

## IKO Plc

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Agrément Certificate  
**89/2299**  
Product Sheet 1

## PERMAPHALT ROOF WATERPROOFING SYSTEMS

### PERMAPHALT

This Agrément Certificate Product Sheet<sup>(1)</sup> relates to Permaphalt, a polymer modified bitumen mastic asphalt for use as a waterproofing layer on flat roofs and zero-pitched roofs with limited access, podiums, green roofs and roof gardens.

(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 product will resist the passage of moisture into a building (see section 6).

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

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

**Resistance to mechanical damage** — the product 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 product 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 product described herein. This product 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 Third issue: 4 October 2016

John Albon — Head of Approvals  
Construction Products

Claire Curtis-Thomas  
Chief Executive

Originally certificated on 25 September 1989

*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](http://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, Permaphalt, 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)

<b>Requirement:</b> B4(2)	<b>External fire spread</b>
<b>Comment:</b>	On flat roofs incorporating the product and with one of the supporting structures prescribed in Approved Document B, Table A5, part iv, the roof is deemed to be designation B <sub>ROOF</sub> (t4). See sections 7.1 to 7.5 of this Certificate.
<b>Requirement:</b> C2(b)	<b>Resistance to moisture</b>
<b>Comment:</b>	The product will enable a roof to meet this Requirement. See section 6.1 of this Certificate.
<b>Regulation:</b> 7	<b>Materials and workmanship</b>
<b>Comment:</b>	The product is acceptable. See section 11 and the <i>Installation</i> part of this Certificate.



## The Building (Scotland) Regulations 2004 (as amended)

<b>Regulation:</b> 8(1)(2)	<b>Durability, workmanship and fitness of materials</b>
<b>Comment:</b>	The product satisfies the requirements of this Regulation. See sections 10.1 and 11 and the <i>Installation</i> part of this Certificate.
<b>Regulation:</b> 9	<b>Building standards applicable to construction</b>
<b>Standard:</b> 2.8	<b>Spread from neighbouring buildings</b>
<b>Comment:</b>	All exposed specifications must be evaluated with reference to clause 2.8.1. See sections 7.1, 7.4, 7.5 and 7.6 of this Certificate.
<b>Standard:</b> 3.10	<b>Precipitation</b>
<b>Comment:</b>	The product will enable a roof to satisfy the requirements of this Standard, with reference to clauses 3.10.1 <sup>(1)(2)</sup> and 3.10.7 <sup>(1)(2)</sup> . See section 6.1 of this Certificate.
<b>Standard:</b> 7.1(a)	<b>Statement of sustainability</b>
<b>Comment:</b>	The product 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.
<b>Regulation:</b> 12	<b>Building standards applicable to conversions</b>
<b>Comment:</b>	Comments made in relation to the product under Regulation 9, Standards 1 to 6 also apply to this Regulation, with reference to clause 0.12.1 <sup>(1)(2)</sup> and Schedule 6 <sup>(1)(2)</sup> . (1) Technical Handbook (Domestic). (2) Technical Handbook (Non-Domestic).



## The Building Regulations (Northern Ireland) 2012 (as amended)

<b>Regulation:</b> 23(a)(b)(i)	<b>Fitness of materials and workmanship</b>
<b>Comment:</b>	The product is acceptable. See section 11 and the <i>Installation</i> part of this Certificate.
<b>Regulation:</b> 28(b)	<b>Resistance to moisture and weather</b>
<b>Comment:</b>	The product will enable a roof to meet the requirements of this Regulation. See section 6.1 of this Certificate.
<b>Regulation:</b> 36(b)	<b>External fire spread</b>
<b>Comment:</b>	On flat roofs incorporating the product and with one of the supporting structures prescribed in Technical Booklet E, Table 5.6, part iii, the roof is deemed to be designation B <sub>ROOF</sub> (t4). See sections 7.1 to 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 section: 3 *Delivery and site handling* (3.1) of this Certificate.

# Additional Information

## NHBC Standards 2016

NHBC accepts the use of Permaphalt, provided it is installed, used and maintained in accordance with this Certificate, in relation to *NHBC Standards*, Chapter 7.1 *Flat roofs and balconies*.

# Technical Specification

## 1 Description

1.1 Permaphalt is a polymer-modified bitumen mastic asphalt for use as a waterproofing layer on conventional flat and zero-pitched roofs with limited access, podiums, green roofs and roof gardens.

1.2 Other items<sup>(1)</sup> which may be used with the product, but which are outside the scope of this Certificate, are:

- separating/isolating/vapour control membranes
- insulation
- solar reflective paint
- protective paving.

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

## 2 Manufacture

2.1 The product 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 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 IKO Plc has been assessed and registered as meeting the requirements of BS EN ISO 9001 : 2008 by BSI (Certificate FM 595512).

## 3 Delivery and site handling

3.1 The product 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.

# Assessment and Technical Investigations

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

## Design Considerations

### 4 General

4.1 Permaphalt is satisfactory for use as a waterproofing layer on flat and zero-pitched roofs with limited access, podiums, green roofs and roof gardens in accordance with the relevant clauses of BS 8218 : 1998 and, where appropriate, BS 8217 : 2005. Typical design specifications are shown in Figure 1.

Figure 1 Typical design specification

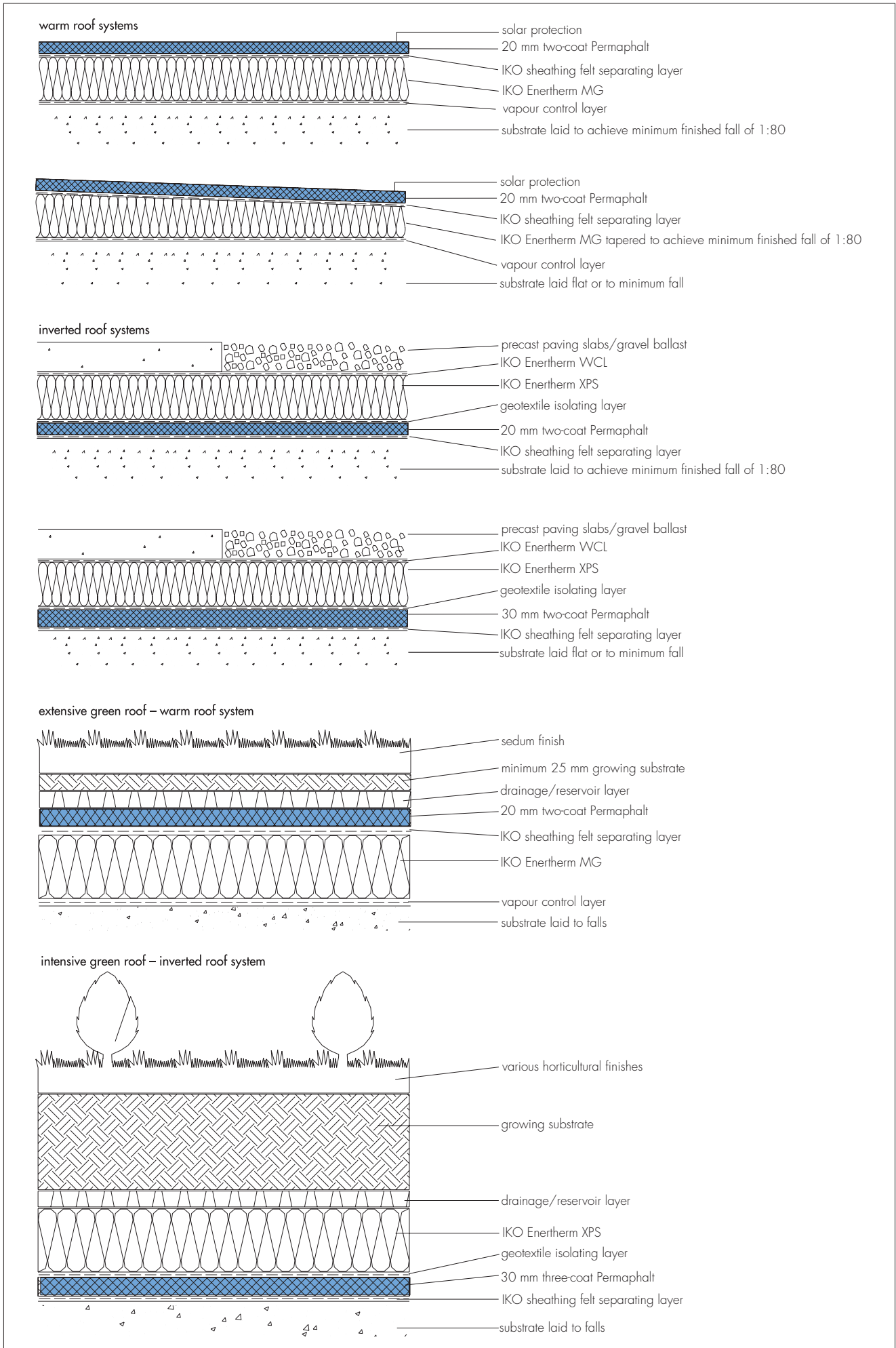
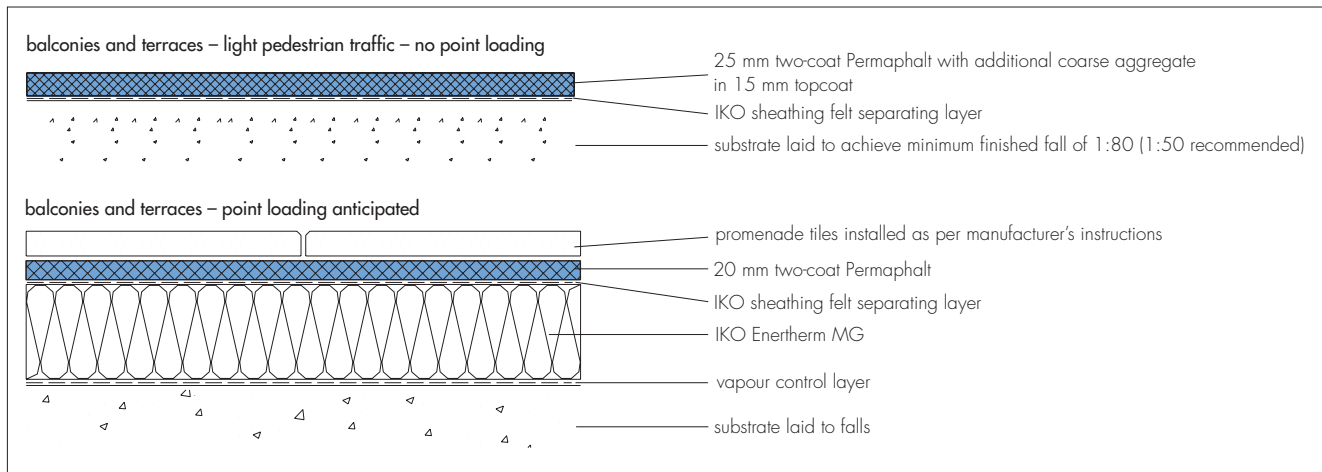


Figure 1 Typical design specification — continued



4.2 Limited access roofs are defined for the purpose of this Certificate as those roofs subjected only to pedestrian traffic for maintenance of the roof covering and cleaning of gutters, etc. Where traffic in excess of this is envisaged, additional protection to the product should be considered, eg paving.

4.3 Flat roofs are defined for the purpose of this Certificate as those having a minimum finished fall of 1:80 and zero-pitched roofs as those having a minimum finished fall which can vary between 0° and 0.7°. Reference should also be made to the appropriate clauses in Liquid Waterproofing Alliance (LWRA) Note 7 — Specifier Guidance for Flat roofs.

4.4 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, direction of falls, etc.

4.5 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 2016*, Chapter 7.1.

4.6 Structural decks for roof gardens, inverted roofs and green roofs must be designed and be 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.

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

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

4.8 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.

4.9 On zero-pitched roofs, it is particularly important to identify the correct drainage points to ensure that the drainage provided is effective.

4.10 Normal good practice in respect of vapour barriers and/or ventilation of existing insulation must be followed to control interstitial condensation.

## 5 Practicability of installation

Installation must be carried out by a competent roofing contractor experienced with this type of product. Details of Registered/Approved Contractors are available from the Certificate holder.

## 6 Weathertightness



6.1 The product 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 product 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 product 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'  $B_{\text{ROOF}}$  (t4) classification to BS EN 13501-5: 2005.

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  $B_{\text{ROOF}}$  (t4).

7.5 In the opinion of the BBA, when used 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<sup>(1)</sup> and Annex 2.F<sup>(2)</sup>.

(1) Technical Handbook (Domestic).

(2) Technical Handbook (Non-Domestic).

## 8 Resistance to wind uplift

When applied to an air impermeable deck, the product will resist the effects of wind suction likely to occur in practice.

## 9 Resistance to mechanical damage

9.1 The product 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 to 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 4.7). Guidance is available within the latest edition of *Guidelines to Green Roofing*, published by The Green Roof Organisation (GRO).

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 product will 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 product 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 product comprises polymer-modified bitumen and graded aggregates that can be recycled.

# Installation

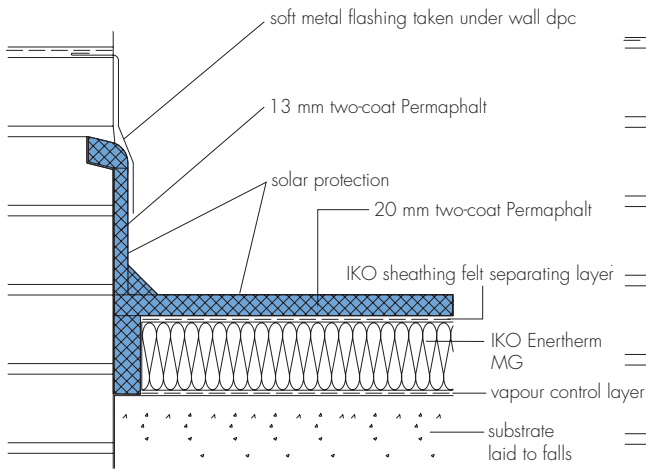
## 13 Procedure

13.1 Deck surfaces must be dry, clean and free from sharp projections such as nail heads and concrete nibs.

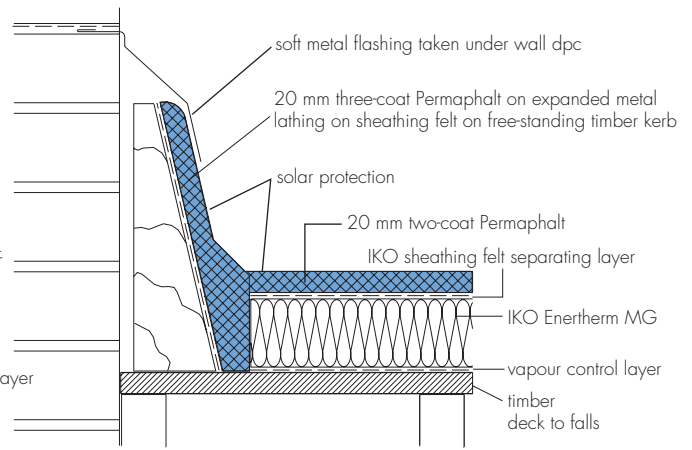
13.2 Installation of Permaphalt should be carried out using the techniques for laying mastic asphalt described in the relevant clauses of BS 8218 : 1998 and in accordance with the Certificate holder's instructions. Typical specifications are shown in Figure 1.

13.3 Where applicable, details are to be worked in accordance with traditional methods. Typical installation details are shown in Figure 2.

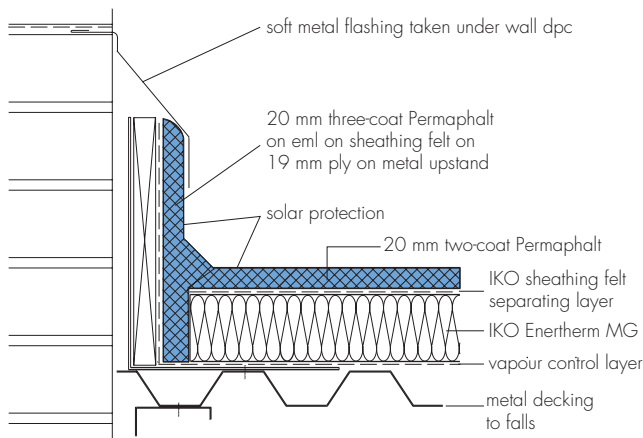
Figure 2 Typical installation details



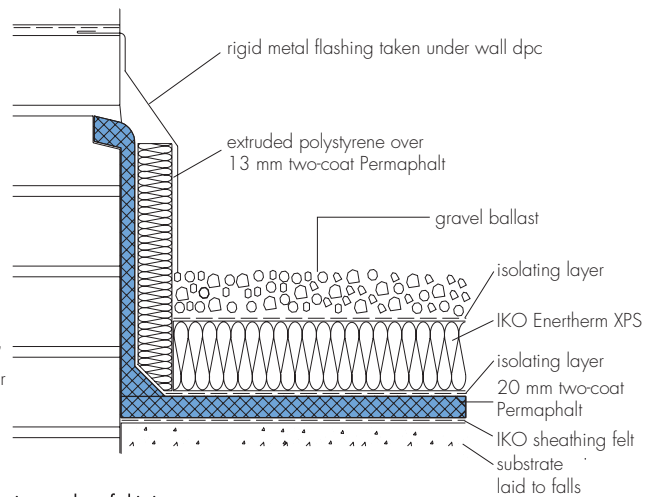
warm roof skirting to brick or concrete



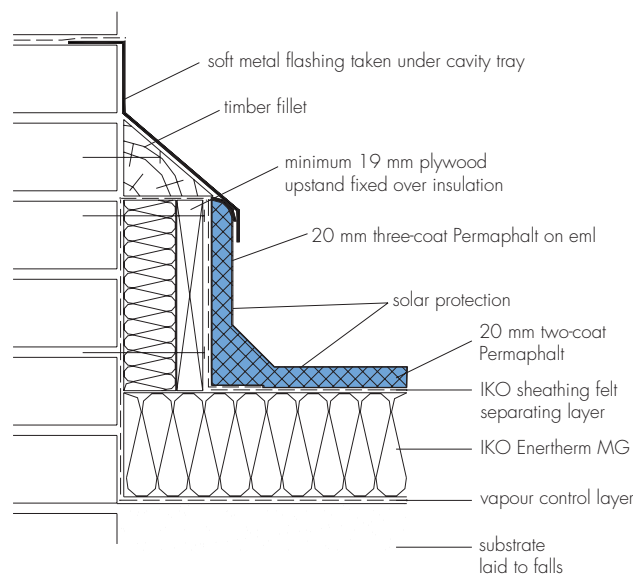
warm roof skirting to timber kerb



warm roof skirting to metal deck

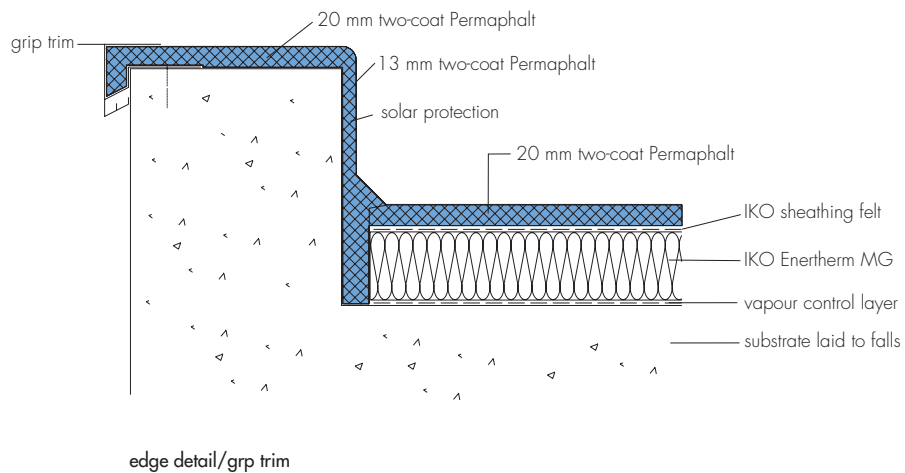
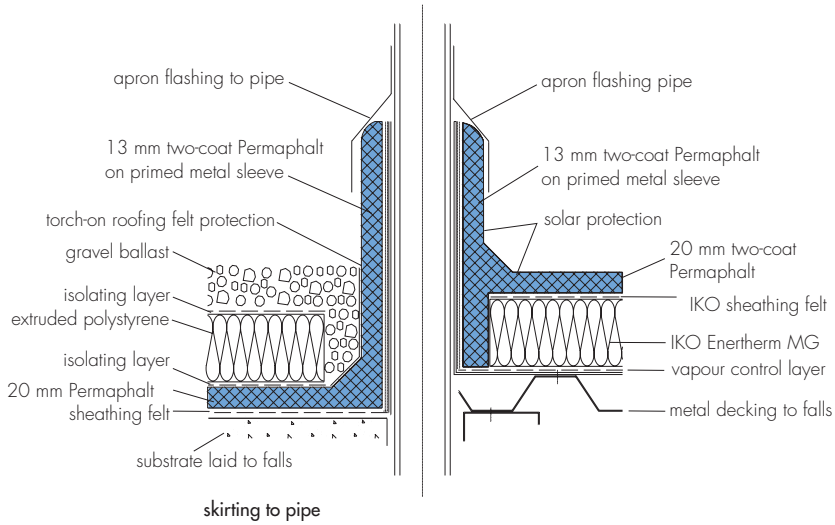
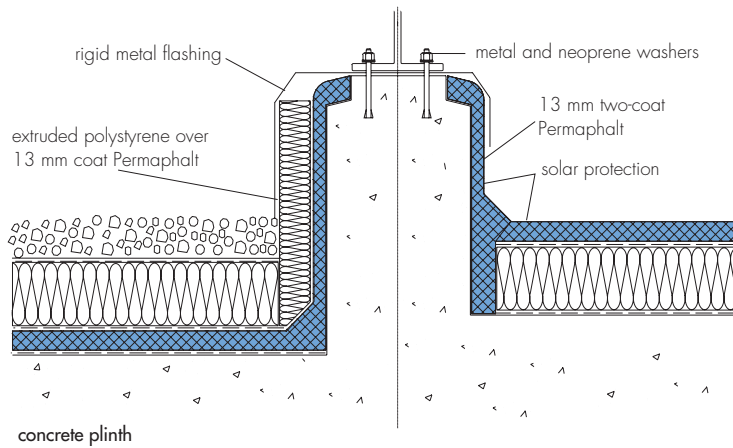
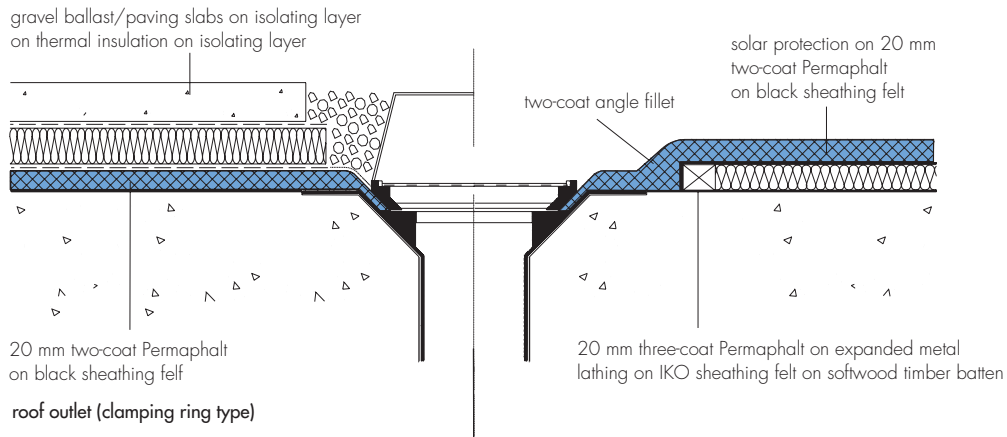


inverted roof skirting



insulated warm roof skirting

Figure 2 Typical installation details — continued





13.4 On completion of the roof, the final coat is rubbed with coarse sharp sand using a wooden float. For solar protection, or for protection against foot traffic, Permaphalt should have one of the following surface finishes which are included in BS 8218 : 1998:

- (a) stone chippings of limestone, granite, gravel, calcined flint, calcite, feldspar or similar, of 14 mm nominal size, free from dust, bedded in a suitable compound
- (b) stone aggregate of 20 mm nominal size, loose laid, but secured around outlets
- (c) light-coloured pedestrian tiles bedded in a compound in accordance with the tile manufacturer's recommendations, particularly where continuous foot traffic is expected
- (d) concrete paving slabs or similar bedded in cement/sand mortar bed on a loose-laid isolating membrane
- (e) concrete paving slabs on shims or proprietary spacers and timber decking systems. In all cases measures must be taken to ensure that the asphalt is protected from the risk of indentation
- (f) solar reflective paint, applied and maintained in accordance with the Certificate holder's and the paint manufacturer's recommendations.

13.5 Before a solar protection coating is applied, the roof surface must be completely dry and free of dirt.

13.6 If point loads or continuous foot traffic is expected, surface finishes described in sections 13.4(c), (d) and (e) are recommended.

## Technical Investigations

### 14 Tests

14.1 Tests were carried out on samples of Permaphalt and the results assessed to determine:

#### General characteristics

- ash content
- ring and ball softening point
- penetration

#### 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  $-10^{\circ}\text{C}$  and at  $+20^{\circ}\text{C}$ .

14.2 A series of comparative tests were performed, assessing both Permaphalt and traditional grades of mastic asphalt conforming to BS 6925 : 1988. Satisfactory results were obtained.

14.3 Additional test data comparing the properties of Permaphalt and traditional grades of mastic asphalt at low temperatures, supplied from a suitable test authority, were evaluated by the BBA. It was concluded that the product has improved flexibility at low temperatures.

### 15 Investigations

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

## Bibliography

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

BS 6925 : 1988 *Specification for mastic asphalt for building and civil engineering (limestone aggregate)*

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 + 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 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 ISO 9001 : 2008 *Quality management systems — Requirements*

## Conditions of Certification

### 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.