

Lake Wise Info Sheet



Shoreland Best Management Practices for Lake-friendly Living.

Benefits

- Water Quality
- Prevents Erosion
- Slow, Spread, Sink Stormwater
- Small spaces
- Visual Appeal
- Protection & Resiliency

VT DEC suggested BMP for shorelands

Related Info Sheets:

- Planning Pathways
- Infiltration Trenches
- Dry Wells
- Rain Gardens

PERMEABLE PAVERS

Upland stormwater management



Right: Adobe Stock, Left: HEXpave

Description.

Permeable paver blocks and geogrid reinforced aggregate or turf are structural surfaces consisting of a permeable material underlain by a storage or infiltration reservoir. They can be installed to infiltrate, filter, and store stormwater.

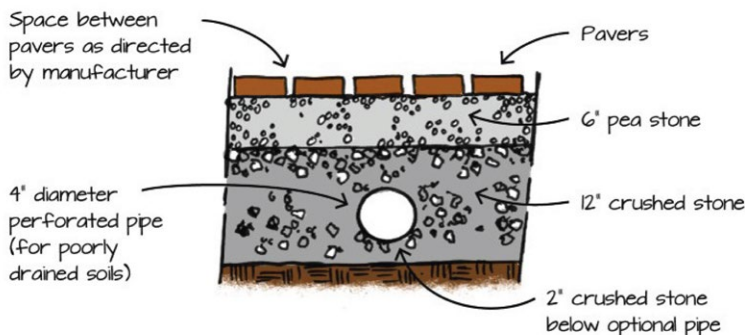


Alliance for the Chesapeake Bay

Clockwise from top left: geogrid reinforced peastone, turf block pavers, block pavers

Applicability.

Permeable pavers and pavement can be installed in the place of traditional impervious pavement or gravel walkways and driveways to reduce stormwater runoff and erosion and protect water quality through infiltration. Permeable pavers (block pavers and geogrid reinforced aggregate or turf) are good alternatives for pathways and driveways and can be installed with relative ease, which we will outline here. Permeable pavements, such as pervious concrete and porous asphalt, are also good alternatives but require special equipment and professional installation. Permeable pavers are ideal for slopes less than 5 percent (20:1). Soils should be well drained or an underdrain should be installed.



Permeable pavers can last longer than conventional paved driveways and pathways!

Section diagram of permeable paver blocks. VT Guide to Stormwater Management.

VERMONT

DEPARTMENT OF ENVIRONMENTAL CONSERVATION
WATERSHED MANAGEMENT DIVISION

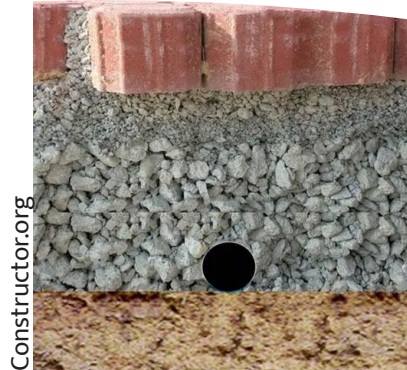


Graphics by Greenleaf Design, LLC



Virginia ASWCDs

Laying interlocking permeable paver blocks.



Constructor.org

Layers of pavers and stone.

Permeable pavers can be plowed and can reduce snow and ice accumulation by allowing drainage. Ensure the reservoir can drain in 24 hours or less to avoid frost heave.

How to: Permeable pavers.

1. Determine the area where pavers will be installed. Avoid areas with significant stormwater run on. Do not install within 10 feet of septic systems. If installing adjacent to a structure, make sure the ground is sloped away from the structure; DO NOT direct water towards a structure. Mark the area with string or spray paint.

2. Measure the area with a tape measure where pavers will be installed to determine the appropriate volumes of stone and number of pavers needed. Determine the area of a paver by measuring it or from manufacturer's specifications. It is recommended that some additional pavers are purchased to ensure full coverage. Use the following equations to acquire the necessary materials.

Yards of 1 ½ inch washed crushed stone = project area (ft²) * 1 ft * 0.037

Yards of 3/8 inch pea stone = project area (ft²) * 0.5 ft * 0.037

Number of pavers = (paver area (in²) * 0.00694) * project area (ft²)

3. Dig down approximately 20 inches in the marked area. Create a flat bottom or a very gradual slope slanting away from structures. Lay down a layer of nonwoven geotextile fabric.

4. In well drained soils, add approximately 12 inches of washed crushed stone. In soils that are not well drained, add two inches of washed drainage stone and lay down a four-inch perforated pipe (holes pointed up) that slopes slightly towards the outlet, which should drain towards a stable vegetated area or another stormwater practice. Add approximately 10 inches of washed drainage stone.

5. Lay down a second layer of nonwoven geotextile fabric. Add 6 inches of pea stone.

6. Install the pavers with the spacing specified by the manufacturer (spacing varies depending on paver type). Fill spaces between the pavers with more pea stone.

Materials.

- ✿ Measuring tape
- ✿ Spray paint or string to mark area
- ✿ Shovel
- ✿ 1 ½ inch washed crushed stone
- ✿ 3/8 inch pea stone
- ✿ Nonwoven geotextile fabric
- ✿ Pavers or geogrids
- ✿ Topsoil and grass seed (if creating turf geogrids)
- ✿ Four-inch PVC underdrain pipe (if soils are not well-drained)
- ✿ Drill to perforate underdrain pipe (if required)





Geogrid reinforced aggregate surfaces are great for access pathways at public beaches or roads at boat launches and can be ADA compliant!



Geogrid boat ramp for erosion control infiltrates rainfall at the source and protects water quality.



ADA compliant geogrid beach access at Brighton State Park.

VT Lake Wise Program

How to: Geogrids.



Note that manufacturer's instructions should be followed for installation. General geogrid instructions are provided below. Soils should be well drained.

1. Determine the area where geogrids will be installed. Mark the area with string or spray paint.
2. Measure the installation area and consult with the geogrid manufacturer to ensure appropriate amount of materials are acquired.
3. Remove existing vegetation from the installation area and roughly level the ground surface.
4. Spread two to three inches of a level washed crushed gravel base.
5. Install a layer of nonwoven geotextile fabric over the gravel.
6. Lay out the geogrid and stake down the edges using j-hook rebar anchors or a similar anchor ensuring that the geogrid is stretched tight and fully expanded.
7. Fill the geogrids with pea stone until level. Do not overfill grids by more than a 1/2 inch to prevent instability. If a reinforced turf area is desired, instead fill the grids with topsoil and plant with grass seed. Straw or hay mulch can be applied to stabilize soil and retain moisture until grass grows. Fence off area until grass is fully established.

Maintenance.

If any weeds grow up between pavers or in geogrids, they should be removed. Clean and replace pea stone if it becomes clogged over time. Do not apply sand. Avoid blowing leaves, grass clippings, or other debris across the area. Inspect outlet pipe (if applicable) and ensure no clogs have developed.

For more information...

-  The Vermont Guide to Stormwater Management for Homeowners and Small Businesses (2018)
-  The Vermont Stormwater Management Rule and Design Guidance (Ch. 4.3.8, 2017)

