



GREEN GROUND

Low Impact Development Program

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Low Impact Development: Rain Gardens/Bioretention Cells

What does it take to build a hard-working rain garden or a bioretention cell. These landscape elements are designed to filter water and slow its passage through the landscape. Water management on your land involves more than just conservation, soaker hoses and drought-tolerant plants.

In the spring we receive significant precipitation and sometimes, when it runs off, it can cause erosion, isolated flooding and may contain pollutants from roofs and pavement. If it is not contained or slowed down the water runs, unfiltered into our watershed: the streams, lakes and ultimately Puget Sound. A good rain garden collects, absorbs and filters water in much the same way a wetland does. In the book "Rain Gardens" (Timber Press) the authors describe the concept as a linked chain, starting with water collected off roofs and ending with the lowest geographical point on the property.

Getting started. Notice where water naturally puddles on your property and taking advantage of that. There are maps of soil types from the USDA-NRCS and formulas for figuring out soil drainage (see the book mentioned above). The water needs to be retained in the soil, and many landscapes already have low-lying areas that do just that. If not, you can create one by digging a basin shaped depression 4 to 8 inches deep that collects rain. Locate your rain garden at least 10 feet away from foundations of buildings. Avoid septic tanks and drain fields, and don't dig near the edge of steep slopes. For maximum impact, you can direct water flowing off a roof or driveway through a swale to your rain garden.

Amending the soil with compost to create permeability and covering with mulch is the next step. Finally, once the soil is ready, it's time for the plants. The planting plan can utilize Northwest native plants which help to provide habitat for insects and birds. Many native plants thrive in damp conditions, like red twig dogwood, rushes, sedges, salmonberry and twinberry. Ornamentals that can endure wet feet, include royal ferns add seasonal interest and color.

Plant the rain garden generously and it won't look like a water-filtration system just part of your beautiful landscape.

Other useful LID concepts include reducing lot size, increasing buffers and preserving open space, reducing street width and impervious surfaces, using grasscrete or pervious concrete underlain with gravel for parking and roads, promoting infiltration through the use of soil amendments, and reuse of rooftop runoff for non-potable application on-site.

Instead of a conventional curb and gutter storm drain system with detention ponds, the LID designs first reduced total on-site runoff and relied on swales and large open spaces to convey stormwater runoff. These concepts reduced the effective impervious area (the area directly connected to the storm sewer system) from 30% to 7% and 23% to near zero, respectively for each development.

The costs associated with designing LID developments were generally less than the costs to design developments served by conventional stormwater management systems. The exception was for developments incorporating a rooftop collection system including a storage tank and pump, which added significantly to the cost. Water quality benefits realized include a significant reduction in peak flows for low impact designs when compared to conventional designs and a reduction in the percentage of the time when the channel is dry. Additional non-quantified benefits include significant green space, a more walkable community, and increased public awareness of water quality issues. Low impact development techniques are a viable option to reduce impacts from stormwater discharges, protect critical resources such as wetlands and small streams, increase open space within the community, and include homeowners as partners in protecting water quality. These all relate to an increase in the quality of life for Pierce County citizens. Visit www.pierce.wsu.edu/water_quality/LID for a detailed, downloadable pamphlet called "Rain Garden Handbook for Western Washington Homeowners" or call the Natural Lawn and Garden Hotline at 206-633-0224 to order a hard copy.

References:

"Absorb This", Valerie Easton

"Anatomy of a Rain Garden" is from the Rain Garden Handbook for Western Washington Homeowners.

Nigel Dunnett and Andy Clayden "Rain Gardens" (Timber Press)