So, you want to construct a RAINGARDEN?

**Raingardens in King County**

- Main Points to address:

  - What might trigger a King County permit when building an ‘optional’ rain garden.
  - Site suitability, design considerations, and feasibility concerns related to rain gardens.
  - Resources for determining permit triggers, site suitability, design standards, and infeasibility criteria.

**Raingardens in King County**

**Brief History of Raingarden BMP Requirement at King County**

- Early manuals (pre-1998) promoted bioswales and wetponds (for water quality, not flow control)
• BMPs for flow control appeared in the 1998 King County Surface Water Design Manual (KCSWDM) (Chapter 5 and Appendix C). These focused on dispersion and infiltration and were used on single family residential projects in lieu of traditional pond/detention facilities.

• Rain gardens first appeared in the 2005 KCSWDM. Rain gardens (and other BMPs) were required where feasible with flow control modeling credits given to either reduce pond/facility sizes or eliminate the need for a formal facility entirely. BMP requirements were dependent size of the site and availability of areas to disperse/infiltrate.
The new KCSWDM update (estimated January, 2015) will require an expanded use of FCBMPs. Non engineered raingardens and engineered raingardens (bioretention) figure prominently.

**Raingardens in King County**

**DO I NEED A PERMIT?**

— maybe...

Some rain gardens are mitigation required under a development permit. Other “optional” rain gardens may or may not trigger a permit. Some factors that may trigger a permit are:

- **GRADING:** Cut & Fill heights and volumes
- **CLEARING:** There are few exceptions...
- **USE OF PUBLIC RIGHT-OF-WAY:** Any design or construction related impacts/encroachments

**Raingardens in King County**

Permitting Information Bulletins from the King County Department of Permitting and Environmental Review (DPER) at [www.kingcounty.gov/permits](http://www.kingcounty.gov/permits), select FAQs on the sidebar
Clearing Permit

When is a clearing and grading permit necessary?

Property owners will need to obtain a Clearing and Grading Permit before doing any of the following - land clearing, filling, and/or grading activities on their property:

- Grading an area that produces more than 2,000-square-feet of new impervious surface; or
- Clearing within the Urban Growth Boundary (consider that clearing would be undesirable to replace it with a raingarden, native growth is effective already); or
- Cumulative clearing of more than 7,000-square-feet on rural zoned properties. If your site already exceeds 7,000-square-feet of cleared area, any additional clearing requires a permit;
- Any clearing, filling, or excavating on: Steep Slopes, Landslide Hazard Areas, Channel Migration Hazard Zones, Wetlands, Aquatic Areas, Wildlife Habitat Conservation Areas, Wildlife Habitat Networks, or any other critical area as defined in KCC Chapter 21A.24;
- Clearing, filling, or excavating within special district overlays, (SO-220 and SO-210), or in the Soos Creek Basin, Issaquah Creek Basin and Bear Creek Basin as specified in KCC Chapter 16.82; or
- Class IV Forest Practice work.

Raingardens in King County

Right-Of-Way Use Permit

- Chapter 14.28 of the King County Code (KCC) states that a right-of-way use permit is required if King County-owned right-of-way is privately improved or used by an individual

Examples:

- Connection to a public facility (underdrain to catch basin or open ditch)
- Overflow onto public right-of-way (safety issue, dependent on local regulations)
- Culvert maintenance
- ROW-encroaching berms or slope catch lines
- Vegetation and irrigation

Raingardens in King County

Site Suitability / Design Criteria and Constraints

- Infeasibility Criteria – Ecology Stormwater Management Manual and KCSWDM Appendix C discuss feasibility for particular BMPs.
- Zoning (Berms, fences, other disallowed improvements in setbacks)
- Easements (language in document frequently limits improvements)
- Check for zoning/easement/setback restrictions for facility and outfall
- Safety at outfall – Respect and Protect your neighbors
- Diversions (KCSWDM Core Req #1 Discharge at Natural Location)

REQUIREMENTS AND REQUIRED DESIGN CRITERIA FOR PERMITTED RAINGARDENS ARE JUST AS USEFUL FOR YOUR SMALL NO-PERMIT-REQUIRED RAINGARDEN

Raingardens in King County

Infeasibility Criteria

- Where professional geotechnical evaluation recommends infiltration not be used due to reasonable concerns about erosion, slope failure, or down gradient flooding.
- Within an area whose ground water drains into an erosion hazard, or landslide hazard area.
- Where the only area available for siting would threaten the safety or reliability of pre-existing underground utilities, pre-existing underground storage tanks, pre-existing structures, or pre-existing road or parking lot surfaces.
- Where the only area available for siting does not allow for a safe overflow pathway to the municipal separate storm sewer system or private storm sewer system.
- Where there is a lack of usable space for rain garden/bioretenion facilities at re-development sites, or where there is insufficient space within the existing public right-of-way on public road projects.
- Where infiltrating water would threaten existing below grade basements.
- Where infiltrating water would threaten shoreline structures such as bulkheads.

Raingardens in King County

Infeasibility Criteria

- Within setbacks from structures as established by the local government with jurisdiction.
- Where they are not compatible with surrounding drainage system as determined by the local government with jurisdiction (e.g., project drains to an existing stormwater collection system whose elevation or location precludes connection to a properly functioning bioretention facility).
- Where the site cannot be reasonably designed to locate bioretention facilities on slopes less than 8%.
- Within 50 feet from the top of slopes that are greater than 20% and over 10 feet of vertical relief.
- For properties with known soil or ground water contamination (typically federal Superfund sites or state cleanup sites under the Model Toxics Control Act (MTCA))

Raingardens in King County

Infeasibility Criteria

- Within 100 feet of a closed or active landfill.
- Within 100 feet of a drinking water well, or a spring used for drinking water supply.
- Within 10 feet of an on-site sewage disposal drainfield, reserve area, or grey water reuse systems.
- Within 10 feet of an underground storage tank and connecting underground pipes when the capacity of the tank and pipe system is 1100 gallons or less.
- Within 100 feet of an underground storage tank and connecting underground pipes when the capacity of the tank and pipe system is greater than 1100 gallons.
- Where the minimum vertical separation of 1 foot to the seasonal high water table, bedrock, or other impervious layer would not be achieved below [small] bioretention or rain gardens.
- Where the field testing indicates potential bioretention/rain garden sites have a measured (a.k.a., initial)
native soil saturated hydraulic conductivity less than 0.30 inches per hour.

A Side Note regarding Compost: Concerns with Compost Leachate are being evaluated but are not among the Infeasibility Requirements at this time

Raingardens in King County

Other Site Suitability Factors

• Utility conflicts: Consult local jurisdiction requirements for horizontal and vertical separation
• Transportation safety: Select plant types and design configuration to provide adequate sight distances, clear zones, and setbacks in accordance with local jurisdiction requirements.
• Ponding depth and surface water draw-down time (aesthetics, mosquito control).
• Impacts of surrounding activities: Locate bioretention areas away from traveled areas to prevent soil compaction and damage to vegetation; provide elevated or bermed pathways for foot traffic; provide barriers, such as wheel stops, in roadside applications.
• Visual buffering, enhance privacy among residences, aesthetics.
• Site growing characteristics (sun exposure, soil moisture) and plant selection (native species or hardy cultivars are recommended; consider adjacent plant communities)
• Invasive species control may be necessary (NO FERTILIZERS OR PESTICIDES).
• Phosphorus-sensitive Waterbodies: Rain gardens constructed with imported compost materials should not be used within one-quarter mile of phosphorus-sensitive waterbodies. Preliminary monitoring indicates that new rain gardens can add phosphorus to stormwater. Therefore, they should also not be used with an underdrain when the underdrain water would be routed to a phosphorus-sensitive receiving water.

Raingarden Soil Specification

Quality

• All Composts are NOT equal – can be a source for leachable metals, phosphorus (including residual fertilizer in immature compost), fecal coliforms and pathogens, human waste, e.g. pharmaceuticals, personal products
• Disallow biosolids, avoid manure; Use matured compost
• WAC 173-350-220 for information regarding composting facility requirements
• Talk with your supplier

Placement

• Application Methods:
  1) Till 4” quality Compost into top 8” of native soil, scarify below, or
  2) Overexcavate and place prepared mix (18” typical minimum, organics 10% by weight, 40%+ by volume; “60/40” mix); avoid over-compacting
• May require reapplication over time
Operation and Maintenance

Think of your raingarden as an inlet to the stormwater collection system, like a catch basin in the street

“DUMP NO POLLUTANTS, OUTFALLS TO STREAM”

- Avoid foot traffic – compacts soil, impedes infiltration
- Clear trash, debris and leafdrop; clean catch basin by hand; carefully remove any sedimentation and address source with BMPs
- Prune plants, replace as needed
- Weed by hand; remove invasive plants and “volunteers”
- Repair erosion rills, address concentrated flows on sideslopes, maintain protective rock pads at inlet and outlet; avoid damage to liner above storage
- Replace contaminated soils, apply source control BMPs as needed

NO PESTICIDES OR FERTILIZERS

RESOURCES AT KING COUNTY

- Permitting (King County Department of Permitting and Environmental Review) (link to bulletins): www.kingcounty.gov/permits and select FAQs on the sidebar

NUMEROUS OTHER RESOURCES

- Infeasibility Criteria can be found in the Ecology manual: http://www.ecy.wa.gov/programs/wq/stormwater/manual.html and follow the link for the 2012 Stormwater Management Manual for Western Washington (SWMMWW), pick Vol.V Ch.7.4, pp. 7-7 through 7-10; BMP T7.30: Bioretention Cells, Swales, and Planter Boxes
- Raingarden Handbook for Western Washington Homeowners: http://raingarden.wsu.edu/
Questions

Thank You for your interest in Low Impact Development Practices