



Malarkey
Roofing Products®

SPEC MANUAL

B.U.R., MODIFIED & SHINGLE
ROOFING SYSTEMS

Chapter 2A

Low Slope Roofing
Installation Instructions

2A.1 STORAGE & HANDLING

The following is a list of Malarkey's basic requirements for handling and storing roof insulations, roofing products, and construction materials.

Unload, handle, and store all roofing products and construction materials with care.

Store roll roofing and materials on pallets, keeping them off the ground or roof deck.

Check all materials delivered to the work site for damage. If any material is damaged, contact your roofing products distributor to resolve the issue. All damaged material must be removed and replaced. Malarkey will assume no liability for damaged material once it has been released from Malarkey's manufacturing or warehouse facilities.

Protect roofing materials and construction products from weather before, during, and after delivery.

Store roll goods on end in a cool, dry, well-ventilated area until applied. Use breathable tarpaulin or covers to allow venting and protection from the weather. At the end of each working day, ensure unused materials are protected as described above.

Lightweight insulation products must be stored and properly weighted-down to avoid wind-related damage.

Protect roll goods, adhesives, and coatings from freezing.

When storing materials, ensure the container and/or area are designed for that purpose and will not endanger any of the occupants or contents of the building being roofed.

Materials stored on the roofing surface shall be dispersed to avoid concentrated loading. Set larger concentrations over major structural members.

Materials should be stored at temperatures above 50°F (10°C) for a minimum of 24 hours prior to installation. When temperatures exceed 80°F (27°C), leave self-adhering materials rolled-up and stored out of direct sunlight until immediately prior to installation. Unrolling and allowing the material to heat up may result in extreme difficulty removing the release film.

2A.2 SAFETY

Malarkey recommends all applicable safety standards and good roofing practices be followed.

Roofing and construction personnel are responsible for their own safety on the work site, as well as for those around them.

Roofers should always wear and maintain their *personal protection equipment* (PPE) when handling or installing components of the roofing system.

Keep the roofing and staging areas clean.

Roofing personnel must be properly trained to operate and install roofing systems safely and effectively.

Roofing and construction materials should be stored and protected in a manner that does not endanger any personnel, personal property, building occupants or contents of the building being roofed.

Always keep first-aid kits, emergency telephone numbers, escape routes, and area maps to emergency facilities in a place easily located and accessible.

Train all personnel on preventing and safely extinguishing fires.

Train all personnel in first aid procedures.

Never allow contact between the heated surface of roofing membranes, adhesives, and flame equipment to your skin, hair, or clothing.

Have the correct type and number of fire extinguishers near the area being roofed and the area where the roofing kettle or tanker is located. Properly store and handle flammable materials.

Only use flammable materials in safe, well-ventilated areas.

Regularly service and maintain all roofing equipment.

2A.3 INSULATION

Malarkey recommends research be done to determine the types and advantages of the many insulation products available when considering incorporating insulation into your Malarkey roofing system.

Installation can vary greatly depending on deck type, wind uplift requirements, roof slope, and performance.

Should you have any questions whether the insulation you are considering will work with and meet Malarkey's minimum standards, contact our Technical Services Department.

2A.3.1 POLYISOCYANURATE

Polyisocyanurate (polyiso) is a rigid foam insulation board that consists of closed cell, blown pentane derivatives with a facer.

Polyiso is the most commonly used insulation in roofing systems because of its great thermal resistance, lightweight nature, and ability to be installed with conventional roofing practices.

Polyiso can be manufactured in various thicknesses and made to provide roof slope.

Malarkey requires a cover board or layer of Malarkey ESHAvent™ ventilating base sheet (SKU: 1000) be installed over the polyiso before the application of Malarkey roofing membranes. Specific brands of polyiso are included in the Malarkey Total System Warranty.

Contact Malarkey's Technical Services Department for details.

2A.3.2 EXPANDED POLYSTYRENE (EPS)

EPS is a closed cell, rigid plastic insulation made from petroleum derived from crude oil and formed into a variety of sizes and thicknesses.

EPS can be manufactured as fill insulation or to provide slope for roof decks.

Malarkey requires a cover board be installed over EPS before application of Malarkey roofing membranes. Contact Malarkey's Technical Services Department for details.

2A.3.3 PERLITE

Perlite is an expanded volcanic ore, blended with selected binders and fibers, and formed into a homogeneous board.

Perlite can be manufactured in various thicknesses and used as fill insulation, a tapered insulated system, cant strip or tapered edge strips, or as cover board.

2A.3.4 WOOD FIBER

Wood fiber insulation/cover or re-cover boards consist of wood pulp, sugar cane, and water blended with a binder that are formed into a solid sheet/board.

The boards can be coated with asphalt slurry on one or all six sides to reduce blisters and eliminate the need for priming in some roof systems. Specific brands of wood fiber cover boards are included in the Malarkey Total System Warranty. Contact Malarkey Technical Services or your sales rep for details.

2A.3.5 GYPSUM ROOF BOARDS

Gypsum roof boards are manufactured with a gypsum slurry, fire retardant chemicals, water, and have various facers.

Contact Malarkey for approval when using gypsum roof boards as a re-cover or roofing substrate.

2A.3.6 RIGID INSULATION WITH FACTORY-LAMINATED NAILABLE SUBSTRATE

The following information is intended for use on steep slope commercial applications when enhanced fastening is required. This is an alternative to the installation of an insulated, steep slope commercial application that uses pressure treated wood nailers and/or insulation stops for back-nailing of roofing piles and the cap sheet.

For residential shingle application over rigid insulation with a nailable substrate, refer to the installation

instructions in this manual's **Steep Slope** section, subsection *RIGID INSULATION AND VENTING*.

Above-roof-deck, rigid insulation with a factory-laminated, nailable substrate can be used under Malarkey roofing systems, but the use and installation of this product must be in strict compliance with the manufacturer's requirements and recommendations.

Malarkey recommends a thermal barrier (a low permeance underlayment, vapor retarder/barrier, or gypsum roof utility board) be installed directly to the roof deck, staggered and secured, prior to installation of rigid roof insulation with a factory-laminated nailable substrate. A barrier of this type has been shown effective in reducing thermal transfer between the joints/gaps in the decking that cause "picture framing" of the rigid insulation.

Contact Malarkey if you have any questions regarding above-roof-deck insulation with a factory-laminated, nailable substrate.

Malarkey will accept no responsibility for damage to the decking, building, or contents of the building when above-roof-deck insulation is used.

2A.4 INSULATION ATTACHMENT REQUIREMENTS FOR SPECIFIC DECK TYPES

Note: See Malarkey's requirements for the following deck types in the **General Requirements** section of this manual.

2A.4.1 STRUCTURAL CONCRETE DECKS

Structural concrete decks are to be primed with asphalt-based primer and the insulation set in a uniform mopping of asphalt at a nominal rate of 30 lbs. (13.6 kg) per square.

Other options for attachment are concrete fasteners with insulation plates or roof insulation adhesive.

2A.4.2 PRE-CAST CONCRETE DECKS

Pre-cast concrete decks are to be primed with asphalt-based primer and the insulation set in a uniform mopping of asphalt at a nominal rate of 30 lbs. (13.6 kg) per square.

Other options for attachment are concrete fasteners with insulation plates or roof insulation adhesive.

2A.4.3 WOOD DECKS

Wood decks require the use, number, and pattern of approved screw fasteners for securing roof insulation.

Alternate attachments may be used only after submission and approval by Malarkey's Technical Services Department prior to job start.

2A.4.4 POURED GYPSUM DECKS

Poured gypsum decks require a layer of Malarkey Paragon® MOD Base (SKU: 501) SBS base sheet, mechanically attached with approved fasteners, over the entire roof deck surface. Roof insulation, if specified, is installed on the base sheet using a uniform mopping of asphalt at a nominal rate of 30 lbs. (13.6 kg) per square.

2A.4.5 LIGHTWEIGHT CONCRETE DECKS

Lightweight concrete decks require either a layer of 501 SBS base sheet or an inverted Malarkey Pano™ Cap (SKU: 502) cap sheet, mechanically attached with approved lightweight concrete fasteners, over the entire roof deck surface. Roof insulation, if specified, is installed on the base sheet using a uniform mopping of asphalt at a nominal rate of 30 lbs. (13.6 kg) per square.

2A.4.6 STEEL DECKS

Steel decks require the use of approved screw fasteners and plates that are secured through the roof insulation to the steel deck. Fastener attachment shall penetrate the top of the decking flutes, and extend a minimum of 3/4" (19 mm) from the bottom side of the steel decking.

Alternate attachments may be used only after submission and approval by Malarkey Technical Services before job start.

2A.4.7 STRUCTURAL WOOD FIBER DECKS

Structural wood fiber decks require a layer of SBS base sheet, mechanically attached with approved fasteners, over the entire roof deck surface. Roof insulation, if specified, is installed on the base sheet using a uniform mopping of asphalt at a nominal rate of 30 lbs. (13.6 kg) per square.

2A.5 INSULATION FASTENING PATTERNS

Board size, thickness, and type determine the number of fasteners, insulation plates, and spacing. Always use screws and 3" diameter (76 mm) plates when fastening boards.

The following patterns are Malarkey's standard attachment patterns for 4' x 8' (1.2 m x 2.4 m) rigid insulation boards. (See Figures 1 and 2)

When the roof system is required to meet a specified wind uplift, contact Malarkey Technical Services. Patterns shown are for warranties only.

2A.5.1 MECHANICAL ATTACHMENT

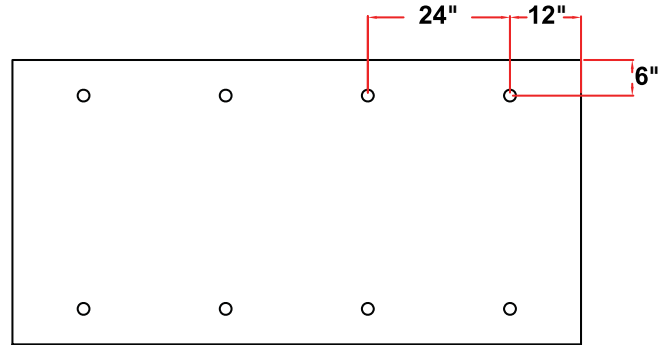


Figure 1 - One Fastener per 4 Square Feet (Rigid Insulation Thickness of 1.1" and Greater)

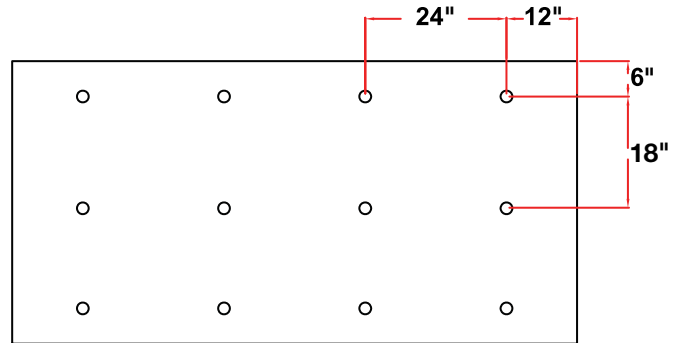


Figure 2 - One Fastener per 2.66 Square Feet (Rigid Insulation Thickness up to 1")

2A.5.2 STAGGERING OF 4' X 8' INSULATION BOARD

Start at the lowest part of an approved deck with a first course of full-size roof insulation boards (maximum size, 4' x 8'). Employ approved plates and screw fasteners per the fastening pattern specified.

Continue to install full-size boards of roof insulation along the lowest part of the deck.

Start the second course with a half-size, 4' x 4' (1.2 m x 1.2 m) piece of roof insulation, and install approved plates and screw fastenings per the fastening pattern specified. This pattern is designed to stagger insulation joints and prevent issues that can develop from a non-staggered, insulated roof system.

Continue the second course by installing full-size boards of 4' x 8' insulation using approved plates and screw fasteners per the fastening pattern specified.

Repeat in this fashion until the deck is covered.

2A.5.3 ASPHALT ATTACHMENT OF A SINGLE LAYER OF ROOF INSULATION

Note: Malarkey recommends any insulation (other than cover or re-cover boards) installed with asphalt be limited to 4' x 4'. Contact Malarkey for details.

Start at the lowest part of the roof by mopping asphalt directly to the approved, primed deck (see general requirements for approved deck types and conditions prior to installing roof installation) at a rate of 30 lbs. (13.6 kg) per square, and install a first course of roof insulation boards (preferably 4' x 4') across the deck.

Set the insulation into a fresh mopping of asphalt, and carefully walk over the surface of the insulation to promote contact between the insulation and asphalt.

Do not kick or damage the insulation at any time during the roofing process.

Start the second course of insulation by installing a *half-size* piece (2' x 4' for 4' x 4' boards, 4' x 4' for 4' x 8' boards) into a fresh mopping of asphalt, at the nominal rate of 30 lbs. (13.6 kg) per square, directly to the approved, primed deck. Starting with a half-size board is designed to stagger insulation joints and prevent issues that can develop from a non-staggered, insulated roof system.

Continue the second course across the deck by installing *full-size* boards of insulation into fresh moppings of hot asphalt.

Carefully walk the surface of the insulation to promote contact with the asphalt.

Do not kick or damage the insulation at any time during the roofing process.

Continue adding courses in this fashion until the deck is covered.

2A.5.4 ADHESIVE ATTACHMENT

Refer to adhesive manufacturer's installation requirements.

2A.5.5 ADDITIONAL INSULATION REQUIREMENTS

Install only as much insulation as can be completed (insulation, base, and inter-ply) that workday.

When possible, Malarkey recommends divorcing the insulation screws and plates from the roofing system.

Gaps along the joints of the insulation are to be less than ¼" (6 mm). All gaps in excess of ¼" (6 mm) are to be filled with the same insulation being installed.

Offset all side and end joints of the insulation layers a minimum of 12" (305 mm).

Insulation should be set in position and walked on to ensure contact between the bottom of the insulation and the asphalt or adhesive used to attach the insulation to the deck surface.

Kicking the insulation into position is not acceptable and can result in damage that will affect the layout and surface of the insulated roof deck.

Malarkey recommends the size of insulation boards attached with asphalt be a maximum of 4' x 4'. Cover boards are the exception and may be installed in 4' x 8' sections.

All polyiso and EPS insulation is to receive a cover board (perlite; asphalt coated, single sided, wood fiber board; or gypsum board). Type, thickness, and attachment method will be determined by the architect, specifier, or roofing professional per the insulation manufacturer's installation requirements.

Malarkey recommends polyiso be installed in a single layer, maximum thickness, 2" (51 mm).

Mechanical attachment of insulation will be secured as recommended by the insulation manufacturer. If that information is unavailable, refer to Malarkey's standard insulation attachment patterns.

Metal insulation plates are to be used when fastening a base sheet over insulation when torch-down (APP) membranes are to follow. No plastic plates should be used.

Malarkey will not accept any overlay of spray polyurethane foam (SPF) roofs. A complete tear-off and removal of the SPF roof to the deck must occur before attaching insulation for a Malarkey roof system.

2A.6 MEMBRANE INSTALLATION

2A.6.1 GENERAL RULES

Before installing any heavy duty base or cap sheet, the membranes must be cut to desired lengths and allowed to relax prior to installation.

Additional time and methods may be needed to fully allow the membranes to relax when installing in colder temperatures. Contact Malarkey Technical Services for recommendations.

Malarkey's Pano™ Ply 4 (SKU: 500) and Pano™ Ply 6 (SKU: 506) ply sheets do not require relaxing prior to installation.

Care must be used when staging, positioning, and installing any membrane.

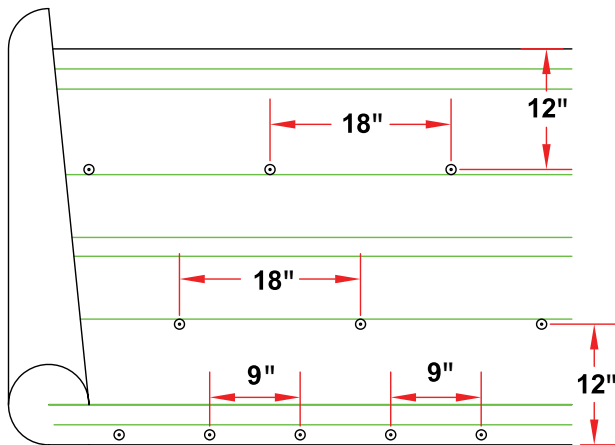
All base sheets should be positioned and kept taut while mechanically attaching.

2A.7 BASE SHEET FASTENING PATTERN

2A.7.1 BASE SHEET FASTENING: HAND NAILING WITH 1" (25 MM) DIAMETER METAL CAP NAILS

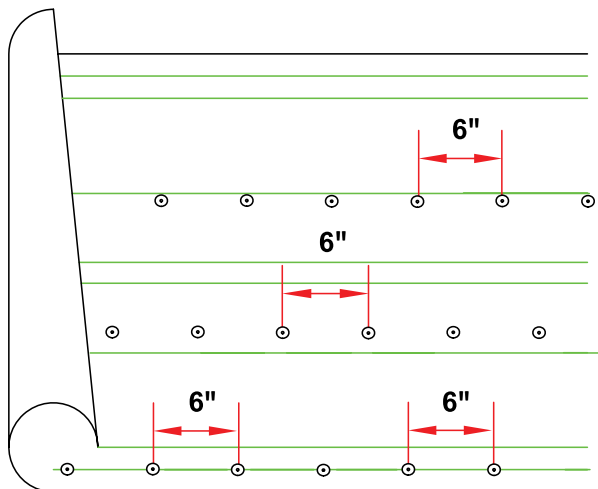
Install one (1) ply of specified base sheet so the flow of water is over or parallel to, but never against the laps. Lap 2" (51 mm) on sides, 6" (152 mm) on the ends, and turn up to the top of the cant.

MEETS DESIGN WIND PRESSURE -30 PSF



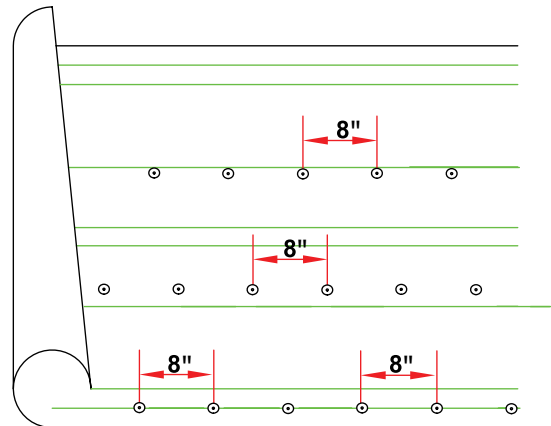
9" o.c. at 2" wide laps and 18" o.c., staggered in two rows 12" from each edge.

MEETS DESIGN WIND PRESSURE -75 PSF



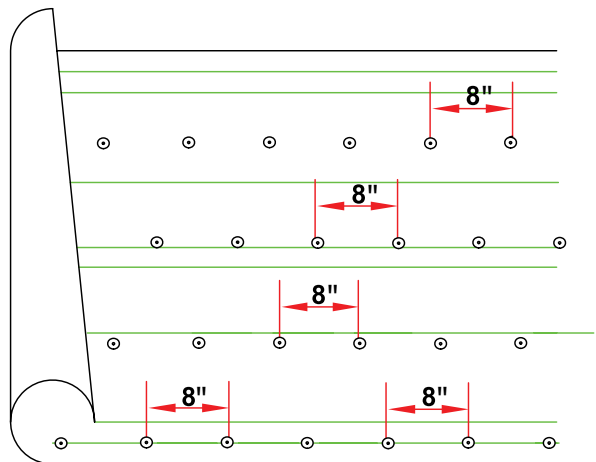
6" o.c. at 2" wide laps and 6" o.c. at two equally spaced, staggered center rows over a 7/16" OSB deck at 24" spans.

MEETS DESIGN WIND PRESSURE -75 PSF



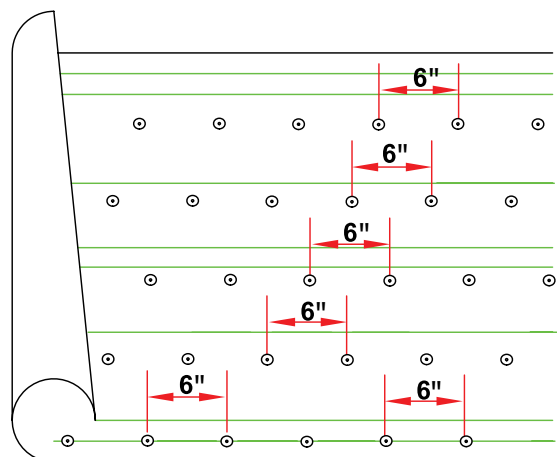
8" o.c. at 2" wide laps and 8" o.c. at two equally spaced, staggered center rows over a 1 1/2" plywood deck at 24" spans.

MEETS DESIGN WIND PRESSURE -90 PSF



8" o.c. at 2" wide laps and 8" o.c. at three equally spaced, staggered center rows over a 1 1/2" plywood deck at 24" spans.

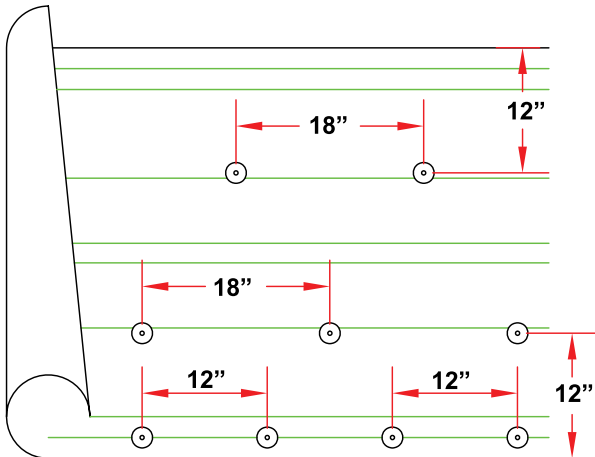
MEETS DESIGN WIND PRESSURE -105 PSF



6" o.c. at 2" wide laps and 6" o.c. at four equally spaced, staggered center rows over a 7/16" OSB deck at 24" spans.

2A.7.2 BASE SHEET FASTENING PATTERN USING PLATES & SCREWS

Install one (1) ply of specified base sheet so the flow of water is over parallel to, but never against the laps. Lap 2" (51 mm) on sides, 6" (152 mm) on the ends, and turn up to the top of the cant.



12" o.c. at 4" wide laps and 18" o.c. staggered at two center rows 12" from each edge.

2A.7.3 BASE SHEET ATTACHMENT USING TAPE AND STAPLES

Install one (1) ply of specified base sheet so the flow of water is over or parallel to, but never against the laps.

Lap 2" (51 mm) on sides, 6" (152 mm) on the ends, and turn up to the top of the cant.

Install a row of tape and staples at all side laps at 9" (229 mm) centers, and install two (2) rows of tape and staples at 12" (305 mm) centers along a line 12" (305 mm) from each edge. Enhanced fastening would be 9" (229 mm) on center for all rows.

2A.7.4 BASE SHEET ATTACHMENT USING HOT ASPHALT AND COLD ADHESIVE

Always stand above or on the up-slope deck side of the installation when installing membranes to prevent asphalt or adhesive displacement.

Avoid foot and machine traffic over any newly-laid membranes to reduce asphalt or adhesive displacement, a condition that may affect the overall adhesion and performance of the membranes and could result in voids within the roofing system.

Install a uniform mopping of asphalt at a nominal rate of 25 lbs. (11.3 kg) per square or cold adhesive at the nominal rate of 1.5 to 2 gallons (5.7 to 7.6 liters) per square directly to the insulation cover board, and install one (1) ply of specified base sheet so the flow of water is over or parallel to, but never against the

laps. For cold adhesive attachment of base sheets to cover board, Malarkey recommends using asphalt impregnated wood fiberboard.

Install the membrane without wrinkles, buckles, voids, and fishmouths in direct membrane to membrane contact or direct lap to lap contact.

Cut and patch any wrinkles, buckles, voids, fishmouths, membrane to membrane, or lap to lap with a like amount and type of membrane a minimum of 6" (152 mm) beyond all sides of the affected area set in hot asphalt or cold adhesive.

Lap 2" (51 mm) on sides, 6" (152 mm) on the ends, and turn up to the top of the cant, achieving an asphalt or cold adhesive bleed-out of the seams at a minimum ¼" (6 mm) to a maximum of 1" (25 mm).

When hot mopping, only mop 8' (2.4 m) ahead of the set roll to prevent the asphalt from cooling.

When using cold adhesive, set all base, inter-plies, or cap into the wet adhesive.

Broom all plies to ensure a good bond between the asphalt or cold adhesive and bottom of the membrane.

2A.7.5 THERMALLY-ADHERED BASE SHEETS

Malarkey ESHAvent® (SKU: 1000) is a thermally adhered, bituminous waterproofing and ventilating base sheet membrane. The top surface is coated with a weathering grade of SBS bitumen and surfaced with fine mineral sand. The underside is covered with a perforated aluminum foil sheet protected by release film, allowing the adhesive SBS undercoating to "spot weld" to the deck or insulation. The "weld" is enhanced to its permanent bonded state upon application of a torch or hot asphalt applied system.

Concrete decks require the installation of asphalt primer prior to the application of ESHAvent® base sheet.

All vertical surfaces require the installation of asphalt primer prior to the application of ESHAvent® when used as a part of the base flashing assembly.

Position ESHAvent® over approved roof deck or insulation so the flow of water is over or parallel to, but never against the laps.

With the roll of ESHAvent® at a lower corner of roof, reach underneath and carefully peel back the release film, exposing the adhesive. Apply heavy hand pressure to adhere the starting end to the deck, and continue unrolling the membrane across the roof while simultaneously pulling up (and removing) the release film.

Wait to remove the release film covering the selvage edge until the second course is ready to be applied. Once peeled away, press the overlapping base sheet into the selvage edge adhesive.

Continue to install ESHAvent™ over the remaining roof deck or insulation.

Apply a uniform layer of *asphalt roof cement* (conforming to ASTM D4586) a minimum of 3" (76 mm) wide under each end lap of ESHAvent™ and press the overlapping end into the adhesive.

Install ESHAvent™ to the top of the cant at vertical wall surfaces before installing the field inter-ply, surfacing, or base flashing membranes.

2A.7.6 INTER-PLY HOT/COLD ADHESIVE ATTACHMENT

When using cold adhesive, only base sheets are to be used: DO NOT USE CONVENTIONAL PLY SHEETS.

Always stand above or on the up-slope side of the installation when installing membranes to prevent asphalt or adhesive displacement.

Avoid foot and machine traffic over any newly-laid membranes to reduce asphalt or adhesive displacement, a condition that may affect the overall adhesion and performance of the membranes and could result in voids within the roofing system.

Install all inter-plys so the flow of water is over or parallel to, but never against the laps in a uniform mopping of hot asphalt at a rate of 25 lbs. (11.3 kg) per square or 1.5 to 2 gallons (5.7 to 7.6 liters) per square of cold method adhesive.

Install the membrane without wrinkles, buckles, voids, fishmouths, direct membrane to membrane contact, or direct lap to lap contact.

Cut and patch any wrinkles, buckles, voids, fishmouths, membrane to membrane, or lap to lap with a like amount and type of membrane a minimum of 6" (152 mm) beyond all sides of the affected area set in hot asphalt or cold adhesive.

Only install adhesive per the manufacturer's specifications.

Asphalt or cold adhesive bleed out of the seams shall be a minimum of ¼" (6 mm) to a maximum of 1" (25 mm).

When hand-mopping, only mop ahead of the set roll 8' (2.4 m) to prevent the asphalt from cooling.

When using cold adhesive, set all base, plies, and cap sheets into the wet adhesive.

Broom all plies to ensure a good bond between the asphalt or cold adhesive and bottom of the membrane.

2A.7.7 INTER-PLY TORCH INSTALLATION

Torch-weld inter-ply sheets so the flow of water is over or parallel to, but never against the laps. Unroll

first roll completely and set in position. Re-roll the membrane a minimum of 6' or no more than 16" (½ of total length), making sure the sheet remains correctly aligned.

Install the membrane without wrinkles, buckles, voids, and fishmouths.

Cut and patch any wrinkles with a like amount and type of membrane a minimum of 6" (152 mm) beyond all sides of the affected area.

A propane torch flame is applied to the exposed surface of the membrane's underside in an even and steady motion until the membrane reaches an application temperature of 350°F– 400°F (177°C–204°C).

An indicator of proper application temperature is the complete melting of the burn-off film and a slight compound flow that's present at the bottom of the rolled membrane.

Apply the flame in a steady, L-shaped motion as the membrane is slowly unrolled across the deck. Start at the head lap side of the roll and work toward the side lap side, then away from the applicator on the side lap side from 8" to 18" (203–457 mm). With the "L" completed, reverse the motion, and work back up to the head lap. Split the flame 75% to 25% between the rolled membrane and base/inter-ply.

A minimum compound flow-out of ¼" (6 mm) to a maximum of 1" (25 mm) of bitumen should be visible from all sides and end laps of the membrane. This is an indication of a fully-adhered membrane.

Laps that do not have a minimum ¼" (6 mm) compound flow-out may be lifted, reheated, and sealed.

If the reheated membrane does not achieve minimum compound flow-out, strip off with a 10" wide (254 mm) layer of membrane, centered over the suspect seam, and torch into place.

2A.7.8 CAP SHEET TORCH INSTALLATION

Torch-weld the specified cap sheet over the base sheet/inter-ply sheets so the flow of water is over or parallel to, but never against the laps.

Unroll first roll completely and set in position. Re-roll the membrane a minimum of 6' (1.8 m) and no more than 16' (½ the total roll length; 4.9 m), making sure it remains correctly aligned.

Install the membrane without wrinkles, buckles, voids, and fishmouths.

Cut and patch any wrinkles with the like amount and type of membrane a minimum of 6" (152 mm) beyond all sides of the affected area.

A propane torch flame is then applied to the exposed outer surface of the membrane's underside in an

even and steady motion until the membrane reaches the application temperature of 350 to 400 degrees (177°C–204°C). An indicator of proper application temperature is the complete melting of the burn-off film and a slight compound flow that's present at the bottom of the rolled membrane.

Apply the flame in a steady, L-shaped motion as the membrane is slowly unrolled across the deck. Start at the head lap side of the roll and work toward the side lap side, then away from the applicator on the side lap side from 8" to 18" (203–457 mm). When complete, reverse the motion. The flame should be split between the rolled membrane and the base/inter-ply (75% rolled membrane, 25% base/inter-ply).

A minimum compound flow-out of ¼" (6 mm) to a maximum 1" (25 mm) of bitumen should be visible from all side and end laps of the membrane. This is an indication of thermally-sealed membrane.

When installing Malarkey ESHAlum™ cap sheet (SKU: 1020) *torch-applied*, immediately use a damp sponge or mop to cool the metal film after the membrane has been torched in place. Roll any delaminating metal facing with a silicone roller into the heated membrane immediately after the membrane has been torched, then use a damp sponge or mop to cool.

All laps that do not have a minimum ¼" (6 mm) compound flow-out may be lifted, reheated, and sealed.

If the reheated membrane does not achieve minimum compound flow-out, strip off with a 10" wide (254 mm) layer of membrane, centered over the suspect seam, and torch into place.

Cap sheet laps should not be located on top of either inter-ply or base sheet laps.

2A.7.9 CAP SHEET HOT/COLD ADHESIVE ATTACHMENT

Install the specified cap sheet so water flow is over or parallel to, but never against the laps.

Cut cap in lengths ⅓ to ½ the total length of the roll for hot asphalt or to the longest workable length for cold adhesive; allow membrane to relax.

Position the cap sheet for installation and embed in a uniform mopping of hot asphalt at a rate of 25 lbs. (11.3 kg) per square. For cold adhesive, position the cap sheet and apply cold adhesive to the base sheet/inter-ply sheet only, then embed the cap sheet into the wet adhesive.

Install the membrane without wrinkles, buckles, voids, and fishmouths.

When installing ESHAlum™ *mop-applied*, immediately use a damp sponge or mop to cool the metal film after the membrane has been hot-mopped in place. Roll any delaminating metal facing with a silicone roller

into the heated membrane immediately after the membrane has been mopped in place, then use a damp sponge or mop to cool.

Cut and patch any wrinkles with a like amount and type of membrane to a minimum of 6" (152 mm) beyond all sides of the affected area.

Broom or roll all of the cap membrane to ensure contact between it and the hot/cold adhesive.

2A.8 LOW SLOPE MEMBRANE INSTALLATION WITH SLOPES 1" (25 MM) OR GREATER

Commercial roof systems over decks with slope of 1" (25 mm) or greater require *strapped installation*. Strapped installations run *parallel* to roof slope.

Non-insulated, nailable roof decks require no additional nailers to attach components of the roof systems (edge metal, straight metal flanges, etc.). These components can be flashed as shown in the Malarkey commercial details sections of this specification manual.

Insulated roof decks require mechanically-attached wood nailers, the same thickness as the roof insulation and cover board, be installed to the roof deck, perimeter of the roof deck, and around penetrations (i.e., sheet metal, non-lead flashings), rooftop equipment, and projections (unless the roofer obtained a variance approved by Malarkey prior to job start). Wood nailers or insulation stops are to be a minimum width of 3½" (89 mm).

Wood nailers and/or insulation stops shall be placed in the field of the roof, perpendicular to the roof slope at the spacing intervals indicated in the **General Requirements** section of this manual, Figure 1.

Install cover boards up to ¾" (19 mm) in thickness directly over the insulation. Wood nailers/insulation stops should match the thickness of the insulation and cover boards.

Install the inter-ply over the cover board and secure the leading edge with 1" (25 mm) metal cap fasteners no more than 1½" (38 mm) from the outside edge of the sheet at all wood nailers and/or insulation stops. The fastener must penetrate the wood nailer ¾" (19 mm) minimum.

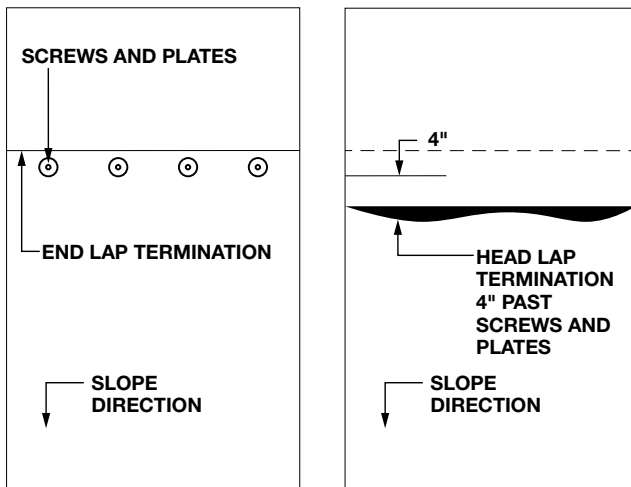
Install all overlapping inter-ply as described above.

Note: Cover inter-ply fasteners with the amount of inter-ply specified (i.e., two-ply inter-ply, if installed correctly, will have two (2) plies over each nailhead). Cap sheet installation does not require a staggered end lap pattern and can be run in a common end lap configuration as indicated in the **General Requirements** section of this manual, Figure 2.

When securing a strapped, mineral-surfaced cap sheet membrane without nailers/insulation stops, use

insulation screws and plates. Fasten the *end lap* with four (4) screws and plates in a straight line and evenly spaced. The overlapping, mineral-surfaced cap sheet *head lap* shall cover all screws and plates and terminate a minimum of 4" (102 mm) past the fasteners. (See *Figure 1*)

FIGURE 1



2A.9 PHASING

Phasing is when sections of roof are partially completed and left exposed for a period of time before continuing or surfacing.

Whenever practical, phasing of your roof system should be avoided.

Phasing can occur during the installation of the base, ply, cap, or surfacing.

Problems such as blistering, delaminating, physical abuse, other trade damage, and water intrusion can result from phased roofing.

Incomplete sections of exposed base or ply sheets can also accumulate dirt or contamination on its surface which can affect the bond between the adhesive and the rest of the built-up roofing membranes.

Any areas that are damaged due to phased roofing must be repaired in a manner acceptable to Malarkey before continuing the roof installation.

Malarkey recommends roofing contractors complete the surfacing of any roof system as soon as possible after plies have been installed. This will limit the exposure of plies to the weather.

2A.10 COLD WEATHER INSTALLATIONS

(See *General Requirements* / Cold Weather Precautions section.)

2A.11 ROOF ADHESIVES APPLICATION INSTRUCTIONS

2A.11.1 PARAGON® LOW ODOR ADHESIVE PARAGON® LOW ODOR ADHESIVE FLASHING GRADE

PRODUCT DESCRIPTION

Malarkey's *Paragon® Low Odor* line of mod-bit adhesives are one-part, solvent-free/low odor, moisture cure, polyether/asphalt adhesives. *Cold process* adhesives, they are used to fully adhere ASTM D6162/D6163/D6164 SBS-modified bitumen membranes (do not use with conventional multi-ply systems).

Paragon® Low Odor adhesives are designed to cure in a variety of temperature and humidity conditions. Solvent-free and low odor, they are safe for occupied buildings such as schools, hospitals, and food processing plants where hot asphalt kettles and strong vapors are not tolerated. They contain very low VOCs, are OSHA-compliant, and eliminate chronic exposure hazards common to solvent-based adhesives.

Paragon® Low Odor Adhesive (SKU: 737) comes in 5-gal. buckets and Paragon® Low Odor Adhesive Flashing Grade (SKU: 738) in 3.5-gal. pails.

STORAGE PRECAUTIONS

High temperatures and humidity will reduce shelf life. Store original, unopened containers in a cool, dry area, and protect from water, heat, and direct sunlight. Products will not freeze. Products are best when used within six (6) months of manufacture. Should a "skin coat" develop on the surface of the adhesive, completely remove and discard the skin prior to use.

HANDLING PRECAUTIONS

Paragon® Low Odor adhesives are ready to use, right from the pail. Do not thin.

Paragon® Low Odor adhesives are heat sensitive, so ambient conditions are a factor. Weather conditions should be dry and clear, with a temperature at least 40°F (4°C) and rising. Minimum desired material temperature at the point of application is 70°F (21°C), so store adhesives (and membrane rolls) in a warm, dry area prior to application. If necessary to avoid wrinkling, membrane rolls may be unrolled, cut into shorter lengths, and laid out to relax before application.

High humidity and high temperatures will speed the cure and shorten tack-free time; low humidity and cold temperatures will slow the cure and lengthen tack-free time. Do not use when temperatures will drop below freezing within 12 hours of installation.

Pay close attention to the adhesive's tack-free time, typically 10 to 20 minutes. The embedment of membrane rolls with Paragon® Low Odor adhesives must take place before the adhesive's tack-free time has

been reached. Otherwise, membranes will not adhere properly.

Remove any skin coat of adhesive that may be present in pails; do not attempt to use skinned or thickened adhesive. Cover pails when not in use.

APPLICATION INSTRUCTIONS

Paragon® Low Odor Adhesive

Mechanically fasten a base sheet to the roof sheathing or install insulation/cover board. Do not adhere roofing membranes directly to the sheathing.

Apply adhesive only to clean, dry substrates free of surface contaminants. Use a straight blade or ¼-inch (6 mm) notched, neoprene squeegee at the rate of approximately 2.0 to 2.5 gallons per square or 100 square feet. Spread evenly along the path of the roll, and ensure there are no voids. The width of the adhesive should be slightly wider than the width of a roll, and a small, even bead of bleed-out should be obvious at side laps once a roll has been laid.

Roll or “fly-in” the SBS membrane into the still-wet and uncured adhesive. Use a weighted roller after application to ensure full contact and eliminate air pockets between the membrane and substrate.

At side and end laps, apply additional adhesive (roughly double the membrane amount) to the entire length and width of the lap, and press the overlapping membrane down over it. Roll to promote complete adhesion.

As with any cold-applied system, it is best to refrain from excessive traffic on the membranes until the system has cured.

Paragon® Low Odor Adhesive *Flashing Grade*

Flashing Grade adhesive is easy to trowel and used primarily for vertical wall and curb base flashings but can also seal side laps, end laps, and fishmouths on SBS modified bitumen roofing systems.

Spread with a flat blade or ¼-inch (6 mm) notched hand trowel at an application rate of approximately 2.0 to 2.5 gallons per square. Rough or absorbent surfaces may require additional adhesive.

Apply adhesive to both the flashing ply and substrate before placing the flashing ply. Press the SBS membrane immediately into the uncured adhesive, and apply heavy hand pressure. Roll to ensure full contact.

FINAL NOTE

These instructions are meant to act as a general guide. If you have questions about this installation or any Malarkey roofing product, please contact our Technical Services Department weekdays at (800) 545-1191 or (503) 283-1191, 7:00 am to 5:00 pm, Pacific Time. You can also email us at technicalinquiries@malarkeyroofing.com. Thank you.