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Agrément Certificate
13/5077
Product Sheet 2

BRIGGS AMASCO ROOF AND STRUCTURAL WATERPROOFING SYSTEMS

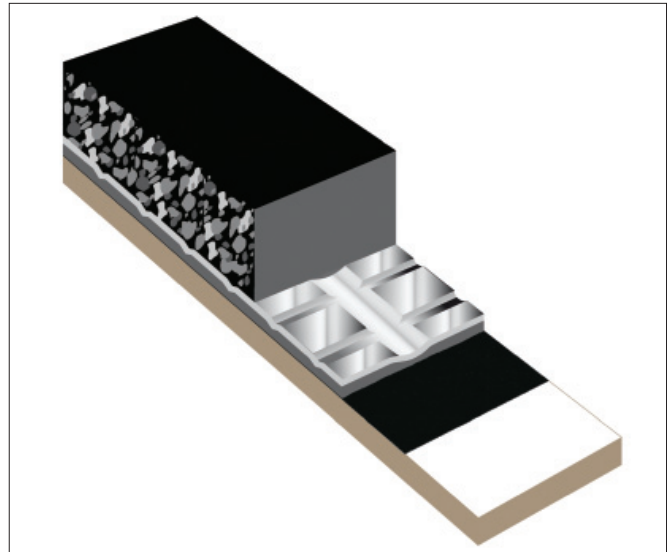
FLEXIPHALTE TRIPLE PROTECTION ROOFING AND STRUCTURAL WATERPROOFING SYSTEMS

This Agrément Certificate Product Sheet⁽¹⁾ relates to Flexiphalte Triple Protection Roofing and Structural Waterproofing Systems, comprising Flexiphalte Pommar, a polymer-modified mastic asphalt, and Flexiphalte Baryprene, a high-performance polymer-modified bitumen membrane, for use in inverted waterproofing specifications on flat roofs (including completely flat roofs) with limited access, or as a structural waterproofing on green roofs, roof gardens, podiums and roadways.

(1) Hereinafter referred to as 'Certificate'.

CERTIFICATION INCLUDES:

- factors relating to compliance with Building Regulations where applicable
- factors relating to additional non-regulatory information 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

Weathertightness — the systems will resist the passage of moisture into the building (see section 6).

Properties in relation to fire — the use of the systems will enable a roof to be unrestricted under the current Building Regulations (see section 7).

Resistance to wind uplift — the systems will resist the effects of any likely wind suction acting on the roof (see section 8).

Resistance to mechanical damage — the systems will accept, without damage, the limited foot traffic and loads associated with installation and maintenance operations, and the effects of thermal or other minor movement likely to occur in practice (see section 9).

Durability — under normal service conditions the systems will provide a durable waterproof surfacing with a service life in excess of that of conventional grades of mastic asphalt (see section 11).

The BBA has awarded this Certificate to the company named above for the systems described herein. These systems have been assessed by the BBA as being fit for their intended use provided they are installed, used and maintained as set out in this Certificate.

On behalf of the British Board of Agrément



Date of First issue: 23 December 2013

Simon Wroe
Head of Approvals — Materials

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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Regulations

In the opinion of the BBA, Flexiphalte Triple Protection Roofing and Structural Waterproofing Systems, if installed, used and maintained in accordance with this Certificate, will meet or contribute to meeting the relevant requirements of the following Building Regulations (the presence of a UK map indicates that the subject is related to the Building Regulations in the region or regions of the UK depicted):



The Building Regulations 2010 (England and Wales) (as amended)

Requirement: B4(2)	External fire spread
Comment:	On flat roofs, the systems, when used in inverted roof specifications, including a minimum surface finish of 50 mm of aggregate or concrete paving slabs, may be deemed to be designated B _{ROOF} (t4). See sections 7.1 to 7.5 of this Certificate.
Requirement: C2(b)	Resistance to moisture
Comment:	The systems will enable a roof structure to satisfy this Requirement. See section 6.1 of this Certificate.
Regulation: 7	Materials and workmanship
Comment:	The systems comprise acceptable materials. See section 11 and the <i>Installation</i> part of this Certificate.



The Building (Scotland) Regulations 2004 (as amended)

Regulation: 8(1)(2)	Fitness and durability of materials and workmanship
Comment:	The use of the systems satisfies the requirements of this Regulation. See sections 10.1, 10.2 and 11 and the <i>Installation</i> part of this Certificate.
Regulation: 9	Building standards applicable to construction
Standard: 2.8	Spread from neighbouring buildings
Comment:	When used in inverted roof specifications including a minimum surface finish of 50 mm of aggregate or concrete paving slabs, a roof incorporating the systems can be regarded as having low vulnerability under clause 2.8.1 ⁽¹⁾⁽²⁾ of this Standard. See sections 7.1, 7.4, 7.5 and 7.6 of this Certificate.
Standard: 3.10	Precipitation
Comment:	The systems will enable a roof to satisfy the requirements of this Standard, with reference to clauses 3.10.1 ⁽¹⁾⁽²⁾ and 3.10.7 ⁽¹⁾⁽²⁾ . See section 6.1 of this Certificate.
Standard: 7.1(a)	Statement of sustainability
Comment:	The systems can contribute to meeting the relevant requirements of Regulation 9, Standards 1 to 6, and therefore will contribute to a construction meeting a bronze level of sustainability as defined in this Standard.
Regulation: 12	Building standards applicable to conversions
Comment:	All comments given for the systems under Regulation 9, Standards 1 to 6 also apply to this Regulation, with reference to clause 0.12.1 ⁽¹⁾⁽²⁾ and Schedule 6 ⁽¹⁾⁽²⁾ . (1) Technical Handbook (Domestic). (2) Technical Handbook (Non-Domestic).



The Building Regulations (Northern Ireland) 2012

Regulation: 23(a)(b)(i)	Fitness of materials and workmanship
Comment:	The systems comprise acceptable materials. See section 11 and the <i>Installation</i> part of this Certificate.
Regulation: 28(b)	Resistance to moisture and weather
Comment:	The system will enable a roof to satisfy the requirements of this Regulation. See section 6.1 of this Certificate.
Regulation: 36(b)	External fire spread
Comment:	On flat roofs, the systems when used in inverted roof specifications, including a minimum surface finish of 50 mm of aggregate or concrete paving slabs may be deemed to be designated B _{ROOF} (t4). See sections 7.1 to 7.5 of this Certificate.

Construction (Design and Management) Regulations 2007

Construction (Design and Management) Regulations (Northern Ireland) 2007

Information in this Certificate may assist the client, CDM co-ordinator, designer and contractors to address their obligations under these Regulations.

See section: 3 *Delivery and site handling* of this Certificate.

Additional Information

NHBC Standards 2013

NHBC accepts the use of Flexiphalte Triple Protection Roofing and Structural Waterproofing Systems, provided they are installed, used and maintained in accordance with this Certificate, as meeting Technical Requirements R3 in relation to *NHBC Standards, Chapter 7.1 Flat roofs and balconies*.

Technical Specification

1 1 Description

1.1 Flexiphalte Triple Protection Roofing and Structural Waterproofing Systems consist of Flexiphalte Pommar and Flexiphalte Baryprene. The systems are fully bonded to the substrate, eliminating lateral tracking of moisture directly beneath the waterproofing layer.

1.2 Flexiphalte Pommar is a waterproofing grade polymer-modified mastic asphalt.

1.3 Flexiphalte Baryprene is a polymer-modified membrane reinforced with 50 g·m⁻² glassfibre mat, with talc on the upper surface and sanded finish on the underside. The membrane is for use as a higher-specification alternative to a traditional underlay, and is fully bonded using traditional pour and roll techniques. The membrane has the nominal dimensions of:

Thickness (mm)	2.5
Length (m)	10
Width (m)	1
Mass per unit area (kg·m ⁻²)	3.05

1.4 Flexiphalte Baryprene Plus (B3A) is a polymer-modified membrane with an embossed aluminium foil on the upper surface and sanded finish on the underside. The membrane is for use as an alternative to the Flexiphalte Baryprene membrane and as a higher-specification alternative to a traditional underlay. The membrane is fully bonded using traditional pour and roll methods. The membrane has the nominal dimensions of:

Thickness (mm)	3.0
Length (m)	10
Width (m)	1
Mass per unit area (kg·m ⁻²)	3.2

1.5 Also used with the systems, but outside the scope of this Certificate, is High Bond Primer — a fast-drying bituminous primer for use prior to applying Flexiphalte Baryprene membranes.

2 Manufacture

2.1 Flexiphalte Pommar is manufactured by mixing bitumen, SBS polymer and limestone with fine and coarse aggregates and other additives, using conventional techniques.

2.2 Flexiphalte Baryprene and Flexiphalte Baryprene Plus (B3A) membranes are manufactured using normal bitumen membrane manufacturing techniques.

2.3 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.

3 Delivery and site handling

3.1 Flexiphalte Pommar is supplied in hot charge (molten) form, delivered to site in purpose-built transporters. The product information is supplied on the relevant delivery notes with each consignment.

3.2 Alternatively, Flexiphalte Pommar can be supplied in block form (similar to traditional grades of mastic asphalt) with labels bearing the product type and name, and the BBA logo incorporating the number of this Certificate. Each block can weigh up to 25 kg and must be stored in the same manner as traditional mastic asphalt.

3.3 Flexiphalte Baryprene and Flexiphalte Baryprene Plus (B3A) membranes are supplied in rolls with labels bearing the product name. These should be stored on end on a clean, level surface, away from excessive heat and under cover.

3.4 High Bond Primer is supplied in 5, 25 and 200 litre cans/drums.

3.5 High Bond Primer is classified as 'flammable' and 'harmful' under *The Chemicals (Hazard Information and Packaging for Supply) Regulations 2009 (CHIP4)/Classification, Labelling and Packaging of Substances and Mixtures (CLP Regulation) 2009* and has a flashpoint of 32°C. The product bears the appropriate hazard warning.

Assessment and Technical Investigations

The following is a summary of the assessment and technical investigations carried out on Flexiphalte Triple Protection Roofing and Structural Waterproofing Systems.

4 Use

- 4.1 Flexiphalte Triple Protection Roofing and Structural Waterproofing Systems are satisfactory for use as an inverted waterproofing layer on flat roofs (including completely flat roofs) with limited access, green roofs, roof gardens, podiums and roadways.
- 4.2 Limited access roofs are defined for the purpose of this Certificate as those subjected only to pedestrian traffic for maintenance of the roof covering, cleaning of gutters etc. Where traffic in excess of this is envisaged, additional protection to the product must be considered, eg tiling or paving.
- 4.3 Roadways are defined for the purpose of this Certificate as carriageways or driveways that do not form part of the public highway but receive cars, light vans, occasional heavy goods vehicles and fire tenders.
- 4.4 Flexiphalte Baryprene and Flexiphalte Baryprene Plus (B3A) membranes should be installed using traditional pour and roll techniques.
- 4.5 Flexiphalte Pommar must be installed in accordance with the relevant clauses of BS 8218 : 1998, and, where appropriate, BS 8217 : 2005 and the manufacturer's instructions.
- 4.6 The structure must be designed to support all dead and imposed loads without undue deflection. For the purpose of calculating design loads, a mass per unit area of $2.4 \text{ kg}\cdot\text{m}^{-2}$ per mm thickness of Flexiphalte Pommar should be used. The Certificate holder must be consulted for the weights of specific specifications.
- 4.7 Flat roofs are defined for the purpose of this Certificate as those having a minimum finished fall of 1:80 and completely flat roofs as those having a minimum finished fall of less than 1:80.
- 4.8 When designing flat roofs, twice the minimum finished fall should be assumed, unless a detailed analysis of the roof is available, including overall and local deflection of falls etc.
- 4.9 Decks to which the product is to be applied must comply with the relevant requirements of BS 8218 : 1998, BS 6229 : 2003 and, where appropriate, *NHBC Standards*, Chapter 7.1.
- 4.10 Structural decks to which green roof, roof gardens and podiums are to be applied must be of concrete, and suitable to transmit the dead and imposed loads calculated in accordance with BS EN 1991-1-1 : 2002, BS EN 1991-1-3 : 2003 and their respective UK National Annexes.
- 4.11 The drainage system must be correctly designed and provision made for access for maintenance purposes. Dead loads will increase if the drains become partially or completely blocked causing waterlogging of the drainage and soil layers.
- 4.12 Due to the high application temperatures, insulation materials used in conjunction with the product must be approved by the Certificate holder.
- 4.13 Normal good practice in respect of vapour control layers and/or ventilation of cavities must be followed to control interstitial condensation.

5 Practicability of installation

The system is designed to be installed only by competent contractors experienced with laying this type of product.

6 Weathertightness



6.1 Results of tests confirm that the system will adequately resist the passage of moisture into the building and enable a roof to comply with the requirements of the national Building Regulations:

England and Wales — Approved Document C2, Requirement C2(b), Section 6

Scotland — Mandatory Standard 3.10, clauses 3.10.1 and 3.10.7

Northern Ireland — Regulation 28(b)

6.2 The system is impervious to water, is flexible and can accommodate, without leakage, the movement due to cracking permitted by BS EN 1992-1-1 : 2004 and its UK National Annex.

7 Properties in relation to fire



7.1 In the opinion of the BBA, the system will have similar properties in relation to fire as the traditional grades of mastic asphalt described in BS 8218 : 1998.



7.2 When fully supported on structures described in the following references, exposed mastic asphalt has a 'notional' B_{ROOF} (t4) classification to BS EN 13501-5 : 2005:

England and Wales — Approved Document B, Table A5, Part (iv).

Northern Ireland — Technical Booklet E, Table 5.6 Part (iii).

7.3 The designation of other specifications should be evaluated in accordance with the following guidance:
England and Wales — Approved Document B, Volumes 1 and 2, paragraphs 10.4 and 14.4 respectively
Northern Ireland — Test or assessment by a UKAS accredited laboratory, or an independent consultant with appropriate experience.



7.4 In the opinion of the BBA, a roof garden incorporating the product covered with a drainage layer of gravel 100 mm thick and a soil layer of minimum 300 mm thick will be designated B_{ROOF} (t4).

7.5 In the opinion of the BBA, in irrigated roof gardens the use of the product will be unrestricted under the national requirements.



7.6 All specifications should be evaluated in accordance with Mandatory Standard 2.8, Annex 2.C⁽¹⁾ and Annex 2.F⁽²⁾.

- (1) Technical Handbook (Domestic).
- (2) Technical Handbook (Non-Domestic).

8 Resistance to wind uplift

When applied to an air-impermeable deck, the system will resist the effects of wind suction likely to occur in service.

9 Resistance to mechanical damage

9.1 The system can accept, without damage, the thermal movement likely to occur in practice, and the limited foot and light concentrated loads associated with installation and maintenance operations. Where access exceeding this is envisaged, this should be taken into account when determining the application thickness and surface protection.

9.2 Reasonable care is required to avoid prolonged loading by heavy and/or sharp objects.

9.3 Where the control of traffic is not possible, or in areas of public access, a surface protection of suitable tiles or pavements must be used.

10 Maintenance



10.1 Roofs must be the subject of regular inspections, particularly in autumn after leaf fall and in spring, to ensure that unwanted vegetation and other debris are cleared from the roof and drainage outlets (see section 4.1.1). Guidance is available within the latest edition of *Guidelines to Green Roofing*, published by The Green Roof Organisation (GRO).

10.2 The condition of any solar reflective or decorative finish should be inspected and re-coated if required and/or as part of a planned maintenance programme.

10.3 The maintenance of the roofs must be carried out in accordance with the Certificate holder's maintenance procedures.

11 Durability



11.1 Results of tests indicate that Flexiphalte Triple Protection Roofing and Structural Waterproofing Systems have improved high-temperature stability and increased extensibility at lower temperatures compared with conventional mastic asphalt. Accelerated ageing tests indicate a satisfactory retention of properties. On the basis of available data, Flexiphalte Triple Protection Roofing and Structural Waterproofing Systems should have a life expectancy in excess of that of conventional grades of mastic asphalt used in roofing applications.

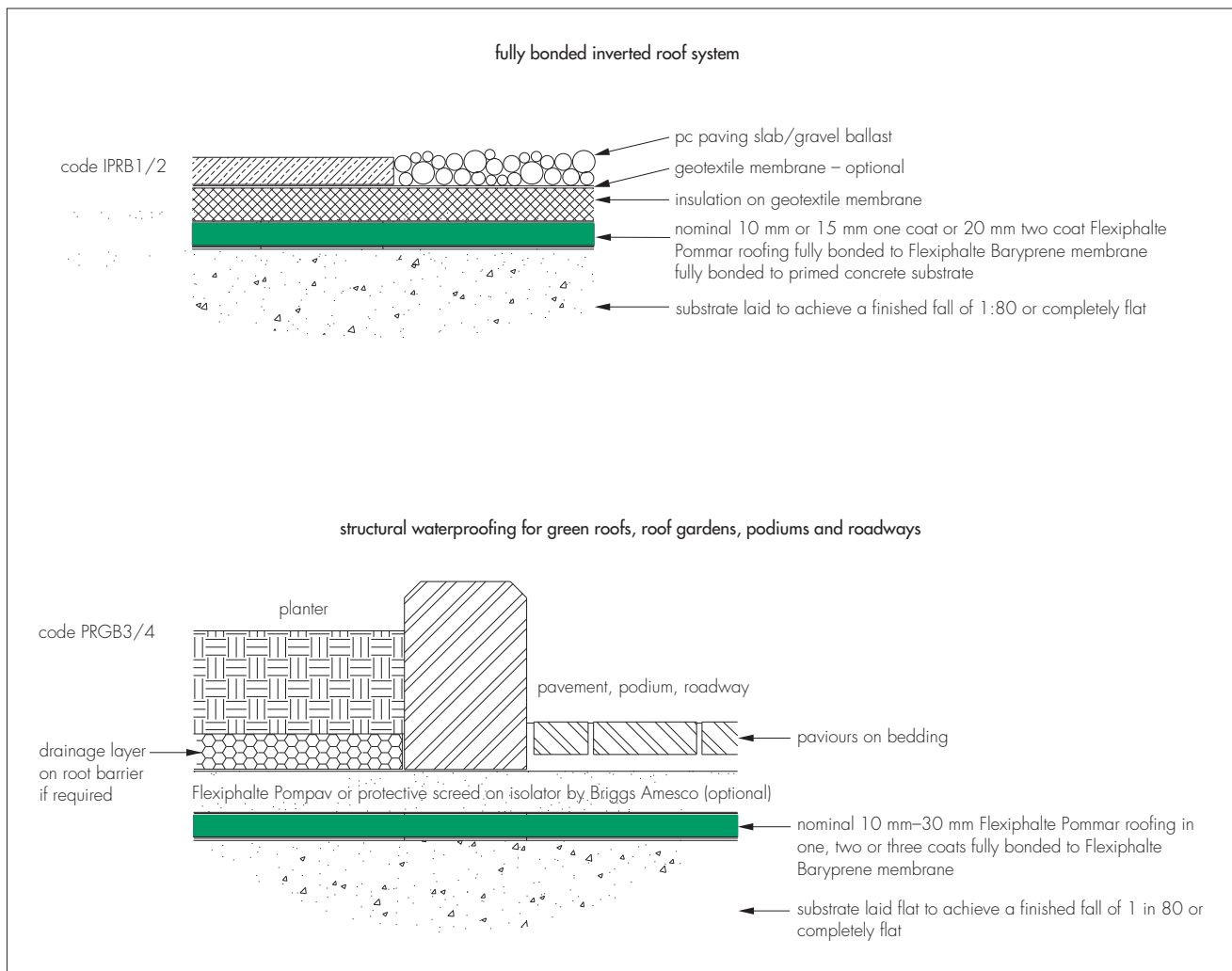
11.2 When fully protected and subject to normal service conditions the systems will provide an effective barrier to the transmission of liquid water vapour for the design life of the roof/substrate on which it is incorporated.

Installation

12 Procedure

12.1 Installation of Flexiphalte Triple Protection Roofing and Structural Waterproofing Systems must be carried out using the traditional techniques for laying mastic asphalt described in the relevant clauses of BS 8218 : 1998 and in accordance with the Certificate holder's instructions. Typical specifications are shown in Figure 1.

Figure 1 Design specifications



12.2 Deck surfaces must be dry, clean, and free from sharp projections such as nail heads and concrete nibs. Lightweight screeds may require increased drying times.

12.3 Flexiphalte Baryprene membrane must be fully bonded using the traditional pour and roll methods in accordance with BS 8217 : 2005.

12.4 Flexiphalte Pommar must be fully bonded to Flexiphalte Baryprene membrane using traditional techniques for laying mastic asphalt in accordance with the relevant clauses of BS 8218 : 1998.

12.5 Where applicable, details are to be worked in accordance with the Certificate holder's instructions. Typical installation details are shown in Figures 2 and 3.

Figure 2 Typical installation details using mastic asphalt

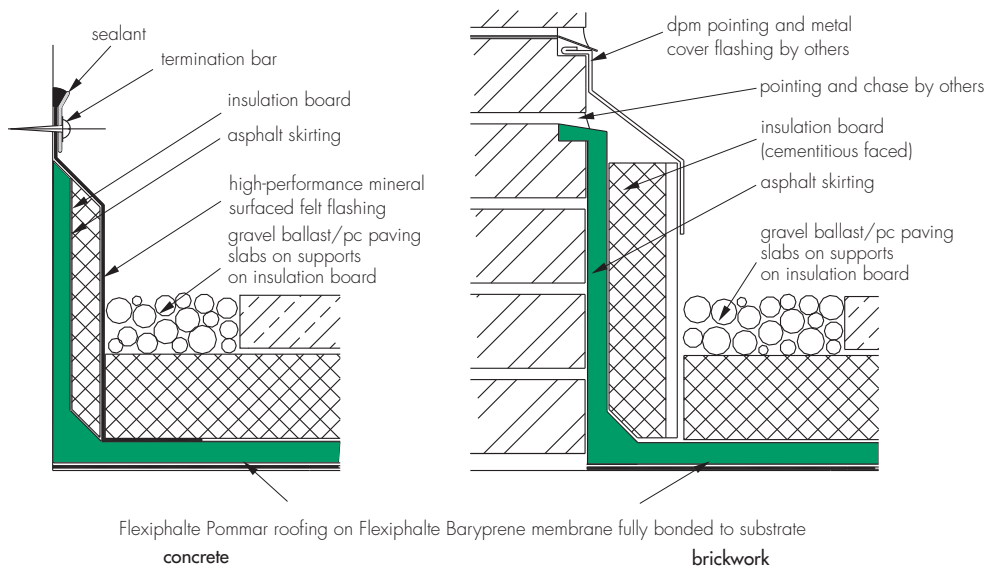
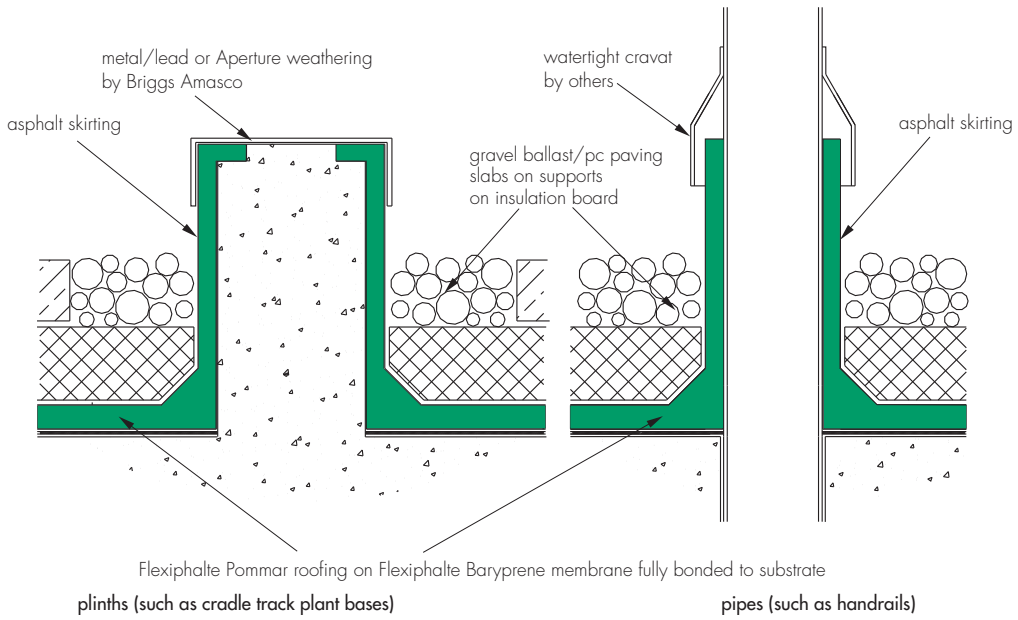
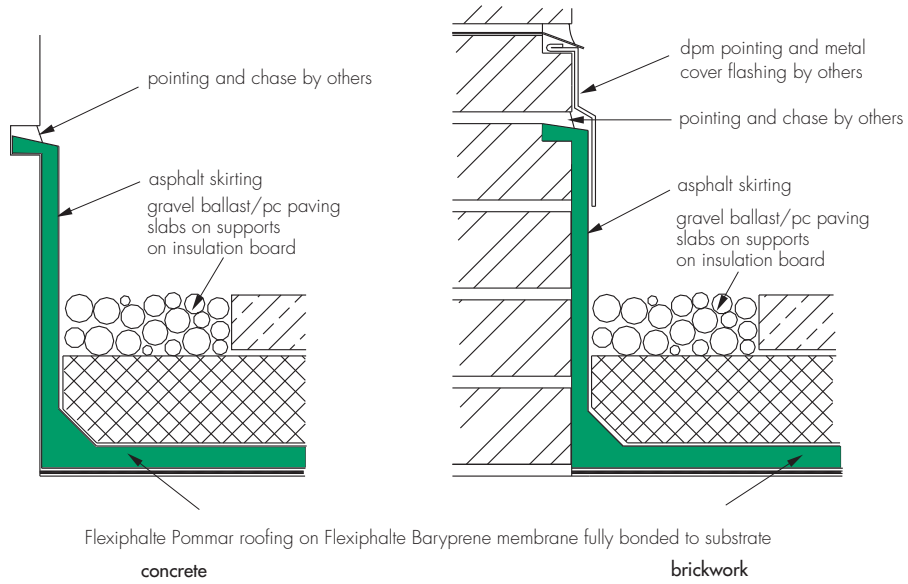
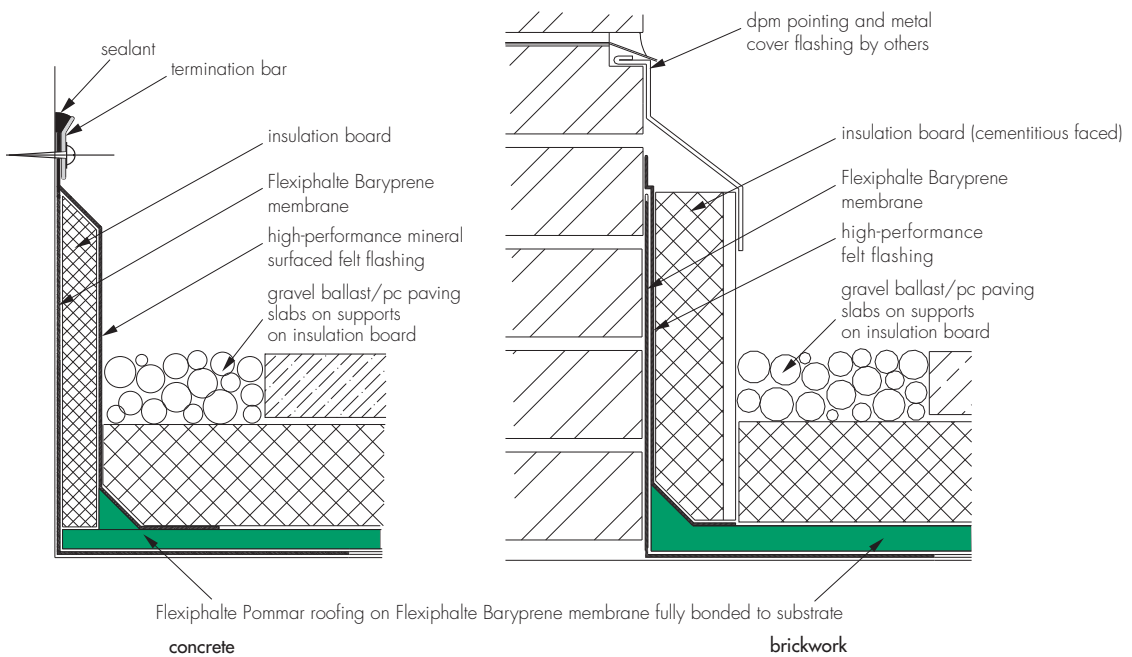
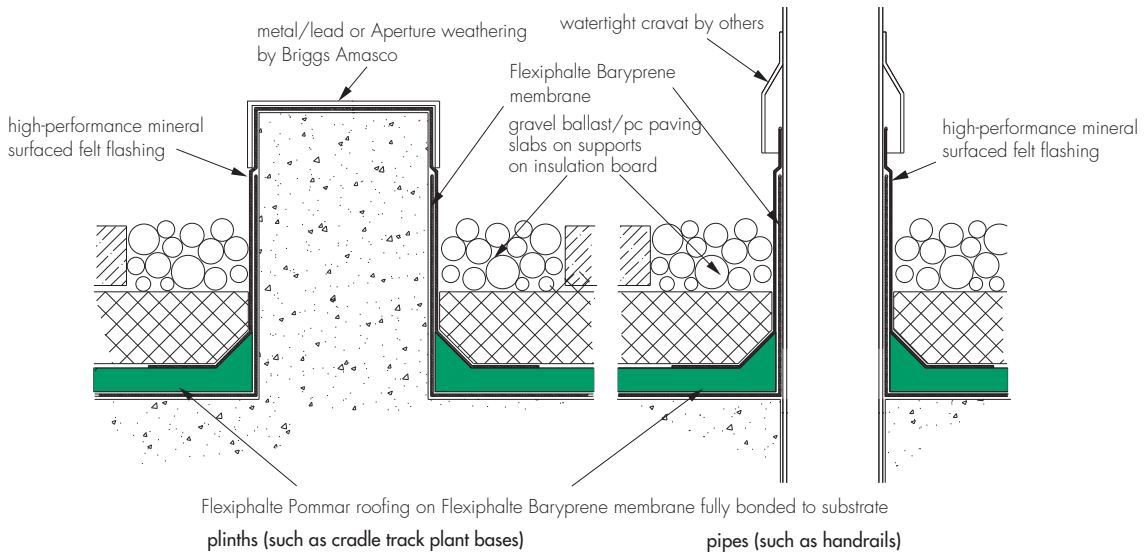
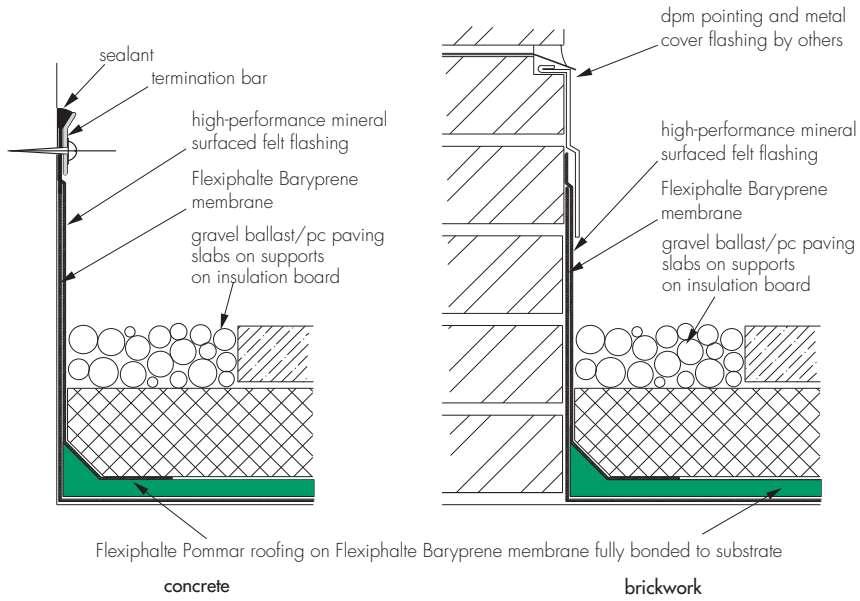


Figure 3 Typical installation details using high-performance membranes



12.6 On completion of the roof, the final coat is rubbed with coarse sharp sand using a wooden float.

12.7 Insulation is installed, using the normal inverted roof method, over a geotextile membrane in accordance with Clause 8.5.2 of BS 8218 : 1998. The insulation must be approved by Briggs Amasco.

12.8 Paving slabs or ballast are laid on the insulation.

12.9 Other applications, such as green roofs or roof gardens, can have a layer of Flexiphalte Pompave⁽¹⁾ or a protective screed laid on the asphalt or an isolating membrane, depending on the circumstances and in accordance with the Certificate holder's instructions.

(1) Subject of BBA Certificate 13/5078 Product Sheet 1.

13 Repairs

Should damage occur, or alterations to the roof structure be required, the recommendations of BS 8218 : 1998, Section 11 *Maintenance and Repair*, should be followed. The system should be reinstated to the original specification.

Technical Investigations

14 Tests

Tests were carried out on samples of Flexiphalte Pommar to determine:

- fines content
- mass per unit area
- tensile strength and elongation on unaged and heat aged samples
- water vapour permeability
- resistance to water pressure
- static loading
- dynamic impact at -10°C and at 21°C
- resistance to chloride ion penetration
- hardness on unaged and heat aged samples.

15 Investigations

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

15.2 A user survey was carried out to assess the system's performance in service.

15.3 Test data on low temperature flexibility and dimensional stability for Flexiphalte Baryprene was evaluated.

15.4 Data on the suitability of Flexiphalte Baryprene and Flexiphalte Baryprene Plus (B3A) was evaluated.

Bibliography

BS 6229 : 2003 *Flat roofs with continuously supported coverings — Code of practice*

BS 8217 : 2005 *Reinforced bitumen membranes for roofing — Code of practice*

BS 8218 : 1998 *Code of practice for mastic asphalt roofing*

BS EN 1991-1-1 : 2002 *Eurocode 1. Actions on structures — General actions*

NA to BS EN 1991-1-1 : 2002 *UK National Annex to Eurocode 1 — Actions on structures — General actions*

BS EN 1991-1-3 : 2003 *Eurocode 1. Actions on structures — General actions*

NA to BS EN 1991-1-3 : 2003 *UK National Annex to Eurocode 1 — Actions on structures — General actions*

BS EN 1992-1-1 : 2004 *Eurocode 2 — Design of concrete structures — General rules and rules for buildings*

NA to BS EN 1992-1-1 : 2004 *UK National Annex to Eurocode 2 — Design of concrete structures — General rules and rules for buildings*

BS EN 13501-5 : 2005+A1 : 2009 *Fire classification of construction products and building elements — Classification using data from external fire exposure to roofs tests*

16 Conditions

16.1 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.

16.2 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.

16.3 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.

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

16.5 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.

16.6 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.