

Cully Grove EcoRoofs

05.20.13

Location: 4745 NE Going Street, Portland OR 97218

Project: Two carports totaling 2035 square feet

Project Overview

Cully Grove is a 16-home planned development on two acres near NE Going Street and 47th Avenue. An important focus of the new community will be environmental stewardship through landscaping and gardening, so ecoroofs fit well within the project intent. Objectives include managing stormwater in a beautiful manner, providing habitat, expanding the pallet of native plants used on Portland ecoroofs, and exploring effective ways to keep project costs to a minimum.

Two 1,017 square foot carport structures along the west property boundary were engineered to support green roofs. All stormwater is managed on site; green roof overflow will travel by surface to a bioswale in the northwest corner of the property. During summer 2012, members of the Cully Grove landscape team set up a nursery to grow all plants for the ecoroof from cuttings donated by friends and by propagating native plants from seed or vegetatively. Volunteers planted the roof in April 2013 and continue to maintain it on a monthly basis.



Details

Structural: 4x12 beams every 24" on center with 5/8" plywood overlayment. Total load: 80 PSF which works out to 45 psf for the green roof, 25 psf for snow and 10 psf the dead load of the roof itself. The roof slope is 5% pitch toward the east.

EcoRoof Assembly (from bottom up)

- 1) 4x12 beams every 24" on center with 5/8" thick plywood
- 2) 60 millimeter TPO membrane was tied to drains and wrapped parapet walls. This was capped with aluminum flashing (photo taken before flashing installed).
- 3) River rock "burritos" surround the drains, taking up minimal roof area(top right). Four inch cross-sections from a tree on site were cut to create a pathway down the middle of each roof (pictured right).
- 4) Upside-down reclaimed carpet (0.5") from East County Recycling Center covers most of the area. The carpet was a very large unused remnant; it was tested for radiation. Ecoroof drainage mat from the Habitat ReStore covers 5 feet along the downslope edge for most of the length - especially near drains.
- 5) Planting mix varies in depth from 3-6" to diversify growing conditions. 22.5 yards of ProGro's extensive mix was delivered by Site One conveyor to the top of the roofs (below left). An additional two yards of semi-intensive mix was lifted to the roof and broadcast post-planting to increase the depth of the north carport roof (below right).
- 6) Sedums and native forbs. Since we planted late in the



season (April), we focused on covering the entire roof with sedums (76 flats of plugs and 40 gallons of cuttings). Native forbs were planted in areas receiving late afternoon shade (about 10% of roof area). Additional sedum cuttings will be planted as needed in fall 2013 and more native forbs and grasses will be planted in early spring 2014. (See plant list below)



Successes

It has been a really a nice opportunity to design a carport structure with a green roof in mind and create a relatively large expanse of green roof as a group project. We relied heavily on the technical info on the BES website, as well as books from the library. Over the course of a year, about 20 people contributed to sedum cutting collection, propagation, and installation - creating nice opportunities for us to get to know each other. One person on the landscape team will be charged with green roof maintenance oversight and others will welcome the chance to visit the roof for periodic weeding and planting. It was really nice having a GradAll available on site to lift material to the roofs.

Lessons Learned

When working with volunteers on a major planting project, don't put too much time into an exacting design. Chances are good a fairly random pattern will emerge. Don't skimp on the soil mix when your roof is designed for 45 PSF!

Team:

- The carport structure was designed by Hans Kretschmer and Kai Yonezawa at Green Gables. Structural engineer: David Horn
- Cully Grove LLC: Eli Spevak, Zach Parrish
- Orange Splot LLC: Noelle Studer-Spevak, Chris Mayou, Simon Lyle, Manda Clayton, Eli Spevak
- Cully Grove Landscape Team & Volunteers: Ruth Romer & Sabrina, Rosemarie Sweet, Megan Glor, Nora Stern, Dale Allen, David Sweet, Abe Cohen, Suzanne Millies, Jessica Parrish, Ben Davis, Martin, Mary, Ruth's friend, Adlai, Makhai, Layla, and Ozora helped, too!
- Cutting Sources: Mike O'Brien, Mark Lakeman, Pedro Ferbel, Larry Miller - Betty's Bloomers
- Plants transported from nursery to carport area by Center for Earth Leadership volunteers

Costs

Plant material & nursery supplies - est. \$400

Growing Mix & Transport - \$1,431

Membrane - \$7,350

Hoses & Sprinklers - \$114

Additional costs for structural engineering, architectural design, materials and labor were incurred, but are difficult to separate from total project costs. Plant material costs would have been quite a bit more without volunteer energy.

Rough Total: \$10,000 excluding "Additional costs" summarized above

Resources

- <http://www.portlandoregon.gov/bes/article/331490>
- <http://www.portlandoregon.gov/bes/article/261055>
- <http://www.nativeseednetwork.org/ecodetail?region=3>
- <http://www.goert.ca>
- Encyclopedia of Northwest Native Plants for Gardens & Landscapes (Robson, Richter, and Filbert)

Plant List

Sedum album

Sedum spurium

Sedum kamtschaticum

Sedum divergens

Sedum oreganum

Sedum spathifolium

Sedum telephium

Sedum rupestre erectum

Sedum acre

Sedum hispanicum

Sempervivum tectorum

Misc. sedums

Fragaria chiloensis

Achillea millefolium

Heuchera

Sisyrinchium douglasii

Epilobium canum - Hummingbird trumpet

Lewisia cotyledon

Prunella vulgaris



Additional native plants will be installed next year in early spring since the initial planting was so late (April) 2013.