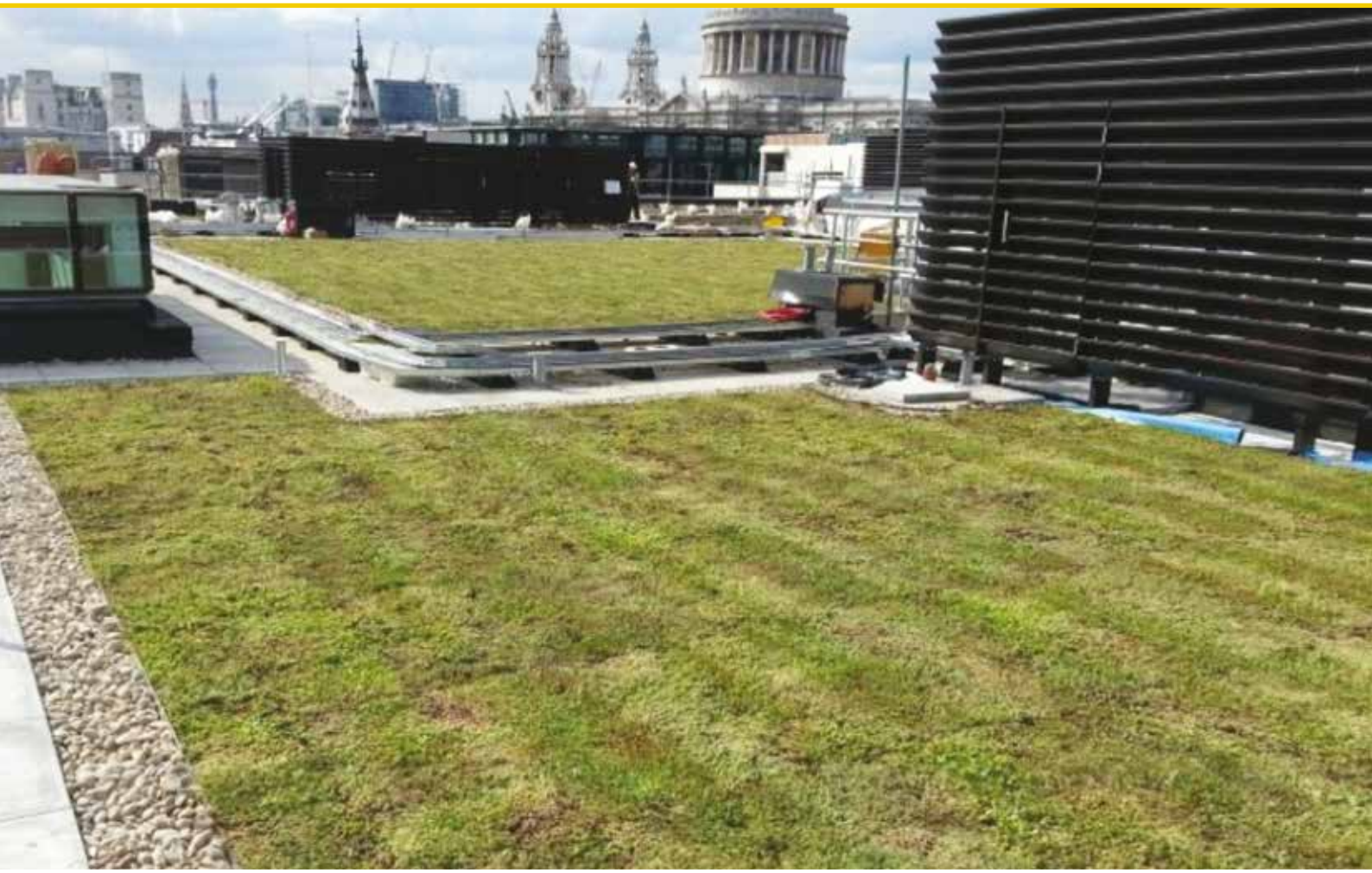
Proteus Waterproofing

PROTEUS – HOT MELT WATERPROOFING MANUAL



LRWA Liquid Roofing and Waterproofing Association

QMS ISO 9001 : 2015 REGISTERED

QMS ISO 14001 : 2015 REGISTERED

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1. PRODUCT RANGE AND SYSTEM COMPONENTS

Primers

Pro-Prime Bitumen is suitable for application to a variety of substrates, in order to seal and improve the adhesion of bituminous waterproofing treatments.

System

Pro-Compound HM is a tough and very flexible monolithic waterproofing membrane made from a special blend of bitumen, synthetic rubbers, polymers and other additives.

Pro-Force HM is an open weave glass fibre reinforcing mesh.

Pro-Felt HM is a polyester reinforced SBS-modified elastomeric bitumen membrane. Both the upper and lower surfaces are finished with silica sand to prevent sticking in the roll. It is used as a protection layer with all side and end laps sealed.

Protection Sheets

Pro-Felt Ultima Mineral Capsheet is torch-applied polyester reinforced SBS-modified elastomeric bitumen membrane. The upper surface is finished mineral granules, and the lower surface is finished with a thermofusible film which is removed by the gas torch during application.

Pro-Felt Ultima Mineral Capsheet is used as a protection sheet at details where the waterproofing is exposed to sunlight / UV radiation.

Pro-Felt Ultima Anti Root Capsheet is torch-applied polyester reinforced SBS-modified elastomeric bitumen membrane with root inhibiting additives. The upper surface is finished with green mineral granules, and the lower surface is finished with a thermofusible film which is removed by gas torch during application.

Pro-Felt Ultima Anti Root Capsheet is used as a protection sheet and root inhibitor beneath green roof system build-ups.

System Ancillaries

Pro-Expansion Joint Strip HM is an unreinforced elastomeric bitumen membrane used to bridge the expansion joint gap between adjacent waterproofing membranes.

Pro-Expansion Joint Cord HM is a flexible extruded cord made from synthetic rubber used as a joint filler/backer rod.

Delivery and storage

Pro-Compound HM is packed in a cardboard box with a silicon coating on the inside to allow easy removal of the bitumen compound. The storage time of the compound is unlimited.

Bitumen membranes

The membranes are delivered to site in rolls secured with paper wrapper bearing the product name, and batch stickers. The material when removed from the pallet must be stood on end on a flat level surface, under cover and away from exposure to the sun and away from heat sources. Mechanical damage must also be avoided.

Do not store where membranes are liable to come into contact with hydrocarbon solvents, such as petroleum spirit or diesel oil or other organic solvents.

Primers

Product must be stored under cover on a flat, level, and clean surface away from sources of direct heat, ignition, including pilot lights and sparks. Keep containers tightly closed when not in use.

2. TOOLS AND EQUIPMENT

This is a basic list of tools and equipment and their operation necessary to install a Proteus Hot Melt Waterproofing System. Depending on the project, other tools and equipment may be required. Additionally, these instructions are provided as recommended guidelines to follow to ensure proper performance of the equipment and successful installation of the membrane. Proteus does not endorse or recommend any particular brand of equipment.

Equipment

Thermostatically Controlled Bitumen Boiler

A bitumen pot boiler with thermostatic controls.

Buckets

A galvanised metal 'V' lipped bucket with handles to facilitate transport and pouring of the Pro-Compound HM.

Ladels

A long handle galvanised metal bitumen ladle for transferring / pouring the Pro-Compound HM.

Scraper

A metal scraper may be required.

Cutting Tools

Cutting tools, such as a fixed blade utility knife, eg Stanley Knife, with both straight and hook blades. Large scissors may also be required.

Personal Protective Equipment

Gloves, overalls, goggles, masks and other personal protective equipment (PPE) will be required.

3. SYSTEM APPLICATION

General

Working conditions

Do not apply membrane if temperature is less than 0 °F (-18 °C), or to a damp, frosty, snow covered or contaminated surface. Any surface dampness can seriously affect adhesion of the membrane. Residual excessive dampness within the substrate can result in blistering. After a period of rainfall, allow at least one full day of good drying conditions.

Pre-start / Pre-commencement

Waterproofing work should be carefully co-ordinated with other trades on-site. The applicator should have sole right of access to the specified areas for the time needed to complete the application.

Protect adjoining surfaces not to be waterproofed against damage or spoiling. Protect plants, vegetation and animals which might be affected by waterproofing operations.

Warn personnel against breathing of vapours and contact of material with skin or eyes. Wear applicable protective clothing and respiratory protection gear where applicable. Refer to relevant material safety datasheet.

Keep flammable products away from spark or flame. Do not allow the use of spark producing equipment during application until all vapours have dissipated. Post 'NO SMOKING' signs.

Maintain work area in a neat and orderly condition, removing empty containers, rags and rubbish daily from the site.

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Substrate preparation

Density of Concrete

The following are the types of concrete used in construction with their acceptability to receive the Proteus Hot Melt system:

- **In-situ concrete:** Structural concrete will have a density of 2,160 kg/m^3 to 2,500 kg/m^3 and will retain 3 to 5% moisture by volume when cured. Concrete with high moisture content requires a minimum curing period of 28 days to ensure adequate drying. Low density concrete (less than 1,850 kg/m^3) will create adhesion difficulties due to the friable / dusty nature of the surface.
- **Precast concrete:** This is generally an ideal substrate for the Proteus Hot Melt system.
- **Concrete block:** For vertical applications, concrete block is acceptable.
- **Lightweight structural concretes** are considered acceptable substrates when the density is between 1400 kg/m^3 and 1800 kg/m^3; retaining 5% to 20% moisture when cured.
- **Lightweight insulating concretes** are not acceptable substrates.

The concrete surfaces shall be of sound structural grade, and shall have a wood float or fine broom finish, free of fins, ridges, voids or entrained air holes. A steel trowelled finish or shiny surface is not acceptable. All knots and dust must be removed.

Laitance: Loose concrete towards the surface must be removed. Concrete shall be cured by water curing method. Pure sodium silicate curing compounds are acceptable.

Contamination: All contaminants must be properly cleaned before application of the Hot Melt system can commence.

Concrete shall be cured for a minimum 28 days.

Voids, rock pockets and excessively rough surfaces shall be repaired with approved non-shrink grout or ground to match the un-repaired areas.

Form Release Agents used to facilitate removal of formwork from cast concrete can be transferred to the face of the concrete once the formwork has been struck. Such agents can detrimentally affect the adhesion of the monolithic membrane. As a result all agents transferred to concrete must be removed prior to application of the membrane. Furthermore, accelerators within the concrete can migrate to the surface leaving a shiny surface. These should be removed.

Two-stage drains shall have a minimum 75mm flange and be installed with the flange flush and level with the concrete surface.

Installation

Bond Tests

Before the Proteus membrane is installed an adhesion test must be conducted to ascertain the suitability of the concrete surface. Bond tests are advised to the area to be coated that day prior to the main application.

To complete the bond test, apply a small amount of primer to the cleaned and prepared area and allow this to dry. Apply a small amount of the Pro-Compound HM membrane and allow it to cool. Make a triangular incision into the middle of the patch. If the membrane can be easily peeled away from the deck then the substrate is not ready. If it is not possible to peel back the membrane, the adhesion is considered satisfactory.

If the test patch is acceptable, protect the patch until the main area material is to be applied. The test material will react with the new material maintaining a monolithic membrane.

Priming

Prime all areas to receive the Pro-Compound HM using Pro-Prime Bitumen and allow this to dry. Apply a thin coat and avoid pooling. Allow to dry thoroughly before over coating.

The primer should be applied to the prepared concrete surface by brush or roller at an approximate coverage rate of 5m^2/L (coverage rate will vary subject to substrate porosity).

Drying time for the primed surface will be 1 to 3 hours dependent upon ambient conditions and substrate porosity.

Application: Field area

Application of the Hot Melt compound

Above the primed surface, unroll the Pro-Force HM, overlapping adjoining roll lengths by minimum 75mm.

Position the Pro-Felt HM above the unrolled reinforcing fabric by rolling out to the required length and rolling back on itself in readiness for application. Side laps should be a minimum 100mm and end laps should be 150mm. End laps of adjacent capsheets should be staggered to avoid excessive build-up of membranes.

Transfer the heated Pro-Compound HM from the thermostatically controlled bitumen boiler to the 'V' lipped buckets, taking care when doing so (appropriate PPE should be worn).

Pour the heated Pro-Compound HM through the Pro-Force HM at a coverage rate of 3kg/m^2. Immediately begin to unroll the positioned Pro-Felt HM capsheet into the Pro-Compound HM liquid, continuing to pour ahead of the unrolled membrane. Excess material may extrude at the edges. Ensure all areas are fully bonded and the reinforcing fabric is fully encapsulated.

** When installing beneath a green roof, the waterproofing system, inclusive of the Pro-Felt HM membrane, should be installed and completed. The Pro-Felt Ultima Anti Root Capsheet should be subsequently installed by torch application above the Pro-Felt HM membrane, taking care to only torch the underside of the anti-root membrane.

At the end of the working day, all areas should be completely sealed.

Application: Details area

Prime all surfaces at details to receive the waterproofing membrane.

Upstands / Angle Changes

Mechanically fix a 50 x 50mm timber angle fillet at the base of all upstands.

Pre-cut lengths of Pro-Felt HM to the appropriate size to accommodate the upstand detail. Dress Pro-Compound HM membrane up the upstand using a pouring ladle and subsequently dress the prepared sections of Pro-Felt HM into the Pro-Compound HM. Complete the upstand detail by fully bonding by torch application Pro-Felt Ultima Mineral Capsheet, ensuring a 5mm bead of bitumen extrudes at the edges. Dress down onto the field area membrane a minimum of 200mm, ensuring a thorough bond is achieved.

Once secured, dress Pro-Compound HM membrane up the upstand and subsequently fully bond by torch application Pro-Felt Ultima Mineral Capsheet, ensuring a 5mm bead of bitumen extrudes at the edges. Dress down onto the field area membrane a minimum of 200mm, ensuring a thorough bond is achieved.

Where terminating vertically, all upstands should be a minimum 150mm above the finished roof level and should be mechanically restrained beneath a termination bar and suitably pointed.

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Cover Flashings

Pre-cut any chases prior to application of the system. Cut new 25mm deep chases in all masonry upstands. These should provide a minimum 150mm upstand above the finished level of the roof. The new waterproofing is to finish flush with the bottom of the cut chase and mechanically restrained along the leading edge using a suitable termination bar. Install the new flashing, dressing into the chases provided. Cut, joint and dress the new flashing neatly. Temporarily secure the flashing and then point with a suitable sealant.

Rainwater Outlets

Install a rainwater outlet of the required diameter prior to installation of the Pro-Compound HM membrane. Torch-apply the bituminous flange to the primed concrete surface ensuring a full bond. Dress the Pro-Compound HM membrane onto the membrane flange a minimum of 100mm. Please note, a slight watercheck could be created when dressing onto the membrane flange.

Expansion Joints

Torch-apply the Pro-Expansion Joint to each side of the expansion joint detail allowing the centre of the strip to drape / turn into the expansion joint gap. Loose lay the Pro-Expansion Chord into the expansion joint gap and complete the detail by torching the Pro-Felt Ultima Mineral Capsheet across the joint, taking care not to directly torch the cord itself.

Rooflights

Rooflights shall consist of a pre-fabricated timber, masonry or concrete upstand kerb. Apply the Pro-Compound HM membrane to the upstand kerb prior to installing the specified rooflight.

Pitch Pockets

Where there is an irregular shaped penetration through the roof structure, a pitch pocket detail can be used to achieve a watertight detail.

Apply the Pro-Compound HM membrane up to the designated penetration detail.

Install prefabricated sections of once-bent galvanised steel angles to create a former to the circumference of the detail. The horizontal leg of the metal angle should face outwards and strips of the torch-applied Pro-Felt Ultima Mineral Capsheet should be used to seal the junction between the horizontal leg and underlying hot melt membrane. Ensure there are no gaps between formwork sections.

Prime the metal former with Pro-Prime Bitumen and allow this to dry.

When fully prepared, pour Pro-Compound HM into the former. Apply in layers of 10mm thickness, until a satisfactory depth has been achieved. Where the pitch pocket detail is applied over bolt heads, ensure the hot melt finish is 50mm above the level of the bolt head.

Gutters

Internal gutters shall be waterproofed in same manner as the main flat roof area, taking care to ensure all laps are fully sealed.

Membrane Termination

The waterproofing system must be suitably terminated to the surrounding construction to prevent water penetration 'behind' the new waterproofing system.

Depending upon the nature of the installation and construction, the membrane should be protected with a 'Cover Flashing'. Alternatively, the membrane may be secured with a 'Termination Bar' which is then weatherproofed by pointing a suitable mastic sealant along the top edge between the construction and the Termination Bar.

The waterproofing should finish on the vertical a minimum 150mm from the finished roof level, in accordance with 'BS 6229:2003 Flat roofs with continuously supported coverings. Code of practice'. In the case of roofs with paving or other coverings such as a green roof, the 150mm should be from the uppermost finished level, and not the level of the waterproofing.

Flashings

Lead flashings should be installed in accordance with codes of practice and recommendations of the Lead Sheet Association. The flashing should provide sufficient coverage of the waterproofing, extending down a minimum 75mm over the waterproofing system.

Termination Bar

Depending on the method of installation and the type of termination bar used, the waterproofing membrane may first require mechanical restraint using a fixing bar. The termination bar is mechanically fastened to the wall at regular fixing centres. A suitable mastic sealant is applied behind the lip of the termination bar just prior to the final tightening of the fasteners. This provides a compression to the sealant ensuring that the detail is sufficiently weatherproof.

4. COMPLETION

Quality Assurance

Please note; the validity and the extent of the Proteus warranty will only apply where Hot Melt components and accessories (or products made by others approved by Proteus prior to commencement of works) have been used. Any alterations to agreed system specifications shall render any warranty offer null and void.

Furthermore, should the Proteus Hot Melt system fail to be installed in accordance with the current guidelines (unless otherwise agreed), the warranty offer shall be rendered null and void.

Integrity Testing

Upon completion of the Proteus Hot Melt roof, it is the contractor's responsibility to arrange an independent non-destructive integrity test to ensure the roof system is 100% watertight.

If the independent report shows failure points, these should be repaired, and the roof retested. The independent third-party report showing that the system is 100% watertight should be forwarded to Proteus Industrial Technologies Ltd when requesting a Proteus warranty.

Hand-over

It is recommended that the roofing sub-contractor advise the main contractor or client when the roof area is 100% watertight and received formal certification to that affect. The roofing sub-contractor should formally handover of the designated roof area at this point. Subsequent damage sustained by the membrane after this point which is found to be a result of the main contractor's or client's activities should not be the responsibility of the roofing sub-contractor.

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