Rain Garden Design & Construction Worksheet

Garden Design

Step 1: Determine Drainage Area

What areas do you want to capture water from?

Drainage Area	Area in sq ft
☐ Gutter/Roof – area 1	_____
☐ Gutter/Roof – area 2	_____
☐ Driveway (slopes to Garden)	_____
☐ Walkway, patio	_____
☐ Low spot	_____
☐ Lawn	_____
☐ Base of hill	_____
☐ Other:	_____
TOTAL sq ft DRAINAGE	

Step 2: Determine Location

Where do you want to build your rain garden?* Does that location meet the following criteria?

- ☐ Garden at least 10’ from house
- ☐ Garden is not over utilities (Call MB Hydro/MTS for locates)
- ☐ Garden is not over septic system
- ☐ Slope is less than 12% (12’ rise over 100’ distance)

* It is also good practice to place rain gardens in sunny or semi-sunny locations to facilitate evapotranspiration. HOWEVER, direct sun off of the south side of a building (or other reflective surface) is often too hot/dry for water loving plants.

Step 3: Analyze Soil and Determine Amendments – Soil Texture

What type of soil are you dealing with?

Test more than one area of the garden. Take soil sample 6"-12" below bottom of garden. Use soil texture worksheet (Appendix A) to determine texture, or have a professional soil test done.

Your soil	Class	Texture	Recommended amendments
☐	A	Sandy	Compost helpful, but not required
☐	B	Silt loam/loam	Add 1-2" compost
☐	C	Sandy clay loam	Add 2-4" compost
☐	D	Clayey	Add 2-4" compost

Step 4: Determine Garden Depth and Size

How big does your garden have to be?***

Depth: Gardens with clay soils will be shallower since they infiltrate slowly and rain gardens should infiltrate within 24-48 hours. Constructing deep rain gardens in clay soils will create a "bowl" where water will pool for prolonged amounts of time.

Soil Type	Typical Depth
A – Sandy	☐ 9"-12"
B – Silty loam	☐ 6'-9"
C – Sandy clay loam	☐ 6'-9"
D - Clay	☐ 4" maximum depth

Area: Size is based on drainage area and soil type. Gardens with clay soils are shallower, so usually will require larger area to gain the same amount of infiltration. These are guidelines!!

Total Drainage Area (from Step 1): _____ sq ft

Multiply by factor in table below x _____

Minimum size: = _____ sq ft

Soil Type	Min. Garden Size	Multiply by
A – Sandy	5% of drainage area	.05
B – Silty Loam	8%	.08
C – Loamy	10%	.10
D - Clay	15%	.15

***NOTE: these calculations are based on the assumption that you want to collect 100% of your runoff, there is no rule stating that you must do this. If you only have a limited amount of space then work with what you have and collect all the water from a portion of your impermeable surfaces or collect a portion of the water from all your impermeable surfaces and allow the rest to overflow. This alternative equation **(Area available for garden in sq ft/factor from table above = total potential drainage area)** will give

you an idea of how much water you can collect based on a limited space for the garden.

Also note that creating several small rain gardens is often better than creating one huge garden! This delivers the water to several locations instead of one (improves infiltration) and is also easier to manage. Plus you can do this in steps over several years.

Step 5: Determine Inlet

How will water enter garden?

Method	Materials; Size (length, width, diameter, quantity)
☐ Extended downspout***	
☐ Buried downspout or tile drain	
☐ Across lawn	
☐ Vegetated swale	
☐ Other:	

Erosion Potential	Materials and Quantity
☐ Erosion should not be a problem	
☐ Erosion possible, address with:	
☐ Grading	
☐ Rocks to stabilize	
☐ Erosion control blanket	

***point source inlets such as downspouts can result in erosion and transport sediment into your garden. If possible, allow water to run from downspout across a patch of lawn before entering the garden or use erosion control material where the water enters the garden to ensure water doesn't wash away your soil.

Step 6: Determine Overflow

Check all that apply:

- ☐ Yes, overflow is away from buildings
- ☐ Berm higher near building
- ☐ Overflow sheets over lawn or garden
- ☐ Overflow sheets over driveway, walkway
- ☐ Other

*** consider where the water would go if there wasn't a rain garden, over a patch of lawn and into a ditch might be the best options in tight urban settings

Step 7: Summarize Design

Area:
Depth:
Soil Amendments:

Materials:

Planting Methods and materials

Step 1: Determine Design Elements

Style:

- Wild
- Naturalistic but not too wild
- Relatively formal
- Formal
- Other:

What types of plants? Check all that apply

- Perennials
- Shrubs
- Natives only
- Mix of natives and non-natives
- Non-natives only

*** plant selection has almost as much to do with personal preference as it does with functionality. Remember that trees and shrubs can uptake a lot more water than perennial herbaceous plants. Before you start selecting plants, make sure you're aware of the different moisture zones in your garden. The bottom will require moisture loving plants, the periphery drought tolerant plant. Also consider the shade created by any trees or shrubs.

Step 2: Create Design

1. List plants to use in wet zone
2. List plants to use in upland
3. Will plants be mixed or massed?
4. Draw design on paper.

Construction Methods & Materials

Step 1: Call MB Hydro and MTS

Before digging call 1-888-624-9376 and 1-888-365-1172. Mark all utilities in the vicinity of the garden.

Step 2: Mark and Dig Garden

Use a rope and pegs to delineate the perimeter of your garden. Once you've got your garden outlined use a piece of rope tied to two pegs to level the garden. Plant one peg at one end of the garden and the other peg

How to remove soil?

- ☐ Shovel
- ☐ Mini-backhoe
- ☐ Other:

Where to put excess soil?

- ☐ Use for berm around garden
- ☐ Use or store elsewhere on-site
- ☐ Haul off-site

Be sure garden bottom is flat and slopes are gentle.

Step 3: Scarify and add amendments

Scarify bottom 6-12" with:

- ☐ Shovel
- ☐ Fork
- ☐ Tiller
- ☐ Other:

How to incorporate amendments

- No amendments
- Turn into soil with shovel
- Till into soil
- Other:

*Must incorporate, do not create layer

AVOID COMPACTING SOIL!!!! Plan your work for the least amount of walking in the garden.

Step 4: Edge of Garden

Type of Edging

- Plastic
- Brick
- Other:

CALCULATION for Mulch or other amendment

Area of garden / 1000 x 3.12 x depth of amendment (inches) = _____cu yards of mulch

Example: 200 sq ft x 3.12 x 3" mulch = 1.9 cu yards of mulch

APPENDIX A

Determining Soil Texture

When a quick determination is required, the "feel method" may be used to determine soil texture. A soil sample is mixed with water and manipulated in the hand. In general, grittiness (detected both by feel and sound) denotes a sandy soil. Clay or loam is indicated if the soil can be rolled into a moist soil ball and it stains your fingers. Clay is sticky; silt is smooth and velvety. Clay soil will "ribbon" that is, by pressing and working a moist sample, it can be rolled and pushed into a ribbon.

Specific soil texture categories as determined by the "feel method" are described below:

Sandy

Dry Loose, single grained, gritty; no clods (or they are very weak).

Moist Gritty; forms easily crumbled ball; does not ribbon.

Wet Lacks stickiness, but may show faint clay staining (especially loamy sand). Individual grains can be both seen and felt under all moisture conditions.

Loam

NOTE: This is the most difficult texture to indentify since characteristics of sand, silt and clay are all present but none predominates.

Dry Clods are slightly difficult to break; somewhat gritty.

Moist Forms firm ball; ribbons poorly; may show poor fingerprint.

Wet Gritty, smooth, and sticky – all at the same time; stains fingers.

Silt Loam

Dry Clods are moderately difficult to break and they can rupture suddenly, turning them into a floury powder that clings to fingers; shows fingerprints.

Moist Has smooth, slick, velvety, or buttery feel; forms firm ball; may ribbon slightly before breaking, shows good fingerprint.

Wet Smooth with some stickiness from clay; stains fingers; the grittiness of sand is present, but other separates are more dominant.

Sandy Clay Loam

Dry Clods break with difficulty.

Moist Forms firm ball, becoming moderately hard on drying; ribbons fairly well, but ribbons barely support their own weight; shows fair to good fingerprint.

Wet Moderately sticky, with stickiness dominating over grittiness and smoothness; stains fingers.

Clay

NOTE: Think of molding clay here (smooth and sticky).

Dry Clods predominate.

Moist Forms very firm ball, very hard on drying; ribbons very easily; shows fingerprint.

Wet Stains fingers, sticky, no grittiness.