

large storms. Because the first flush of storm water carries the most pollutants, cleaning the first flush has excellent water quality benefits.

Maintenance

Proper and timely maintenance is crucial to ensure sustained function of these systems over time. Recommended maintenance practices are:

- inspect the site annually
- vacuum the paving periodically to remove any build-up of leaves and dirt; vacuum-type street sweeping is most effective
- inspect after extremely large storms to assure full functioning
- use scraping and shoveling of snow and ice; avoid chemicals and sand

Potential Sites for Pervious Paving

- Parking Lots
- Overflow Parking
- Roadway Aprons
- Boat Ramps
- Emergency Access Areas
- Plazas
- Private Roads
- Driveways
- Sidewalks
- Bike Paths
- Walking Trails
- Campgrounds
- Patios



The parking lot of the Northern Plains Resource Council building in Billings, Montana consists of a grid of rings (recycled plastic) over a geotextile fabric that holds the small gravels in place. 100% recycled glass cullet was used instead of gravel in the top layer.

Low Impact Development (LID)

Traditionally, storm water management has involved the rapid conveyance of water via storm sewers to surface waters. Low impact development (LID) is a different approach that retains and infiltrates rainfall on site.

The LID approach emphasizes site design and planning based on the natural path of water: infiltrating through healthy soils and gradually replenishing groundwater. This process sustains our streams with groundwater rather than the hard rush of storm water which brings pollution, degradation, and flooding.

Why is LID Important

to the environment?

- protects local and regional water quality by reducing delivery of sediment, nutrients, and other pollutants
- reduces stream bank erosion by controlling surges from storm sewers after rains
- stabilizes stream levels by restoring groundwater recharge into streams
- reduces potential for flooding

to residents?

- protects recreational and scenic waters
- adds open space
- increases a sense of community and creates community character
- increases resale value of property

to developers?

- reduces land clearing and grading costs
- increases value and marketability

to communities?

- reduces infrastructure and maintenance costs
- balances growth needs with environmental protection
- improves quality of life

More Information on Pervious Paving and LID

www.thcahill.com
www.lpspavement.com
www.advancedpavement.com
www.perviouspavement.com
www.lowimpactdevelopment.org
www.stormwatercenter.org
www.cwp.org
www.lid-stormwater.net



Pervious Paving

... allows water to infiltrate

Pervious Paving Systems

Pervious paving allows water to infiltrate into layers of crushed rock placed below the paving and then into soil and groundwater below. By infiltrating most of the storm water on site, the amount of water and pollution flowing into storm sewers and directly to rivers and streams is greatly reduced. This protects water quality, maintains more stable base flows to streams, reduces flood peaks, and reduces stream bank erosion. With infiltration, groundwater is recharged and streams are replenished with cool, clean groundwater in a more natural way. Pervious paving is one component of Low Impact Development (LID).

Depending on the site, pervious paving systems may result in significant savings by eliminating required retention and detention ponds and reducing the need for conventional storm sewers.

Design

Pervious paving systems may be installed at new or existing building sites. In both scenarios, careful planning and soil testing are required. Following design standards developed by manufacturers and government agencies is vitally important to ensure the systems work effectively.

Pervious paving systems can be designed to infiltrate any storm event, including the 100-year storm. They can also be used with less costly traditional paving to infiltrate small, frequent rains and the first flush of

Types of Pervious Paving Systems	
Type of Paving System	General Description
Porous paving	Porous asphalt, crushed glass, or porous concrete installed over an infiltration storage bed of uniformly graded crushed rock
Permeable pavers (modular paver blocks)	Modular concrete pavers that fit together with funnel-like openings installed over an infiltration storage bed of uniformly graded crushed rock



A walking path includes both porous asphalt and non-porous asphalt. The porous asphalt allows rainwater to infiltrate while the non-porous surface has standing water.

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Pervious Paving

Modular paver blocks installed over a storage area of uniformly-sized crushed rock

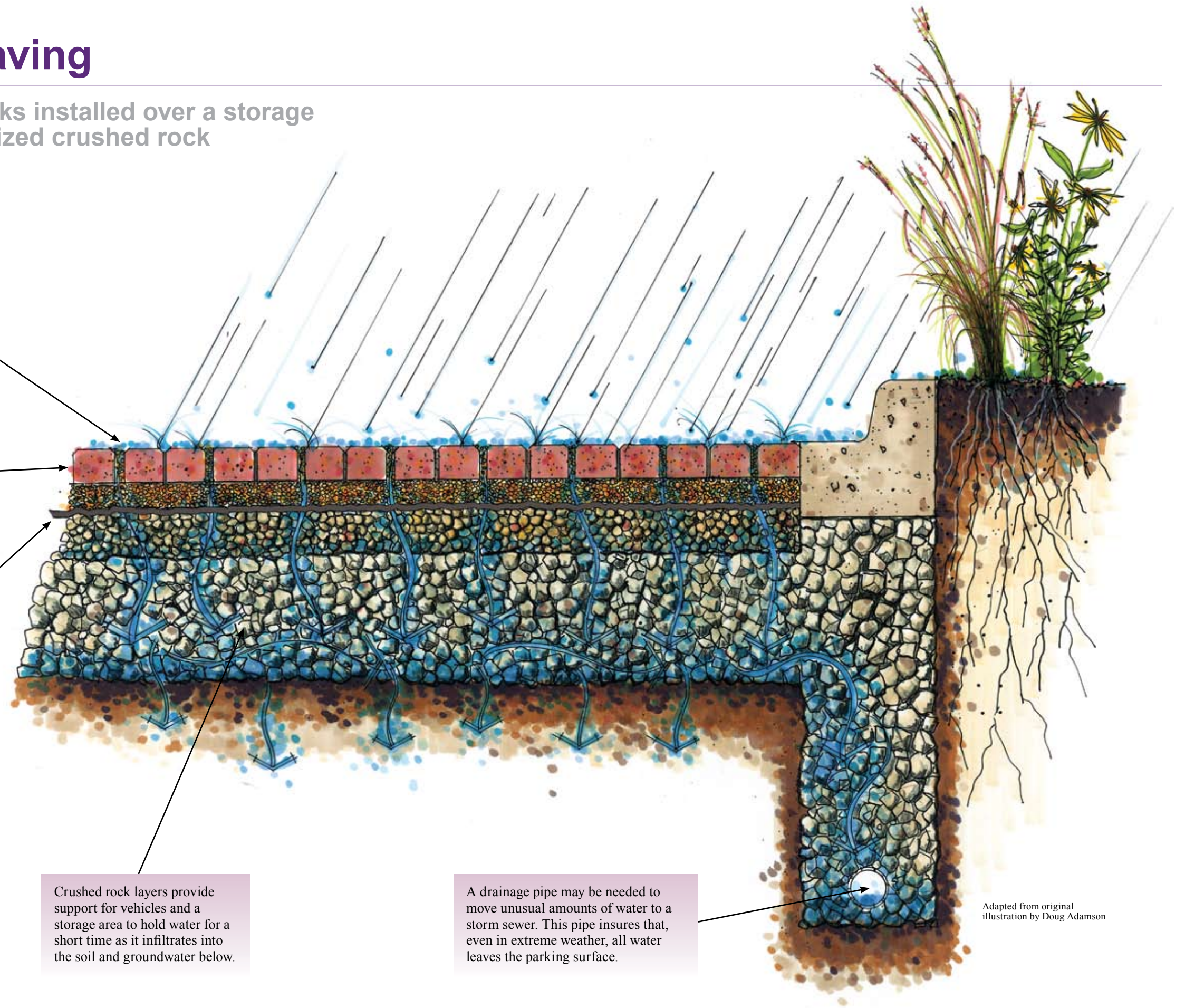
This system prevents car-related pollutants on parking areas from reaching our rivers and streams.



Spaces between modular pavers funnel storm water into an 18-inch layer of crushed rock aggregate base. Here, water is temporarily stored as it infiltrates into the soil and groundwater below. Filter cloth allows water to pass through while keeping smaller-sized crushed rock in the upper layer.

Crushed rock layers provide support for vehicles and a storage area to hold water for a short time as it infiltrates into the soil and groundwater below.

A drainage pipe may be needed to move unusual amounts of water to a storm sewer. This pipe insures that, even in extreme weather, all water leaves the parking surface.



Adapted from original illustration by Doug Adamson