



Pervious Concrete

It Doesn't Hold Water – But That's the Point

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As more development occurs and more and more natural vegetation and soil is covered over with hard surfaces, less water naturally infiltrates the ground. This creates more surface run-off that needs to be removed through stormwater systems of underground pipes and ditches. And because stormwater run-off from developed areas flows to receiving waters much faster and in greater volume than under natural conditions, the result can be destructive: channel erosion, flooding, loss of aquatic habitat, and water quality degradation.

Municipalities must therefore either expand the infrastructure to deal with the increase in stormwater run-off, or find ways to decrease the volume of run-off that flows to streams.

Pervious concrete is one possible solution to decreasing the volume of run-off. Used as an alternative to asphalt and conventional concrete, pervious concrete is extremely porous. It allows rainwater to pass through and into the underlying soil at a rate of 100 to 750 litres per square metre each minute. It has been used successfully in parts of the US for over twenty years and is beginning to find its way into British Columbia.

Also referred to as "no-fines concrete" or "porous concrete," this material is a simple mix of coarse aggregate, cementitious materials, water, and in some cases, fibres for binding. Carefully controlled amounts of water

and cementitious materials are used to create a paste that forms a thick coating around aggregate particles without flowing off during mixing and placing. Using just enough paste to coat the particles maintains a system of interconnected voids on the order of 15% to 35% depending on materials and intended application. The result is a very high permeability concrete mix that is suitable for parking lots, sidewalks, driveways, green house floors or low-speed applications such as golf course paths and residential streets.

After placement, pervious concrete resembles a rice crispy square. Rainwater runs through it and is absorbed into the soil below, eliminating the need for conventional stormwater collection systems. Gutters, bioswales and water detention vaults are unnecessary, since the water management system is essentially built into the pavement. Thus, while pervious concrete initially costs approximately 15 per cent more than conventional concrete, the savings in infrastructure more than offsets the initial added expense.

Beyond stormwater management, pervious pavement helps to control the amount of hazardous contaminants in our waterways. Impervious pavements – particularly in parking lots – collect oil, anti-freeze and other automobile fluids which may be washed into streams and lakes by rain.



Pervious concrete – great for driveways

Pervious concrete reduces run-off. In addition, it can be used to help reduce the level of pollution contained in captured stormwater – the so-called "first flush" that contains most of the pollution that comes from an impervious surface. By capturing the first flush of rainfall and allowing it to percolate into the ground, soil chemistry and biology are allowed to naturally "treat" the polluted water.

As the concept of controlling stormwater becomes more widespread throughout the province, so will the use of this beneficial porous pavement.

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Bowker Creek

A Watershed in Transition

Bowker Creek is an urban watershed. In fact, it is one of the most highly urbanized watersheds in the Capital Region, yet it offers a unique retreat from the noise and traffic of the city and provides habitat for birds and other wildlife.

The 8 km creek flows from the University of Victoria south through the Shelbourne valley, meandering through neighbourhoods in Saanich, Victoria and Oak Bay before entering the ocean near the Oak Bay marina. A short tributary flows out of the Cedar Hill Park and Golf Course. It feeds several wetlands and connects a number of existing parks, schoolyards and public facilities. Over the years, much of the original creek channel has been straightened or enclosed in underground pipes; today only about 2.5 km remain above ground.

In March 2004, the Bowker Creek Urban Watershed Renewal Initiative (BCI) was established to implement actions from the 2003 watershed management plan. The current activities are to:

- create signage for each municipality
- develop an inter-municipal Master Drainage Plan
- improve communication about the watershed
- investigate the potential for a demonstration restoration project

Two successful BCI events were held this spring. On April 2, the official BCI launch was held at the Spirit Garden in Victoria. Friends of Bowker Creek Society director Ian Graeme, Oak Bay High student Alan Manning and MLA Sheila Orr, as well as councillors David Cubberly, Denise Savoie and Allan Cassidy all spoke of the importance of the creek. Four interpretive signs were unveiled.

The signs – for placement at the University of Victoria, Mt. Tolmie (Saanich), Spirit Garden (Victoria) and Bowker Creek Park (Oak Bay) – describe Bowker Creek, explain watershed concepts and the effect of human activities, and provide ideas on how individuals can help to improve the health of the watershed.

On May 14, the 8th Annual Bowker Creek Clean Up and Rubber Duck Race was held at Oak Bay High School. Hosted by Oak Bay High's Visions Environmental and Interact Clubs, Friends of Bowker Creek Society, Oak Bay Rotary Club and the Bowker Creek Initiative, the event brought out a team of thirty people to help clean up the creek. Following the clean-up, Mayor Causton unveiled the Oak Bay Bowker Creek sign and launched the Rubber Duck Race. About \$1,000 was raised for planting vegetation in Bowker Creek.

For more information, contact Lehna Malmkvist, Bowker Creek Initiative Coordinator, at lmalmkvist@crd.bc.ca or 360-3302, or visit the Bowker Creek web site at www.bowkercreek.org.



Bowker Creek

URBAN WATERSHED RENEWAL INITIATIVE



Courtesy of Henrich Design and Illustration



Bowker Creek – Rubber Duck Race

Upcoming Events

Bowker Creek Brush Up

- Join us for art and education in Bowker Creek Park
- Sunday, August 14, 2005
 - Bowker Creek Park, Oak Bay (St. Anns and Bowker Creek - across from the Fire Hall)
 - Check out Art in the Park
 - Learn about Bowker Creek

The Dirt on Do-It-Yourself Car Washing

According to ICBC, 137,705 passenger vehicles were registered in Victoria in 2004. Even if only a quarter of these cars are washed by do-it-yourselfers each month, the resulting environmental damage can be significant. Assuming each car owner uses 40 litres (or 5 buckets) of water, 16.5 million litres of potentially contaminated wash water enters the storm drainage system and ends up in our waterways each year.

While the majority of car owners likely do not realize the environmental hazards associated with washing their own vehicles, they could be inadvertently polluting our waterways with a number of harmful materials:

- metals from rust and brake linings
- oil and grease
- detergents and surfactants (substances that break down the surface tension property of water)
- nutrients from ammonia or phosphorus-based detergents

- petroleum hydrocarbons from tire cleaners

Before you reach for your bucket and sponge, consider modifying your routine:

- Let someone else do the work. Switch to commercial car washes, which use about 60% less water (some even use recycled water) and are required to meet discharge standards in the CRD.
- Wash your car over pervious surfaces like lawns and gravel so suds and rinse water can't drain directly into streams or storm drains.
- Wash your car less frequently, and use smaller amounts of cleaning products when you do.
- If you live in a townhouse or apartment where a pervious surface isn't available, use a device to block off storm drains and divert the rinse water to the sanitary sewer, to a safe recharge area or to an infiltration area;



Washing on a pervious surface

- Use biodegradable, low-phosphate or no-phosphate detergents and the least-toxic additional cleaning products possible. Many tire care products, for instance, are labelled "harmful or fatal if swallowed" and should be avoided;
- Use hoses with automatic shut-off nozzles.

By being aware of the hazards and by following a few simple guidelines, a clean car – and a cleaner environment – are easily within reach.

The City of Victoria's Catch Basin Replacement Program

As you travelled along Blanshard, Government, Douglas and Bay streets earlier this year, you probably noticed a good deal of roadside construction. What you witnessed was part of the City of Victoria's three-year catch basin replacement program – an initiative to keep contaminated stormwater from entering the harbour.

The new catch basins will help to remove harmful pollutants and protect the harbour environment by treating urban stormwater road run-off before it enters the system.

National studies of sediments captured from roadside catch basins indicate that higher levels of metal contaminants (copper, lead, chromium,

cadmium, zinc, lead, mercury, silver and arsenic) are found in commercial and industrial areas and near paved roads with high volumes of traffic. Pollutants found in the catch basins are considered non-point source pollution, meaning no single source can be identified.

Older-style catch basins are small and ineffective in high traffic areas. They fill with sediment very quickly, especially during the winter season when sand is applied to roadways. The improved catch basin developed by City of Victoria Engineering staff incorporates a larger volume sump, an extra gutter intake and a trapping hood that captures oils and floatables.

By April 2006, a total of 300 catch basins will have been replaced, including 93 in 2004 and 107 so far this year.

This catch basin replacement project is jointly funded through a five-year Federal / Provincial / Municipal cost-share program. The Canada / British Columbia Infrastructure Program stipulates that such work is to be carried out by forces other than the City's. Pedre Contractors Ltd. was the successful bidder. For more information on the catch basin replacement program or other City of Victoria stormwater initiatives, please contact Gary Pleven, Pollution Abatement Officer, at 361-0314.

Program Partner: CRD Regional Source Control Program

On page 3 of this edition of Stormwater News, we recommend taking vehicles to commercial car washes instead of washing them yourself. As one of several industries governed by the codes of practice of the CRD's Regional Source Control Program, commercial car washes help minimize the impact of car washing on the environment.

The Regional Source Control program is a pollution prevention initiative aimed at eliminating or reducing the amount of chemicals and other contaminants being discharged to the sanitary sewer system by local businesses, institutions and households. The program also helps to protect stormwater quality and

watercourses. In some cases, properly managed non-domestic wastewater can be discharged to a sanitary sewer instead of into storm drains and catch basins.

Under the Code of Practice for Vehicle Wash Operations (Schedule N of Bylaw 2922), car wash operators must follow a set of specific requirements in discharging their wastewater to the sanitary sewer. Specifically, the code requires commercial car washes to install and maintain properly sized vehicle wash interceptors. The businesses must not exceed discharge limits of 15 mg/L oil and grease (hydrocarbons) and 350 mg/L suspended solids. Operators are also required to inspect the interceptors



on a monthly basis and have them cleaned whenever the oil and grease or settled solids reach a prescribed level – at least once each year.

The Code of Practice for Vehicle Wash Operations is one of eleven Regional Source Control program codes that affect over 2,500 capital region business in industries ranging from food services, dentistry and carpet cleaning to dry cleaning, laboratories and automotive repair.

For more information on the Regional Source Control program contact Henry Lee by email at RSCP@crd.bc.ca

STORMWATERlinks

- CRD Environmental Services
www.crd.bc.ca/es
- Harbours Atlas
www.harboursatlas.ca
- Natural Areas Atlas
www.naturalareasatlas.ca
- Bowker Creek
www.bowkercreek.org
- City of Victoria
www.city.victoria.bc.ca
- British Columbia Ready Mix Concrete Association
www.bcrmca.bc.ca
- Residential Watershed Pledge
www.RestoreRockBay.com
- Georgia Basin Action Plan
www.pyr.ec.gc.ca/georgiabasin/index_e.htm
- Environment Canada
www.ec.gc.ca



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