

# SUSTAINABLE STORMWATER

Stormwater management is a key element in maintaining and enhancing Portland's livability. As the city is developed, new impervious surfaces increase the amount of run-off during rainfall events and disrupt the natural hydrologic cycle. These conditions erode stream channels and prevent groundwater aquifer recharge. Parking lots, streets and roofs increase the pollution levels and temperature of stormwater run-off that is transported to our streams and rivers. Protecting these waters is vital for a great number of uses, including fish and wildlife habitat, drinking water, and recreation.

New Columbia's stormwater management system employs Low Impact Development (LID) strategies. LID uses topography, vegetation and soil features to naturally infiltrate rain water into the groundwater aquifer where it falls. LID eliminates the need for expensive conveyance systems and is a foundation of sustainable development at a community-wide scale. *New Columbia has 80% less underground stormwater piping than a comparable traditional development, and retains 98% of the stormwater that falls on public and private property on site!*

The city's Bureau of Environmental Services calls New Columbia "the ultimate green streets development". With 101 pocket swales, 31 flow-through planter boxes and 40 public infiltration dry wells, New Columbia is Portland's largest green streets site.

Stormwater from the public streets is treated in biofiltration areas (swales and planter boxes) located within the public rights-of-way. Biofiltration areas are designed to allow run-off to filter through the planter soils and then infiltrate into native soils. Small storm events are completely infiltrated by the swales and planter boxes. Large storm events cause the swales and planter boxes to overflow into 30' deep drywells located below the streets.



## PERMEABLE PAVING DEMONSTRATION

New Columbia's private stormwater is collected in common greens and alleys. The alleys located on blocks 1 through 7 (bordered by Fiske Avenue, Trenton Street, Adriatic Avenue and Columbia Boulevard) are one of Portland's largest porous pavement demonstration areas. At the centerline of these alleys, a strip of porous pavers sits on top of a soakage trench. Stormwater from the private property enters the soakage trench through the pavers and filters to 30' deep drywells located at the either end of each alley. The trenches filter hazardous pollutants like phosphorous, lead and motor oil from the water before returning it—cleaner than it was when it entered the trench—to the aquifer.



### Photos from top:

*A pocket swale is inspected by an engineer from BES before it's backfilled and planted.*

*Testing a pocket swale.*

*A soakage trench in an alley, under construction.*

## STRONG PUBLIC PARTNERSHIPS

New Columbia wouldn't be as great as it is without the support of the City of Portland. During the planning phase, staff from the development bureaus participated in a Technical Advisory Committee, a group formed especially for New Columbia to brainstorm and troubleshoot innovative ideas on stormwater management, street and utility design, uses for recreational space, and other sustainability-related topics. Additionally, the Office of Sustainable Development hosted two green building workshops during the planning phase for design consultants, residents, and operations and maintenance personnel. These workshops surfaced and resolved concerns and issues that usually aren't discussed until after a project is built and occupied!

**SWALES, SUMPS, SOAKAGE TRENCHES...***they're not all the same. The following techniques are all used at New Columbia. Definitions are from the Bureau of Environmental Services Stormwater Management Manual:*

**BIOFILTRATION:** *The combined physical, biological, and chemical processes that remove pollutants from stormwater in a vegetated treatment facility such as a pond, wetland, or swale.*

**DRYWELL (ALSO A SUMP):** *A structural subsurface facility with perforated sides or bottom, used to infiltrate stormwater into the ground.*

**INFILTRATION:** *The percolation of water into the ground.*

**FLOW-THROUGH PLANTER BOX:** *A structural facility filled with topsoil and*

*gravel and planted with vegetation. A perforated collection drain in the bottom directs stormwater to an acceptable disposal point.*

**SOAKAGE TRENCH:** *A linear excavation backfilled with sand and gravel, used to filter pollutants from and infiltrate stormwater into the ground.*

**VEGETATED SWALE (ALSO A POCKET SWALE):** *A surface facility planted with a variety of trees, shrubs, and grasses. Stormwater is directed through the swale, where it is slowed and infiltrated, allowing pollutants to settle out.*

