

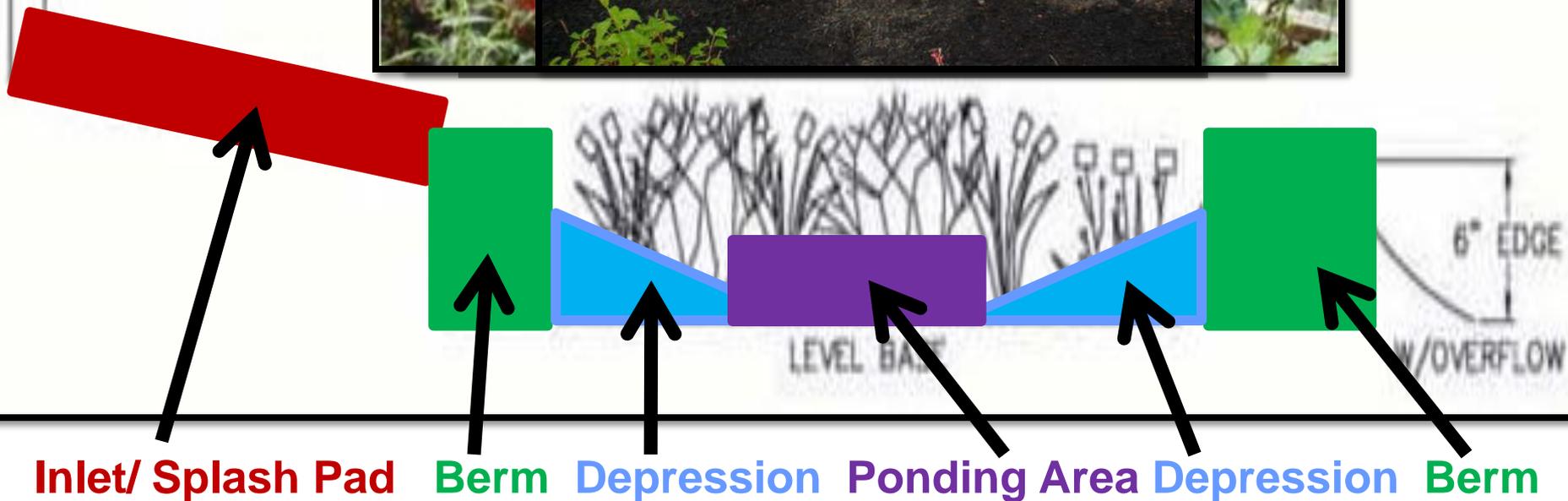
# RUTGERS

THE STATE UNIVERSITY  
OF NEW JERSEY

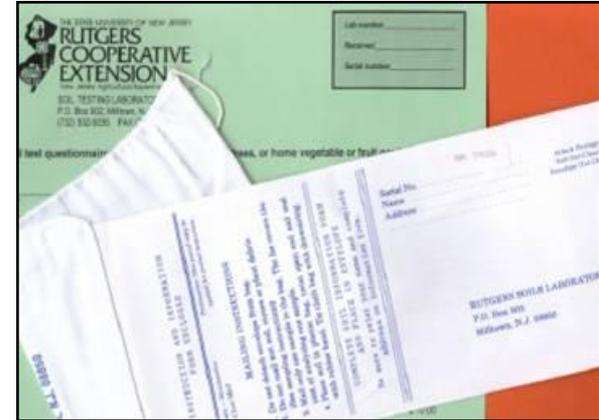
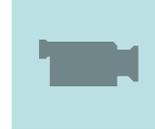
## *Rain Garden Construction*



## Parts of the Rain Garden



# Percolation Test & Soil Test



**Rutgers Soil Test - \$15**

- 💧 **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**

# 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)



- **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



# Installation Step 1

## Remove Existing Grass



**Q: What to 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**

### Excavate to Desired Elevation and Grade



*Leonard Park, Morris County*



*Gloucester County 4-H Fairgrounds*

### Add Soil Amendments



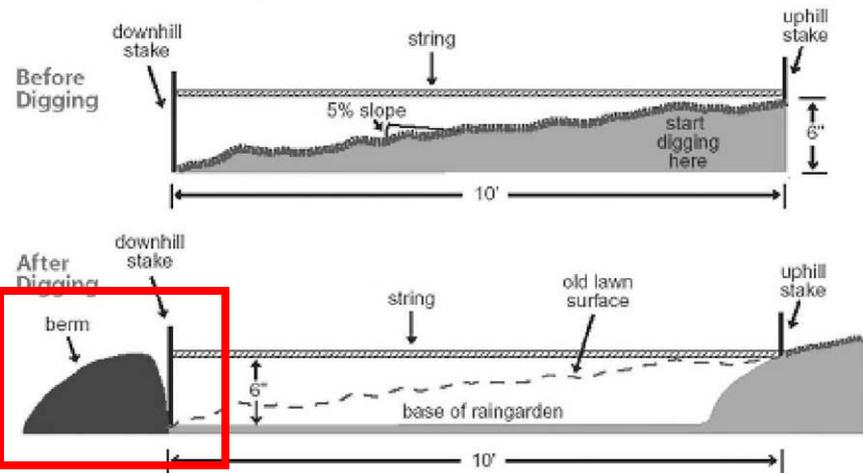
The rain garden may be fertilized at planting, based on Soil Test. Add thin layers of humus-topsoil-sand rototilled in as needed

*Gloucester County 4-H Fairgrounds*

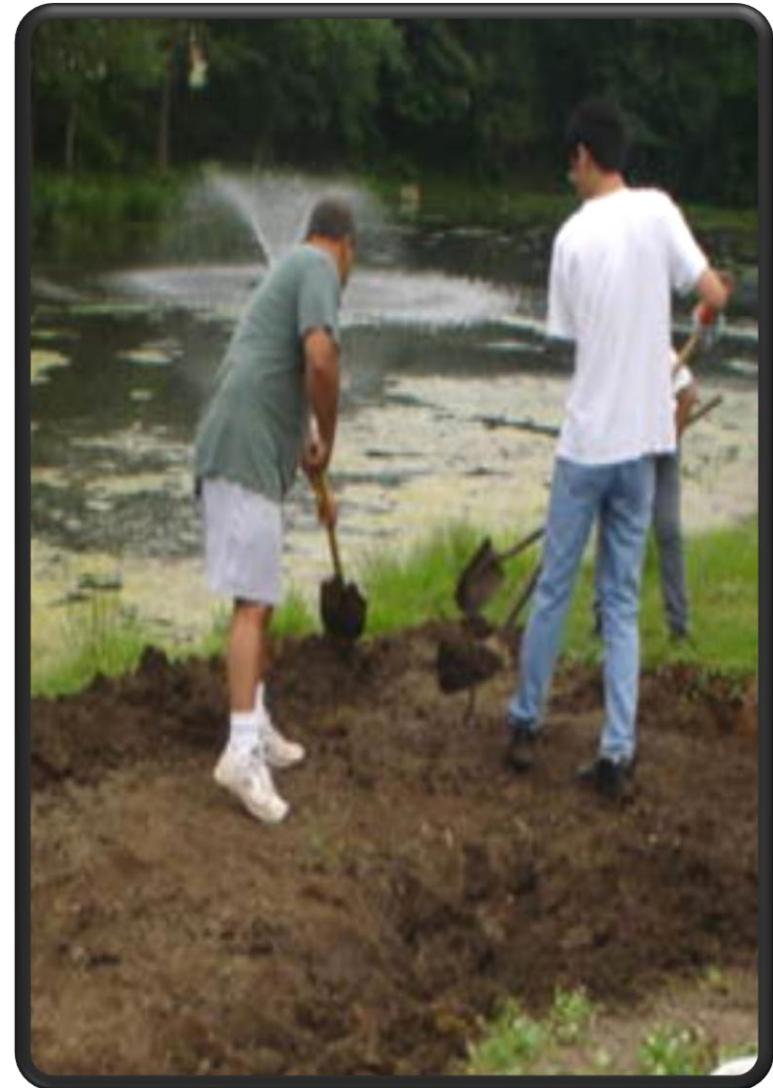
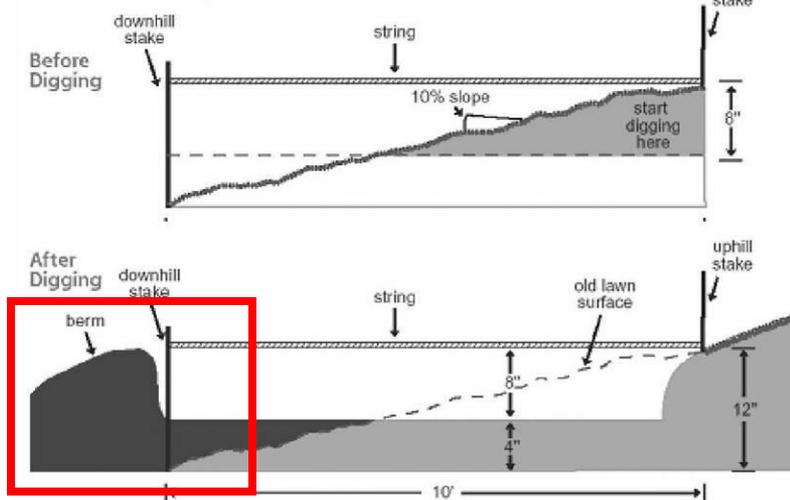


## Building the Berm

a. Between 3% and 8% slope lawn



b. Greater than 8% slope lawn



### Prepare the Overflow



*Gloucester County 4-H Fairgrounds*



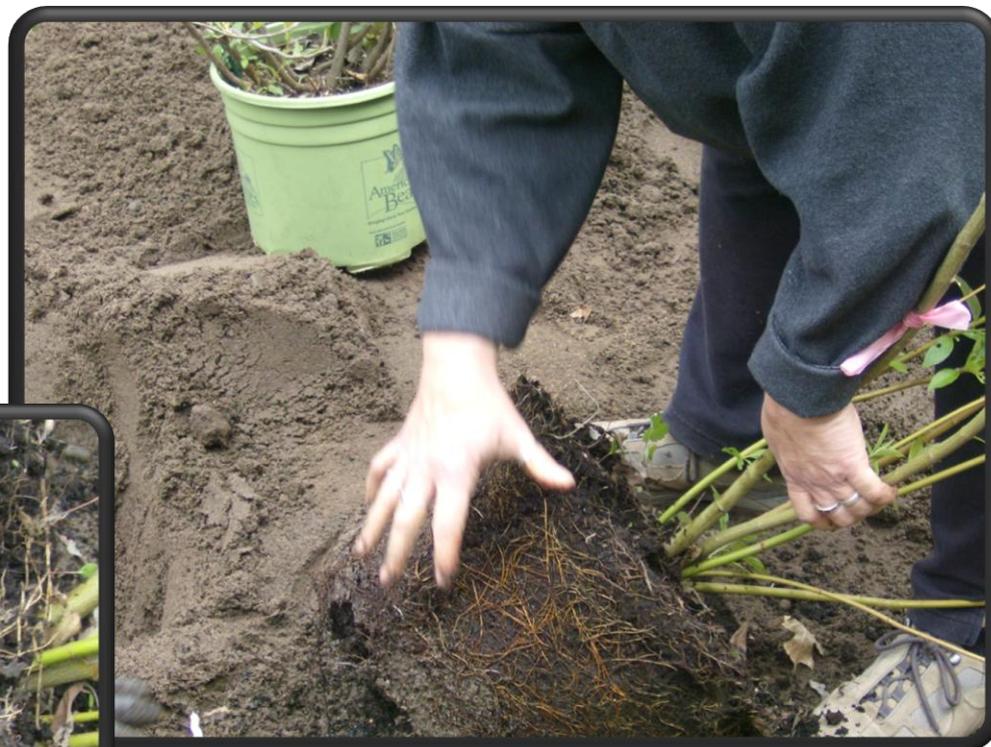
*Leonard Park, Morris County*



## Installation Step 7

### Plant the Native trees & large shrubs

**Cut the Root Ball**

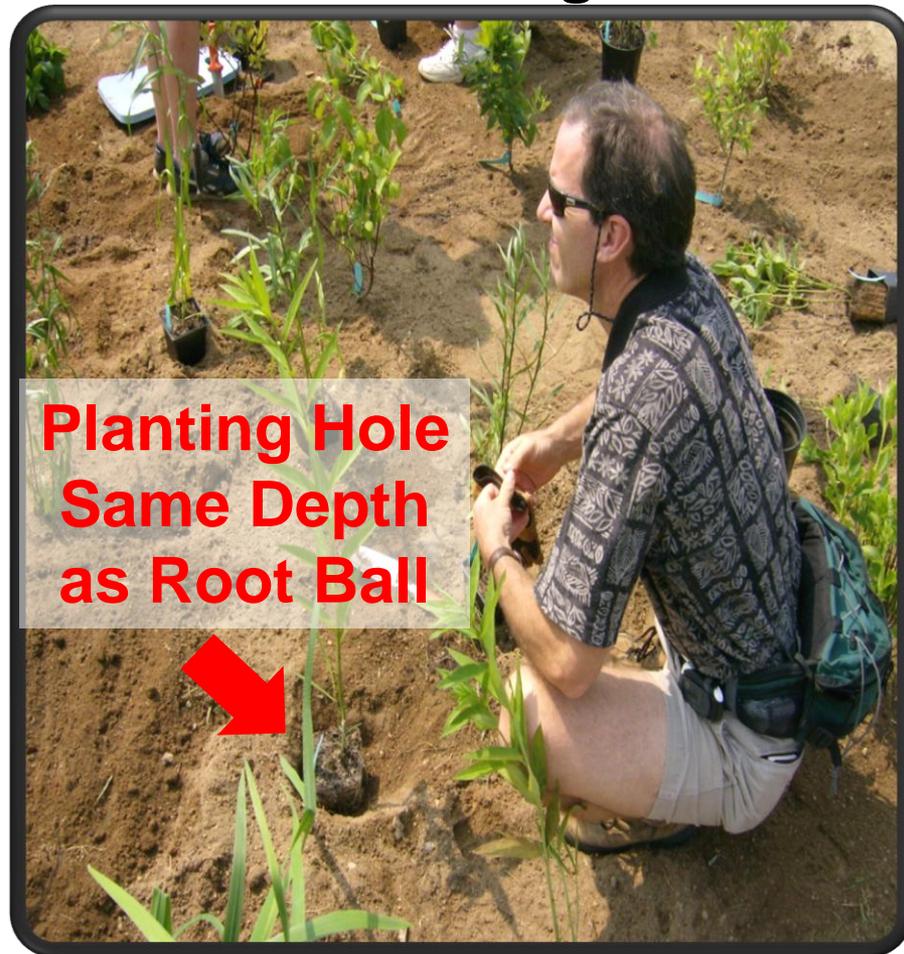


*Ulster County, New York*

### Plant the native shrubs, perennial flowers & grasses



*Ulster County, New York*



*Hockman Farm, Winchester, Virginia*

### Apply the Mulch

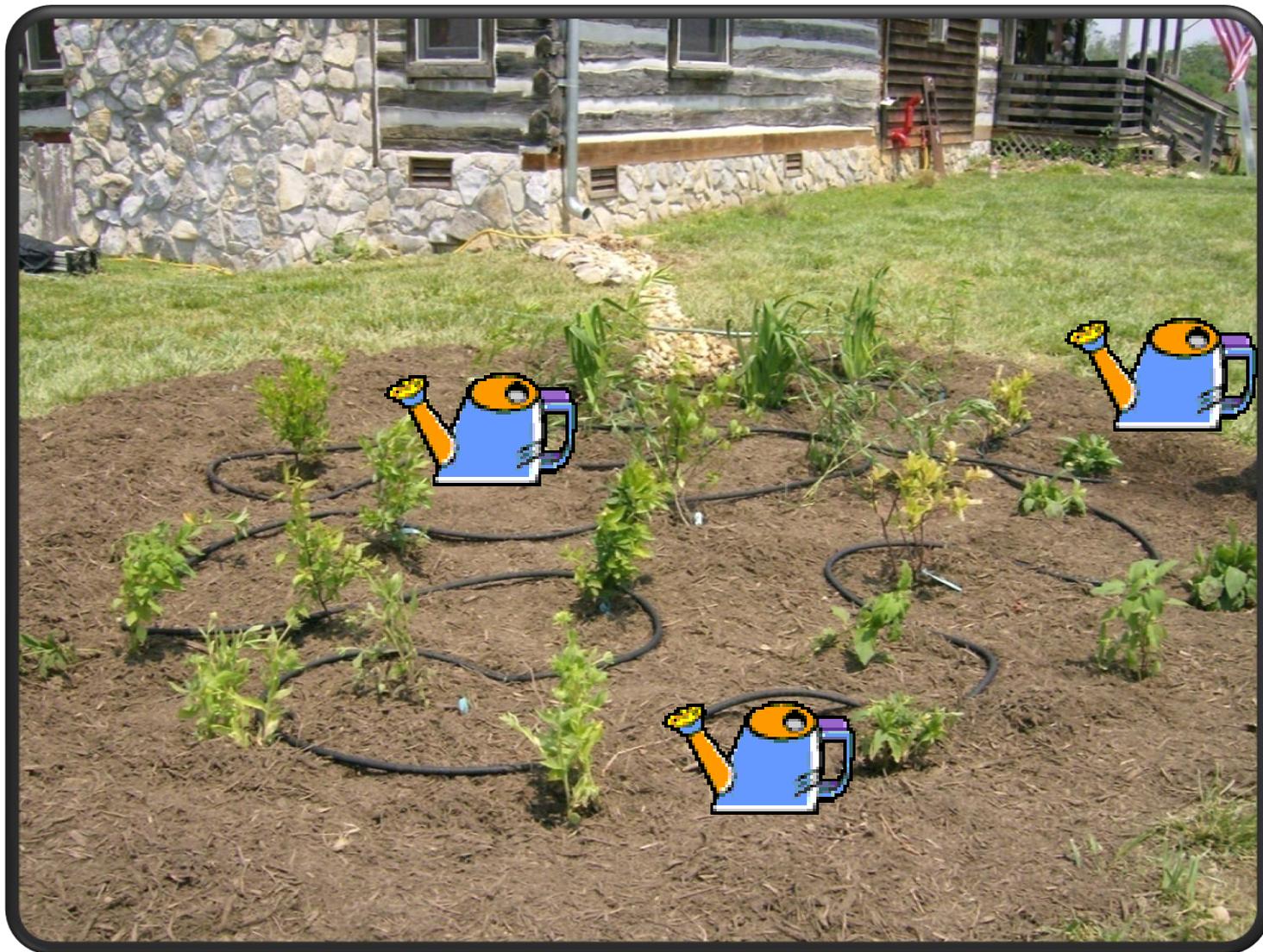
**Protect Small Plants  
when Mulching**



*Ulster County,  
New York*

## Installation Step 9

### Water the Native Plants



# 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

Items for 100 Square Foot Rain Garden – small sized	Cost
Rutgers Soil Test Kit for nutrients and pH	\$15.00
Rutgers Soil Test Kit for soil texture analysis	\$60.00
White Mark-Out Paint	\$5.00
1 yard of concrete or bank run sand (~\$30.00/yard)	\$30.00
1 yard of compost (~\$30.00/yard)	\$30.00
5 pound bag of fertilizer	\$5.00
Native Plants (does not include shipping)	\$305.00
1 yard of mulch (~\$30.00/yard)	\$30.00
1 roll of landscape fabric	\$10.00
Landscape pins	\$4.00
8 bags of 1.0"-1.5" river rock	\$28.00
Soaker hose	\$13.00
PVC pipe (~\$2.00/linear foot)	\$20.00
<b>TOTAL</b>	<b>\$555.00</b>

## 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

Quantity	Item	Unit Price	Total
1	Soil Test for mechanical analysis	\$45.00	\$45.00
5	Bags 2" river stone	\$3.50	\$17.50
6	Yards Topsoil	\$31.00	\$186.00
3	Yards Hardwood mulch	\$30.00	\$90.00
8	Bags 1.3 -3" riverstone	\$3.50	\$28.00
1	Can of Mark-out Paint (white)	\$5.14	\$5.14
2	10' sections 4" PVC pipe	\$12.03	\$24.06
1	PVC pipe elbow	\$2.27	\$2.27

# Union County Rain Garden

## Total Plant and Supply Costs \$915.47

Quantity	Item	Unit Price	Total
1	Cement Handipack	\$5.96	\$5.96
2	Grate Screens	\$4.96	\$9.92
9	Tons bank run sand	\$33.00	\$299.97
1	50' soaker hose	\$14.95	\$14.95
1	100' light duty hose	\$25.95	\$25.95
15	1 gallon container shrubs	\$4.75	
10	Gallon Perennials	\$4.25	
5	Quart Perennials	\$1.85 - \$2.05	
50	2" plugs	\$0.63-\$0.67	
80	Native Plants		\$160.75

## 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**

## 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*