

BRIDGEGUARD

Bridge Deck Waterproofing System



Technical data

Typical properties:-

Bridgeward membrane

Roll length	8m
Roll width	1m
Roll weight	40kg
Overall thickness	4.5mm
Weight per m ²	5kg
Polyester reinforcement	350gsm
Selvedge width	100mm
Head laps	150mm
Tensile strength (EN 12311-1)	
Machine direction	800 N/50mm
Cross direction	700 N/50mm
Elongation (EN 12311-1)	
Machine direction	30%
Cross direction	30%
Low temperature flexibility (EN 1109)	-20°C

Ruberoid Bitumen Primer

Relative density at 15°C	0.92
Flash point (Abel closed cup)	33°C (min)
Coverage rate	
Concrete	4 to 6m ² /litre
Metal	10 to 12m ² /litre

Ruberoid Bonding Bitumen

Application temperature	220°C to 240°C
Maximum heating temperature	260°C
Grade	95/25
Keg size	40kg
Coverage rate	2kg/m ²

Ruberoid Joint Sealant

Solids content	90%+
Density	1.3kg/litre
Low temperature flexibility	Excellent
Heat ageing	Excellent
De-icing salts	Resistant
Butt joint movement	10%
Lap joint movement	20%

Contact information



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Storage

Full and detailed information for each component is contained in the Bridgeward Installation and Operations Manual. Information is also shown on the component package labels. Bridgeward rolls should be stored on end and on a clean level surface, under cover and away from excessive heat.

Curing compounds

Advice note BA 47/99 (Waterproofing and Surfacing of Concrete Bridge Decks) draws attention to the adverse effects upon the adhesion of waterproofing systems, that can result from the use of curing liquids, compounds and membranes. Reference to the restricted use of curing agents is contained within clause 1710.5 of the Specifications for Highway Works (MCHW 1). In circumstances where advice and clarification should be needed in connection with a concrete curing process, assistance can be obtained from BDW (Services) Limited.

Expansion joints

Waterproofing continuity between expansion/movement joints and the main bridge deck waterproofing system is essential. The comprehensive support services available for Bridgeward, include a facility whereby the most suitable measures can be established for the achievement of waterproofing continuity.

Detailing

Where non-standard detailing situations arise that are not contained within the Bridgeward Installation and Operations Manual, appropriate solutions will be produced.

Project references

Project references drawn from a substantial list of Bridgeward installations can be provided on request.

Availability

By arrangement with Ruberoid Building Products Limited, the Bridgeward system is exclusively supplied by BDW (Services) Limited. Supply, installation, support services and all other requirements for Bridgeward, are provided by BDW (Services) Limited and their authorised specialist installation contractors.



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System

Bridgeward is an approved waterproofing system for concrete bridge decks on new highway and motorway constructions, improvement and maintenance projects. The system is fully approved and certificated for installation to:

- Highway/motorway bridges
- Accommodation bridges
- Box type underpasses
- Culverts
- Cattle creeps
- Service ducts
- Bottom slabs of tunnels and underpasses
- Other selected structures

System comprises:

- One part substrate primer
- Single part, hot applied bitumen adhesive
- Single layer, reinforced and preformed bituminous membrane
- Chase sealant

Standards/references

- BD 47/99 - Waterproofing and Surfacing of Concrete Bridge Decks
- BA 47/99 - Waterproofing and Surfacing of Concrete Bridge Decks (advice notes)
- Specification for Highway Works (MCHW 1)
- BBA Certificate No. 01/R126
- Proprietary Waterproofing System (PWS) data sheet
- BS EN ISO 9002
- SA1 - Lists of approved registered products (MCHW 0.3.1)



Features and benefits

- Reliable
- Durable
- Robust
- Fast, simple installation
- Specialist installation contractors
- Technical support and design services
- On-site support services
- Economic
- Substrate surface finish tolerant
- Tack coat not required
- Maintenance free
- Long, excellent installation history
- Safe, non-hazardous

In-service performance

In addition to the very high performance demands for approval and certification, the durability and reliability of the Bridgeward system has also been established by extensive installations to a wide variety of UK roads and motorway structures since 1987. Strictly applied regulatory surveillance procedures confirm a wholly satisfactory, trouble-free installation and in-service performance. Additionally, other major installations in the Middle and Far East provide further evidence of the capacity of the system to accommodate other severe and varying conditions.

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System components

Bridgeward membrane

Preformed polymer modified bituminous sheet, incorporating selected stabilising fillers and a tough non-woven polyester central core. Upper surface of the membrane is finished with a layer of white slate granules, except for a 100mm wide plain selvedge located along one side of the sheet. A carefully controlled manufacturing process ensures that the membrane consistently satisfies the designed overall nominal thickness of 4.5mm and 3.8mm excluding the surface granules. Membrane flexibility remains excellent at a temperature as low as -20°C. A tack coat, or other similar agent, is not required for the adhesion of the subsequently applied surface finishes.

Ruberoid Bonding Bitumen

High quality bitumen adhesive, complying with BS 3690: Part 2: 1989 (1997) – Specification for bitumens for industrial purposes. Bitumen is melted by temperature monitored equipment. It is then applied by controlled pouring onto the primed substrate, immediately in front of the membrane roll. The molten bitumen adheres to the primed substrate and to the underside of the membrane, filling small crevices, undulations and other surface irregularities. Membrane laps are bonded and sealed by the molten bitumen.

Ruberoid Bitumen Primer

Single part, low viscosity bituminous solution that penetrates and seals porous concrete surfaces and also firmly adheres to metal surfaces. Applied by thoroughly brushing onto the substrate to achieve a uniformly thin layer. The dried primer layer facilitates the desired degree of adhesion between the substrate and the bitumen adhesive.

Ruberflex Joint Sealant

One part bitumen sealant modified with synthetic rubber. Formulated for installation to chases and low amplitude, low frequency movement joints. Applied by hand pressure gun. Excellent adhesion to unprimed Bridgeward membrane and to primed chases.

Supplementary products

Additional products/systems that are intended to be installed in conjunction with the Bridgeward system or separately can be supplied and installed, including concrete patching/repair materials, self-adhesive and torch-on membranes, protection boards, bituminous coatings and drainage layers.



Proprietary Waterproofing System (PWS) data sheet

Approved document, issued by the Highways Agency in conjunction with the manufacturer/supplier, provides the following information:

- System identification
- Description of system and components
- General requirements
- Particular requirements
- Installation instructions
- Guidance notes
- Health and Safety

Specialist installation contractors

The services of trained, competent contractors should be engaged for the installation of the Bridgeward system. Installation by authorised contractors will ensure compliance with the BBA agreed Method Statement, the requirements of the BBA Certificate and the Bridgeward Installation and Operations Manual.

Support services

Comprehensive technical, design and on-site support services are readily available from BDW (Services) Limited and authorised specialist installation contractors.

Installation

Full and detailed information for the installation of the Bridgeward system is contained in the following:

- Bridgeward Installation and Operations Manual
- BBA Certificate No. 01/R126
- BBA Method Statement
- Proprietary Waterproofing System (PWS) data sheet

Other information relating to bridge deck waterproofing installation is contained in:

- Document BA 47/99 - Waterproofing and Surfacing of Concrete Bridge Decks
- Series 2000 - Specification for Highway Works, Volume 1 (MCHW 1)
- Series NG 2000 - Specification for Highway Works, Volume 2 (MCHW 2)

General guide notes for installation are as follows:

Substrate

Document BD 47/99 and the Design Manual for Roads and Bridges stipulates that the surface finish of new bridge decks should be Class U4. The surface of existing bridge decks requiring maintenance and refurbishment works may not comply with this standard of finish. Whilst the Bridgeward system can accommodate a variety of surface finishes, appropriate measures may be required for the correction of exceptional circumstances. Any necessary measures should be identified and implemented at an early stage. The requirements that apply to all approved bridge deck waterproofing systems, regarding the minimum age of concrete (28 days) and the air temperature at the time of the installation works (+4°C and rising) should be observed. Surfaces must be dry, clean, free from laitance, contaminants and curing compounds.

Priming

Ruberoid Bitumen Primer is applied by thorough brushing to achieve full coverage and a uniform film thickness over the substrate. Whilst the coverage rate may vary according to the texture of the substrate surface, a rate of 4 to 6m²/litre would be suitable for a Class U4 finish. Allow primer to dry thoroughly. If any primed surface areas remain exposed longer than a period of 24 hours, they should be re-primed.

Adhesive

Solid portions of Ruberoid Bonding Bitumen 95/25 grade are heated by temperature monitored equipment, to produce a pouring consistency for application between 220°C and 240°C. Adhesive is pour applied immediately ahead of the progressively laid membrane with full coverage over the substrate and membrane lap areas. Applied adhesive layer to be sufficient to

ensure a fully filled continuous seam between the underside of the membrane and the substrate surface.

Waterproofing membrane

The Bridgeward membrane is laid by progressively unrolling the individual sheets onto newly poured hot bitumen adhesive. White slate granule surface finish of the membrane to be uppermost. Where possible, the membrane installation works should be commenced at the low points of the bridge deck, so that subsequent overlap areas will be formed in the direction of the water drainage. Similarly where possible, the membrane sheets should be laid in the direction of the sand asphalt layer compaction operation. Side laps, formed over the plain selvedge side of the membrane, to be 100mm wide. Head laps to be minimum of 150mm wide and positioned at staggered locations, so that adjacent membrane sheet ends do not coincide. Membrane installation to upstands and other vertical faces can be carried out by mopping the hot bitumen adhesive onto the membrane and the primed concrete. Membrane terminations at the top of upstands to be finished within a chase.

Chase sealant

Ruberflex Joint Sealant is applied by hand pressure gun. Chase should be completely filled so that the sealant is in full contact with the membrane and the chase interface. The face of the sealant should be 'tooled' with a spatula to achieve a finish flush with the face of the chase.

Quality control

System components

All components are manufactured in accordance with the quality control standards and requirements demanded by BS EN ISO 9002, 1994, the Method Statement and Roads and Bridges Certificate No. 01/R126 issued by the BBA and also the PWS data sheet.

Workmanship

High quality of workmanship for the installation of the Bridgeward system is regulated and assured by the requirements stipulated in the Bridgeward Installation and Operations Manual and the BBA Roads and Bridges Certificate. The quality of installation works are also regulated by site inspections carried out by BDW (Services) Limited and periodic assessments by the BBA.

Health and Safety

The requirements of the Health and Safety at Work Act, 1974, including the Control of Substances Hazardous to Health (COSHH) Regulations 1989 are applicable. Safety data sheets for each component within the system are available. The nature of the Bridgeward system and the installation works do not require any provisions for special protection or respiratory equipment.

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