2007 Department of Ecology
Low Impact Development Stormwater Grant Program

City of Redmond – Grass Lawn Park Phase III Project

Rain garden

Project description

Grass Lawn Park, a 28.5-acre park in Redmond, Washington, is located at the headwaters of a branch of Peters Creek. More than 138,000 people visit this park each year. Developed in 1978, it offers many amenities accessible through conventional asphalt walkways:

- Two parking lots
- Two basketball courts
- Three softball fields
- One soccer field
- Six tennis courts
- Picnic shelter and restrooms

The city recently undertook the Grass Lawn Park Phase III renovation project to improve a two-acre section of the park. The project proposed these improvements:

- New pavilion.
- "Green roof" for new maintenance building. The roof is partially or completely covered with vegetation and soil planted over a waterproof membrane.
- Play areas with pervious walking paths.

Pervious pavement

The Grass Lawn Park Phase III project incorporates the following low impact development (LID) elements:

1. Permeable pavement/porous concrete – a basketball court, pavilion patio, and walking paths throughout this section of the park.
2. Dry creek bed/water feature – the pavilion roof drains through a water feature.
3. Rain garden – water from the pavilion and the water play areas drain to the rain garden.
4. Compost-amended soil – grass areas were enriched with compost amended soils to increase water retention and reduce the need for irrigation.
5. "Green roof" – the maintenance building's new vegetated roof will decrease the impervious surface.
6. Tree retention – nearly all trees on site were retained and many more were planted.

Lessons learned/challenges

Porous pavement. The city evaluated two different porous pavement technologies, Porous Asphalt Concrete Pavement (Asphalt) and Porous Portland Cement Concrete (Cement), for use in the park pathways and the basketball court. Although the asphalt looks more

April 2009 *Ecology Publication No. 09-10-035*

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like regular asphalt, with recent improvements it looks similar to cement mixes. Asphalt mixes cost less than the cement mixes by a factor of almost 3:1. Asphalt requires special batching at the asphalt plant, so owners must consider the quantity required during the planning process. For this project, the city decided to go with the porous asphalt.

Permeable court tile

Permeable plastic court tile was used on the basketball court to resolve concerns with players kicking up aggregate, since the porous asphalt has less binder in the mix.

Both products performed well during the first heavy storm event. No standing water was present, and the basketball court retained good traction. Prior to LID installation, these areas experienced significant ponding and drainage problems.

Green roof. The "green roof" reduces the visual impact of the maintenance building to the park and blends with the surrounding park landscape. Due to the added weight of the roof, the substructure element walls, roof beams, joists, and decking needed upsizing. The city minimized penetrations through the roof, such as exhaust fans and plumbing vents, to reduce the leakage potential in the waterproof membrane. A short-term irrigation system was installed to help plants get established.

Projected environmental benefits

Initial results show that the implemented LID techniques are reducing flow. The city contracted with Herrera Environmental Consultants to conduct environmental monitoring. Monitoring activities include continuous hydrologic monitoring (from play courts, rain garden, and below the vegetated roof). The city is also monitoring water quality from the vegetated roof and a nearby traditional metal roof for a number of metals, total suspended solids, polycyclic aromatic hydrocarbons (PAHs), and total hardness. Monitoring will continue for three years after construction. The project goals are to meet the following outcomes:

"Green roof"

1. A 62 percent reduction in stormwater runoff volume from the project site as a result of the installation of two rain gardens, 1,300 square feet of "green roof," and pervious surfaces.
2. Removal of 15,000 square feet of impervious surface (asphalt and existing buildings), including the conversion of 9,000 square feet of concrete walkway to pervious concrete.
3. Retention of 70 percent of existing trees and a net increase in number of trees.
4. Better community awareness of low impact development (LID) techniques.

Public education

The city held a Grand Opening Ceremony that attracted approximately 60 local residents, developers, and project participants. The park displays a kiosk that describes the LID components used.

Cost information

The total renovation project cost approximately $1,869,000. Ecology funded the LID components through a $469,200 grant. Ecology's grant monies helped fund design, construction, monitoring, and outreach/education elements.

ITEM	TOTAL PROJECT COST	TOTAL ECOLOGY GRANT AWARD
Project Management	$5,300	$5,300
Final LID Design	$60,900	$60,900
Contract Documents	$28,800	$28,800
LID Construction	$308,800	$308,800
Education & Outreach	$5,000	$5,000
Monitoring Plan/Program	$90,400	$90,400
Non-LID Project elements	$1,370,000	
Total	$1,869,200	$469,200

Playground

Redmond Project Manager, Steve Gibbs

Partners

Ecology recognizes, but does not endorse, the following agencies and organizations who contributed to this effort:

- City of Redmond Parks and Public Works Departments: Project Development and Management
- City of Redmond Stormwater Utility Fund: Project Funding.
- Department of Ecology: Project Funding
- U.S. EPA Manchester Laboratory: Environmental Laboratory Analysis
- Bruce Dees and Associates – Site design
- Wayne Ivary Architects – Building Design
- Herrera Environmental Consultants: Water Quality and Environmental Monitoring
- Roy E. Dunham Co. – Construction Contractor
- Tri-Falls Construction was the Landscape subcontractor

For more information

Steven Gibbs, P.E.
Project Manager
City of Redmond Parks Department
15670 NE 85th Street
Redmond, WA 98073
425-556-2729
sgibbs@redmond.gov

Anne Dettelbach
Project Manager
WA Department of Ecology
3190 – 160th Avenue SE
Bellevue, WA 98008-5452
425-649-7093
adet461@ecy.wa.gov

Emily Morris
Financial Manager
WA Department of Ecology
PO Box 47600
Olympia, WA 98503
360-407-6703
emar461@ecy.wa.gov

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