUM MAY BE USED FOR FLASHING MATERIAL IN LIEU OF HOT ASPHALT APPLIED SBS FLASHING MEMBRANE. DURAFLEX ALUM MAY ONLY BE APPLIED WITH HOT ASPHALT OR USING THE HEAT WELDING METHOD OR PLYLINK FLASH-N-PATCH. DO NOT USE SOLVENT BASED ADHESIVES TO INSTALL DURAFLEX ALUM.

DF-18_SBS ONE WAY RELIEF VENT FLASHING DETAIL

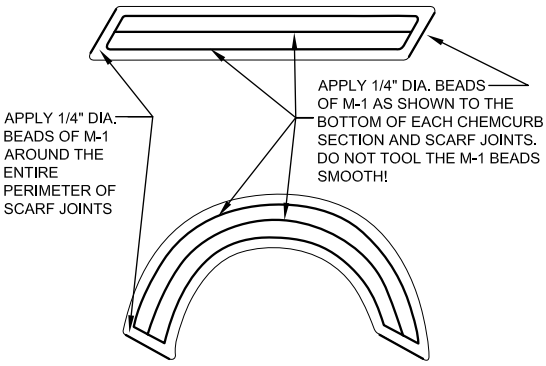


DF-19_SBS ROOF PENETRATION FLASHING DETAIL

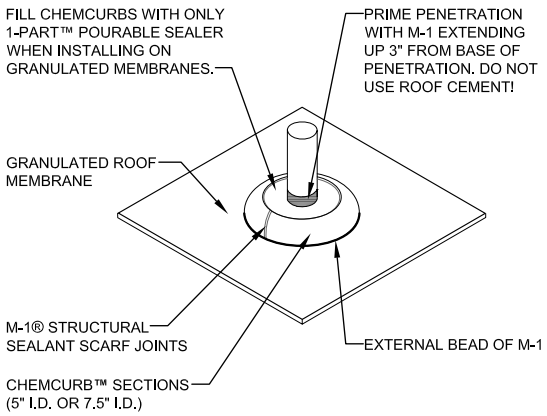


DF-20_CHEMCURB ROOF PENETRATION FLASHING DETAIL

M-1 APPLICATION TO THE BOTTOM AND SCARF JOINTS OF CHEMCURB SECTIONS

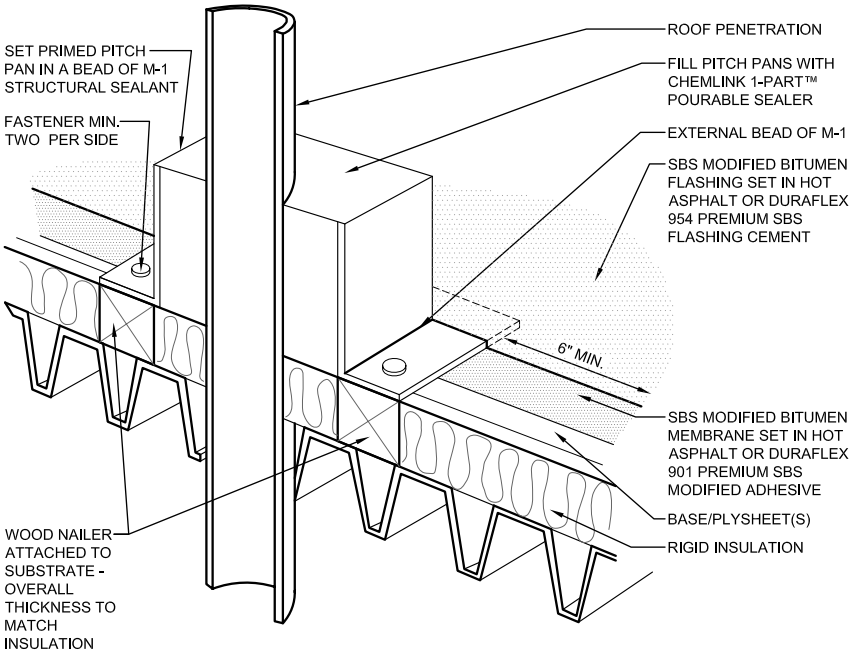


STANDARD CHEMCURB DETAIL



A MINIMUM 1" SPACE IS REQUIRED BETWEEN ALL PENETRATIONS AND THE INTERIOR WALL OF ALL CHEMCURBS.

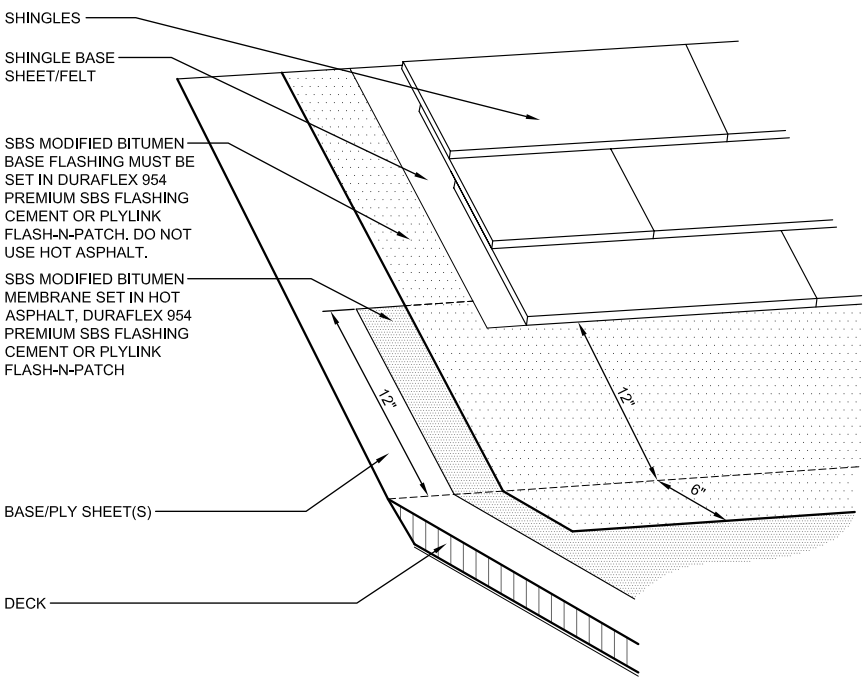
DF-21_SBS PITCH PAN FLASHING DETAIL



NOTES:

1. REFER TO CHEMCURB™ ROOF PENETRATION DETAIL FOR 15 AND 20 YEAR SYSTEMS.
2. PIPE PENETRATION AND BASE OF PENETRATION MUST BE CLEAN AND FREE OF DIRT AND MASTIC BEFORE APPLYING POURABLE SEALER.
3. CLEAN AND PRIME PENETRATION WITH M-1 EXTENDING 2" ABOVE TOP OF PAN.
4. CLEAN AND PRIME INSIDE TOP 2" OF PAN WITH M-1.
5. DURAFLEX ALUM MAY BE USED FOR FLASHING MATERIAL IN LIEU OF HOT ASPHALT APPLIED SBS FLASHING MEMBRANE. DURAFLEX ALUM MAY ONLY BE APPLIED WITH HOT ASPHALT OR USING THE HEAT WELDING METHOD OR PLYLINK FLASH-N-PATCH. DO NOT USE SOLVENT BASED ADHESIVES TO INSTALL DURAFLEX ALUM.

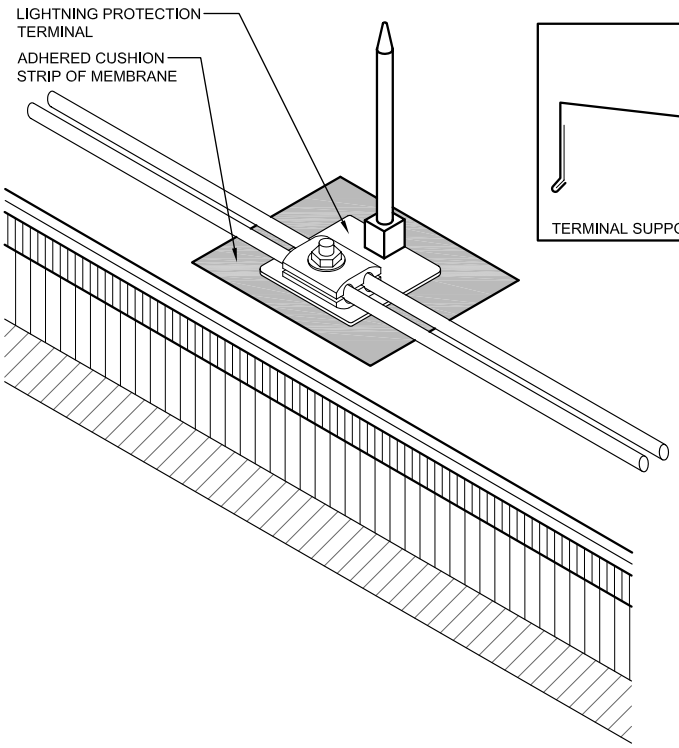
DF-22_SBS FLAT SHINGLE FLASHING DETAIL

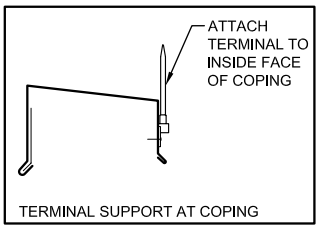


NOTES:

1. BASE/PLY SHEET(S) AND SBS MODIFIED BASE FLASHING MUST BE EXTENDED UP TO A MINIMUM OF 3 COURSES OF SHINGLES.
2. DURAFLEX ALUM MAY BE USED FOR FLASHING MATERIAL IN LIEU OF HOT ASPHALT APPLIED SBS FLASHING MEMBRANE. DURAFLEX ALUM MUST BE APPLIED USING PLYLINK FLASH-N-PATCH. DO NOT USE HOT ASPHALT OR DO NOT USE SOLVENT BASED ADHESIVES TO INSTALL DURAFLEX ALUM.

DF-23_SBS LIGHTNING PROTECTION TERMINAL DETAIL

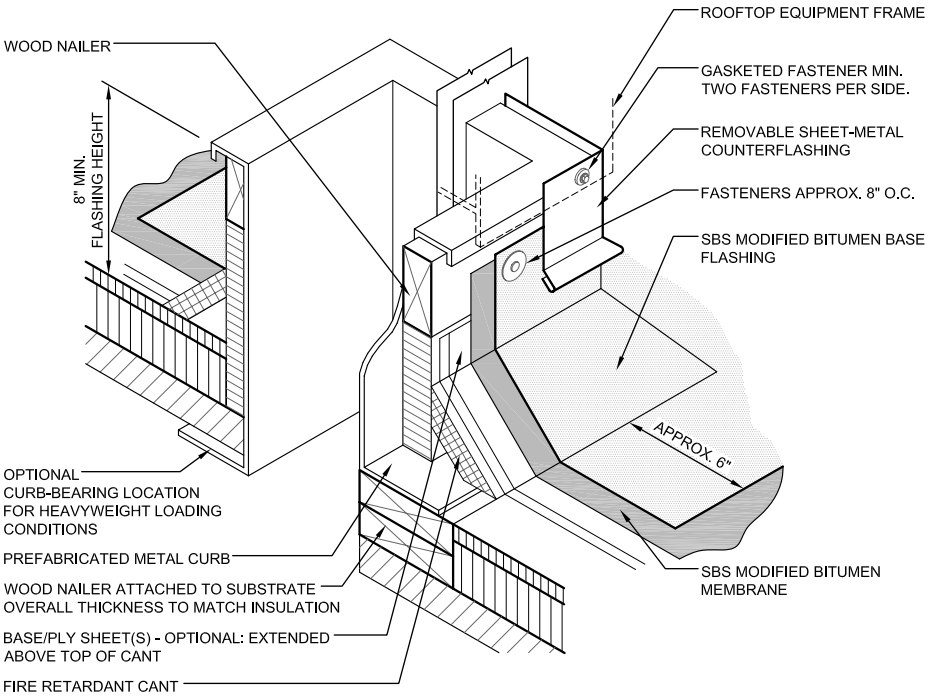




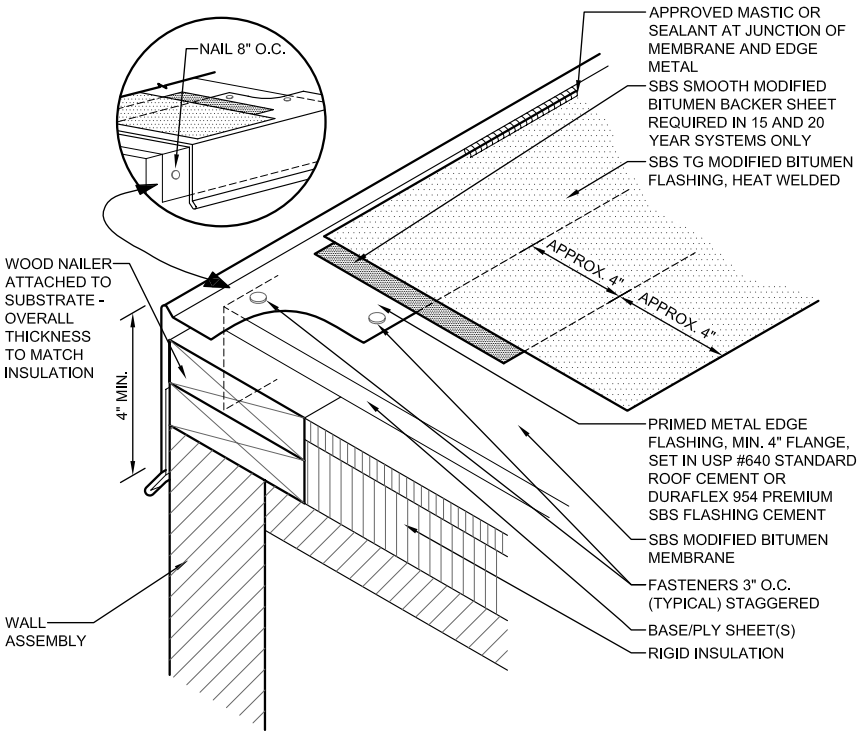
NOTES:

1. THIS DETAIL IS APPLICABLE FOR MOP, COLD OR TORCH-APPLIED FLASHING SYSTEMS.
2. DETAIL DEPICTS THE WEATHERPROOFING PROTECTION AND DOES NOT REPRESENT LIGHTNING PROTECTION DESIGN.
3. FOR ROOF SYSTEMS WITH FACTORY-APPLIED GRANULE SURFACING, PROPERLY PREPARE CAP SHEET TO RECEIVE FLASHING.

DF-24_SBS BASE FLASHING AT PREFABRICATED METAL CURB DETAIL



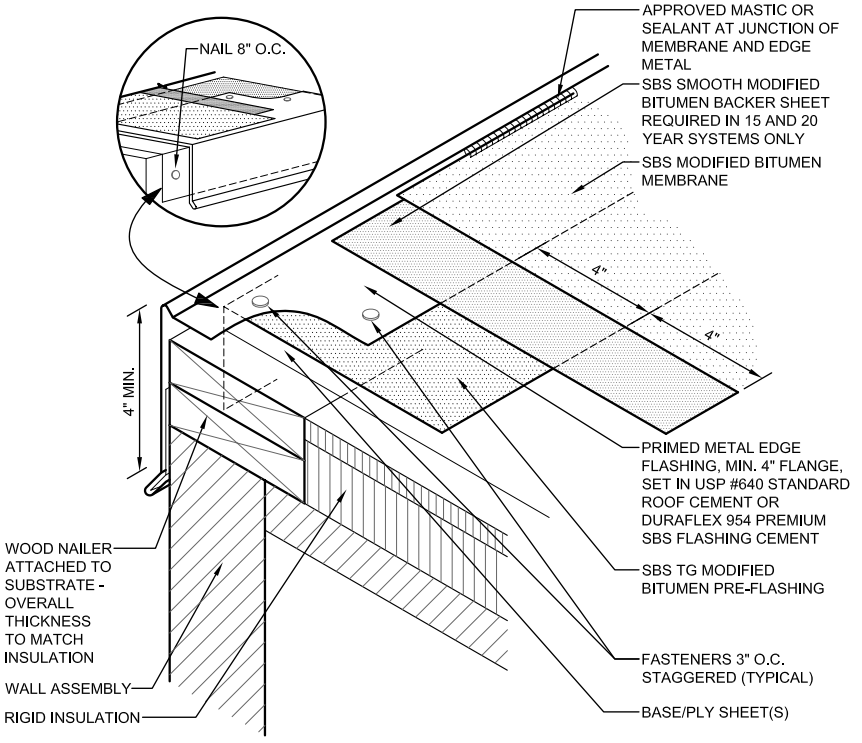
DFTG-01_SBS PERIMETER FLASHING DETAIL



NOTES:

1. BASE/PLY SHEET(S) AND MEMBRANE TURNED OVER EDGE AND EXTENDED BELOW BLOCKING OR A MINIMUM OF 1 ½" (38 MM), WHICHEVER IS GREATER.
2. 15 & 20 YEAR DETAIL: SBS SMOOTH MODIFIED BITUMEN BACKER SHEET AND SBS GRANULE SURFACED MODIFIED BITUMEN MEMBRANE ARE APPLIED OVER METAL FLANGE.
3. APPROVED MASTIC OR SEALANTS ARE DURAFLEX 954 PREMIUM SBS FLASHING CEMENT, PLYLINK CONSTRUCTION ADHESIVE/SEALANT, OR LIQUA-PLY FLASHING.
4. DURAFLEX ALUM MAY BE USED FOR FLASHING MATERIAL IN LIEU OF HEAT WELDED SBS FLASHING MEMBRANE.

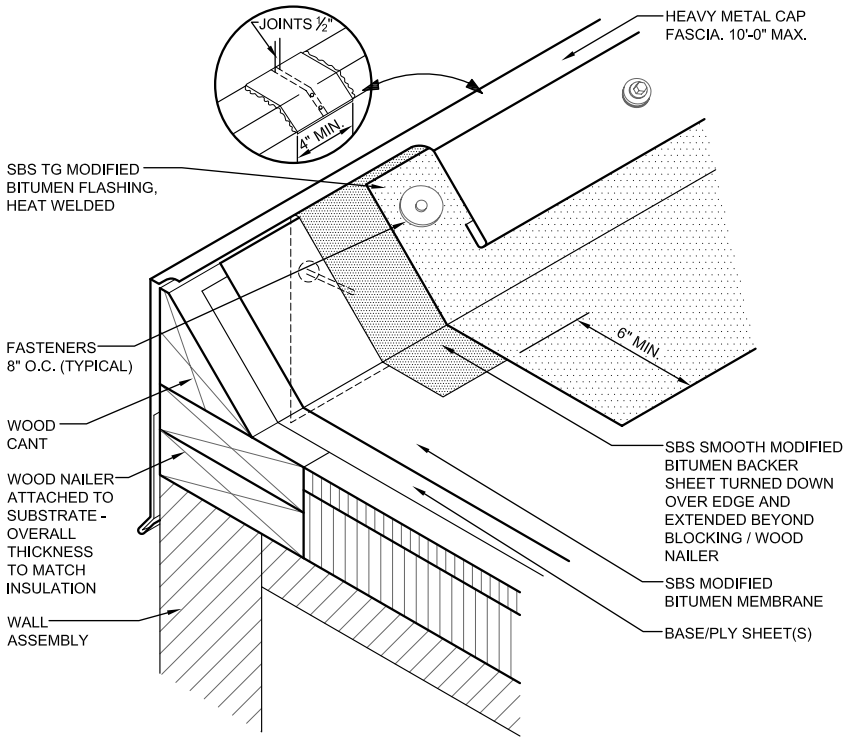
DFTG-02_SBS PERIMETER FLASHING DETAIL (GRANULATED)



NOTES:

1. BASE/PLY SHEET(S) TURNED OVER EDGE AND EXTENDED BELOW BLOCKING OR A MINIMUM OF 1 ½" (38 MM), WHICHEVER IS GREATER.
2. 15 & 20 YEAR DETAIL: SBS SMOOTH MODIFIED BITUMEN BACKER SHEET AND SBS GRANULE SURFACED MODIFIED BITUMEN MEMBRANE ARE APPLIED OVER METAL FLANGE.
3. APPROVED MASTIC OR SEALANTS ARE DURAFLEX 954 PREMIUM SBS FLASHING CEMENT, PLYLINK CONSTRUCTION ADHESIVE/SEALANT, OR LIQUA-PLY FLASHING.
4. DURAFLEX ALUM MAY BE USED FOR FLASHING MATERIAL IN LIEU OF HEAT WELDED SBS FLASHING MEMBRANE.

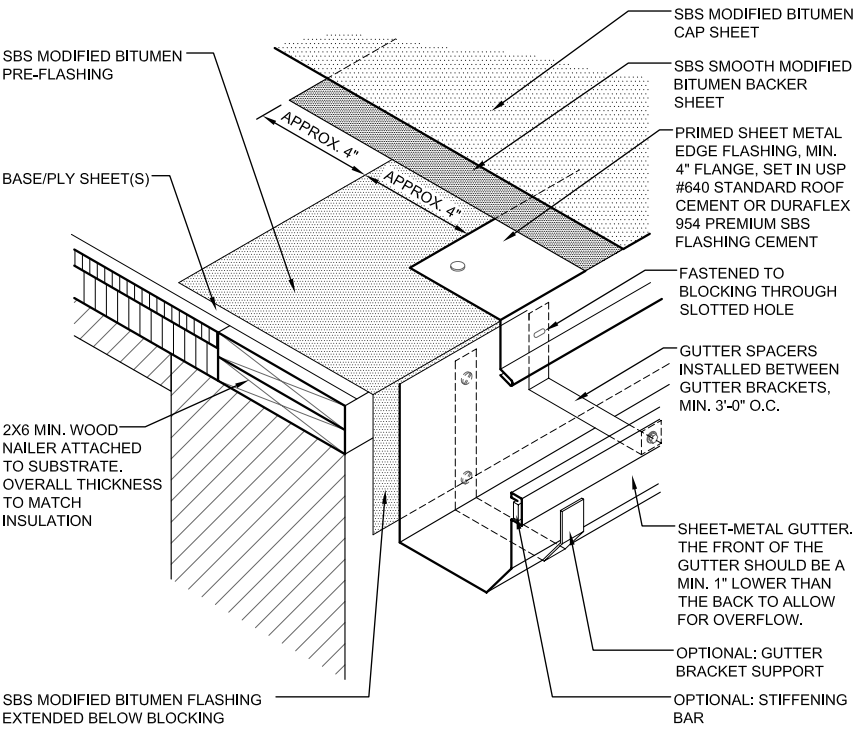
DFTG-03_SBS PERIMETER CURB FLASHING DETAIL



NOTES:

1. FASTENERS SHALL BE PLACED IN EACH SECTION OF CAP FASCIA IN ACCORDANCE WITH SMACNA REQUIREMENTS AND WIND LOAD REQUIREMENTS.
2. COVER PLATE SHALL BE EMBEDDED IN PLYLINK HP SEALANT OR OTHER APPROVED SEALANT. TWO FASTENERS SHALL BE PLACED AT THE CENTER OF EACH SECTION OF CAP FASCIA AND COVER PLATE. SEAL FASTENERS WITH PLYLINK HP SEALANT OR OTHER APPROVED SEALANT.
3. DURAFLEX ALUM MAY BE USED FOR FLASHING MATERIAL IN LIEU OF HEAT WELDED SBS FLASHING MEMBRANE.

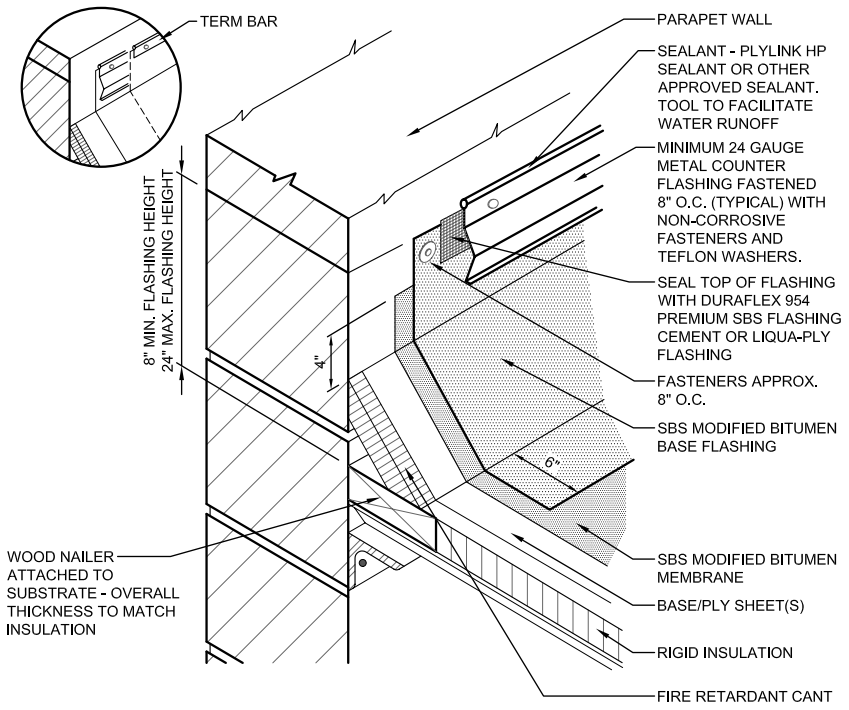
DFTG-04_SBS GUTTER FLASHING DETAIL



NOTES:

1. BASE/PLY SHEET(S) TURNED OVER EDGE PRIOR TO GUTTER INSTALLATION A MINIMUM OF 1 ½" (38 MM) OR THICKNESS OF NAILER, WHICHEVER IS GREATER.
2. SBS MODIFIED BITUMEN FLASHING TURNED OVER EDGE PRIOR TO GUTTER A MINIMUM OF 1 ½" OR THICKNESS OF NAILER, WHICHEVER IS GREATER.
3. IF GUTTER IS EXISTING, TURN SBS MODIFIED BITUMEN FLASHING OVER EDGE INTO GUTTER A MINIMUM OF 1 ½" OR BELOW THICKNESS OF NAILER, WHICHEVER IS GREATER.
4. DURAFLEX ALUM MAY BE USED FOR FLASHING MATERIAL IN LIEU OF HEAT WELDED SBS FLASHING MEMBRANE.

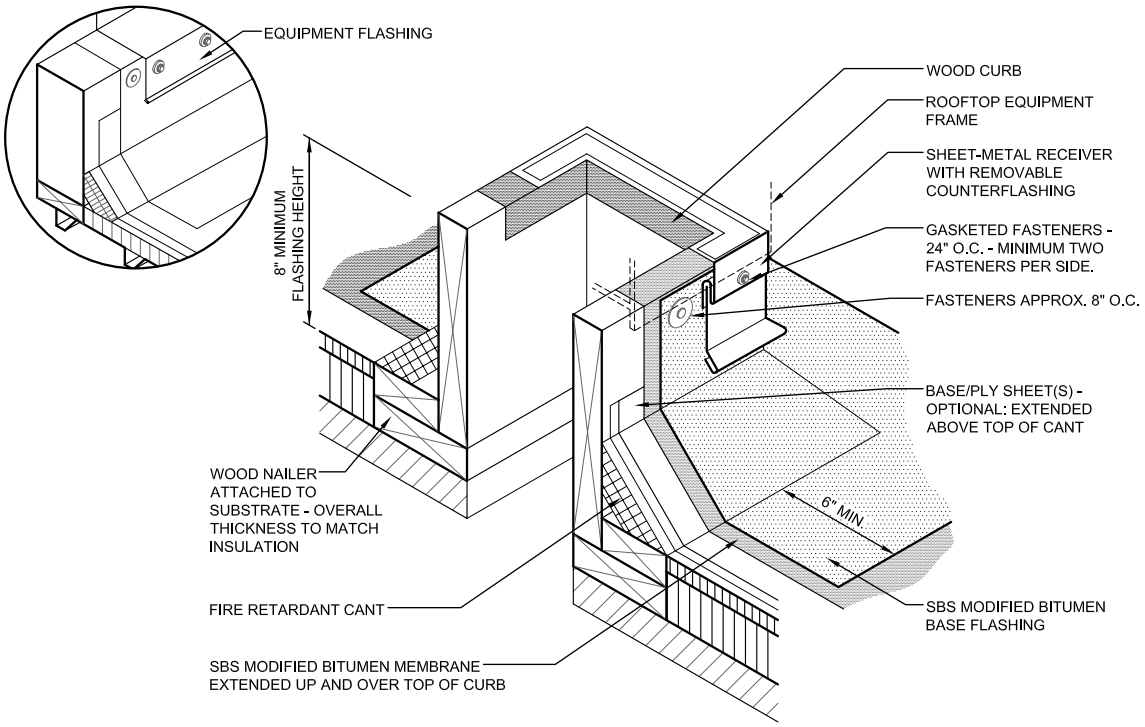
DFTG-05_SBS COUNTER FLASHING DETAIL



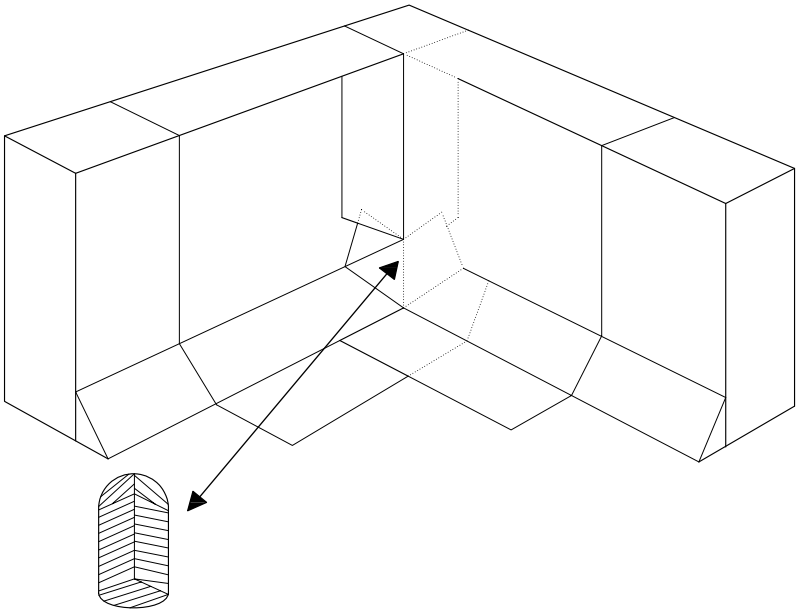
NOTES:

1. WHEN PARAPET WALL EXCEEDS 24" IN HEIGHT, REFER TO DURAFLEX TG SBS HIGH WALL FLASHING DETAIL.
2. MASONRY WALLS TO BE PRIMED PRIOR TO FLASHING. WOOD WALLS REQUIRE BASE SHEET NAILED TO WALL 8" O.C. ALONG TOP AND LAPS, ONE PER S.F. FIELD.
3. TERM BAR SHALL BE MINIMUM 1" WIDE EXTRUDED ALUMINUM, FASTENED 8" O.C. (TYPICAL) WITH NON-CORROSIVE FASTENERS AND TEFLON WASHERS.
4. TERM BAR, IN LIEU OF COUNTER FLASHING, IS NOT ACCEPTABLE FOR 15 AND 20 YEAR SYSTEMS.
5. DURAFLEX ALUM MAY BE USED FOR FLASHING MATERIAL IN LIEU OF HEAT WELDED SBS FLASHING MEMBRANE.

DFTG-06_SBS EQUIPMENT CURB FLASHING DETAIL



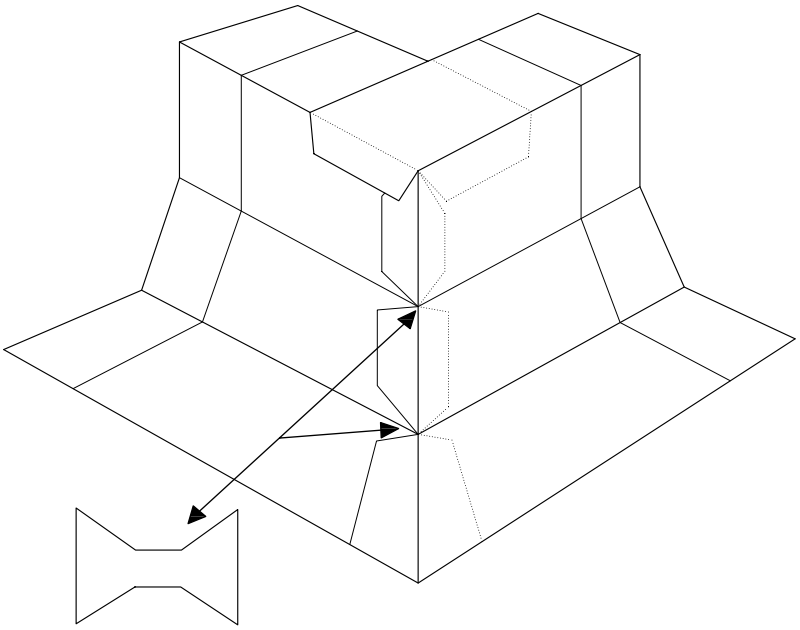
DFTG-07_SBS INSIDE CORNER FLASHING DETAIL



NOTES:

1. MAKE FIELD CUTS AT TOP AND BOTTOM OF CANT TO PROPERLY FOLD.
2. INSTALL SBS CORNER MEMBRANE FLASHING OVER CUTS MADE IN SBS MODIFIED BITUMEN FLASHING.
3. WHEN DURAFLEX ALUM IS USED FOR BASE FLASHING MATERIAL IN LIEU OF HEAT WELDED SBS BASE FLASHING, THE CORNERS SHALL BE MITERED. THE CORNERS SHALL BE OVERLAPPED AND CORNER PATCHED WITH SBS MEMBRANE PRIOR TO THE INSTALLATION OF THE DURAFLEX ALUM.

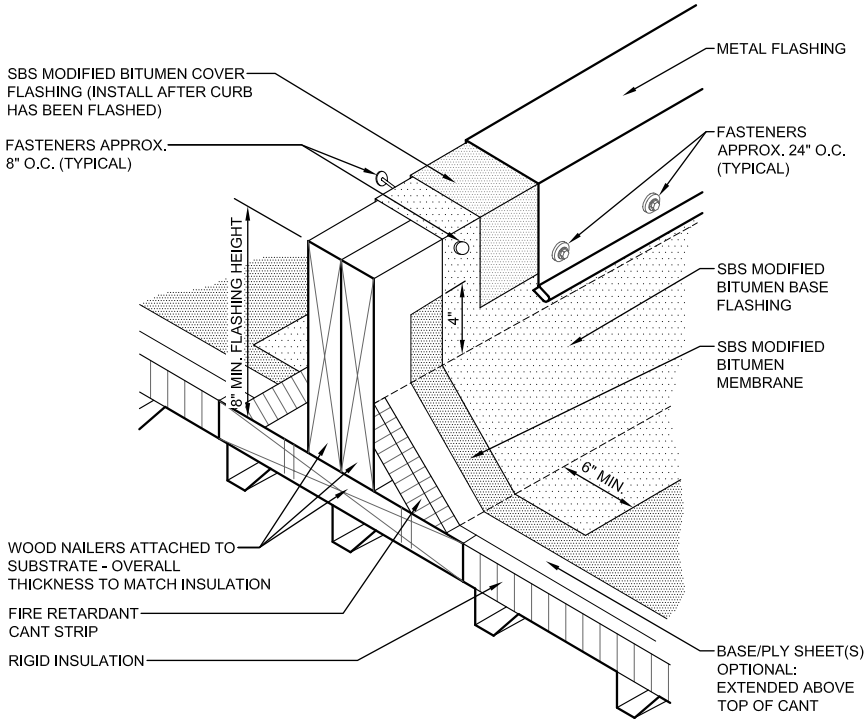
DFTG-08_SBS OUTSIDE CORNER FLASHING DETAIL



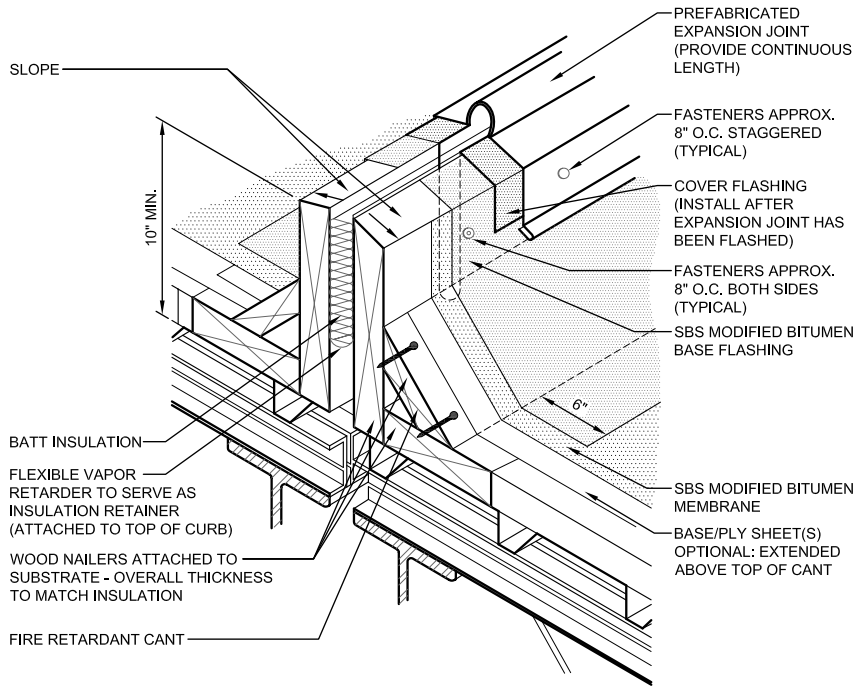
NOTES:

1. MAKE FIELD CUTS AT TOP AND BOTTOM OF CANT TO PROPERLY FOLD.
2. INSTALL SBS CORNER MEMBRANE FLASHING OVER CUTS MADE IN SBS MODIFIED BITUMEN FLASHING.
3. 3 COURSING WITH PLASTIC ROOF CEMENT IS NOT AN ACCEPTABLE ALTERNATIVE.
4. WHEN DURAFLEX ALUM IS USED FOR BASE FLASHING MATERIAL IN LIEU OF HEAT WELDED SBS BASE FLASHING, THE CORNERS SHALL BE MITERED. THE CORNERS SHALL BE OVERLAPPED AND CORNER PATCHED WITH SBS MEMBRANE PRIOR TO THE INSTALLATION OF THE DURAFLEX ALUM.

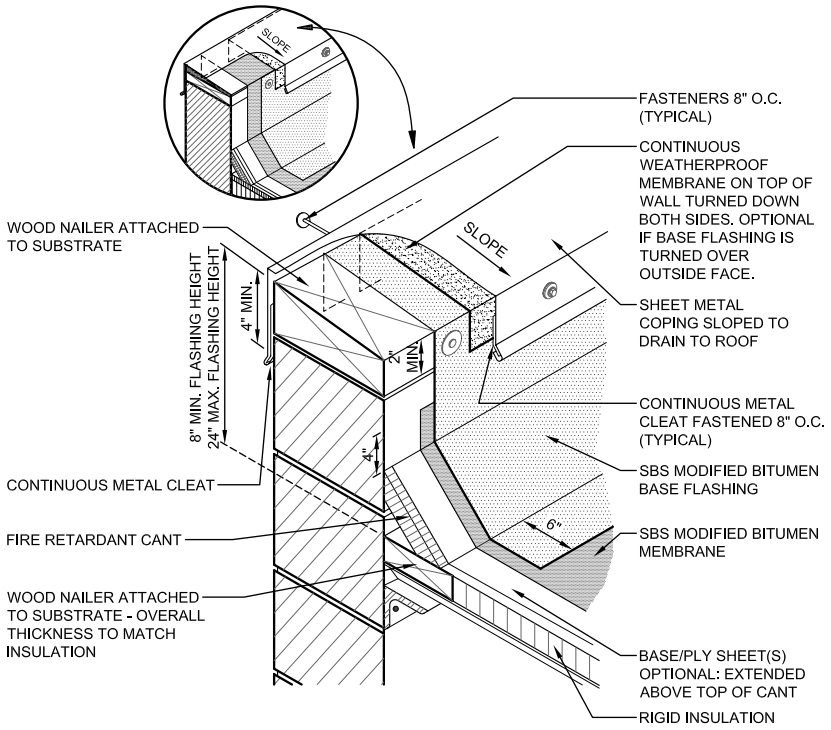
DFTG-09_SBS CURB DIVIDER FLASHING DETAIL



DFTG-10_SBS EXPANSION JOINT CURB FLASHING DETAIL



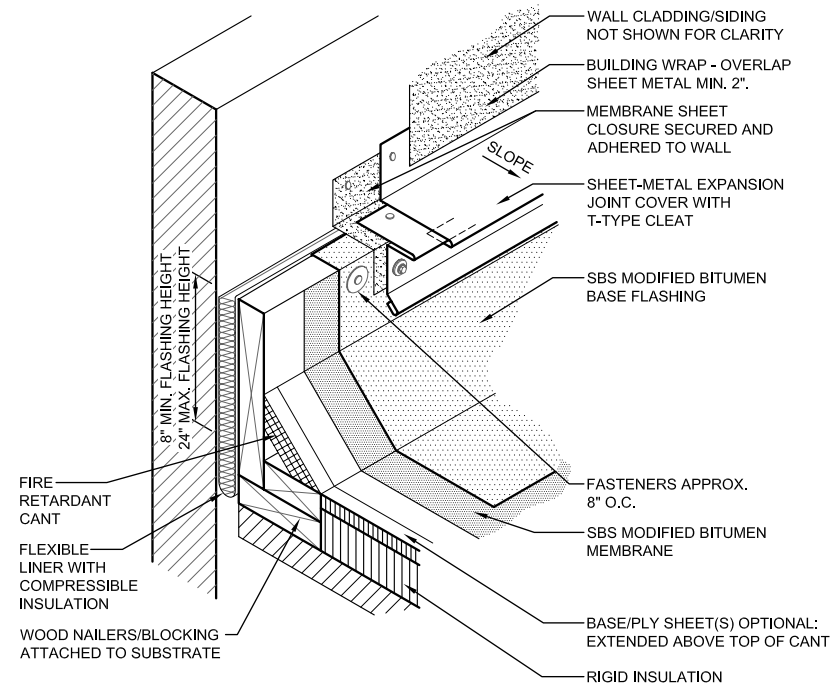
DFTG-11_SBS SUPPORTED WALL FLASHING DETAIL



NOTES:

1. WHEN PARAPET WALL EXCEEDS 24" IN HEIGHT, REFER TO DURAFLEX TG SBS HIGH WALL FLASHING DETAIL.
2. MASONRY WALLS TO BE PRIMED AS REQUIRED PRIOR TO FLASHING. WOOD WALLS REQUIRE BASE SHEET NAILED TO WALL 8" O.C. ALONG TOP AND LAPS, ONE PER S.F. FIELD.
3. SBS MODIFIED BITUMEN BASE FLASHING TURNED OVER EDGE AND EXTENDED BELOW BLOCKING OR A MINIMUM OF 1 ½" (38 MM), WHICHEVER IS GREATER.
4. CONTINUOUS WEATHERPROOF MEMBRANE ON TOP OF WALL TURNED DOWN BOTH SIDES. OPTIONAL IF BASE FLASHING IS TURNED OVER OUTSIDE FACE. REFER TO DETAIL INSET.
5. FASTEN SBS MODIFIED BITUMEN BASE FLASHING WITH FASTENERS APPROX. 8" O.C. REFER TO DETAIL INSET.
6. DURAFLEX ALUM MAY BE USED FOR FLASHING MATERIAL IN LIEU OF HEAT WELDED SBS FLASHING MEMBRANE.

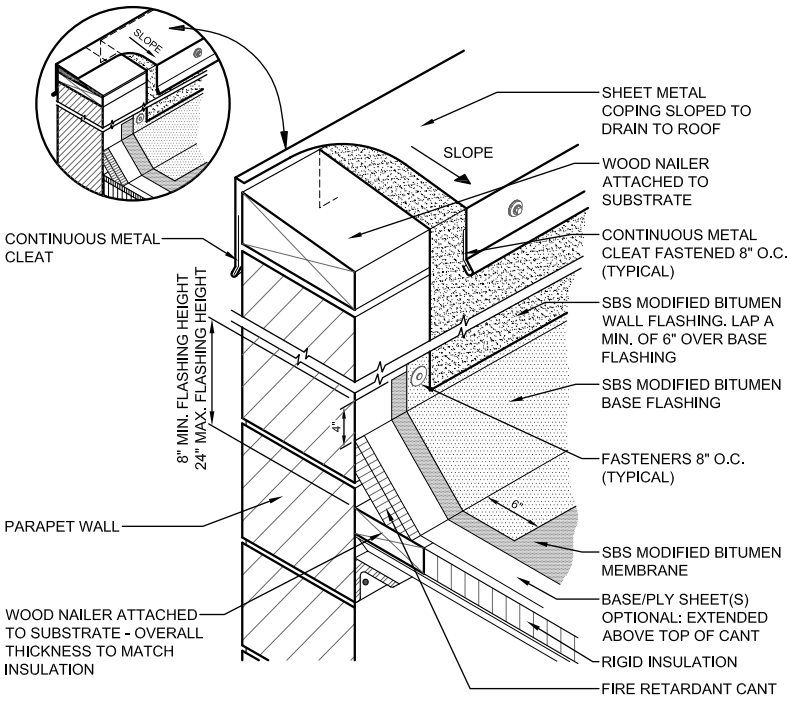
DFTG-12_SBS NON SUPPORTED WALL FLASHING DETAIL



NOTES:

1. MASONRY WALLS TO BE PRIMED PRIOR TO FLASHING. WOOD WALLS REQUIRE BASE SHEET NAILED TO WALL 8" O.C. ALONG TOP AND LAPS, ONE PER S.F. FIELD.
2. FOR TILT WALLS, BASE FLASHINGS SHALL BE SEPARATED FROM WALL BY WOOD NAILERS/BLOCKING ATTACHED TO SUBSTRATE ONLY.
3. DURAFLEX ALUM MAY BE USED FOR FLASHING MATERIAL IN LIEU OF HEAT WELDED SBS FLASHING MEMBRANE.

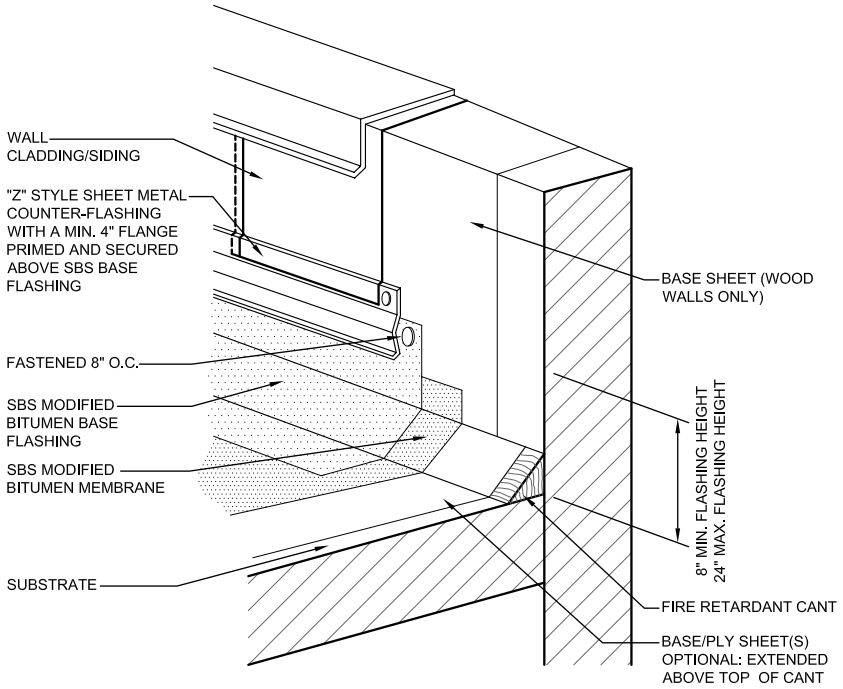
DFTG-13_SBS HIGH WALL FLASHING DETAIL



NOTES:

1. MASONRY WALLS TO BE PRIMED AS REQUIRED PRIOR TO FLASHING. WOOD WALLS REQUIRE BASE SHEET NAILED TO WALL 8" O.C. ALONG TOP AND LAPS, ONE PER S.F. FIELD.
2. SBS MODIFIED BITUMEN WALL FLASHING TURNED OVER EDGE AND EXTENDED BELOW BLOCKING OR A MINIMUM OF 1 ½" (38 MM), WHICHEVER IS GREATER.
3. CONTINUOUS WEATHERPROOF MEMBRANE ON TOP OF WALL TURNED DOWN BOTH SIDES. OPTIONAL IF BASE FLASHING IS TURNED OVER OUTSIDE FACE. REFER TO DETAIL INSET.
4. FASTENED SBS MODIFIED BITUMEN BASE FLASHING WITH FASTENERS APPROX. 8" O.C. REFER TO DETAIL INSET.
5. DURAFLEX ALUM MAY BE USED FOR FLASHING MATERIAL IN LIEU OF HEAT WELDED SBS FLASHING MEMBRANE.

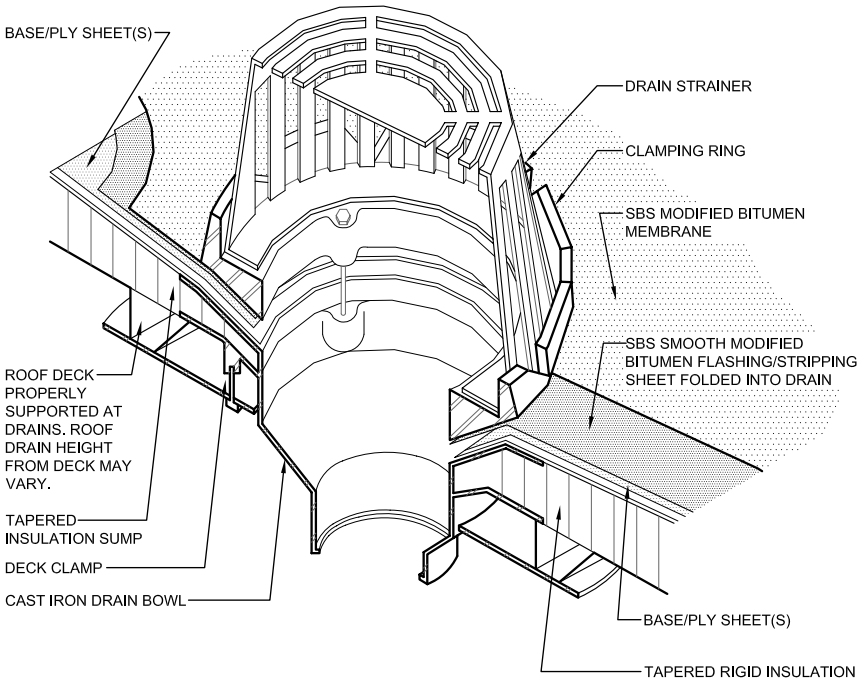
DFTG-14_SBS HIGH WALL 2-PIECE FLASHING DETAIL



NOTES:

1. MASONRY WALLS TO BE PRIMED AS REQUIRED PRIOR TO FLASHING. WOOD WALLS REQUIRE BASE SHEET NAILED TO WALL 8" O.C. ALONG TOP AND LAPS, ONE PER S.F. FIELD.
2. DURAFLEX ALUM MAY BE USED FOR FLASHING MATERIAL IN LIEU OF HEAT WELDED SBS FLASHING MEMBRANE.

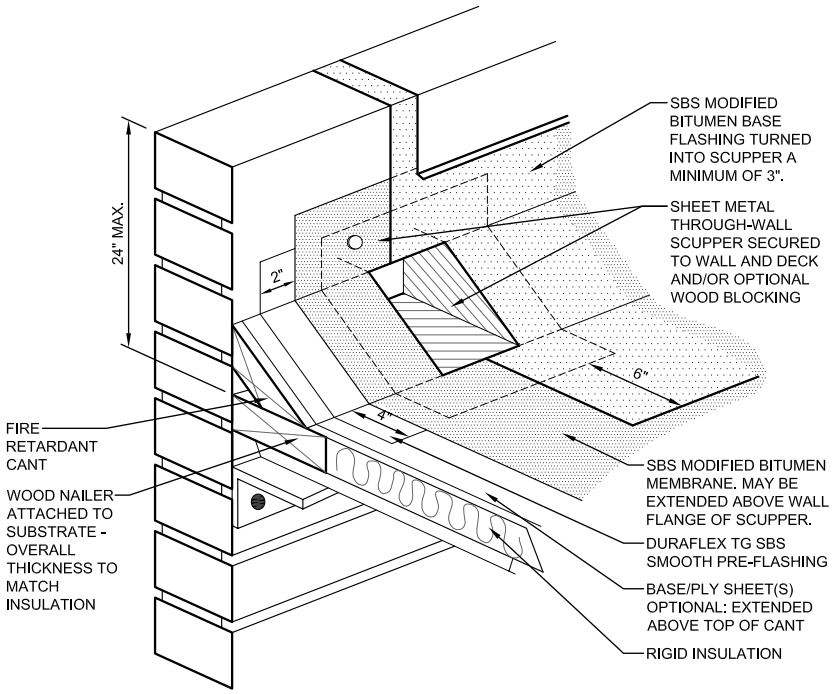
DFTG-15_SBS ROOF DRAIN FLASHING DETAIL



NOTES:

1. PRIME DRAIN FLANGE PRIOR TO APPLYING MEMBRANE.
2. MEMBRANE AND FLASHING MUST EXTEND UNDER CLAMPING RING.
3. PLASTIC ROOF DRAINS CANNOT BE USED.
4. DURAFLEX ALUM MAY BE USED FOR FLASHING MATERIAL IN LIEU OF HEAT WELDED SBS FLASHING MEMBRANE.

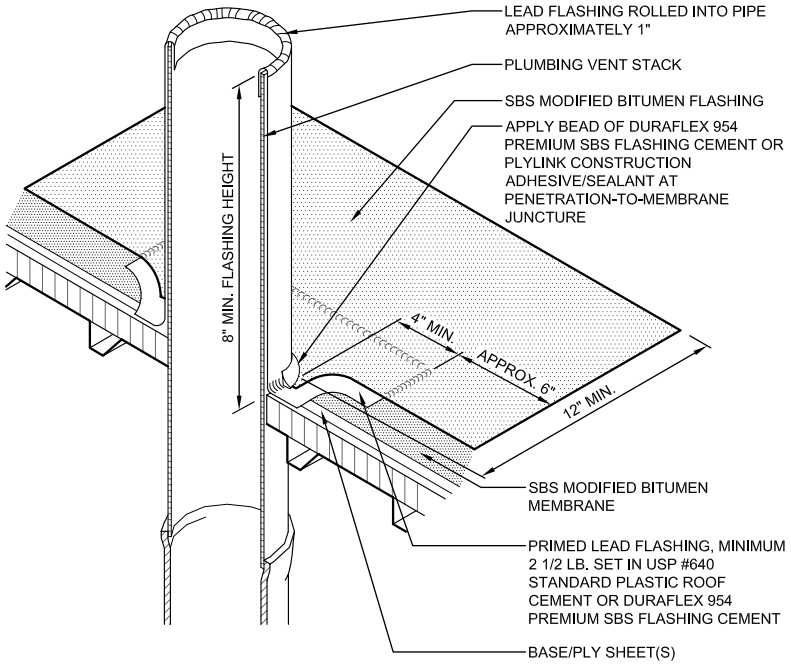
DFTG-16_SBS ROOF SCUPPER FLASHING DETAIL



NOTES:

1. SEE DURAFLEX TG SBS HIGH WALL FLASHING DETAIL FOR WALL FLASHING ABOVE 24".
2. SET SCUPPER FLANGES IN DURAFLEX 954 PREMIUM SBS FLASHING CEMENT - PRIME FLANGE BEFORE STRIPPING.
3. APPLY A BEAD OF DURAFLEX 954 PREMIUM SBS FLASHING CEMENT, LIQUA-PLY FLASHING OR PLYLINK CONSTRUCTION ADHESIVE/SEALANT TO THE MEMBRANE TERMINATION INSIDE SCUPPER AND AT SCUPPER OPENING CORNERS.
4. DURAFLEX ALUM MAY BE USED FOR FLASHING MATERIAL IN LIEU OF HEAT WELDED SBS FLASHING MEMBRANE.

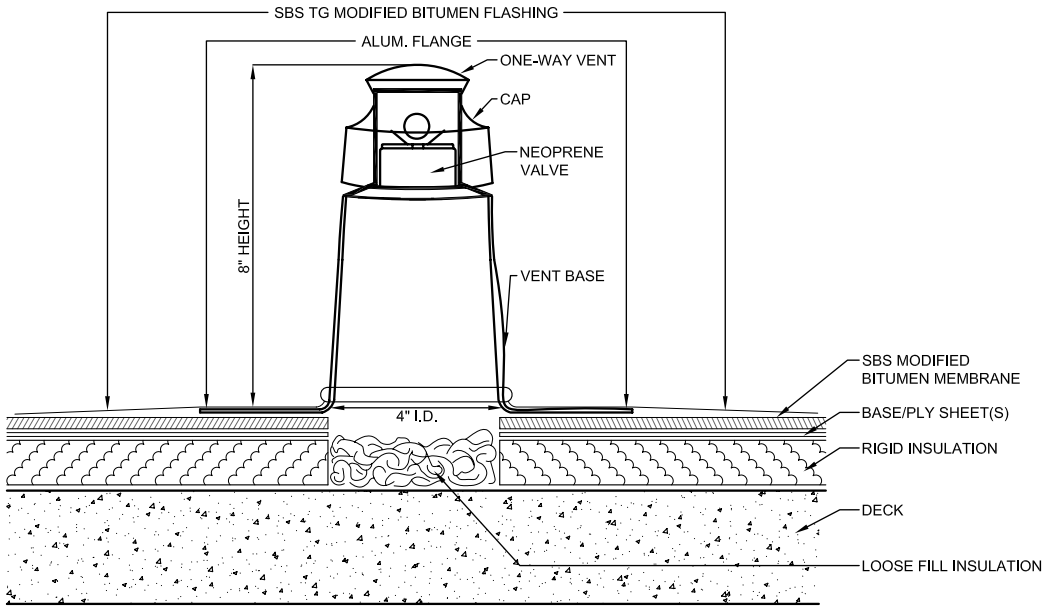
DFTG-17_SBS VENT STACK FLASHING DETAIL



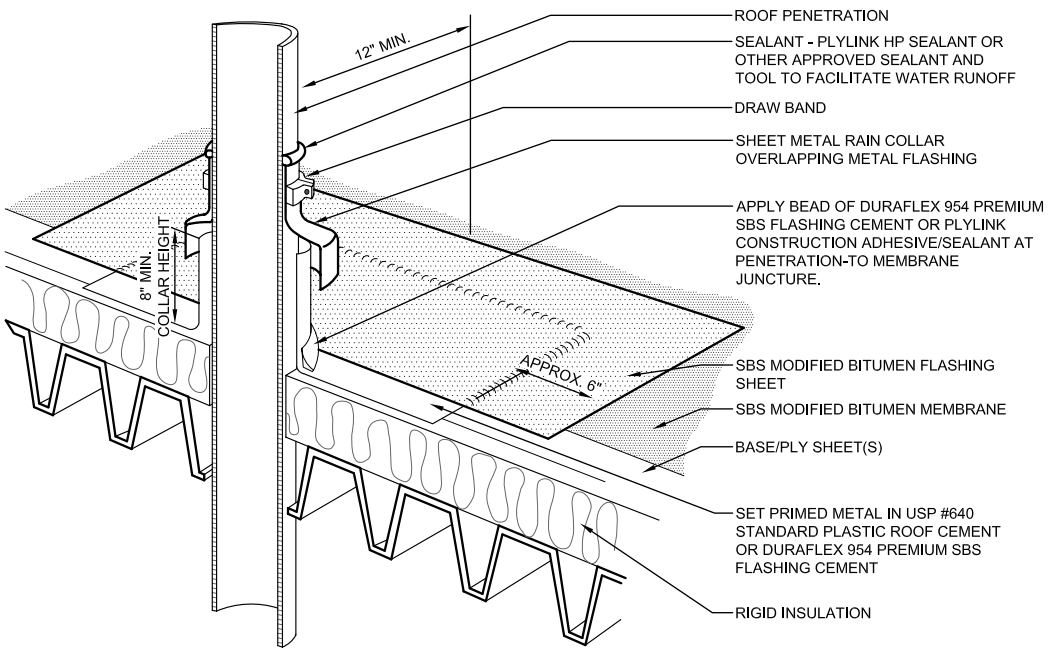
NOTES:

1. FOR PIPES UNDER 8" IN HEIGHT, A TUBOS PIPE INSERT MAY BE APPLIED TO REACH PROPER HEIGHT.
2. DURAFLEX ALUM MAY BE USED FOR FLASHING MATERIAL IN LIEU OF HEAT WELDED SBS FLASHING MEMBRANE.

DFTG-18_SBS ONE WAY RELIEF VENT FLASHING DETAIL

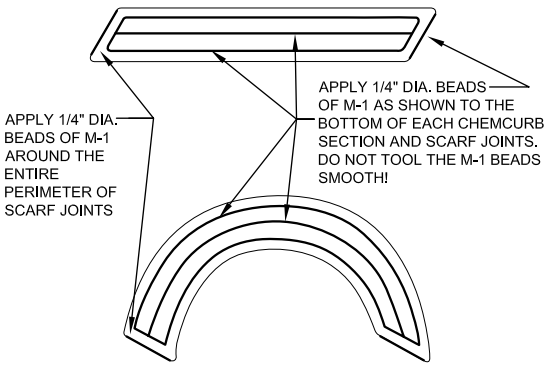


DFTG-19_SBS ROOF PENETRATION FLASHING DETAIL

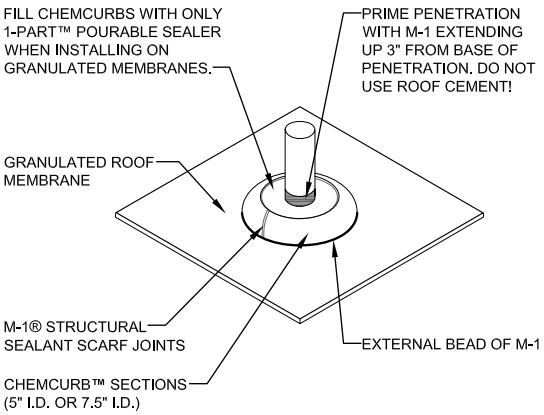


DFTG-20_CHEMCURB ROOF PENETRATION DETAIL

M-1 APPLICATION TO THE BOTTOM AND SCARF JOINTS OF CHEMCURB SECTIONS

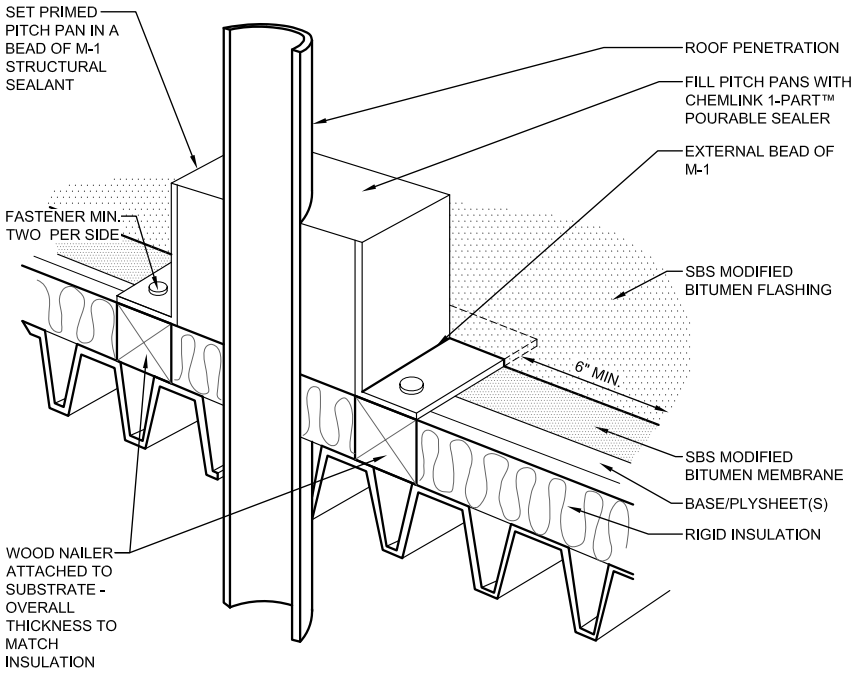


STANDARD CHEMCURB DETAIL



A MINIMUM 1" SPACE IS REQUIRED BETWEEN ALL PENETRATIONS AND THE INTERIOR WALL OF ALL CHEMCURBS.

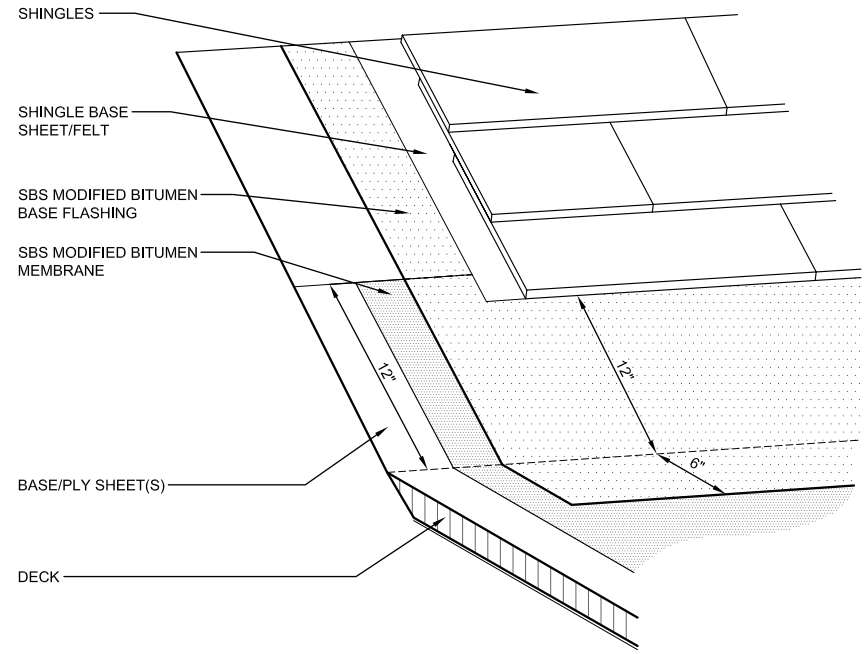
DFTG-21_SBS PITCH PAN FLASHING DETAIL



NOTES:

1. REFER TO CHEMCURB™ ROOF PENETRATION DETAIL FOR 15 AND 20 YEAR SYSTEMS.
2. PIPE PENETRATION AND BASE OF PENETRATION MUST BE CLEAN AND FREE OF DIRT AND MASTIC BEFORE APPLYING POURABLE SEALER.
3. CLEAN AND PRIME PENETRATION WITH M-1 EXTENDING 2" ABOVE TOP OF PAN.
4. CLEAN AND PRIME INSIDE TOP 2" OF PAN WITH M-1.
5. DURAFLEX ALUM MAY BE USED FOR FLASHING MATERIAL IN LIEU OF HEAT WELDED SBS FLASHING MEMBRANE.

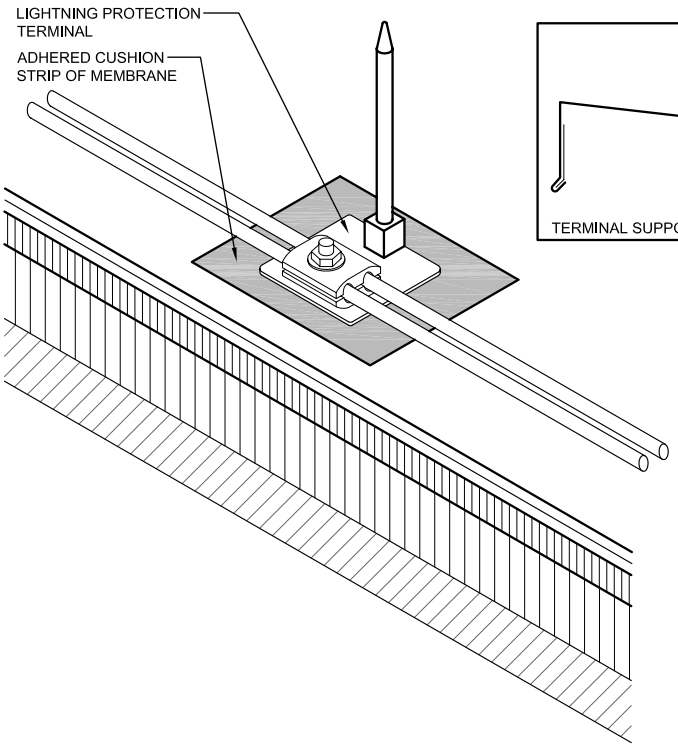
DFTG-22_SBS FLAT SHINGLE FLASHING DETAIL

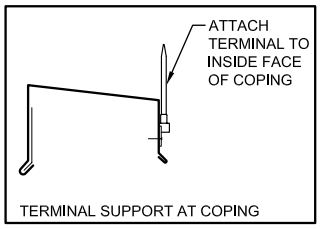


NOTES:

1. BASE/PLY SHEET(S) AND SBS MODIFIED BASE FLASHING MUST BE EXTENDED UP TO A MINIMUM OF 3 COURSES OF SHINGLES.
2. DURAFLEX ALUM MAY BE USED FOR FLASHING MATERIAL IN LIEU OF HEAT WELDED SBS FLASHING MEMBRANE.

DFTG-23_SBS LIGHTNING PROTECTION TERMINAL DETAIL

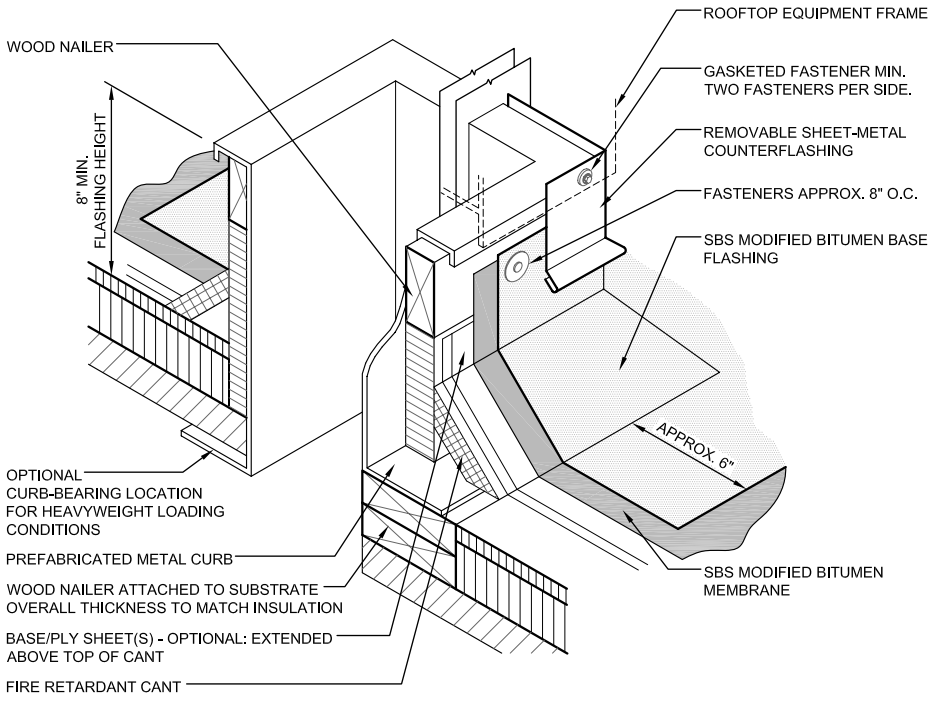




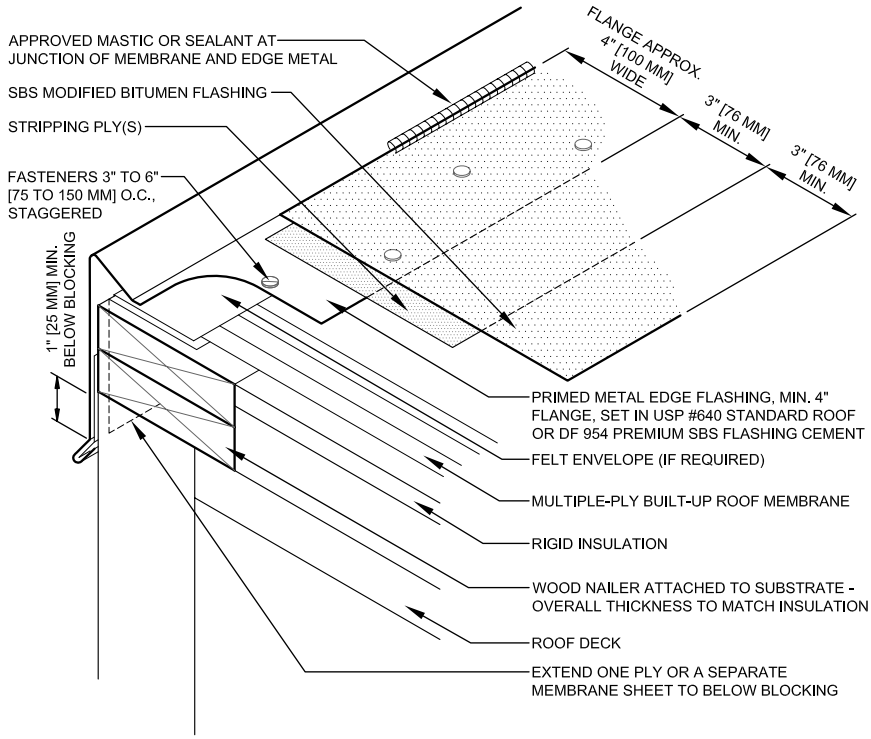
NOTES:

1. THIS DETAIL IS APPLICABLE FOR MOP, COLD OR TORCH-APPLIED FLASHING SYSTEMS.
2. DETAIL DEPICTS THE WEATHERPROOFING PROTECTION AND DOES NOT REPRESENT LIGHTNING PROTECTION DESIGN.
3. FOR ROOF SYSTEMS WITH FACTORY-APPLIED GRANULE SURFACING, PROPERLY PREPARE CAP SHEET TO RECEIVE FLASHING.

DFTG-24_SBS BASE FLASHING AT PREFABRICATED CURB DETAIL



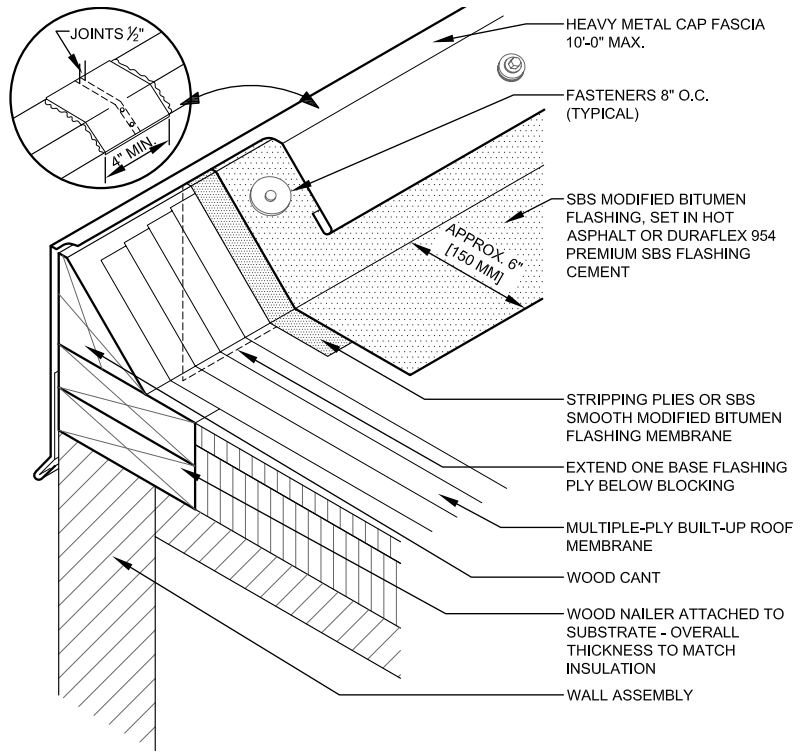
BUR-01_BUR EMBEDDED PERIMETER EDGE FLASHING DETAIL



NOTES:

1. BASE/PLY SHEET(S) TURNED OVER EDGE AND EXTENDED BELOW BLOCKING OR A MINIMUM OF 1 ½" (38 MM), WHICHEVER IS GREATER.
2. 5, 10 AND 12 YEAR GUARANTEES REQUIRE A MINIMUM 2-PLY FLASHING CONSTRUCTION CONSISTING OF ONE PLY OF STRIPPING PLY TO BE SAME AS ROOF PLIES AND ONE PLY OF DURAFLEX™ 190 SBS MODIFIED BITUMEN MEMBRANE OR HEAVIER.
3. 15 AND 20 YEAR GUARANTEES REQUIRE A MINIMUM 3-PLY FLASHING CONSTRUCTION CONSISTING OF TWO PLIES OF STRIPPING PLY TO BE SAME AS ROOF PLIES AND ONE PLY OF DURAFLEX™ 190 SBS MODIFIED BITUMEN MEMBRANE OR HEAVIER.
4. APPROVED MASTIC OR SEALANTS ARE DURAFLEX 954 PREMIUM SBS FLASHING CEMENT, PLYLINK CONSTRUCTION ADHESIVE/SEALANT, OR LIQUA-PLY FLASHING.
5. DURAFLEX ALUM MAY BE USED FOR FLASHING MATERIAL IN LIEU OF HOT ASPHALT APPLIED SBS FLASHING MEMBRANE. DURAFLEX ALUM MAY ONLY BE APPLIED WITH HOT ASPHALT OR USING THE HEAT WELDING METHOD OR PLYLINK FLASH-N-PATCH. DO NOT USE SOLVENT BASED ADHESIVES TO INSTALL DURAFLEX ALUM.

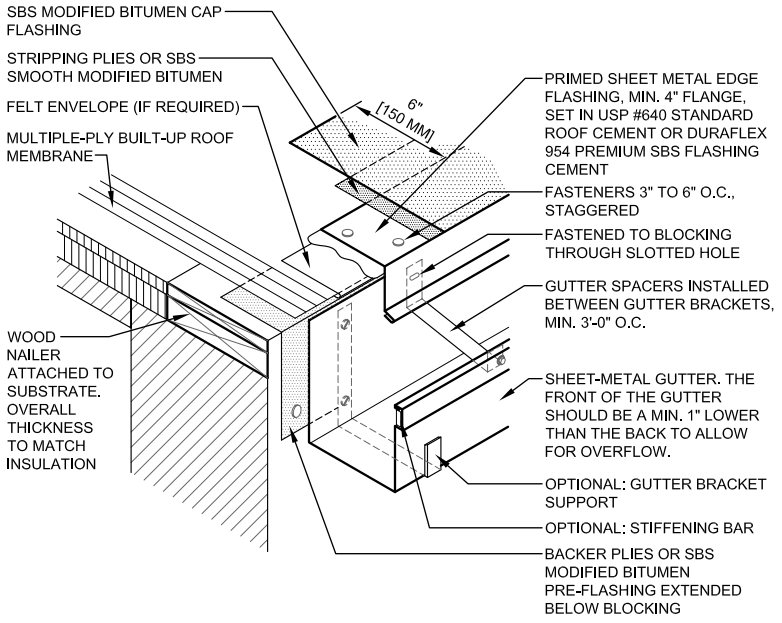
BUR-2 – RAISED PERIMETER EDGE WITH METAL FLASHING (FASCIA CAP)



NOTES:

1. FASTENERS SHALL BE PLACED IN EACH SECTION OF CAP FASCIA IN ACCORDANCE WITH SMACNA REQUIREMENTS AND WIND LOAD REQUIREMENTS.
2. COVER PLATE SHALL BE EMBEDDED IN PLYLINK HP SEALANT OR OTHER APPROVED SEALANT. TWO FASTENERS SHALL BE PLACED AT THE CENTER OF EACH SECTION OF CAP FASCIA AND COVER PLATE. SEAL FASTENERS WITH PLYLINK HP SEALANT OR OTHER APPROVED SEALANT.
3. 5, 10 AND 12 YEAR GUARANTEES REQUIRE A MINIMUM 2-PLY FLASHING CONSTRUCTION CONSISTING OF ONE PLY OF STRIPPING PLY TO BE SAME AS ROOF PLIES AND ONE PLY OF DURAFLEX™ 190 SBS MODIFIED BITUMEN MEMBRANE.
4. 15 AND 20 YEAR GUARANTEES REQUIRE A MINIMUM 3-PLY FLASHING CONSTRUCTION CONSISTING OF TWO PLIES OF STRIPPING PLY TO BE SAME AS ROOF PLIES AND ONE PLY OF DURAFLEX™ 190 SBS MODIFIED BITUMEN MEMBRANE.
5. DURAFLEX ALUM MAY BE USED FOR FLASHING MATERIAL IN LIEU OF HOT ASPHALT APPLIED SBS FLASHING MEMBRANE. DURAFLEX ALUM MAY ONLY BE APPLIED WITH HOT ASPHALT OR USING THE HEAT WELDING METHOD OR PLYLINK FLASH-N-PATCH. DO NOT USE SOLVENT BASED ADHESIVES TO INSTALL DURAFLEX ALUM.

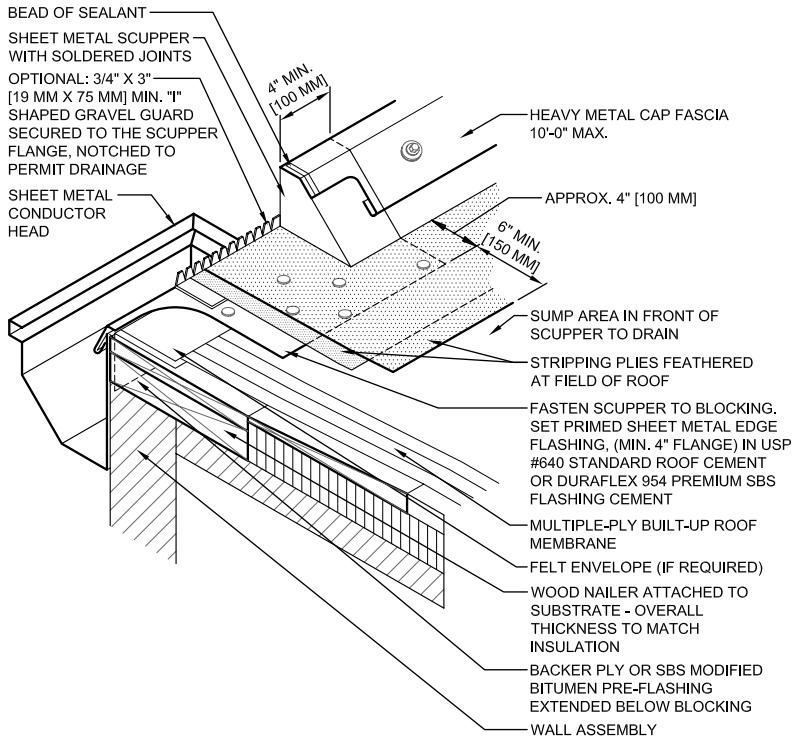
BUR-03_BUR GUTTER FLASHING DETAIL



NOTES:

1. IN CLIMATES WHERE THE WINTER TEMPERATURE REMAINS BELOW FREEZING FOR EXTENDED PERIODS OF TIME, IT IS RECOMMENDED TO USE DETAIL BUR-2 AND INTERIOR DRAINS OR THROUGH-CURB SCUPPERS TO DRAIN THE ROOF.
2. BASE/PLY SHEET(S) TURNED OVER EDGE PRIOR TO GUTTER INSTALLATION A MINIMUM OF 1 ½" (38 MM) OR THICKNESS OF NAILER, WHICHEVER IS GREATER.
3. IF GUTTER IS EXISTING, TURN SBS MODIFIED BITUMEN FLASHING OVER EDGE INTO GUTTER A MINIMUM OF 1 ½" OR BELOW THICKNESS OF NAILER, WHICHEVER IS GREATER.
4. 5, 10 AND 12 YEAR GUARANTEES REQUIRE A MINIMUM 2-PLY FLASHING CONSTRUCTION CONSISTING OF ONE PLY OF STRIPPING PLY TO BE SAME AS ROOF PLIES AND ONE PLY OF DURAFLEX™ 190 SBS MODIFIED BITUMEN MEMBRANE.
5. 15 AND 20 YEAR GUARANTEES REQUIRE A MINIMUM 3-PLY FLASHING CONSTRUCTION CONSISTING OF TWO PLIES OF STRIPPING PLY TO BE SAME AS ROOF PLIES AND ONE PLY OF DURAFLEX™ 190 SBS MODIFIED BITUMEN MEMBRANE.
6. DURAFLEX ALUM MAY BE USED FOR FLASHING MATERIAL IN LIEU OF HOT ASPHALT APPLIED SBS FLASHING MEMBRANE. DURAFLEX ALUM MAY ONLY BE APPLIED WITH HOT ASPHALT OR USING THE HEAT WELDING METHOD OR PLYLINK FLASH-N-PATCH. DO NOT USE SOLVENT BASED ADHESIVES TO INSTALL DURAFLEX ALUM.

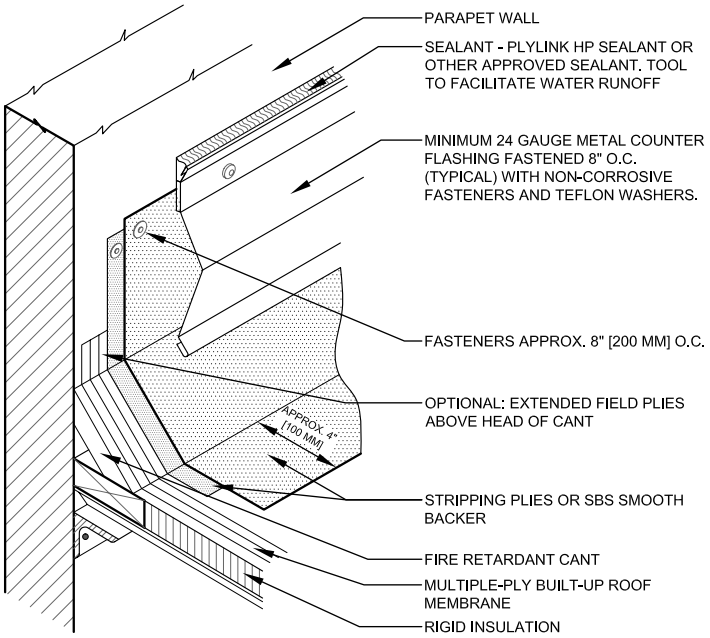
BUR-04_BUR SCUPPER THROUGH RAISED PERIMETER EDGE DETAIL



NOTES:

1. ROOF SURFACES SHOULD BE SLOPED TO DRAIN.
2. FASTENERS SHALL BE PLACED IN EACH SECTION OF CAP FASCIA IN ACCORDANCE WITH SMACNA REQUIREMENTS AND WIND LOAD REQUIREMENTS.
3. COVER PLATE SHALL BE EMBEDDED IN PLYLINK HP SEALANT OR OTHER APPROVED SEALANT. TWO FASTENERS SHALL BE PLACED AT THE CENTER OF EACH SECTION OF CAP FASCIA AND COVER PLATE. SEAL FASTENERS WITH PLYLINK HP SEALANT OR OTHER APPROVED SEALANT.
4. 5, 10 AND 12 YEAR GUARANTEES REQUIRE A MINIMUM 2-PLY FLASHING CONSTRUCTION CONSISTING OF ONE PLY OF STRIPPING PLY TO BE SAME AS ROOF PLIES AND ONE PLY OF DURAFLEX™ 190 SBS MODIFIED BITUMEN MEMBRANE.
5. 15 AND 20 YEAR GUARANTEES REQUIRE A MINIMUM 3-PLY FLASHING CONSTRUCTION CONSISTING OF TWO PLIES OF STRIPPING PLY TO BE SAME AS ROOF PLIES AND ONE PLY OF DURAFLEX™ 190 SBS MODIFIED BITUMEN MEMBRANE.
6. DURAFLEX ALUM MAY BE USED FOR FLASHING MATERIAL IN LIEU OF HOT ASPHALT APPLIED SBS FLASHING MEMBRANE. DURAFLEX ALUM MAY ONLY BE APPLIED WITH HOT ASPHALT OR USING THE HEAT WELDING METHOD OR PLYLINK FLASH-N-PATCH. DO NOT USE SOLVENT BASED ADHESIVES TO INSTALL DURAFLEX ALUM.

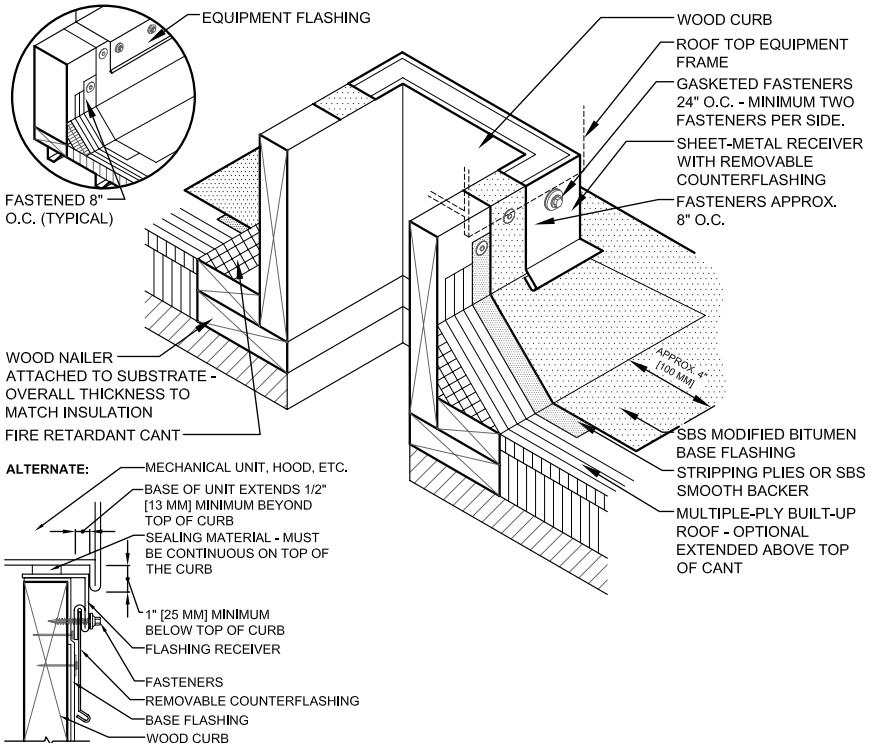
BUR-05_BUR SURFACE MOUNT COUNTER FLASHING DETAIL



NOTES:

1. WHEN PARAPET WALL EXCEEDS 24" IN HEIGHT, REFER TO DURAFLEX SBS HIGH WALL FLASHING DETAIL.
2. MASONRY WALLS TO BE PRIMED PRIOR TO FLASHING. WOOD WALLS REQUIRE BASE SHEET NAILED TO WALL 8" O.C. ALONG TOP AND LAPS, ONE PER S.F. FIELD.
3. COUNTERFLASHING DETAIL MAY BE A TWO-PIECE REGLET AND COUNTERFLASHING.
4. 5, 10 AND 12 YEAR GUARANTEES REQUIRE A MINIMUM 2-PLY FLASHING CONSTRUCTION CONSISTING OF ONE PLY OF STRIPPING PLY TO BE SAME AS ROOF PLIES AND ONE PLY OF DURAFLEX™ 190 SBS MODIFIED BITUMEN MEMBRANE.
5. 15 AND 20 YEAR GUARANTEES REQUIRE A MINIMUM 3-PLY FLASHING CONSTRUCTION CONSISTING OF TWO PLIES OF STRIPPING PLY TO BE SAME AS ROOF PLIES AND ONE PLY OF DURAFLEX™ 190 SBS MODIFIED BITUMEN MEMBRANE.
6. DURAFLEX ALUM MAY BE USED FOR FLASHING MATERIAL IN LIEU OF HOT ASPHALT APPLIED SBS FLASHING MEMBRANE. DURAFLEX ALUM MAY ONLY BE APPLIED WITH HOT ASPHALT OR USING THE HEAT WELDING METHOD OR PLYLINK FLASH-N-PATCH. DO NOT USE SOLVENT BASED ADHESIVES TO INSTALL DURAFLEX ALUM.

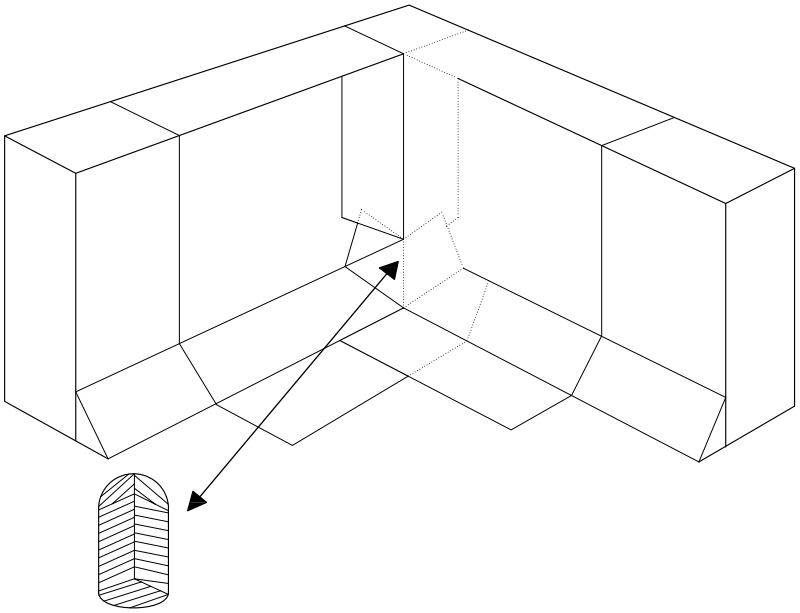
BUR-06_BUR EQUIPMENT CURB FLASHING DETAIL



NOTES:

1. WHEN POSSIBLE, THE MECHANICAL UNITS SHOULD NOT BE SET UNTIL THE ROOF MEMBRANE AND FLASHING HAVE BEEN INSTALLED.
2. 5, 10 AND 12 YEAR GUARANTEES REQUIRE A MINIMUM 2-PLY FLASHING CONSTRUCTION CONSISTING OF ONE PLY OF STRIPPING PLY TO BE SAME AS ROOF PLIES AND ONE PLY OF DURAFLEX™ 190 SBS MODIFIED BITUMEN MEMBRANE.
3. 15 AND 20 YEAR GUARANTEES REQUIRE A MINIMUM 3-PLY FLASHING CONSTRUCTION CONSISTING OF TWO PLIES OF STRIPPING PLY TO BE SAME AS ROOF PLIES AND ONE PLY OF DURAFLEX™ 190 SBS MODIFIED BITUMEN MEMBRANE.
4. DURAFLEX ALUM MAY BE USED FOR FLASHING MATERIAL IN LIEU OF HOT ASPHALT APPLIED SBS FLASHING MEMBRANE. DURAFLEX ALUM MAY ONLY BE APPLIED WITH HOT ASPHALT OR USING THE HEAT WELDING METHOD OR PLYLINK FLASH-N-PATCH. DO NOT USE SOLVENT BASED ADHESIVES TO INSTALL DURAFLEX ALUM.

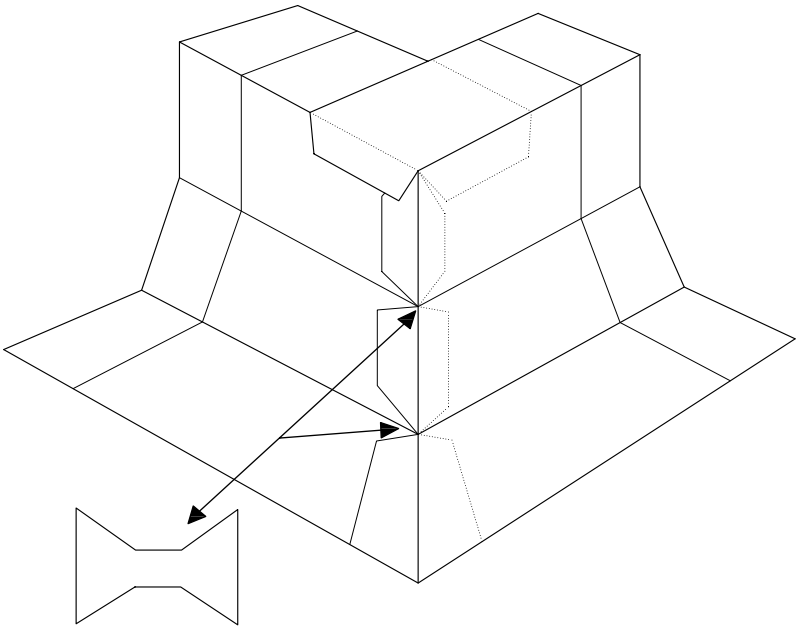
BUR-07_BUR INSIDE CORNER FLASHING DETAIL



NOTES:

1. MAKE FIELD CUTS AT TOP AND BOTTOM OF CANT TO PROPERLY FOLD.
2. INSTALL SBS CORNER MEMBRANE FLASHING OVER CUTS MADE IN SBS MODIFIED BITUMEN FLASHING.
3. DURAFLEX ALUM MAY BE USED FOR FLASHING MATERIAL IN LIEU OF HOT ASPHALT APPLIED SBS FLASHING MEMBRANE. DURAFLEX ALUM MAY ONLY BE APPLIED WITH HOT ASPHALT OR USING THE HEAT WELDING METHOD OR PLYLINK FLASH-N-PATCH. DO NOT USE SOLVENT BASED ADHESIVES TO INSTALL DURAFLEX ALUM.
4. WHEN DURAFLEX ALUM IS USED FOR BASE FLASHING MATERIAL IN LIEU OF HOT ASPHALT APPLIED SBS BASE FLASHING, THE CORNERS SHALL BE MITERED. THE CORNERS SHALL BE OVERLAPPED AND CORNER PATCHED WITH SBS MEMBRANE PRIOR TO THE INSTALLATION OF THE DURAFLEX ALUM.

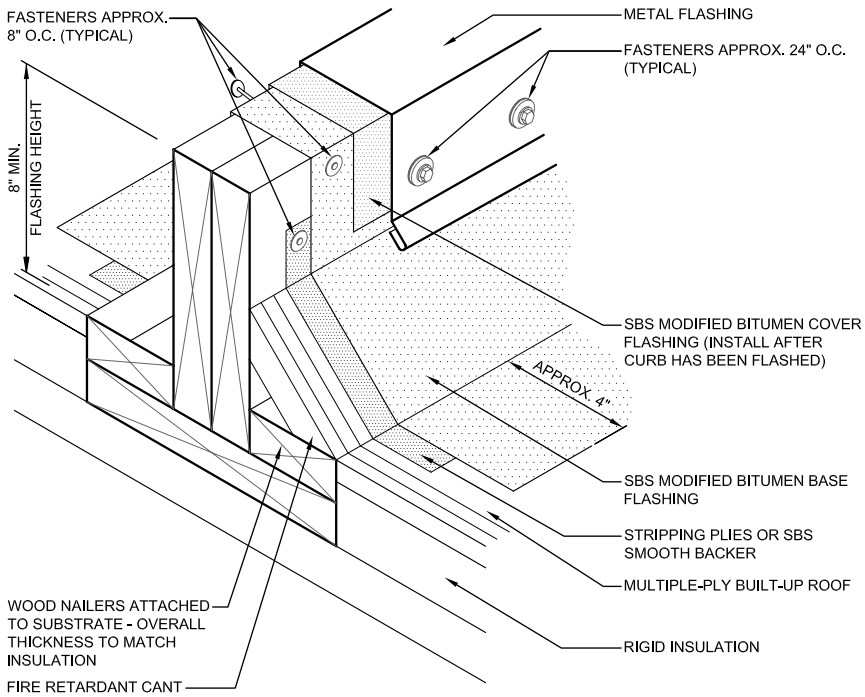
BUR-08_BUR OUTSIDE CORNER FLASHING DETAIL



NOTES:

1. MAKE FIELD CUTS AT TOP AND BOTTOM OF CANT TO PROPERLY FOLD.
2. INSTALL SBS CORNER MEMBRANE FLASHING OVER CUTS MADE IN SBS MODIFIED BITUMEN FLASHING.
3. 3 COURSING WITH PLASTIC ROOF CEMENT IS NOT AN ACCEPTABLE ALTERNATIVE.
4. DURAFLEX ALUM MAY BE USED FOR FLASHING MATERIAL IN LIEU OF HOT ASPHALT APPLIED SBS FLASHING MEMBRANE. DURAFLEX ALUM MAY ONLY BE APPLIED WITH HOT ASPHALT OR USING THE HEAT WELDING METHOD OR PLYLINK FLASH-N-PATCH. DO NOT USE SOLVENT BASED ADHESIVES TO INSTALL DURAFLEX ALUM.
5. WHEN DURAFLEX ALUM IS USED FOR BASE FLASHING MATERIAL IN LIEU OF HOT ASPHALT APPLIED SBS BASE FLASHING, THE CORNERS SHALL BE MITERED. THE CORNERS SHALL BE OVERLAPPED AND CORNER PATCHED WITH SBS MEMBRANE PRIOR TO THE INSTALLATION OF THE DURAFLEX ALUM.

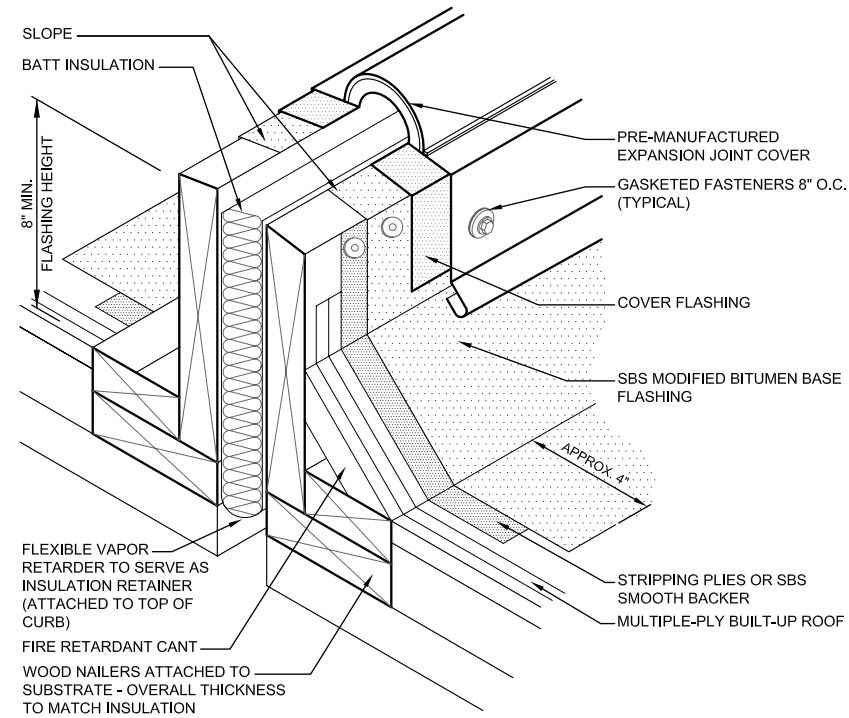
BUR-09_BUR AREA CURB DIVIDER FLASHING DETAIL



NOTES:

1. AN AREA DIVIDER IS A RAISED DOUBLE WOOD MEMBER THAT IS PROPERLY ANCHORED TO THE ROOF DECK. AREA DIVIDERS SHOULD NEVER RESTRICT THE FLOW OF WATER.
2. FLASHING REQUIREMENTS TYPICAL FOR BOTH SIDES OF AREA DIVIDER.
3. 5, 10 AND 12 YEAR GUARANTEES REQUIRE A MINIMUM 2-PLY FLASHING CONSTRUCTION CONSISTING OF ONE PLY OF STRIPPING PLY TO BE SAME AS ROOF PLIES AND ONE PLY OF DURAFLEX™ 190 SBS MODIFIED BITUMEN MEMBRANE.
4. 15 AND 20 YEAR GUARANTEES REQUIRE A MINIMUM 3-PLY FLASHING CONSTRUCTION CONSISTING OF TWO PLIES OF STRIPPING PLY TO BE SAME AS ROOF PLIES AND ONE PLY OF DURAFLEX™ 190 SBS MODIFIED BITUMEN MEMBRANE.
5. DURAFLEX ALUM MAY BE USED FOR FLASHING MATERIAL IN LIEU OF HOT ASPHALT APPLIED SBS FLASHING MEMBRANE. DURAFLEX ALUM MAY ONLY BE APPLIED WITH HOT ASPHALT OR USING THE HEAT WELDING METHOD OR PLYLINK FLASH-N-PATCH. DO NOT USE SOLVENT BASED ADHESIVES TO INSTALL DURAFLEX ALUM.

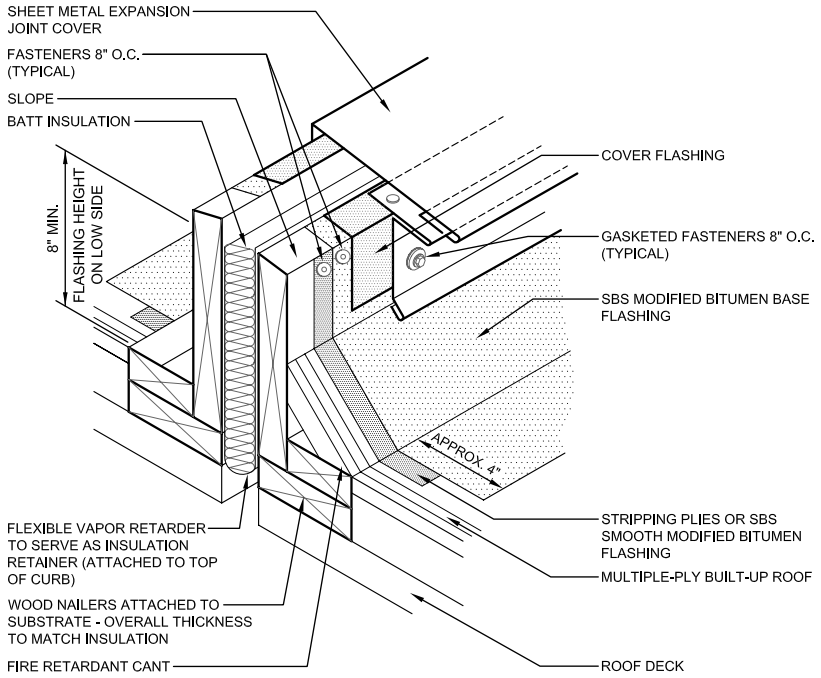
BUR-10A_BUR EXPANSION JOINT WITH PRE-MANUFACTURED COVER DETAIL



NOTES:

1. THIS DETAIL ALLOWS FOR BUILDING MOVEMENT IN MULTIPLE DIRECTIONS.
2. FLASHING REQUIREMENTS TYPICAL FOR BOTH SIDES OF EXPANSION JOINT.
3. 5, 10 AND 12 YEAR GUARANTEES REQUIRE A MINIMUM 2-PLY FLASHING CONSTRUCTION CONSISTING OF ONE PLY OF STRIPPING PLY TO BE SAME AS ROOF PLIES AND ONE PLY OF DURAFLEX™ 190 SBS MODIFIED BITUMEN MEMBRANE.
4. 15 AND 20 YEAR GUARANTEES REQUIRE A MINIMUM 3-PLY FLASHING CONSTRUCTION CONSISTING OF TWO PLIES OF STRIPPING PLY TO BE SAME AS ROOF PLIES AND ONE PLY OF DURAFLEX™ 190 SBS MODIFIED BITUMEN MEMBRANE.
5. DURAFLEX ALUM MAY BE USED FOR FLASHING MATERIAL IN LIEU OF HOT ASPHALT APPLIED SBS FLASHING MEMBRANE. DURAFLEX ALUM MAY ONLY BE APPLIED WITH HOT ASPHALT OR USING THE HEAT WELDING METHOD OR PLYLINK FLASH-N-PATCH. DO NOT USE SOLVENT BASED ADHESIVES TO INSTALL DURAFLEX ALUM.

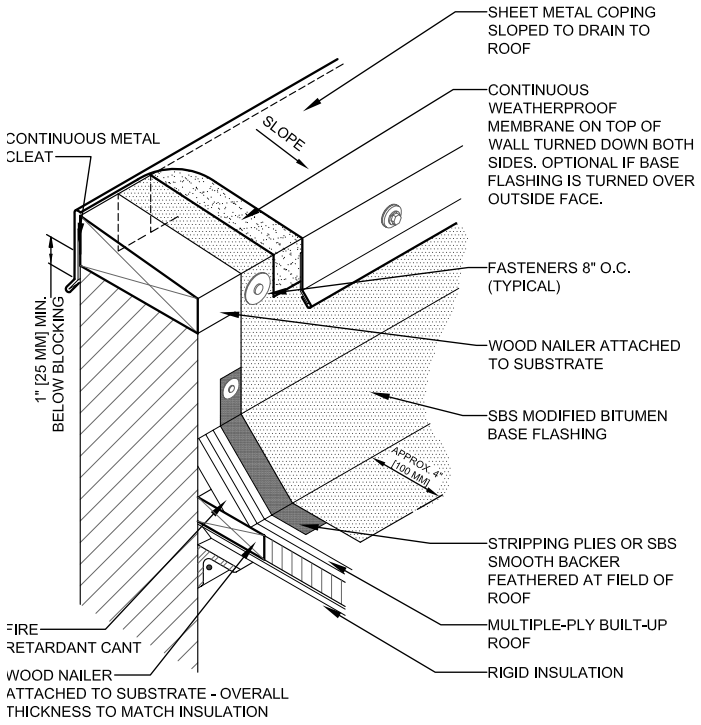
BUR-10B_BUR EXPANSION JOINT WITH METAL COVER DETAIL



NOTES:

1. THIS DETAIL ALLOWS FOR BUILDING MOVEMENT IN MULTIPLE DIRECTIONS.
2. FLASHING REQUIREMENTS TYPICAL FOR BOTH SIDES OF EXPANSION JOINT.
3. 5, 10 AND 12 YEAR GUARANTEES REQUIRE A MINIMUM 2-PLY FLASHING CONSTRUCTION CONSISTING OF ONE PLY OF STRIPPING PLY TO BE SAME AS ROOF PLIES AND ONE PLY OF DURAFLEX™ 190 SBS MODIFIED BITUMEN MEMBRANE.
4. 15 AND 20 YEAR GUARANTEES REQUIRE A MINIMUM 3-PLY FLASHING CONSTRUCTION CONSISTING OF TWO PLIES OF STRIPPING PLY TO BE SAME AS ROOF PLIES AND ONE PLY OF DURAFLEX™ 190 SBS MODIFIED BITUMEN MEMBRANE.
5. DURAFLEX ALUM MAY BE USED FOR FLASHING MATERIAL IN LIEU OF HOT ASPHALT APPLIED SBS FLASHING MEMBRANE. DURAFLEX ALUM MAY ONLY BE APPLIED WITH HOT ASPHALT OR USING THE HEAT WELDING METHOD OR PLYLINK FLASH-N-PATCH. DO NOT USE SOLVENT BASED ADHESIVES TO INSTALL DURAFLEX ALUM.

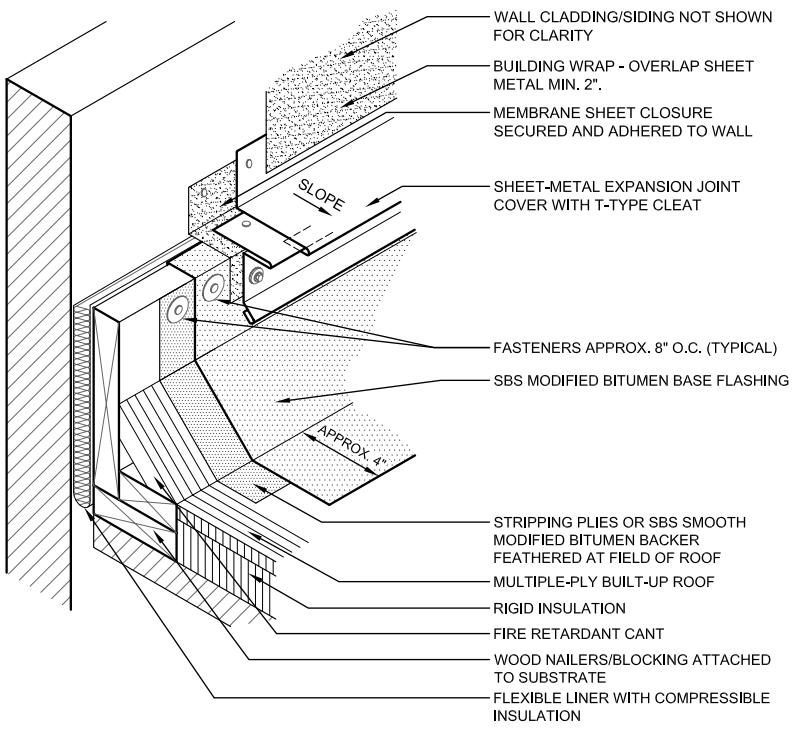
BUR-11_BUR SUPPORTED WALL FLASHING DETAIL



NOTES:

1. THIS DETAIL SHOULD BE USED ONLY WHEN THE ROOF DECK IS SUPPORTED BY THE WALL. DETAIL BUR-15 SHOULD BE USED FOR NON-WALL SUPPORTED DECK.
2. MASONRY WALLS TO BE PRIMED AS REQUIRED PRIOR TO FLASHING. WOOD WALLS REQUIRE BASE SHEET NAILED TO WALL 8" O.C. ALONG TOP AND LAPS, ONE PER S.F. FIELD.
3. 5, 10 AND 12 YEAR GUARANTEE REQUIRE A MINIMUM 2-PLY FLASHING CONSTRUCTION CONSISTING OF ONE PLY OF STRIPPING PLY TO BE SAME AS ROOF PLIES AND ONE PLY OF DURAFLEX™ 190 SBS MODIFIED BITUMEN MEMBRANE.
4. 15 AND 20 YEAR GUARANTEES REQUIRE A MINIMUM 3-PLY FLASHING CONSTRUCTION CONSISTING OF TWO PLIES OF STRIPPING PLY TO BE SAME AS ROOF PLIES AND ONE PLY OF DURAFLEX™ 190 SBS MODIFIED BITUMEN MEMBRANE.
5. SBS MODIFIED BITUMEN BASE FLASHING TURNED OVER EDGE AND EXTENDED BELOW BLOCKING OR A MINIMUM OF 1 ½" (38 MM), WHICHEVER IS GREATER.
6. CONTINUOUS WEATHERPROOF MEMBRANE ON TOP OF WALL TURNED DOWN BOTH SIDES. OPTIONAL IF BASE FLASHING IS TURNED OVER OUTSIDE FACE. REFER TO DETAIL INSET.
7. FASTEN SBS MODIFIED BITUMEN BASE FLASHING WITH FASTENERS APPROX. 8" O.C. REFER TO DETAIL INSET.
8. DURAFLEX ALUM MAY BE USED FOR FLASHING MATERIAL IN LIEU OF HOT ASPHALT APPLIED SBS FLASHING MEMBRANE. DURAFLEX ALUM MAY ONLY BE APPLIED WITH HOT ASPHALT OR USING THE HEAT WELDING METHOD OR PLYLINK FLASH-N-PATCH. DO NOT USE SOLVENT BASED ADHESIVES TO INSTALL DURAFLEX ALUM.

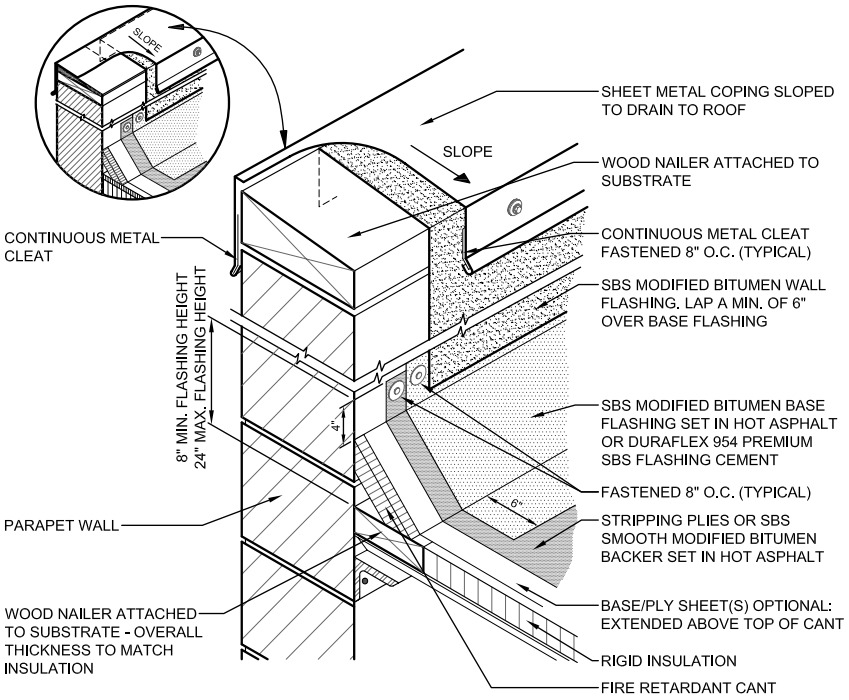
BUR-12_BUR NON SUPPORTED WALL FLASHING DETAIL



NOTES:

1. MASONRY WALLS TO BE PRIMED PRIOR TO FLASHING. WOOD WALLS REQUIRE BASE SHEET NAILED TO WALL 8" O.C. ALONG TOP AND LAPS, ONE PER S.F. FIELD.
2. FOR TILT WALLS, BASE FLASHINGS SHALL BE SEPARATED FROM WALL BY WOOD NAILERS/BLOCKING ATTACHED TO SUBSTRATE ONLY.
3. 5, 10 AND 12 YEAR GUARANTEES REQUIRE A MINIMUM 2-PLY FLASHING CONSTRUCTION CONSISTING OF ONE PLY OF STRIPPING PLY TO BE SAME AS ROOF PLIES AND ONE PLY OF DURAFLEX™ 190 SBS MODIFIED BITUMEN MEMBRANE.
4. DURAFLEX ALUM MAY BE USED FOR FLASHING MATERIAL IN LIEU OF HOT ASPHALT APPLIED SBS FLASHING MEMBRANE. DURAFLEX ALUM MAY ONLY BE APPLIED WITH HOT ASPHALT OR USING THE HEAT WELDING METHOD OR PLYLINK FLASH-N-PATCH. DO NOT USE SOLVENT BASED ADHESIVES TO INSTALL DURAFLEX ALUM.
5. 15 AND 20 YEAR GUARANTEES REQUIRE A MINIMUM 3-PLY FLASHING CONSTRUCTION CONSISTING OF TWO PLIES OF STRIPPING PLY TO BE SAME AS ROOF PLIES AND ONE PLY OF DURAFLEX™ 190 SBS MODIFIED BITUMEN MEMBRANE.

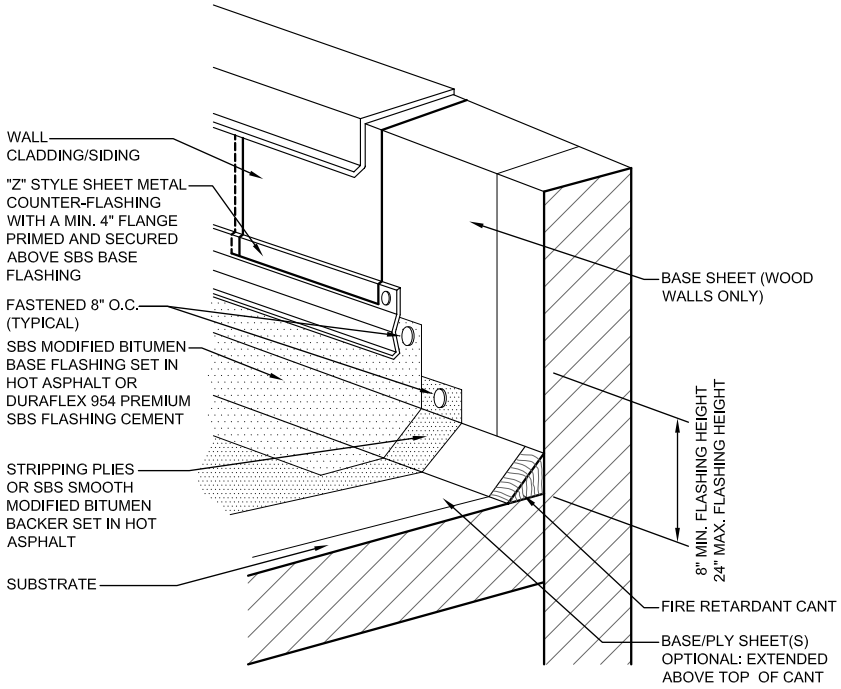
BUR-13_BUR HIGH WALL FLASHING DETAIL



NOTES:

1. MASONRY WALLS TO BE PRIMED AS REQUIRED PRIOR TO FLASHING. WOOD WALLS REQUIRE BASE SHEET NAILED TO WALL 8" O.C. ALONG TOP AND LAPS, ONE PER S.F. FIELD.
2. SBS MODIFIED BITUMEN WALL FLASHING TURNED OVER EDGE AND EXTENDED BELOW BLOCKING OR A MINIMUM OF 1 ½" (38 MM), WHICHEVER IS GREATER.
3. CONTINUOUS WEATHERPROOF MEMBRANE ON TOP OF WALL TURNED DOWN BOTH SIDES. OPTIONAL IF BASE FLASHING IS TURNED OVER OUTSIDE FACE. REFER TO DETAIL INSET.
4. FASTENED SBS MODIFIED BITUMEN BASE FLASHING WITH FASTENERS APPROX. 8" O.C. REFER TO DETAIL INSET.
5. DURAFLEX ALUM MAY BE USED FOR FLASHING MATERIAL IN LIEU OF HOT ASPHALT APPLIED SBS FLASHING MEMBRANE. DURAFLEX ALUM MAY ONLY BE APPLIED WITH HOT ASPHALT OR USING THE HEAT WELDING METHOD OR PLYLINK FLASH-N-PATCH. DO NOT USE SOLVENT BASED ADHESIVES TO INSTALL DURAFLEX ALUM.

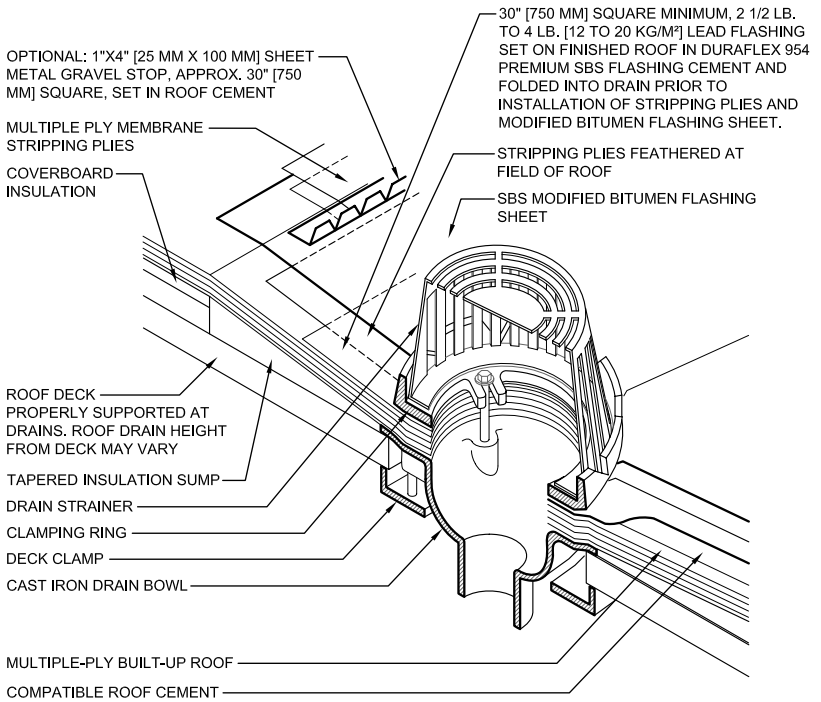
BUR-14_BUR HIGH WALL 2-PIECE FLASHING DETAIL



NOTES:

1. MASONRY WALLS TO BE PRIMED AS REQUIRED PRIOR TO FLASHING. WOOD WALLS REQUIRE BASE SHEET NAILED TO WALL 8" O.C. ALONG TOP AND LAPS, ONE PER S.F. FIELD.
2. DURAFLEX ALUM MAY BE USED FOR FLASHING MATERIAL IN LIEU OF HOT ASPHALT APPLIED SBS FLASHING MEMBRANE. DURAFLEX ALUM MAY ONLY BE APPLIED WITH HOT ASPHALT OR USING THE HEAT WELDING METHOD OR PLYLINK FLASH-N-PATCH. DO NOT USE SOLVENT BASED ADHESIVES TO INSTALL DURAFLEX ALUM.

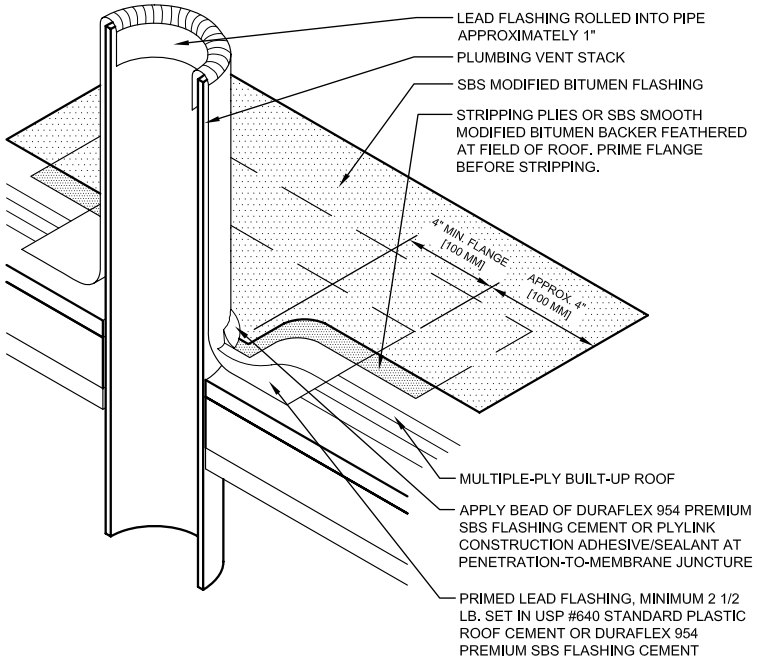
BUR-15_BUR ROOF DRAIN FLASHING DETAIL



NOTES:

1. THE USE OF A METAL DECK SUMP PAN IS NOT RECOMMENDED. HOWEVER, DRAIN RECEIVER/BEARING PLATES ARE APPLICABLE WITH SOME PROJECTS.
2. DO NOT APPLY COAL TAR OR DEAD LEVEL ASPHALT INTO DRAIN SUMP.
3. MEMBRANE AND FLASHING MUST EXTEND UNDER CLAMPING RING.
4. PLASTIC ROOF DRAINS CANNOT BE USED.
5. 5, 10 AND 12 YEAR GUARANTEES REQUIRE A MINIMUM 2-PLY FLASHING CONSTRUCTION CONSISTING OF ONE PLY OF STRIPPING PLY TO BE SAME AS ROOF PLIES AND ONE PLY OF DURAFLEX™ 190 SBS MODIFIED BITUMEN MEMBRANE.
6. 15 AND 20 YEAR GUARANTEES REQUIRE A MINIMUM 3-PLY FLASHING CONSTRUCTION CONSISTING OF TWO PLIES OF STRIPPING PLY TO BE SAME AS ROOF PLIES AND ONE PLY OF DURAFLEX™ 190 SBS MODIFIED BITUMEN MEMBRANE.
7. DURAFLEX ALUM MAY BE USED FOR FLASHING MATERIAL IN LIEU OF HOT ASPHALT APPLIED SBS FLASHING MEMBRANE. DURAFLEX ALUM MAY ONLY BE APPLIED WITH HOT ASPHALT OR USING THE HEAT WELDING METHOD OR PLYLINK FLASH-N-PATCH. DO NOT USE SOLVENT BASED ADHESIVES TO INSTALL DURAFLEX ALUM.

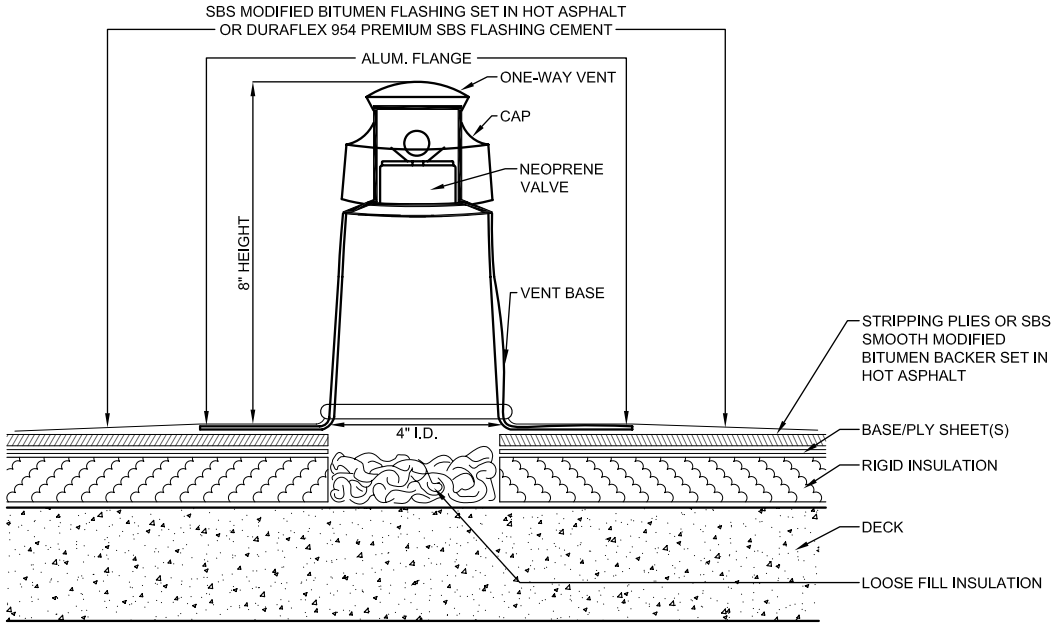
BUR-17_BUR PLUMBING VENT STACK FLASHING DETAIL



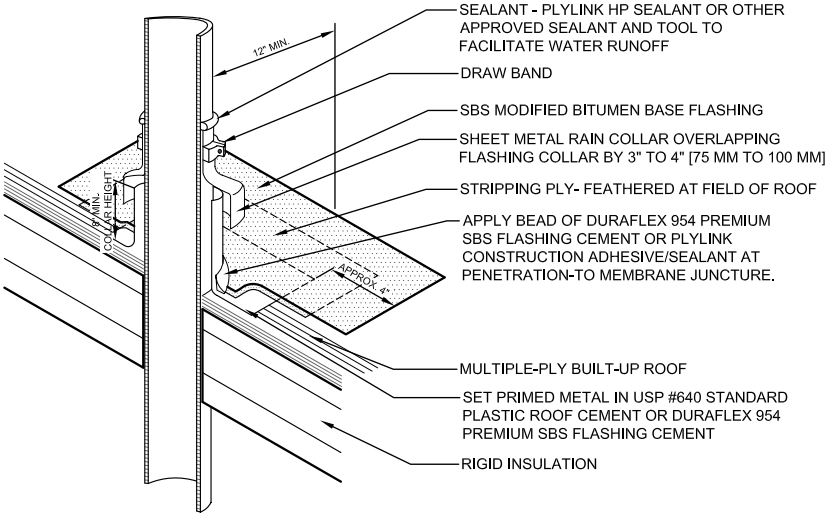
NOTES:

1. FOR PIPES UNDER 8" IN HEIGHT, A TUBOS PIPE INSERT MAY BE APPLIED TO REACH PROPER HEIGHT.
2. 5, 10 AND 12 YEAR GUARANTEES REQUIRE A MINIMUM 2-PLY FLASHING CONSTRUCTION CONSISTING OF ONE PLY OF STRIPPING PLY TO BE SAME AS ROOF PLIES AND ONE PLY OF DURAFLEX™ 190 SBS MODIFIED BITUMEN MEMBRANE.
3. 15 AND 20 YEAR GUARANTEES REQUIRE A MINIMUM 3-PLY FLASHING CONSTRUCTION CONSISTING OF TWO PLIES OF STRIPPING PLY TO BE SAME AS ROOF PLIES AND ONE PLY OF DURAFLEX™ 190 SBS MODIFIED BITUMEN MEMBRANE.
4. DURAFLEX ALUM MAY BE USED FOR FLASHING MATERIAL IN LIEU OF HOT ASPHALT APPLIED SBS FLASHING MEMBRANE. DURAFLEX ALUM MAY ONLY BE APPLIED WITH HOT ASPHALT OR USING THE HEAT WELDING METHOD OR PLYLINK FLASH-N-PATCH. DO NOT USE SOLVENT BASED ADHESIVES TO INSTALL DURAFLEX ALUM.

BUR-18_BUR ONE WAY RELIEF VENT FLASHING DETAIL



BUR-19_BUR ROOF PENETRATION FLASHING DETAIL

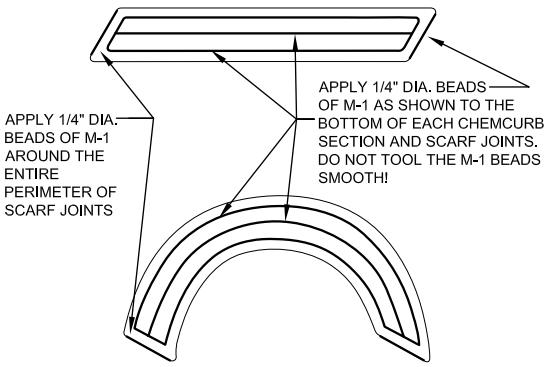


NOTES:

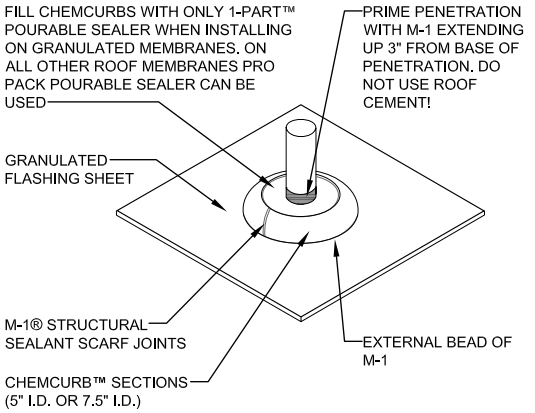
1. 5, 10 AND 12 YEAR GUARANTEES REQUIRE A MINIMUM 2-PLY FLASHING CONSTRUCTION CONSISTING OF ONE PLY OF STRIPPING PLY TO BE SAME AS ROOF PLIES AND ONE PLY OF DURAFLEX™ 190 SBS MODIFIED BITUMEN MEMBRANE.
2. 15 AND 20 YEAR GUARANTEES REQUIRE A MINIMUM 3-PLY FLASHING CONSTRUCTION CONSISTING OF TWO PLIES OF STRIPPING PLY TO BE SAME AS ROOF PLIES AND ONE PLY OF DURAFLEX™ 190 SBS MODIFIED BITUMEN MEMBRANE.

BUR-20_CHEMCURB ROOF PENETRATION DETAIL

M-1 APPLICATION TO THE BOTTOM AND SCARF JOINTS OF CHEMCURB SECTIONS

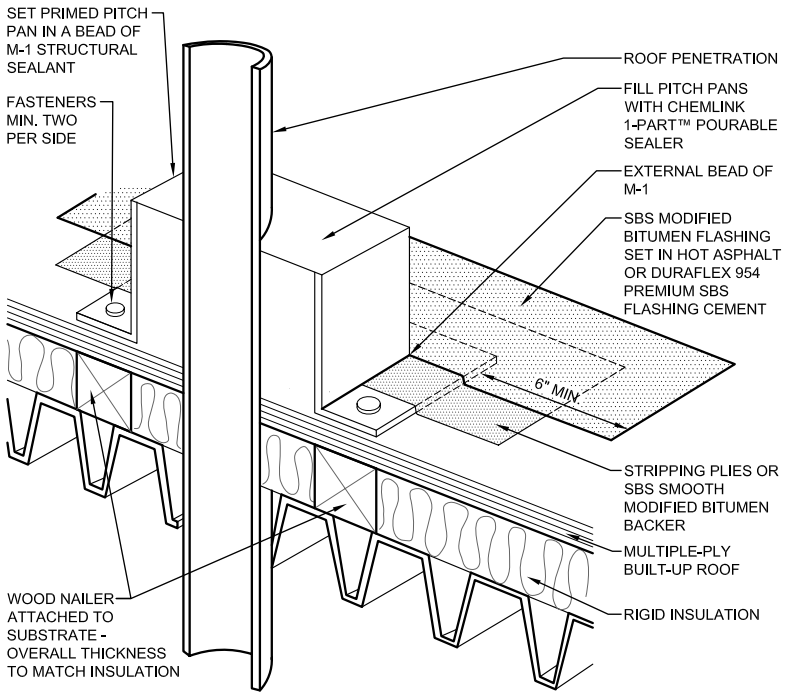


STANDARD CHEMCURB DETAIL



A MINIMUM 1" SPACE IS REQUIRED BETWEEN ALL PENETRATIONS AND THE INTERIOR WALL OF ALL CHEMCURBS.

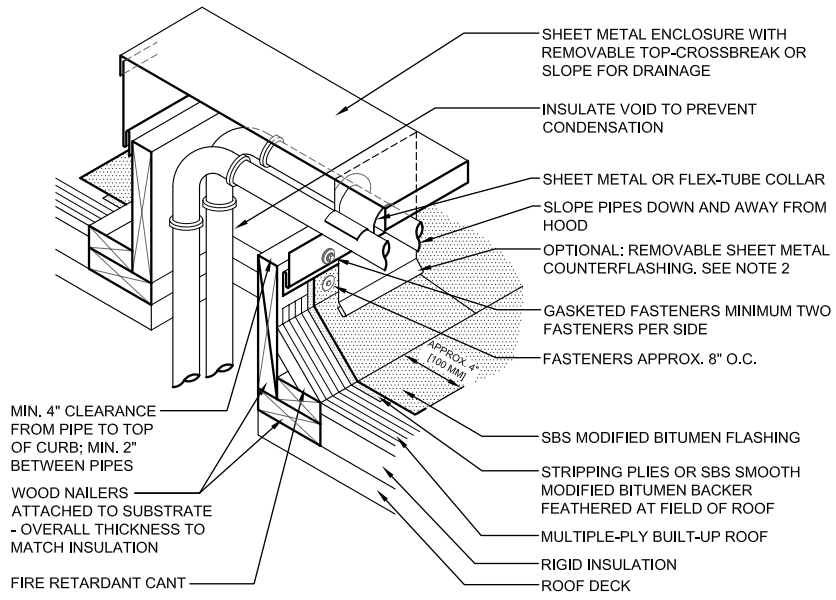
BUR-21_BUR PITCH PAN FLASHING DETAIL



NOTES:

1. REFER TO CHEMCURB™ ROOF PENETRATION DETAIL FOR 15 AND 20 YEAR SYSTEMS.
2. 5, 10 AND 12 YEAR GUARANTEES REQUIRE A MINIMUM 2-PLY FLASHING CONSTRUCTION CONSISTING OF ONE PLY OF STRIPPING PLY TO BE SAME AS ROOF PLIES AND ONE PLY OF DURAFLEX™ 190 SBS MODIFIED BITUMEN MEMBRANE.
3. 15 AND 20 YEAR GUARANTEES REQUIRE A MINIMUM 3-PLY FLASHING CONSTRUCTION CONSISTING OF TWO PLIES OF STRIPPING PLY TO BE SAME AS ROOF PLIES AND ONE PLY OF DURAFLEX™ 190 SBS MODIFIED BITUMEN MEMBRANE.
4. PIPE PENETRATION AND BASE OF PENETRATION MUST BE CLEAN AND FREE OF DIRT AND MASTIC BEFORE APPLYING POURABLE SEALER.
5. CLEAN AND PRIME PENETRATION WITH M-1 EXTENDING 2" ABOVE TOP OF PAN.
6. CLEAN AND PRIME INSIDE TOP 2" OF PAN WITH M-1.
7. DURAFLEX ALUM MAY BE USED FOR FLASHING MATERIAL IN LIEU OF HOT ASPHALT APPLIED SBS FLASHING MEMBRANE. DURAFLEX ALUM MAY ONLY BE APPLIED WITH HOT ASPHALT OR USING THE HEAT WELDING METHOD OR PLYLINK FLASH-N-PATCH. DO NOT USE SOLVENT BASED ADHESIVES TO INSTALL DURAFLEX ALUM.

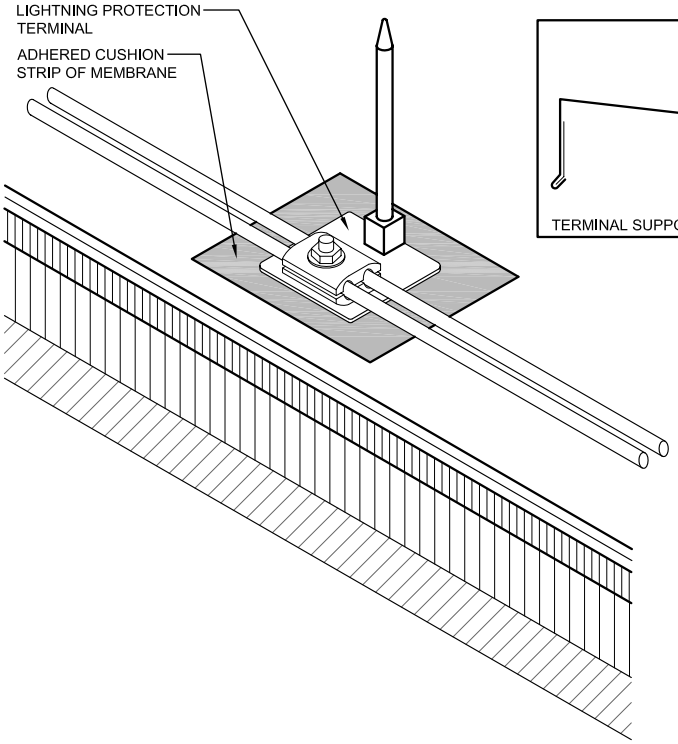
BUR-22_BUR SHEET METAL ENCLOSURE FOR PIPING THROUGH ROOF DECK DETAIL

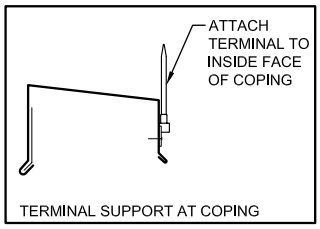


NOTES:

1. THIS DETAIL ILLUSTRATES ANOTHER METHOD OF ELIMINATING PITCH POCKETS AND AN OPTIONAL METHOD OF GROUPING PIPING THAT MUST PENETRATE THE ROOF.
2. WHERE THE SHEET METAL ENCLOSURE OVERLAPS THE BASE FLASHING AT LEAST 3" [75 MM], THE REMOVABLE SHEET METAL COUNTERFLASHING IS NOT REQUIRED.
3. 5, 10 AND 12 YEAR GUARANTEES REQUIRE A MINIMUM 2-PLY FLASHING CONSTRUCTION CONSISTING OF ONE PLY OF STRIPPING PLY TO BE SAME AS ROOF PLIES AND ONE PLY OF DURAFLEX™ 190 SBS MODIFIED BITUMEN MEMBRANE.
4. 15 AND 20 YEAR GUARANTEES REQUIRE A MINIMUM 3-PLY FLASHING CONSTRUCTION CONSISTING OF TWO PLIES OF STRIPPING PLY TO BE SAME AS ROOF PLIES AND ONE PLY OF DURAFLEX™ 190 SBS MODIFIED BITUMEN MEMBRANE.

BUR-23_BUR LIGHTNING PROTECTION TERMINAL DETAIL

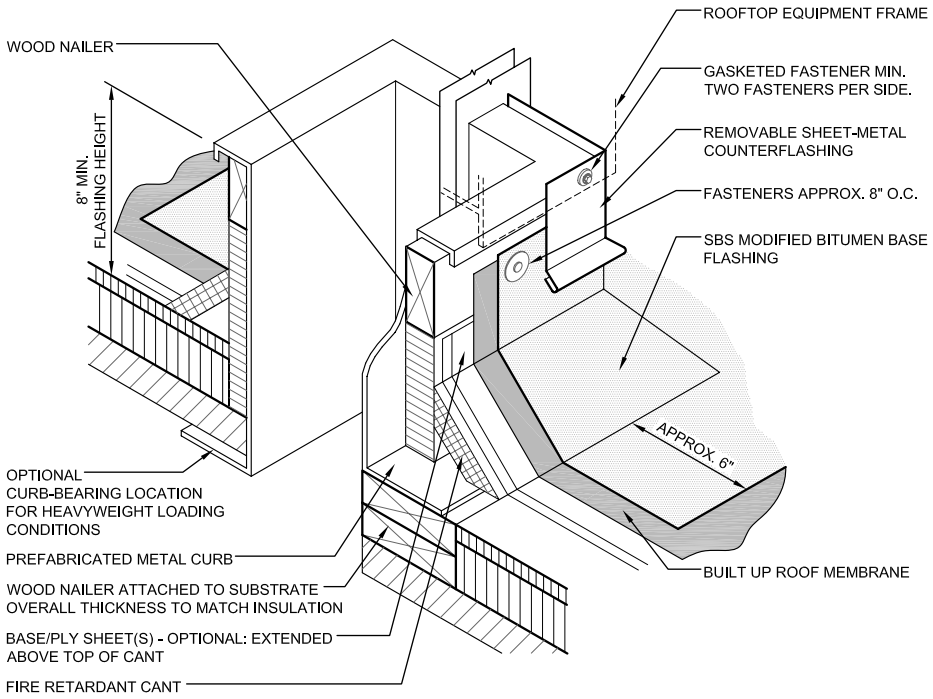




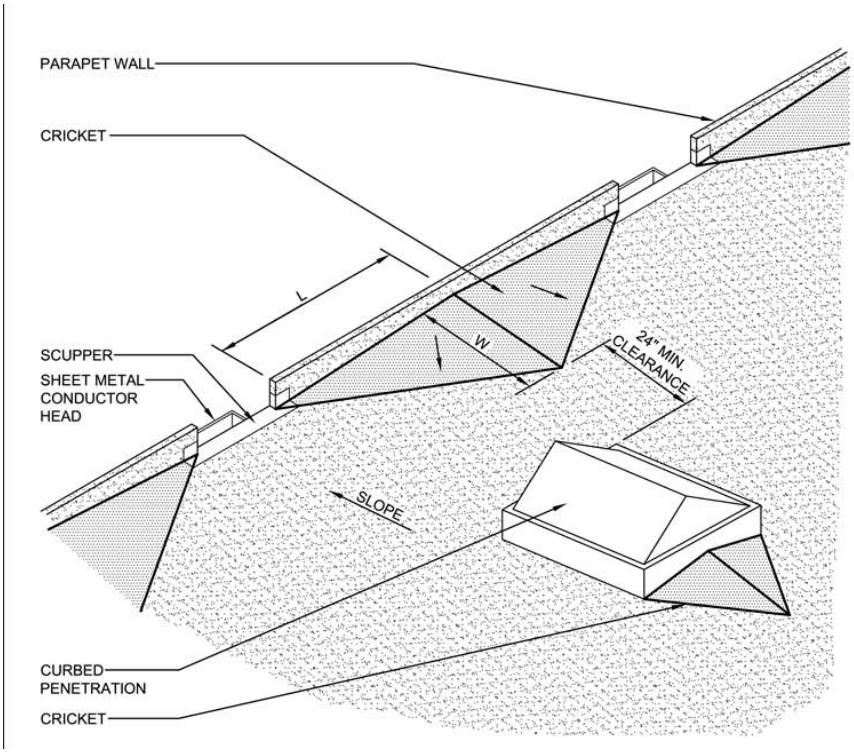
NOTES:

1. THIS DETAIL IS APPLICABLE FOR MOP, COLD OR TORCH-APPLIED FLASHING SYSTEMS.
2. DETAIL DEPICTS THE WEATHERPROOFING PROTECTION AND DOES NOT REPRESENT LIGHTNING PROTECTION DESIGN.
3. FOR ROOF SYSTEMS WITH FACTORY-APPLIED GRANULE SURFACING, PROPERLY PREPARE CAP SHEET TO RECEIVE FLASHING.

BUR-24_BUR BASE FLASHING AT PREFABRICATED CURB DETAIL



C-01 – CRICKET DETAIL



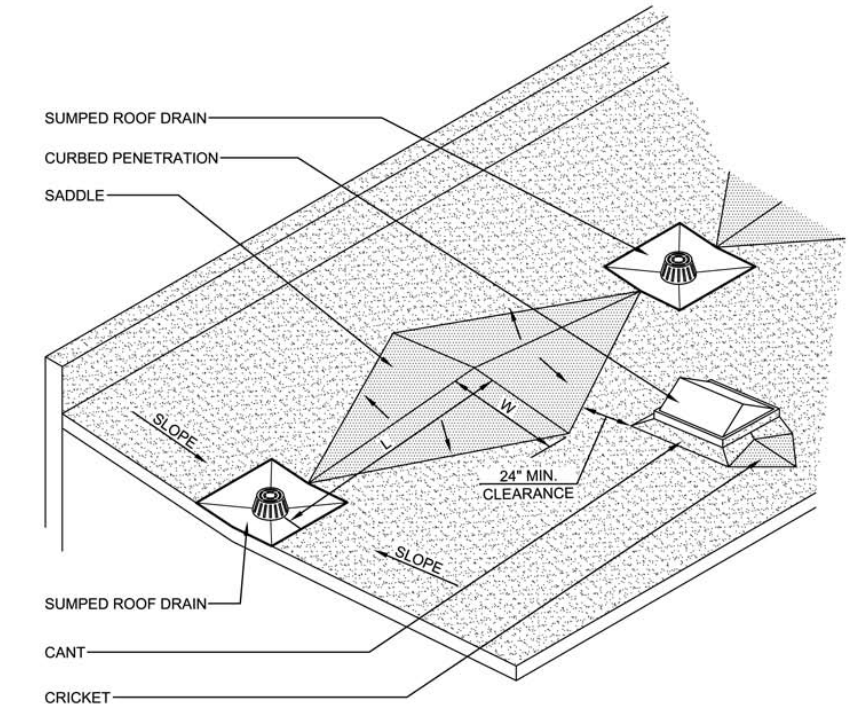
NOTES:

1. CRICKETS SHOULD BE LOCATED BETWEEN PERIMETER AND/OR THROUGH WALL SCUPPERS AND ON THE HIGH SIDE OF CURBS.
2. RAISED PERIMETER EDGES WHERE TAPERED CRICKETS ARE USED MAY NECESSITATE THE USE OF RELATIVELY WIDE (TALL) DIMENSIONAL LUMBER OR THE ERECTION OF FRAMED WALLS.
3. SADDLE INSULATION MAY BE SANDWICHED BETWEEN LAYERS OF FLAT STOCK INSULATION.

RECOMMENDED MAXIMUM L:W RATIOS FOR AND CRICKETS

ROOF SLOPE	CRICKET MATERIAL SLOPE	L:W RATIO
1/8	1/4	3:1
1/4	1/2	3:1
1/2	1/2	4:1

CS-01 – CRICKET AND SADDLE DETAIL



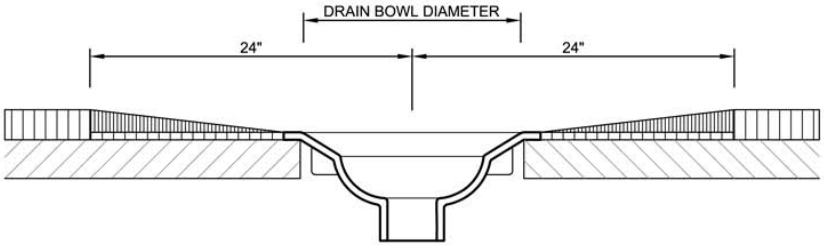
NOTES:

1. SADDLES SHOULD BE LOCATED IN VALLEYS BETWEEN ROOF DRAINS, AND CRICKETS SHOULD BE LOCATED ON THE HIGH SIDE OF CURBS.
2. LOCATE ROOF DRAINS AT POINTS OF MAXIMUM DECK DEFLECTION/LOW AREAS FOR DRAINAGE.
3. SADDLE INSULATION MAY BE SANDWICHED BETWEEN LAYERS OF FLAT STOCK INSULATION

RECOMMENDED MAXIMUM L:W RATIOS FOR SADDLES AND CRICKETS

ROOF SLOPE	SADDLE MATERIAL SLOPE	L:W RATIO
1/8	1/4	3:1
1/4	1/2	3:1
1/2	1/2	4:1

DS-01 – DRAIN SUMP DETAIL



NOTES:

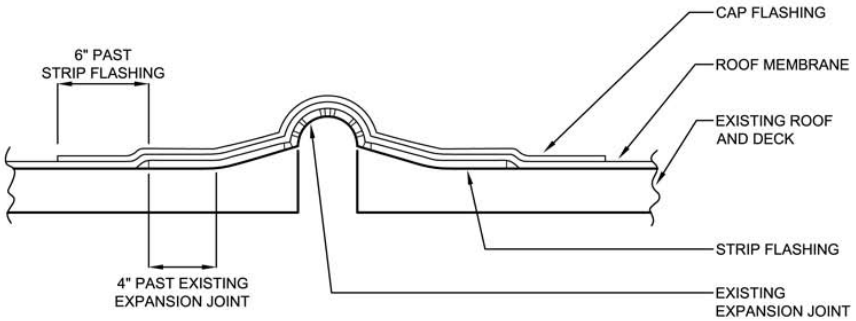
1. REFER TO DETAILS CS-1 - CRICKETS AND SADDLES AND C-1 - CRICKETS FOR ADDITIONAL INFORMATION REGARDING CRICKET AND SADDLE SLOPE AND LENGTH-TO-WIDTH (L:W) RATIOS.
2. DRAIN SUMP SIZE MAY BE INCREASED. WHEN DRAIN SUMP SIZE IS INCREASED, SADDLES BETWEEN DRAIN SUMPS SHOULD START AT OUTER EDGE OF THE DRAIN SUMP.

INSULATION THICKNESS AT OUTER EDGE OF SUMP	1 1/2"	2"	2 1/2"	3"	3 1/2"	4"	4 1/2"
HEIGHT OF DRAIN BOWL RIM ABOVE DECK	0"	1/2"	1"	1 1/2"	2"	2 1/2"	3"

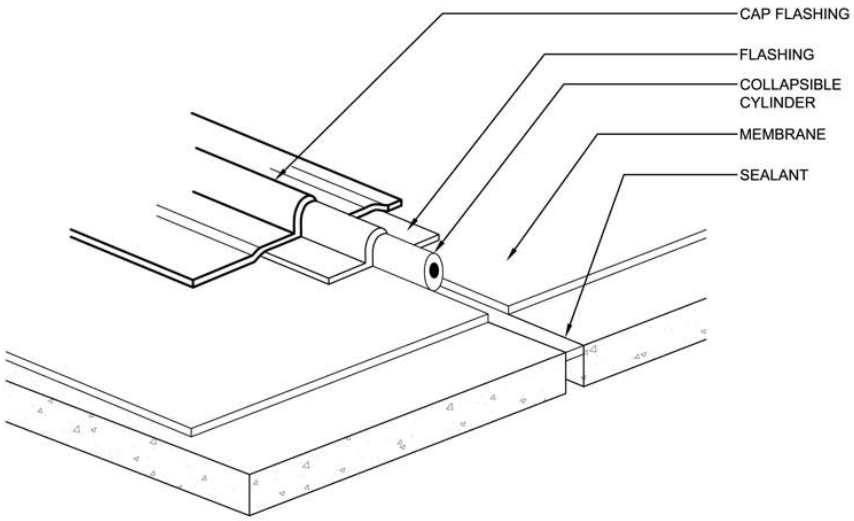
EJ-01 – EXPANSION JOINT FLASHING DETAIL

NOTES:

1. CYLINDER MUST BE 2 ½ TIMES LARGER THAN EXPANSION JOINT AREA.
2. THIS EXPANSION JOINT CAN NOT BE USED IN AREAS WHERE THERE IS PONDING WATER.



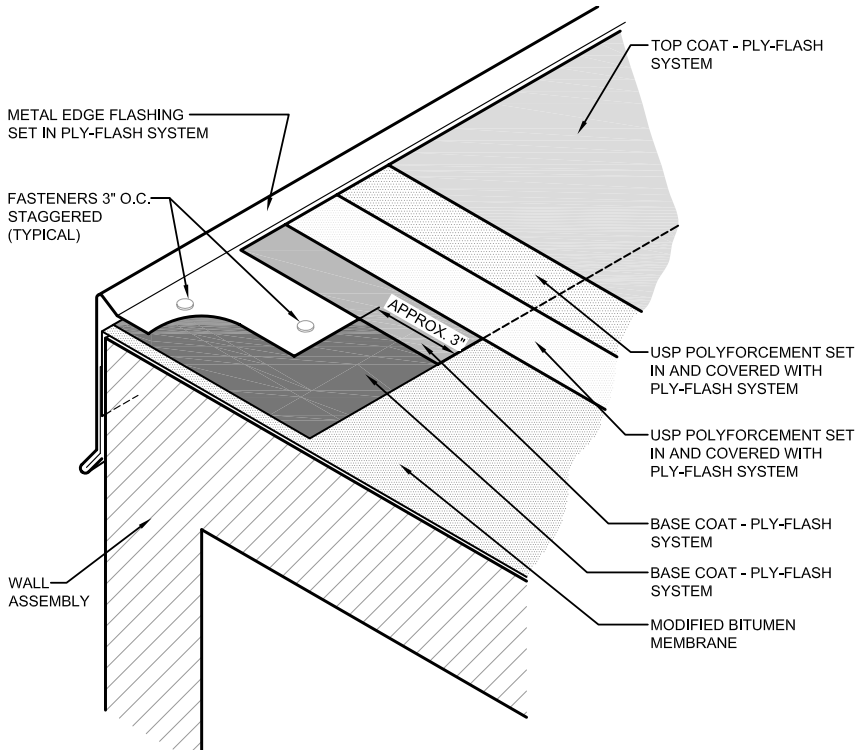
EJ-02 – ALTERNATE JOINT FLASHING DETAIL



NOTES:

1. CYLINDER MUST BE 2 ½ TIMES LARGER THAN EXPANSION JOINT AREA.
2. THIS EXPANSION JOINT CAN NOT BE USED IN AREAS WHERE THERE IS PONDING WATER.

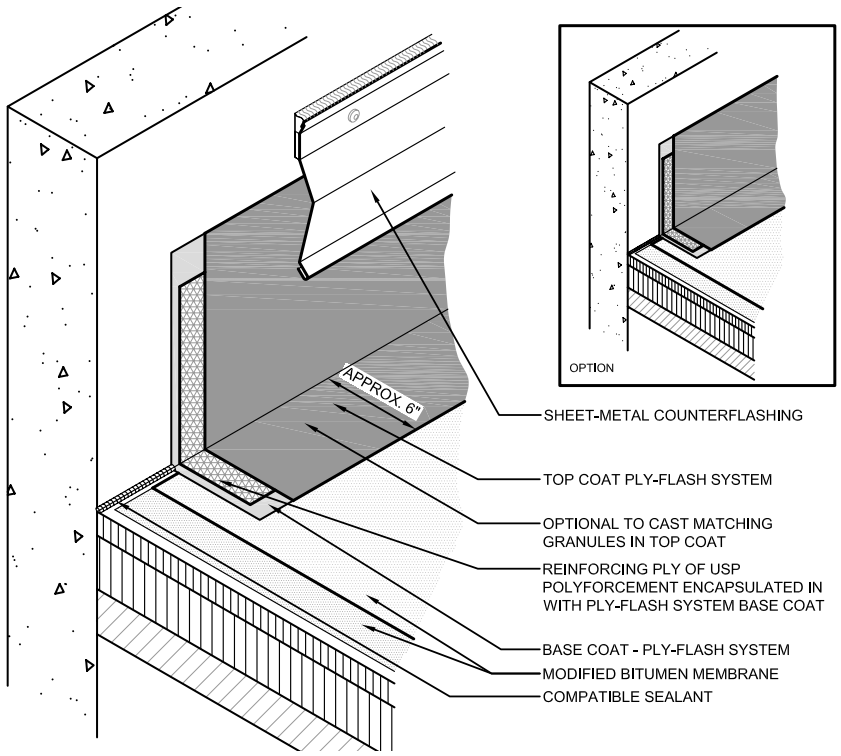
PF-25 USP PLY-FLASH AT PERIMETER FLASHING DETAIL



NOTES:

1. MODIFIED MEMBRANE TURNED OVER EDGE BELOW BLOCKING OR A MINIMUM OF 1 ½" (38 MM), WHICHEVER IS GREATER.
2. 15 & 20 YEAR DETAIL: PLY-FLASH SYSTEM WITH USP POLYFORCEMENT SHALL BE APPLIED OVER METAL FLANGE.

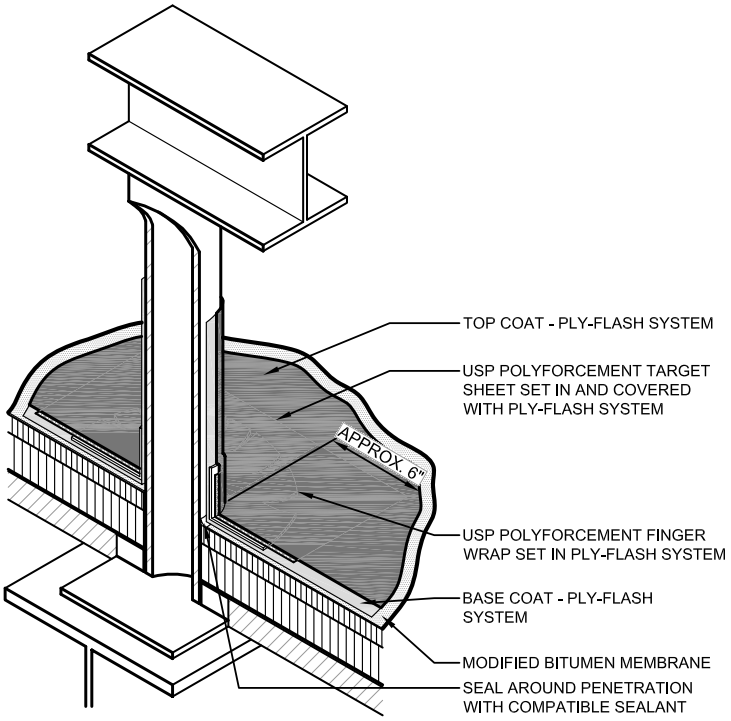
PF-26 USP PLY-FLASH OF BASE FLASHING AT CONCRETE WALL DETAIL



NOTES:

1. THIS DETAIL DOES NOT ALLOW FOR DIFFERENTIAL MOVEMENT BETWEEN THE DECK AND WALL.
2. DETAIL DEPICTS THE WEATHERPROOFING PROTECTION AND DOES NOT REPRESENT COUNTER FLASHING DESIGN.
3. FOR ROOF SYSTEMS WITH FACTORY-APPLIED GRANULE SURFACING, PROPERLY PREPARE CAP SHEET TO RECEIVE FLASHING.

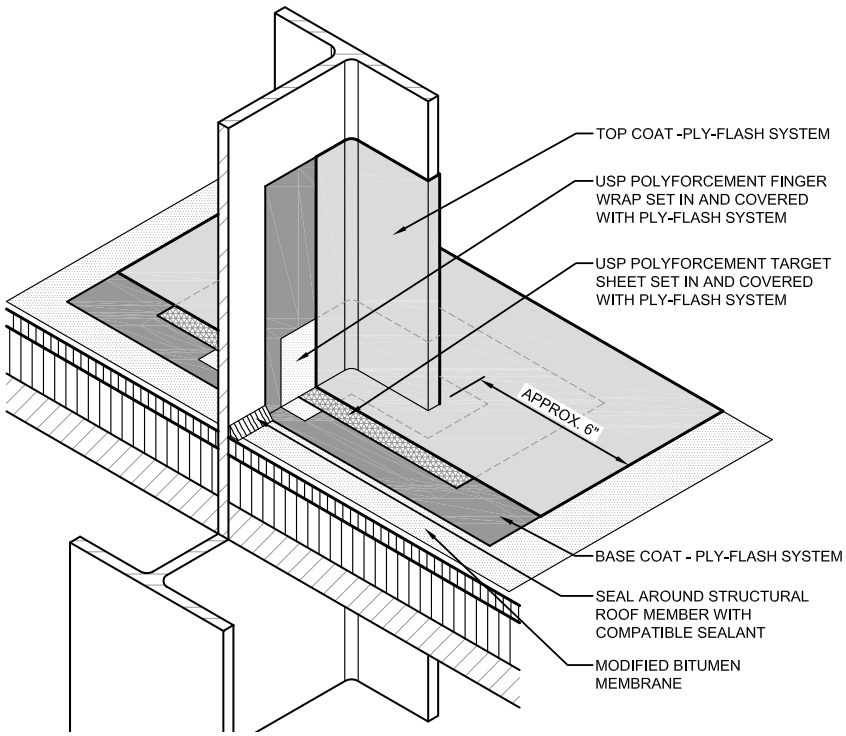
PF-27 USP PLY-FLASH AT EQUIPMENT SUPPORT STAND LEG



NOTES:

1. THIS DETAIL DOES NOT ALLOW FOR DIFFERENTIAL MOVEMENT BETWEEN DECK AND PENETRATION.
2. OPTIONAL CAST MATCHING GRANULES IN PLY-FLASH SYSTEM.

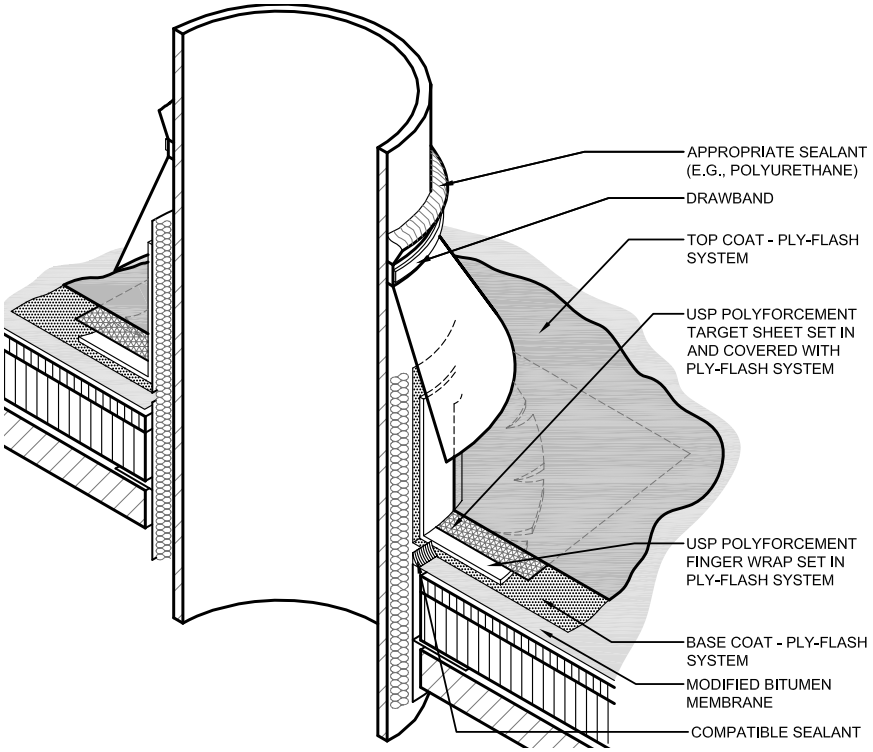
PF-28 USP PLY-FLASH AT STRUCTURAL ROOF MEMBER THROUGH ROOF DECK



NOTES:

1. OPTIONAL: CAST MATCHING GRANULES IN PLY-FLASH SYSTEM.
2. THIS DETAIL DOES NOT ALLOW FOR DIFFERENTIAL MOVEMENT BETWEEN DECK AND PENETRATION.

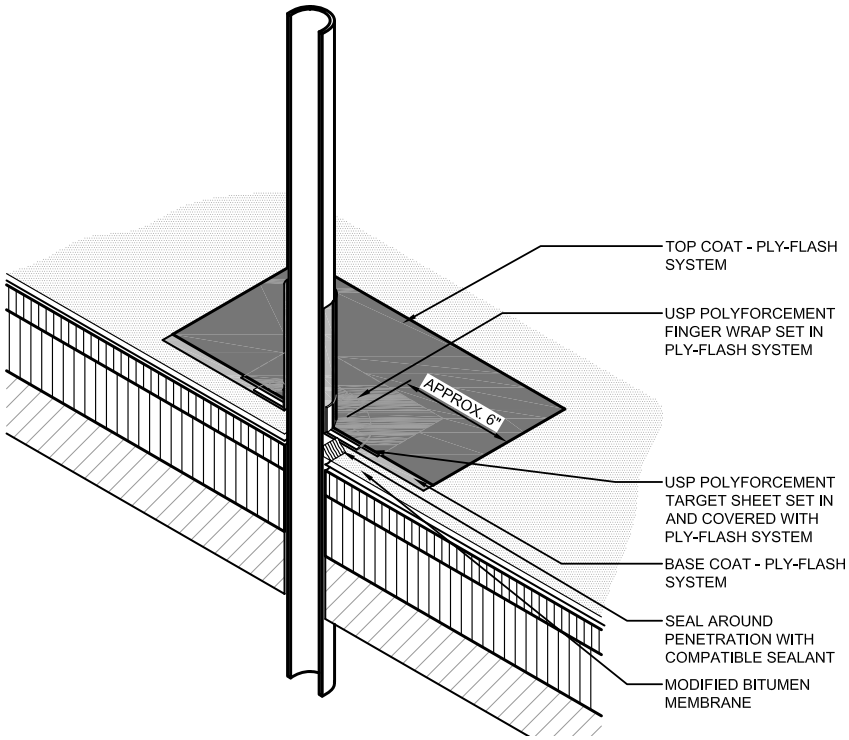
PF-29 USP PLY-FLASH AT SHEET METAL STACK VENT



NOTES:

1. OPTIONAL: CAST MATCHING GRANULES IN PLY-FLASH SYSTEM.
2. DETAIL DEPICTS THE WEATHERPROOFING PROTECTION AND DOES NOT REPRESENT THE STACK OR COUNTER FLASHING DESIGN.

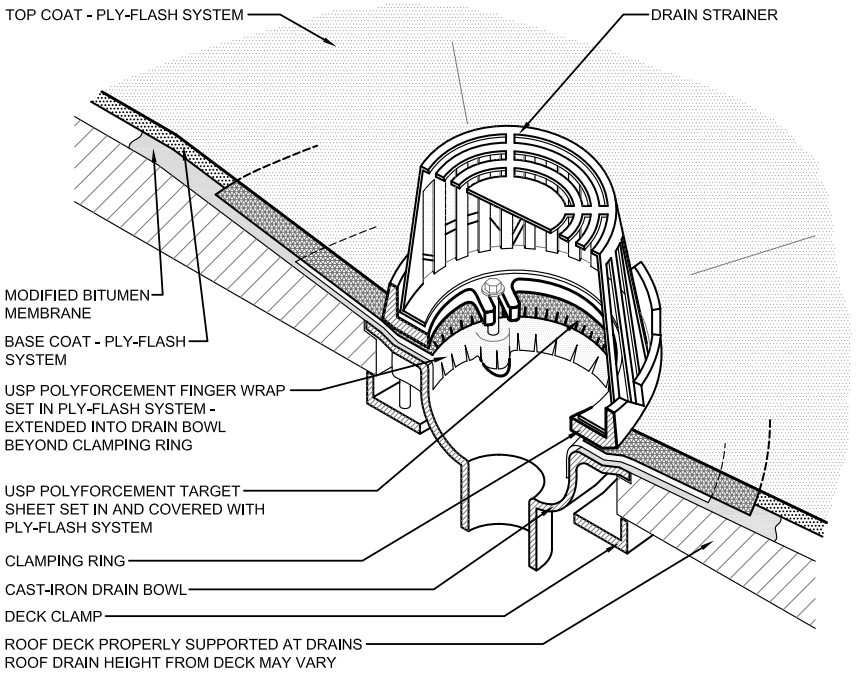
PF-30 USP PLY-FLASH AT SINGLE PIPE PENETRATION



NOTES:

1. OPTIONAL CAST MATCHING GRANULES IN PLY-FLASH SYSTEM.
2. THIS DETAIL DOES NOT ALLOW FOR DIFFERENTIAL MOVEMENT BETWEEN THE DECK AND PENETRATION.

PF-31 USP PLY-FLASH DRAIN DETAIL FLASHING



NOTES:

1. THE USE OF A METAL DECK SUMP PAN IS NOT RECOMMENDED. HOWEVER, DRAIN RECEIVER/BEARING PLATES ARE APPLICABLE WITH SOME PROJECTS.
2. THE DESIGNER SHOULD CONSIDER INSULATING THE DRAIN COMPONENTS BELOW THE DECK TO PREVENT POTENTIAL CONDENSATION.
3. OPTIONAL CAST MATCHING GRANULES IN PLY-FLASH SYSTEM.

HELPFUL DEFINITIONS

Anchor Sheet: A mechanically fastened sheet over the deck primarily used when insulation is to be applied without adhering to the deck.

Aggregate: (1) Crushed stone, crushed slag or water worn gravel used for surfacing a built-up roof; (2) any granular mineral material.

Asphalt: A substance left as a residue after evaporating or otherwise processing crude oil or petroleum. Asphalt can be refined to conform to various roofing grade specifications:

- **Dead-Level Asphalt:** A roofing asphalt conforming to the requirements of ASTM D 312, Type I. This asphalt is not approved for use with U.S. Ply roofing systems.
- **Flat Asphalt:** A roofing asphalt conforming to the requirements of ASTM D 312, Type II. This asphalt is not approved for use with U.S. Ply roofing systems.
- **Steep Asphalt:** A roofing asphalt conforming to the requirements of ASTM D 312, Type III. This asphalt is for use with certain mop applied materials up to ¾" per foot in slope (½" per foot for SBS materials).
- **Special Steep Asphalt:** A roofing asphalt conforming to the requirements of ASTM D 312, Type IV. This asphalt is for use with mop applied materials up to 3" per foot in slope. In certain climates it can be used in built-up roofs which do not exceed 6" per foot in slope.

Atactic Polypropylene: Also known as APP. A group of high molecular weight polymers formed by the polymerization of propylene used to modify asphalt for increased flexibility and excellent weathering ability.

Backnailing: The practice of blind nailing roofi ng felts to a substrate in addition to hot-mopping to prevent slippage.

Base Flashing: The portion of the membrane flashing attached to or resting on the roof which extends up the cant area and wall. Directs the flow of water onto the roof covering.

Base Sheet: The first layer of membrane applied over the substrate in a multi-layer roofing system.

Bitumen: (1) A class of amorphous, black or dark colored (solid, semi-solid or viscous) cementitious substances, natural or manufactured, composed principally of high molecular weight hydrocarbons, soluable in carbon disulfide, and found in asphalts, tars, pitches and asphaltites; (2) Generic term used to denote any material composed principally of bitumen.

Brooming: Embedding a ply of roofing material by using a broom to smooth out the ply and ensure contact with the adhesive under the ply.

Built-Up Roofing Membrane: A continuous, semi-flexible roof membrane assembly, consisting of plies of saturated felts, coated felts, fabrics or mats between which alternate layers of bitumen are applied, generally surfaced with mineral aggregate, bituminous materials, or a granule-surfaced roofing sheet. Abbreviation: BUR.

Cant Strip: A beveled strip used under flashing to modify the angle at the point where the roofing or waterproofing membrane meets any vertical element.

Cap Sheet: Surface sheet in built-up roofing systems. The surface sheet used in a multi-layer modified bitumen roofing system.

Coping: The covering piece on top of a wall exposed to the weather, usually sloped to shed water.

Counterflashing: Formed metal or elastomeric sheeting secured on or into a wall, curb, pipe, rooftop unit or other surface, to cover and protect the upper edge of a base flashing and its associated fasteners.

Cricket: A peaked saddle construction of either deck material or tapered roof insulation at an exterior wall or between roof drains designed to direct the flow of water to specific drainage outlets.

Deck: The structural material installed over the support framing members to which the roof system is to be applied.

Drain: A device that allows for the flow of water from a roof area.

DuraFlex®: The U.S. Ply trademark name for SBS modified bitumen product line. DuraFlex® SBS is mop or cold adhesive applied. DuraFlex® TG is torch applied.

DuraWeld®: The U.S. Ply trademark name for APP modified bitumen product line. DuraWeld® APP is torch applied.

Equiviscous Temperature (EVT): The temperature at which the viscosity is 75 centipoise for asphalt and 25 centipoise for coal-tar products; the recommended temperature plus or minus 25 F at the time of application.

Expansion Joint: A structural separation between two building elements that allows free movement between the elements without damage to the roofing or waterproofing system.

Flashing: The system used to seal membrane edges at walls, expansion joints, drains, gravel stops, and other places where the membrane is interrupted or terminated. Base flashing covers the edge of a membrane. Cap flashing or counterflashing shields the upper edges of the base flashing.

Flashing Cement: A trowelable mixture of cutback bitumen and mineral stabilizers, including inorganic fibers.

Flood Coat: The top layer of bitumen into which the aggregate is embedded on an aggregate-surfaced built-up roof.

Glaze Coat: (1) The top layer of asphalt in a smooth surface built-up roof assembly; (2) A thin protective coating of bitumen applied to the lower plies or top ply of a built-up roof membrane when application of additional felts or the flood coat and aggregate surface are delayed.

Gravel: Course, granular aggregate, with pieces larger than sand grains, resulting from the natural erosion of rock.

Mechanical Fasteners: Special screws and plates used to secure roof insulation to a deck.

Metal Flashing: (See Flashing) Metal flashing is frequently used as through-wall flashing, cap flashing, counterflashing or gravel stops.

Mineral Granules: Opaque, natural, or synthetically colored aggregate commonly used to surface cap sheets, granule-surfaced sheets, and roofing shingles.

Modified Bitumen: Are composite sheets consisting of a copolymer modified bitumen often reinforced and sometimes surfaced with various types of films, foils and mats. (1) APP Modified Bitumen sheets are modified with Atactic-Polypropylene. (2) SBS Modified Bitumen sheets are modified with Styrene-Butadiene-Styrene.

Mop-and-Flop: An application procedure in which roofi ng elements (insulation boards, felt plies, cap sheets, etc.) are initially placed upside down adjacent to their ultimate locations, are coated with adhesive and are then turned over and applied to the substrate.

Mopping: The application of hot bitumen with a mop or mechanical applicator to the substrate or to the felts of a built-up roof membrane.

Solid Mopping: A continuous mopping of a surface, leaving no unmopped areas.

Spot Mopping: A mopping pattern in which heated bitumen is applied in roughly circular areas, leaving a grid of unmopped, perpendicular bands on the roof.

Square: A unit of roof area covering 100 square feet or 10' x 10'.

Strip Mopping: A mopping pattern in which hot bitumen is applied in parallel bands. Strip mopping is not acceptable to U.S. Ply.

Parapet Wall: That part of any wall entirely above the roof.

Pitch Pocket: A flange, open bottomed, metal container placed around columns or other roof penetrations that is filled with hot bitumen or flashing cement to seal the joint.

Positive Drainage: The drainage condition in which consideration has been made for all loading deflections of the deck, and additional roof slope has been provided to ensure drainage of the roof area within 48 hours of rainfall.

Re-covering: The process of covering an existing roofing system with a new roofing system.

Reglet: A groove in a wall or other surface adjoining a roof surface for use in the attachment of counterflashing.

Re-roofing: The process of re-covering or replacing an existing roof system. (See Re-covering and Replacement)

Ridging: An upward, tenting displacement of a roof membrane frequently occurring over insulation joints, deck joints and base sheet edges.

Roof Insulation: A rigid board material of various thicknesses from ½" to 4", usually applied with some form of mechanical fasteners or adhesive. When more than one layer is applied, the second layer will be applied with either hot asphalt or cold adhesive.

Roof System: A system of interacting roof components (not including the roof deck) designed to weather proof and, normally, to insulate a building's top surface.

SafeWeld®: The U.S. Ply trademark name for APP modified bitumen that is cold adhesive applied with heat-welded seams.

Sealant: A mixture of polymers, fillers and pigments used to fill and seal joints where moderate movement is expected; it cures to a resilient solid.

Smooth-Surfaced Roof: A built-up roof membrane surfaced with a layer of hot-mopped asphalt, cold applied asphalt clay emulsion, cold applied, asphalt cutback, or sometimes with an unmopped inorganic felt.

Softening Point: The temperature at which bitumen becomes soft enough to flow, as determined by an arbitrary, closely defined method.

Spudding: The process of removing roofing aggregate and most of the bituminous top coating by scraping and chipping.

Styrene-Butadiene-Styrene: Also known as SBS. A rubber like elastomer used to modify asphalt to increase elasticity and flexibility at low temperatures. Exhibits good fatigue resistance.

Substrate: The surface upon which the roofing or waterproofing membrane is applied (i.e., the structural deck or insulation).

Sump: An intentional depression around a drain.

Tapered Edge Strip: A tapered insulation strip used to (1) Elevate the roof at the perimeter and at curbs that extend through a roof; (2) Provide a gradual transition from one layer of insulation to another.

Through-Wall Flashing: A water-resistant membrane or material assembly extending through a wall and its cavities, positioned to direct water entering the top of the wall to the exterior.

USP®: The trademark of U.S. Ply, Inc.

Vapor Retarder: A material designed to restrict the passage pf water vapor through a roof or wall.

Vent: An opening or device used to permit air or vapors to exit an enclosed structure.

NOTES

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