



IKO PERMATRACK BRIDGE DECK SURFACING

DESIGN & INSTALLATION GUIDANCE DOCUMENT



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PRODUCT SCOPE

This design guidance document relates to IKO Permatrack Bridge Surfacing for use as a surface course, and as a protection layer on new and refurbished carriageway/cycleway/walkway constructions for steel, concrete and timber bridge decks.



DESCRIPTION

IKO Permatrack Bridge Surfacing is used on steel, concrete, timber bridges and elevated carriageway structures. IKO Permatrack Bridge Surfacing is mastic asphalt manufactured from selected SBS modified bitumen, Trinidad Lake Asphalt, limestone filler and specially graded aggregates.

The system is designed primarily for use as a wearing course over a proprietary accredited PMMA or bituminous sheet waterproofing system. Tack coat/bond coats may be required as recommended by the manufacturer of the waterproofing system and IKO Permatrack Bridge Surfacing can also be applied to an existing planed traditional road surfacing material.

IKO Permatrack Bridge Surfacing is also used as a protection layer over the waterproofing system prior to installing the traditional surfacing system or ballast for railway bridges.



FEATURES & BENEFITS



Versatile

Can be used for a range of roadway applications as listed in this guidance document.



Waterproof

Impervious to water penetration and therefore unaffected by the effects of vehicle pressures and freeze thaw cycling.



No compaction

Unlike conventional road surfacing, no compaction is required.



Reduced structural loading

Dead loads on structure can be reduced through minimising the thickness of surfacing.



Durable

Designed for long-term durability, helping reduce the need for follow-up repairs and minimise disruption to road users.



Large/small areas

Can be installed in varying size areas to produce a seamless running surface



Flexible

Polymer modification within the mastic asphalt offers greater flexibility at low temperatures and increased thermal stability at higher temperatures.

KEY FACTORS

- ✓ Thickness – can be installed at a range of thicknesses to accommodate varying levels of road surfacing for either new, refurbishment or maintenance applications.
- ✓ Can be built up in multiple layers.
- ✓ Surface Texture – when used in conjunction with surface bitumen pre coated chippings or other suitable surface dressings a surface texture depth and skid resistance can be achieved for use on all types of highways.
- ✓ Indentation – in accordance with test BS EN 12697-20.
- ✓ Wheel tracking – not applicable to mastic asphalt type surface, however laboratory test results from independent third party have shown satisfactory figures for initial rut depth and overall rut depth.
- ✓ Sensitivity to water – impervious to water ingress.
- ✓ TLA – Trinidad Lake Asphalt – contains naturally occurring bituminous material in the overall binder content to provide additional thermal stability and improve workability and resistance to rutting and deformation under loading.
- ✓ Durability – will accept without significant damage, the type of traffic and concentrated loads associated with all types of highways.
- ✓ Bond to substrate – the installed system has excellent bond strengths to concrete, bituminous materials and when used in conjunction with proprietary bituminous or PMMA waterproofing systems.

MANUFACTURE

IKO Permatrack Bridge Surfacing is manufactured using mastic asphalt production methods.

The products referenced in the technical guidance document have been assessed as meeting the requirements of BS EN 13108-6 and have verified Declarations of Performance (DoP's) with the products certified as UKCA/CE marked for use on highways, roads and bridges.

The Quality Management System of IKO PLC has been assessed and registered as meeting the requirements of BS EN ISO 9001 (Certificate No. FM595512).

The Environmental Management System of IKO PLC has been assessed and registered as meeting the requirements of ISO 14001 (Certificate No. 24700).

The Health & Safety Management System of IKO PLC has been assessed and registered as meeting the requirements of ISO 45001 (Certificate No. 24873)

The Responsible Sourcing Management System of IKO PLC has been assessed and registered as meeting the requirements of BES 6001: Issue 3 (Certificate No 24703).



DELIVERY AND SITE HANDLING

IKO Permatrack Bridge Surfacing is normally supplied direct to site in purpose built hot charge transporters capable of holding up to 18 tonnes of material. IKO Permatrack Bridge Surfacing is also available in block form for remelting on site, blocks may require the addition of sourced* granite coarse aggregate prior to installation depending on the application.

*Added coarse aggregate should be sourced/purchased directly for IKO to meet the requirements of the IKO issued Declaration of Performance.

IKO Permatrack Bridge Surfacing is not classified under The Chemicals (Hazard Information and Packaging for Supply) Regulations 2009 (CHIP4)/ The Classification, labelling and Packaging of Substances and Mixtures (CLP Regulations) 2009.

Table 1: Identification, UoM & delivery quantities

PRODUCT	CODE	SIZE	QTY/PALLET
IKO Permatrack Bridge Surfacing – Hot Charge			
Main Carriageway: 45% 10mm (45 MA10 10/20) 40% 10mm (40 MA10 10/20)	54911045 54911140	Made to order	4min – 18max tonnes
Footpaths/Cycleways: 25% 4mm (MA4 10/20)	54910425		
Added grit* – Bags: 6mm Basalt 10mm Granite	39983100 39983200	25kgs 25kgs	50 bags per pallet 50 bags per pallet

*Sourced directly from IKO PLC to meet the requirements of the relevant Declaration of Performance (DoP)

UKCA/CE MARKING

IKO has undertaken UKCA/CE marking the IKO Permatrack Bridge Surfacing in accordance with harmonised European Standard BS EN 13108-6. An asterisk (*) appearing in the following data indicates that data shown are given in the manufacturers Declaration of Performance.

DESIGN CONSIDERATIONS

GENERAL

IKO Permatrack Bridge Surfacing is suitable for use on bituminous, concrete, steel and timber substrates/structures provided they are stable and have sufficient loadbearing strength to support the loads imposed during installation and service.

*Applications of Permatrack Bridge Surfacing to timber substrate would typically be with a Sheathing Felt (B SF) underlay and overlaid with Expanded Metal Lathe (EML) mechanically fixed.

PRACTICALITY OF INSTALLATION

Installation can only be carried out by specialist contractors using purpose-designed equipment, or by hand where appropriate. Operatives should be fully trained and experienced in mastic asphalt laying techniques. (See installation section of this data sheet).

DENSITY

The mass per unit area of mastic asphalt varies due to a number of factors such as the differing proportions of constituents and the nature and quantity of coarse aggregate added. For practical and load calculation purposes the mass of the mastic asphalt can be taken to be 2.4Kg/m² per millimetre of thickness or 2.4 tonnes per cubic metre.

THICKNESS – BS 594987

Roads and carriageways generally min 40mm in a single layer.

For surfacing thicknesses below 40mm please contact IKO Road technical services

Footpaths and cycleways generally min 20mm in a single layer.

Roads and carriageways of greater depth can be built up in multiple layers.

IKO Permatrack Bridge Surfacing can be used as a regulating layer, binder course and surface course.

Please refer to table M.1 of BS 594987 Annex M for further information.

Table 2: Quantity calculations & usage rates

IKO Permatrack Bridge Surfacing thickness (mm)	Kg/m ²	m ² per tonne
25mm	60	16.0
30mm	72	13.5
35mm	84	11.5
40mm	96	10.0
45mm	108	9.0
50mm	120	8.0
55mm	132	7.5
60mm	144	6.5

SURFACE MACROTEXTURE

The IKO Permatrack Bridge Surfacing on its own does not provide a surface macrotexture but requires bitumen coated chippings of a specific size and min 65 PSV (Polished Stone Value), max 10 AAV (Aggregate Abrasion Value) to be embedded into the surface. Or alternative surface dressing material.

Unless otherwise specified by the purchaser, the mastic asphalt for highways, while still warm and in a plastic condition, should be covered with a layer of coated chippings.

Table 3: Surface finish, Spread Rates & system thickness

Surface finish	System thickness (mm)	Rate (kg/m ²)
Sand rubbed (crimped)	All thicknesses*	N/a
6mm pre-coated chipping	All thicknesses	6.0 – 7.5
10mm pre-coated chipping	All thicknesses	7.5 - 9.5
14mm pre-coated chipping	Minimum 35mm	7.5 – 10.0
20mm pre-coated chipping	≥40mm	10.0 – 13.0
High friction	All thicknesses	N/a

Application of the pre-coated chippings can be by either machine or by hand. If applied by hand then some variability in spread rate or distribution can occur. It may be prudent prior to installation of the full bridge surfacing to install a trial area with the specified chippings which is assessed and agreed/signed off by the client/specifier as acceptable.

The chippings should then be lightly rolled into the surface of the asphalt by means of a suitable hand or mechanical roller.

When the chippings are being spread, the channels against kerbs should be covered by battens, not less than 150mm wide, so as to ensure that a smooth channel is maintained to facilitate the flow of surface water to the gullies.

When used with the appropriate surface finish the system can achieve an initial texture depth in excess of 1.5mm and retained texture depth after rutting to a depth of 5mm in excess of 1.0mm.

Where high Skid Resistance Values (SRV's) are specified the application of high friction surfacing may be required. Installed in accordance with the manufacturers instructions.

PERMANENT DEFORMATION (*) – EN 13108-20

The indentation of specimens prepared in accordance with EN 13108-20.

The indentation shall be determined in accordance with EN 13108-20.

IKO Permatrack Bridge Surfacing has indentation limits as declared on the relevant Declaration of Performance certificate.

WHEEL TRACKING – EN 12697

The resistance to permanent deformation was also assessed by means of the Wheel Tracking Test (WTT), in accordance with EN 12697.

SENSITIVITY TO WATER

The standard Saturation Ageing Tensile Stiffness (SATS) described in SHW clause 953 combines the ageing and moisture damage mechanisms. The durability assessment showed that materials performed well under SATS conditions.

DURABILITY

In the UK there are numerous examples of mastic asphalt used as a surfacing material on major bridges such as The Forth Road Bridge (original crossing), Severn Bridge (original crossing), Humber Bridge, etc. Mastic Asphalt has also been used on other bridge structures such as swing bridges and lifting bridges.

Durability can be determined by the Indirect Tensile Stiffness Modulus test in accordance with EN 12697.

A correctly installed, well maintained IKO Permatrack Bridge Surfacing can last in excess of 20 years.

INSTALLATION

GENERAL

IKO Permatrack Bridge Surfacing must be installed in accordance with the recommendations listed below and in accordance with BS 594987.

The system can be applied to bituminous, concrete, steel and timber substrates/structures.

SUBSTRATE PREPARATION

The surface on which the IKO Permatrack Bridge Surfacing is to be laid should be made good and adjusted to a contour approximating to the final contour and swept clean of debris and standing water.

All surfaces should be clean dry and free from dust, oil, grease contaminants.

For bridge surface course applications applied over a BBA HAPAS certified PMMA waterproofing system a tack coat as recommended by the waterproofing manufacturer must be installed.

For a surface course over an existing bituminous material a bitumen emulsion tack coat must be applied uniformly.

For a surface course over new bituminous material no specific preparation is required.

Note: In circumstances where blowing of the IKO Permatrack Bridge Surfacing occurs and no specific bond strength to the substrate is required (never for bridge decks) an isolating layer of Glass Fibre Tissue may be used with approval of the purchaser/client.



MATERIAL

Material remelted on site from blocks broken into pieces of convenient size and carefully re-melted, preferably in mechanical mixers. At this stage the requisite proportion of coarse aggregate should be fed in successive portions until the complete charge is thoroughly incorporated. At no time during re-melting should the temperature exceed 230°C

The coarse aggregate content is expressed as a percentage by mass of the as-laid material. The mass of coarse aggregate has to be deducted from the tonnage of the as-laid material to give the mass of mastic blocks required.

Material prepared and transported hot from the manufacturer will contain the prerequisite amount of coarse aggregate and must be transported to the point of laying in suitably agitated mechanical mixers.



IKO Hot Charge vehicle



IKO Luggers for transportation to point of lay

RECOMMENDATIONS FOR LAYING

IKO Permatrack Bridge Surfacing should be laid, normally in one coat (multiple layers are acceptable), at a temperature between 175°C and 230°C and spread uniformly by hand using wooden floats or by machine on the prepared and regulated surface. The thickness of the IKO Permatrack Bridge Surfacing mastic asphalt and the percentage of added coarse aggregate should be in accordance with the manufacturers instructions and as specified by the purchaser/client. Where necessary steel gauges of the requisite dimensions should be employed. Preferably splayed/angled gauges should be used for side/centre joints to maximise the joint bond and reduce the likelihood of cracking or splitting of the joint.

Where blowing is likely to occur during laying it may be prudent to install in two, or more layers. Piercing and making good any areas of blowing as the installation progresses.

It is advised that when working on cambers or cross-falls in the structure, then works should be started at the top of the camber/crossfall to reduce any 'rolling' of the material and therefore any discrepancy in the levels between bays.

When working on (access) ramps or inclines then installation should start at the bottom of the ramp/incline but at the top of the bay, so the levels can be controlled during installation, again reducing the likelihood of material 'roll' and subsequent level discrepancies.

Further information on installation is detailed in BS 594987



Hand Lay



Machine Lay

JOINTS

Care should be taken to ensure that all joints are properly and truly made.

The joints between sections of work should be made by warming the existing IKO Permatrack Bridge Surfacing mastic asphalt by the application of an excess of hot mastic asphalt (hot poultice) which is subsequently trimmed off to form an accurately level joint.

Use of a gas/heating gun to warm the joint should be used sparingly to avoid burning, and therefore potentially hardening the joint

Alternatively saw cut to three quarter depth, nominal 10mm wide. Clean then seal with N2 Bituminous hot poured sealant compliant with EN 14188:1 or similar

PROJECTIONS

Before laying the IKO Permatrack Bridge Surfacing mastic asphalt the edges of all manholes, gully frames, boxes etc. against which it is to abut should be thoroughly cleaned and primed and removable steel gauges placed against the upstands. Allow the mastic asphalt to cool, remove the gauges and infill the gap with N2 Bituminous hot poured sealant compliant with EN 14188:1 or similar.

Alternatively proprietary self-adhesive bituminous tapes can be installed against all ironworks.

Where the IKO Permatrack Bridge Surfacing is to abut kerbs, the edges of these should be similarly treated.

The finished surface should be kept flush with, or not exceeding 3mm above, such projections.

SURFACE FINISH

Unless otherwise stated by the purchaser/client, the IKO Permatrack Bridge Surfacing mastic asphalt for roads and carriageways, while still warm and in a plastic condition should be covered with a layer of coated 6mm*, 10mm*, 14mm or 20mm bitumen coated chippings or specified high friction surfacing (see surface macrotexture above).

Surface finish of footways, unless otherwise specified by the purchaser/client can be sand rubbed and if required lightly rolled using a dimpled roller to provide a crimped finish.

*Due to the hand-laid application of 6mm and 10mm pre-coated chippings being a 'blinding' of the surface, the surface should be immediately swept, prior to rolling, checking for any unchipped patches, which can then be corrected to ensure full surface treatment coverage.

For surface regularity for both machine/paver and hand-laid applications refer to table M.2 of BS 594987 or as specified by the client/specifier/engineer.

The surface of the IKO Permatrack Bridge Surfacing mastic asphalt, tested with a straight-edge 3m long placed parallel to the centre line of the carriageway should comply with Table M.2 of BS 594987.

Newly-laid sections should not be opened to traffic until the IKO Permatrack Bridge Surfacing mastic asphalt has cooled to the prevailing atmospheric temperature.

MAINTENANCE & REPAIR

A 150mm – 300mm channel free from pre-coated chippings should be formed at the kerbs to allow for free draining of surface water to the drainage outlets/gullies.

The system is not subject to any routine maintenance requirements. However, any damage must be repaired.

Any damaged areas must be cut back to sound material by planing or other suitable means and replaced with IKO Permatrack Bridge Surfacing mastic asphalt including all jointing to existing as described above.

In the event of any minor level discrepancies infrared equipment can be used to warm the area and re-levelled accordingly.

Gas gun/torch should not be used to re-heat joints as this can damage (burn/harden) the material.

GUARANTEE

IKO Permatrack Bridge Surfacing material comes with a 10-year material guarantee from the date of practical completion against manufacturing defects subject to terms and conditions (available on request).

CONDITIONS OF TECHNICAL GUIDANCE DOCUMENT

This technical guidance document is applied to products sold by IKO PLC and valid until withdrawal or until modification. Since this document may be subject to revision, it is the responsibility of designer/end-user to make sure of possessing the latest version of the datasheet (*see date of issuing).

Most recent version of this datasheet can be also accessed under www.ikogroup.co.uk
Modification of this guidance document repeals the previously issued versions.



BES 6001

Responsible Sourcing



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