

***ULTI**DRIVE*

POROUS

GUIDE FOR APPROVED CONTRACTORS

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INTRODUCTION

The **ULTIDRIVE POROUS** range of free draining asphalt materials are designed for car parking and similar application. They can be used as part of a (SuDS) pavement construction.

ULTIDRIVE POROUS is sold only to Approved Contractors who have received training in the products and a copy of the Approved Contractors Guide.

The materials are suitable for lightly trafficked private driveways and car parking areas. Porous surface course, binder course and base asphalt mixtures are available depending on the required thickness of

asphalt. This should be laid on a granular reservoir layer which is designed to hold the necessary volume of rainfall.

The key areas that require specific attention are:

- Pre-Site planning
- Material thickness
- Joint patterns
- Roller/Plant types
- Weather conditions
- Speed of laying & compaction
- Experience
- Material temperature
- Material choice, including bitumens

The requirements of this guide are aimed at ensuring that proper compaction can be achieved along with the high levels of surface finish expected by customers.

1. APPROVAL OF LAYING CONTRACTORS

ULTIDRIVE POROUS is supplied to approved laying contractors and its use is subject to ongoing surveillance. The approval process is explained below.

1.1 Preparation for Approval

Applications for approval will be considered from experienced surfacing contractors who are established customers of Tarmac.

A meeting shall be held between the management of the contractor and a Tarmac Technical Department representative where the specific laying techniques associated with **ULTIDRIVE POROUS** shall be explained, along with the requirements detailed in this document.

During the presentation, an Approved Contractor application form shall be completed and signed by the representative of the contractor applying for approval.

The application form shall be counter signed by the representative of Tarmac.

1.2 Laying approval

The initial contract shall be monitored by Tarmac personnel to ensure that satisfactory performance is achieved.

1.3 Approval

Subject to the successful completion of the initial contract, approval will be given for the contractor to be added to the list of Approved Contractors. A certificate will normally be issued at this stage.

Approval shall be reviewed on an annual basis and may be withdrawn at any time at the discretion of Tarmac.

1.4 Surveillance

Any contract where **ULTIDRIVE POROUS** is to be laid may be subject to surveillance by Tarmac personnel. If ongoing performance is unsatisfactory, approval may be suspended or withdrawn.

2. MATERIAL SELECTION

2.1 Aggregate & Mixture Type

It is important that the correct material is carefully chosen to suit the site conditions, areas of high stress and high traffic loadings need consideration.

Due to the turning stresses from vehicles with power steering **ULTIDRIVE POROUS** surface course is mixed with a modified binder. It has significant implications for in-situ performance and for ease/difficulty of laying.

Not all asphalt plants are able to supply the modified binder surface course. The Approved Contractor should obtain from Tarmac a list of local plants able to supply all the **ULTIDRIVE POROUS** materials (asphalt and granular) but particularly the surface course.

6mm **ULTIDRIVE POROUS** is recommended for private driveways and is suitable for hand lay.

20mm **ULTIDRIVE POROUS** Bin is recommended for domestic driveways.

10mm **ULTIDRIVE POROUS** is recommended for machine laid work subjected to higher stresses and parking areas.

32mm **ULTIDRIVE POROUS** Base/Bin is recommended for larger car parks.

3. SITE ASSESSMENT

The Contractor shall ensure that a condition survey is carried out on each site prior to contract commencement.

Particular attention should be paid to the following:

- a) Suitability of the site for a porous pavement. (see introduction)
- b) Use / type of application (see 2.1 above for material selection).
- c) Exact areas involved, and required thickness (see section 7.3).
- d) Are there any PSV requirements?
- e) Suitability and regularity of the receiving course - Where's the water going?
- f) Will the material be machine laid, hand laid, or a combination of both?
- g) Accessibility for delivery vehicles, and for plant.
- h) Will barrowing or re-handling be necessary, and if so - over what distance?
- i) Laying, rolling and compaction patterns.
- j) Roller type (see section 7.4) and any other plant required.
- k) Any performance guarantees required by the client.

Relevant site assessment details shall be submitted along with the enquiry.

4. SURFACE PREPARATION

The receiving surface should be sound, free draining and of suitable regularity to ensure satisfactory water drainage and layer thickness.

Suitable free draining aggregates are available in the Tarmac **ULTIFLOW** range.

Existing surfaces should be cleaned and all loose material, mud, dirt and other debris must be removed.

Ironwork should be raised prior to surfacing and precautions taken to ensure it is kept clean.

Water must be able to pass through the underlying layers to allow adequate water drainage away from the **ULTIDRIVE POROUS**.

Existing surfaces may require additional treatment to allow for water drainage.

5. TRANSPORT

Vehicles used for the transport of **ULTIDRIVE POROUS** must be adequately cleaned prior to loading so that there is no risk of contamination.

Water or an approved release agent may be used in the vehicle body. Diesel must not be used as this causes binder softening and affects durability.

Excess liquid should be drained out by raising the vehicle body and allowing it to drain through the tailgate prior to loading.

ULTIDRIVE POROUS should only be transported on fully insulated vehicles. The insulation should include the vehicle floor to prevent excessive cooling of the material.

A rear hatched lorry is recommended for areas involving hand-lay or extended working times,

ULTIDRIVE POROUS must not be worked from a heap. The delivery vehicle should have a mechanical sheeting system, or a weather proof oversheet in combination with an undersheet or insulating duvet.

6. LAYING OPERATION

6.1 Material Receipt

The delivery ticket of each load of asphalt should be checked to confirm the correct material has been supplied.

Compaction and cleanliness of each of the asphalt layers are key factors in the structural and hydraulic performance of **ULTIDRIVE POROUS** and these are influenced by the following:

- a) Material temperature
- b) Weather conditions (temperature, wind, precipitation).
- c) Layer thickness
- d) Compaction plant
- e) Site trafficking
- f) Material storage

In order to ensure adequate compaction and workability of the material the maximum time recommended between manufacture and placement of Surface Course material is 4 hours. The material temperature shall be such that the minimum rolling temperature can be achieved. A calibrated probe may be useful to monitor material temperature.

Material Temperatures

Material	Binder Type	Minimum rolling temperature (°C)
6mm Surface Course	Modified	Commence rolling without delay to avoid chilling of the surface
10mm Surface Course	PMB	
Base/Binder Course	100/150pen	95
	40/60pen	105

6.2 Placement

Prior to placement of an asphalt course, the receiving layer shall be visually inspected to ensure it is clean and free from any contamination that may affect the porosity of the layer.

Due to their open grading, porous materials are more susceptible to wind chill and as a consequence have a shorter window for laying and compaction than conventional dense asphalts. This is particularly the case with the surface course which is thinner and contains a modified binder with a relatively pronounced 'crunch' temperature below which further compaction is impossible. Site trials have shown a rapid drop in temperature of surface course between discharge into a paver and compaction in mild but windy conditions of up to 30°C. Hand laying will inevitably be slower and runs a much more significant risk of not achieving full compaction. A maximum 5 minutes window between vehicle discharge and compaction is therefore strongly recommended.

Laying should be suspended during periods of heavy or sustained rainfall and/or when ambient temperatures are low (<5°C), particularly in highwinds. All these result in rapid chilling of the mat making full compaction difficult or impossible.

Tack coat is not required between asphalt layers due to their high binder content and open texture. When hand laying, asphalt shall be used directly from the delivery vehicle through shutes to avoid heat loss and contamination.

Care should also be taken to minimise walking on the surface course to avoid disturbance of the laid surface as blemishes will show up much more readily on such an open graded material.

By its nature, significant volumes of water will need to be applied to prevent materials sticking to equipment. Water should be applied through a spraybar or rose.

6.3 Joints

6.3.1 Base and Binder Course

Longitudinal joints do not need to be formed. Painting of joints is unnecessary. Transverse joints shall be cut back at least 300mm from the day joint and painted with hot bitumen or an approved cold bituminous emulsion.

6.3.2 Surface Course

Hot matching of the surface course gives the best type of construction joint reducing weak spots. However, this can be difficult to achieve with this material due to the fast temperature loss. If hot matching can be achieved the open joint must still be compacted and not left un rolled. If in doubt cut all longitudinal joints and form by using a cutting wheel whilst still warm, to a full depth vertical face and paint with hot bitumen or cold bituminous emulsion prior to matching.

Care shall be taken to ensure joints are cut straight as this is important in achieving the high standard of finish that customers expect from the system.

Transverse joints shall be saw-cut to a vertical face and painted with hot bitumen or cold bituminous emulsion prior to matching.

When joints are saw cut, dust must be prevented from marking the adjoining finished surface. The newly laid surface must be dowsed with water immediately prior to any such activity to prevent dust impregnating the bitumen binder.

All surface course joints should be located away from high stress points i.e turning areas on the driveway.

6.4 Thickness

The nominal compacted layer thickness should be as follows:

Nominal Size	Minimum thickness at any point	Nominal Layer Thickness
32mm Base	50mm	70-120mm
20mm Binder	35mm	50-80mm
10mm Surface Course	20mm	25-50mm
6mm Surface Course	20mm	25-40mm

Surface course thickness in particular should be monitored closely to avoid thin areas which are more susceptible to rapid chilling and therefore compaction problems.

6.5 Compaction

The selection of compaction plant should reflect the area of surfacing to be laid. Where compaction of material is not possible with conventional rollers, i.e. adjacent to walls, then whacker plates, pedestrian rollers and elephant foot tampers may be used. Neither type of compaction is as effective as conventional rollers.

Hand laid areas, those with restricted access or on small contracts may be compacted with a vibratory steel wheeled tandem roller with a minimum deadweight of 1.5 tonnes. Otherwise a 3-4 tonne tandem roller shall be used.

The use of tandem rollers operating in vibrating mode on surface course shall only be permitted for a single pass over the mat width or as required on restricted access or hand laid areas.

It is vital to roll the open joint first with no stand-off from the edge, with the roller to overhang the free edge by a minimum 100mm.

All rollers shall have fully operational water spray systems.

7. INSPECTION & TEST OF LAID MATERIAL

The contractor should ensure that the final laid material is visually inspected to check for defects. Where required, the laid material should be sampled and tested in accordance with individual contract requirements.