RAIN GARDEN – WORKBOOK

Site Review

Review your property to determine:

- ☐ Desired location of rain garden
- ☐ General drainage patterns
- ☐ Downspout locations

Things to consider when deciding where to put your rain garden:

- ☐ Rain garden should be at least 10 feet away from your foundation, in an area that slopes away from your house.
- ☐ Avoid placing rain gardens over underground utilities, septic drain fields (at least 6ft away), or wells (at least 8ft away).
- ☐ Avoid placing rain garden in an area that is constantly wet or under trees.
- ☐ Don't place rain gardens in an area that will get a lot of additional water from neighboring properties.
- ☐ Avoid placing rain gardens upstream of a retaining wall.
- ☐ Brainstorm how you use your space (foot traffic patterns, play areas, etc.), and ensure rain garden placement won't interfere with your desired uses.
- ☐ Complementing existing landscaping.
- ☐ View of your garden from inside your home, the street or other walkways.

Features of Garden Location

- ☐ Sun Conditions (circle one):

  Full Sun Part Sun Full Shade

- ☐ Soil Type (circle one; if unknown, see Attachment 1):

  Sandy Silty Clayey

- ☐ Ground Slope (Height/Distance x 100): _____ %
- ☐ Runoff Area draining to Proposed Rain Garden: _____ ft^2

Garden Sizing and Basic Design

1. Proposed Garden Size: _____ ft2

Soil Type	Garden Size
Sandy (>1.0 in/hr)	10% of runoff area
Silty (0.41-1.0 in/hr)	20% of runoff area
Clayey (0.15-0.40 in/hr)	30% of runoff area

Proposed Maximum Garden Depth: _____ inches

Slope	Recommended Maximum Depth
Less than 4%	3-5 inches
5% - 7%	6-7 inches
8% - 12%	8 inches
Greater than 12%	Not recommended

2. Approximate Number of Plants*: _____

   *General rule of thumb is 1 plant per 1-2 square feet

   1 plant/1 ft^2= rain garden size (ft^2)/1

   1 plant/1.5 ft^2 = rain garden size (ft^2)/ 2.25

   1 plant/2 ft^2 = rain garden size (ft^2)/4

3. Plan to direct water from downspout to rain garden:

   _____

   _____

4. Overflow route:

   _____

   _____

5. Borders, berms, shape (rectangular, bean, oval) or other design features (benches, bird baths, bird houses):

   _____

   _____

   _____

Plant Selection and Garden Design

Basic Considerations:

Sunlight, Soil Moisture (see Attachment 2 for more information)

Additional Considerations:

Plant Height (screening/vision hazards), Plant Colors, Bloom Time (provide sources of nectar for pollinators from early spring to late fall)

Plant Placement:

- Place taller plants towards the middle (or back) of the garden, and shorter plants towards the edges (or front) of the garden.
- Consider spreading out plants with different bloom times to achieve interest throughout the garden.

- Cluster plant species in groups for better visual appeal and place about 1 foot apart or more for species that need more space.

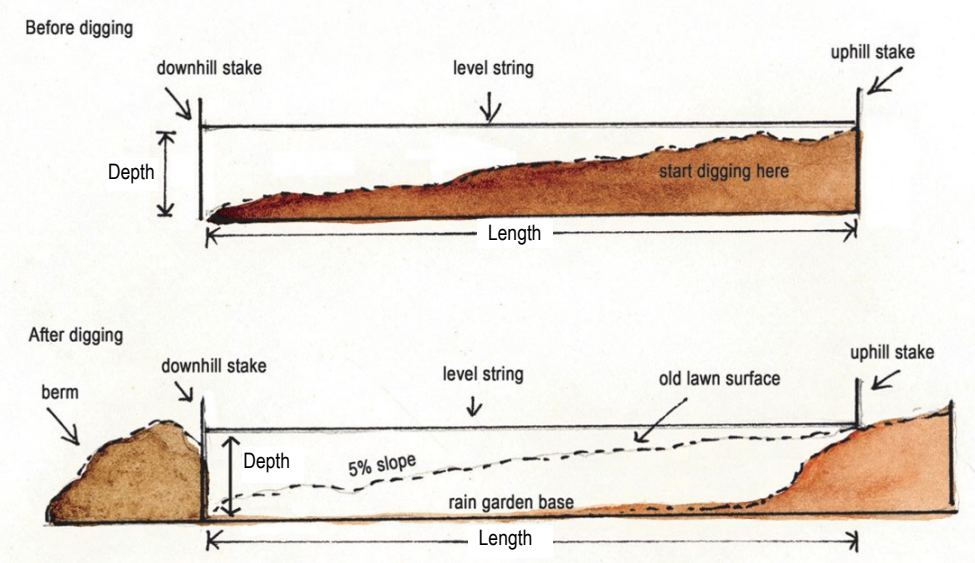
Choose species using the suggested formula (use Attachment 3):

- 1-3 blooming species for each part of the growing season (early, mid, late)
- 1-3 grass species/sedge species
- 1 milkweed species

Use graph paper to sketch your garden outline and plant placement or use sample Planting Plans.

Construction Guidance

- Before getting started, call Digger's Hotline (811) to mark underground utilities for free. Private lines, such as invisible fences, will not be marked by Digger's Hotline.
- Prepare site by removing the sod layer (if applicable). Killing the grass will make sod removal easier, and will ensure that long taproots of weeds don't sprout within your rain garden. An herbicide can be used, but a more environmentally friendly approach is to smother the lawn until the grass dies. This can be achieved, for example, by placing black plastic over the area for a few weeks. Sod-cutters, available for rent from hardware stores, make it easier to cut and remove sod, which can be composted or used in the berm.
- To dig the rain garden:
    - Identify the perimeter of the bottom of the rain garden using string, hose or marking with spray paint. The berm will be constructed outside of the string.
    - Put a stake at the uphill and downhill sides of the rain garden. Tie a level string between these stakes; use a line level (see figure on following page).
    - Start digging at the uphill side. The bottom of the rain garden should be level. Use excavated dirt to create the berm. Unneeded dirt can be spread around the lawn in a thin layer or used elsewhere.



Planting

- Incorporate soil amendments (if any are planned) prior to planting.
- Till, rake, turn and fluff the soil to mitigate any compaction before planting.
- Use a hand shovel or auger to dig a hole and plant the plants.
- Add a 2 - 3 inch thin layer of hardwood mulch.
- *Alternately, you can add mulch layer before planting and use an auger to plant directly through the mulch layer into the soil.*
- Label plants with plant markers. This will help you identify the plants and weeds during the growing season.

Maintenance

Initial Maintenance

- Water newly installed plants until established (about 1" water per week).
- During the first season or two, weed, weed, weed! This is the best strategy to help your plants be successful.

Ongoing Maintenance

- Check for erosion in the basin and re-vegetate as necessary.
- Consider leaving dead vegetation rather than cutting down in the fall. 30% of bees are hollow wood or stem nesters, so this provides good habitat for those insects in the spring. The vegetation also provides visual interest over the winter.
- Another option is to mow over the rain garden and leave mulched material in the garden to decompose.
- If ponding becomes an issue, it may be a result of dead vegetation creating a dense layer that isn't allowing water to

soak in. Raking, tilling in compost, or removing some material can help. As a last resort, lowering the berm is an option.

- Avoid placing leaf piles in rain garden. Leaves will form a mat that will prevent water from soaking into the garden

ATTACHMENT 1. SOIL INVESTIGATION

Soil Testing

Soil testing can be completed through the UW Soil and Forage Lab. More details can be found at: https://uwlab.soils.wisc.edu/soil-samples/lawn-garden/ . This can help determine if soil amendments would be beneficial.

Soil Ribbon Test

1. Collect handful of soil from beneath your topsoil layer (4-6 inches deep).
2. Add water to the soil and squeeze into ball. If it doesn't remain in a ball, you have Sandy soil.
3. Push out ribbon between thumb and forefinger until it breaks.

   Ribbon is less than 1 inch → Silty soil

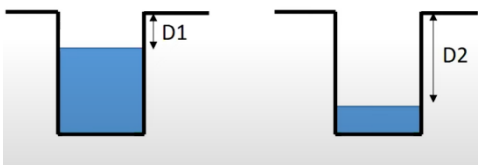
   Ribbon is 1 – 2 inches → Clayey soil

   Ribbon is more than 2 inches → Not a great spot for a rain garden

Infiltration Test

1. Dig a hole 6-12 inches deep.
2. Fill the hole with water and let it stand 1 hour.
3. After one hour, fill the hole again and measure the depth of the water (D1).
4. One hour later, measure the water depth (D2).

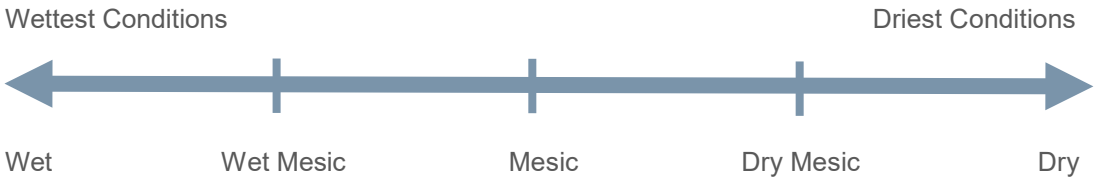
Infiltration Rate (in/hr) = D2 – D1



ATTACHMENT 2. SOIL MOISTURE

Soil Moisture

"Soil moisture" is a categorization of how wet a soil is on average. It ranges from wet to dry.



Plant Selection

Different plant species will thrive in different soil moisture conditions. For example, a plant species that will do well in "Wet Mesic-Dry" conditions, will do well in any soils classified as either wet mesic, mesic, dry mesic, or dry.

A rain garden has different areas (see **Figure 1**), that will likely have different soil moisture conditions. In general, the bottom of the rain garden will be the wettest area, and the top of the berm will be driest area. **Table 1** provides a "rule of thumb" for what soil moisture conditions you can expect in different areas of a rain garden.

Figure 1. Areas of a Rain Garden

Table 1. Rules of Thumb: Soil Moisture for Different Areas of a Rain Garden

	Sandy	Silty	Clayey
Top of Berm	Dry	Dry Mesic to Mesic	Mesic
Side Slopes	Dry	Dry Mesic to Mesic	Mesic to Wet Mesic
Bottom	Dry to Mesic	Mesic to Wet Mesic	Mesic to Wet Mesic

ATTACHMENT 3. PLANT SELECTION SPREADSHEET

		Bloom Time			Moisture Preferences			Diversity Checks				
Plant Name and Color	**Height**	**Spring** (April - May)	**Summer** (June - Aug)	**Fall** (Sep - Oct)	**Wet (basin)**	**Medium (side slopes)**	**Dry (berm)**	**Milkweed**	**Grass or Sedge Species**	**Legume**	**Aggressive Spreader**	**# Plants Needed**