

know where it goes

take simple
steps to reduce
STORMWATER POLLUTION

Block Pavers

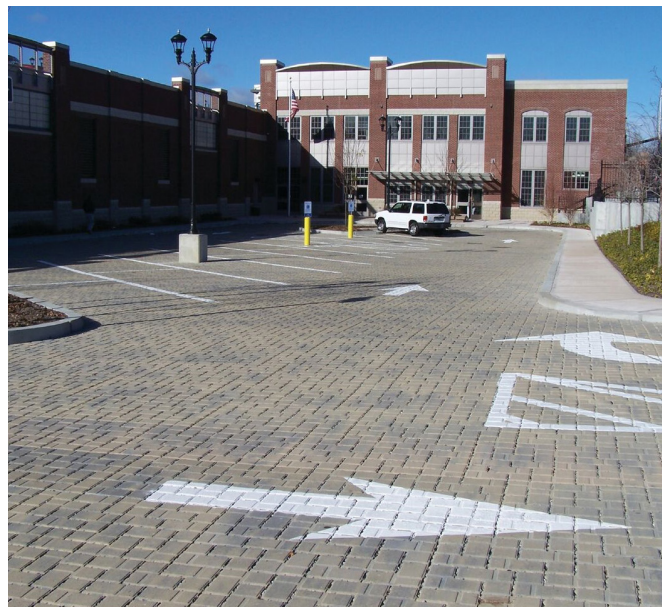
The choice with the highest load-bearing capacity

Description

Block pavers are impermeable blocks made of brick, stone, or concrete, set on a prepared sand, stone, or mixed base. Some have an open-cell design to increase permeability.¹ Others rely solely on the voids between their interlocking shapes. Block paver technology has largely moved away from the use of pervious concrete blocks with voids throughout their structure, and towards solid block designs that allow stormwater to filter through the void spaces between blocks. The void spaces between the pavers allow water to infiltrate into the underlying gravel reservoir. The thickness of the gravel sub-base, and the type of material used to fill the void spaces, determines the amount of infiltration permitted.



Block paver parking lane on Broad Street in Newport. Photo courtesy of the Unilock New York Inc.



RIPTA bus lot in Providence. Photo courtesy of the Unilock New York Inc.

Uses & Benefits

Block pavers are recommended for use in:

- Standard parking lots
- Overflow lots
- Residential streets
- Medians
- Driveways
- Sidewalks
- Fire lanes
- Pedestrian plazas

Of all the permeable pavement options, block pavers have the highest load-bearing capacity. Block pavers can cut stormwater infrastructure costs, reduce warming effects brought about by the use of asphalt, and are well suited to cold-climate applications.²



St. Clare Parish walk in Westerly. Photo courtesy of the Unilock New York Inc.

Design Criteria

Block paver installation generally consists of a soil subgrade, a gravel base, a layer of bedding sand, and the pavers. If the pavers are intended for light use, the gravel base can be forgone. The void space around the pavers can be filled with either gravel or soil and grass. Depending on soils and intended use, the soil subgrade may require compacting. This can decrease the infiltration rate of the soil which may require the addition of a drainage pipe to the design. While block pavers can be installed by homeowners, professional contractors are better equipped to prepare the subbase and are therefore recommended.

Site specifications for block pavers are as follows:

- Vertical separation from seasonal high water table of, typically, three feet
- Minimum surface infiltration of 0.01- 3.0 in./hr for soil²



Block paving parking spots in front of Charlestown Wine & Spirits.

Maintenance

Maintenance suggestions for permeable pavers usually include regular cleaning with a vacuum sweeper. However, according to block paver manufacturer Unilock the effectiveness of standard street-sweeping options is beginning to emerge. Always be aware of manufacturer maintenance recommendations and warnings. Block pavers require the following maintenance:

- Seasonal, or as recommended by manufacturer, sweeping with a machine broom or regenerative air street sweeper ⁶
- Regular monitoring to ensure that the paving surface drains properly after storms, perhaps substituted with infiltration tests offered by some manufacturers
- Vacuum sweeping spot-cleaning in the event of poor drainage ⁴
- Periodically replenish joint material ⁵
- Post signs identifying porous pavement areas
- Maintain adjacent landscaped areas to prevent soil from being transported onto the pavement
- Minimize use of salt during winter months. Do not use sand as this will clog joint material ⁶
- Raise plow blade or used rubber-tipped blade to prevent catching the pavers ⁵

A Note on Use in Public Spaces...

The use of block pavers in public spaces has sometimes resulted in litter, particularly cigarette filters, getting trapped in the void spaces, raising risk of clogging and eroding street cleanliness. The design of the blocks determines the width of the void spaces between them (for example, Unilock's designs range from quarter-inch to half-inch). To avoid trapping litter, choose a product with a narrow joint width design.



Infiltration tests can be performed on any sort of permeable pavement to determine the rate at which an area is draining. Image courtesy of Coastal Green & Resilient Infrastructure Project.



Cigarettes and other small litter may be likely to get caught in the void spaces between block pavers, prompting special maintenance tasks or concerns. Image courtesy of Coastal Green & Resilient Infrastructure Project.

Reducing Stormwater Runoff

Impervious surfaces such as rooftops, driveways, roads, and parking lots change the flow of water over the land. Conventional stormwater management focuses on quickly removing runoff from a developed area, most often by using pipes to move water to sewers or directly to nearby waterways. Excessive stormwater runoff entering coastal waters can cause problems including harmful algal blooms and beach closures. Permeable pavement infrastructure provides necessary hard surfaces while simultaneously reducing the amount of stormwater exiting a developed area.

Environmental Packaging International, a small environmental consulting firm located in Jamestown, built its office (below) according to U.S. Green Building Council's LEED standards. The building's 1,200 square foot green roof and open-cell design block paver walkways curb the generation of stormwater runoff.



Estimating Cost

Cost of pavers is relatively low. Unilock products regularly used in RI and New England range from \$3.50 (Eco Piora™) per square foot for residential use to \$6 (Thornbury) to \$9 (Town hall), depending on the design chosen and finish applied. Unilock has a project calculator available online to estimate cost of installation, and Unilock will refer interested parties to experienced contractors. The Belgard paver Eco-Dublin is in use locally and is \$4.98 per square foot. The Belgard website also offers a tool to connect you with contractors and estimate cost of installation.

Sources

- 1 Massachusetts Low Impact Development Toolkit. "Permeable Paving." Fact sheet. Metropolitan Area Planning Council. Boston, MA. n.d. Web.
- 2 UNH Stormwater Center. "Permeable Interlocking Pavement for Stormwater Management." Fact sheet. University of New Hampshire. Durham, NH. 2017. Web.
- 3 (2017). Permeable Pavers Installation. Interlocking Concrete Pavement Institute. Web.
- 4 Belgard. "Permeable Paver Post-Construction Services." Fact sheet. Belgard Commercial. Atlanta, GA.
- 5 Stormwater Facility Maintenance Program. "How to maintain your Porous Pavement." Fact sheet. Maryland Department of Environmental Protection. Montgomery County, MD. 2013. Web.
- 6 Unilock: Designed to Connect. "Permeable Paver Maintenance Guide." Guide. Hengestone Holdings, Inc. 2015. Web.

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