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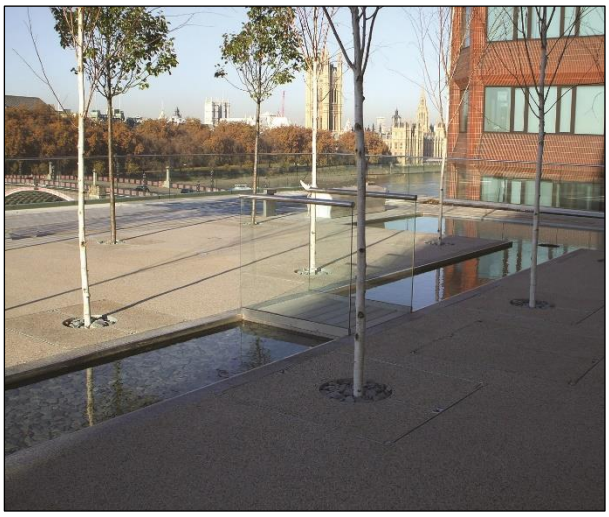
Agrément Certificate
89/2299
Product Sheet 2

IKO PERMAPHALT ROOF WATERPROOFING SYSTEMS

IKO PERMAPHALT *FULL*BOND

This Agrément Certificate Product Sheet(1) relates to IKO Permaphalt *Full*Bond, for use as a waterproofing layer on inverted roofs and zero fall roofs with limited access, podiums, green roofs, biodiverse/brown roofsroof gardens and blue roof specifications in combination with a stormwater attenuation system(2).

(1) Hereinafter referred to as 'Certificate'.
(2) The stormwater attenuation system is outside the scope of this 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 system will resist the passage of moisture into the interior of a building (see section 6).

Properties in relation to fire — the use of the system can enable a roof to be unrestricted under the national Building Regulations (see section 7).

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

Resistance to mechanical damage — the system will accept 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 system 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 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

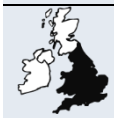
Date of Fourth issue: 3 July 2020

Originally certificated on 12 September 2005

Hardy Giesler
Chief Executive Officer

Regulations

In the opinion of the BBA, IKO Phermaphalt *Full*Bond, if installed, used and maintained in accordance with this Certificate, can satisfy or contribute to satisfying 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 a suitable substructure and/or with a suitable inorganic covering, the use of the system can enable a roof to be unrestricted under this Requirement. See sections 7.1, 7.2, 7.4 (Wales only) and 7.5 of this Certificate.

Requirement: **C2(b)** **Resistance to moisture**
Comment: The system will enable a roof to satisfy this Requirement. See section 6.1 of this Certificate.

Regulation: **7(1)** **Materials and workmanship**
Comment: The system is acceptable. See section 11 and the *Installation* part of this Certificate.

The Building (Scotland) Regulations 2004 (as amended)

Regulation: **8(1)(2)** **Durability, workmanship and fitness of materials**
Comment: The system satisfies the requirements of this Regulation. See sections 10.1 and 11 and the *Installation* part of this Certificate.

Regulation: **9** **Building standards applicable to construction**
Standard: 2.8 Spread from neighbouring buildings
Comment: When protected with a suitable inorganic covering, the use of the system can enable a roof to be unrestricted under this Requirement. See sections 7.1, 7.2 and 7.5 of this Certificate.

Standard: 3.10 Precipitation
Comment: The system 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 system 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: Comments made in relation to the system 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 (as amended)

Regulation: **23(a)(b)(i)** **Fitness of materials and workmanship**
Comment: The system is acceptable. See section 11 and the *Installation* 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 a suitable substructure and/or with a suitable inorganic covering, the use of the system can enable a roof to be unrestricted under this Requirement. See sections 7.1, 7.2, 7.4 and 7.5 of this Certificate.

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: 1 *Description* (1.2) and 3 *Delivery and site handling* (3.1 and 3.4) of this Certificate.

Additional Information

NHBC Standards 2020

In the opinion of the BBA, IKO Permaphalt *Full*Bond, if installed, used and maintained in accordance with this Certificate, can satisfy or contribute to satisfying the relevant requirements in relation to *NHBC Standards,* Chapter 7.1 *Flat roofs and balconies.*

Technical Specification

1 Description

1.1 IKO Permaphalt *Full*Bond comprises IKO Permaphalt polymer-modified asphalt and IKO 4 kg APP Plain. The system is fully bonded to the substrate, eliminating lateral tracking of moisture directly beneath the waterproofing layer.

1.2 IKO 4 kg APP Plain is a polymer-modified membrane reinforced with a 100 g·m^{-2} glassfibre mat. The membrane is fully bonded to the primed substrate using traditional torching techniques. The membrane has the nominal dimensions of:

Minimum thickness (mm)	3.0
Length (m)	8
Width (m)	1
Weight per unit area (kg·m^{-2})	4.0
Roll weight (kg)	32.0.

1.3 Substrates should be primed with IKO Quick Dry Bitumen Primer prior to the application of the membrane.

1.4 Other items(1) which may be used with the system, but which are outside the scope of this Certificate, are:

- geotextile/isolating layers
- extruded or expanded polystyrene insulation
- water control layer
- drainage layer
- growing medium
- protective paving.

(1) Details of suitable products can be obtained from the Certificate holder.

2 Manufacture

2.1 IKO Permaphalt polymer-modified asphalt is manufactured by a batch blending process by mixing a polymer-modified asphaltic cement with limestone filler, graded limestone coarse aggregates and other additives.

2.2 IKO 4 kg APP Plain is 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.

2.4 The management system of IKO Plc has been assessed and registered as meeting the requirements of BS EN ISO 9001 : 2015 by BSI (Certificate Q05233).

3 Delivery and site handling

3.1 IKO Permaphalt polymer-modified asphalt is supplied either in blocks weighing approximately 20 kg for re-melting on site or in hot-charge transporters in 18 tonne maximum loads.

3.2 Blocks must be stored protected from heat sources and sources of contamination.

3.3 IKO 4 kg APP Plain is supplied in rolls with labels bearing the system name. These should be stored on end on a clean, level surface and not exposed to excessive heat.

3.4 The Certificate holder has taken the responsibility of classifying and labelling the product 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).

Assessment and Technical Investigations

The following is a summary of the assessment and technical investigations carried out on IKO Permaphalt *Full*Bond.

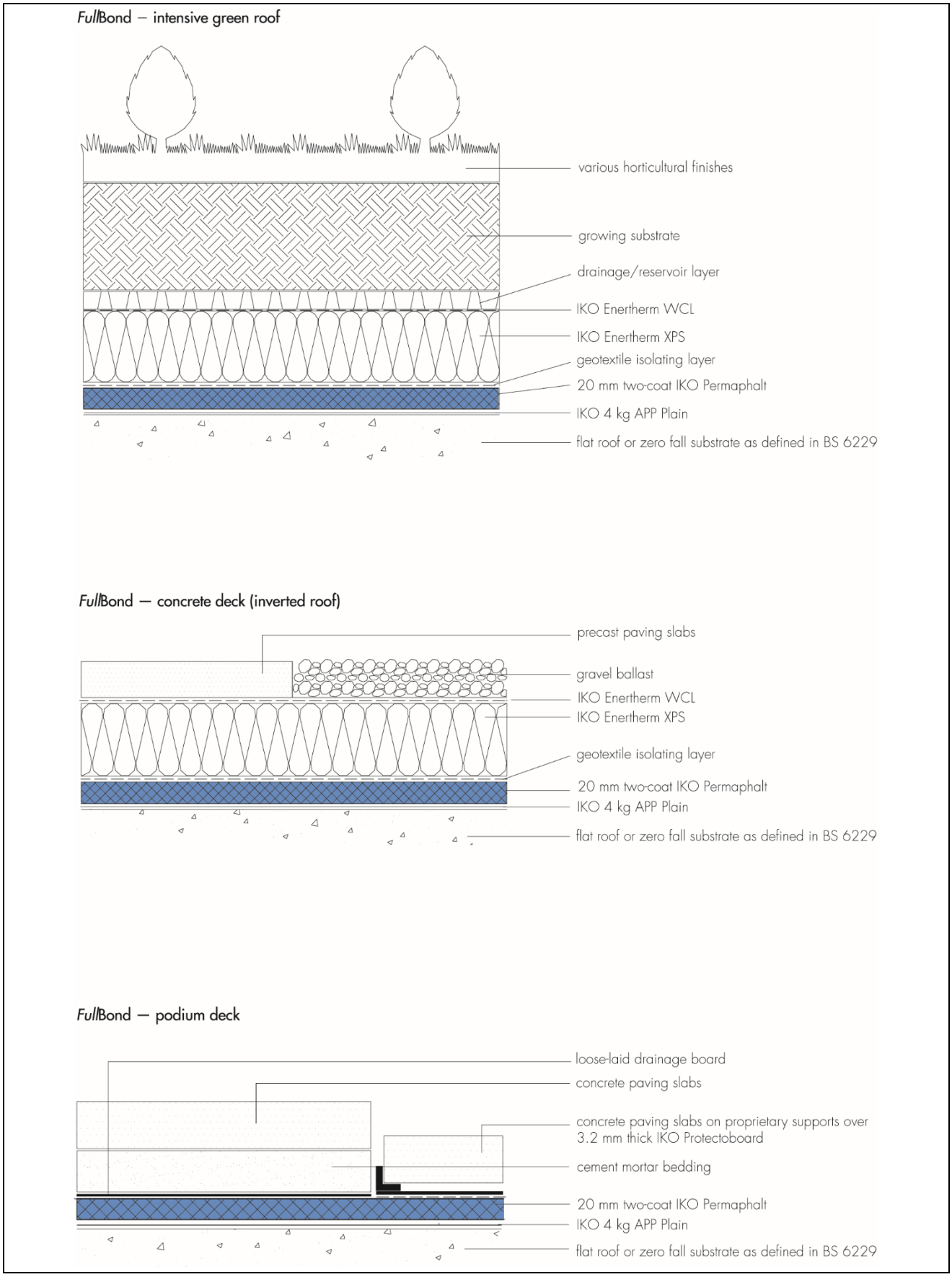
Design Considerations

4 General

4.1 IKO Permaphalt *Full*Bond is satisfactory for use as a waterproofing layer on flat and zero fall roofs with limited access, podiums, green roofs, roof gardens, biodiverse / brown roofs and blue roofs in combination with a storm water attenuation system(1) in accordance with the relevant clauses of BS 8218 : 1998. BS 8000-0 : 2014, BS 8000-4 : 1989 and, where appropriate, BS 8217 : 2005. Typical design specifications are shown in Figure 1.

(1) The stormwater attenuation system is outside the scope of this Certificate.

Figure 1 Typical design specification



4.2 Decks to which the system is to be applied must comply with the relevant requirements of BS 6229 : 2018, BS 8218 : 1998, BS 8217 : 2005 and, where appropriate, *NHBC Standards* 2019, Chapter 7.1.

4.3 The following terms are defined for the purpose of this Certificate as:

- roof garden (intensive) — a roof with a substantial layer of growing medium with planting that can include shrubs and trees, generally accessible to pedestrians
- green roof (extensive) — a roof with a shallow layer of growing medium planted with low-maintenance plants such as mosses, sedums, grasses and some wild flower species
- brown roof - a roof with a growing medium selected to allow indigenous plant species to inhabit the roof over time; no deliberate planting is undertaken
- biodiverse roof – a roof where deliberate planting is undertaken to replicate the ecology of the local environment
- blue roof — a flat roof designed to allow controlled attenuation of rain fall during heavy and storm events, as part of sustainable urban drainage systems (SUDS). Guidance for the design and construction of blue roofs is available in the NFRC Technical Guidance Note for the construction and design of Blue Roofs.

4.4 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 system must be provided (see section 9 of this Certificate and the relevant clauses of the Certificate holder's installation instructions).

4.5 Flat roofs are defined for the purpose of this Certificate as those having a minimum finished fall of 1:80(1). For design purposes, twice the minimum finished fall should be assumed unless a detailed analysis of the roof is available, including overall and local deflection, direction of falls, etc.

4.6 Pitched roofs are defined for the purpose of this Certificate as those having a fall in excess of 1:6.

4.7 Zero fall roofs are defined for the purpose of this Certificate as those having a finished fall which can vary between 0 and 1:80(1). Reference should also be made to appropriate clauses in Liquid Roofing and Waterproofing Association (LRWA) Note 7 – *Specifier Guidance for Flat Roof Falls.*

(1) NHBC Standards 2019 require a minimum finished fall of 1:60 for green roofs and roof gardens.

4.8 Structural decks to which the system is to be applied must be suitable to transmit the dead and imposed loads experienced in service.

4.9 Imposed loads, dead loading and wind loads are calculated in accordance with BS EN 1991-1-1 : 2002, BS EN 1991-1-3 : 2003 and BS EN 1991-1-4 : 2005, and their UK National Annexes.

4.10 Recommendations for the design of green roofs and roof garden specifications are available within the latest edition of *The GRO Green Roof Code – Green Roof Code of Best Practice for the UK*.

4.11 The drainage systems for inverted roofs, zero fall roofs, green roofs or roof gardens must be correctly designed, and the following points should be addressed:

- provision made for access for maintenance purposes
- for zero fall roofs, it is particularly important to identify the correct drainage points, to ensure that drainage is sufficient and effective to avoid ponding water
- dead loads for green roofs and roof gardens can increase if the drains become partially or completely blocked causing waterlogging of the drainage layer
- additional guidance for inverted roof specifications is given in BBA Information Bulletin No 4 *Inverted roofs – Drainage and U value corrections*.

4.12 Insulation materials to be used in conjunction with the system must be in accordance with the Certificate holder's instructions and be either:

- as described in the relevant clauses of BS 8217 : 2005 and BS 8218 : 1998, or
- the subject of a current BBA Certificate and be used in accordance with that Certificate.

4.13 Contact with oil-based products should be avoided as the system may not be compatible with these types of products. If contact with such products the advice of the Certificate holder must be sought.

5 Practicability of installation

Installation must be carried out by a competent roofing contractor experienced with this type of system.

6 Weathertightness

6.1 The system will adequately resist the passage of moisture into the interior of a building and enable a roof to comply with the requirements of the national Building Regulations.

6.2 The system is impervious to water and, when used as described in this Certificate, will give a weathertight roofing capable of accepting minor structural movement.

7 Properties in relation to fire

7.1 The system, when used in protected or inverted roof specifications including an inorganic covering listed in the Annex of Commission Decision 2000/553/EC, can be considered to be unrestricted under the national Building Regulations.

7.2 In the opinion of the BBA, a roof incorporating the system will be unrestricted under the national Building Regulations in the following circumstances:

- a roof garden covered with a drainage layer of gravel 100 mm thick and a soil layer 300 mm thick
- irrigated roof gardens, brown or green roofs.

7.3 If allowed to dry, the plants used may allow flame spread across the roof. This should be taken into consideration when selecting suitable plants for the roof. Appropriate planting irrigation and/or protection should be applied to ensure the overall fire-rating of the roof is not compromised.

7.4 In Wales and Northern Ireland, a roof comprising a concrete substrate and fully supported mastic asphalt has a 'notional' $B_{ROOF}(t4)$ designation to BS EN 13501-5 : 2016.

7.5 The designation of all other specifications should be confirmed by reference to the requirements of the documents supporting the national Building Regulations.

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 practice.

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 traffic 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 point loading by heavy and/or sharp objects.

10 Maintenance and repair

10.1 Roofs must be the subject of six monthly inspections in accordance with BS 6229 : 2018, Chapter 7, to ensure continued performance.

10.2 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.

11 Durability

11.1 The system will have a service 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 system will provide an effective barrier to the transmission of liquid water and water vapour for the design life of the roof/substrate on which it is incorporated.

12 Reuse and recyclability

The system comprises polymer-modified bitumen and graded aggregates that can be recycled.

Installation

13 Procedure

13.1 IKO Permaphalt *Full*Bond should be installed in accordance with the Certificate holder's instructions and generally in accordance with BS 8218 : 1998, BS 8217 : 2005 and BS 8000-4 : 1989. Typical specifications are shown in Figure 1.

13.2 Structural decking should comply with the recommendations laid down in BS 6229 : 2018 and be laid in accordance with the relevant Code of Practice.

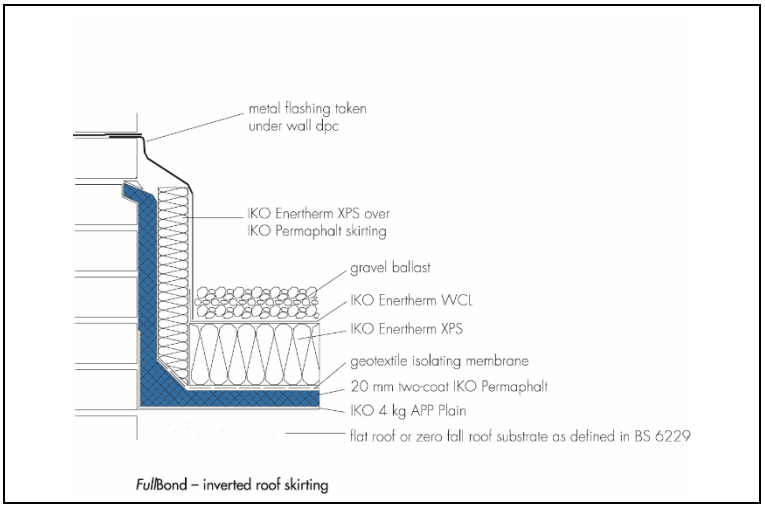
13.3 Deck surfaces must be dry, clean and free from sharp protrusions. The substrate must be primed with IKO Quick Dry Bitumen Primer and allowed to dry.

13.4 IKO 4 kg APP Plain is then fully bonded to the primed deck using traditional torching techniques, ensuring that 75 mm side and end laps are achieved.

13.5 IKO Permaphalt polymer-modified asphalt is then applied 20 mm thick in two coats and uniformly spread using traditional techniques for laying mastic asphalt in accordance with the relevant clauses of BS 8218 : 1998.

13.6 Details should be worked in accordance with traditional methods. Typical installation details are shown in Figure 2.

Figure 2 Typical installation details



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

14 Tests

The following tests were carried out on samples of IKO Permaphalt *Full*Bond and the results were assessed in context of UK roofing practices to determine:

General physical properties

- density
- tensile strength and elongation on unaged and heat aged samples
- dimensional stability
- water vapour permeability

Service performance

- ring and ball softening point
- hardness on unaged and heat aged samples
- resistance to water pressure
- flow resistance
- static indentation on soft and hard substrates
- hard body impact at -10 and +21°C

IKO 4 kg APP Plain

- thickness
- dimensional
- low temperature flexibility.

15 Investigations

Site visits were carried out to evaluate the system's performance in use and practicability of installation.

Bibliography

BS 6229 : 2018 *Flat roofs with continuously supported flexible waterproof coverings — Code of practice*

BS 8000-0 : 2014 *Workmanship on construction sites — Introduction and general principals*
BS 8000-4 : 1989 *Workmanship on building sites — Code of practice for waterproofing*

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— Densities, self-weight, imposed loads for buildings*
NA to BS EN 1991-1-1 : 2002 UK National Annex to *Eurocode 1 : Actions on structures — General actions— Densities, self-weight, imposed loads for buildings*
BS EN 1991-1-3 : 2003 + A1 : 2015 *Eurocode 1 : Actions on structures — General actions — Snow loads*
NA to BS EN 1991-1-3 : 2003 + A1 : 2015 UK National Annex to *Eurocode 1 : Actions on structures — General actions — Snow loads*
BS EN 1991-1-4 : 2005 + A1 : 2010 *Eurocode 1 — Actions on structures — General actions — Wind actions*
NA to BS EN 1991-1-4 : 2005 + A1 : 2010 UK National Annex to *Eurocode 1 — Actions on structures — General actions — Wind actions*

BS EN 13501-5 : 2005 + A1 : 2009 *Fire classification of construction products and building elements — Classification using data from external fire exposure to roof tests*
BS EN 13501-5 : 2016 *Fire classification of construction products and building elements — Classification using data from external fire exposure to roofs tests*

BS EN ISO 9001 : 2015 *Quality management systems — Requirements*

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.

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