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1.1 Scope of Works

E The Installation and Quality Control of the PmB (Blueshield) Structural Waterproofing System

This document defines the method of applying the PmB structural waterproofing system to concrete, steel and masonry structures. This is a general guidance note detailing installation procedure. To be amended by Pitchmastic licensed installer as appropriate.

The waterproofing shall be carried out by approved and licensed PmB installers only- appointed by Conserv/Pitchmastic.

- 1.2 Hazards Identified (Refer to Pitchmastic Licensed Installer's Health, Safety and Environmental Procedures.)
COSHH

Add local hazards and appropriate wording.

1.3 Interface with General Public

The works are to be carried out in areas to which access for the general public is prevented. However should pedestrian access ie designated footways, travel through the working area then suitable and safe methods of protection and working space should be allowed. A Banksman should also be used to guide pedestrians if the area is not shielded. All works which may pose a risk to passing public or other site personnel shall cease until the personnel have passed or with suitable protective screening if required.

1.4 Labour, Plant and Materials

- a) Labour - The following labour will be utilised.

Contracts Supervisor – Main contact on site. Pitchmastic or Conserv appointed representative.

Plant Forman – Responsible for control of works and supervision of operatives and fully trained in the use of the PmB material and plant.

Two Technicians – varies



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- B) Plant – Application
- i) Spray plant on board truck
 - ii) Compressor
 - iii) Material supply equipment
 - iv) Generator

Plant Equipment for testing

- i) Thermometer
- ii) Hygrometer (relative humidity and dew point)
- iii) Moisture meter (Protimeter or similar approved).
- iv) Pull off tester
- v) Micrometer
- vi) Pinhole tester



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1.5 Attendances to be provided by general contractor unless otherwise agreed

- (i) Surface preparation on the deck and the edge beam areas to receive the waterproofing. The extent of the preparation is likely to involve the removal of all loose laitance, concrete high spots using a combination of floor scabbling and grit blasting equipment appropriate. Local partners may price for this item. Subject to further discussion.

The Pitchmastic Licensed Installer will also have a floor scabbler which can be used to prepare any local areas.

The PmB Blueshield system can be installed over uneven surfaces however, the concrete must be clean, dry and free of all loose contaminants prior to installation.

- (ii) Air compressor – a 250 CFM compressor is required on site for our use during the works.

- (iii) Safe and Suitable Access

All necessary means of access is to be provided in order that the bridge deck and vertical surfaces can be waterproofed safely.

This may require scaffold, towers or harnesses.



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1.6 Supervision

The Supervisor/Forman is competent to control the works and site operatives.

1.7 Personnel Protective Equipment

- i) The instruction detailed in the manufacturers safety data sheets and internally prepared Risk Assessments are to be complied with.
- ii) The required Personnel Protective Equipment (PPE) is used/worn during the application and the materials and reasons are shown below.

Applies to well ventilated areas ie: open air.

Priming – A1/P3 charcoal filter mask

- Gloves
- Overalls
- Safety boots
- Hi visibility vests class 3 appendix g to comply with legislation.
- Safety helmets to be worn at all times.
- Ear Defenders/plugs

Spraying PmB - A1/P3 filter mask with twin charcoal filter

- Safety goggles
- Overalls
- Boots
- Hi Visibility vests
- Gloves
- Ear Defenders/plugs

Polyurethane Binder	-	Impervious gloves
Tackcoat PMV345(s)	-	Glasses/goggles
	-	Protective overalls
	-	Safety boots
	-	Hi Vis vests
	-	Helmets

2-5mm aggregates	-	As above
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D449 Type 3

Hot melt adhesive	-	Heat resistant gloves
	-	Goggles



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- Heat resistant overalls (Proban flame proof)
- Safety boots
- Hi vis vests
- Helmet

1.8 Welfare and First Aid

Welfare facilities will be provided by general contractor on a shared basis.

In addition sufficient first aid facilities will be carried on board the spray lorry.

The Foreman (or at least one of the team) will be a qualified first aider who will take command in the event of an emergency.

1.9 Emergency Procedures

Fire – compliance with agreed procedures in the event of a fire or other emergency requiring evacuation.

Reference should be made to the general contractor's specific procedures at all times whilst on site.

A fire extinguisher (dry powder) shall be provided adjacent to the works.

2.0 Handling and Storage

All proprietary materials are to be stored and handled in accordance with the manufacturer's instructions on site. PmB membrane is stored within the spray lorry within 60kg (132lb) drums or 1000kg (2200 lb) totes which remain within the unit. Primer and tackcoat are removed as required from the support vehicle and any waste drums taken away.

2.1 Sequence of Works

The Pitchmastic/Con-Serv Supervisor will have received the appropriate information from the general contractor prior to arrival on the works area. All personnel will have attended a site briefing carried out by the general contractor. This Method Statement is to be briefed and understood together with the contents of any relevant contractor/client information.

An exclusion zone shall be set up at either end of the working area by the applicator.



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All equipment shall be checked prior to use including the compressor which is to be provided by the general contractor.

2.2 General

- 2.2.1 The installation and composition of PmB Bridgedeck Waterproofing System shall be as stated in the relevant specification entry and this Method Statement. In the USA an alternative tackcoat system is used for use with thin asphalt overlays.
- 2.2.2 A programme of work shall be agreed with the general contractor prior to commencement of installation. Requirements for the provision of sufficient working area, plant, safety and, if required, protection to the system shall be agreed.
- 2.2.3 Work by other contractors shall be sufficiently complete not to delay the installation or leave the system vulnerable to damage.
- 2.2.4 The current Method Statement together with all necessary Health & Safety Data Sheets, and COSHH Risk Assessment for the works shall be deposited with general contractor and maintained on-site.

2.3 Quality Control

- 2.3.1 All batches of the system shall be supplied with a certificate of conformity.
- 2.3.2 Every batch shall be subject to visual control checks to ensure compliance with the system specification.
- 2.3.3 Each component received on-site shall be logged and stored to prevent contamination or deterioration, in accordance with the manufacturer's instructions.

2.4 Suitability of the Concrete Bridge Deck and Adjacent Areas

- 2.4.1. The system is deemed suitable for use on concrete bridge decks which are a minimum of 7 days with a maximum surface moisture content of 6%, and the concrete finished to a U4 standard by steel float. The surface moisture content shall be verified by the installer prior to commencement of the works using a protimeter moisture meter or similar approved.



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2.4.2 Where the concrete bridge deck does not meet the requirements of Section 2.4.1 The Pitchmastic PmB Ltd licensed installer will have to consult with the general contractor on the course of action to be taken prior to the commencement of work on-site.

2.5 Preparation of the Concrete Bridge Deck/Upstands

2.5.1 The areas to which the system is to be installed shall be clearly defined by the general contractor prior to commencement of work on-site.

2.5.2 All imperfections in the concrete bridge deck shall be reinstated by the general contractor or the Pitchmastic approved installer with a material agreed in consultation with the client.

2.5.3 The concrete bridge shall be clean, dry and free from ice, frost, laitance, loose aggregate, oil, grease, moss, algae growth, dust and other debris, and also where the adhesion to the concrete would be impaired, free from curing liquids, compounds and membranes.

2.5.4 Where waterproofing is to be applied onto a steel surface then the steel shall be clean, dry and free of any oxidation, oils, grease or other contaminants. If a rust inhibitor is used then this shall be compatible with the waterproofing system. Please consult with the manufacturer in this regard.



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2.5.5 Where the concrete bridge deck does not comply with Section 2.5.3 it shall either be cleaned by the client or their agent, by grit blast, high pressure water jetting, low pressure water/abrasive blast cleaning, scarifying, scabbling or other means approved by Pitchmastic. To remove dust, laitance and other loose matter the concrete bridge deck should be vigorously brushed or treated with compressed air. Any oil visible on the concrete bridge deck shall be removed by washing and scrubbing with a suitable detergent solution followed by flushing with clean water or by other suitable means.

2.6 Weather Conditions

2.6.1 Installation of the system shall only be carried out when the air temperature shall be at least 3°C (37°F) above the dew point. Where the air temperature is below 4°C (39°F) the concrete shall be forced air dried to ensure there is no ice or frost on the surface.

2.6.2 Air temperature together with relative humidity shall be recorded at the start and if the weather is variable during the installation process.

2.6.3 The concrete bridge deck and edges shall be dry before and during the installation of the system.

2.7 Installation

2.7.1 Installation of the PmB Blueshield Waterproofing System shall only be carried out by the Pitchmastic PmB licensed installer's trained operatives under competent supervision.

2.7.2 Primer

a) Pitchmastic PMCS/01 primer can be applied by spray, roller or brush at a coverage rate of 40g/m² to 65g/m² (0.10m²) dependent on the porosity of the concrete surfaces.



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- b) Ponding of the primer shall be avoided, however should ponding occur, the surplus primer shall be removed or evenly dispersed by brushing.
- c) The primer shall be dry and solvent free before application of the waterproofing membrane commences. Drying time of the primer will depend upon site conditions. Typical drying time at 20°C (68°F) is 30 minutes.
- d) The primer will accept foot traffic once it is dry and solvent free, and where necessary will accept vehicular traffic with rubber tyres thereafter within one hour. However, vehicular traffic should be avoided. No temporary protection is required.
- e) The primer can be over-sprayed with PmB waterproofing membrane at any time within 24 hours of application, provided the primed surface is clean and dry.
- f) If the 24 hours is exceeded or the primed surface becomes wet due to rain or condensation, the primer shall be abraded and the area re-primed.
- g) The primer shall be allowed to dry prior to the application of the PmB waterproofing membrane.

2.7.3 Waterproofing Membrane

- a) PmB Blueshield waterproofing consisting of Part A, PmB TP PU 0308/catalyst/blue pigment and Part B, Desmodur TP PU 0309 shall be stored in temperature controlled tanks, maintained at 50°C (122°F) to 80°C



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(176°F), within the spray equipment plant during application.

b) The spray equipment monitors mixing and is set at a ratio of 100:96±5% by weight. Application rate and quantities area also monitored.

c) PmB waterproofing membrane, pigmented blue, is spray applied in one, two or multiple coats at a nominal coverage rate of 2.7kg/m² (5.94lb/m²) to give a minimum total thickness of 2mm (100 mils) overall, including peaks, arises and irregularities in the concrete deck.

d) Typical drying time of the membrane is eight seconds.

e) The membrane will accept foot traffic within two minutes and where necessary vehicular traffic with rubber tyres within 20 minutes. No temporary protection is required for the membrane.

2.7.4 Lapping – General Procedures

a) Where the waterproofing membrane is to be joined to an existing PmB waterproofing membrane and at day joints, the new application shall be lapped onto the existing by a minimum 100mm (4").

b) Where the existing membrane is clean and less than four hours old, no additional preparation is necessary.

c) When the membrane is clean but over four hours old, Pitchmastic PMCS/01 primer shall be applied to give a minimum margin of 20mm greater than the lap and allowed to dry.



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d) Where the existing membrane is dirty, the surface shall be cleaned using a suitable solvent and abraded using a wire brush/mechanical means on day joints the membrane lap shall also be cleaned and abraded and treated as in Section 2.7.4 (c)

Phased Contracts – Lapping Procedures

a) For contracts which are phased and require a longitudinal or other form of overlap the following procedure shall be adopted.

i) On the clean and prepared concrete apply primer PMCS/01 in accordance with manufacturer's instructions up to the point designated by the Main Contractor. This preferably should be at least 100mm from the existing asphalt surface.

The primer is to be applied with care to avoid contamination onto unprepared concrete.

ii) Once the primer has cured install the PmB membrane as per the manufacturer's recommendation. To prevent overspray onto untreated surfaces use either PVC tape 100mm wide or straight – avoid spraying to uneven line as this will be damaged during phase (ii) removal works. Carry out testing of the waterproofing layer as per the Method Statement.

iii) Once the membrane has been sprayed, formed a neat edge and completion of the testing lay 150mm x 1mm thickness galvanised steel plates over the edge of the waterproofing to protect the membrane overlap (150mm). The plates should be bonded on the edge adjacent to the area to be tackcoated to avoid contamination during the surfacing works. A thin layer of PmB should be sprayed onto the one side of the plate. Ensure air is turned down to avoid unnecessary build up and wastage of material.

iv) Once the plates are in place carry out tackcoating works.

b) On Phase 2

i) Cut back the plate and remove any excess membrane by Stanley knife as appropriate. At this point you should report



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any damage to the plates or membrane to the Main Contractor's Site Agent and advise him that the overlap will require cutting back to reveal at least 150mm or undamaged waterproofing membrane.

- ii) Upon removing the plate clean 150mm membrane overlap with solvent and abrade by wire brush to provide key for subsequent primer.
- iii) Apply primer onto phase ii deck and onto prepared overlap ensuring again that primer is controlled adjacent to the new surfacing laid on phase i.
- iv) Once cured apply PmB onto deck and over 150mm lap working to a taped edge or Perspex sheet to avoid overspray onto unprepared surfaces.
- v) To verify adhesion levels carry out at least one bond test to overlap location and record with client/main contractor test results on site instruction sheet.
- vi) Take photographs of overlap.

2.7.5 **Sealing into Parapet Chase**

- a) PmB waterproofing membrane shall be terminated into a primed chase wherever provide, or terminated to a designated level via tape protection.



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2.7.6 Tack Coat

The tackcoat system for use in the USA where asphalt overlay depths are typically less than 60mm (2½") comprises the following elements. Where the asphalt is greater than 4" then an alternative system is available.

(i) Polyurethane Binder PMV 345(s)

Two component mix with added filler mixed and applied over the PmB waterproofing layer with serrated edged squeegee. Typical coverage rate 1.0kg/m² (2.2lbm²).

(ii) 2-5mm Aggregates (nominal 1/8").

Aggregates are to be clean, washed and dried, bagged in 25kg (55 lb) units and overblinded into the wet resin binder at a nominal 4.0kg/m² (8.6lb/m²) applied 80% coverage rate. The binder and aggregates should be left 2 hours prior to applying the hot melt adhesive. All loose aggregates should be removed prior to laying the adhesive.

(iii) D449 Type 3 Hot Melt Adhesive

Heated to 190°C (374°F) within bitumen boiler and applied by squeegee over the PMV 345(s) and aggregates at a nominal 1.50 – 2.0kg/m² (2.3 – 4.4 lb.m²).



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The D449 hot melt may receive asphalt within 2 hours once fully cured.

- a) The tackcoat may be applied over the PmV345(s) aggregates waterproofing system after two hours of initial membrane installation.
- b) The tackcoat system shall be applied to the areas of membrane to receive the asphalt overlay materials.
- c) The tackcoat shall be dry before the application of the asphalt. Drying time will depend upon site conditions. Typical drying time at 20°C (68°F) is 2 hours. When necessary the tackcoat will accept foot traffic and vehicular traffic once it is dried for limited use during either activity.
- e) Providing no damage results, plant equipment and traffic fitted only with rubber tyres may stand or travel on the waterproofing system solely for the purposes of laying the asphalt surfacing. All such plant, equipment and traffic shall have its tyre treads regularly inspected and any embedded stones removed.
- f) Where it is necessary for the plant, equipment or traffic to stand or travel on the waterproofing system, suitable temporary protection shall be provided by the general contractor designated subcontractor.
- g) Rollers shall not be permitted to stand or travel directly on the waterproofing system.

2.8 System Installation Checks

2.8.1 Primer



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- a) All concrete bridge deck surfaces to receive waterproofing shall be primed.
- b) Coverage rate/usage and batch number of the Pitchmastic PMCS/01 primer shall be recorded.

2.8.2 Waterproofing Membrane

- a) Processing parameters shall be recorded on an hourly basis giving time and date.
- b) Coverage rate/usage and batch numbers of PmB TP PU0308/catalyst/blue pigment and Desmodur TP PU 0309 shall be recorded.
- c) Thickness checks on the applied PmB waterproofing membrane shall be carried out by cutting out small sections in the uncured membrane and measured for thickness.
- d) Tensile adhesion checks on the applied PmB waterproofing membrane shall be carried at one per 500 square meters (5,000 ft²) or one per day, with an Elcometer using 40mm (1½") diameter metal dollies applied directly to the tack/uncured membrane. Values shall be recorded.

2.8.3 Tack coat

- a) Coverage rate/useage and batch number of the Pitchmastic polyurethane binder, aggregates and D449 hot melt tack coat shall be recorded.
- b) All waterproofed areas to receive the asphalt shall be tack coated.



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2.9 Site Samples

2.9.1 Representative free-film samples of the PmB waterproofing membrane shall be prepared by Pitchmastic PmB Ltd, at the start and finish of application on a daily basis where the total surface area exceeds 1,000 square metres (10,000ft²). Contracts less than 1,000 square metres (1,000ft²) shall be restricted to one free-film sample, or one per day.

2.9.2 Free-film samples from section 2.9.1, suitably identified shall be submitted to Pitchmastic PmB Ltd or authorised installer for retention and testing if required.

2.10 Repair of Defects

2.10.1 Pin/blow holes

a) Within four hours of membrane application, identified pin/blow holes shall be over-sprayed with PmB waterproofing membrane to a minimum thickness of 2mm. 100 mils)

b) After four hours of membrane application, the area over and around any pin/blow holes shall be cleaned using a suitable solvent, ensuring a minimum 150mm (6") lap. The repair area shall be abraded and Pitchmastic PMCS/01 primer applied, by brush or spray.

c) A minimum of 30 minutes shall be allowed for the primer to dry and PmB waterproofing membrane applied to a minimum thickness of 2mm (100 mils) ensuring a minimum peripheral lap of 100mm around the repair. The membrane shall be allowed to dry prior to the application of tackcoat system.

2.10.2 Blisters and damage

These shall be made good by cutting back to sound material and repair as in Section 2.10.1.

2.11 Spillage of Petrol, Oil and Diesel

Precautions shall be taken to avoid contamination or damage by the spillage of petrol, oil diesel fuel, hydraulic fluid and other solvents onto the waterproofing system. Any part of the waterproofing system so damaged or contaminated shall be cut out and the damaged area repaired.



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2.12 Integrity

- 2.12.1 Where required the integrity of the PmB waterproofing membrane shall be confirmed using a non-destructive electronic leak detector test method, prior to the application of the tack coat.
- 2.12.2 A test voltage of maximum 11KV shall be used after the membrane has been allowed to stand for a minimum of one hour, and shall be clean and dry.



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2.12.3 Any defects/pin/blow holes identified in the membrane by this method shall be reinstated as in Section 2.10 and only the repaired areas re-tested, prior to the application of the tack coat.

2.13 Documentation

All work records shall be completed and maintained by Pitchmastic PmB Ltd. or their authorised installer.

2.14 Asphalt Surfacing

2.14.1 The applied tack coat shall be allowed to dry for a minimum of two hours dependant on ambient conditions, and be tack free prior to the application of the asphalt surfacing.

2.14.2 The temperature of the asphalt surfacing when applied, shall exceed the minimum reactivation temperature of 290°F - 330°F required for the Pitchmastic tack coat system

2.14.3 During high ambient temperatures it is good practice to wet the wheels of the asphalt tracks and laying equipment with water/soap solution to prevent tracking up of the tackcoat caused by premature softening.

3.1 COSHH Assessments

As attached

4.0 Briefing

All Operatives are to have this method statement explained to them and they are to sign a record sheet as evidence of the same.



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- 5.0 Distribution
Site File
Original – Adrian Pike
Client/General Contractor
Con-Serv – Richard Drummond
Pitchmastic Licensed installer