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August 2002



Guaranteed Car Parking Solutions

GUARANTEED
ASPHALT

INTRODUCTION

Guaranteed Asphalt Ltd. is a leading manufacturer of mastic asphalt producing both British Standard and high performance polymer modified grades for a wide range of waterproofing/paving applications.

The Company is a manufacturing and contracting member of MAC (the Mastic Asphalt Council) and operates a Technical/Specification service to provide designers and specifiers with the full range of services required to ensure a trouble free installation.

INSTALLATION

Guaranteed Asphalt Ltd operate a registered list of contractors with the experience and resource to ensure the same high standards are carried through to completion.

A range of Guarantees are available to provide cover up to 20 years (including insurance backed options).

For further information please contact Guaranteed Technical Services on 020 7732 7781.



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DESIGN OF THE BASE GENERAL

The structural base should be of concrete either in situ or precast and designed to support the anticipated imposed loads without appreciable deflection or other movement.

In the case of precast concrete beams and similar units, adequate end and side restraints should be provided to reduce structural movements to a minimum. The manufacturer's advice should be sought on the need for a structural topping with this type of deck.

Surfaces to which mastic asphalt is to be installed should be prepared to a true and even surface free from irregularities enabling the mastic asphalt to be applied to a reasonably uniform thickness.

Before work begins all necessary scaffolding should be in position together with sufficient hoisting facilities and measures appropriate for the protection of personnel and the public. It is particularly important that roofs be provided with safety rails and all openings adequately protected.

The deck should be in an adequate condition to receive the mastic asphalt and all necessary builder's work should have been completed.

DRYING OUT THE BASE

Concrete slabs and concrete decks cast in situ should be drained downwards through temporary drain holes formed in the low points of the deck. Subject to checking their effect on structural strength, the holes should be 25mm diameter, positioned to avoid reinforcement bars in the concrete in accordance with BS 6229:1982. The holes should not be filled until seepage has ceased, before finishing work on the ceiling is commenced. Precast concrete roof decking units with open joints are self draining and holes are not required, but if the joints are subsequently sealed, they should be left open for as long as possible.

The concrete structure must be designed in accordance with BS 8110:Part 1:1997 and able to support all static and imposed loads without undue deflection.

The designer should study the need for movement joints in the structure. Movement joints should be continued at upstands, walls and edges of buildings.

FALLS

The falls should normally be provided in the base on which the asphalt covering is to be laid. To ensure adequate drainage, allowance should be made for normal construction tolerances and deflections in order to achieve a minimum finished fall of 1:80. Particular attention should be made to areas subject to pedestrian traffic.

DRAINAGE

Drainage should be provided and designed in accordance with the requirements of BS 6367:1983, Code of Practice for drainage of roofs and paved areas. Outlets should always be located at the level of the waterproof membrane and should be suitable for use in conjunction with mastic asphalt.

SUBSTRATES

CONCRETE

For in situ concrete or hollow tile constructions with an irregular surface, all falls except when provided as part of the structure should be formed by a screed such as given in BS 6229:1982. The surface should be provided with a float finish to a plane even surface free from ridges and indentations.

PRECAST CONCRETE UNITS

Precast concrete units should be used and fixed in accordance with manufacturer's instructions, finished with a suitable screed or concrete topping to receive mastic asphalt. Falls should be incorporated in the supporting structure or in the screed or concrete topping.



SAND AND CEMENT SCREEDS

When a reinforced concrete roof slab is overlaid with a screed to provide falls, the screed should be laid in accordance with BS 6229:1982. The surface should be provided with a float finish, even and smooth, free from hollows and ridges. The screed should be designed to remain free from cracks.

SUBSTRATES FOR RAMPS

The surface of the concrete or screed on a ramp should be lightly cross-tamped to provide a key. Tamps should not exceed 5mm in height, and it may be necessary to reduce the bay size to reduce slump during application.

TRAFFICKED APPLICATIONS

Mastic asphalt provides a versatile answer to the problem of providing paving or combined waterproofing and paving to structures and areas subject to traffic.

The specification to be used is dependent on a number of factors such as the type and degree of traffic to which the paved area will be subjected, whether point loading is anticipated and whether the paving is over accommodation areas.

Note: Whilst the product is designed for vehicle traffic some indentations should be expected from long-standing point loads and deformation may result from situations of very high stress.

DELIVERY

The product is normally delivered for use in bulk transporters containing the necessary coarse aggregate addition for the nominated paving thickness.

Block materials for traditional site remelt are available for detail work and horizontal areas not accessible by bulk delivery techniques.

LAYING – INSTALLATION/JOINTING TECHNIQUES – MASTIC ASPHALT PAVING

Each coat should be laid as evenly as practicable using a hand float and undue delay between coats should be avoided to prevent contamination.

Suitable gauges should be used to control the thickness of horizontal work.

Any blows should be pierced and made good whilst the mastic asphalt is still warm.

JOINTS

The junction between contiguous bays of mastic asphalt should be not less than 75mm from the corresponding junction in the preceding coat. The edge of the previously laid bay should be warmed and cleaned by the application of hot mastic asphalt which is then removed before the joint with the new materials is made.

SURFACE FINISHES

It is normal practice to sand-rub mastic asphalt paving. In addition, the surface can be crimped but the advice of the asphalt contractor should be sought as the gradient of the ramps may make control of the crimping roller difficult or it may be physically impossible to crimp edges. Alternatively, if superior skid resistance is necessary a synthetic resin-bonded grit or other surface dressing can be applied subject to specification.

SOLAR REFLECTIVE TREATMENT

The use of solar reflective paint on mastic asphalt skirtings and vertical work is recommended. The solar reflective treatment should be applied as soon as practicable after the mastic asphalt has been laid.

Care should be taken to ensure that paints specified as a solar reflective treatment on mastic asphalt are suitable for the purpose and that the specification requires their application in accordance with the manufacturer's instructions.

TECHNICAL SPECIFICATIONS DESCRIPTION

Guaraflex P polymer modified asphalt waterproofing and paving system for elevated decks for cars, light commercial and heavy goods vehicles may comprise a waterproofing layer of asphalt cement with graded limestone aggregate and a paving layer, incorporating 6mm or 10mm coarse aggregate.

Lytag/sand concrete or similar used with A142 steel mesh reinforcement to provide protection to the insulation in insulated specifications.

Standard specifications, descriptions and uses are given in the following pages.

Materials used with the system include:

Guaraflex PR - polymer modified mastic asphalt waterproofing layer/layers

Guaraflex PP - polymer modified mastic asphalt paving (standard grade)

Guaraflex PPH - polymer modified mastic asphalt paving (hard grade) for use in uninsulated, heated internal areas and heavy vehicle applications

Guaraflex U - 4mm thick polymer modified bitumen torch-on membrane used as flashing at abutments

Guaraflex T - 4mm thick polymer modified bitumen torch-on membrane (mineral finished) used as flashing at abutments

Guarafelt CP - 2mm thick polymer modified bitumen membrane

Guarafelt CP Super - 2mm thick aluminium faced polymer modified bitumen membrane

Guaralath - 1 to 2 mm thick expanded metal sheet for use on heavy duty applications

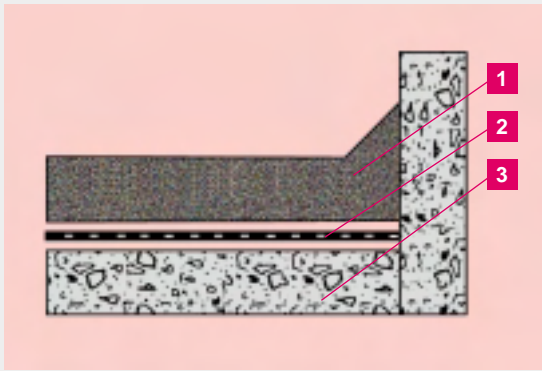
High density extruded polystyrene insulation - for use in insulated specifications. (Grade and thickness to suit required U value) or other suitable insulation approved by Guaranteed Technical Services



STANDARD SPECIFICATIONS

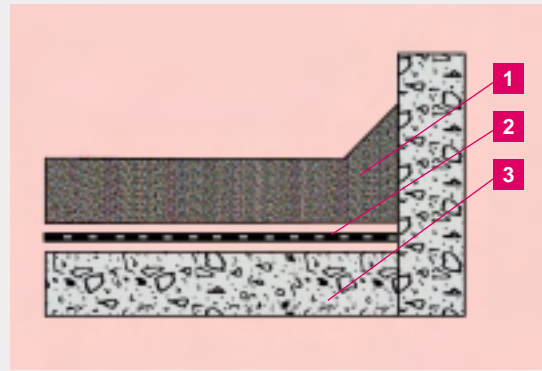
The waterproofing layer may be omitted from internal specifications where not subjected to hosing.

1 **Guaraflex P system 1**
 uninsulated, unheated, internal decks for cars and light commercial vehicles not subject to hosing



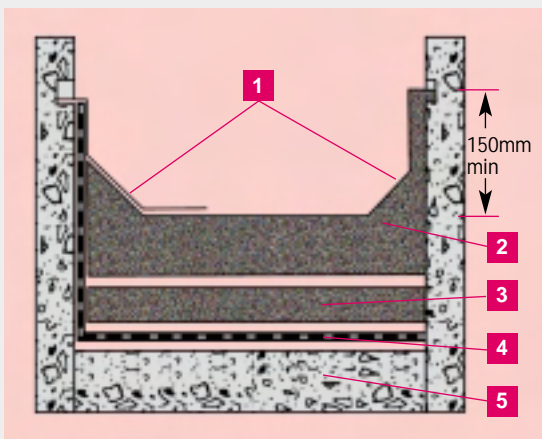
1. 25mm Guaraflex PP
2. Guarafelt CP
3. Concrete deck

2 **Guaraflex P system 2**
 uninsulated, heated, internal areas not subject to hosing



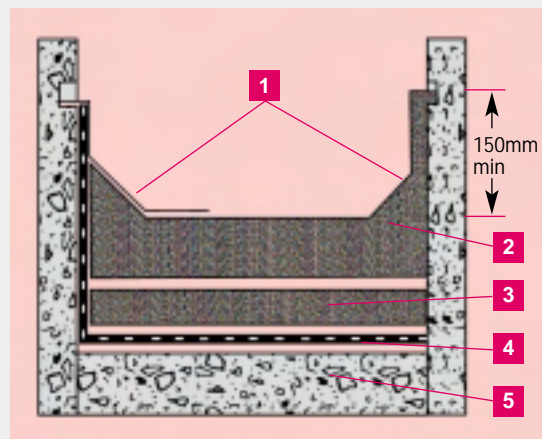
1. 25mm Guaraflex PPH
2. Guarafelt CP
3. Concrete deck

3 **Guaraflex P system 3**
 uninsulated, unheated, internal areas subject to hosing



1. 13mm Guaraflex PR skirting and fillet or Guaraflex U & T skirting (abutments)
2. 25mm Guaraflex PP
3. 10mm Guaraflex PR
4. Guarafelt CP
5. Concrete deck

4 **Guaraflex P system 4**
 uninsulated, heated, internal areas subject to hosing



1. 13mm Guaraflex PR skirting and fillet or Guaraflex U & T skirting (abutments)
2. 25mm Guaraflex PPH
3. 10mm Guaraflex PR
4. Guarafelt CP
5. Concrete deck



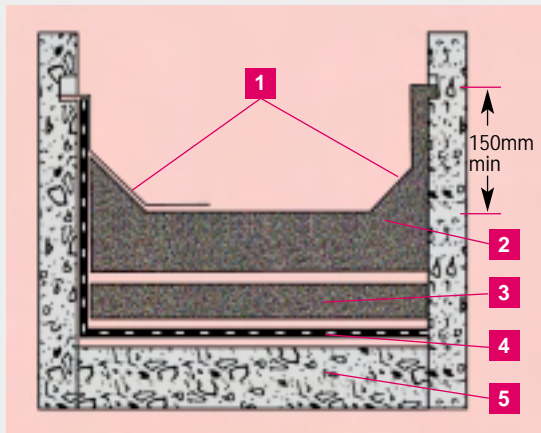
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5

Guaraflex P system 5

uninsulated, external decks for multi-storey roof top car parks for cars and light commercial vehicles

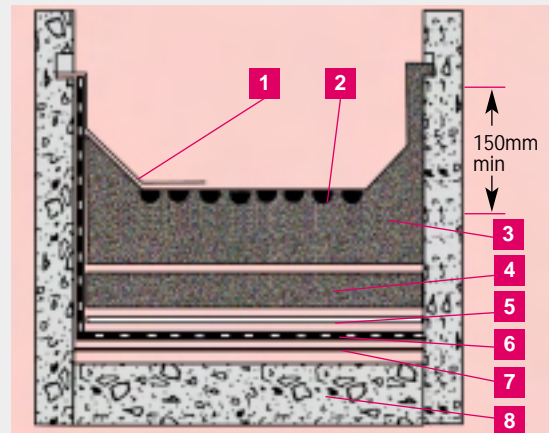


1. 13mm Guaraflex PR skirting and fillet or Guaraflex U & T skirting (abutments)
2. 25mm Guaraflex PP
3. 10mm Guaraflex PR
4. Guarafelt CP Super
5. Concrete deck

6

Guaraflex P system 6

uninsulated, external elevated decks for heavy commercial vehicles

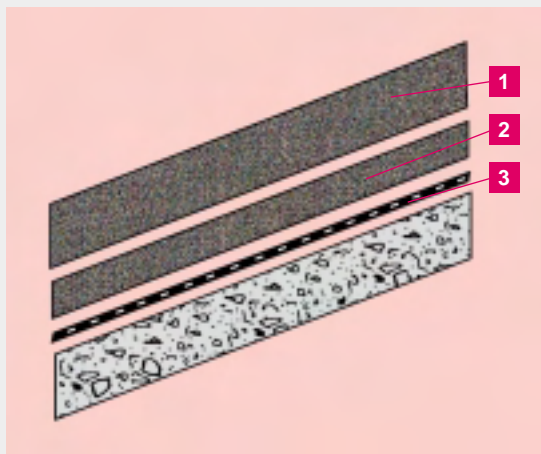


1. 13mm Guaraflex PR skirting and fillet or Guaraflex U & T skirting (abutments)
2. 20mm pre-coated chippings, rolled into surface
3. 35mm Guaraflex PPH
4. 15mm Guaraflex PR
5. Guaralath (drilled and plugged to concrete)
6. Guarafelt CP super
7. Bitumen primer
8. Concrete deck

7

Guaraflex P system 7⁽¹⁾

external ramps (not exceeding 1 to 10 gradient) for heavy commercial vehicles

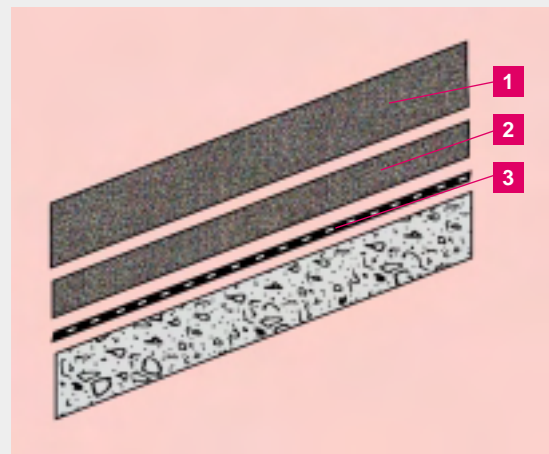


1. 30mm Guaraflex PPH
2. 15mm Guaraflex PR
3. Guaraglass bitumen coated glass tissue

8

Guaraflex P system 8⁽¹⁾

external ramps (not exceeding 1 to 10 gradient) for cars and light commercial vehicles



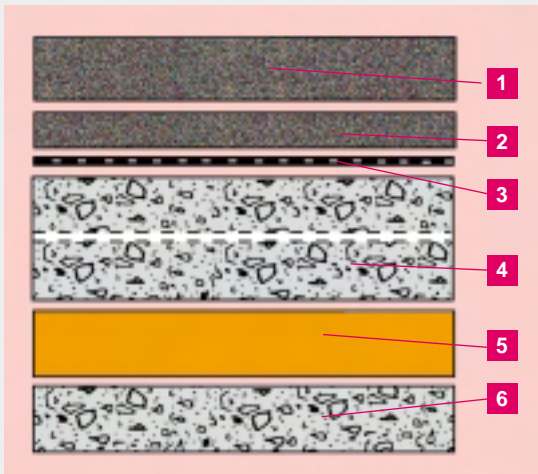
1. 25mm Guaraflex PP
2. 10mm Guaraflex PR
3. Guaraglass bitumen coated glass tissue



9

Guaraflex P system 9⁽¹⁾

insulated decks for cars and light commercial vehicles (max wheel load 2 tonne per axle)



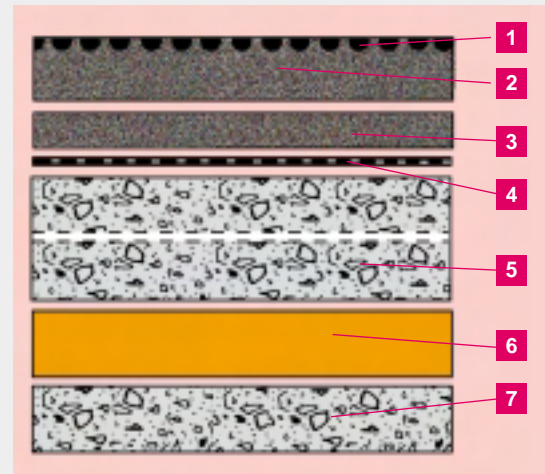
1. 25mm Guaraflex PP
2. 10mm Guaraflex PR
3. Guarafelt CP Super
4. 100mm min Lytag/sand concrete (Grade 20) or similar with A142 mesh reinforcement
5. Extruded polystyrene insulation
6. In situ concrete deck (falls 1 in 80 with 25mm drainage holes)

⁽¹⁾ 13 mm Guaraflex PR skirting and fillet or Guaraflex U & T at all abutments (not shown)

10

Guaraflex P system 10⁽¹⁾

insulated decks for heavy commercial vehicles (max wheel load 10.5 tonne per axle)



1. 20mm pre-coated chippings, rolled into surface
2. 35mm Guaraflex PPH
3. 15mm Guaraflex PR
4. Guarafelt CP Super
5. 100mm min Lytag/sand concrete (Grade 20) or similar with A142 mesh reinforcement
6. Extruded polystyrene insulation
7. In situ concrete deck (falls 1 in 80 with 25mm drainage holes)



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MAINTENANCE AND REPAIR

GENERAL

Guaraflex car parks which have been installed in accordance with the recommendations of this technical guide and the relevant British Standard Code of Practice can be expected to provide trouble-free service provided proper maintenance is observed.

Maintenance inspections should be carried out regularly by persons knowledgeable in mastic asphalt work.

All car parks should be inspected annually, preferably in the autumn, to clear leaves, debris and dirt, which may prevent proper drainage or cause deterioration. Where the car park is in an area of high dust or pollution, or in close proximity to trees, more frequent inspections may be necessary.

Inspection should be carried out both internally and externally. Particular attention should be given externally to car park covering abutments, joints, gutters and outlets and internally to corners, abutments and penetrations. Observations by occupants of building should be noted. During the course of maintenance inspections the wear of the car park should be systematically checked and a note made of any items requiring attention.

Localised repairs should be conducted by a specialist asphalt contractor generally in accordance with the recommendations of BS 8218 : 1998, Section 11 Maintenance and Repair.

For situations not covered by the above please contact Guaranteed Technical Services on 020 7732 7781.

DURABILITY

Test data examined by the BBA indicate that the product is stable at high temperatures and is flexible and resistant to impact damage at low temperatures. Accelerated ageing tests indicate a satisfactory retention of properties.

Available evidence indicates that the product should have a life expectancy in excess of that of conventional grades of mastic asphalt used in car parking and HGV Service Deck situations. With proper maintenance and repair, Guaraflex P should perform satisfactorily for a period in excess of 20 years.

General physical properties – Guaraflex P paving		
Test (units)	Method	Result
Density (kgm ⁻³):	direct measurement	
10mm Guaraflex PR		2137
25mm Guaraflex PP		2177
25mm Guaraflex PPH		2143
Weight per unit area (kgm ⁻²):	direct measurement	
10mm Guaraflex PR		22
25mm Guaraflex PP		54
25mm Guaraflex PPH		54
Tensile strength (Nmm ⁻²)	BS 2782 : Part 3 : Method 320E	
10mm thick Guaraflex PR:		
unaged		0.62
56 days heat aged at 70°C		0.97
180 days heat aged at 70°C		1.33
Elongation (%)	BS 2782 : Part 3 : Method 320E	
10mm Guaraflex PR:		
unaged		3.6
56 days heat aged at 70°C		1.9
180 days heat aged at 70°C		0.9
Water vapour permeability (gm ⁻² day ⁻¹)	BS 3177 : (75% RH/25°C)	
10mm Guaraflex PR		0.067





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