

# CATCHING RAIN:

## Rain Garden Construction Checklist

6

Effective rain gardens start with successful installations! Here are tips from experienced rain garden builders.

### 1. Educate Yourself & All Field Personnel

- If you're new to rain gardens (or bioretention facilities), learn more! Here are some resources: *Rain Garden Handbook for Western Washington*; a video: *Building a Rain Garden: Keeping our Pacific Northwest Waters clean* (<http://raingarden.wsu.edu/>); and the *LID Technical Guidance Manual for Puget Sound, 2012*.
- Take a workshop offered through WSU Extension or your local conservation district.
- Be sure all your field staff understand the project fully.

### 2. Planning

**Review the design and site plans well in advance to ensure that:**

- a percolation test dug to at least 2 feet has already been done to ensure proper drainage on site
- enough detail is provided for you to fully understand the plan
- the plants are appropriate and available from regional suppliers
- site access and staging areas are defined and workable
- the right schedule has been set if the rain garden is part of a larger construction project (see our companion fact sheet: "Construction Sequencing for Rain Gardens").

### 3. Procurement

- Begin procurement of plants and materials early. Some rain garden plants may have limited availability or be available only seasonally, especially bare-root rushes and sedges.
- If using arborists' wood chips for mulch, seek a source early and designate an accessible delivery site. Use a reputable source for mulch, free of debris or weed seeds.

### 4. Materials Specifications

- If using native soils, double check that they drain appropriately.
- Check with suppliers to be sure they will meet the plan's requirements for specified bioretention soil mix or compost. Rain gardens have particular requirements that must be met, and not all suppliers have appropriate materials.
- Order "washed" rock to armor inflows and overflows and inspect the rock on delivery to make sure it was really washed.

### 5. Construction Concerns

#### **Excavation:**

- Ensure the rain garden area is excluded from other construction operations to prevent compaction—heavy vehicles can compact soils up to 3 feet below in a single pass!
- Use the smallest possible equipment for the job to prevent compacting soils.
- Know the location of all utilities before digging—call 811 for free locator service.
- Remember that the capacity of the rain garden will be determined by the footprint of the excavated bottom—be sure you follow the plans when sizing the garden.
- Check all excavation calculations before you dig: how deep to dig, where to set the inflow level, where to set the ponding depth, where to place the overflow. (See <http://raingarden.wsu.edu/> for a rain garden calculations work sheet.)
- Never place excavation equipment in the excavated rain garden—back away as you dig.
- The bottom of the excavated rain garden should be at the same elevation throughout for even distribution of the stormwater.
- Scarify or "rip" the bottom to a depth of at least 2 inches, then rake smooth before applying the bioretention soil mix specified.

#### **Berm & Slopes:**

- Prior to setting the grade of side slopes inside the rain garden, break up compacted native soils to allow better mixing of existing soils and new bioretention soils or compost placed on top.
- Extra soils from excavation can be used to create a berm.
- Make sure the berm is well compacted and a minimum of 2 feet wide at the base (usually wider).

*Continued >*

Look for the other helpful fact sheets in this series:

1. Low Impact Development
2. LID Stormwater Regulations
3. LID Development Process
4. Pavement Maintenance
5. Rain Garden Maintenance
- ✓ 6. Rain Garden Construction Checklist
7. Rain Garden Construction Sequencing



A pit test to calculate soil drainage rates is a critical first step.  
Photo: Erica Guttman



Measuring elevations before and during construction will ensure your rain garden manages water properly.  
Photo: Erica Guttman

## *Continued: Rain Garden Construction Checklist, Construction Concerns, Berm & Slopes*

- Steep side slopes are hard to plant and maintain, and can be a safety hazard. If not otherwise specified, make side slopes 3:1 or even 4:1, remembering that the shallower the slope, the larger the rain garden's overall footprint will be to still achieve the required space at the bottom.
- Generally, berms should be landscaped with shrubs, groundcovers, and perennials—turf is hard to maintain on a slope and can pose a maintenance problem by invading the rain garden.
- Establish a border around the perimeter to deter the spread of grasses from adjacent lawn areas.

### **Inflow & Overflow:**

- Stormwater can be conveyed to the rain garden through a rock-lined swale, or through an underground pipe.
- Inflow grade should flow at a minimum of ¼-inch drop per foot of run; if the run is steep, build small rock check dams across the swale every 5 to 10 feet to slow the water.
- Swales need to be well armored with drain rock applied 2-3 inches at minimum to prevent bringing silt into the rain garden.
- Underground pipe specifications should consider the future expected above-ground load, for instance from vehicles.
- Inflow pipes should be installed to maximize ease of maintenance and prevent potential clogging.
- The opening of inflow pipes must be fully clear to allow water to enter freely.
- Several inches of drain rock should be placed underneath the pipe and extend into the garden a few feet to prevent erosion as stormwater flows in.
- Rain garden plans should always include at least one clearly defined overflow, either as a raised grate within the garden or as a low point in the berm. These areas must also be armored with clean drain rock to prevent erosion, and should extend about 3 to 4 feet outside the garden to slow water.
- The overflow water should be directed to a storm drain, vegetated landscape, or another rain garden—never onto a neighboring property or towards a structure of any kind.
- The placement of the rain garden's inflow and overflow are dependent on the existing topography and the ponding depth (usually at least 6 to 12 inches) called for in the plan.
- The overflow must be placed lower than the downspout connection point of the building, but at least 6 inches above the ponding depth (see Rain Garden Handbook for Western Washington).
- Always use a reliable elevation measuring device, such as a properly calibrated laser level.

### **Plants & Early Care:**

- Rain garden emergents, such as rushes, sedges, and bulrushes, can be purchased bare-root or in plugs.
- When planting, be sure that a deep narrow hole is dug so that the roots do not bend back upward ("J-roots") and instead go straight down. A planting bar and weeding knife help with this.
- Use a planting bar or weeding knife to bring the soil back over the emergent's roots.
- If using bare-root plants of any kind, keep their roots moist and cool until they're planted.
- Confirm any recommended field adjustments with the designer, such as moving plants that will ultimately be too tall to maintain sight distances or improperly sited plants for sun conditions. Check with the designer before making any field changes to the specified plant layout for any reason.
- Water well immediately after planting and before mulching.

### **Mulch & Armoring:**

- After planting, first apply mulch as specified in the plan. Mulches are usually coarse in texture, such as arborists' wood chips or coarse compost, and the plan may call for applying different kinds of mulch to the bottom than to the sides and top.
- Mulch should be applied thickly between plants (2 to 3 inches unless otherwise specified), more heavily at the top edges if no plants are called for (4-6 inches), and very lightly right around the base of plants, being careful not to place mulch against woody stems.
- After mulch, the last finish to apply is clean drain rock or cobbles to armor inflows and overflows. Apply according to specifications (4 to 8 inches unless otherwise specified).
- Both mulch and rock should be applied by hand to prevent damage to the plants or from mixing materials.



Applying clean drain rock to inflows and overflows prevents erosion and siltation of the rain garden.

Photo: Erica Guttman



Be sure to follow proper planting guidelines so the rain garden gets off to a good start.

Photo: Erica Guttman



Proper rain garden construction is the key to long-term success.

Photo: Erica Guttman

