

SPECIFICATIONS

The Dibiten Specifications Manual has been prepared to serve as a guide for architects, specifiers, roofing contractors and others involved in the roof system selection and application process. This manual is intended only as a guide and the recommendations represent Dibiten's best judgement based on years of experience in the manufacture of modified bitumen roofing material. Dibiten does not claim to be expert with regard to roof system components or elements not manufactured by Dibiten.

In all roofing or waterproofing situations, local code requirements, standard good roofing practices such as those established by the National Roofing Contractors Association, and the requirements and specifications of the manufacturers of other elements of the roof system must be followed.

For information not contained in this manual, or questions regarding system selection, application, or general assistance, please call the Dibiten technical office at (800) 922-5922 (U.S. & Canada) or at www.jm.com/roofing.

Specification & Application Manual

Modified Bitumen Roofing Membranes

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1.1 GENERAL INFORMATION

Technical Assistance:

We encourage the user of this manual to contact our toll free number with any questions concerning product application or specification. The toll free number is: (800) 922-5922 (U.S. and Canada). In some cases technical assistance can be offered in the field, schedules permitting. Inquire about this service through the toll free number listed above.

Suitable Applications:

The *Application Considerations* Section 2.1 of this manual must be referenced for information concerning application guidelines for Dibiten Poly/4, Dibiten Poly/5 and Dibiten Poly/4.5 Granular modified bitumen membrane. Particular attention must be paid to the differences in the application requirements between smooth and granulated products; particularly, the flashing detail guidelines.

In all cases, Dibiten Poly/4 smooth surfaced membrane or Dibiflash (pre-cut Dibiten Poly/4 flashing membrane) must be used for all flashing details.

For ultimate roof life and performance Dibiten recommends consideration of its two ply systems. Specifications and details for the two ply systems, which carry Dibiten's 20 year term warranty, can be found in the *Specifications* Section 6.1 of this manual.

Acceptable Decks & Surfaces:

Roof deck and roof system selection are the responsibility of the architect, engineer and owner. The selection of the proper specifications for a particular substrate, the need for and suitability of vapor retarders, insulations, and other aspects of the deck and roof assembly, rest with the designer.

All roof decks must be applied in accordance with the deck manufacturer's specifications.

Decks must not pond water.

All roof decks must be smooth, free of moisture, free of dirt, properly attached, properly constructed, and designed for anticipated loads with minimum deflection.

No electrical conduit, bolts, or other similar equipment shall be placed on the surface of the roof deck; such surface irregularities cannot be properly insulated and roofed.

The deck manufacturer and the applicator are responsible for determining that the deck is suitable for receiving the Dibiten roof system.

1.2 GENERAL DECK REQUIREMENTS

Nailable Decks:

Whether or not insulation is specified, a base sheet, fastened in accordance with the manufacturer, U.L. 580 and F.M. 1-90 requirements, is required over all wood decks.

■ **Wood Decks.** Wood plank decks should be a minimum of 1" in thickness and of the tongue and groove type. Decks must be designed for anticipated loads with minimum deflection. Cracks or knotholes larger than 1/2" diameter must be covered with sheet metal if they are not covered with roof insulation. All butt joints or end joints of roof boards must be made on rafters. Wood plank decks must be smooth and free of moisture before installation of the roofing system commences.

■ **Plywood Decks.** Plywood used in deck construction must meet the current requirements of the American Plywood Association. The minimum thickness must be 1/2" on rafters not exceeding 24" on center. Plywood decks, as all deck types, must be free of moisture or dirt before roof work commences. All joints should be blocked with wood framing. Ply clips are not acceptable.

■ **Poured Gypsum Decks.** Poured gypsum decks must be constructed in accordance with the deck manufacturer's specifications and in accordance with practices recommended by the Gypsum Roof Deck Association. Form boards that allow the deck to dry from below must be used. The minimum thickness must be no less than 2" and wire mesh reinforcement is required. A base ply must be secured to the deck using fasteners approved by the Gypsum Roof Deck Association.

■ **Lightweight Insulating Concrete Decks.** A lightweight deck is acceptable to receive Dibiten roofing products only under the following conditions:

Proper venting which allows the deck to dry from below must be used. Topside venting is also required at the rate of one roof relief vent per every 1000 square feet of roof area.

The minimum thickness of the deck must be no less than 2". The minimum compressive strength of the deck must be in accordance with the lightweight insulating concrete deck manufacturer's specifications.

A venting type base sheet is required as an overlay over all lightweight insulating concrete decks. It must be installed with fasteners approved for use with this deck.

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The deck must be completely dry.

NOTE: Dibiten will not be responsible for leaks resulting from splits in the roof membrane which are caused by cracking of the gypsum or light-weight insulating concrete deck, regardless of the causes of the deck cracking.

Non-Nailable Deck Types:

- **Steel Decks.** Steel deck must be 22 gauge at a minimum and have a shop coat of priming paint. Galvanized steel is recommended.

Steel deck units should be welded or, preferably mechanically fastened to the structural frame with a minimum of weld holes. Side laps should be fastened with sheet metal screws on not over 3'-0" centers.

- **Structural Concrete Decks.** Concrete decks require priming with a suitable primer at the rate recommended by the manufacturer. Concrete decks must be completely dry before priming and primer must be allowed to dry thoroughly before beginning application of the Dibiten membrane.

- **Precast or Prestressed Slabs.** Precast or prestressed slabs must be smooth, firm, thoroughly dry, and free from dust or the effects of freezing. All slabs shall be anchored against uplift and lateral movement to the supporting framework. Bearing shall be even and full and units laid tight. Joints shall be grouted and struck smooth. Deformed slabs shall be metal banded and provision shall be made for nailing the roofing to treated wood nailing strips at all gables, ridges and eaves. Before receiving any Dibiten roof membrane, the deck must be primed keeping the primer back 4" from joints in the deck.

Dibiten will not be responsible for damage to the roof membrane which occurs due to moisture retention in the deck. All roof decks must be smooth, dry, clean, and properly designed. Responsibility for roof design rests with the architect, engineer and owner. All decks must be applied in accordance with the deck manufacturer's specifications.

1.3 DECK PREPARATION

Roof Drainage:

All decks must have positive drainage incorporating interior drains and/or gutters. The Asphalt Roofing Manufacturer's Association recommends a minimum slope of 1/4" per foot. Interior drains should be recessed below the level of the finished Dibiten roof membrane to allow positive drainage of all water. Roof drains shall be

in sufficient number and size to permit satisfactory and rapid drainage of the roof surface. Condensation of air conditioning or other process liquids should not be allowed to discharge directly onto the roof membrane.

Expansion Joints:

- Expansion joints should be designed into structures to prevent roofing membrane from being damaged by stress caused by expansion and contraction of structural components. The responsibility for placement of the expansion joints rests with the designer or architect. In general, expansion joints should be provided under the following conditions:

Every 200 to 300 lineal feet of roof deck.

Where steel framing, structural steel, or decking change direction.

Where separate wings of "U", "L", "T" or other configurations exist.

Where the deck type changes, such as where a steel deck and a precast concrete deck abut.

Throughout the roofing system wherever control, expansion, or contraction joints are provided in the structural steel, deck material, or deck system.

Whenever "additions" are connected to existing buildings.

At junctions of exposed canopies, overhangs or loading docks to accommodate movement caused by varying ambient temperatures.

Wherever re-entry corners occur.

To be effective, expansion joints must be continuous along the break in the structure. They must not be terminated short of the edge of the roof deck. Insulation or roofing membrane should never bridge expansion joints. Construction "ties" must be removed for expansion joints to function properly. Expansion joints should be elevated at least 4" above the roof surface and should not be located in the valleys. Area dividers or control joints should not be substituted for or considered expansion joints.

Vapor Retarders

The architect or engineer is responsible for determining the need for providing a vapor retarder. The decision should consider the following:

- Climactic Conditions
- Building Use
- Deck Type

Note: Dibiten assumes no liability for the use of, or

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absence of, a vapor retarder in conjunction with its roofing systems.

Cant Strips:

Cant strips are not required in Dibiten roofing systems. However, if cant strips are specified they must be completely covered with an appropriate base sheet. (See also *Safety*, Section 5.1.)

Insulation:

Generally, use of insulation is not required in Dibiten specifications. The need for, and suitability of, insulation in a Dibiten roof system, must be determined by the architect, building owner, and roofing contractor. The following guidelines should be observed:

Most rigid board or panel type insulations which provide a firm surface are acceptable. All insulations are to be fastened in accordance with manufacturer, U.L. 580, F.M. 1-90 requirements. Dibiten recommends mechanical fastening of the insulation, where possible.

A fiber glass base sheet, 25 lbs. per 100 square feet, or heavier, is required over all insulations, except JM DuraBoard. If JM DuraBoard insulation is utilized by itself or as the top layer of a multilayer insulation system, Dibiten smooth or granulated products may be heat welded directly to the DuraBoard.

Insulation may be mechanically attached to metal, gypsum, cementitious wood fiber or structural concrete decks. Insulation may be adhered with an appropriate cold adhesive to structural concrete, cementitious wood fiber and pre-cast concrete decks.

A Dibiten roof system may not be installed over polystyrene roof insulation unless it is sandwiched between two layers of minimum 1/2" thick perlite. Joint taping is required in accordance with the insulation manufacturer's instructions.

Metal Work and Flashing:

The metal work incorporated in an approved Dibiten roof system, as with all components of the roof system not manufactured by Dibiten, is not covered under Dibiten guarantees. It is recommended that all metal work be installed in accordance with the practices outlined in the "*Architectural Sheet Metal Manual*" published by SMACNA, or the "*Roofing & Waterproofing Manual*" published by the National Roofing Contractors Association.

Metal base flashing shall not be used as part of the roof membrane flashing system.

All protrusions shall be at least 2' (two feet) from curbs, walls

and edges to provide adequate space for proper sealing.

All sheet metal and Dibiten flashing assemblies must be securely attached. Flashing should be adhered to walls, curbs, and nailers that are fastened to the deck or deck structural system. This minimizes shear and tensile uplift and thermal contraction forces which might rupture the roof system. Suitable wood nailers (when required) should be provided and anchored at all roof edges and openings to permit the roofing to be adhered with maximum resistance to wind uplift and thermal contraction forces.

New metal flashing such as metal edging must have the oil film removed before the application of the Dibiten membrane. Sandpaper must be used to roughen the surface of the metal and the metal can be slightly heated with the heat weld to remove oil residue. Minimum requirements: 26 gauge - 4" on roof deck. Priming with ASTM D41 asphalt primer is recommended.

Flashing and construction details are generally subjected to the worst possible conditions on the roof. Incorrect flashing and construction detail design may result in damage to the roof system and building interior and contents. Proper flashing and detail design are critical to the success of any roof system.

NOTE: Dibiten strictly prohibits the use of any asphalt based cement products with its membrane, except JM MBR Utility Cement.

1.4 MODIFICATIONS & DISCLAIMERS

Modifications:

Any changes in or variance of the roofing system specifications or application requirements as published by Dibiten must be approved in writing by Dibiten prior to application of the Dibiten products.

Disclaimers:

The selection of the correct roofing system requires the evaluation of many factors: roof incline, roof deck type and condition, climactic conditions, building use and maintenance traffic are among the considerations. Before selecting a particular roofing specification, all factors should be studied.

The information and specifications contained in this manual relating to the application of Dibiten roofing systems are based on years of experience in industrial roofing and waterproofing fields. The specifications and details are designed to meet actual situations and are provided to assist architects, specification writers, engineers and owners solely for guidance purposes. These

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guidelines should not be considered all-inclusive nor shall they be considered as a substitute for good roofing application practices.

Dibiten, as a manufacturer, is not involved in the design or construction of buildings or structures; therefore, technical specifications as shown within this booklet are intended to be used as general guidelines only.

The design, specifications and construction of buildings or structures are the responsibility of the owner or designer.

Dibiten does not in any way claim to be architects, engineers or designers, but only a manufacturer of roofing products. The company does not accept responsibility for the adequacy of building design on either new or existing structures, under any circumstances.

Similarly, Dibiten will not be responsible for the performance of its products when they are impaired or damaged in any way by design or construction faults, inclusions, omissions, acts of God, or any other cause not related to manufacturing defect.

Dibiten will not be responsible for damage to the roof membrane, which occurs due to moisture retention in the deck.

All roof decks must be smooth, dry, clean, and properly designed. Responsibility for roof design rests with the architect, engineer, and owner. All decks must be applied in accordance with the deck manufacturer's instructions.

2.1 APPLICATION CONSIDERATIONS

Weather Conditions:

Dibiten roof systems, like all roof systems, cannot be applied successfully if moisture conditions exist. Do not attempt application if ice, snow, or moisture are present on the surface to be roofed. This will prevent the possibility of trapping moisture in the roof system.

Dibiten roof systems, like all roof systems, cannot be applied successfully if moisture conditions exist. Do not attempt application if ice, snow, or moisture are present on the surface to be roofed. This will prevent the possibility of trapping moisture in the roof system.

Where very cold weather is a consideration, Dibiten membrane can be successfully installed at temperatures of approx. 40° F and rising. In cold weather conditions, the following should be observed:

Rolls should be kept in a heated area prior to installation.

Material Storage & Handling:

Care must be taken in the storage and handling of modified bitumen roofing membrane. Rolls must be stored upright, on pallets, and indoors above ground. Rolls must not be stored on their sides. The membrane must be pro-

tected from exposure to sunshine and moisture and, as stated above, must be stored in a heated area (above 40° F) before application in cold weather. Caution must be used in the handling and loading of the rolls to avoid damage to the membrane.

Job Inspection:

■ **Safety Inspection.** Dibiten modified bitumen roofing membranes are intended to be installed only by licensed, thoroughly qualified roofing contractors and their trained crews. These same professionals must be completely knowledgeable not only in all aspects of roofing, but specifically in the use and operation of roofing heat welding and propane equipment. It is the roofing contractor's sole responsibility to exercise extreme caution and proper safety in the use of heat welding equipment. Dibiten assumes no liability for failure of the roofing contractor or the contractor's personnel to properly or safely install a Dibiten roof system. Reference must be made to the *Safety Guidelines*, Section 5.1 of this manual.

Note: Along with the safe use of heat welding equipment, job inspection must be a part of the modified bitumen roof installation. In addition to the constant visual inspection during the application process, a responsible, knowledgeable crew person must be left on the job site for a minimum of one hour after cessation of heat welding (each day) to watch for smoke, flame or smoldering insulation. Safety inspection should include both the roof and attic.

■ **Application Inspection.** Laps and flashing details are the most critical areas of the roof installation. All laps in a Dibiten roof installation can and should be checked using a heated trowel as follows:

Preheat the trowel.

Use the hot trowel to check under the laps for any unbonded areas.

Slide the preheated trowel under the unbonded lap, lift the unbonded lap and re-heat weld. If the lap cannot be lifted enough to achieve a sufficient seal, apply a strip of Dibiten (minimum six inches in width) over the lap area.

On completion of the job, always inspect the work and confirm the following:

All flashing seamed tightly.

Stacks, vents and other protrusions properly and securely flashed. (Refer to Section 3.1, *Flashing Detail Instructions*, of this manual.)

Minimum of two plies at all flashings.

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2.2 APPLICATION REQUIREMENTS

Recommended Equipment:

The following equipment is recommended for the installation of Dibiten modified bitumen:

Rounded Nose Trowel (4" wide x 6" long)
Roofer's Hooked Blade Knife
Gloves
Propane (LP gas tank with regulator and gauge)
Fire Extinguisher (minimum 20 lb. ABC type)

Heat Welding kit including:

Medium Length Heat Weld (9") for detail work
Long Heat Weld (16") for field work
Electronic Starter
Steel Safety Stand
33' of Rubber Hose, U.L. listed
Regulator, U.L. listed

Follow the respective equipment manufacturer's instructions carefully regarding the proper and safe use, handling and storage of heat welding equipment.

Remember to:

Read the safety section of this manual. Check all fittings for leak bubbles with a liquid soap solution before each use.

Keep equipment clean.

The heat welding flame can be difficult to see in sunlight. Use extreme caution.

When heat welding, work with the heat welder a distance not less than 12" away from the middle of the Dibiten membrane. The hottest zone is normally in the center of the flame.

Methods of Application:

Dibiten modified bitumen membranes must be applied using the heat welding method with suitable roof heat welding equipment. **The use of hot asphalt, glues, solvents, or asphalt based cement products with Dibiten modified bitumen membranes, is strictly prohibited.**

■ **Fully Adhered.** The entire underside of the membrane is fully adhered to the underlying surface using the heat welding method of application.

■ **Roof Layout.** The surface that the Dibiten membrane is to be applied over must be in accordance with the manufacturer and industry standards. Any surface defect must be corrected before the membrane is installed.

The surface to be roofed must be clean, smooth, dry and completely clean of dust, debris, or foreign matter.

As in the proper installation of any built-up roofing system, application of Dibiten membrane must begin in the valleys or low point of the roof and work uphill to avoid backwater laps. On slopes at or above 2/12 pitch, material should be installed with the side laps running parallel to the direction of the roof slope to eliminate the possibility of slippage. No installation shall have laps that cause "bucking water."

On smaller roofs, end laps may be aligned or staggered. A 12" wide strip of Dibiten membrane must be applied over the end laps, if aligned. End laps must be aligned if roof dimensions exceed 100 lineal feet in any one direction.

Base Sheet Requirements:

A suitable base sheet, properly fastened in accordance with U.L. 580, F.M. 1-90 and manufacturer requirements is required over all combustible type decks and over all insulations or recovery boards, except JM DuraBoard. Cant strip should be installed to bridge gaps between the roof deck and parapet wall which exceed 1/4".

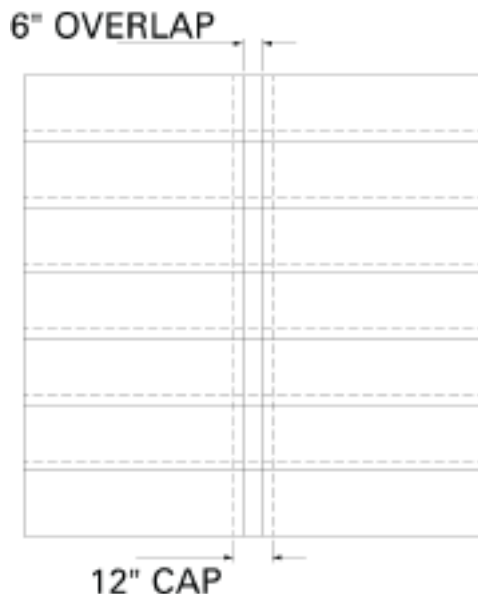
Stress Area Treatment:

Special treatment is required to assure that leaks do not occur in stress areas. A stress area is where movement may occur in the substrate. Stress areas can be found at control joints where a lower roof joins the wall of a higher building section, where additions to buildings occur, at places where the roof slope changes, or where a flat roof joins a steeper section. For example; in reroofing, the stress areas may be evident as splits, buckles, or blisters.

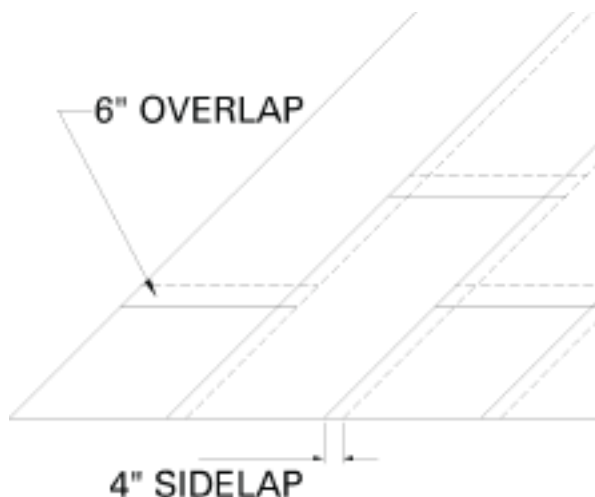
Stress areas need to be identified and treated prior to application of the Dibiten membrane. Once identified, treat the stress areas using a strip of Dibiten (usually 1/3 to 1/2 the width of a roll of membrane) applied over the stress area. The strip is left loose in the center, but sealed at the perimeters in a 3" to 4" width. At walls or curbs, the unheated center of the membrane strip is centered over the joint where deck and parapet meet (over the cant strip, if required) and strips of membrane no longer than 4' to 5' are used. When the main roof and parapet wall counterflashing are applied over this stress treatment, the area will be more able to withstand structural movement and still be secure.

Where the deck changes direction or where there is a change in the material used for the deck or the slope of the deck changes, a strip of Dibiten not less than 1/3 the roll width is used. Again, the edges are heat welded and sealed and the middle portion of the strip is left loose.

The main roof will be fully adhered over this but the stress strip will assist in accommodating structural movement.



Example 1. For roofs in excess of 100 lineal feet in any direction



Example 2. Staggering is acceptable for smaller roofs, less than 100 lineal feet in any direction

2.3 MEMBRANE APPLICATION

Dibiten Smooth Surfaced Poly 4 and Poly 5:

Dibiten recommends the following application procedures for its membrane:

Note: The application requirements are the same for both Dibiten Poly 4/ and Dibiten Poly 5/ smooth surfaced modified bitumen membrane.

1. Unroll the Dibiten membrane fully. Remove the product label tape. Note that the side covered with a very thin polyethylene film is the side of the membrane to be heat welded. The lightly talcked or sanded side faces up.
2. Position, unroll and align the roll.
3. Working from one end, reroll the roll halfway to the center.
4. Standing on the unrolled portion to prevent shifting, begin the heat welding procedure on the coiled portion of the roll.
5. Pass the heat weld flame across the roll slowly from side to side until the membrane develops an even sheen. As you heat weld, walk slowly forward, pushing the roll with your foot as you go, and adhering the heat welded portion to the underlying surface.
6. All the polyethylene must be completely burned away. Additionally, be sure to produce a 1/2" outward flow of melted bitumen at the overlapped seams. This flow, when properly troweled, is the key to a good seal and watertight integrity.
7. Having completed the installation of the first half of the roll, reroll the other half back to the center and pull back to a little beyond the point where the heat weld- procedure was begun. This will eliminate the possibility of voids. Repeat the heat welding procedure. As you install the second roll and all subsequent rolls, be sure to achieve the required 4" side laps and 6" end laps as the membrane is overlapped.
8. Once the second roll is fully installed, immediately use the heat weld flame and heated trowel to completely seal the side and end laps. To accommodate lap troweling, heat the seam area and trowel simultaneously. Use the preheated trowel to smooth the melted compound at the seam, working outward to eliminate the possibility of voids or trapped air. Use the flat part of the trowel across the full width of the lap to assure a complete seal.

Seam troweling is a requirement and will assure the longevity of the Dibiten roof installation.

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9. Check the length and width of all laps to verify that a complete seal has been achieved. Where there is doubt, check the seam with a warm trowel and reseal if necessary. Do not attempt to seal a loose lap by heating the top surface of the membrane only; lift the lap with the warm trowel and re-heat weld, then trowel as described above.

See Section 3.1, *Flashing Details for Dibiten Smooth Surfaced Membrane*, for more application details.

Dibiten Granular (Slate) Surfaced:

The heat welding application method for Dibiten Poly/4.5 Granular membrane is essentially the same as described above for smooth surfaced membrane. However, some very significant differences exist. Of important note are the following:

1. Care must be taken not to scorch granules during application.
2. Care must also be used not to track melted bitumen. It is advisable to walk beside the granular sheet rather than standing on it as you heat weld.
3. Smooth side laps are provided on the Dibiten Poly/4.5 Granular membrane. The laps are a very critical area of the roof and since you cannot trowel the laps when using Dibiten Poly/4.5 Granular membrane, you must be 100% certain of a complete bond through the heat welding procedure. Be certain to achieve a minimum 1/4" flow of melted bitumen from the overlapped seam and allow at least 1/4" extra lap width at the side laps so that the smooth side lap provided is completely sealed and still aesthetically neat. Loose slate granules are provided to dress the bitumen at the seam area while still warm.
4. End laps, like any area where you are overlapping membrane over granulated surface, require the following preparation in order to accomplish a water-tight seal:

Use the heat weld and trowel to scorch the granules of the membrane you are overlapping onto. Bring the bitumen to the surface and smooth the area with the warm trowel. This prepares the membrane to receive the overlap.

5. Do not overlap onto granular membrane without following the above procedure.

In a Dibiten Poly/4.5 Granular roof installation, this procedure will be needed at all end laps, certain flashing details, and anywhere membrane is overlapped onto the granular surface.

Flashing details are quite different for Dibiten Poly/4.5 Granular installations. All flashing details must be accomplished using smooth surfaced Dibiten membrane (Dibiten Poly/4), and these are generally performed

before the application of the granular membrane.

See *Flashing Details* for Dibiten Poly/4.5 Granular, Section 3.1 of this manual, for more information.

Ballast:

Ballast may be applied to a finished Dibiten membrane, but it is not recommended as it inhibits the normal ease with which the membrane is inspected and maintained. If ballast is used, it must be smooth, river bottom stone applied in cold, wet emulsion. Generally, a minimum of 400 lbs. of stone per 100 square feet of roof area is recommended.

Coating:

Dibiten recommends coating all non-granulated finished membranes. This is a requirement if the roof membrane is to be guaranteed. Use a solvent, acrylic or latex based coating compatible with modified bitumen systems. Application rates vary by manufacturer but should never be installed less than 1 gallon per 100 square feet. Coatings will enhance the life of the roof membrane but need to be maintained. Periodic recoating may be necessary. Recoating is the responsibility of the building owner.