Rain Gardens for Nashville

A Resource Guide for **PLANNING, DESIGNING** and **MAINTAINING** a beautiful Rain Garden.

Rain Gardens for Nashville

Make the most of the rain that falls on your property

www.raingardensfornashville.com

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Overview

Do you want to be part of improving the health and beauty of our streams? **Rain Gardens for Nashville** has created this simple step-by-step guide to show you how.

A RAINY DAY STORY… or what can happen when it rains.

If you live in Nashville, much of the land around you has been covered with roads, parking lots and buildings. Rain water that falls onto these hard surfaces becomes runoff that flows across paved areas warming and collecting contaminants, such as oil, pesticides and pet waste, along its way. This warm polluted water flows into storm water sewer systems eventually entering streams. Even worse, in some older areas of the city with combined storm water and sewage pipes, runoff can combine with raw sewage during heavy rains. If the volume of this combined sewage is too great it can overflow untreated into our rivers. All this runoff puts a heavy burden on our streams and leads to flooding, erosion and habitat loss. This costs our city extra money in water treatment and repairs.

A GOOD CLEAN STORY… or what we can do to help.

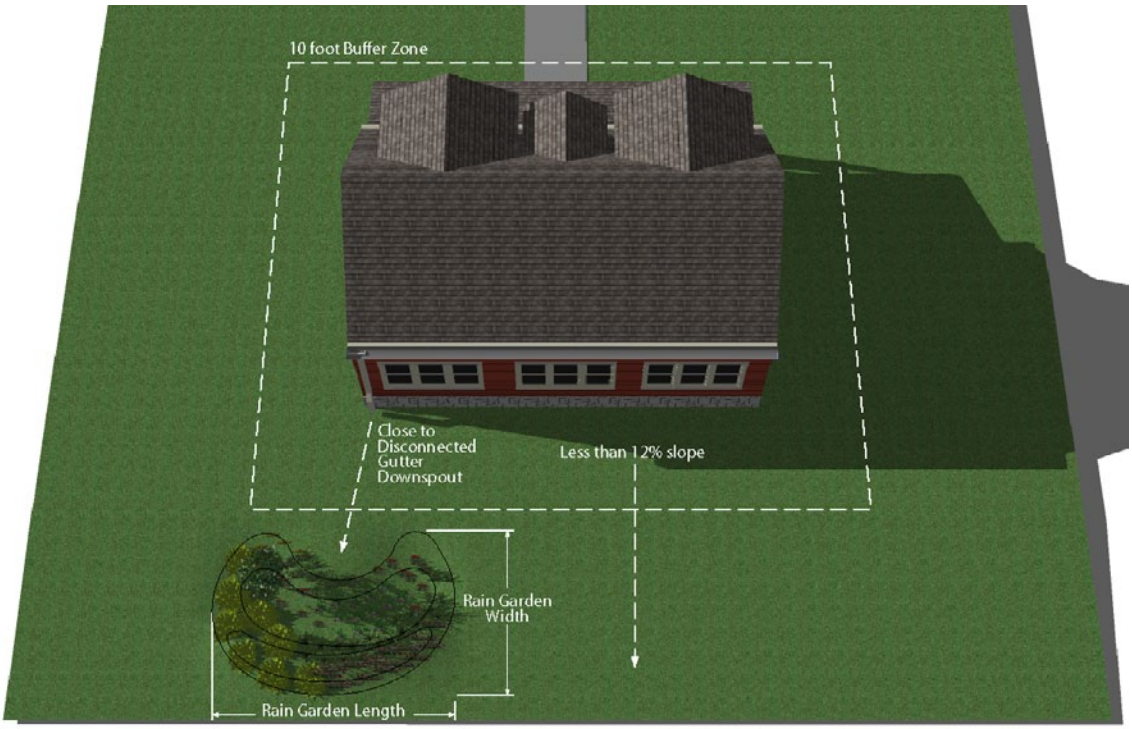
Rain Gardens are a natural and beautiful way to reduce and clean storm water. They are shallow, depressed gardens designed to collect rain water and allow it time to filter into the ground. This results in cleaner water, less water entering our storm systems and more water refilling the underground water table that keeps small streams flowing during the dry summer months.

Rain Gardens are lovely, lively, colorful, low maintenance habitats for insects and animals. Their native plants provide food to song birds and butterflies.

Join Rain Gardens for Nashville in planting 300 Rain Gardens to keep our streams clean, flowing and healthy.

Planning

Many things need to be considered when locating and planning your rain garden. Although each site is different, the following general guidelines will help make your rain garden a success.



LOCATING YOUR RAIN GARDEN

Build your rain garden at least 10 feet downhill from your or your neighbor's house to avoid water getting in the foundation.

Never build a rain garden above a septic system or shallow underground utilities. Call TN One Call (811) before you begin.

Your rain garden should not be located in an area of your yard where water pools because the water can't drain quickly enough.

Tennessee is known for its shallow bedrock, so make sure the soil is at least 24 inches deep in your garden location for proper drainage.

Make sure the slope of your site is less than 12% (see page 5). A site too steep will drain too quickly and needs increased excavation work.

Try not to build your rain garden under existing trees because it can damage roots.

If your downspouts are routed into pipes or onto the ground, disconnect them and try to locate your garden to catch and treat the water.

Make sure your rain garden is not within a stream's floodway or the plants may wash away!

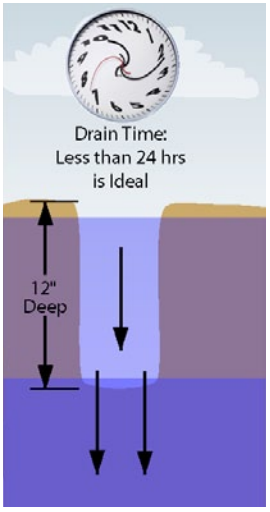
TESTING AND AMENDING YOUR SOIL

Once you have picked a potential location for your rain garden, you will need to test the soil to determine if it will drain properly. If the infiltration rate of your soil is too low, water may pond in your garden for too long breeding mosquitoes and killing your plants.

First, dig a hole 12 inches deep, fill it with water and allow the water to saturate the surrounding soil.

Next, refill the hole and time how long it takes to drain. If it drains in:

- **Less than 24 hours, your infiltration rate is good**
- **Between 24 and 48 hours, your soil will infiltrate, but should be amended with a mixture of 20-30% of the existing soil, 20-30% compost, & 40-60% sand to a depth of 6 inches**
- **Greater than 48 hours, this is not the best spot for a rain garden.**

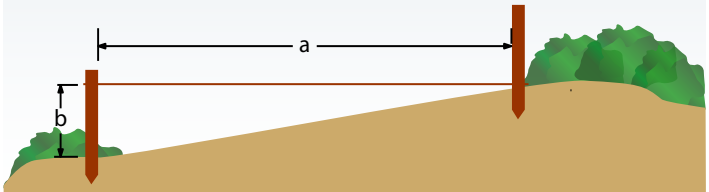


If there are no other suitable locations, you can replace the soil to a depth of 2 feet with a mixture of 20-30% imported topsoil, 20-30% compost, & 40-60% sand.

Another option is to install an under drain system, gravel, or both. Please contact Metro Water Services Stormwater Department for more details at **615-880-2420.**

MEASURING SLOPE

To calculate the percentage of slope follow these steps



1. Pound two stakes into the ground; one at the uphill side of your rain garden and one at the downhill side.
2. Tie a string to the uphill stake at ground level.
3. Tie the other end of the string to the downhill stake, ensuring the string is level.
4. Measure the width in inches between the two stakes (a).
5. Measure the height in inches from the ground to the string on the downhill stake (b).
6. Divide the height (b) by the length (a) and multiply by 100 to calculate the percentage of slope.

SIZING YOUR GARDEN

Whatever the size of your rain garden, catching and infiltrating runoff will improve our water quality. Rain Gardens typically range from 100 – 300 square feet to catch most of the runoff from your yard, although smaller gardens are sometimes necessary due to lot constraints. A simple equation to calculate the best size for your garden is:

$$\text{Rain Garden (ft}^2\text{)} = \frac{\text{Rain Depth (in)} \times \text{Drainage Area (ft}^2\text{)}}{\text{Garden Depth (in)}}$$

Since most of the rainfall events in Nashville are 1 inch or less and your rain garden should be about 6 inches deep, you should use these values in the equation. For example, if the roof area draining to your rain garden is 1000 square feet, then your rain garden will be:

$$\text{Rain Garden} = \frac{1 \text{ in} \times 1{,}000 \text{ ft}^2}{6 \text{ in}} = 167 \text{ ft}^2$$

Design

Rain gardens come in a variety of shapes and sizes. You can select from the templates in this manual, or invent your own shape. The best designs are typically longer than they are wide, with the longer side perpendicular to the direction of water flowing into your garden. You can also get water to your garden by routing a pipe from your gutters or building a stone lined channel to carry the flow. In any of these cases, you should make certain that the water is not entering your rain garden too fast or erosion may occur.

"The first rule of sustainability is to align with natural forces, or at least not try to defy them."

—Paul Hawken

Follow these seven steps for success.

Tools you'll need:

Tape measure

Shovels

Rake

Trowels

Wheelbarrow

Carpenter's level

Marking paint

String

Eye, hand and foot protection. Hard hats if using machinery such as a bobcat or backhoe.

1

GETTING STARTED

- ✓ Remember to call TN One-Call (811) in advance to mark underground utilities.
- ✓ Rent machinery in advance such as a tiller, backhoe, or bobcat if needed.
- ✓ Check the weather forecast and schedule your work for a dry day. Rain will delay construction and cause sediment to wash into the storm system.
- ✓ Gather tools and material close to the site.
- ✓ Ask your friends and neighbors for help with the construction. If you don't want to build it yourself, hire a professional landscaper with rain garden experience.

2

SITE PREPARATION

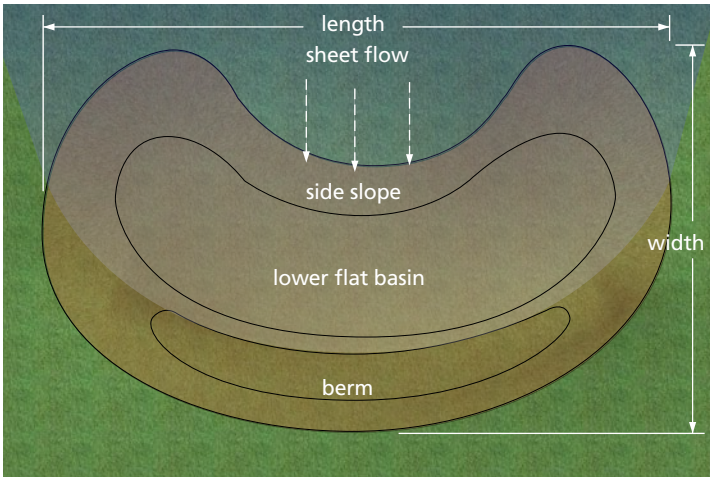
- ✓ Mark the outline of the rain garden on the ground with loose chalk, spray paint, stakes, flags or a garden hose.
- ✓ Install appropriate erosion controls such as silt fence or fiber logs if you are creating run off sediment or mud that will enter storm drains or water bodies. Refer to *The Tennessee Erosion and Sediment Control* Handbook for more information: http://www.tn.gov/environment/wpc/sed_ero_controlhandbook/

3

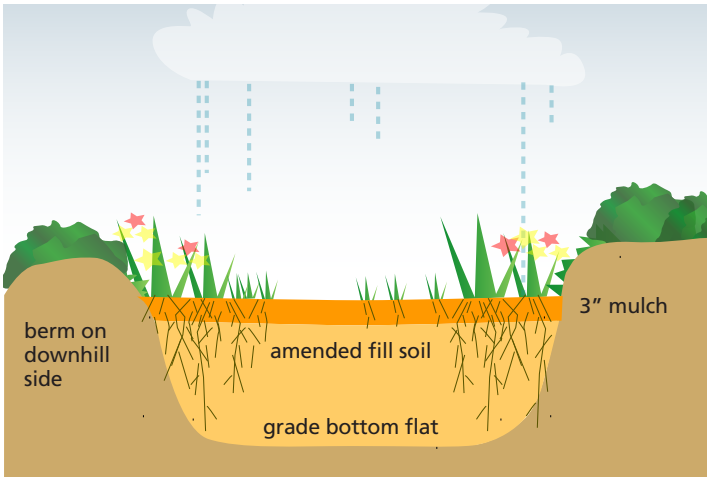
EXCAVATION

- ✓ Dig your garden the size, shape and depth that you have determined during planning. Remember to take into account the soil amendment depth (if needed) and the final 3 inch mulch layer. Your final rain garden should be around 6 inches deep.
- ✓ Do not compact the soil during excavation.
- ✓ **It is crucial to make the bottom flat and level so water will infiltrate evenly and not pool.** Use survey methods or a carpenter's level laid on top of a board to check and correct your work.
- ✓ If your rain garden is on a slope, place excavated soil on the downhill side to be used later to form the berm.

Remember to call TN One-Call (811)



SHAPE OF RAIN GARDEN *Generally twice as long as wide. Length is perpendicular to slope.*



RAIN GARDEN CROSS SECTION

4

AMENDING THE SOIL

- ✓ If your infiltration rate calculation indicated your soil needs amending, backfill the excavated soil mixed to a ratio of 20-30% existing soil or top soil, 20-30% compost and 40-60% coarse sand to the depth outlined in the 'Amending your Soil' section.
- ✓ Mix small portions at a time by hand or with machinery. Allow it to settle overnight and add additional soil if needed. Keep the soil level.

Any work within the public right-of-way should be approved by Metro Public Works. 615-862-8782

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THE BERM

- ✓ If the garden is located on a slope, use the remaining excavated soil to construct a berm on the downhill side of the rain garden.
- ✓ The berm should be rounded and gradually taper on the sides until it meets the existing lawn. Once the berm is shaped, compact it with your feet or a tamping bar. The berm will act as a dam to hold more water in the garden.
- ✓ To prevent erosion the berm will need to be planted with grass or incorporated into the planting design.

6

PLANTING

- ✓ Carefully choose native plants that are quality, established nursery stock.
- ✓ Store plants in protected shady area until ready to plant.
- ✓ Do not allow plants to dry out during storage or installation.
- ✓ Lay out plants according to spacing guidelines on design templates and plant lists. Dig holes twice as wide as the root ball.
- ✓ Plant the crown of the plant level with the existing soil.
- ✓ Gently tamp soil around the roots.
- ✓ Do not step on or compact the roots.
- ✓ Water immediately after installation.
- ✓ Keep tags during warranty period.

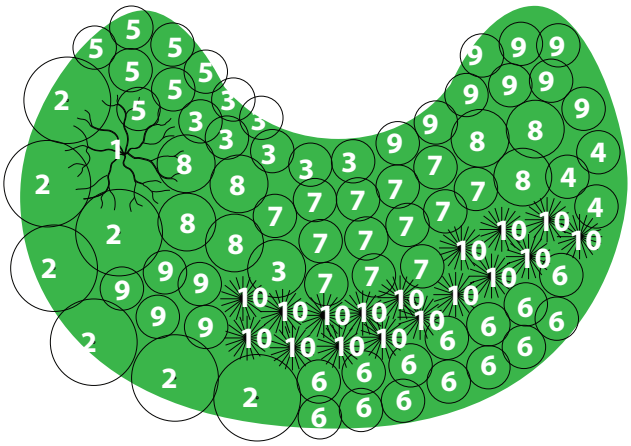
7

EDGING & MULCHING

- ✓ A strong edge for your rain garden has multiple benefits. Using trenches, metal or plastic edging, stone, brick, or even a thick border of native grasses creates a strong visual line and prevents weeds from creeping into your rain garden. Make sure your edge is buried low enough for runoff to flow over it into the garden.
- ✓ Mulch is used to retain moisture, prevent erosion, control weeds and nourish the soil.
- ✓ Spread 3 inches of pine straw or shredded wood mulch over the rain garden taking care not to damage plants.

Design template

A Colorful, Full Sun Rain Garden Planting Design. Size, 20′ x 10′.



Plan View - Full Sun Rain Garden

Perspective View - Full Sun Rain Garden

Native Plant List

KEY	QUANTITY	LATIN NAME	COMMON NAME	SIZE	SPACING	COLOR	HEIGHT
		SHRUBS					
1	1	Cephalanthus occidentalis	Buttonbush	2 gal.	5′	White	15′
2	7	Ilex glabra compacta	Dwarf Inkberry	2 gal.	3′		4-6′
		PERENNIALS					
3	7	Asclepias syriaca	Common Milkweed	plugs-I gal	1 plant/18″ s.f., o.c.	Orange	2-5′
4	3	Asclepias verdis	Green Milkweed	plugs-I gal	1 plant/18″ s.f., o.c.	Green	2′
5	7	Coreopsis lanceolata	Lance-leaf Coreopsis	plugs-I gal	1 plant/18″ s.f., o.c.	Yellow	6-8′
6	14	Echinacea purpurea	Purple Coneflower	plugs-I gal	1 plant/18″ s.f., o.c.	Purple	3-4′
7	13	Iris virginica sherevi	Blue Flag Iris	plugs-I gal	1 plant/18″ s.f., o.c.	Blue	1.5-3′
8	8	Monarda didyma	Bee Balm	plugs-I gal	1 plant/2 s.f., o.c.	Red	3′
9	14	Rudbeckia hirta	Black-eyed Susan	plugs-I gal	1 plant/18″ s.f., o.c.	Yellow	3′
		GRASSES & SEDGES					
10	17	Carex stricta	Tussock Sedge	plugs-I gal	1 plant/18″ s.f., o.c.		2-3′

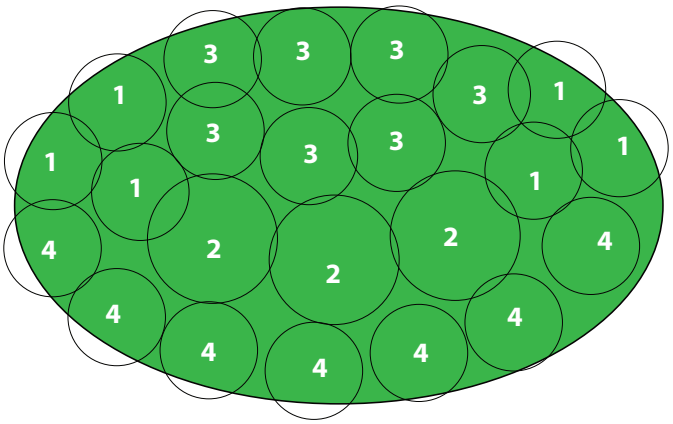
DID YOU KNOW:

Rain Gardens can reduce the amount of nitrogen entering storm sewers by 40% or more.

North Carolina State University

Design template

A Small Full Sun Rain Garden Planting Design. Size, 10′ x 6′.



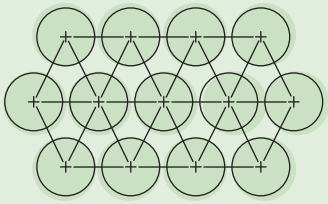
Plan View - Small Rain Garden

Perspective View - Small Rain Garden

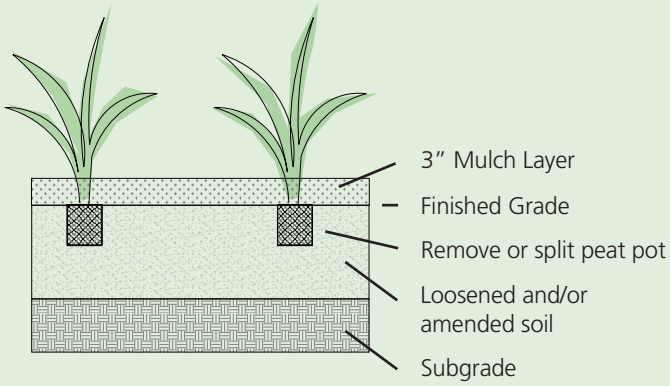
Native Plant List

KEY	QUANTITY	LATIN NAME	COMMON NAME	SIZE	SPACING	COLOR	HEIGHT
		PERENNIALS					
1	6	Echinacea purpurea	Purple coneflower	plugs	1 plant/18″ s.f., o.c.	Purple	3-4′
2	3	Monarda didyma	Bee balm	plugs	1 plant/2 s.f., o.c.	Red	3′
3	7	Oenethera fruticosa	Sundrops	plugs	1 plant/18″ s.f., o.c.	Yellow	1-1.5′
4	7	Rudbeckia hirta	Black-eyed Susan	plugs	1 plant/18″ s.f., o.c.	Yellow	3′

PLANTING DETAIL

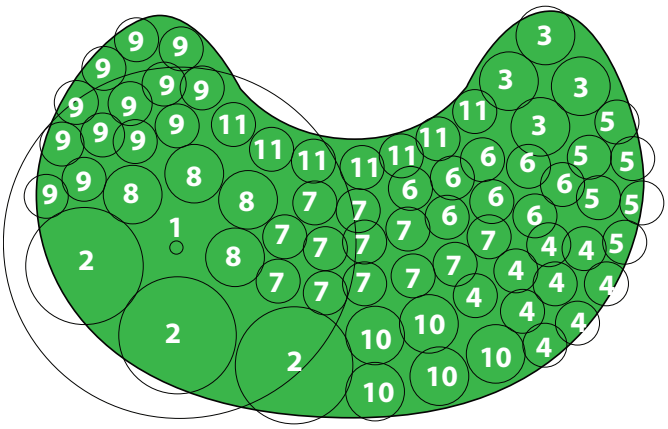


NOTE:
PLANT PERENNIALS USING TRIANGULAR SPACING. REFER TO PLANTING LISTS FOR ON-CENTER PLANTING DIMENSIONS.



Design template

A Shaded Rain Garden Planting Design. Size, 20′ x 10′



Plan View - Shaded Rain Garden

Perspective View - Shaded Rain Garden

Native Plant List

KEY	QUANTITY	LATIN NAME	COMMON NAME	SIZE	SPACING	NOTE	COLOR	HEIGHT
		TREES						
1	1	Cercus canadensis	Redbud	1-2″ cal.			Purple	20-30′
		SHRUBS						
2	3	Itea virginica	Virginia Sweetspire	2 gal.	4′ o.c.		White	4-8′
		PERENNIALS						
3	4	Aster novea-angliae	New England aster	plugs-1 gal.	1 plant/24″ s.f., o.c.		Blue/Purple	3-4′
4	9	Coreopsis major	Tickseed coreopsis	plugs-1 gal.	1 plant/18″ s.f., o.c.		Yellow	3′
5	6	Heuchera americana	Alumroot	plugs-1 gal.	1 plant/18″ s.f., o.c.		Pink	1′
6	8	Lobelia siphilicata	Great blue lobelia	plugs-1 gal.	1 plant/18″ s.f., o.c.	Riparian	Blue	1.5-3′
7	12	Lobelia cardinalis	Cardinal flower	plugs-1 gal.	1 plant/18″ s.f., o.c.	Riparian	Red	2-4′
8	4	Osmunda cinnamomea	Cinnamon Fern	plugs-1 gal.	1 plant/24″ s.f., o.c.	Riparian	Green	3-4′
9	13	Phlox divaricata	Blue phlox	plugs-1 gal.	1 plant/18″ s.f., o.c.		Blue	.5-2′
10	5	Polystichum acrostichoides	Christmas fern	plugs-1 gal.	1 plant/24″ s.f., o.c.	Evergreen	Green	2′
11	7	Stylophorum diphyllum	Wood poppy	plugs-1 gal.	1 plant/18″ s.f., o.c.		Yellow	1.5′

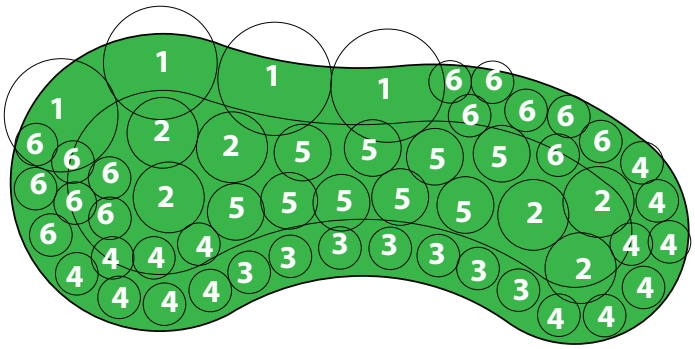
DID YOU KNOW:

Rain gardens can reduce water temperatures by five to ten degrees Fahrenheit.

Low Impact Development (LID) Center

Design template

A No Fail Rain Garden. Size, 24′ x 10′.



Plan View - No Fail Rain Garden

Perspective View - No Fail Rain Garden

Native Plant List

KEY	QUANITITY	LATIN NAME	COMMON NAME	SIZE	SPACING	COLOR	HEIGHT
		SHRUBS					
1	4	Itea virginica	Virginia Sweetspire	2 gal.	4′	White	4-8′
2	6	Hibiscus moscheutos	Swamp Mallow	2 gal.	2.5′	Red-White	4-7′
		PERENNIALS					
3	7	Echinacea purpurea	Purple coneflower	plugs- 1gal.	1 plant/18″ s.f., o.c.	Purple	3-4′
4	14	Rudbeckia hirta	Black-eyed Susan	plugs- 1gal.	1 plant/18″ s.f., o.c.	Yellow	3′
5	9	Vernonia gigantea	Tall ironweed	plugs- 1gal.	1 plant/2 s.f., o.c.	Purple	4-6′
		GRASSES & SEDGES					
6	14	Chasmanthium latifolium	Upland Sea Oats	plugs- 1gal.	1 plant/18″ s.f., o.c.		4′

DID YOU KNOW:

Rain Gardens are like a sponge. They soak up water, clean pollutants and slowly release it back into the ground.

Plant List: Native Perennial List for Rain Garden Design

Full Sun						
Latin name	Common name	Size	Spacing	Moisture	Color	Height
Asclepias incarnata	Marsh milkweed	plugs-1gal.	1 plant/24″ o.c.	Wet	Pink	3-4′
Asclepias purpurescens	Purple milkweed	plugs-1gal.	1 plant/18″ o.c.	Moist	Purple	3′
Asclepias syriaca	Common milkweed	plugs-1gal.	1 plant/18″ o.c.	Moist-Dry	Orange	2-5′
Asclepias tuberosa	Butterfly milkweed	plugs-1gal.	1 plant/18″ o.c.	Dry-Moist	Orange	2
Asclepias verdis	Green milkweed	plugs-1gal.	1 plant/18″ o.c.	Moist	Green	2′
Asclepias verticillata	Whorled milkweed	plugs-1gal.	1 plant/18″ o.c.	Moist	White	2.5′
Aster laevis	Smooth aster	plugs-1gal.	1 plant/18″ o.c.	Moist	Blue	2-4′
Aster novae-angliae	New England aster	plugs-1gal.	1 plant/24″ o.c.	Wet-Moist	Blue	2-5′
Aster sericeus	Silky aster	plugs-1gal.	1 plant/18″ o.c.	Dry	Purple	1-2′
Chamaecrista fasciculata	Partridge pea	plugs-1gal.	1 plant/18″ o.c.	Dry	Yellow	1-2′
Conoclinium coelestinum	Mist flower	plugs-1gal.	1 plant/18″ o.c.	Moist-Dry	Blue	1-2′
Coreopsis lanceolata	Lance-leaf coreopsis	plugs-1gal.	1 plant/18″ o.c.	Moist-Dry	Yellow	6-8′
Echinacea pallida	Pale purple coneflower	plugs-1gal.	1 plant/18″ o.c.	Dry	Purple	2-3′
Echinacea purpurea	Purple coneflower	plugs-1gal.	1 plant/18″ o.c.	Moist-Dry	Purple	3-4′
Eupatorium perfoliatum	Boneset	plugs-1gal.	1 plant/24″ o.c.	Wet	White	3-5′
Eupatorium purpureum	Sweet Joe-Pye weed	plugs-1gal.	1 plant/24″ o.c.	Wet-Moist	Purple	3-6′
Iris cristata	Dwarf crested iris	plugs–1 gal.	1 plant/18″ o.c.	Moist-dry	Purple	4″
Liatris aspera	Rough blazingstar	plugs-1gal.	1 plant/18″ o.c.	Moist-Dry	Purple	2-5′
Liatris microcephalla	Small-headed blazingstar	plugs-1gal.	1 plant/18″ o.c.	Moist-Dry	Purple	3′
Liatris spicata	Dense blazingstar	plugs-1gal.	1 plant/24″ o.c.	Wet-Moist	Purple	1.5′
Liatris squarrulosa	Southern blazingstar	plugs-1gal.	1 plant/18″ o.c.	Moist-Dry	Purple	2-6′
Lobelia cardinalis	Cardinal flower	plugs-1gal.	1 plant/18″ o.c.	Wet-Moist	Red	1.5-3′
Lobelia siphilitica	Great blue lobelia	plugs-1gal.	1 plant/18″ o.c.	Wet-Moist	Blue	2-4′
Monarda didyma	Bee balm	plugs-1gal.	1 plant/24″ o.c.	Wet-Moist	Red	3′
Monarda fistulosa	Wild bergamot	plugs-1gal.	1 plant/18″ o.c.	Moist	Purple	1-3′
Oenethera fruticosa	Sundrops	plugs-1gal.	1 plant/18″ o.c.	Moist-Dry	Yellow	
Penstemon digitalis	Smooth white beardtongue	plugs-1gal.	1 plant/24″ o.c.	Wet	White	2-3′
Penstemon hirsutus	Hairy beardtongue	plugs-1gal.	1 plant/18″ o.c.	Dry	White	1-3′
Penstemon smallii	Beardtongue	plugs-1gal.	1 plant/18″ o.c.	Moist	Purple	1-2′
Pycnanthemum tenui-folium	Slender mountain mint	plugs-1gal.	1 plant/18″ o.c.	Moist	White	1.5-2.5′
Ratibida pinata	Gray-headed coneflower	plugs-1gal.	1 plant/18″ o.c.	Moist	Yellow	5-Feb
Rudbeckia hirta	Black-eyed Susan	plugs-1gal.	1 plant/18″ o.c.	Moist-Dry	Yellow	3′
Salvia lyrata	Lyre-leaf sage	plugs-1gal.	1 plant/18″ o.c.	Moist	Purple	1-2′
Solidago nemoralis	Gray goldenrod	plugs-1gal.	1 plant/18″ o.c.	Dry	Yellow	2′
Solidago rugosa	Rough-leaved goldenrod	plugs-1gal.	1 plant/24″ o.c.	Wet	Yellow	1-6′
Veronacastrum virginicum	Culver's root	plugs-1gal.	1 plant/24″ o.c.	Dry	White	3-6′
Vernonia gigantea	Tall ironweed	plugs-1gal.	1 plant/24″ o.c.	Wet-Moist	Purple	3-4′

Native Perennial List for Rain Garden Design (continued)

Shade						
Latin name	Common name	Size	Spacing	Moisture	Color	Height
Aquilegia canadensis	Wild columbine	plugs-1gal.	1 plant/18″ , o.c.	Moist-Dry	Pink	1-2.5′
Athyrium filix-femina	Lady Fern	1 gal.	1 plant/18″ o.c.	Moist	Green	3′
Arisaema triphyllum	Jack-in-the-pulpit	plugs-1 gal.	1 plant/18″ o.c.	Moist	Green	1.5-2.5′
Ariseama dricontium	Green dragon	plugs-1 gal.	1 plant/18″ o.c.	Wet-Moist	Green	3′
Asarum canadense	Wild ginger	plugs-1 gal.	1 plant/18″ o.c.	Wet-Moist	Red-brown	.5-1′
Aster cordifolius	Blue wood aster	plugs-1 gal.	1 plant/18″ o.c.	Moist-Dry	Blue	1-3′
Aster novea-angliae	New England aster	plugs-1 gal.	1 plant/24″ o.c.	Moist-Dry	Blue/Purple	3-4′
Aster oblongifolius	Aromatic aster	plugs-1 gal.	1 plant/24″ o.c.	Moist-Dry	Blue/Purple	1.5-3′
Coreopsis major	Tickseed coreopsis	plugs-1 gal.	1 plant/18″ o.c.	Moist-Dry	Yellow	3′
Dryopteris marginalis	Shield Fern	plugs-1 gal.	1 plant/18″ o.c.	Moist	Green	2-3′
Geranium maculatum	Wild geranium	plugs-1 gal.	1 plant/18″ o.c.	Moist	Pink	2′
Heuchera americana	Alumroot	plugs-1 gal.	1 plant/18″ o.c.	Moist-Dry	Pink	1′
Iris cristata	Dwarf crested iris	plugs-1 gal.	1 plant/18″ o.c.	Moist-Dry	Purple	4″
Lobelia cardinalis	Cardinal Flower	plugs-1 gal.	1 plant/18″ o.c.	Wet-Moist	Blue	1.5-3′
Lobelia siphilitica	Great blue lobelia	plugs-1 gal.	1 plant/18″ o.c.	Wet-Moist	Red	2-4′
Mertensia virginica	Virginia bluebells	plugs-1 gal.	1 plant/18″ o.c.	Moist	Blue	1.5′
Osmunda cinnamomea	Cinnamon Fern	plugs-1 gal.	1 plant/24″ o.c.	Wet-Moist	Green	3-4′
Phlox divaricata	Blue phlox	plugs-1 gal.	1 plant/18″ o.c.	Moist	Blue	.5-2′
Polemonium reptans	Jacob's Ladder	plugs-1 gal.	1 plant/18″ o.c.	Moist-Dry	Blue	15″
Polystichum acrostichoides	Christmas fern	plugs-1 gal.	1 plant/24″ o.c.	Moist-Dry	Evergreen	2′
Stylophorum diphyllum	Wood poppy	plugs-1 gal.	1 plant/18″ o.c.	Wet-Moist	Yellow	1.5′
Grasses & Sedges						
Carex grayi	Gray's Sedge	1 gal.	1 plant/24″ o.c.	Moist	Green	3′
Carex muskingumensis	Palm Sedge	1 gal.	1 plant/24″ o.c.	Moist	Green	3′
Carex stricta	Tussock Sedge	1 gal.	1 plant/24″ o.c.	Moist	Green	3-4′
Chasmanthium latifolium	Upland Sea Oats	Plugs – 1 gal.	1 plant/18″ o.c.	Moist-dry	Green	4′
Equisetum hyemale	Horsetail	Plugs – 1 gal.	1 plant/18″ o.c.	Wet	Green	3′
Juncus effesus	Soft Rush	Plugs – 1 gal.	1 plant/24″ o.c.	Wet-dry	Green	4-6′
Muhlenbergia capallaris	Muhly Grass	1 gal.	1 plant/24″ o.c.	Moist	Pink	3′
Panicum virgatum	Switchgrass	1-3 gal.	1 plant/48″ o.c.	Moist - dry	Yellow	5-7′
Schizachyrium scoparium	Little Blue Stem	1 gal.	1 plant/24″ o.c.	Moist-dry	Yellow	3′

Native Trees

DT-FT Drought Tolerant-Flood Tolerant

Latin Name	Common Name	DT-FT	Light	Moisture	Notes	Flower Color	Height
Acer rubrum	Red Maple	DT-FT	sun-shade	dry-wet	Fall color		50-70′
Acer saccharum	Sugar Maple		sun-pt shade	moist	Fall color		50-75′
Ameleanchier canadensis	Serviceberry		sun-pt shade	moist-wet	Edible berries	White	15-25′
Asimina triloba	Paw Paw		sun-pt shade	moist	Edible fruits	Maroon	15-30′
Betula nigra	River Birch	FT	sun-pt shade	moist-wet	Exfoliating bark		40-70′
Carpinus caroliniana	Ironwood		sun-pt shade	moist		White	40-60′
Cercus canadensis	Redbud	DT	sun-shade	moist	Pea-like flowers, seed pods	Purple	20-30′
Chionanthus virginicus	Fringetree		sun-pt shade	moist	Panicled, fragrant flowers	White	12-20′
Cladratis lutea	Yellowwood	DT	sun	dry-moist	Fall color	White	30-45′
Cornus florida	Flowering Dogwood		part shade	moist	Red fruit, wildlife	White	15-30′
Fraxinus pennsylvanica	Green Ash	DT-FT	sun	dry-wet		Purple	50-60′
Ilex opaca	American Holly	DT	sun-pt shade	moist	Evergreen	White	30-50′
Liquidambar styracifula	Sweetgum	DT-FT	sun-pt shade	dry-moist	Spiny fruit		60-100′
Magnolia virginiana	Sweetbay Magnolia		sun-pt shade	moist-wet	Evergreen	White	10-60′
Oxydendrum arboreum	Iromwood		sun-pt shade	dry-moist	Wildlife	White	20-40′
Platanus occidentalis	Sycamore	FT	sun-pt shade	moist	White mottled bark		70-100′
Quercus bicolor	Swamp White Oak	DT	sun-pt shade	moist-wet	Acorns		50-60′
Quercus shumardii	Shumard Oak	DT	sun	moist	Acorns		40-60′
Rhamnus caroliniana	Carolina Buckthorn		sun	moist	Black fruit		15-30′
Salix nigra	Black Willow	FT	sun-pt shade	moist-wet	White catkins	Yellow	40-60′

Native Shrubs

DT-FT Drought Tolerant-Flood Tolerant

Latin Name	Common Name	DT-FT	Light	Moisture	Spacing	Notes	Flower Color	Height
Aronia arbutifolia	Red Chokeberry	FT	sun-pt. shade	dry-wet	4′	Red berries, wildlife	White	6-12′
Buddleia davidii	Butterfly Bush	DT	sun-pt sun	dry-moist	4′	Non-native	Blue	5′
Callicarpa americana	American Beautyberry	DT	sun-pt. shade	dry-wet	5′	Showy purple fruit	Lilac	4-6″
Cephalanthus occidentalis	Button Bush	FT	sun-shade	moist-wet	5′	Attracts wildlife	White	6-12′
Clethra alnifolia	Sweet Pepper Bush		sun-pt. shade	dry-moist	3′	Hummingbirds	White	5-8′
Cornus amomum	Silky Dogwood		sun-shade	moist-wet	6′	Blue berries, wildlife	White	6-12′
Corylus americana	American Hazelnut		sun-pt. shade	dry-moist	8′	Edible nuts, wildlife	Yellow	8-15′
Hamamelis virginiana	Witch-hazel		sun-pt. shade	dry-moist	8′	Winter bloom	Yellow	10′
Hibiscus moscheutos	Swamp Mallow	FT	sun	moist-wet	30″	Cold-hardy	White-Red	4-7′
Hydrangea quercifolia	Oakleaf Hydrangea	DT	pt. shade-shade	moist	4′	Winter texture	White	3-6′
Hypericum frondosum	Goldern St. John's Wort	DT	sun-pt. shade	dry-moist	30″	Semi-evergreen	Yellow	2-3′
Hypericum prolificum	Shrubby St. John's Wort	DT	sun-pt. shade	dry-moist	3′	Semi-evergreen	Yellow	3′
Ilex decidua (dwarf varieties)	Possumhaw Viburnum	DT	sun-pt. shade	moist	4-6′	Red berries		6-14′
Ilex glabra	Inkberry	DT	sun-pt. shade	moist-wet	3′	Evergreen		4-8′
Ilex verticillata	Winterberry Holly	FT	sun-pt. shade	moist-wet	3′	Red berries		10′
Itea virginica	Virginia Sweetspire	DT/FT	sun-shade	moist-wet	4′	Fall color	White	4-8′
Lindera benzoin	Spicebush	DT	pt. shade-shade	moist-wet	8′	Butterflies, wildlife	Yellow	6-12′
Viburnum dentatum	Arrowwood Viburnum		sun-shade	dry-wet	6′	Wildlife	White	6-8′

Rain Garden Maintenance

During the first several years your plants are getting established and will need extra maintenance and watering. After establishment maintenance is low. Watering is required during droughts.

Plant Material Tasks
Check plants for signs of distress such as wilting, yellow/brown leaves etc. Relocate or amend soil as needed.
Remove weeds by hand and limit use of herbicides.
Deadhead and clean dead debris from plants in early spring before new growth appears.

Berm Tasks
After a heavy rainstorm, check for failure such as water going through the berm. Erosion ridges can lead to failure. Repair as needed.

Ponding Tasks
If areas do not drain, this indicates the soil pores have become clogged or the soil may have become compacted. Soil may need to be replaced or loosened. Remove excessive accumulated sediment or debris.

Soil Tasks
Perform a pH test as needed for excessive acidity or alkalinity. Adjust pH with amendments if needed. The University of Tennessee Soil, Plant and Pest Center, located at Ellington Agricultural Center in Nashville will perform inexpensive soil tests, recommend amendments and is a great resource for other questions concerning the health of your rain garden.
http://soilplantandpest.utk.edu/

Mulch Tasks
Check regularly to see that mulch has not washed away.
Add a fresh layer of mulch in early spring after clean-up.

DEADHEADING *- or cutting off blooms after they fade, but before they go to seed, will generate more blooms and fuller growth.*

Estimating Rain Garden Costs

An important part of planning your Rain Garden is knowing what it will cost. Rain Gardens of Nashville has provided information on average costs for materials and labor in the Middle Tennessee area for your use. These prices can vary based on individual conditions.

	ITEM	UNIT	AVG. COST
	EQUIPMENT:		
	Backhoe w/operator	per hour	$50-$100
	Backhoe only	per day	$200-$300
	SOIL AMENDMENTS:		
6″ layer of amended soil with 20-30% compost for a 20′ x 10′ rain garden = 1 cubic yard	Compost	cubic yard	$30
6″ layer of amended soil with 40-60% sand for a 20′ x 10′ rain garden = 2 tons	Coarse sand w/o delivery	ton	$20-$30
	Delivery	each	$50
Plants with installation- multiply plant cost by 2.5	PLANTS:		
	Trees	caliper inch	$100/inch
	Shrubs	1 gal.	$15-$25
		2 gal.	$20-$30
	Perennials, grasses	plugs	$20/flat
		4″ pots	$4-$6
		1 gal.	$7-$9
2 cubic yards for 20′ x 10′ rain garden	MULCH:		
3″ layer of mulch for 20′ x 10′ rain garden= 2 cubic yards	Delivered and installed	lump sum	$250
	Mulch only	cubic yard	$50-$70

Rain Garden Construction Cost comparison

Cost for 10′ x 6′ Do It Yourself Rain Garden - $200 - $300 Includes no rental or delivery costs.
Cost for 20′ x 10′ Do It Yourself Rain Garden - $750-$900 Includes no rental or delivery costs.
Cost for 20′ x 10′ Do It Yourself Rain Garden - $1,200- $1,700 Includes backhoe rental and material delivery
Cost for 20′ x 10′ Rain Garden constructed by Landscape Contractor - $3,500 - $4,500

For additional cost saving tips contact: info@cumberlandrivercompact.org

References and Additional Resources:

10,000 Rain Gardens. http://www.rainkc.com/

How to build your own rain garden. Mid-America Regional Council.
http://www.marc.org/environment/water/pdfs/raingardens.pdf

Rain Garden Design and Construction. Northern Virginia Soil and Water Conservation District.
http://www.fairfaxcounty.gov/nvswcd/raingardenbk.pdf

Rain Garden Design Templates. Low Impact Development Center.
http://www.lowimpactdevelopment.org/raingarden_design/whatisaraingarden.htm

Rain Garden Handbook for Western Washington Homeowners. Washington State University.
http://pierce.wsu.edu/Lid/raingarden/Raingarden_handbook.pdf

Rain Gardens: A Do-It-Yourself Guide for Homeowners in Middle Tennessee. Patty Ghertner.
http://www.cumberlandrivercompact.org/pdf/raingardenguide12109.pdf

Rain Gardens: A How-to manual for homeowners. Wisconsin Department of Natural Resources.
http://dnr.wi.gov/runoff/pdf/rg/rgmanual.pdf

Rain Gardens for Home Landscapes. Clean Water Campaign, Atlanta, GA.
http://www.cleanwatercampaign.com/files/rain_garden_brochure.pdf

Rain Gardens Technical Guide. Virginia Dept of Forestry.
http://www.dof.virginia.gov/mgt/resources/pub-Rain-Garden-Tech-Guide_2008-05.pdf

Start-To-Finish Rain Garden Design: A Workbook for Homeowners.
Faribault County Soil & water Conservation District.
http://www.faribaultcountyswcd.com/FileLib/Rain%20Garden%20Design%20Templates.pdf

Three Rivers Garden Alliance. http://raingardenalliance.org/

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Rain Gardens for Nashville

Please contact Metro Water Services Stormwater NPDES Department (www.nashville.gov/stormwater) with any comments or questions: 615.880.2420

Rain Gardens for Nashville was created through a water quality partnership between the Nashville District of the US Army Corps of Engineers and the Metropolitan Government of Nashville and Davidson County's Department of Water and Sewerage Services.

METRO WATER SERVICES

US Army Corps of Engineers ®
Nashville District

Metro Water Services is in the process of complying with all appropriate Americans with Disabilities Act Guidelines. For additional information contact Joseph A. Estes, Sr., 1600 2nd Avenue North, Nashville, TN 37208-2206; telephone 615 862 4862.