Lewellyn Elementary School

6301 SE 14th Avenue

PROJECT SUMMARY

Project Type:	Pavement removal
Technologies:	Asphalt removal; trees
Major Benefits:	• 1,280 square feet of asphalt was removed from the right-of-way and replaced with grassed infiltration areas that manage stormwater runoff from approximately 10,000 square feet of impervious area. • Large canopy street trees were added to increase evapotranspiration and infiltration.
Cost:	$19,664 total, with $19,364 paid by EPA funds
Constructed:	August 2004 through January 2005

Overview of the Stormwater System

- The existing site grading at the back of Lewellyn Elementary School directs stormwater runoff from the school's loading and delivery area to the parking strip median. This project removed approximately 1,280 square feet of asphalt in the parking strip median (Figures 1 and 2) and replaced the asphalt with soil that was then seeded with grass (Figure 3).
- Large canopy street trees were planted (Figure 4) to reduce stormwater runoff through evapotranspiration and infiltration.
- The grading will continue to direct stormwater runoff from the school site to the new landscaped area. Concrete pavers placed across the median at regular intervals provide pedestrian access.

Figure 1: Asphalt parking strip median (middle dark grey areas to right)

Figure 2: Parking strip medians with grass and concrete pavers for pedestrian access

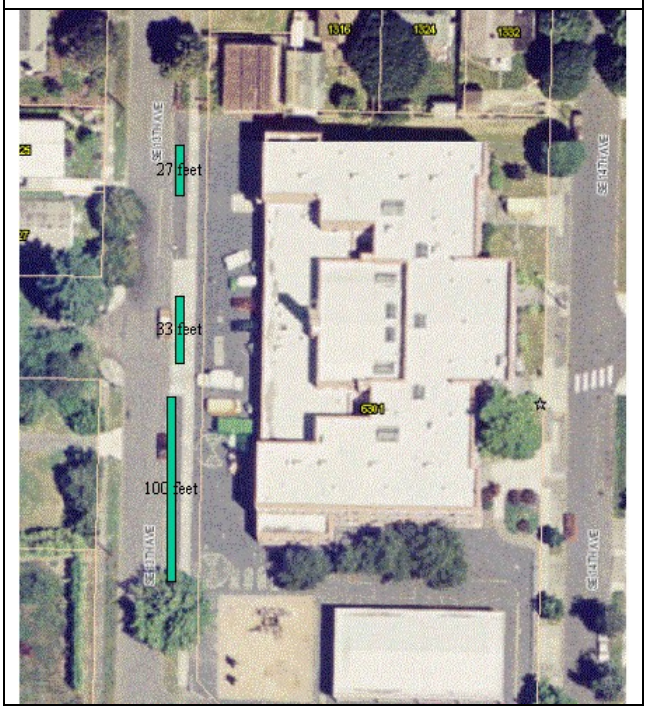
Figure 3: Completed project with street trees

STORMWATER CAPACITY AND SYSTEM COMPONENTS

Stormwater Management Goal

The stormwater management goal was to reduce stormwater runoff by replacing asphalt with grassed landscape areas and adding large canopy trees.

Figure 4: Site Plan



System Components

(See Figure 4.)

Infiltration Areas

Three separate strips of asphalt in the planting strip were removed to create space for infiltration of runoff.

Catchment area: The new infiltration areas drain approximately 10,000 square feet of impervious area.

Facility footprint: The three infiltration areas are each 7 feet, 8 inches wide and 27 feet, 33 feet, and 100 feet long, respectively (north to south).

Overflow: All flows will fill the depressed areas and overflow to the street, either over the curb or across the vehicle cuts.

Additional information: Concrete pavers were added at regular intervals for pedestrian access.

Landscaping

After the asphalt was removed and topsoil was added, the area was seeded with a native grass mixture for erosion control and low-maintenance groundcover. The following grassy swale mix, approved by the City of Portland's 2002 *Stormwater Management Manual,* was used. No irrigation is provided for this grass mixture.

Hobbs and Hopkins Pro-Time 835, Bio-filter Summer Green Vegetative Cover

Perennial ryegrass	*Lolium perenne*
Eureka hard fescue	*Festuca ovina duriuscula* 'Eureka'
Dwarf white yarrow	*Yarrow millefolium*

Friends of Trees planted 12 Raywood ash trees along the landscaped area. Friends of Trees will maintain summer irrigation for the trees by water barrels for 3 years and, if necessary, will replace non-surviving trees.

BUDGET

The Lewellyn Elementary School project cost a total of $19,664 for construction, landscaping (including volunteer tree installation), and permits. Because the project required sidewalk and curb replacement work within the right-of-way, it was implemented by the City's Bureau of Maintenance (BOM). The BOM costs may not reflect true project costs if the work were completed by an outside contractor.

Item	Item Cost	Volunteer Effort	Total Cost
Construction			**$16,090**
BES construction oversight	$3,273		
Bureau of Maintenance excavation, curb installation, topsoil	$12,817		
Subtotal	***$16,090***		
Landscaping			**$3,410**
Plant material (trees, grass seed)	$1,469		
Tree installation – Friends of Trees neighborhood tree planting (15 volunteers for 2 hours at $10/hour)		$300	
Concrete pavers	$58		
Irrigation and plant warranty	$1,583		
Subtotal	***$3,110***	***$300***	
Permits			**$164**
Right-of-way permit	$164		
TOTAL	**$19,364**	**$300**	**$19,664**

Budget Elements

Non-Construction Activities

The cost for design and overall project management was not included in the budget because these elements were considered a part of existing staff responsibilities and were not tracked separately for this project.

Construction Activities

The existing curb and sidewalk were in disrepair. BOM required a new street curb and sidewalk to be installed to support the soil and meet new construction standards (Figure 5).

Figure 5: New curb and sidewalk installation

Cost Components

Construction

The construction elements, including the new curb and sidewalk, cost $16,091, or 83 percent of the total project cost (not including volunteer labor).

Landscaping
The landscaping cost $3,110, or 16 percent of the total project cost (not including volunteer labor).

Permitting
The right-of-way permit for the project cost $164, or 1 percent of the total project cost (not including volunteer labor).

Cost Comparisons

This was a fairly simple retrofit project. If there were no concerns about access, vegetation, existing utilities, and the state of the existing infrastructure (sidewalk and curb), this type of project would be relatively inexpensive.

MAINTENANCE AND MONITORING

Portland Public Schools is responsible for the right-of-way and its maintenance. BES staff will make regular visits to photograph the site and ensure overall performance. Friends of Trees is committed to 3 years of summer watering of the trees and overall tree survival.

PUBLIC INVOLVEMENT

A one-page handout (Attachment 1) was developed to educate the local community about the benefits of the project. Copies were provided for each student at Llewellyn School to take home, and extra copies were provided to school office staff to give to people who had questions (approximately 500 copies total). Friends of Trees was contracted to manage the tree planting during one of its neighborhood planting events in the Sellwood-Moreland neighborhood and provided general environmental education to volunteers at the tree planting event.

SUCCESSES AND LESSONS LEARNED

Construction Budget: The need to construct a new street curb and sidewalk increased costs significantly from initial estimates.

Overall Design: The simple design and existing site grading site allowed for a relatively simple retrofit. If concerns about access, vegetation, existing utilities, and the state of existing infrastructure (sidewalk and curb) can be met, this type of facility is a relatively easy project. Where curbs and sidewalks are in disrepair, this kind of project could be added to other planned repairs.

Facility Damage: The new landscape areas suffered a series of "drive-through" accidents shortly after construction, before the street trees were installed. Waste haulers and parents picking up students drove through the facility by accident, not realizing or remembering that the asphalt was no longer there. Adding street trees (or some other large visual cue such as stakes or a rope fence) shortly after construction could help reduce tire damage to the grass and soil.

Attachment 1: Public Involvement Fact Sheet

Lewellyn Elementary School

Innovative Wet Weather Project

September 2004

working for clean rivers, healthy watersheds, and a livable, sustainable community

You've probably noticed construction on the west side of the school grounds along 13th avenue. Portland's Environmental Services is working with Portland Public Schools on a project to reduce stormwater runoff from the school's back parking areas. Sections of asphalt in the planting strip between curb and sidewalk will be removed and replaced by a series of vegetated swales. The Portland Bureau of Maintenance will also build new curbs and sidewalks around the swales.

The swales will be shallow, narrow grassy depressions that will collect stormwater runoff and allow pollutants to settle and filter out as water soaks into the ground. Stepping stones, which the students will help create, will provide a good walkway across the swales. Friends of Trees will also work with the school to plant 13 street trees in the swales.

Environmental Benefits

Removing pavements reduces stormwater runoff and lets rain soak into the ground. Instead of contributing to basement flooding and combined sewer overflows (CSOs), the rainwater will help refresh the natural groundwater system.

The new trees will also reduce stormwater runoff by holding rainwater on their leaves and branches. Trees also help prevent erosion and provide wildlife habitat.

A New Look

The swales are designed to enhance the appearance of the existing landscape. Students and teachers at Llewellyn are exploring the possibility of planting more native vegetation in the future. New, white curbs will replace old, cracked curbs surrounding the swales and sidewalks. Construction should be finished by October.

Environmental Education

Environmental Services has worked with the school community to make the swales a safe and attractive part of the school grounds, as well as an educational resource. An Environmental Services educator will visit the school this fall to teach students about water quality and stormwater management, and how to be good stewards of the new stormwater management areas.

For More Information

If you have questions or concerns about site activities please contact:
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