

# 2007 Department of Ecology Low Impact Development Stormwater Grant Program

## City of Poulsbo – Caldart Avenue Stormwater LID Project



*Pervious concrete sidewalks*

### Project description

Caldart Avenue is a high-traffic, rapid-growth neighborhood in the city of Poulsbo, Washington. As part of a project to improve motorized and pedestrian safety on a 2,200 foot segment, the city installed the following low impact development (LID) elements:

- Approximately 2,200 feet of new five-foot wide porous concrete sidewalks.
- 800 feet of bioretention swales.
- One traffic island bioretention cell.

These were the first efforts to retain and treat stormwater runoff in the project area. The site

consisted of 57,400 square feet of existing impervious surface. The road expansion improvements added a net of 3,100 square feet of new impervious surface. To counter the additional impervious surfaces added, the city constructed approximately 11,000 square feet of new porous concrete sidewalks to reduce the impervious area and provide water quality benefit. The two bioretention swales of approximately 800 feet will infiltrate and retain runoff. A bioretention cell constructed in a traffic island will also help reduce runoff. Treated stormwater flows directly to the city-owned collection system and detention facilities before discharging to South Fork Dogfish Creek.

### Project challenges

Swale erosion is a problem in a few places. The problem occurs where the vertical curb and flat curb join. A flush concrete curb along the bioswales on the Caldart Avenue project allows water to flow evenly along and into the length of the swale. In places where the flush curb transitions to a standard vertical curb, water runs along the vertical curb until it reaches the flush curb and then flows into the bioswale. The flow is concentrated at these points, and has caused significant erosion in one of the swales. The water flows directly into the overflow grate and does not pass through the bioretention cell as it should.

The vertical curbs should have been designed with catch basins or curb cut-outs spaced evenly along the vertical curb to allow even water flow into the swale. Staff worked with the city inspector to develop a plan to ensure the water is evenly distributed to the bioretention cell before going through the overflow gate.



*Before post-construction adjustments*



*After post-construction adjustments*

### **Projected environmental benefits**

Most stormwater is readily infiltrated by the bioretention cells, and surface runoff has been virtually eliminated during storm events. The city will continue monitoring for several years to learn how the project site hydrology and water quality at Caldart Avenue will meet the project’s initial goals:

- Achieve approximately 90 percent reduction in runoff from porous concrete sidewalk compared to conventional concrete.
- Reduce runoff volume by 80 percent due to bioretention swales.
- Reduce fecal coliform, suspended solids, total phosphorous and total nitrogen in underdrain discharge from bioretention swales.
- Reduce effective impervious surfaces by 11,000 square feet.
- Provide stormwater treatment for 60,500 square feet impervious area through bioretention swales and bioretention cell.

### **Public education**

The city of Poulsbo installed an interpretive sign at the LID project site. More information about this LID project is available on the city’s Web site: [http://www.cityofpoulsbo.com/Works/caldart\\_LID.asp](http://www.cityofpoulsbo.com/Works/caldart_LID.asp)

The city will conduct a LID workshop for the city council; planning for these is in the works.

### **Cost information**

The total project cost, including construction, monitoring and education, is approximately \$1,000,000. Ecology provided a \$263,000 grant to help the city with LID design construction elements, education and outreach, and monitoring.

ITEM	BUDGET	GRANT AWARD
Project Management	\$15,000	\$0
Design	\$19,000	\$19,000
LID Construction	\$194,000	\$194,000
Education	\$20,500	\$8,500
Monitoring	\$45,500	\$41,500
Non-LID Construction	\$456,000	
<b>TOTAL</b>	<b>\$750,000</b>	<b>\$263,000</b>

## Partners

Ecology acknowledges, but does not endorse the following consultant that helped with this project:

ACE Paving Company of Bremerton

They installed all of the LID elements including both the pervious concrete sidewalks and bioretention cells.

### Interpretive sign



## For more information

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