

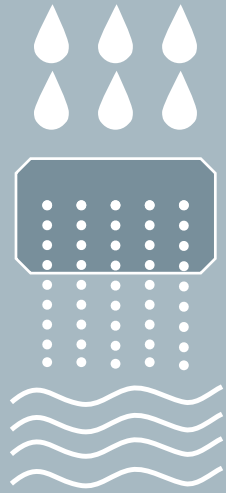
Why porous pavement?

What's good for our streams can be both beautiful and profitable. Building and landscape designs that include permeable or porous surfaces:

- Decrease project costs by reducing or eliminating detention and retention systems necessary with impermeable pavements.
- Reduce the cost of compliance with many stormwater regulatory requirements.
- Allow more efficient land use planning, providing greater economic value for the available property.
- Protect water quality and stream health while increasing urban densities.
- Are aesthetically pleasing and increase market value.

How does porous pavement work?

It's simple. Rain hits it, passes through and soaks into the soil below.



So, what's the cost?

In general the product and installation costs are more than traditional concrete or asphalt – anywhere from 30 – 50% or more, depending on the size of the project. But this can be misleading. For example, a porous concrete parking lot may cost more to install, but may not require an engineered system of catch basins, storm drains and pipes or detention ponds. Costs are certain to come down as the technologies become better understood and more available. Check with your local jurisdiction to find out about any stormwater credits or fee mitigation opportunities.

Want to know more?

To find out more about porous pavers and concrete mixes described in this brochure, check the internet or yellow pages.

The following contacts will get you started:

UNI-GROUP U.S.A. (UNI ECO-STONE®)
4362 Northlake Blvd., Suite 204
Palm Beach Gardens, FL 33410
(800) 872-1864 / (561) 626-4666
www.uni-groupusa.org

GLACIER NORTHWEST
150 N River Street
Portland, OR 97227
(503) 331-3711
www.glaciernw.com

MUTUAL MATERIALS
Locations throughout Oregon and Washington
PO Box 2009
Bellevue, WA 98009
(425) 452-2300
www.mutualmaterials.com

ECOCRETO OF TEXAS, INC.
17050 IH 35, Bldg. 1
Buda, TX 78610
(512) 312-5901, 1-866-ECO-CRETO
www.ecocreto.com

Clean Water Services is a public utility committed to protecting water resources in the Tualatin River Watershed. Nearly 500,000 customers enjoy clean water and healthy rivers and streams through innovative wastewater and stormwater services, flood management projects, water quality and stream enhancement projects, fish habitat protection, and more.



2550 SW Hillsboro Highway
Hillsboro, Oregon 97123
(503) 681-3600
www.CleanWaterServices.org

The Rain Runs Through It

Porous pavement and landscape designs in the Tualatin River watershed



Slow the Flow!

When rain falls on traditional parking lots, sidewalks or driveways, it flows across the surface to the nearest storm drain, and immediately to the nearest stream or river. After all, the drainage system was designed to concentrate surface water flows and efficiently send them downstream. Unfortunately, with the increasing urbanization of the Tualatin River watershed, stormwater runoff now swells our streams, causing flooding, erosion, and degraded water quality and aquatic habitat.

Nearly every time it rains, urban streams rise rapidly, flowing faster and faster. This "flashing" cuts away stream banks and disrupts the physical and biological systems that support fish and other aquatic organisms. Preventing stream flashing is an important strategy to protect and restore our urban stream and wetland systems.

What if rain could flow right through a concrete surface?

In fact it can! Porous concrete and paving allows the rain to be absorbed into the soil, mimicking a natural landscape and minimizing any additional flows into the stream. In addition, the groundwater supply is replenished, providing more natural and consistent stream flows throughout the year.

Site Examples

These sites provide examples of design strategies that manage stormwater on-site and allow rain to be absorbed into the ground. Effective impervious area (the amount of surface land that directly flows to a stream or wetland), has been significantly reduced through thoughtful planning and design, and the use of innovative products in new residential and commercial developments.

Porous driveways and creative swales increase lot density

Auburn Hills by Legend Homes
Auburn Lane in Lake Oswego



Project manager Ron Motsch is proud of the stormwater swale in Phase 2 of the Auburn Hills development, built in 2004. "I consider myself a pretty 'green' guy, always interested in the state of the art."

The varied terrain in Phase 2 made a traditional detention pond difficult. Instead, a design that incorporated porous concrete driveways and vegetated swales fit the bill perfectly. As an added bonus,

the design provided enough space to increase the number of lots from six to eight!

The City of Lake Oswego also liked the idea. Russ Chevrette, an engineer with the City, recalled, "We approved a more traditional detention pond approach to Phase 1. The developers came to us with the porous driveway idea which helped drive a more profitable and innovative design for Phase 2."



RON MOTSCH

"The fact that we could get two more developable lots if we used porous concrete was a huge incentive!"

Un-paving the way to cheaper development and maintenance costs

Lucky Labrador Public House
7675 SW Capital Highway, Portland

Located at the headwaters of Vermont Creek in southwest Portland, the Lucky Labrador Public House reduced its stormwater impact to the Tualatin River by installing Uni-Stone® pavers in its parking lot. Gary Geist, project manager, wanted to do the right thing to protect the Tualatin and the Willamette Rivers. "When I found



GARY GEIST

out we could speed up the permitting process and pay no extra system development charges, I was ready to go! It's been rock solid. It looks cool, like a cobblestone which fits aesthetically with the older, renovated building."

Lucky Lab completed the parking lot in 2002. Staff installed the pavers themselves, which saved significant labor costs.

"The cost was definitely more expensive to install, but when we looked at the engineering and long term maintenance costs, it was worth it. Once it's in, it's done."



Saving Play Fields with Porous Concrete

Hopkins Play Field Complex
800 N Sherwood Blvd., Sherwood



It takes a lot of concrete to provide safe and convenient access to the popular recreational playfields located behind Hopkins Elementary School. A traditional approach would have required over 1,000 feet of pipe and a stormwater detention facility that would have taken away valuable field area. The solution was to use porous concrete.

The 2003 installation, the first ever for Glacier Northwest, cost around 30 percent more than traditional concrete, but saved significant time, money and space. Gene Thomas, senior project manager for the City, said, "This is an in-town field with no space for a treatment facility. We didn't want to lose any play fields. It looks and works great, and maintenance is pretty easy, we just power wash it now and then."

Stormwater management in the built environment

Clean Water Services' Field Operations Facility
2025 SW Merlo Court, Beaverton

The Field Operations Facility's design and landscape features protect local streams and wetlands. Built in 2003, the facility has an ecoroof, porous pavements, and a "green" street that replaces traditional curbs and gutters with vegetated swales that slow water and remove pollutants.



CHRIS BOWLES

All water is treated on the site with native plant landscaping and shallow swales that capture and treat rainfall runoff while providing important food and cover for birds and other wildlife. "Everything we've done is designed to slow down or treat surface water runoff from the site," said Chris Bowles, field operations manager.



Traditional Japanese gardens meet non-traditional stormwater design

Lattice Semiconductors Corporate Headquarters
5555 NE Moore Court, Hillsboro

Space was tight when Lattice Semiconductors built its corporate headquarters in 1999. "Instead of traditional stormwater strategies, we created an artful design with porous parking areas and a rock garden swale that captures and filters our runoff," said project manager Mike Hinsch.



MIKE HINSCH

SADAFUMI UCHIYAMA



Like a Japanese garden, the swale designed by Sadafumi Uchiyama for Kurisu International uses rock and stone functionally and aesthetically. He said, "The system is working almost exactly as I had hoped. The only maintenance was hand weeding until the trees began providing shade."

See for yourself — Compare side by side parking lots

Jurgens Park and Tualatin Police Station
17255 SW Jurgens Avenue, Tualatin
8650 SW Tualatin Road, Tualatin

Jurgens Park, located on the banks of the Tualatin River, manages stormwater runoff with a comprehensive approach that includes gravel walkways, wetlands and porous pavement. "Our goals were to minimize impervious surface, recharge the groundwater, and protect the Tualatin River from more stormwater runoff," said Justin Patterson, parks and recreation manager for the City of Tualatin.

The parking lot, installed in 1999, was designed to demonstrate the aesthetic and functional qualities of Uni-Stone® concrete pavers as one strategy to reduce stormwater runoff.

A visit on any rainy day shows just how well the pavers work. Streams of rainfall flow over the traditional asphalt and directly into the storm drains. Next door, the porous pavement absorbs the rain while adding a softer, cobbled look to the parking lot.

Uni-Stone® concrete pavers can also be seen along the length of the parking lot behind the City of Tualatin Police Station. The row of parking spaces provides a buffer between the traditional parking lot and the adjacent natural area. To a raindrop, these parking spaces mimic natural soils: rain is directly absorbed.



JUSTIN PATTERSON

"We wanted to show that pavers could reduce runoff and be cost effective in the long-run. Maintenance has been almost non-existent. One brick had to be replaced, and that was easy."