Winning Projects

Stormwater Design Award Competition
1996 and 1997
Portland/Vancouver Metropolitan Area

Integrating stormwater, density and natural resources into the urban environment

Sponsors
- Metro, Growth Management Services
- Unified Sewerage Agency of Washington County
- City of Portland Bureau of Environmental Services
- Clark County Development Services Division
- Water Environment Services, a department of Clackamas County

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Winning projects

Stormwater design award competition 1996 and 1997

Published July 1998

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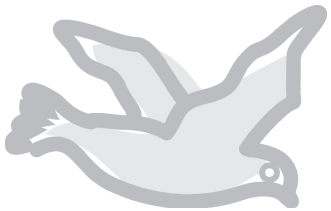

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The Natural Resources Conservation Service

City of Vancouver

Oregon Department of Environmental Quality

Local conservation districts

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Introduction

Innovative development is showing its presence in the Portland/Vancouver metropolitan region. It is reflected in ponds and wetlands that both treat stormwater and provide natural habitat. It is rooted in landscaping that preserves and enhances native vegetation. And it flows through cascades, rivulets and swales that not only collect stormwater runoff, but feature it as a design element.

These development approaches have merit in any environment. They are particularly noteworthy because they show how to accommodate density requirements while protecting water quality and other natural resources. And they are not just ideas waiting to happen. They are – literally – well-grounded realities.

This handbook presents the winners of the 1997 Stormwater Design Award Competition. The six projects include a residential development, a medical facility, a corporate headquarters campus, a retail commercial site and two public facilities. While each is unique in some ways, all share common attributes of vision, practicality and success. This year's handbook also profiles the 1996 competition winners, with an update on how well they are achieving their intended purposes.

We invite you to read about these exceptional projects, learn of their achievements and build on their examples.

The stormwater design award program

The purpose of the award program is to select and award high-quality, innovative development projects that effectively integrate urban density goals, stormwater management, and natural resources protection and enhancement into the urban environment.

The program was created in response to a number of influences: increasing urban densities resulting from Metro's Region 2040 growth concept and Washington's Growth Management Act; Clean Water Act mandates to treat stormwater; and a desire to protect natural resources. As the region becomes more urbanized, there is often a perceived conflict among these goals. The intent of the awards program is to show that the goals can, in fact, be compatible. Recognizing real-life projects that serve these multiple functions can sow the seeds for even more new ideas and successes.

The importance of this integrated approach is demonstrated by the range of program co-sponsors: local, regional and state agencies involved in stormwater management, planning and resource protection throughout Clackamas, Clark, Multnomah and Washington counties.

The strong, positive response to the first awards program in 1996 continued for the 1997 program. The variety and quality of the submitted applications clearly show that both the private and public sector have an interest in putting innovative concepts into practice. The Stormwater Design Award Competition will be continued every two years to stimulate even more resourceful development of this nature.

There were six award winners honored in both 1996 and 1997. In both competitions three projects received honor awards as the highest achievement and three received merit awards of excellence.

Judging criteria

All applications were judged by the following criteria:

All projects must meet the following criteria:

- project must be substantially complete
- project must be located in Clackamas, Clark, Multnomah or Washington counties

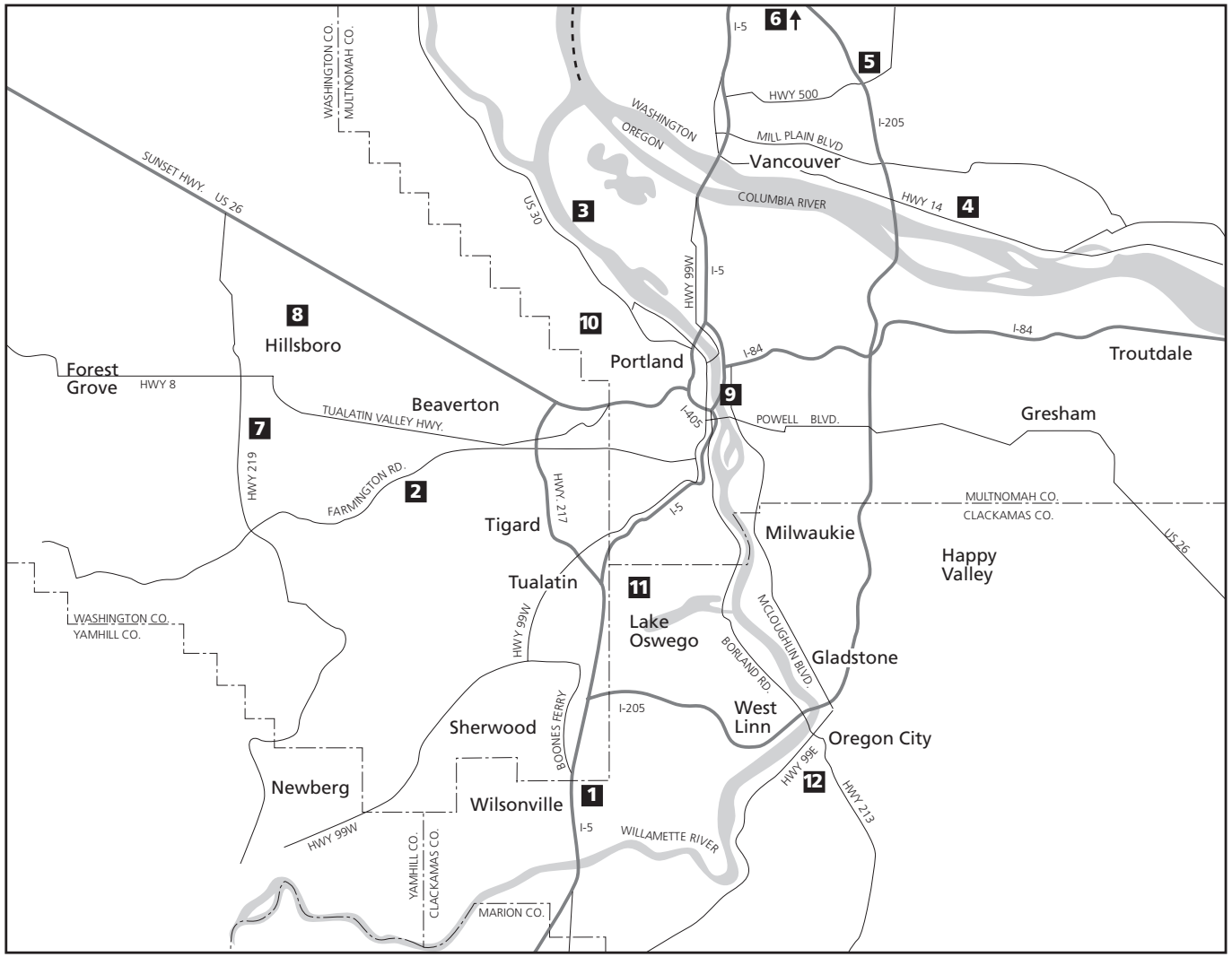
Projects should meet as many of the following criteria as possible:

- landscape and stormwater integrated with the built environment
- natural resources protected and/or enhanced
  - *use of native plants*
  - *habitat improvement*
  - *protection of natural resources at site*
- project design fits with the surrounding environment
- stormwater facility/feature functions as intended/designed
- exhibits innovative water resources management
- helps achieve compact, livable urban development

Note: Wetland mitigation projects did not qualify for the competition.

Next steps

As the Portland/Vancouver metropolitan region continues to grow, in-fill development and redevelopment will have an increasing emphasis. These small, more difficult sites will pose particular constraints and opportunities for stormwater management. This year's judges recommend that the next competition, scheduled for 1999, focus specifically on this kind of development. The past two competitions offer encouraging evidence that developers and designers will continue to meet the challenge of finding creative and workable solutions.



Locations of award-winning projects in the Portland/Vancouver metropolitan region

Award winners

1997

Honor Awards

Mentor Graphics Wilsonville Campus 1

Butternut Creek Water Quality and Detention Facility 2

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Merit Awards

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1996

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1997 Winners

Mentor Graphics Wilsonville Campus

Butternut Creek Water Quality and Detention Facility

Water Pollution Control Laboratory

Heritage Planned Unit Development

Kaiser Permanente Salmon Creek Medical Office

107th Avenue Water Quality Facility

Honor Award
1997

Mentor Graphics Wilsonville Campus

8005 SW Boeckman Rd.
Wilsonville, Oregon

Completed 1990 (Phase I)

Design Team:
Perron Collaborative (site planning and landscape architecture)

Lee/Ruff/Stark (architecture)

W&H Pacific (engineering)

Bill Jablonski, Perron Collaborative
(503) 223-2266

Award Category:
Commercial/Industrial

Project Description

The broad scope and corresponding vision for the Mentor Graphics' Wilsonville Campus set the stage for dramatic design possibilities. A master plan is guiding phased development of the 90-acre site over 10 years. Phase I (the focus of this award) was completed in 1990 and includes 550,000 square feet of office space, a child development center, activity fields and a 12-acre park.

The Mentor campus lies within a 420-acre drainage basin that also includes the Tektronix campus and large parcels of developable land to the north. Before Phase I construction, the basin's drainage system included culverts and ditches that ultimately discharged to the Willamette River. Flooding in downstream portions of the basin was common, including nuisance flooding within a mobile home park.

As part of the development provisions, the city of Wilsonville required a hydrologic analysis of how full site build-out would affect drainage in the basin. The design team went beyond this requirement by modeling drainage effects from full build-out of the entire basin, including undeveloped parts to the north.

In response to the modeling results, the master plan and Phase I construction include stormwater management and water quality features that serve both the campus and neighboring areas. The project also reflects Mentor's desire to blend human and environmental needs and enhance the site's existing natural character.

The central design feature is a 12-acre park comprising wetlands, woodlands, and 3 acres of constructed retention ponds. The ponds accommodate stormwater runoff from the 90-acre Mentor site, plus runoff diverted from adjacent parts of the northern basin. The offsite diversion achieves several benefits: it accommodates development in the northern subbasin by redirecting runoff, minimizes flooding at the mobile home park and moderates downstream flows, resulting in healthier habitat for plant and animal species.

One of the award-winning features is protection of a 1-acre native ash woodland. Landscaping around the onsite retention ponds augments the existing site vegetation. The vegetation provides water quality functions by filtering pollutants from lawn and parking areas. Rock weirs and a circulation pumping system in the ponds aerate the water, helping maintain positive water quality during low flows and intermittent dry spells. One of the ponds features a covered pavilion that appears to float on the water surface and also serves to conceal the inlet pipe.

Another unique feature is the creation of rivulets (swales) that meander throughout the site, collecting stormwater from rooftop drains. The rivulets help slow stormwater flow into the retention ponds, while the associated plant materials have a positive effect on water quality.

Mentor employees participated in the master planning through design charettes (workshops) with the project team. Their ideas find expression in the footpaths, bridges, pavilions, and viewing areas that provide access to aesthetic, educational, and environmental experiences.

Why It Won

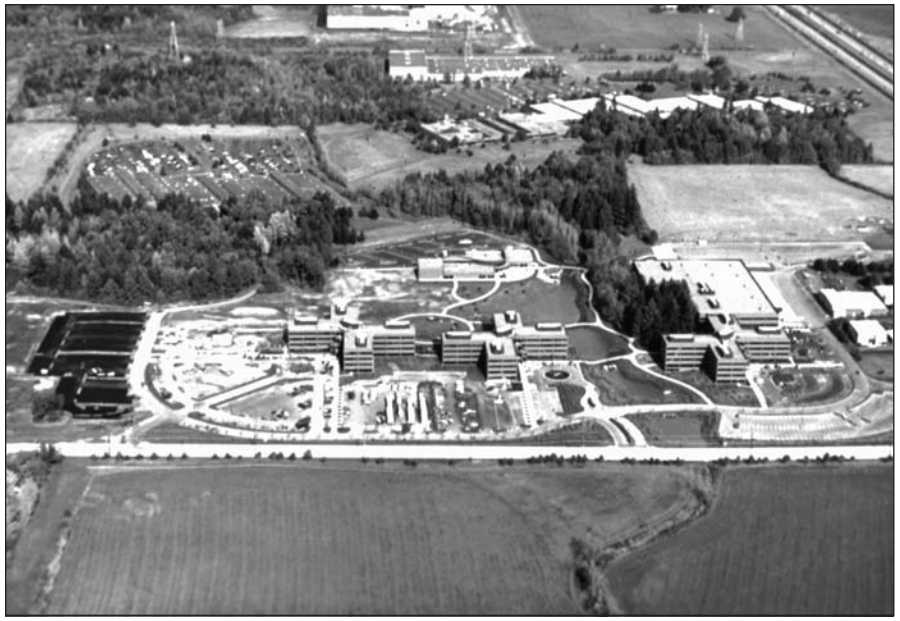
The variety and integration of design elements earned the project its honor award. By protecting and enhancing the existing wetlands and woodlands, the project retains and creates substantial habitat for a diverse community of plant and animal species. The design team exceeded Wilsonville's stormwater management requirements to achieve multiple basinwide benefits. Onsite features such as the rivulets and landscaping are both imaginative and functional.

Challenges, Opportunities and Lessons

The design team cites the project as "a complete opportunity" to apply innovative development techniques. Mentor Graphics and its employees provided important support and guidance for creative approaches. Eight years after construction, the site continues to function beyond its intended design. The site successfully handled stormwater quantities during the major storm events of February 1996.

More plant materials have been added to the site since the initial planting, since natural succession seems to proceed somewhat more slowly with introduced vegetation.

Another lesson learned is that enhanced habitat invites all sorts of residents. Today, a variety of waterfowl and other birds, insects, deer, rabbits, and squirrels call the campus home. Beaver and nutria are also present, however, and present a management challenge. The maintenance crew has taken the innovative approach of wrapping young trees in wire mesh or firm plastic wrap to protect them from these animals.



By protecting and enhancing the existing wetlands and woodlands, the project retains substantial habitat for a diverse community of plant and animal species.

Rivulets (swales) meander through the site, collecting stormwater from rooftop drains.

Honor Award
1997

Butternut Creek Water Quality and Detention Facility

Southwest Bany Road
between Southwest 179th
Avenue and 175th Terrace
Aloha, Oregon

Completed 1997

Owner:
Unified Sewerage Agency of
Washington County

Design/Construction Team:
Kurahashi & Associates

Adolfson Associates

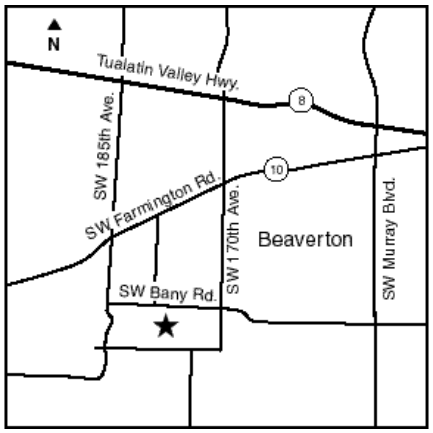
Hong West and Associates

Mark Wilson Installation

CEMS, Inc.

Roger Sutherland,
Kurahashi & Associates
(503) 968-1605

Award Category:
Public Facility



Project Description

The Butternut Creek project is an integrated regional water quality and detention facility in the creek headwaters. The facility provides approximately 3 acre-feet of flood storage from 107 upstream acres of existing and future residential development. It is designed to reduce historical downstream flooding along the creek. It also substantially improves the quality of runoff entering the creek through the processes of sedimentation, filtration, and bioaccumulation. The Unified Sewerage Agency (USA) designated the project as a top priority in its overall management plan for the Butternut Creek subbasin.

Design of the facility involved considerable public involvement, including an advisory committee, public open houses and workshops, and an all-day design charette (workshop). The public involvement process identified four principal guidelines that helped shape the final project configuration:

- increase regional detention
- enhance habitat and minimize aesthetic impact to existing site conditions
- provide access and educational opportunities
- improve water quality.

The project also involved a partnership with the land owner who developed the adjoining residential subdivision. The owner, Cruz Development, Inc., granted a permanent easement encompassing the entire project at no cost to USA. The tract may eventually be donated to the Tualatin Hills Park and Recreation District.

The facility comprises a diversity of wetland communities, with regions of open water, emergent wetland, wet meadow and forested wetland. Two existing marsh areas were converted to detention and passive water quality ponds. Only four trees were removed from an existing forested wetland and are used as basking logs, snags and root wads. Extensive stands of reed canary grass and Himalayan blackberry have been removed through an aggressive, ongoing vegetation management plan, using hand removal where possible to minimize disturbance. These intrusive species have been replaced by a wide variety of native upland and wetland vegetation, which improves water quality through filtration and bioaccumulation. The new vegetation also enhances the wildlife habitat of this area, which the community plan identifies as a significant natural resource.

Why It Won

Distinctive project features include three acres of enhanced habitat and the excellent use of native vegetation. The regional facility has successfully reduced downstream flooding, while also attaining its natural enhancement and preservation goals. The project demonstrates the benefits to be derived from sound public involvement processes and partnerships.

Challenges, Opportunities and Lessons

The multiple goals of the project presented a challenge to the design team. The project also had stringent permit requirements, including a U.S. Army Corps of Engineers 404 permit and a Division of State Lands

permit. A careful hydraulic analysis of both the upper and lower ponds was needed to properly design the outlet control structure.

The facility is functioning as designed for larger storms. USA may modify the outlet of the upper detention area to detain smaller storms, as well. Recent observations indicate the water quality function is working as anticipated.

The facility provides approximately 3 acre-feet of flood storage from 107 upstream acres of existing and future development.

Distinctive features include three acres of enhanced habitat and excellent use of native vegetation.

Honor Award
1997

Water Pollution Control Laboratory

6543 N. Burlington Ave.
Portland, Oregon

Completed 1997

Owner:
City of Portland, Bureau of Environmental Services

Design/Construction Team:
Murase Associates

SERA Architects

Miller Hull Architects

Star Masonry

Robert K. Murase, FASLA,
Murase Associates
(503) 242-1477

Award Category:
Public Facility

Project Description

The city of Portland's new Water Pollution Control Laboratory is an innovative architectural and landscape project that both implements and interprets stormwater treatment. Research is conducted at the laboratory on how contaminants affect water quality. This purpose extends into the surrounding landscaping, which serves as an experimental outdoor laboratory.

The 6-acre site extends 900 linear feet along the Willamette River, in a formerly industrial riverfront area. Incorporating urban runoff into the site design was a major focus of the project. A primary feature is a two-celled water garden pond shaped like converging circles. Runoff from the site and the surrounding 50-acre neighborhood drains into the upper cell, where a curvilinear flume directs the water into the lower cell. Weepholes on the sides of the flume disperse the flow. The circular stone wall in the lower cell is a marker for the changing water elevations and also conceals the pond outlet.

The pond functions by detaining the stormwater, breaking down pollutants through aquatic and emergent plant materials, and allowing the water to filter into the soil. The cleaned water then discharges into the Willamette River.

Bioswales in the parking lot and around the site are vegetated with native wetland plants to filter runoff from the parking lot and rooftop. They also help soften and enhance the visual quality of the parking areas. The laboratory building has no gutters, instead using overhead scuppers that extend beyond the edge of the roof and direct rainwater onto the underlying bioswale.

The form and composition of the flume and stone wall express innate qualities found in nature, suggesting the natural curve in a river or a glacial moraine (deposit of stones). A cantilevered pier extends outside from the building's interior hallway and serves as an overlook to the pond. The shapes and configuration of the landscape elements also connect the building with its waterfront surroundings. These interpretive features serve an important educational function for the numerous school children and community members who tour the site.

The project also fulfills the city of Portland's commitment to improve this part of the waterfront. The riverbank, which had deteriorated through erosion and was littered with industrial debris, was stabilized with natural boulders and restored with native vegetation as part of the project. The Willamette Greenway walk was extended from nearby Cathedral Park and now connects to future riverfront development sites.

Why It Won

The project combines water quality functions with complementary aesthetic and interpretive goals. The water garden pond is an inventive way to treat stormwater from the surrounding neighborhood, and the bioswales demonstrate alternatives to conventional methods for managing onsite runoff from roofs and parking lots. Native plants are put to excellent use as both a treatment method and a design feature. The project also furthers the city's goal of improving the northern riverfront.

Murase Associates has also received an Honor Award from the Waterfront Center of Washington, D.C.,

an Honor Award from the Oregon Chapter of the American Society of Landscape Architects (ASLA), and a Merit Award from the Washington chapter of the ASLA for the project.

Challenges, Opportunities and Lessons

The project's location near the Willamette River, St. Johns Bridge and Cathedral Park provided both the opportunity and the challenge of tying all of these visual and natural resources into the site design. Riverbank stabilization has also required attention. Some areas that were restored with native vegetation had to be restabilized with boulders after the 1996 flooding.

The stormwater design features are working as intended, with only minor maintenance adjustments needed since construction.

Runoff from the site and the surrounding 50-acre neighborhood drains into the upper cell, where a curvilinear flume directs the water into the lower cell.

The laboratory building has no gutters, overhead scuppers direct rainwater onto the underlying bioswales.

Merit Award
1997

Heritage Planned Unit Development

Fisher's Landing area east of Southeast 164th Avenue, south of Southeast 29th Street, and north of Southeast 34th Street
Vancouver, Washington

Completed 1992

Design Team:
Western Planning Associates, Inc. (land planning and landscape architecture)

MacKay & Sposito (engineering, surveying)

William F. Horning, Principal, Western Planning Associates
(503) 294-0223

Award Category:
Other (Mixed Use)

Project Description

Heritage at Fisher's Landing is a mixed-density residential planned unit development. The 90-acre site was developed in phases as part of the Fisher's Landing master plan, and offers a variety of single-family and multi-family housing options.

A major planning objective was to integrate onsite stormwater management into the overall site design. A 5-acre neighborhood park at the center of the development provides a significant open space and recreation feature that includes playing fields, paths, picnic sites and play structures. The park is also an integral part of the stormwater system, containing biofiltration swales to detain and treat runoff. These bioswales are designed around a natural swale, containing an ephemeral drainageway, that previously ran through the park area. Additional bioswales are located along the edges of the development, where they also help reinforce community identity and buffer residential areas from adjoining streets.

The stormwater system is designed and installed to Clark County standards for a 10-year design frequency storm. The standards require all runoff from streets and driveways to be pretreated prior to infiltrating onsite. The runoff is conveyed in closed-conduit storm systems to the biofiltration swales, which remove small particles of sediment, nutrients, and other sediment-borne pollutants. It is then discharged into underground perforated pipes and dry wells to percolate into the ground. For events exceeding the 10-year design storm, the park serves as a ponding location for overflows until the existing downstream storm systems can accommodate the extra runoff.

Why It Won

The project was selected for its innovative integration of stormwater and landscape elements. Through coordinated master planning and engineering, the development incorporates a number of features that serve multiple uses. The park is a prime example, providing for open space and recreation as well as stormwater management. Water quantity and quality functions are well integrated and accomplished entirely onsite through detention, biofiltration and infiltration.

Challenges, Opportunities and Lessons

A state-of-the-art integration of civil engineering and landscape architecture was needed to design swales that were consistent with necessary site grading, met county standards, and achieved a natural look. Because of the difficult grading and narrow planting buffers, it was particularly challenging to configure the bioswales next to the streets so they enhance the streetscape rather than look like barriers or pits. Close coordination of a multidisciplinary team and attention to detail were key to the project's success.

During the past exceptionally wet year, the stormwater system functioned as designed during flood conditions.

Clark County standards require all runoff from streets and driveways to be pretreated prior to infiltrating on-site. This bioswale treats street runoff and provides a buffer for the development.

A five-acre park provides significant open space and recreational opportunities, while also providing stormwater treatment.

Merit Award
1997

107th Avenue Water Quality Facility

107th Avenue, south of Northeast Fourth Plain Boulevard
Vancouver, Washington

Completed 1996

Design/Construction Team:
Greenworks, P.C. (landscape design)

Group MacKenzie (civil engineering)

Dennis' Seven Dees (installation)

Mike Faha, ASLA, Greenworks
(503) 222-5612

Award Category:
Commercial/Industrial

Project Description

The 107th Avenue Water Quality Facility is a constructed wetland designed to treat parking lot runoff from an adjacent retail project. The runoff is diverted over the parking surface into a sediment trap before entering the facility. The 1/2-acre wetland then treats the runoff through a combination of sedimentation, filtration, and absorption. These processes occur primarily within a two-cell system, with a third cell available for storage during high water events. Groundwater recharge is a secondary benefit.

The facility is configured to take advantage of the natural drainage of the site. The constructed wetland is vegetated entirely with locally occurring native plants commonly found in three types of plant communities: emergent marsh, scrub-shrub wetland, and riparian forest buffer. Once water has passed through the facility, it discharges into an adjacent existing forested wetland. The project is designed to blend into this adjacent wetland, both aesthetically and ecologically.

The project meets Clark County standards for onsite pretreatment. Because it is located almost entirely within the 50-foot buffer for the adjacent wetland, it also required a county wetland permit. The location on undevelopable land made it possible to exceed county detention standards, since the added capacity did not increase the project budget.

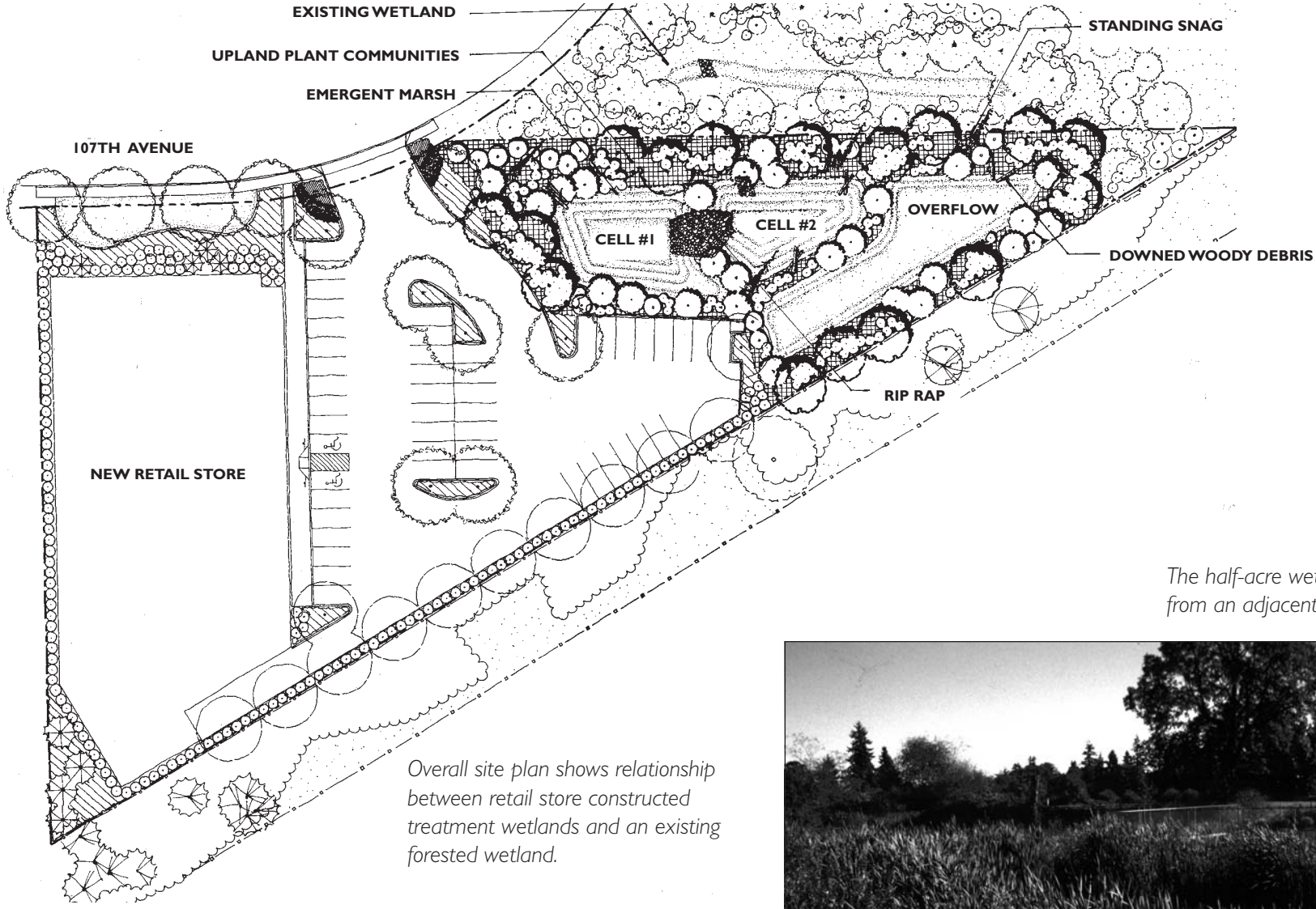
Habitat on the site is enhanced by several elements. The plant material furnishes a food supply and cover for a variety of small animals and birds. Downed woody debris is included at various points along the waterline of the ponds, and standing snags are positioned in upland areas. These snags and debris provide immediate habitat while the newly planted material matures.

Why It Won

The project combines water quality functions with habitat protection and enhancement. It is sensitive to aesthetic concerns and compatible with the existing landscape. The created wetland has a good site configuration and makes excellent use of exclusively native vegetation. The facility demonstrates a workable "green" solution for stormwater treatment in an urban setting.

Challenges, Opportunities and Lessons

The major challenge for this project was achieving the multiple objectives and meeting the jurisdictional requirements within the client's budget. From a visual analysis, the facility appears to be providing the expected level of protection of the existing adjacent wetland.



Overall site plan shows relationship between retail store constructed treatment wetlands and an existing forested wetland.

The half-acre wetland treats runoff from an adjacent retail project.

Merit Award
1997

Kaiser Permanente Salmon Creek Medical Office

14406 Northeast 20th Ave.
Vancouver, Washington

Completed 1996

Design/Construction Team:
BOORA Architects

W&H Pacific

Andersen Construction

Bruce Fong, AIA, Kaiser Permanente
(503) 813-4686

Award Category:
Other (Institutional)

Project Description

The 85,000-square-foot Salmon Creek Medical Office is located on a highly visible site at the intersection of I-5 and I-205. Kaiser's desire was to create an inviting and unique setting, with a finished product that appears natural and "un-engineered." Other considerations were Clark County requirements to manage stormwater onsite and to integrate the stormwater system with that of the neighboring Crossroads Shopping Center.

The design team's solution was to locate an 18,000-square-foot, 10-foot-deep infiltration pond at the lowest portion of the site. The pond collects runoff from the roof and parking lots and allows for natural percolation into native soils. An overflow discharge directs excess runoff from larger storm events into a water quality/detention pond located downstream on the shopping center site. That pond provides water quality filtration before allowing a controlled release into a receiving stream.

The onsite pond is shaped and landscaped to resemble a wetland. The inner third is planted with biofiltration grass mix, the middle third with riparian and emergent plants, and the outer third with drought-tolerant dry meadow mix. The pond serves as a signature landscape element in the foreground of the building, especially when viewed from the freeway.

Another significant landscape feature is a mechanically operated "natural stream" water feature at the front door of the building, which incorporates stormwater runoff from the roof. The water feature was created by artist Michihiro Kosuge and is augmented by several natural stone sculptures.

Before development, the site contained several specimen oak trees, some more than 70 feet tall, as well as mature red cedars and firs. The project was designed to incorporate, protect and enhance the condition of these existing trees. This was accomplished primarily by placing several large planting areas within the parking lot and configuring the access drive to pass through a natural archway of two very large oaks. Another unique feature is an outdoor "poisonous plant" garden that provides public education about toxic plants and poison prevention. The remainder of the site is landscaped primarily with native and drought-tolerant plants.

The building complements its natural setting through the use of earth-toned brick and sandstone. Generous use of glass allows patients inside the building to view the pond, oaks and water feature.

Why It Won

This project is notable for its creative integration of landscape design, stormwater elements, public art and architecture. The pond and water feature are imaginative approaches for managing roof and parking lot runoff, and provide distinctive aesthetic components. Large portions of the parking lot are devoted to landscaped areas for tree preservation, including the excellent retention of the specimen oaks. The design team succeeded in finding functional solutions that maintain a "natural" feel to the setting.

Challenges, Opportunities and Lessons

The project posed several design constraints. Restrictions on the property limited both the height and location of the new building. The existing oaks, red cedars, and firs were important natural resources that merited protection and enhancement. Additional challenges were the need to manage stormwater onsite and to integrate the stormwater system with that of the downstream shopping center.

To date, the stormwater system has performed as expected.

The project was designed to incorporate, protect and enhance the specimen oak trees.

The infiltration pond collects runoff from the roof and parking lots.

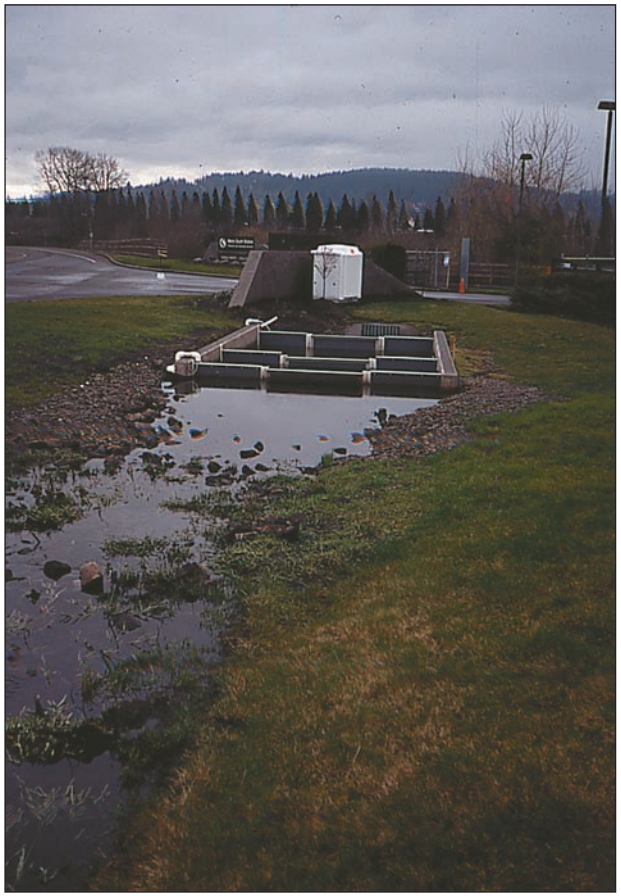
1996 Winners

Unified Sewerage Agency Water Quality Laboratory

Oregon Museum of Science and Industry

OHKA Light Industrial Development

Heritage House Residence



Metro South Station Compost Stormwater Filter

Melrose Street Roadside Stream Improvements

Honor Award
1996

Unified Sewerage Agency (USA) Water Quality Laboratory

2550 SW Hillsboro Hwy.
(Highway 219)
Hillsboro

Completed 1996

Design Company:
Walker & Macy

Bennett Burns or J. Douglas Macy, FASLA
(503) 228-3122

Award Category:
Public Facility

Project Description

USA's new 31,000-square-foot facility includes water quality testing offices and public meeting space. It is situated on six acres just above the Jackson Bottom Wetlands and Wildlife Preserve. At first glance, this location next to a sensitive wetland might seem to present conflicting uses. The creative design and emphasis on site preservation, however, resulted in a project that has become a regional model of outstanding environmental sensitivity.

The project showcases innovative approaches to stormwater collection and treatment. Runoff from all impervious surfaces is treated on site. Roads are designed without curbs to allow stormwater to drain directly into an adjacent bioswale, and runoff from the parking lot and walks is collected in an ornamental trench drain. All stormwater is routed into a cistern directly in the center of the entrance plaza for the public meeting space. From the cistern, the water moves to a gravel sedimentation basin, then flows into a bioswale that meanders around the building by the front employee entrance. Portions of the swale are lined and planted with native vegetation to create a demonstration wetland environment.

The project also emphasizes natural resources enhancement and restoration. Invasive species were eradicated, a native grass and wildflower meadow was established, and disturbed areas were restored with indigenous species to create wildlife habitat. Through these efforts, the site has returned to a more ecologically correct natural condition.

Public education is another key design component. A trail system provides observation points and interpretive information about the wetlands and surrounding ecological systems. School groups can take water samples from the bioswale and cistern to test water quality before and after treatment. In these ways, visitors can experience a personal connection with their environment, appreciate the value of our natural resources and increase their understanding of water quality issues and solutions.

The Jackson Bottom Environmental Learning Center, planned for future construction, will further enhance educational opportunities.

Why it Won

The water quality laboratory is sensitively integrated into its unique site context. The project makes excellent use of stormwater treatment facilities as integral site design features. The prominent position of the cistern and the bioswales is both interesting and educational, highlighting the important link between water quality management and the surrounding environment. The project is an outstanding demonstration of how to protect natural resources while achieving development goals.

Challenges

The water quality laboratory is in a unique setting that entails a complex system of ecological relationships. The project built on this existing system, extending the ecological framework throughout all restored portions of the site. Much of the site had been highly degraded, with numerous invasive species and little significant native vegetation. The project had to be very carefully designed in order to restore the

disturbed areas, create linkages to the surrounding environment and minimize disruptions to the existing natural resources.

Update: How Well Is It Working?

The overall report card is good, with the landscaping elements and water quality swale working as intended. Some invasion of reed canary grass is occurring in the swale, and will be an ongoing maintenance issue. Because of problems with the irrigation system, some trees and shrubs had to be replaced, and sun- and drought-tolerant plants were added in these areas. All are now doing well.

Runoff from the nearby parking area drains directly into an adjacent bioswale and cistern located at the entrance plaza.

Stormwater flows through a bioswale that meanders around the building.

Honor Award
1996

OHKA Light Industrial Development

4600 NW Shute Rd.
Hillsboro

Completed 1992

Design Company:
Murase Associates

Robert K. Murase, FASLA
(503) 242-1477

Award Category:
Commercial/Industrial

Project Description

The OHKA Light Industrial Development demonstrates how landscape and stormwater management can be effectively integrated into industrial development. The traditional site design for this kind of development usually screens any water quality facilities and incorporates broad, manicured lawns. The OHKA project makes a bold departure by prominently displaying a large stormwater facility at the entryway. The design features lush native vegetation, setting a relaxed, naturalistic tone for the site.

The stormwater quality/quantity facility includes a 400-foot meandering swale and a 10,000-square-foot detention area. Wetland plants and trees – including Western red cedar, cattails, Oregon grape, serviceberry and snowberry – filter stormwater generated from the 16-acre site. The capacity of the detention facility allows storage during storm events, helping ease the burden on the public infrastructure.

Undeveloped parts of the site are unirrigated grassland, which needs little maintenance, saves energy, and contributes none of the pollution associated with turf lawn. The grassland also reflects the site's agricultural past and the nearby farmlands that still exist. This design approach offers an aesthetic and environmental sensitivity that helps bridge the gap between our agricultural history and our high-tech future.

Why it Won

This project takes an original design approach, with excellent effect. The idea of highlighting, rather than hiding, the storm-water facility is bold, dynamic and creative. The texture, depth, and color of the native vegetation enhance both the aesthetic quality and the habitat of the site. By successfully integrating all of these elements, the project serves as a promising example of future urban form.

Update: How Well Is It Working?

The stormwater quality and quantity features are functioning well. The site looks attractive and is being well maintained. As intended, the habitat is attracting wildlife. The project designers are happy to report they would not do anything differently.

Undeveloped parts of the OHKA site are unirrigated grassland.

Lush native vegetation in the detention facility welcomes visitors at the OHKA project entrance.

Honor Award
1996

Oregon Museum of Science and Industry

1945 SE Water Ave.
Portland,

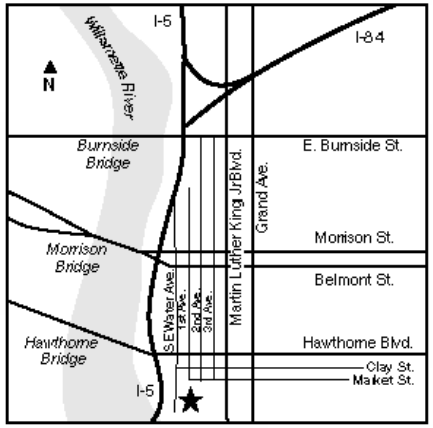
Completed 1993

Design Company:
Murase Associates

Robert K. Murase, FASLA
(503) 242-1477

KPFF Consulting Engineers
Jerry Mitchell
(503) 227-3251

Award Category:
Commercial/Industrial



Project Description

The Oregon Museum of Science and Industry (OMSI) project is a highly successful public/private partnership that showcases native landscape and natural processes in a developed, central city setting. Located in a former industrial area along the Willamette River, the project encompasses three elements: parking lot biofiltration swales for storm-water treatment, a native plant garden and a restored river edge.

OMSI's 10-acre 768-car parking lot incorporates about 2,300 lineal feet of bioswales in place of traditional landscaped islands. These are essentially small, linear wetlands planted with a variety of riparian-type plants and moisture-tolerant shade trees. As stormwater runoff passes through the swales, check dams slow its speed. This allows sediment to drop out and water to infiltrate into the soil. At the same time, the vegetation filters out oils and other pollutants.

Preliminary findings indicate the bioswales are operating as intended. Infiltration exceeds expectations, and little storm-water has been discharged into the storm drain system, except during high rainfalls. In addition, the bioswales cost $70,000 less to construct and are as easy to maintain as a conventional storm drain system.

Another project goal was to help "repair" the site, which had been highly modified and degraded during former uses. A native plant garden provides both a convenient plant study area and a pleasant view garden for the public and employees. The river's edge was stabilized with riprap, then overlaid with soil and planted with native riparian shrubs. Together with the bioswale plantings, this vegetation and enhanced habitat reestablishes the site's connection with the river and helps unify it with the regional landscape.

Why it Won

The project was selected for its innovative stormwater treatment and parking lot design. Another key feature is the excellent aesthetic effect resulting from the texture, depth and color of the landscape. Given the site restraints, there is a good attempt to revegetate the riverbank and enhance the habitat. The project also serves the important role of supporting OMSI's educational mission. It is receiving wide attention as a demonstration site, showing that water quality measures can fit into constrained spaces, save construction costs and provide habitat and aesthetic benefits.

Challenges

The intensively developed, highly restricted central city setting posed design challenges. The bioswales had to fit within a limited space, while also conforming as much as possible to standard design, construction and maintenance practices for parking lots and storm drain facilities. This approach is pragmatic and results in stormwater quality facilities that get built and maintained. However, some compromises had to be made on treatment value and removal efficiency.

The bank stabilization and revegetation projects also presented challenges. Because of its proven protective value, riprap was required up to the 10-year flood elevation. This meant that bioengineering techniques could not be used to construct a living bank protection. The solution was to plant riparian vegetation on a soil overlay. A compromise was also necessary to determine bank slopes. While flatter slopes would enhance natural resource values, they would also decrease the amount of available developable land. The solution has to balance these two needs.

The chosen solution has already provided an important demonstration by surviving the floods of February 1996 and January 1997 with no damage. The OMSI bank stabilization and revegetation projects have been cited as examples by FEMA (Federal Emergency Management Agency). They also represent an important step toward the eventual integration of bioengineering techniques into waterfront developments on the lower Willamette and Columbia systems.

Update: How Well Is It Working?

The biofiltration swales are functioning even better than expected for stormwater management. More curb cuts would, however, allow better distribution of the runoff. The owners are very pleased with the project results.

(Above) Runoff from parking areas is channeled into adjacent bioswales.

(Below) OMSI's parking lot incorporates stormwater treatment through aesthetically pleasing vegetated bioswales.

Merit Award
1996

Heritage House Residence

9119 NW McKenna Drive
(Forest Heights)
Portland

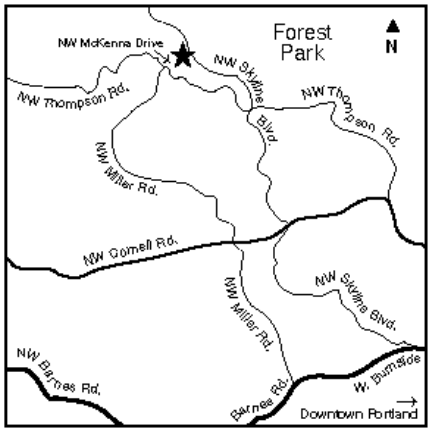
Completed 1996

Design Company:
Neil Kelly Designers, Remodelers

Chris Spence
(503) 288-7461

Pavlik's Custom Landscaping
Ray Pavlik
(503) 297-9300

Award Category:
Residential



Project Description

The Heritage House residence uses an innovative application of a centuries-old tradition: collecting and reusing rain water. It is an excellent example of how a private residence can contribute to both stormwater management and water conservation in an urban setting.

A rain drain system collects roof runoff from the house and conveys it to a 500-gallon collection tank at the low end of the property. The water is pumped uphill to a 2,500-gallon storage tank, which feeds both a drip irrigation system and a pop-up lawn sprinkling system by gravity pressure. Cued by a soil moisture sensor, valves open when irrigation is needed. This automatic system both conserves water and minimizes homeowner guesswork and effort. While the system is designed for year-round irrigation, it is linked to the potable water source in case of a prolonged drought.

The house construction added many square feet of hard surface area to the site. To compensate, subgrade percolation tiles are used to control stormwater runoff. This feature enables post-development runoff conditions to remain the same as pre-development conditions.

Why it Won

Heritage House was selected for its resourceful approach to both onsite stormwater retention/reuse and water conservation. It is a good example of how a project can meet and even exceed stormwater standards of local jurisdictions. The project is receiving public attention in the press, through the 1996 Street of Dreams show, and in national magazines. Its success is helping demonstrate how single-family residences can incorporate effective new technologies that enhance both personal and community livability.

Challenges

The site conditions presented some landscape challenges. Containment of the steep slopes was necessary to mitigate erosion and earth movement. It was also important to save the existing fir trees and to select plants and trees that both complement the house and preserve a natural look. The result is a design that is functional, achievable within an urban development, and compatible with the surrounding environment.

Update: How Well Is It Working?

The designed system is working very well. The irrigation system is currently being expanded to accommodate increased landscaping by the new owners.

The Heritage House residence uses innovative approaches to stormwater management and water conservation.

At the Heritage House, a 500-gallon collection tank will store rainwater from the roof.

Merit Award
1996

Melrose Street Roadside Stream Improvements

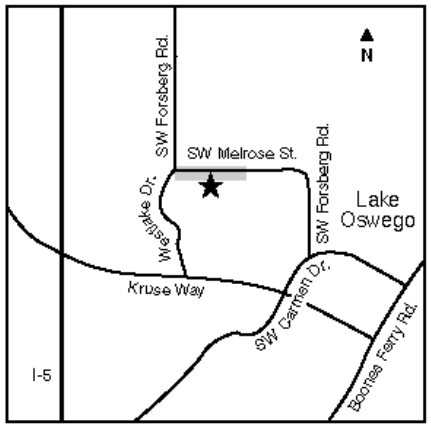
Along Melrose Street,
east of intersection with
Westlake Drive
Lake Oswego

Completed 1991

Design Agency:
City of Lake Oswego
Public Works

Andy Harris
(503) 635-0284

Award Category:
Transportation



Project Description

When the city of Lake Oswego widened Melrose Street, it also was decided to relocate and improve the stream that ran adjacent to the road for about 1,200 feet. Before the project, the stream was in a roadside ditch. It was in very poor condition, with continuing erosion of the stream channel caused by the depth and steepness of the channel banks. Some existing riparian vegetation provided habitat for birds and other wildlife, but habitat value was limited by the poor channel conditions and lack of species diversity.

The improvements were designed to stabilize the stream channel, enhance open space and wildlife habitat values and improve storm-water runoff quality. The stream channel banks were flattened, and the channel depth was reduced from 4-5 feet to 3-4 feet. The stream corridor was widened to an average of 28 feet, with sections up to 50 feet. The new stream channel was stabilized by reducing the channel slope and installing boulder check dams. Emergent vegetation was planted in the channel to reduce flow velocity, provide erosion control, and enhance water quality by reducing turbidity and increasing nutrient uptake. Riparian vegetation was planted to restore and enhance wildlife habitat.

The original stream channel contained an approximately 960-square-foot wetland. Its value was limited, however, by its small size and limited variety of plant species. The project enlarged the wetland to 1,375 square feet. Wetland vegetation was planted to increase species diversity and enhance the wetland functions.

Why it Won

The project is an admirable transformation of an unsightly roadside ditch into a creek. It exhibits excellent native plant use and habitat restoration. The improvements enhance the character and livability of the neighborhood and provide a valuable community asset. The project also presents educational opportunities, with a school located across the street.

Challenges

Careful design and construction were required to protect water quality, aquatic life and habitat values. The project involved work in the waterway and diversion of the stream flow, calling for appropriate construction methods and scheduling. Existing wetland, riparian and stream vegetation had to be transplanted into the new stream and pool areas. Suitable bank protection and erosion control were essential throughout construction.

Update: How Well Is It Working?

The general project assessment is positive. The native vegetation has done very well, but highlights the need for a commitment to long-term maintenance. A drip irrigation system has been installed, which also requires maintenance.

Because the downstream end outlet was not sized properly, it was overflowing and causing flooding of adjacent roads. Flooding was also occurring when debris became stuck in the original overflow outlet. This has been solved by replacing the box grate outlet on top with larger spacing, allowing debris to pass through more easily.

There has been good neighborhood involvement with the site, including plant maintenance and interest in future educational activities.

Before the Melrose Street project was started, the stream flowed in a roadside ditch.

The completed road project is a sharp contrast to its prior degraded condition.

Merit Award
1996

Metro South Station Compost Stormwater Filter

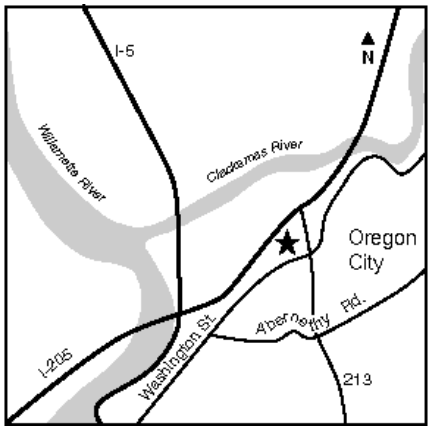
2001 Washington St.
Oregon City

Completed October 1993

Design Company:
Stormwater Management

Mike Myers or Jim Lenhart
(503) 240-3393

Award Category:
Public Facility



Project Description

This project involved installation of a stormwater treatment system (CSF®) to provide additional stormwater treatment at the Metro South Station. The 7.5-acre transfer facility handles approximately 370,000 tons of solid waste and 750,000 pounds of household hazardous waste per year. Pollutants generated by vehicle traffic and liquids draining from the waste trucks enter the stormwater runoff from the site. A portion of the site runoff is directed to a 300-foot grass swale that discharges to the system and then to a nature pond.

The pond has important value as habitat for various waterfowl, small mammals, amphibians and other organisms. It is surrounded by a walking path, and the banks are well vegetated with native and exotic plants. Before the system was installed, workers at the facility began to notice murky water and an oily sheen in the pond after storms. It became apparent that the existing swale was not providing adequate stormwater treatment.

The system was installed at the end of the swale to provide additional treatment. It consists of a layer of pelletized leaf compost that filters out debris, sediments, toxic heavy metals, and petroleum products. After its use as a filter media, the compost material can be reused for onsite land application, re-composted with mixed yard debris to produce mulch or applied as a landfill cover material.

Why it Won

The project takes an innovative approach to stormwater treatment and demonstrates a useful solution for compact urban sites.

Challenges

The new system was needed to augment an existing treatment system (swale) that was not effectively removing pollutants from the transfer station's stormwater runoff. It had to fit into a small land area in an already developed site. Its ability to meet these challenges makes it an excellent method of protecting surface waters in the dense urban environment.

Update: How Well Is It Working?

The filter system is still in operation, with annual maintenance provided by the company that installed it. Reports from Metro state that the water coming from the filter is cleaner than other stormwater entering the receiving pond.

The filter has served as a prototype, and new models have since been developed.

The stormwater treatment facility at Metro South Station contains pelletized leaf compost that filters pollutants.