2007 Department of Ecology
Low Impact Development Stormwater Grant Program

SNOHOMISH COUNTY – EVERGREEN STATE FAIRGROUNDS LID IMPROVEMENTS PROJECT

Installation of porous concrete for walkway at Long House, which was followed by installation of porous pavers within rectangular blocks.

Project description

Snohomish County recently installed many low impact development (LID) improvements at the Evergreen State Fairgrounds in Monroe, including:

- Seven **rain gardens** (bioretention areas) to infiltrate runoff from adjacent impervious parking lots, roadways, and building roofs.
- Six types of **porous surfaces**, including porous asphalt, two types of porous pavers, and three types of porous concrete, to replace two impervious walkways and part of the fair entrance.
- Two **bioretention planter boxes** to replace regular planter boxes and infiltrate roof runoff from adjacent buildings.
- **Compost-amended lawns and landscaping** to provide dispersion areas to infiltrate runoff from adjacent roads and buildings.
- **Infiltration trenches** to help runoff get through slower draining soils down to the faster draining soil layers.

These improvements help reduce stormwater runoff from the fairgrounds and help improve water quality in the French Creek Watershed, a sub-basin of the Snohomish River Basin. Runoff previously flowed through catch basins and culverts to the French Creek Watershed and contributed to previously observed sediment deposition; erosion; elevated fecal coliform bacteria; lead; and copper levels in the creek. These improvements also provide an excellent opportunity for public education, as over a million people from throughout the region visit the fairgrounds each year.

Lessons learned

- The county included requirements in the contract specifications that certain improvements would need to be performed by personnel or sub consultants that have prior construction experience, specifically for the landscaping, porous concrete, and porous pavers. These requirements proved very helpful, particularly for the installation of the porous concrete and porous pavers. The prime contractor had no prior experience with these improvements, and therefore used highly qualified sub-consultants.
- The actual soil conditions encountered during construction differed from the soil borings in some cases. This resulted in the need to excavate further down to reach the better draining soils, which increased the cost of some improvements.

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Infiltration trench installed to help runoff drain down to faster draining soils.

- Some of the rain gardens and bio-infiltration planter boxes initially drained slower than designed. The county needs to investigate this further, but suspects too much fine material accumulated at the surface of these facilities during construction.

- The county rejected the first installation of granolithic porous concrete because it did not have the proper consistency. The delivery truck traveled a long distance and the drum revolved too much before the load arrived, changing the consistency of the material.

- Colored concrete pavers can go through a process called efflorescence, where a white film appears on the surface of the pavers. While this affects only the aesthetics and not the function of the pavers, the city is exploring options to restore the original paver colors.

- The city placed plastic sheet over the colored sections of porous concrete for curing purposes. However, since the sheeting was in direct contact with the concrete, it caused some minor discoloration. It was later suggested that using a tented approach, where the sheeting does not directly contact the concrete, would prevent this type of discoloration.

- It was difficult to find suppliers to provide the compost-amended soil to meet a particular specification. The specifications for soil mixes should be as similar to compost-amended soil mixes as possible and be supplied from local stores. In addition, the county recommends conducting soil tests on the compost prior to accepting the material.

Projected environmental benefits

While the visual evidence exists, the county is collecting continuous flow and precipitation monitoring to determine the infiltration capacity of the rain gardens through a continuous monitoring rain gauge, a flow gauge in an overflow pipe to measure flows leaving the rain garden. This project intends to meet the following environmental water quality goals:

1. Improved hydrology and water quality at portions of the Evergreen Fairgrounds site.
2. Treat runoff from approximately 16,200 square feet of roof area through rain gardens, dispersion, planter boxes, and landscaped areas with compost-amended soils.
3. Achieve a 90 percent reduction in the volume of stormwater runoff generated by impervious surfaces at the fairgrounds by maximizing infiltration in LID project areas.
4. Provide a targeted 80 percent reduction in pollutants, particularly metals, hydrocarbons, and total suspended solids, by runoff from existing roadways and parking lots to the proposed bioretention areas.

Public education

Interpretive signs were prepared that describe the improvements that were installed at different locations at the fairgrounds. In addition, a kiosk provides additional educational materials, a map of the installed improvements, and take-home brochures.

Project cost

The budget for the entire LID project is $393,400, of which $323,400 is supported by the EcologyLID stormwater grant. Matching fund sources include the Snohomish County Parks Department and Surface Water Management Division of Public Works. In-kind services were donated by the Sustainable Development Taskforce of Snohomish County (see http://www.sustainablesnohomishcounty.org/ for more info).

Item	Budget	Grant Award
Project Management	$25,000	$0
Design	$68,900	$63,900
Construction	$254,400	$229,400
Monitoring	$30,100	$15,100
Education	$15,000	$15,000
Total	**$393,400**	**$323,400**

Partners

Ecology recognizes, but does not endorse or recommend the following contractors who participated in the project:

- *Snohomish County Public Works Dept.*: Project funding, project management, construction of porous pavement at two sites, construction inspection, design of educational materials, flow monitoring.
- *Snohomish County Parks Dept.*: Project funding, site preparation for construction.
- *The Sustainable Development Task Force of Snohomish County*: Public education tasks.
- *SvR Design Company*: Project design.
- *Taylor Associates, Inc.*: Flow gage installation.
- *Colleen Barker*: Design of paver art mosaics.
- *Earthwork Enterprises Inc.*: Prime contractor for majority of construction.
- *Edge Concrete LLC*: Subcontractor for porous concrete at two sites.
- *RMB Finoti Enterprise:* Subcontractor for porous pavers at two sites.
- *Out West Landscape and Irrigation Inc.*: Subcontractor for landscaping at multiple sites.

Rain gardens installed to infiltrate parking lot runoff.

For more information

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Site photos

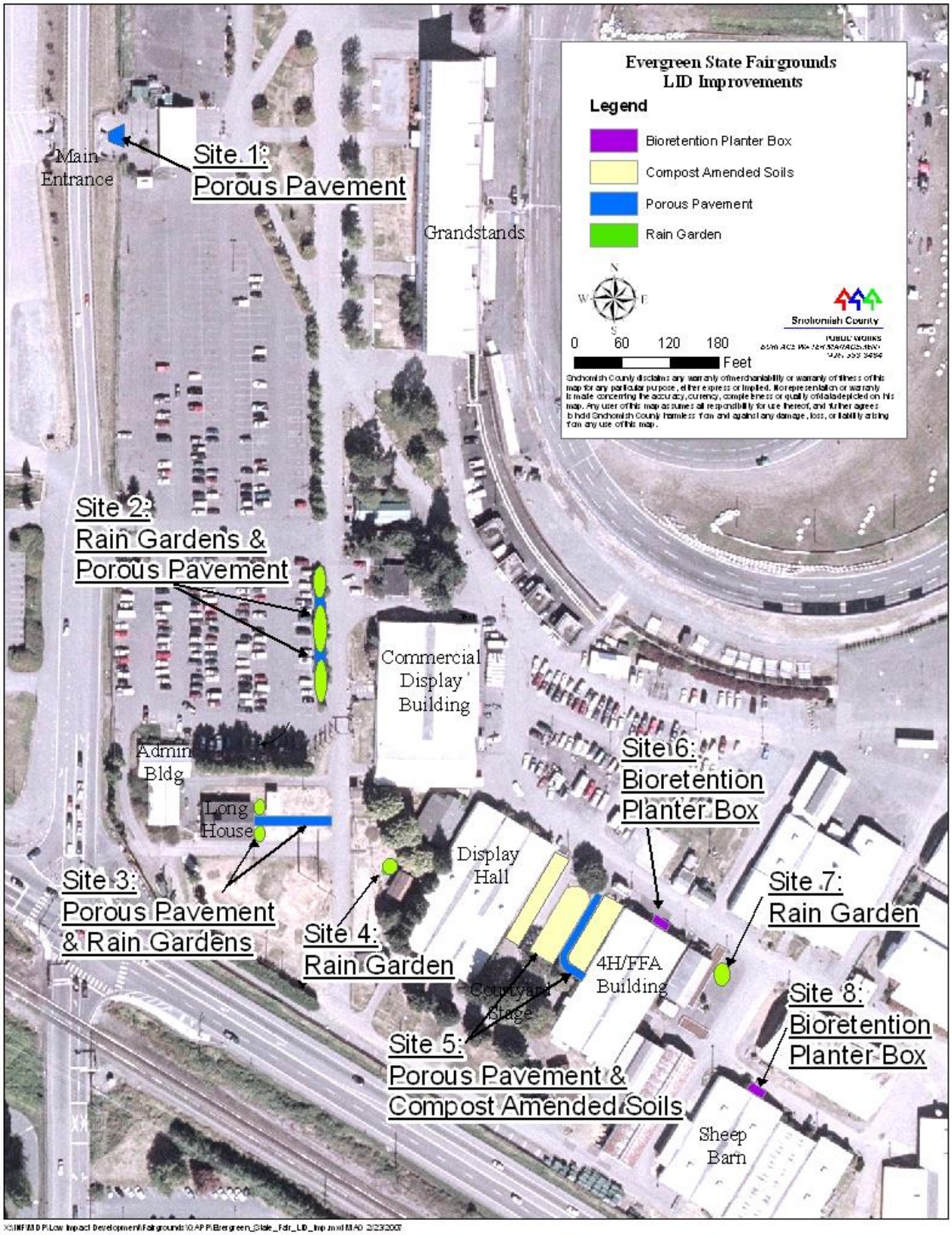
Two types of porous concrete installed at the fairgrounds entrance.

Porous asphalt walkway, Ecostone pavers, and compost amended soils in lawn and landscaped area.

Porous walkway installed with porous concrete and colored pavers that create Native American art mosaics.

Rain garden installed to infiltrate runoff from adjacent road and building roof.

Biofiltration planter box installed to infiltrate roof runoff.



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