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BBA APPROVAL INSPECTION TESTING CERTIFICATION
TECHNICAL APPROVALS FOR CONSTRUCTION

HAPAS Certificate
17/H257
Product Sheet 1

ANTIROCK BRIDGE DECK WATERPROOFING SYSTEMS BY SOPREMA

ANTIROCK BRIDGE

This HAPAS Certificate Product Sheet(1) is issued by the British Board of Agrément (BBA), supported by Highways England (HE) (acting on behalf of the Overseeing Organisations of the Department for Transport; Transport Scotland; the Welsh Assembly Government and the Department for Regional Development, Northern Ireland), the Association of Directors of Environment, Economy, Planning and Transport (ADEPT), the Local Government Technical Advisers Group and industry bodies. HAPAS Certificates are normally each subject to a review every three years.
(1) Hereinafter referred to as 'Certificate'.

This Certificate relates to Antirock Bridge, a reinforced SBS-modified bitumen waterproofing membrane for use on concrete decks of highway bridges.

CERTIFICATION INCLUDES:

- factors relating to compliance with HAPAS requirements
- factors relating to compliance with Regulations where applicable
- independently verified technical specification
- assessment criteria and technical investigations
- design considerations
- installation guidance
- regular surveillance of production
- formal three-yearly review.

KEY FACTORS ASSESSED

Performance — the system, when assessed against the requirements of the *Guidelines Document for the Assessment and Certification of Waterproofing Systems for use on Concrete Decks of Highway Bridges*, in conjunction with EN 14695 : 2010, has satisfactory performance (see section 5).

Durability — provided the installed system is not damaged during subsequent resurfacing, it will provide an effective waterproof layer to the concrete bridge deck (see section 8).

The BBA has awarded this Certificate to the company named above for the system described herein. This system has been assessed by the BBA as being fit for its intended use provided it is installed, used and maintained as set out in this Certificate.

On behalf of the British Board of Agrément

Date of First issue: 3 February 2017

Simon Wroe
Head of Approvals — Engineering

Claire Curtis-Thomas
Chief Executive

The BBA is a UKAS accredited certification body — Number 113. The schedule of the current scope of accreditation for product certification is available in pdf format via the UKAS link on the BBA website at www.bbacerts.co.uk

Readers are advised to check the validity and latest issue number of this Agrément Certificate by either referring to the BBA website or contacting the BBA direct.

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Requirements

In the opinion of the BBA, Antirock Bridge, when assessed in accordance with the *Guidelines Document for the Assessment and Certification of Waterproofing Systems for use on Concrete Decks of Highway Bridges* and used in accordance with the provisions of this Certificate, will meet or contribute to meeting the requirements of the *Manual of Contract Documents for Highways Works* (MCHW)[1], *Specification for Highways Works* (SHW), Volume 1, Series 2000.

(1) The MCHW is operated by the Overseeing Organisations: Highways England (HE), Transport Scotland, the Welsh Assembly Government and the Department for Regional Development (Northern Ireland).

Regulations

Construction (Design and Management) Regulations 2015

Construction (Design and Management) Regulations (Northern Ireland) 2016

Information in this Certificate may assist the client, designer (including Principal Designer) and contractor (including Principal Contractor) to address their obligations under these Regulations.

See sections: 3 *Delivery and site handling* (3.1, 3.3 and 3.4) and 10 *Precautions* of this Certificate.

Additional Information

CE marking

The Certificate holder has taken the responsibility of CE marking the system in accordance with harmonised European Standard EN 14695 : 2010. An asterisk (*) appearing in this Certificate indicates that data shown are given in the manufacturer's Declaration of Performance.

Technical Specification

1 Description

1.1 Antirock Bridge is an SBS-modified bitumen waterproofing membrane incorporating a nominal 250 g·m^{-2} polyester reinforcement. The top side has a mineral finish and includes a 100 mm mineral-free wide selvedge, which is protected with a polyethylene terephthalate (PET) release film. The membrane has a polypropylene thermofusible film on the underside and has a nominal mass per unit area of 4.7 kg·m^{-2} and a thickness of 4 mm (including mineral finish).

1.2 The membrane has the following nominal characteristics:

Thickness (including mineral) (mm)	≥4.0
Watertightness*	Pass
Water absorption* (%)	≤0.75
Bond strength (23°C)* (MPa)	≥0.67
Shear bond strength (23°C) * (MPa)	≥0.3
Tensile strength* (N/50 mm)	
longitudinal	≥550
transverse	≥400
Tensile elongation* (%)	
longitudinal	≥30
transverse	≥30
Low temperature flexibility* (°C)	≤–10
Resistance to compaction of a coarse bituminous mixture*	Pass
Flow resistance* (°C)	≥80.

1.3 Ancillary items for use with the system and included in this assessment are:

- Aquadere TP — bitumen emulsion primer
- Elastocol 500 TP — bitumen solution primer.

1.4 Bituminous sealant, for sealing/terminating the membrane into chases, may also be used with the system, but is outside the scope of this Certificate. Details of suitable products/specifications may be obtained from the Certificate holder.

2 Manufacture

2.1 The membrane is manufactured using conventional blending and continuous-bitumen-coating processes.

2.2 As part of the assessment and ongoing surveillance of product quality, the BBA has:

- agreed with the manufacturer the quality control procedures and product testing to be undertaken

- assessed and agreed the quality control operated over batches of incoming materials
- monitored the production process and verified that it is in accordance with the documented process
- evaluated the process for management of nonconformities
- checked that equipment has been properly tested and calibrated
- undertaken to carry out the above measures on a regular basis through a surveillance process, to verify that the specifications and quality control operated by the manufacturer are being maintained.

2.3 The management system of Soprema S.A.S has been assessed and registered as meeting the requirements of BS EN ISO 9001 : 2008 by BSI (Certificate FM 513481).

3 Delivery and site handling

3.1 The membrane is supplied in 1 m wide rolls with lengths of 8 m for manual installation and 200 m for machine installation, with nominal weights of 45 and 1150 kg respectively. Other lengths are available on request.

3.2 The rolls are delivered to site on wooden pallets, stored upright and shrink-wrapped for protection. The rolls must be stored under dry conditions, protected from heat, freezing weather and potential sources of contamination.

3.3 The primers are supplied in the pack sizes detailed in Table 1.

Table 1 Primer pack sizes

Product	Pack size (litres)	Packs per pallet
Aquadere TP Primer	25, 1000	27, 1
Elastocol 500 TP Primer	30	24

3.4 The Certificate holder has taken the responsibility of classifying and labelling the system components under the *CLP Regulation (EC) No 1272/2008 on the classification, labelling and packaging of substances and mixtures*. Users must refer to the relevant Safety Data Sheet(s).

3.5 All system components must be stored in accordance with the Certificate holder's recommendations, with the product data sheets consulted for correct storage and shelf life details.

Assessment and Technical Investigations

The following is a summary of the assessment and technical investigations carried out on Antirock Bridge.

Design Considerations

4 Use

4.1 Antirock Bridge is satisfactory for use as a waterproofing system on concrete highway bridge decks in new works and in existing maintenance applications.

4.2 The system can be used on concrete decks with a Class U4 (in accordance with the MCHW, Volume 1, Clause 1708.4) formed or tamped concrete-surface finish. Concrete must be at least 28 days old (or minimum 14 days where agreed with the purchaser), with a maximum surface moisture content of 7%.

4.3 The membrane can be overlaid with an asphalt surfacing based on a coarse bituminous mixture as defined in EN 13375 : 2004.

5 Performance

The system has been assessed in accordance with the requirements of the Guidelines Document, in conjunction with the principles and requirements of harmonised Standard EN 14695 : 2010, and is deemed to have satisfactory performance.

6 Practicability of installation

The system should only be installed by authorised contractors who have been trained and approved by the Certificate holder (see section 9.2).

7 Maintenance

The system is not subject to any routine maintenance requirements. If the membrane is damaged during the installation it must be repaired before being overlaid (see section 13).

8 Durability

8.1 The system will provide an effective waterproof layer to the concrete bridge deck, provided that care is taken to ensure that it is not damaged during installation or subsequent resurfacing work.

8.2 The durability of the system is satisfactory but is dependent on the surfacing and will vary according to a number of factors, including traffic load, location and environmental conditions.

9 General

9.1 Installation of Antirock Bridge must only be carried out by contractors authorised and trained by the Certificate holder.

9.2 The Certificate holder is responsible for training and monitoring its authorised contractors to ensure that the system is installed in accordance with the BBA Agreed Method Statement and this Certificate.

10 Precautions

Safety data sheets and a Control of Substances Hazardous to Health Regulations 2002 (COSHH) risk assessment for the works must be deposited with the purchaser and maintained on site.

11 Preparation

11.1 Imperfections in the concrete deck must be made good by the purchaser, with a material agreed in consultation with the authorised contractor.

11.2 The concrete deck must be clean, dry, and free from ice, frost, laitance, loose aggregate, oil, grease, moss, algal growth, dust and other debris. Where adhesion to the concrete would be impaired, it must also be free from curing liquids, compounds and membranes.

11.3 The air temperature, substrate temperature and relative humidity must be recorded; installation of the system must only be carried out when the minimum air and substrate temperature is at 4°C and rising, with the bridge deck temperature above the dewpoint.

11.4 The adhesion of the system to the prepared substrate should be assessed by tensile bond tests at a rate of one test per 100 m^2. A minimum tensile bond strength of 0.3 MPa is required. Where lower values are recorded, the contractor must consult with the purchaser/client and Certificate holder to decide on the course of action to be taken prior to commencing the installation.

12 Application

Primer

12.1 The prepared substrate must be primed with either Aquadere TP Primer or Elastocol 500TP Primer using a stiff brush or roller, to achieve a target coverage rate of 250 to 350 $g \cdot m^{-2}$ and 150 to 250 $g \cdot m^{-2}$ respectively. Ponding of the primer must be avoided.

Antirock Bridge membrane

12.2 The membrane is installed using traditional torch-on techniques and in accordance with the Certificate holder's instructions. Alternatively, the membrane can be laid using semi-automated Mini-Macaden or, where conditions allow, Macaden machine with jumbo rolls.

12.3 The installation should start at the lowest point ensuring that the overlaps are weathered.

12.4 To avoid corrugation effects, the membrane is unrolled and placed so that it is parallel to the direction of the traffic. On curved parts of the structure, the strips should be arranged, as far as is practicable, so that they do not form an angle larger than 60° with the direction of traffic.

12.5 The substrate must be heated strongly during the installation.

12.6 The underside of the membrane is torched, ensuring that the thermofusible film is melted and that a 5 to 10 mm bead is exuded either side of the membrane.

12.7 Side laps must overlap by at least 100 mm, using the mineral-free selvedge as a guide.

12.8 End laps must be at least 150 mm, ensuring that, before welding, the mineral granules are removed from the top surface of the membrane to be covered, and must be staggered to prevent more than three overlaps coinciding.

12.9 All joints must be pressed down with a spatula or roller, and checks made to ensure that the overlaps are secure and fully sealed with a bead of exuded compound. The bead should be bevelled to provide a smooth transition to the adjacent sheet, using a hot spatula.

12.10 Upstands must be at least 150 mm and terminated in a sealed chase using a suitable sealant, and may be protected with a suitable flashing detail.

12.11 The membrane must be overlaid with a suitable hot-rolled or mastic asphalt wearing surface as soon as practicable after installation and before the membrane is subjected to vehicular trafficking.

13 Repair

13.1 Damage to the system, eg cuts, perforations and blisters, can be repaired by cutting out and replacing the damaged area with fresh material to the same specification, ensuring a minimum 10 cm overlap of new material over the existing material. The mineral finish must be removed from the area where the bond is to be made.

13.2 The integrity and adhesion of the repaired section must be checked using organoleptic non-destructive methods.

13.3 Where extensive damage or contamination has occurred, it may be necessary to remove the system from the deck before re-applying. In this case, the Certificate holder must be consulted for advice.

13.4 The asphalt wearing surface must be reinstated once the repair to the system has been completed.

14 Surfacing

14.1 The rolling temperature of the coarse bituminous asphalt mix must be ≥160°C. The maximum temperature of the asphalt must be ≤200°C.

14.2 Where required, the tensile adhesion bond strength and the shear bond strength of the coarse bituminous mixture to be used with the membrane must be determined by test to confirm compliance with any specific contract requirements, due to implementation of guidance given in Interim Advice Note (IAN) 96/07.

Technical Investigations

15 Tests

Laboratory performance tests were carried out by the BBA and/or independent laboratories on the system, in accordance with the requirements of EN 14695: 2010 and the Guidelines Document, and the results assessed to determine:

- visible defects
- handling characteristics at –10°C
- thickness and mass per unit area
- initial amount of mineral surface protection
- tensile properties
- water absorption
- flexibility at low temperature
- flow resistance at elevated temperature
- thermal ageing behaviour
- tensile bond strength to concrete substrate including formed, tamped, young concrete (<14 days) and after freeze/thaw
- shear strength to concrete substrate and a coarse bituminous mixture
- crack bridging ability
- compatibility by heat conditioning
- resistance to compaction of an asphalt layer
- resistance to aggregate indentation at 40°C
- resistance to chisel impact
- watertightness including joints
- characterisation tests on the primers.

16 Investigations

16.1 An installation site trial was carried out to assess the practicability of the installation and quality/assurance procedures.

16.2 The manufacturing process was evaluated, including the methods adopted for quality control, and details were obtained of the quality and composition of the materials used.

Bibliography

BS EN ISO 9001 : 2008 *Quality management systems — Requirements*

EN 13375 : 2004 *Flexible sheets for waterproofing — Waterproofing of concrete bridge decks and other concrete surfaces trafficable by vehicles — Specimen preparation*

EN 14695 : 2010 *Flexible sheets for waterproofing — Reinforced bitumen sheets for waterproofing of concrete bridge decks and other trafficked areas of concrete — Definitions and characteristics*

IAN 96/07 *Guidance on implementing results of research on bridge deck waterproofing*

17 Conditions

17.1 This Certificate:

- relates only to the product/system that is named and described on the front page
- is issued only to the company, firm, organisation or person named on the front page — no other company, firm, organisation or person may hold or claim that this Certificate has been issued to them
- is valid only within the UK
- has to be read, considered and used as a whole document — it may be misleading and will be incomplete to be selective
- is copyright of the BBA
- is subject to English Law.

17.2 Publications, documents, specifications, legislation, regulations, standards and the like referenced in this Certificate are those that were current and/or deemed relevant by the BBA at the date of issue or reissue of this Certificate.

17.3 This Certificate will remain valid for an unlimited period provided that the product/system and its manufacture and/or fabrication, including all related and relevant parts and processes thereof:

- are maintained at or above the levels which have been assessed and found to be satisfactory by the BBA
- continue to be checked as and when deemed appropriate by the BBA under arrangements that it will determine
- are reviewed by the BBA as and when it considers appropriate.

17.4 The BBA has used due skill, care and diligence in preparing this Certificate, but no warranty is provided.

17.5 In issuing this Certificate, the BBA is not responsible and is excluded from any liability to any company, firm, organisation or person, for any matters arising directly or indirectly from:

- the presence or absence of any patent, intellectual property or similar rights subsisting in the product/system or any other product/system
- the right of the Certificate holder to manufacture, supply, install, maintain or market the product/system
- actual installations of the product/system, including their nature, design, methods, performance, workmanship and maintenance
- any works and constructions in which the product/system is installed, including their nature, design, methods, performance, workmanship and maintenance
- any loss or damage, including personal injury, howsoever caused by the product/system, including its manufacture, supply, installation, use, maintenance and removal
- any claims by the manufacturer relating to CE marking.

17.6 Any information relating to the manufacture, supply, installation, use, maintenance and removal of this product/system which is contained or referred to in this Certificate is the minimum required to be met when the product/system is manufactured, supplied, installed, used, maintained and removed. It does not purport in any way to restate the requirements of the Health and Safety at Work etc. Act 1974, or of any other statutory, common law or other duty which may exist at the date of issue or reissue of this Certificate; nor is conformity with such information to be taken as satisfying the requirements of the 1974 Act or of any statutory, common law or other duty of care.

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