

Porous paving

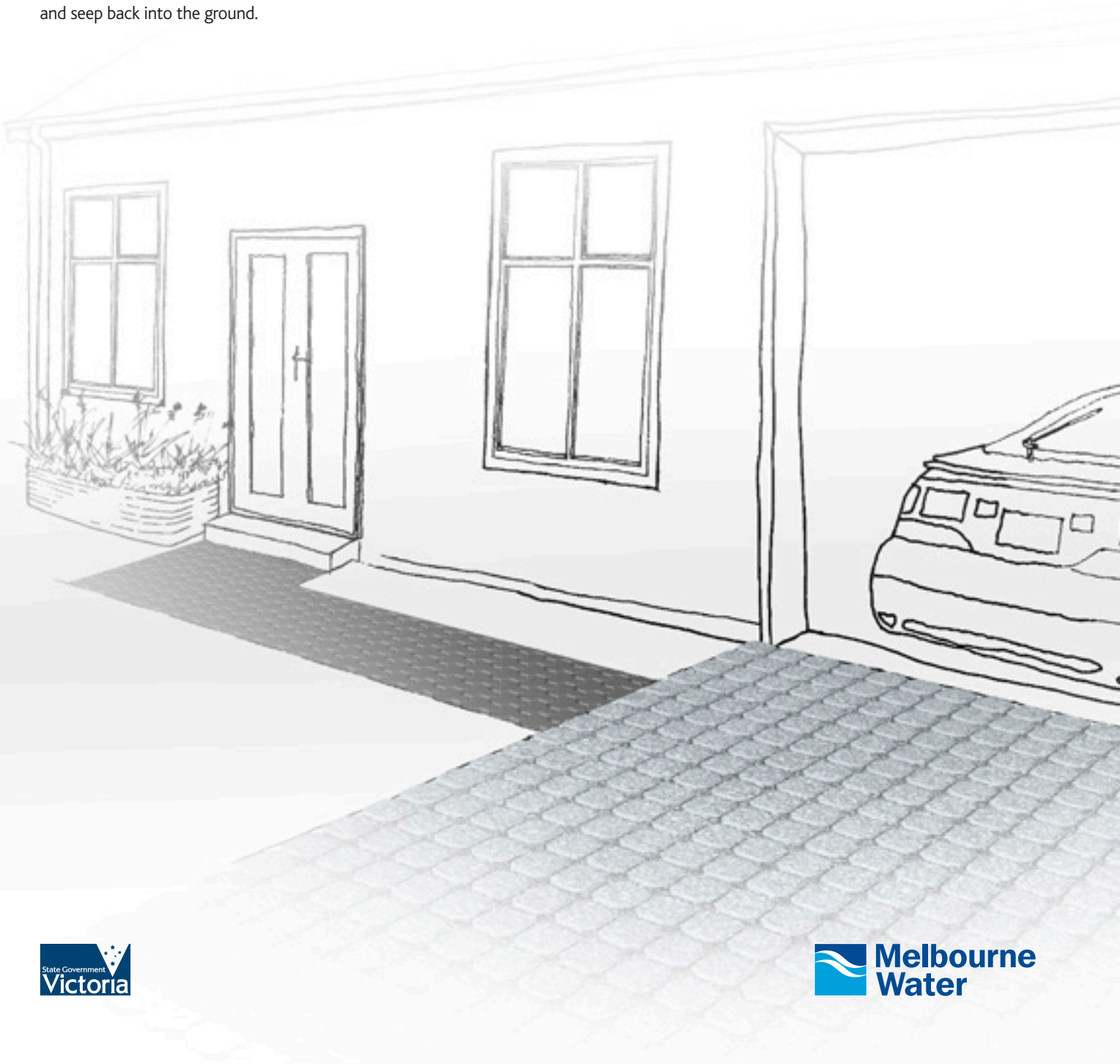
What is porous paving?

Installing porous paving instead of concrete or standard paving is a simple way to help the environment and the health of our local waterways.

Porous paving is designed to allow water to soak through the paving and seep back into the ground.

This not only reduces the volume of stormwater run off and pollutants entering our rivers and creeks, but also benefits nearby plants and trees by allowing both air and water to reach the root zone underneath the paved area.

Did you know you can build different types of raingardens? For more information visit melbournewater.com.au/raingardens



Different types of porous paving

Before installing porous paving in a driveway, path or patio area, you need to decide which type to install – **loose gravel, structural gravel or grass, masonry pavers or engineered pavers.**

Things to consider when selecting a paving system include traffic type (vehicle or pedestrian) and frequency, existing soil type, location, aesthetic preference and cost.

Note: A number of porous paving systems are available from different manufacturers and installation methods will vary. While this instruction sheet provides a general overview of the installation process, it is important to follow the manufacturer's specifications.

Location

If the paved area slopes towards the house, a pit or strip drain connected to existing stormwater may be required to remove excess water during heavy rainfall. However, paths and driveways with a gradient greater than 5% (1:20) may not be suitable for porous paving.

Traffic type

The table below provides an overview of the suitability of the various porous paving options in terms of traffic type and frequency.

Soil type

Porous paving is most effective when installed in sandy areas where rainwater can easily drain away from the soil. If you are planning to install porous paving in an area with heavy clay soil or poor drainage, additional sub surface drainage may be needed.

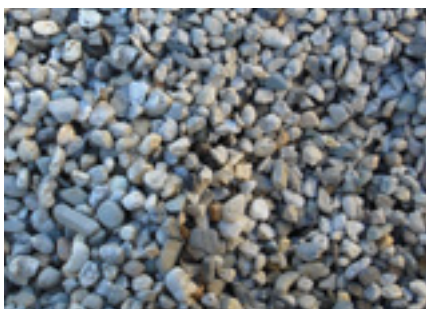
Underground services

Be aware of any underground services (gas, electricity, water) before excavating the pavement area. Porous paving should not be built over or in close proximity to a septic system.

What's the difference between masonry and engineered pavers?

Masonry pavers allow water to pass through porous sand or gravel filled joints between each paver, while an engineered paver is designed to let water pass through the paver itself.

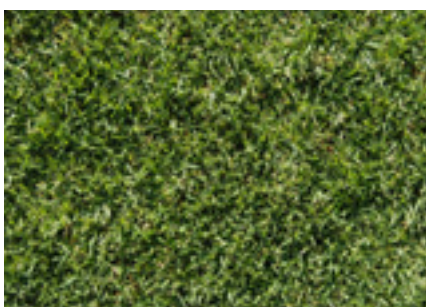
Handy hint – Impervious surfaces such as pavements, driveways and footpaths are a major source of stormwater runoff. Replacing these hard surfaces with permeable paving helps the environment by reducing the amount stormwater that flows into our rivers and creeks.



LOOSE GRAVEL



STRUCTURAL GRAVEL

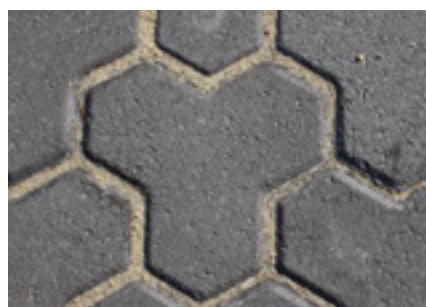


STRUCTURAL GRASS

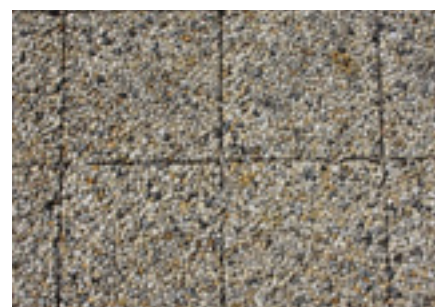
*** Note on timber edging**
 Timber edging is commonly used to contain surfaces that might be subject to movement. When the porous paving surface adjoins an existing hard surface (i.e. concrete or asphalt), no timber edge is required. However, if the porous paving surface is next to an existing lawn or garden, it may be beneficial to install timber edging to keep the material in place.

POROUS PAVING TYPE	VEHICLE		PEDESTRIAN	
	HIGH USE	LOW USE	HIGH USE	LOW USE
GRAVEL PAVING	×	□	□	□□
STRUCTURAL PAVING (GRAVEL)	□	□□	□□	□□
STRUCTURAL PAVING (GRASS)	×	□	□	□□
MASONRY PAVER	×	□	□□	□□
ENGINEERED PAVER	×	□	□□	□□

□□ = most suitable □ = suitable × = not recommended



MASONRY PAVERS



ENGINEERED PAVERS

Loose gravel

A pavement or path constructed of loose gravel is the cheapest and easiest way to create porous paving. Traditional gravel paving is designed to drain water away from the surface and direct it to a stormwater pit. However, loose gravel "porous" paving is built to allow rainfall to permeate through the gravel and infiltrate back into the ground.

Note: Loose gravel paving is not suitable for wheelchair use or high frequency / heavy vehicle traffic. It is also not recommended for steep sites or areas prone to flooding.

Constructing porous paving using loose gravel

- › Mark out the area to be paved and determine the quantity of materials required. Refer to Materials List (right).
- › Excavate the area to a depth of 250mm.
- › If any section of the excavated area seems softer than other areas, dig out the "soft" section and fill it with 5-7mm screenings (a type of gravel rock).
- › Where required, use timber edging to stabilise the sides of the excavated area and keep the top gravel layer in place.
- › Place free draining 5-7mm screenings across the base of the excavated area to a minimum depth of 150mm, and lightly compact the screenings to create a stable base.
- › Add your chosen gravel or pebble mix on top of the screenings layer to a depth of 100mm. Ensure that the mix is clean and free of fines. Rake the gravel/pebble mix to ensure an even surface and lightly compact to complete the installation process.

Materials List – what you need for loose gravel paving

The following table details the materials required per m² of paving. While item cost prices will vary depending on the materials selected, loose gravel paving is likely to cost around \$10-15 per m².

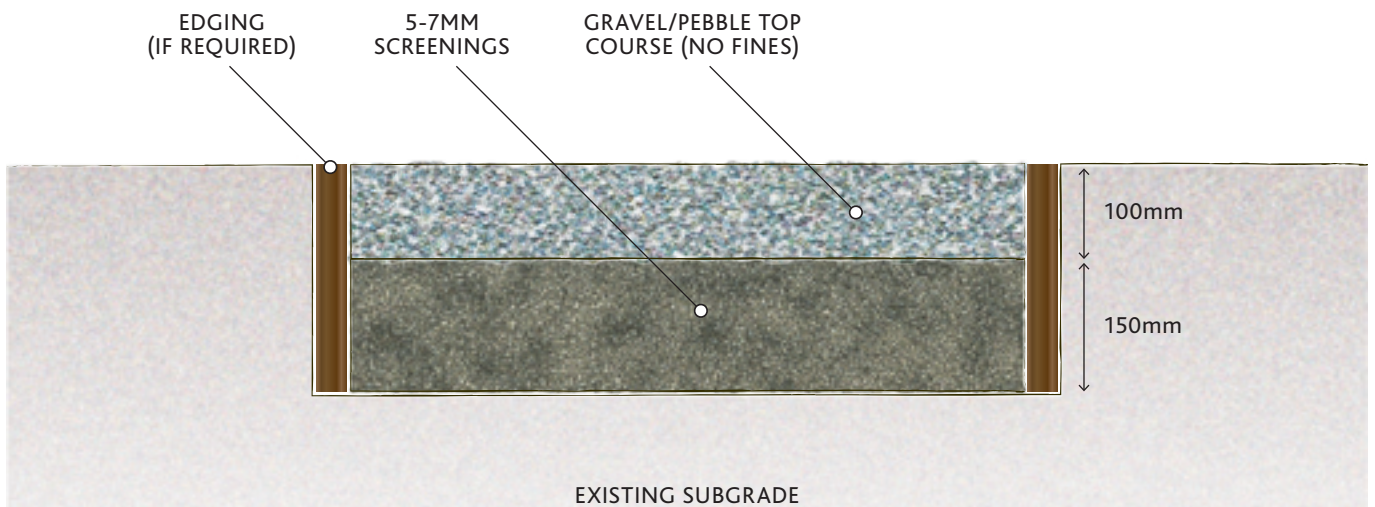
MATERIAL	QUANTITY FOR 1M ² PAVED AREA
5 - 7mm SCREENINGS	0.15m ³
LOOSE GRAVEL OR PEBBLE MIX	0.1m ³
TIMBER EDGING*	4 X 1m

mm = millimetres
m² = square metres
m³ = cubic metres

**Refer to note on timber edging – page 2*

Note: Products such as granitic gravel are not suitable in this instance as it has the capacity to compact to a hard surface and is not free draining.

CROSS SECTION OF LOOSE GRAVEL POROUS PAVING



Structural gravel or grass

A number of systems can be used to add structural strength to porous gravel or grass surfaces which allow them to take a heavier traffic load, while retaining the ability to soak up rainwater. Some systems are even robust enough to cope with heavy vehicle traffic. When maintained correctly, lawn covered porous surfaces are indistinguishable from a regular lawn. However, because the surface is free draining, it may require some water to maintain the grass quality in drier months.

Note: If vehicles are left parked on a structural grass surface for an extended period, the grass may die off.



GRASS PAVING

Constructing porous paving using structural gravel or grass

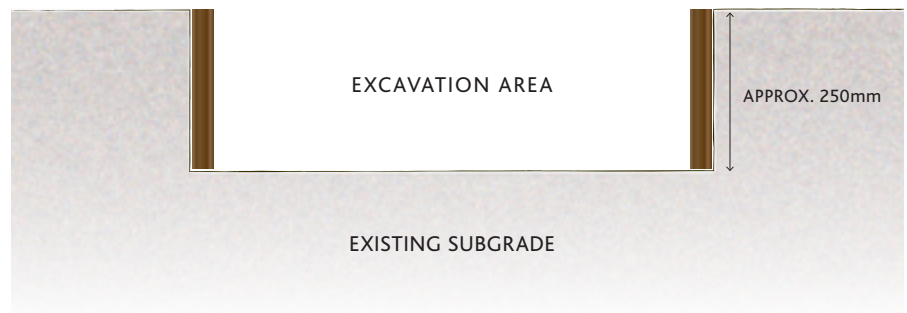
Step 1

- › Mark out the area to be paved and determine the quantity of materials required. Refer to Materials List (next page).
- › Excavate the area to a depth of 250mm.
- › If any section of the excavated area seems softer than other areas, dig out the “soft” section and fill it with 5-7mm screenings.
- › Where required, use timber edging to stabilise the sides of the excavated area and keep the top gravel layer in place.

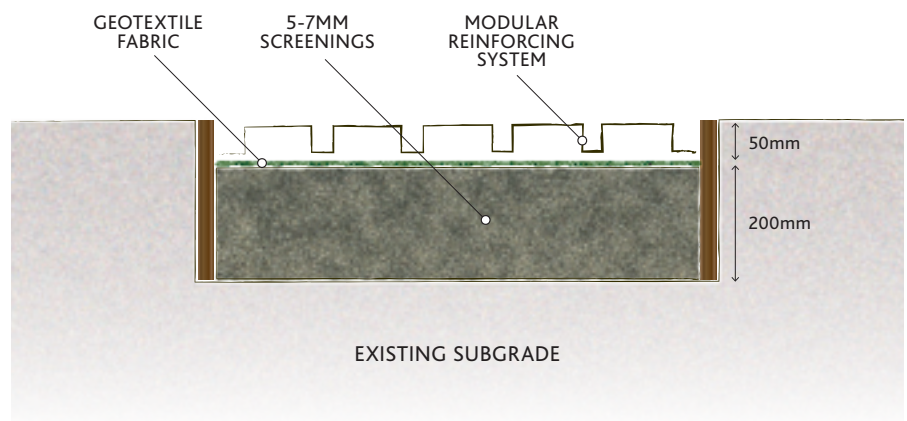
Step 2

- › Place free draining 5-7mm screenings across the base of the excavated area to a minimum depth of 200mm, and lightly compact the screenings to create a stable base.
- › Roll out geotextile fabric to cover the base of the excavated area.
- › Install the modular reinforcing system (a type of plastic cell to hold structure) following the manufacturer's instructions.
- › To complete the construction process, follow the instructions on the next page for either gravel or grass paving.

STEP 1



STEP 2



For gravel paving

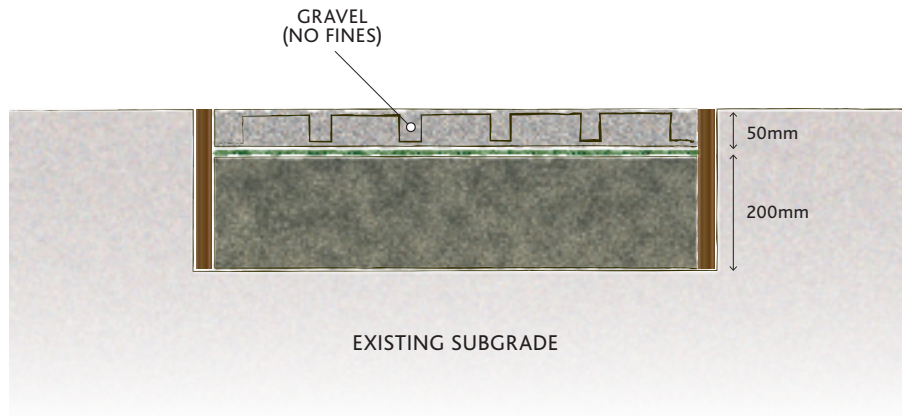
Fill and cover the modular system with 3-5mm gravel. Ensure that the gravel is clean and free of fines. Rake the gravel layer to create an even cover and lightly compact to complete the installation process.

For grass paving

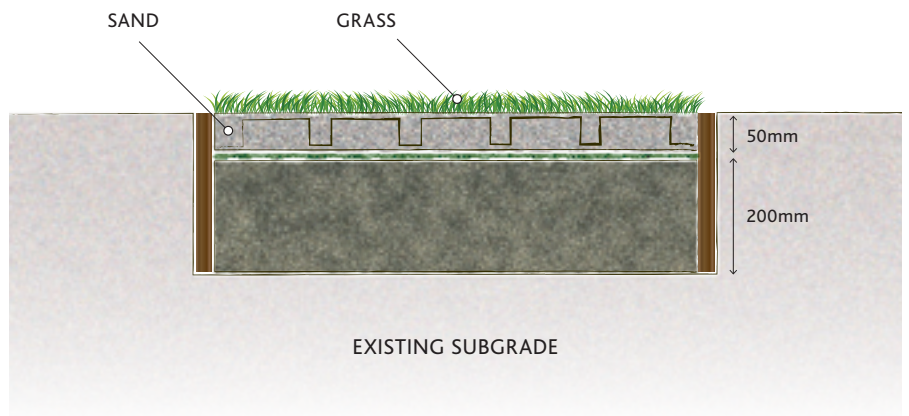
Fill and cover the modular system with course sand and rake to create an even surface. Lay the grass (turf) on top of the sand and flatten it to eliminate air pockets, ensuring good grass root contact with the course sand. Keep the lawn watered and traffic free until established. To avoid any damage to the modular system – never aerate the lawn.

Note: Hydro-mulching/direct seeding may be suitable for some systems and provide a cheaper alternative to turfing. This process requires a higher level of maintenance during the establishment period and needs to be protected from traffic during this time.

GRAVEL PAVING (step 3)



GRASS PAVING (step 3)



Materials List – what you need for structural gravel & structural grass paving

The following tables detail the materials required per m² of paving. While item cost prices will vary depending on the materials selected, reinforced gravel paving is likely to cost around \$40- 50 per m² while reinforced grass may cost around \$50-60 per m².

GRAVEL

MATERIAL	QUANTITY FOR 1M ² PAVED AREA
5 - 7mm SCREENINGS	0.2m ³
GEOTEXTILE FABRIC	1m ²
MODULAR REINFORCING UNIT (PLASTIC CELLS)	1m ²
3-5MM GRAVEL	0.1m ³
TIMBER EDGING*	4 x 1m

mm = millimetres
 m² = square metres
 m³ = cubic metres

GRASS

MATERIAL	QUANTITY FOR 1M ² PAVED AREA
5 - 7mm SCREENINGS	0.2m ³
GEOTEXTILE FABRIC	1m ²
MODULAR REINFORCING UNIT (PLASTIC CELLS)	1m ²
COURSE SAND (WHITE WASHED)	0.1m ³
INSTANT TURF	1m ²
TIMBER EDGING*	4 x 1m

*Refer to note on timber edging – page 2

Masonry pavers

Special masonry pavers can be used to create porous paving. The pavers allow water to pass through highly pervious gravel or sand filled joints between the pavers and infiltrate back into the ground below the paved area. Several products are available which all vary slightly in design and function. Speak to your local garden specialist for more information.

Constructing porous paving using masonry pavers

Step 1

- › Mark out the area to be paved and determine the quantity of materials required. Refer to Materials List (below).
- › Excavate the area to a depth of 300mm.
- › If any section of the excavated area seems softer than other areas, dig out the "soft" section and fill it with 5-7mm screenings.
- › Where required, use timber edging to stabilise the sides of the excavated area and keep the top gravel layer in place.
- › Place 5-7mm screenings across the base of the excavated area to a minimum depth of 200mm, and compact the screenings to create a stable base.
- › Roll out geotextile fabric to cover the base of the excavated area.

Step 2

- › Place a layer of course sand over the geotextile fabric to a depth of 50mm and compact to ensure an even bed for the pavers.
- › Lay the masonry pavers following the manufacturer's instructions.
- › Sweep 3-5mm screenings over the pavers to fill the voids and complete the installation process.

Materials List – what you need for masonry paving

The following table details the materials required per m² of paving. While item cost prices will vary depending on the materials selected, porous masonry paving is likely to cost around \$60-80 per m².

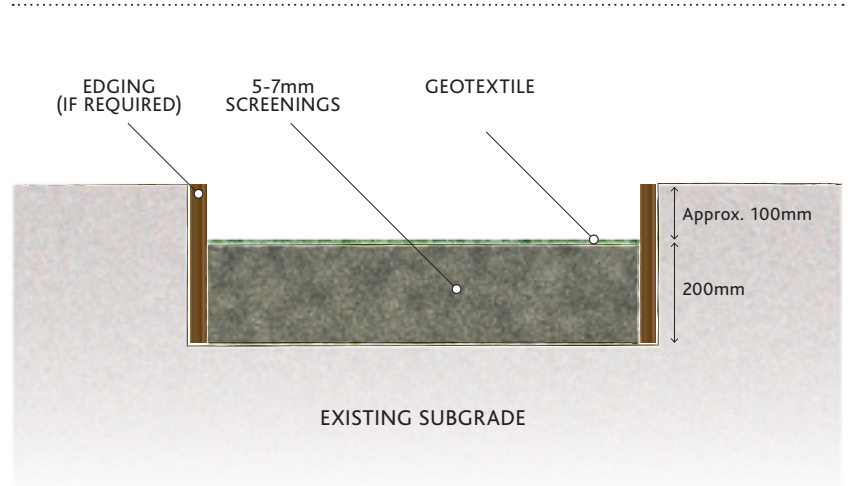
MATERIAL	QUANTITY FOR 1M ² PAVED AREA
5 - 7mm SCREENINGS	0.2m ³
GEOTEXTILE FABRIC	1m ²
MASONRY PAVERS	1m ²
COURSE SAND (WHITE WASHED)	0.05m ³
3-5MM SCREENINGS	0.02m ³

(NOTE – SCREENINGS TYPE AND SIZE MAY VARY DEPENDING ON THE PAVING SYSTEM SELECTED.)

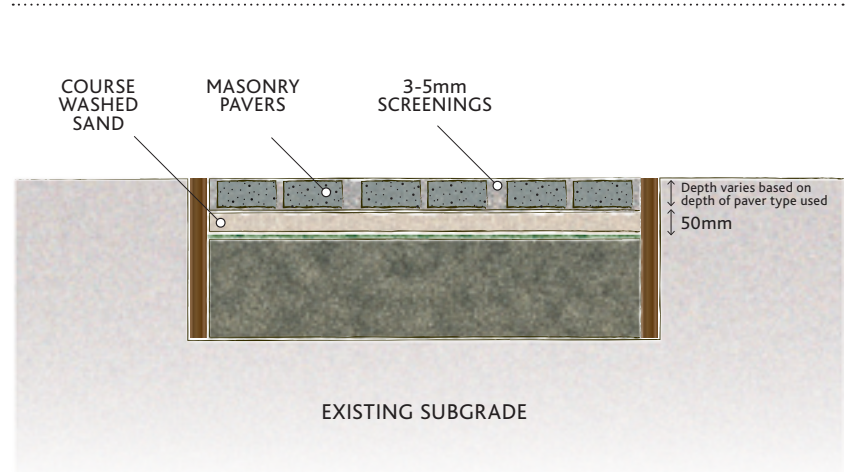


MASONRY PAVERS

STEP 1



STEP 2



Engineered pavers

Engineered paving stones are designed to allow water to pass through the paver itself. With a range of products on the market, price, design and how porous the paver is should all be considered when selecting the paver type.

Constructing porous paving using engineered paver

Step 1

- › Mark out the area to be paved and determine the quantity of materials required. Refer to Materials List (below).
- › Excavate the paving area to a depth of 300mm.
- › If any section of the excavated area seems softer than other areas, dig out the "soft" section and fill it with 5-7mm screenings.
- › Where required, use timber edging to stabilise the sides of the excavated area and keep the top gravel layer in place.
- › Place 5-7mm screenings across the base of the excavated area to a minimum depth of 200mm, and compact the screenings to create a stable base.
- › Roll out geotextile fabric to cover the base of the excavated area.

Step 2

- › Place a layer of 3-5mm screenings to a depth of 50mm over the geotextile fabric and compact.
- › Lay the engineered pavers following the manufacturer's instructions.

Materials List – what you need for engineered pavers

The following table details the materials required per m² of paving. While item cost prices will vary depending on the materials selected, porous engineered paving is likely to cost around \$100-120 per m².

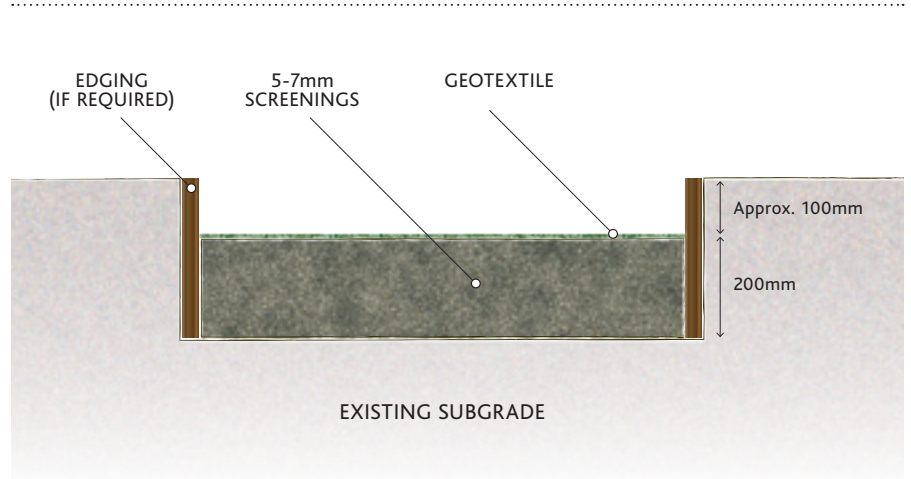
MATERIAL	QUANTITY FOR 1M ² PAVED AREA
5 - 7mm SCREENINGS	0.2m ³
GEOTEXTILE FABRIC	1m ²
3-5MM SCREENINGS	0.05m ³
ENGINEERED PAVERS	1m ²

mm = millimetres
 m² = square metres
 m³ = cubic metres

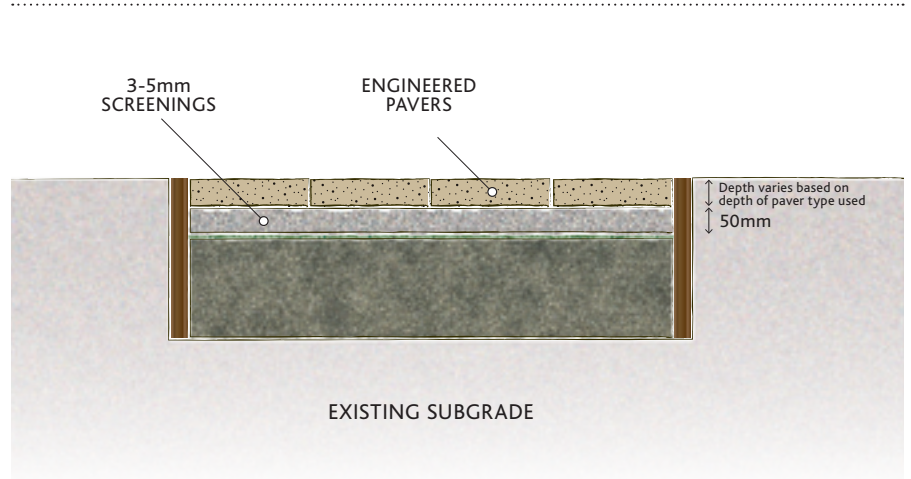


ENGINEERED PAVERS

STEP 1



STEP 2



Looking after your porous paving

Once installed, porous paving needs no more maintenance than traditional paving. However, following a few simple tips will ensure that your paving works as it should.

- › Keep the surface free of leaves, mud and other litter that could limit infiltration.
- › Remove weeds by hand.
- › Avoid mixing concrete, storing soil or any other activities on the pavement surface that may limit its ability to absorb water.
- › Do not allow surrounding surfaces, particularly garden beds, to drain onto the surface of the paving. Porous paving is designed to capture rainfall only, and excess runoff may flood or clog the paving.
- › If the surface of the porous paving becomes blocked, it can be cleaned using a small vacuum, road sweeper or a pressure washer.

Need help?

If you have any questions about porous paving, your local landscape gardener may be able to help.

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