Shield Membranes Ltd
Princewood Road
Earlstrees Industrial Estate
Corby
Northants NN17 4AP

Tel: 020 7740 9279
e-mail: info@shieldmembranes.com
website: www.shieldmembranes.com

Agrément Certificate
17/5459
Product Sheet 1

SHIELDFLEX R WATERPROOFING SYSTEMS

SHIELDFLEX R ROOF WATERPROOFING SYSTEM

This Agrément Certificate Product Sheet(1) relates to the Shieldflex R Roof Waterproofing System, a polymer-modified bitumen mastic asphalt for use as a waterproofing layer on flat roofs, including inverted and protected zero falls, 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 system will resist the passage of moisture into the interior of a building (see section 6).

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

Adhesion — 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 minor structural movements likely to occur in practice (see section 9).

Resistance to penetration by roots — when used in conjunction with a root resistant membrane, the system will resist penetration by plant roots (see section 10).

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 12).

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

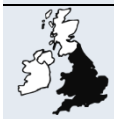
Hardy Giesler
Chief Executive Officer

Date of Second issue: 30 November 2022

Originally certificated on 2 November 2017

Regulations

In the opinion of the BBA, the Shieldflex R Roof Waterproofing System, 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, the system may 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 of this Certificate.
Regulation:	**7(1)**	**Materials and workmanship**
Comment:		The system is acceptable. See section 12 and the *Installation* 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 system satisfies the requirements of this Regulation. See sections 11.1 and 12 and the *Installation* part of this Certificate.
Regulation:	**9**	**Building standards applicable to construction**
Standard:	2.8	Spread from neighbouring buildings
Comment:		On a suitable substructure, the system may enable a roof to be unrestricted under clause 2.8.1(1)(2) of this Standard. 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 of this Certificate.
Standard:	7.1(a)	Statement of sustainability
Comment:		The system can contribute to satisfying 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 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(1)(a)**	**Fitness of materials and workmanship**
Comment:	**(b)(i)**	The system is acceptable. See section 12 and the *Installation* part of this Certificate.
Regulation:	**28(b)**	**Resistance to moisture and weather**
Comment:		The system can satisfy the requirements of this Regulation. See section 6 of this Certificate.

Regulation:	**36(b)**	**External fire spread**
Comment:		On a suitable substructure, the use of the system may enable a roof to be unrestricted under the requirements of this Regulation. 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 section: 3 *Delivery and site handling* of this Certificate.

Additional Information

NHBC Standards 2022

In the opinion of the BBA, the Shieldflex R Roof Waterproofing System, 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 roof, terraces and balconies.*

The NHBC Standards do not cover the use of the system in the refurbishment of existing roofs.

Technical Specification

1 Description

1.1 The Shieldflex R Roof Waterproofing System is based on Shieldflex PR, a polymer-modified bitumen mastic asphalt for use as a waterproofing layer on conventional flat, including protected zero fall, roofs with limited access, podiums, green roofs and roof gardens.

1.2 Other items which may be used in the system include:

- Shieldflash U — a 4 mm thick, polymer-modified bitumen, torch-on membrane used as flashing at abutments
- Shieldflash T — a 4 mm thick, polymer-modified bitumen, mineral-finished, torch-on membrane used as flashing at abutments
- Shieldlath — a 1 to 2 mm thick, expanded metal sheet to enable Shieldflex R to be applied at abutments
- Shield CP — a 2 mm thick, polymer-modified glass fibre mat reinforced bitumen membrane
- Shield CP Super — a 4 mm thick, polymer-modified glass fibre mat reinforced bitumen membrane
- Shield Prime — a bitumen primer for use when required.

1.3 The Certificate holder recommends the following ancillary items for use with the system, but these materials have not been assessed by the BBA and are outside the scope of this Certificate:

- mastic asphalt screed for use as a protection layer, levelling coat or to add falls
- Shieldscreed — polymer-modified design mix asphalt screed[(1)] for use as a supporting layer under Shieldflex PR in warm roof specifications or as a protection layer over Shieldflex PR
- Shieldflash T Root Barrier — a 4 mm thick, polymer-modified, torch-on membrane with mineral finish, having root-resistant properties for use in roof garden applications
- flexible fillet strip — a 15 mm thick by 45 mm wide torch-on, flexible, preformed strip used as an alternative to an in-situ formed asphalt fillet
- Procoat — a liquid-applied polyurethane spray or float-applied rubber compound used for forming skirting details
- solar reflective paint
- insulation
- protective paving
- water attenuation crates
- water flow reducing layers

- cold applied membranes
- upstand boards
- XPS insulation
- EPS insulation
- sedum blanket/plug plant growing mediums (when used with Shieldflash T Root Barrier)
- decking
- cellular glass insulation
- Vacuum Pack Insulation (VIP)
- mastic asphalt (including all variations of Shieldflex)
- PU adhesives
- drainage matts.

(1) Available in a terrazzo finish for internal application.

Details of suitable products may be obtained from the Certificate holder.

2 Manufacture

2.1 Shieldflex PR is manufactured by a batch-blending process, by mixing a polymer-modified bitumen with filler and graded aggregates.

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.

3 Delivery and site handling

3.1 Shieldflex PR can be 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. The Certificate holder's Material Safety Data Sheet should be consulted prior to discharging and handling the molten product.

3.2 Alternatively, the product may be supplied in block form (similar to traditional mastic asphalt) with labels bearing the product type and name. Each block weighs approximately 16 kg and should be stored in the same manner as traditional mastic asphalt.

3.3 The bitumen primer is supplied in 5- and 25-litre drums.

3.4 Shieldflash and Shield membranes are supplied as rolls and should be stored on end on a clean, level surface, away from heat and protected from inclement weather. Nominal roll sizes and weights are given in Table 1.

Table 1 Nominal roll sizes and weights

Product	Roll size (m^2)	Weight/area ($kg \cdot m^{-2}$)
Shieldflash U	1 x 8	4
Shieldflash T	1 x 8	5
Shield CP	1 x 16	2
Shield CP Super	1 x 8	4

3.5 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).

Assessment and Technical Investigations

The following is a summary of the assessment and technical investigations carried out on the Shieldflex R Roof Waterproofing System.

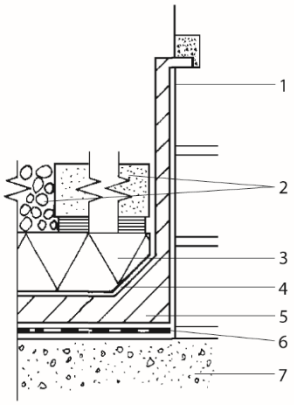
Design Considerations

4 General

4.1 The Shieldflex R Roof Waterproofing System is satisfactory for use as a waterproofing layer on flat roofs (including those with zero falls), with limited access, inverted roofs, podiums, green roofs and roof gardens 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.

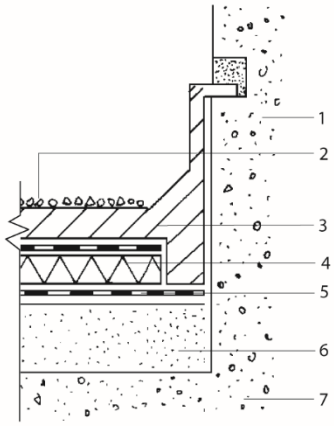
Figure 1 Typical design specifications

asphalt upstand



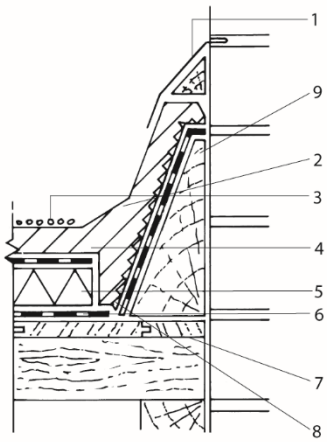
DS1(a)/DS2(a) inverted insulated roof/patio

1 traditional asphalt detail with Shieldflex PR
2 precast paving slabs on pads/gravel ballast 50 mm to 75 mm
3 thermal insulation
4 geotextile membrane
5 15/20 mm Sheildflex PR
6 Shield CP or Shield CP Super
7 concrete substrate with Shieldscreed or sand-cement screed to falls



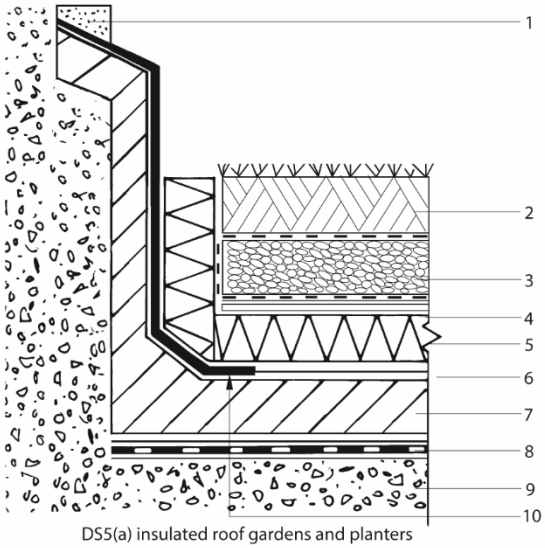
DS3(a) warm roof concrete deck

1 traditional asphalt detail with Shieldflex PR
2 solar reflective paint or 10 mm reflective chippings in bitumen compound
3 15/20 mm Shieldflex PR on Shield CP Super
4 insulation board
5 single-layer Shieldflex PR or Shield CP vapour control layer
6 concrete substrate with Shieldscreed or sand-cement screed to falls
7 concrete deck



DS4(a) warm roof-timber deck

1 cover flashing
2 traditional asphalt detail with Shieldflex PR
3 solar reflective paint, or 10 mm reflective chippings in bitumen compound
4 15/20 mm Shieldflex PR on Shield CP Super
5 insulation board
6 single-layer Sheildflex PR or Shield CP vapour control layer
7 plywood deck or softwood boarding
8 expanded metal lathing on Shield sheathing
9 free-standing timber kerb

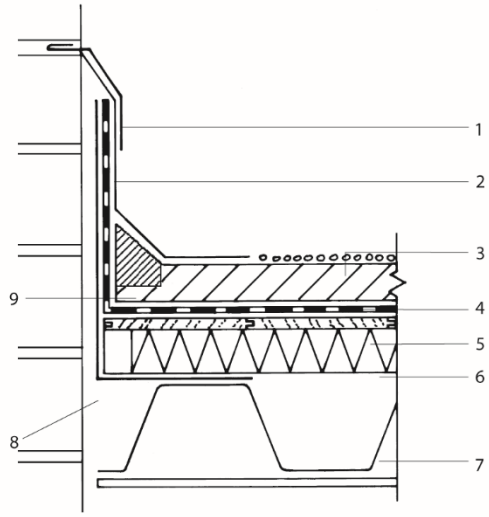


DS5(a) insulated roof gardens and planters

1 cement mortar pointing
2 soil and vegetation
3 filter layer with filter membrane
4 paving slab
5 insulation board
6 non-woven polyester fleece isolating layer
7 two--coat Shieldflex PR, 25 mm horizontally and three-coat 20 mm vertically, continued 150 mm above landscaped level
8 Shield CP Super
9 concrete roof deck/Shieldscreed or sand-cement screed
10 Shieldflash T protection

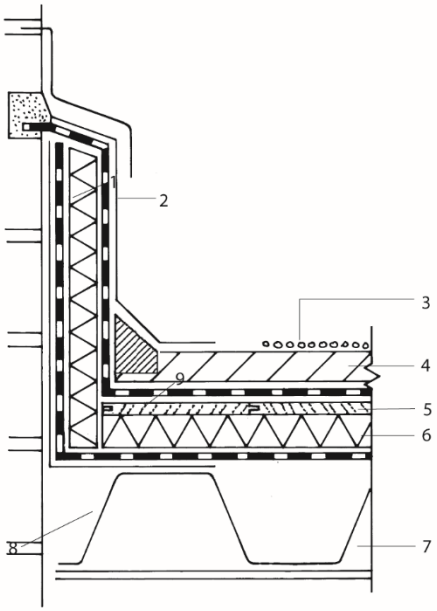
Figure 1 Typical design specifications (continued)

flexible upstand



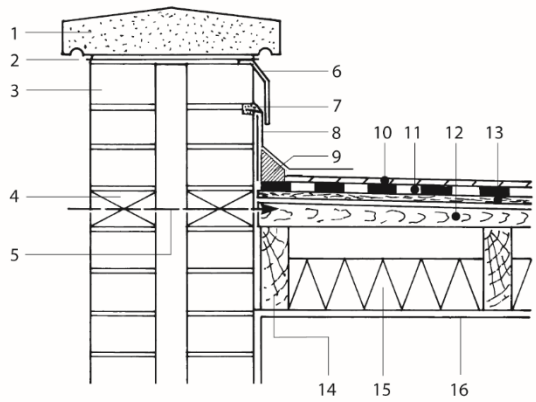
DS6 warm roof — metal deck

1 cover flashing
2 Shieldflash U and T upstands
3 solar reflective paint or chippings
4 20 mm Shieldflex PR on Shield CP Super
5 plywood joints taped with Shieldfelt CP
6 insulation board with plywood face and foil vapour barrier fixed to deck
7 metal deck
8 metal angle
9 flexible fillet strip



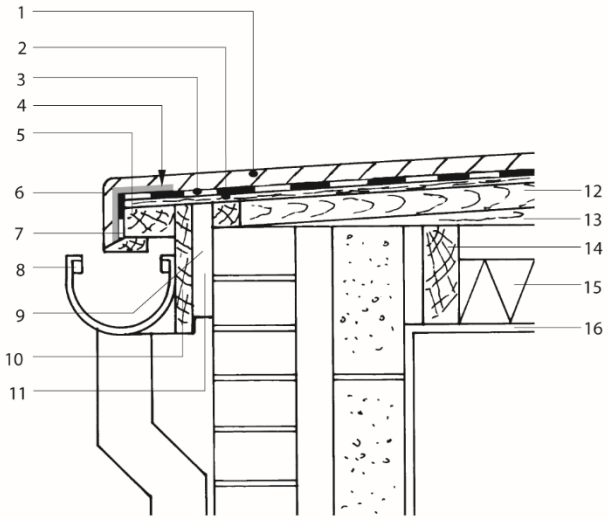
DS6 warm roof — metal deck insulated upstand

1 cover flashing
2 Shieldflash U and T insulated upstand
3 solar reflective paint or chippings
4 20 mm Shieldflex PR on Shield CP Super
5 plywood joints taped with Shieldfelt CP
6 insulation board with plywood face and foil vapour control layer fixed to deck
7 metal deck
8 metal angle
9 flexible fillet strip



DS7 cold roof — timber deck

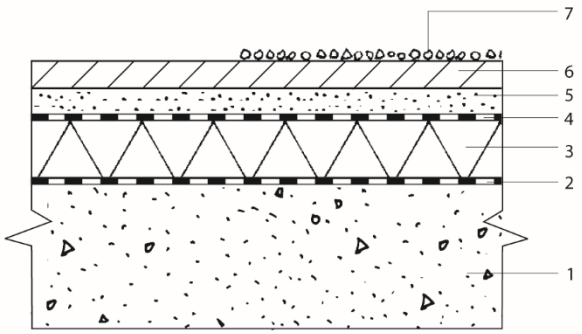
1 concrete coping stone or similar capping
2 damp-proof course
3 brick cavity wall
4 air brick or similar ventilation
5 air flow ventilation space
6 metal cover flashing
7 25 mm by 25 mm chase with mastic sealant pointing
8 Shieldflash U and T upstand
9 flexible fillet strip
10 15/20 mm Shieldflex PR
11 Shield CP Super
12 timber firrings, minimum fall 1:80
13 timber board-type decking or similar
14 softwood roof joists
15 insulation
16 foil-backed plasterboard ceiling



DS7 cold roof timber deck edge detail

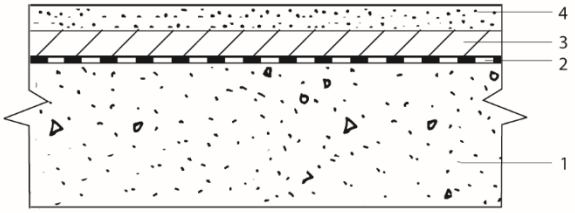
1 15/20 mm Shieldflex PR
2 softwood or plywood decking to cross battens at 450 mm centres
3 Shield CP Super
4 EM L
5 softwood batten 50 mm by 75 mm screwed through fascia
6 Shieldflex PR apron 15 mm with splayed edge
7 temporary splay batten to form asphalt feathered edge to apron
8 150 mm deep-flow PVC guttering fixed level to provide shallow falls with gutter brackets; brick or block cavity walls
9 25 mm air flow gap between brickwork and fascia
10 25 mm timber fascia board fixed to 25 mm by 75 mm hardwood
11 insect mesh fixed to fascia
12 softwood cross battens 38 mm by 38 mm
13 softwood firrings fixed to timber roofing joists
14 softwood roofing joists
15 insulation laid between joists with minimum 75 mm air flow from top of firrings
16 foil-backed plasterboard ceiling

Figure 1 Typical design specifications (continued)



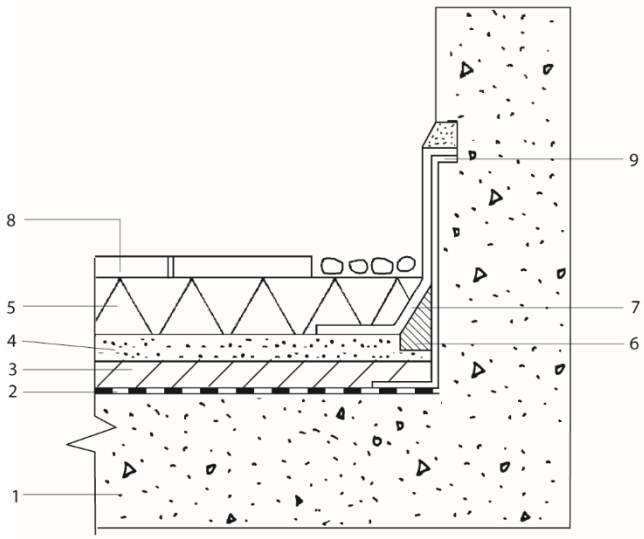
DS8 warm roof — concrete deck
Shieldscreed (PMDMAS) over insulation

1 substrate (concrete/precast grouted planks)
2 Shield CP vapour control layer
3 insulation board
4 Shield CP Super separating layer
5 minimum 10 mm Shieldscreed, laid to falls
6 15/20 mm Shieldflex PR waterproofing
7 solar reflective paint or chippings



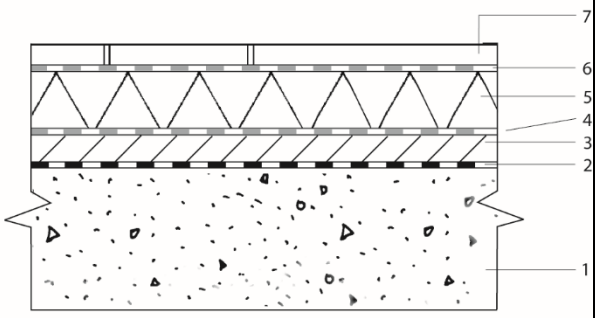
DS9 cold roof — concrete deck
Shieldscreed protection to waterproofing

1 substrate (concrete/precast grouted planks)
2 Shield CP separating layer
3 10 mm Shieldflex PR waterproofing
4 minimum 10 mm Shieldscreed, laid to falls



DS10 warm roof — concrete deck fully protected
system for podiums and pedestrian areas

1 concrete deck
2 Shield CP isolating membrane
3 10 mm minimum Shieldflex PR waterproofing
4 10 minimum Shieldscreed, laid to falls
5 geotextile membrane loose-laid with 100 mm laps
covered with 25 mm extruded polystyrene
6 flexible fillet strip
7 Shieldflash T
8 surface finish, eg paving slabs with margin infill at abutments
9 Shieldflash U

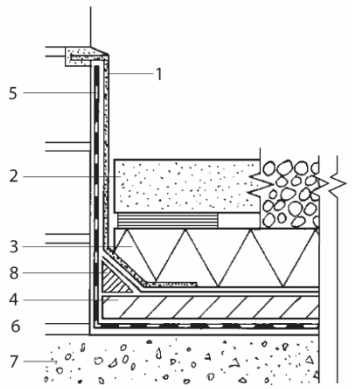


DS11 fully-bonded triple protection inverted roof system
for podiums, pedestrian areas and balconies

1 concrete deck, flat or laid to falls
2 Shield CP (bonding layer)
3 15 mm Shieldflex PR waterproofing
4 filter membrane
5 insulation board
6 permeable membrane
7 surface finish, eg paving slabs

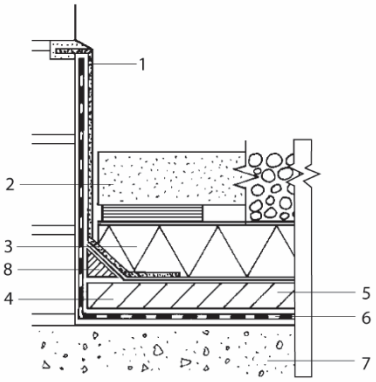
Figure 1 Typical design specifications (continued)

flexible upstand



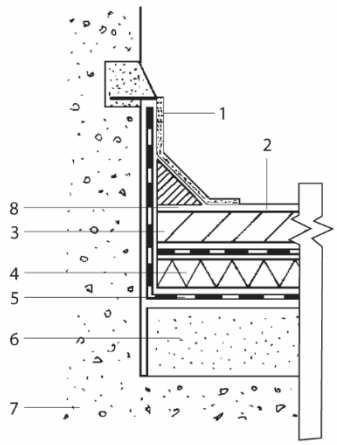
DS1 standard inverted insulated roof/patio

1 Shieldflash U and T upstand
2 precast paving slabs on pads/gravel ballast 50 mm to 75 mm
3 thermal insulation
4 geotextile membrane
5 15/20 mm Guaraflex PR
6 Shield CP
7 concrete substrate with Shieldscreed or sand-cement screed to falls
8 flexible fillet strip



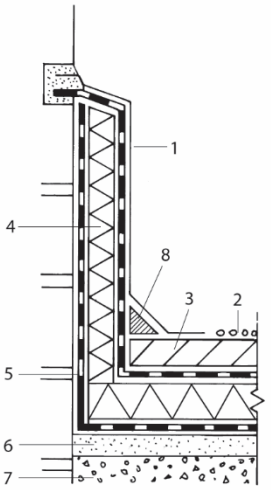
DS2 super inverted insulated roof/patio

1 Shieldflash U and T upstand
2 precast paving slabs on pads/gravel ballast 50 mm to 75 mm
3 thermal insulation
4 geotextile membrane
5 20 mm Shieldflex PR
6 Shield CP Super
7 concrete substrate flat or with Shieldscreed or sand-cement screeds to falls
8 flexible fillet strip



DS3 warm roof concrete deck

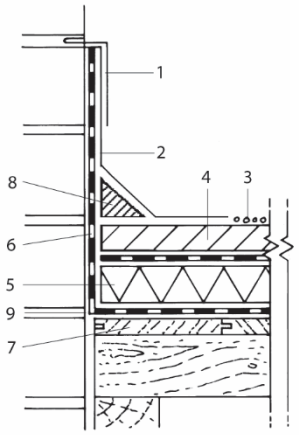
1 Shieldflash U and T upstand
2 solar reflective paint or 10 mm reflective chippings in bitumen compound
3 15/20 mm Shieldflex PR on Shield CP Super
4 insulation board
5 single-layer Shieldflex PR or Shield CP vapour control layer
6 Shieldscreed or sand-cement screed to falls
7 concrete deck
8 flexible fillet strip



DS3(1) warm roof insulated upstand

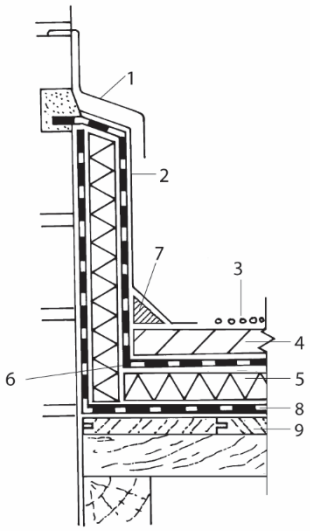
1 Shieldflash U and T upstand
2 solar reflective paint or 10 mm reflective chippings in bitumen compound
3 15/20 mm Shieldflex PR on Shield CP Super
4 insulation board
5 single-layer Shieldflex PR or Shield CP vapour control layer
6 Shieldscreed or sand-cement screed to falls
7 concrete deck
8 flexible fillet strip

Figure 1 Typical design specifications (continued)



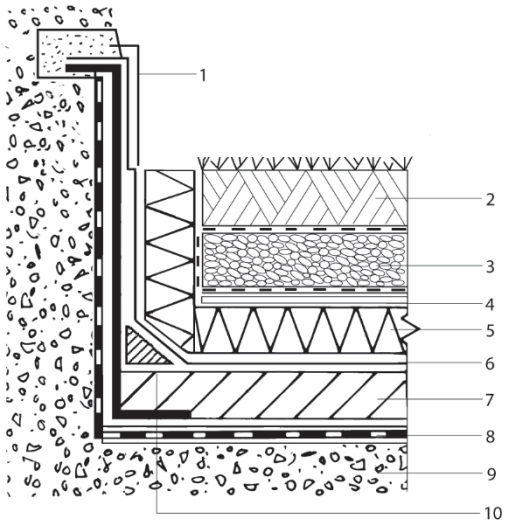
DS4 warm roof timber deck

1 cover flashing
2 Shieldflash U and T upstand
3 solar reflective paint, or 10 mm reflective chippings in bitumen
4 15/20 mm Shieldflex PR on Shield CP Super
5 insulation board
6 Shield CP Super
7 plywood deck or softwood boarding
8 flexible fillet strip
9 Shield CP vapour control layer



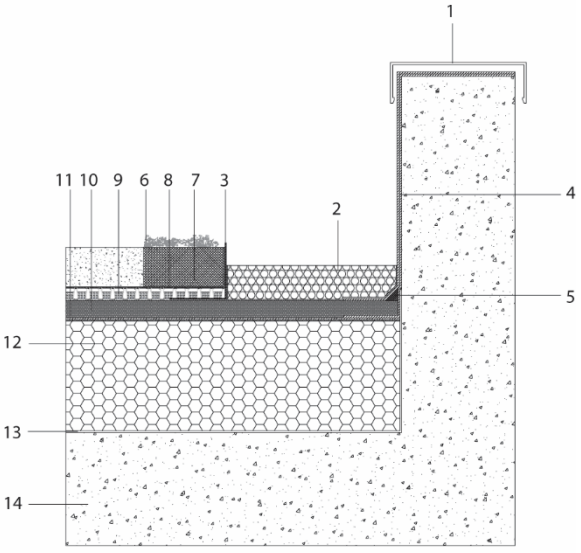
DS4(1) warm roof timber insulated upstand

1 cover flashing
2 Shieldflash U and T upstand
3 solar reflective paint, or 10 mm reflective chippings in bitumen
4 15/20 mm Shieldflex PR
5 insulation board
6 Shield CP Super
7 flexible fillet strip
8 Shield CP Super vapour control layer
9 plywood deck or softwood boarding



DS5 insulated roof gardens and planters

1 Shieldflash U and T upstand
2 soil and vegetation
3 filter layer with filter membrane
4 paving slab
5 insulation board
6 non-woven polyester fleece isolating layer
7 two-coat Shieldflex PR, 25 mm horizontally and three-coat 20 mm vertically, continued 150 mm above landscaped level
8 Shield CP Super
9 concrete substrate/Shieldscreed or sand-cement screed to falls
10 flexible fillet strip



DS7 warm roof systems (zero falls)

1 aluminium coping (by others)
2 vegetation barrier (20-40 mm grade ballast (60 mm deep x 300 mm wide around upstand)
3 aluminium edge retainer
4 Shieldflash U and T upstand
5 flexible fillet strip
6 growing medium and vegetation or roofing slabs on 10 mm paving supports
7 root barrier membrane
8 drainage layer
9 Geotextile protection membrane
10 three 10 mm coats Shieldflex PR
11 Shield CP
12 PIR torch receivable insulation minimum compressive strength 150 kPa (10%) (flatboards) with taped joints
13 vapour control layer
14 reinforced concrete (zero falls)

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* 2022, 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.

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 and 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 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* 2022 require a minimum finished fall of 1:60 for green roofs and roof gardens.

4.7 Structural decks for roof gardens, inverted roofs and green roofs must be suitable to transmit the dead and imposed loads experienced in service.

4.8 Imposed loads, dead loading and wind loads are calculated in accordance with BS EN 1991-1-1 : 2002 and BS EN 1991-1-3 : 2003 and their UK National Annexes. For the purpose of calculating design loads, a weight per unit area of 2.4 $kg \cdot m^{-2}$ per mm thickness of Shieldflex PR should be used. The Certificate holder must be consulted for the weights of individual specifications.

4.9 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*.

4.10 The 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.

4.11 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 in accordance with the relevant clauses of BS 6229 : 2018
- 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, suitable for use with mastic asphalt and be either:

- as described in the relevant clauses of BS 6229 : 2018, or
- the subject of a current BBA Certificate and used in accordance with, and within the scope of, that Certificate.

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

4.14 The NHBC requires that roof waterproofings, once installed, are inspected in accordance with *NHBC Standards* 2022, Chapter 7.1, Clause 7.1.11, and undergo an appropriate integrity test, where required. Any damage to the membrane is repaired in accordance with section 15 of this Certificate and reinspected.

5 Practicability of installation

The system must be installed by contractors who have been trained and approved by the Certificate holder.

6 Weathertightness

The system will adequately resist the passage of moisture into the interior of a building and enable a structure to satisfy the relevant requirements of the national Building Regulations.

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 with respect to the proximity to a boundary by the documents supporting the national Building Regulations.

7.2 A roof incorporating the system will also be unrestricted with respect to the proximity to a boundary 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 and 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 and so, is also unrestricted in terms of proximity to a boundary.

7.5 The classification and permissible areas of use of other specifications should be confirmed by reference to the requirements of the documents supporting the national Building Regulations.

8 Adhesion

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.

9.3 The system is capable of accepting minor structural movement while remaining weathertight.

10 Resistance to penetration by roots

When used in conjunction with Shieldflash T Root Barrier, the system will resist penetration by plant roots and can be used as a waterproofing system in green roof and roof garden specifications.

11 Maintenance and repair

11.1 The roof system must be the subject of six-monthly inspections and maintenance in accordance with the recommendations in BS 6229 : 2018, Chapter 7 and the Certificate holder's own maintenance requirements, where relevant, to ensure continued satisfactory performance.

11.2 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.

12 Durability

12.1 The system will have a service life in excess of that of conventional grades of mastic asphalt used in roofing applications.

12.2 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.

13 Reuse and recyclability

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

Installation

14 Procedure

14.1 Installation of the Shieldflex R Roof Waterproofing System is 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. The waterproofing layer can be applied in one or more layers. Typical specifications are shown in Figure 1.

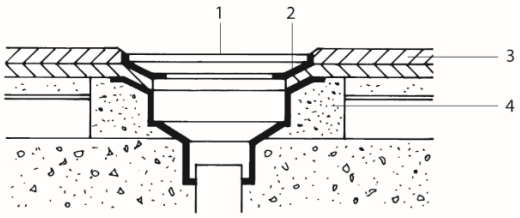
14.2 Deck surfaces must be dry, clean and free from sharp projections such as nail heads or concrete nibs.

14.3 Care must be taken not to exceed the maximum safe heating temperature of 240°C.

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

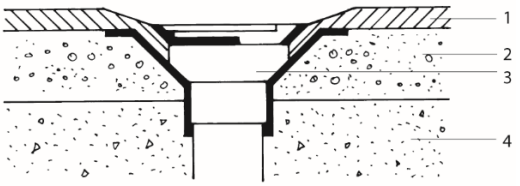
Figure 2 Typical installation details

Rainwater outlet — insulated deck



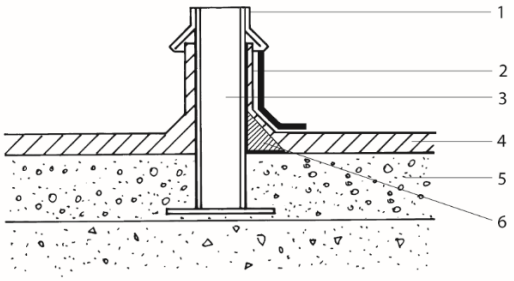
1 approved rainwater outlet
2 waterproof asphalt or membrane dressed into outlet
3 specified roof finish
4 concrete surround

Rainwater outlet — uninsulated deck



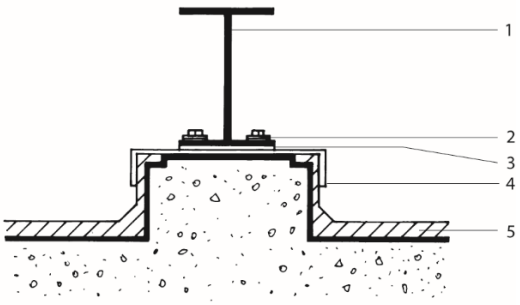
1 roof finish, selected specification
2 screed or similar to deck
3 flat roof rainwater outlet
4 solid slab

Handrail — standard



1 watertight collar
2 two coats mastic asphalt to skirting or Shieldflash U and T
3 standard/support
4 specified roof finish
5 screed or similar deck
6 flexible fillet strip

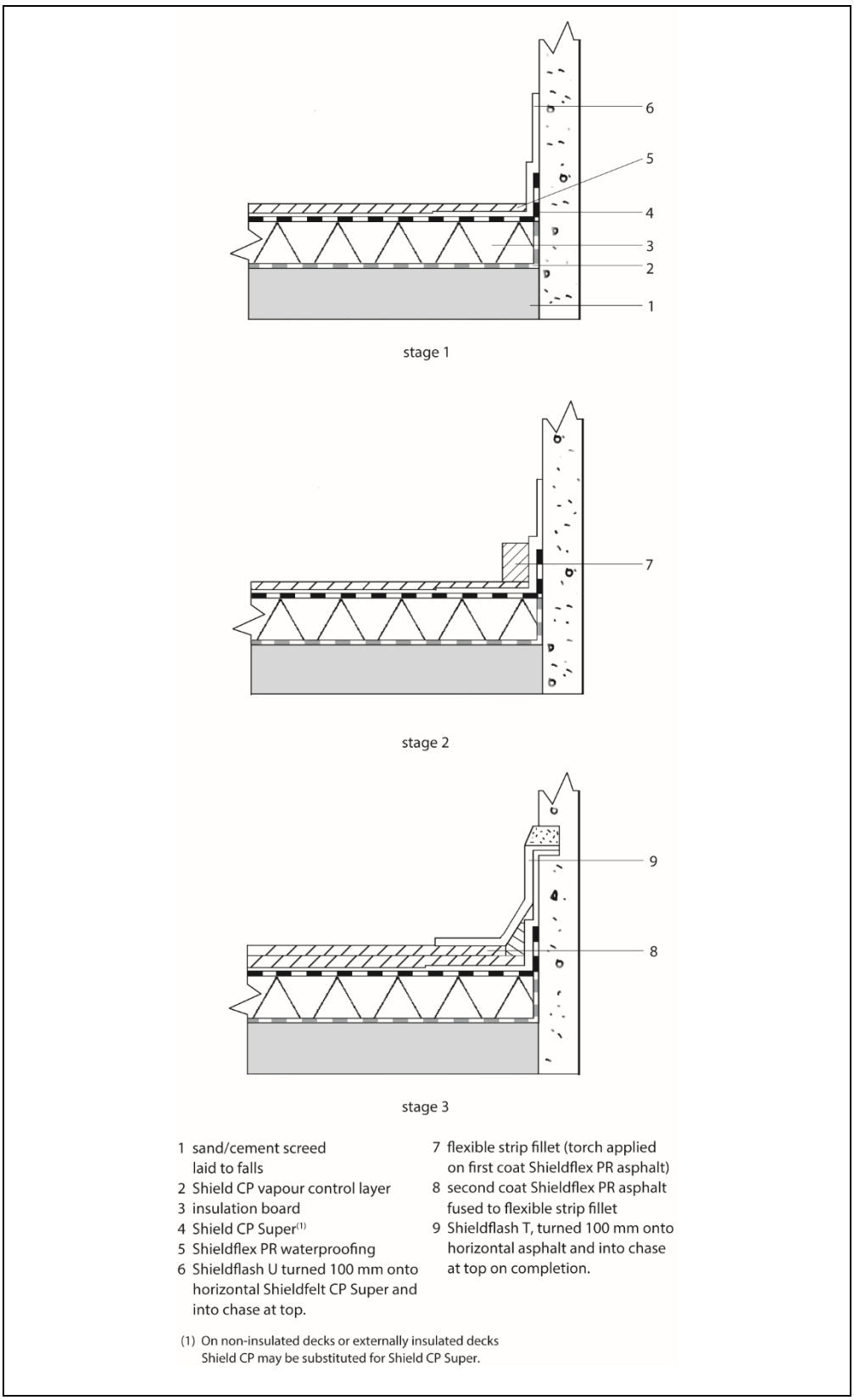
Cradle track plinth



1 RSJ or similar track
2 lead washers under mild steel washers
3 mastic bedding
4 code 4 lead capping
5 specified roof finish

14.5 When incorporating a preformed flexible fillet strip in place of the angle fillet, upstand details must be made in accordance with the build-up procedure detailed in Figure 3.

Figure 3 Sequence of build-up — upstand details incorporating preformed flexible fillet



1 sand/cement screed laid to falls
2 Shield CP vapour control layer
3 insulation board
4 Shield CP Super(1)
5 Shieldflex PR waterproofing
6 Shieldflash U turned 100 mm onto horizontal Shieldfelt CP Super and into chase at top.
7 flexible strip fillet (torch applied on first coat Shieldflex PR asphalt)
8 second coat Shieldflex PR asphalt fused to flexible strip fillet
9 Shieldflash T, turned 100 mm onto horizontal asphalt and into chase at top on completion.

(1) On non-insulated decks or externally insulated decks Shield CP may be substituted for Shield CP Super.

14.6 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, the system should have one of the following surface finishes which are included in BS 8218 : 1998:

a) mineral aggregates of limestone, granite, gravel, calcined flint, calcite, feldspar or similar, of 14 mm nominal size, free from dust, bedded in a suitable compound
b) ballast of 20 to 40 mm graded aggregate, 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.

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

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

14.9 Other applications, such as green roofs or roof gardens, may need a protective screed laid on the asphalt or an isolating membrane, depending on the circumstances. In these situations, the advice of the Certificate holder should be sought.

Technical Investigations

15 Tests

Tests were carried out on samples of the Shieldflex R Roof Waterproofing System and the results assessed to determine:

General characteristics

- ash content
- ring and ball softening point
- penetration
- weight per unit area.

General physical properties

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

Service performance

- hardness on unaged and heat-aged samples
- resistance to water pressure
- flow resistance
- static indentation on hard substrate
- hard body impact at -10°C and at +20°C.

16 Investigations

16.1 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.

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

Bibliography

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

BS 8000-0 : 2014 *Workmanship on construction sites. Introduction and general principles*
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*
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 + A2 : 18 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 : 2016 *Fire classification of construction products and building elements — Classification using data from external fire exposure to roofs tests*

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.