

RUTGERS

THE STATE UNIVERSITY
OF NEW JERSEY

Rain Garden Maintenance

*Presented at Schuylkill Action Network
Stormwater Workgroup meeting*

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www.water.rutgers.edu



Rutgers Cooperative Extension

Rutgers Cooperative Extension (RCE) helps the diverse population of New Jersey adapt to a rapidly changing society and improves their lives through an educational process that uses science-based knowledge.



RCE Water Resources Program



Our mission is to identify and address water resources issues by engaging and empowering communities to employ practical science-based solutions to help create a more equitable and sustainable New Jersey.

RUTGERS

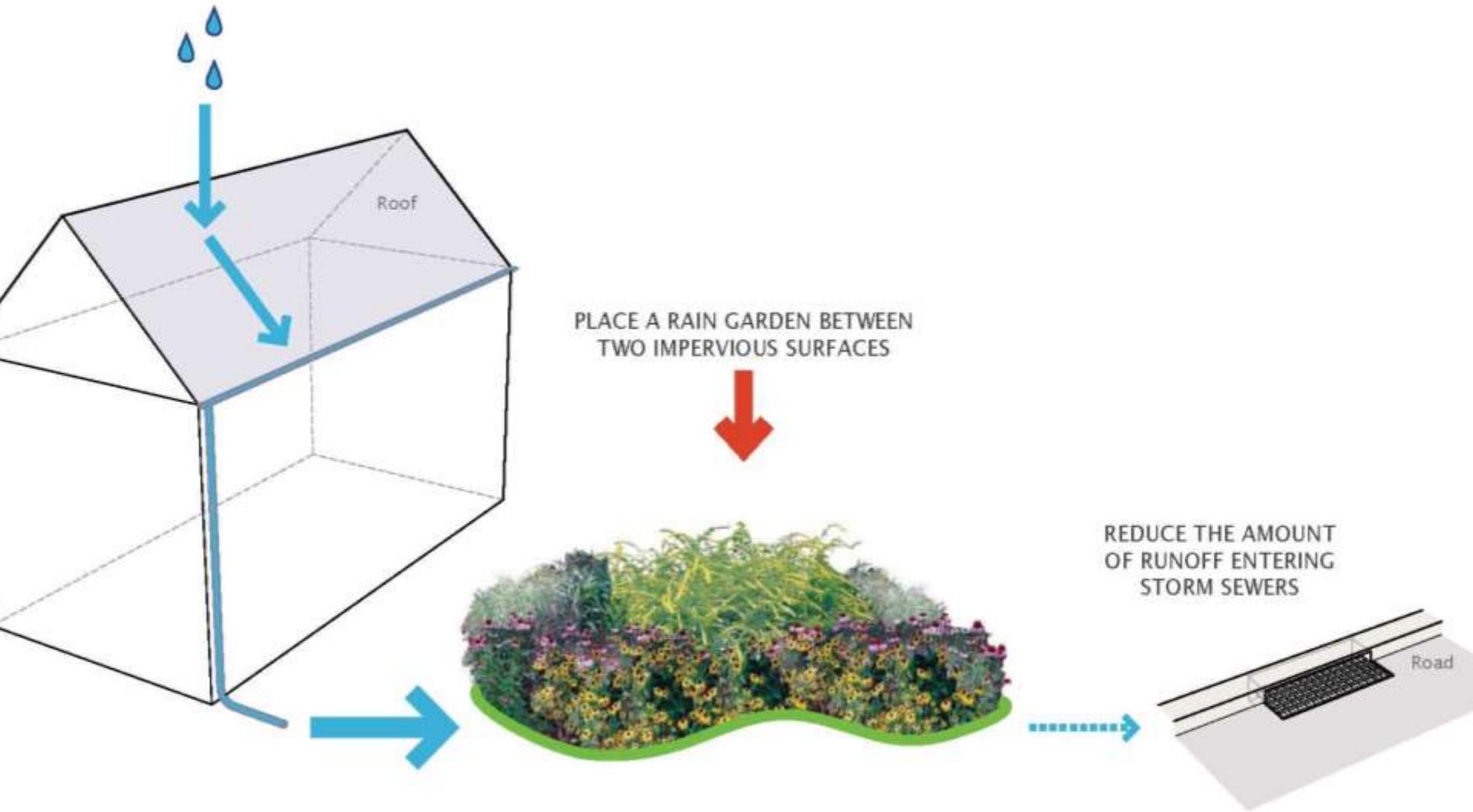
New Jersey Agricultural
Experiment Station



Connected or Disconnected?



The Solution

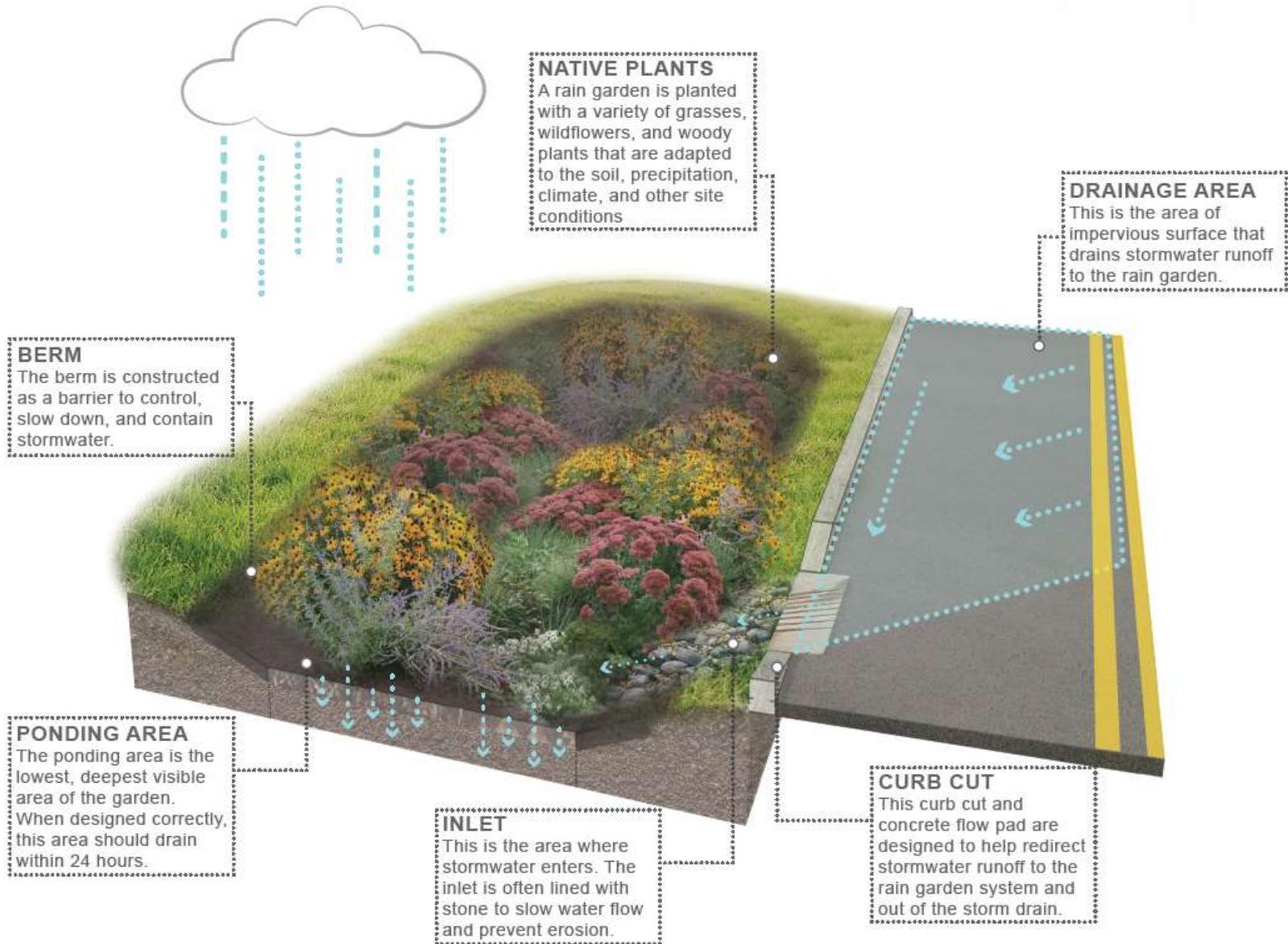


Rain Gardens

A rain garden is a landscaped, shallow depression that is designed to capture, treat, and infiltrate stormwater at the source before it becomes runoff.



Bioretention Systems/Rain Gardens



Rain Garden

MAINTENANCE



Overview of Maintenance Measures

More Frequent Tasks:

1. Watering
2. Inspecting
3. Weeding

Less Frequent Tasks:

1. Mulching
2. Pruning
3. Re-planting
4. Removing sediment
5. Soil Testing
6. Harvesting Plants
7. Cleaning of Inlets/Outlets
8. Replacing materials (stone, landscape fabric)

Watering – Tools and Equipment

- Soaker hose
- Hose/shower-type wand
- Sprinklers
- Tree watering bags
- Buckets
- Keys for irrigation boxes
- Water backpack (for small areas)
- Water source (e.g., watering truck)



Watering – Frequency

- Initial Establishment (First Year after Plant Installation): Water in absence of rainfall in order to maintain a rate of 1” of water per week.
- Year 2, Year 3: Water as needed (generally up to ½” of water per week) during the first 4 - 6 weeks of the growing season, and then only during extended periods of drought and only when ground is not frozen.
- Year 4 and beyond: Water to supplement rainfall only during extended periods of drought and only when ground is not frozen.



Weeding, Inspecting, Mulching – Tools and Equipment

- Hand Pruners
- Mulch
- Mulch fork
- Rake
- Spade shovel
- Pitchfork
- Weeding fork
- Plant and Weed Photo ID Sheet
- Trash bag, gloves



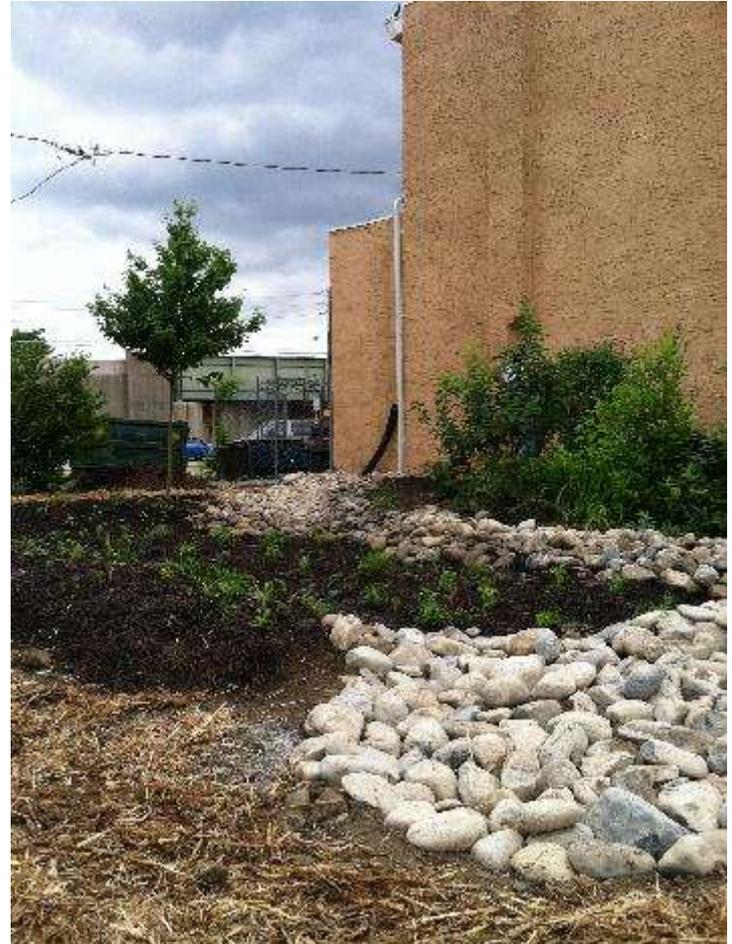
Weeding, Inspecting, Mulching – Frequency

- Inspection: 1x/year minimum (Late May to early July, and/or late August/early September)
- Weeding: 3x/year minimum (Spring cleanup, summer maintenance, fall put to bed)
 - Pull weeds at the root
 - Remove invasives
- Mulching: Minimum 1x/year (Spring), 2-3 inches, remove old mulch



Landscape Features Maintenance

- Maintenance of Vegetation
 - Frequency:
 - Checking vegetation for damage caused by a lawnmower, string trimmers, edger, or other power equipment
 - **Weeding: early and often- 3x spring, 1x fall and summer**
 - Pull weeds from there roots use tool if it is difficult
 - Avoid compacting the soil and other plants
 - Remove invasive plants
 - Tools and supplies:
 - Trash bags, gloves, shovels, trowels, weed id guide



COMMON PROBLEMS



Issues and Concerns: Pedestrian Safety

- Obstructions to sidewalks
- Line of sight obstruction
- Tripping hazards
- Standing water (over 72 hours)
- Icing



Issues and Concerns: Vehicle Safety

- Branches/debris in roadway or parking area
- Lines of sight at intersections or parking areas
- Water overflow and icing in the roadway



Issues and Concerns: Sediment & Debris

- Trash accumulation
- Sediment accumulation
- Erosion
- Dumping
- Road salt and sand
- Bare soils



Issues and Concerns: Clogging

- Leaves and plant material
- Sediment
- Debris
- Ponding
- Filter screen or fabric
- Stone



Issues and Concerns: Ponding

- Standing water for more than 72 hours
- Saturated soils
- Plant loss
- Poor soil infiltration
- High groundwater
- Insufficient drain piping
- Too much water



Some examples from the National Green Infrastructure Certification Program (Water Environment Federation)

MORE COMMON PROBLEMS

<https://ngicp.org/>



OPERATIONS & MAINTENANCE

Identifying Proper Operation

- No erosion at inlet, outlet or in cell (or tree planting area).



OPERATIONS & MAINTENANCE

Identifying Proper Operation

- Sediment buildup limits bioretention performance.



Bioretention facility overwhelmed by sediment,
Stormwater Maintenance, LLC, 2011

OPERATIONS & MAINTENANCE

Identifying Proper Operation

- Minimal sediment deposition at inlet and no sediment at outlet (some sediment at inlet is normal).



OPERATIONS & MAINTENANCE

Identifying Proper Operation

- Inlet should be properly/adequately stabilized.



Bioretention inlet failure, NY State, 2017

Bioretention inlet properly stabilized, NY State, 2017

OPERATIONS & MAINTENANCE

Identifying Proper Operation

- Inlet, outlet, and planting area clear of debris.



OPERATIONS & MAINTENANCE

Identifying Proper Operation

- Inlet, outlet, and planting area clear of debris.



OPERATIONS & MAINTENANCE

Identifying Proper Operation

- Plant establishment ideally a minimum of 80% of planting plan density and plants are species designated in planting plan.



OPERATIONS & MAINTENANCE

Identifying Proper Operation

- Plants are healthy, as indicated by good foliage color and coverage.



OPERATIONS & MAINTENANCE

Identifying Proper Operation

- Plant density is consistent with designed coverage for facility and is not negatively impacting required maintenance or public safety.



OPERATIONS & MAINTENANCE

Identifying Proper Operation

- Good visibility for pedestrians and drivers at intersections.

