



PERMEABLE PAVEMENT

Operation & Maintenance Guide

STORMWATER DEVICE INFORMATION SERIES



Permeable pavement at Olympic Park, Waitakere



Final Construction result

What are permeable pavements?

Permeable pavements are hard surface paving systems that reduce stormwater runoff flows and improve runoff water quality. The porous surface of permeable pavement allows stormwater to soak through to an underlying coarse gravel layer, before slowly draining away. They are used in low traffic areas such as carparks, driveways and footpaths.

Nine key components of permeable pavements

7. Pavers

Three main types: open cell grid of concrete or plastic with sand or grass cover; solid interlocking blocks with drainage gaps; porous interlocking blocks.

8. Edge beams

300 x 300mm concrete to fix pavers in place.

6. Bedding material

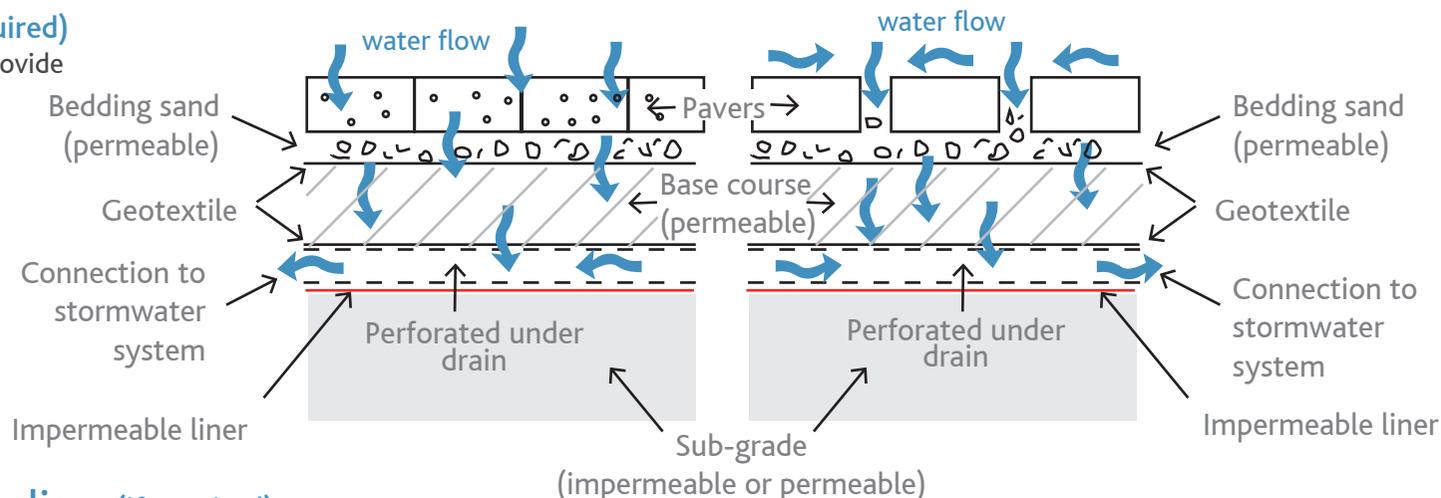
Porous material. May be coarse sand or fine gravel (2-5mm), depending on paver type. Filters pollutants from runoff.

4. Geotextile (if required)

Placed between layers to provide additional tensile strength.

Porous Block Pavers (permeable)

Modular Block Pavers (impermeable)



5. Basecourse

Strong, durable high volume draining material (up to 30% voids). Provides temporary storage for runoff.

9. Overflow

To take excess flows. Includes catchpits.

2. Impermeable liner (if required)

Prevents water draining through to subgrade material. May be specified on sites with poor draining soils, in high groundwater areas or in structurally sensitive soils. On some sites, clay soils create a natural impermeable layer.

1. Sub-grade material

Strong and durable material to withstand wetting and drying over time.

3. Underdrain (if present)

Directs flow draining through pavers. Perforated pipes connecting to local stormwater system.

Other types of permeable / porous surfaces

Porous Paving



Porous Concrete



Open Grade Porous Asphalt



(Photo: Leighton Contractors)

MAINTENANCE SCHEDULE

How and when should maintenance be carried out? There are two main maintenance concerns for permeable pavements. First, the settling of paving after construction, and second, ongoing care to avoid clogging of the pavement by weeds and sediment. The schedule below outlines timing for checking these concerns.

TIMING	COMPONENT	ACTION
After storms	Gravel basecourse	<ul style="list-style-type: none">• Inspect paving area to check water drains away after heavy rain. Ponding may be due to clogging in drainage system.
	Inspection chambers (if included)	<ul style="list-style-type: none">• Place in permeable paving to monitor water levels in basecourse.
Ongoing	Permeable paving	<ul style="list-style-type: none">• Where areas of paving settle, lift blocks, re-level bedding material and lay blocks at new level.
Monthly	Permeable paving	<ul style="list-style-type: none">• If present, mow grass and resow as required.
Annually	Permeable paving	<ul style="list-style-type: none">• Sweep solid block or porous pavers with wet vacuum sweeper to prevent clogging with sediment.
	Joint and bedding material	<ul style="list-style-type: none">• After cleaning solid block or porous pavers with wet vacuum sweeper, check joint material and top up as necessary.

TROUBLESHOOTING

SYMPTOM	POSSIBLE PROBLEMS	SOLUTION
<p>Water ponding or flowing off pavers.</p>	<p>Pavers clogged with sediment or other organic matter.</p> <p>Slope of pavers too steep.</p>	<ul style="list-style-type: none"> • Wet vacuum surface to clean off build up. • Lift and relay basecourse and sand to flatten slope.
<p>Pavers lifting and rutting.</p>	<p>Settling causing pavers to settle unevenly.</p> <p>Vehicle loads on pavers exceed design load.</p>	<ul style="list-style-type: none"> • Lift pavers and re-grade sub-layers (subgrade, gravel and sand), adding material if required. • Stop heavy vehicle access to area.
<p>Water samples downstream show pollutants flowing through pavers without filtering.</p>	<p>Rip or hole in impermeable layer or damaged underdrain.</p> <p>Pollutants entering area too high to be filtered by permeable pavement system.</p>	<ul style="list-style-type: none"> • Lift pavers and basecourse to check underdrain and impermeable layer, and repair if required. • Install a primary stormwater treatment device (for instance, a grass swale or rain garden) to filter runoff before reaching permeable pavers.

Quick maintenance checks

- ✓ Inspect permeable pavement area frequently for sediment build up and to check drainage
- ✓ Block or divert new or existing inlets and outlets.

Avoid

- ✗ Do not use high pressure water blaster to clean pavers – this will remove bedding material.
- ✗ Do not use herbicides on pavers – this will enter downstream stormwater system.

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