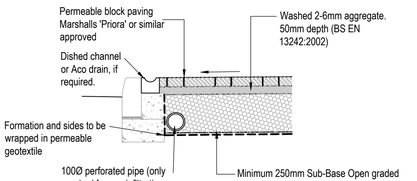
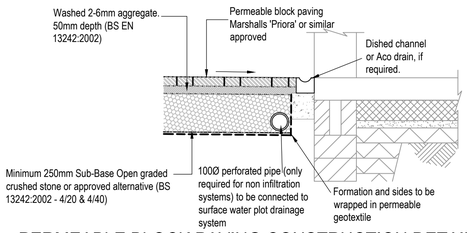


PERMEABLE BLOCK PAVING CONSTRUCTION DETAIL (PRIVATE DRIVE FALLING TOWARDS HIGHWAY)

(1:20)



PERMEABLE BLOCK PAVING CONSTRUCTION DETAIL (PRIVATE DRIVE FALLING TOWARDS GARAGE/PLOT)

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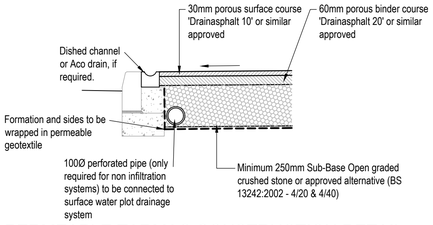

PERMEABLE TARMAC CONSTRUCTION DETAIL (PRIVATE DRIVE FALLING TOWARDS HIGHWAY)

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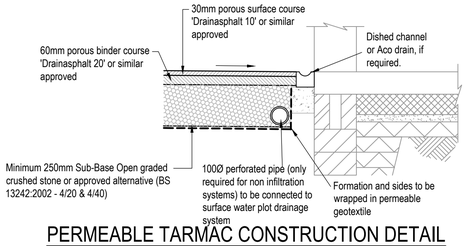

PERMEABLE TARMAC CONSTRUCTION DETAIL (PRIVATE DRIVE FALLING TOWARDS GARAGE/PLOT)

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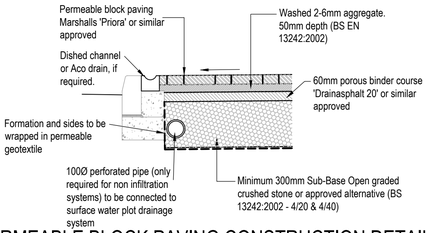
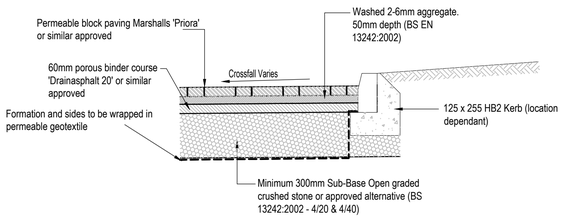


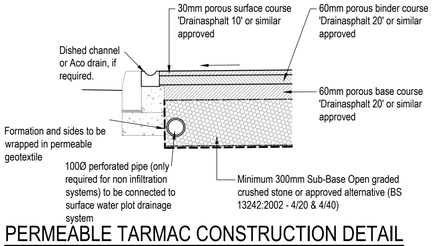
PERMEABLE BLOCK PAVING CONSTRUCTION DETAIL (SHARED DRIVE FALLING TOWARDS HIGHWAY)

(1:20)



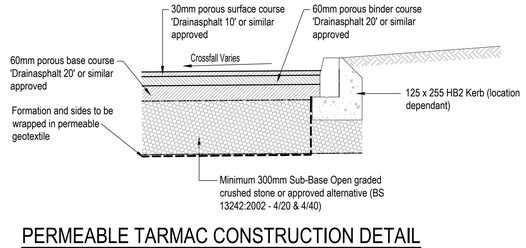
PERMEABLE BLOCK PAVING CONSTRUCTION DETAIL (SHARED DRIVEWAY AREAS)

(1:20)



PERMEABLE TARMAC CONSTRUCTION DETAIL (SHARED DRIVE FALLING TOWARDS HIGHWAY)

(1:20)



PERMEABLE TARMAC CONSTRUCTION DETAIL (SHARED DRIVEWAY AREAS)

(1:20)

SUBGRADE CBR	ADJUSTMENT TO THICKNESS OF SUB BASE(mm)
>4	250
3	350
2	600
1	SUBGRADE IMPROVEMENT REQUIRED

TABLE 1

Subgrade Improvement Table for Low CBR Values

PERMEABLE PAVEMENT OPERATION AND MAINTENANCE REQUIREMENTS

Maintenance schedule	Required action	Maintenance frequency
Regular maintenance	Brushing and vacuuming.	Three times/year at end of winter, mid-summer. after autumn leaf fall, or as required based on site-specific observations of clogging or manufacturers recommendations.
Occasional maintenance	Stabilise and mow contributing and adjacent areas.	As required.
	Removal of weed.	As required.
Remedial actions	Remediate any landscaping which, through vegetation maintenance or soil slip, has been raised to within 50mm of the level of the paving.	As required.
	Remedial work to any depressions, rutting and cracked or broken blocks considered detrimental to the structural performance or a hazard to users.	As required.
	Rehabilitation of surface and upper sub-structure.	As required (if infiltration is reduced as a result of significant clogging).
	Regritting block paving	Anually.
Monitoring	Initial inspection.	Monthly for 3 months after installation.
	Inspected for evidence of poor operation and/or weed growth. If required take remedial action.	3-monthly, 48h after long storms.
	Inspect silt accumulation rates and establish appropriate brushing frequencies.	Anually.
	Monitoring inspection chambers.	Anually.

NOTE: All permeable paving to be installed and maintained strictly in accordance with manufacturers details and recommendations.

1. If fill is needed to build up levels beneath the permeable paving, then the fill material must have similar or superior properties to the existing sub grade, e.g. permeability, strength/stiffness. Consideration must be given if it is proposed to use crushed concrete as fill material, as water that infiltrates though this fill and into the sub grade may have an elevated alkalinity and this may not be desirable or be allowed.

2. For full infiltration permeable paving a geotextile shall be installed between the sub-base and sub grade. The geotextile can be either a mono filament woven, non woven bonded or needle punched non-woven fabric. The geotextile shall be manufactured from a suitable polyethylene or polypropylene filament able to withstand naturally occurring chemical and microbial effects.The production of the geotextile shall be in accordance with BS EN ISO 9001: 2008 .
The tensile properties of the material shall be verified in accordance with BS EN ISO 10319: 1996.

3 An impermeable membrane is required for all non infiltration permeable paving to contain water within the pavement. A Category 2 membrane is required for pavements other than light duty pavements and roof protection.
Category 2 impermeable membrane shall be manufactured from a durable robust material such as High Density Poly Ethylene (HDPE), Ethylene Propylene Diene Monomer (M-class) rubber (EPDM) or polypropylene, or similar approved material.
The membrane shall be resistant to puncture, the stresses and strains associated with multi-axle movement and environmental stress cracking. The membrane shall be unaffected by potential pollutants such as alkaline or acidic groundwater.
The membrane shall be able to resist punching stresses caused by loading or sharp points of contact with the aggregate throughout the design life of the pavement and to withstand the additional loads applied during construction.
All joints between adjacent layers and discharge outlets shall be watertight and welded joints are to be tested to ensure the integrity of the system.
The impermeable membrane shall be installed and tested by competent personnel in accordance with the membrane's manufactures recommendations.

4 The sub-base aggregate shall comply with the requirements of BS 7533 -13:2009 Pavements constructed with Clay, natural stone or concrete pavers - Guide for the design of permeable pavements constructed with concrete paving blocks and flags, natural stone slabs and setts and clay pavers, as follows:-

- The aggregate shall be a crushed coarse graded (CGA) ,Type 4/20 (4 mm minimum and 20 mm maximum particle size)
- The voids ratio of the sub-base aggregate shall be at least 30%.
- Aggregate Particle Shape: Preferably a hard crushed rock. The aggregate must have sufficient internal stability to perform both during installation and in the long term.
- Physical properties shall comply with BS EN 13242: 2002 – Aggregates for unbound and hydraulically bound materials for use in civil engineering work and road construction.

5. The permeable sub-base shall be laid in 100 – 150 mm layers and compacted to ensure that the maximum density is achieved for the particular material type and grading, without crushing the individual particles, or reducing the void ratio below the design value. The surface level tolerance shall be within +20 mm to –15 mm of the design levels.

Care shall be taken to avoid segregation of the aggregate, but if this occurs, remedial corrective action must be taken to ensure that the completed sub-base has evenly distributed aggregate particle sizes.
The permeable sub-base shall not be used as a temporary access road for general site traffic or as a hard standing storage area.
The materials are relatively self compacting and heavy vibrating compaction is not usually required. Satisfactory results may be achievable by rolling without vibration.

6. The block layer is to be installed in accordance with BS 7533 - 3: 2005 A1: 2009, 'Code of practice for laying precast concrete paving blocks and clay pavers for flexible pavements.

7. The block paving surfacing shall comply with the following criteria:
- Laying Course thickness after compaction 50 mm ±20 mm
- Joint space width - see table 5 above
- Variation in block to block height (lipping) 2 mm
- Surface smoothness - is not applicable to a permeable pavement,
- Height of blocks against edge restraints, drainage pits/channels etc plus 5mm

8. Adequate edge restraints along the exposed perimeter of block paving and to drainage items and other penetrations within the pavement shall be installed. These edge restraints shall be completed before the block laying proceeds and shall be in the form of concrete kerbs, adjacent structures or other suitable restraint as shown on the drawings. The face of the edge restraint, where it abuts block paving, shall be vertical, with a smooth surface to ensure a consistent joint space between edge restraint and the first row of block paving.

9. After laying the blocks, the blocks shall be bedded by not less than two passes of a suitable plate compactor. The use of steel drum rollers shall not be permitted. Typically the compactor shall be a vibrating flat plate compactor with a mass of not less than 350 kg, generating a centrifugal force in the range of 30 to 40kN a frequency in the range of 65 to 100 Hz. The compacter shall not damage the block paving. It is permissible to fit protective mats to the underside of the compactor. Compaction shall proceed as closely as possible following laying and prior to the acceptance of any traffic other than that necessary for the laying operation. Compaction shall not be attempted within 1 m (approx) of the laying face. Compaction shall continue until lipping between adjoining units has been minimised and in any case shall not exceed 2 mm. Any blocks which are damaged after the compaction process, shall be immediately removed and replaced.

REV	DESCRIPTION	SIG	CHK	DATE
P01	First Issue.	RJ	CH	09.03.23

DUCHY HOMES

DARTON LANE

PERMEABLE DRIVEWAY CONSTRUCTION DETAILS

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ECE PROJECT No	SCALE AT A1	STATUS	SUITABLE FOR
47509	1:20	S0	Initial

DRAWING NUMBER: 47509 - ECE - XX - XX - DR - C - 0015 (Project - Originator - Zone - Level - Type - Role - Number)

REV: P01