Rain Garden Construction
Parts of the Rain Garden

Inlet/ Splash Pad  Berm  Depression  Ponding Area  Depression  Berm
- Dig 8” hole & fill with water to saturate soil; refill in a few hours after water drains
- Water should completely drain within 12 hours.
- Poor drainage will require amending the soil or another site
Planning & Preliminary Tasks

- Utility Mark-Out: NJ One Call

Markout of underground gas, water, sewer, cable, telephone & electric utility lines

NJ “One Call” System 1-800-272-1000

Measure garden
Buy native plants
Get volunteers
Materials & Tools Needed

On Installation Day…

- **Triple-shredded hardwood mulch (no dye)**
- **Plants**
- **Soil amendments (if necessary)**
  - Fertilizer
  - pH adjustment (lime)
  - Coarse sand (bank run)
- **Optional**
  - Decorative stone
  - Pipe extensions
  - Grass seed/sod
  - Pavers for path

**TOOLS**

- Soil rakes
- Shovels
- Rototiller (borrow, buy or rent)
- Wheelbarrow
- Rakes (for spreading mulch)
- Work crew (5-10 neighbors or family/friends)
Logistics and People Management

- Get people there – set a date & time and provide directions
- Communicate frequently – phone, e-mail, etc.

- Weather – have a rain date
- Teamwork & team leaders
- Division of labor
- Appropriate # of workers
- Hands-on Education
Installation Steps

1. Remove existing grass
2. Excavate to desired elevation and grade
3. Add soil amendments
4. Prepare the berm
5. Prepare the overflow
6. Level the lowest zone/ponding area
7. Plant the native plants
8. Apply the mulch
9. Water the native plants
Q: What do I do with my existing grass before starting the rain garden?
A: Two options:
1. Kill the grass with herbicide beforehand, or
2. Remove the turf as sod pieces. You can reuse it on your berm or another area of your yard.
Installation Step 2

• Excavation - Hand Dig vs. Renting Equipment

• If heavy machinery is driven onto the underlying soils of the rain garden, you can till the rain garden with tiller penetrating at least the top 8 inches to loosen up the soil.
Leveling & grading

Excavate to Desired Elevation and Grade

Leonard Park, Morris County

Gloucester County 4-H Fairgrounds
Add Soil Amendments

The rain garden may be fertilized at planting, based on Soil Test. Add thin layers of humus-topsoil-sand rototilled in as needed.
Building the Berm

a. Between 3% and 8% slope lawn

Before Digging

- downhill stake
- string
- start digging here

After Digging

- downhill stake
- string
- old lawn surface
- uphill stake
- base of raingarden

b. Greater than 8% slope lawn

Before Digging

- downhill stake
- string
- start digging here

After Digging

- downhill stake
- string
- old lawn surface
- uphill stake
Installation Step 5

Prepare the Overflow

Gloucester County 4-H Fairgrounds

Leonard Park, Morris County
Level the Lowest Zone/ Ponding Area
Plant the Native trees & large shrubs

Cut the Root Ball

Ulster County, New York
Installation Step 7 Cont.

Plant the native shrubs, perennial flowers & grasses

Planting Hole
Same Depth as Root Ball

Ulster County, New York

Hockman Farm, Winchester, Virginia
Apply the Mulch

Installation Step 8

Ulster County,
New York
Installation Step 9

Water the Native Plants

Hockman Farm, Winchester, Virginia
Project Costs

- **Plants**: $200 - $750
- **Triple-Shredded Hardwood Mulch**: $20 - $30 per yard
- **Coarse Sand (Bank Run)**: $20 – $40 per yard
- **Compost or Topsoil**: $20 - $40 per yard
- **Equipment Rentals**:
  - Rototiller (per day)
  - Bobcat/small backhoe, if necessary (per day)
- **Rutgers Soil Test**:
  - $15 for a standard fertility test (pH and nutrient analysis)
  - $75 for a texture analysis test (soil mechanical analysis)
- **White mark-out paint**: $5
- **Good Quality Tall Fescue Grass Seed (50 lb. bag)**: $73
- **Organic Blood Meal Fertilizer**: $5.50
## Example Costs

<table>
<thead>
<tr>
<th>Items for 100 Square Foot Rain Garden – small sized</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rutgers Soil Test Kit for nutrients and pH</td>
<td>$15.00</td>
</tr>
<tr>
<td>Rutgers Soil Test Kit for soil texture analysis</td>
<td>$60.00</td>
</tr>
<tr>
<td>White Mark-Out Paint</td>
<td>$5.00</td>
</tr>
<tr>
<td>1 yard of concrete or bank run sand (~$30.00/yard)</td>
<td>$30.00</td>
</tr>
<tr>
<td>1 yard of compost (~$30.00/yard)</td>
<td>$30.00</td>
</tr>
<tr>
<td>5 pound bag of fertilizer</td>
<td>$5.00</td>
</tr>
<tr>
<td>Native Plants (does not include shipping)</td>
<td>$305.00</td>
</tr>
<tr>
<td>1 yard of mulch (~$30.00/yard)</td>
<td>$30.00</td>
</tr>
<tr>
<td>1 roll of landscape fabric</td>
<td>$10.00</td>
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<tr>
<td>Landscape pins</td>
<td>$4.00</td>
</tr>
<tr>
<td>8 bags of 1.0”-1.5” river rock</td>
<td>$28.00</td>
</tr>
<tr>
<td>Soaker hose</td>
<td>$13.00</td>
</tr>
<tr>
<td>PVC pipe (~$2.00/linear foot)</td>
<td>$20.00</td>
</tr>
</tbody>
</table>

**TOTAL** $555.00
Medium sized rain garden

- This rain garden captures stormwater runoff from a parking lot.
- The garden size is 360 square feet.
## Costs for the Union County Vocational Technical School Rain Garden

<table>
<thead>
<tr>
<th>Quantity</th>
<th>Item</th>
<th>Unit Price</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Soil Test for mechanical analysis</td>
<td>$45.00</td>
<td>$45.00</td>
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<tr>
<td>5</td>
<td>Bags 2” river stone</td>
<td>$3.50</td>
<td>$17.50</td>
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<tr>
<td>6</td>
<td>Yards Topsoil</td>
<td>$31.00</td>
<td>$186.00</td>
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<tr>
<td>3</td>
<td>Yards Hardwood mulch</td>
<td>$30.00</td>
<td>$90.00</td>
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<tr>
<td>8</td>
<td>Bags 1.3 -3” riverstone</td>
<td>$3.50</td>
<td>$28.00</td>
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<tr>
<td>1</td>
<td>Can of Mark-out Paint (white)</td>
<td>$5.14</td>
<td>$5.14</td>
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<tr>
<td>2</td>
<td>10’ sections 4” PVC pipe</td>
<td>$12.03</td>
<td>$24.06</td>
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<tr>
<td>1</td>
<td>PVC pipe elbow</td>
<td>$2.27</td>
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### Union County Rain Garden

**Total Plant and Supply Costs $915.47**

<table>
<thead>
<tr>
<th>Quantity</th>
<th>Item</th>
<th>Unit Price</th>
<th>Total</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>Cement Handipack</td>
<td>$5.96</td>
<td>$5.96</td>
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<tr>
<td>2</td>
<td>Grate Screens</td>
<td>$4.96</td>
<td>$9.92</td>
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<tr>
<td>9</td>
<td>Tons bank run sand</td>
<td>$33.00</td>
<td>$299.97</td>
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<tr>
<td>1</td>
<td>50’ soaker hose</td>
<td>$14.95</td>
<td>$14.95</td>
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<tr>
<td>1</td>
<td>100’ light duty hose</td>
<td>$25.95</td>
<td>$25.95</td>
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<tr>
<td>15</td>
<td>1 gallon container shrubs</td>
<td>$4.75</td>
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</tr>
<tr>
<td>10</td>
<td>Gallon Perennials</td>
<td>$4.25</td>
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<tr>
<td>5</td>
<td>Quart Perennials</td>
<td>$1.85 - $2.05</td>
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<tr>
<td>50</td>
<td>2” plugs</td>
<td>$0.63-$0.67</td>
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<tr>
<td>80</td>
<td>Native Plants</td>
<td>$160.75</td>
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Additional Costs for the Union County Vocational Technical School Rain Garden

Labor for Day 1: Excavation
1 County Backhoe operator 6 hours
2 Extension Employees 6 hours

Labor for Day 2: Planting
- 30 Landscape Professionals for 4 hours
- 2 Extension Employees for 5 hours
Large Rain Garden Construction

Visualizing commercial equipment

Rutgers Cooperative Extension of Monmouth County/ Agriculture Building

Think safety
Summary Rain Garden Points

Planning, Preparation & Implementation

REMEMBER

• Standard supplies that will be used for each installation
• Delivery fees
• Labor
• Plant Materials
• Soil Amendments
• Make it easy to maintain the garden! Soaker hoses for first year or two.

Enjoy the work
Instruct & Educate

Leonard Park, Morris County