

Rain Garden Maintenance Manual

Harmony Township School

2551 Belvidere Road

Harmony Township

Warren County

New Jersey

July 2018

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Rain Garden Description

A rain garden is a landscaped, shallow depression that captures, filters, and infiltrates stormwater runoff. The rain garden removes nonpoint source pollutants from stormwater runoff while recharging groundwater. A rain garden has two main goals. The first goal is to serve as a functional system to capture, filter, and infiltrate stormwater runoff at the source, and the second goal is to be an aesthetically pleasing garden. Rain gardens are an important tool for communities and neighborhoods to create diverse, attractive landscapes while protecting the health of the natural environment. Rain gardens:

- capture stormwater runoff reducing erosion and sedimentation and the amount of water that flows to our streams and waterways during rain storms
- protect water quality by filtering out and breaking down pollutants
- infiltrate runoff and thereby recharge groundwater supplies and provide baseflow to nearby streams and waterways
- provide the opportunity to establish native plant communities to promote biodiversity and habitat for beneficial wildlife
- integrate necessary soil improvements and native plants adapted to periodic wet and dry periods mimicking our New Jersey natural landscape

To a certain extent, a traditional landscaped bed or flower garden can provide functions similar to a rain garden. But, to provide all the benefits of a rain garden including capturing, filtering, and infiltrating stormwater runoff, a shallow basin must be dug and planted slightly below-grade to store water. Ideally, a rain garden is planted with a variety of grasses, wildflowers, and woody plants that are adapted to the soil, precipitation, climate, and other specific site conditions. Using native plants with deeper root systems facilitates infiltration and also sustains the landscape through periods of drought.

(SOURCE: "Rain Garden Manual of New Jersey," Rutgers Cooperative Extension)

Responsible Owner Information

The following individual/s are responsible for preventative and corrective maintenance of the rain garden installed on the property located at 2551 Belvidere Road, Phillipsburg, NJ.

NAME: Harmony School

ADDRESS: 2551 Belvidere Road, Phillipsburg, NJ

PHONE NUMBER: 908-859-1001

NOTE: Responsibility for maintaining the rain garden shall remain with the owner of the property

Preventative and Corrective Maintenance

Proper and timely maintenance is important for continuous, effective function of the rain garden. Access to the rain garden from surrounding lawn areas should be maintained at all times. The following maintenance actions are required to keep the rain garden functioning properly.

WATERING

Water is essential for the survival of a newly installed rain garden. The garden should be watered regularly during the first three months and as needed throughout the future in times of drought. Plants should be watered every day for the first week they are in the ground and then once a week after that, unless there is substantial rainfall. In hot weather or times of drought, the rain garden will need water one to two times a week to prevent the loss of plants, even if the garden is already established.

WEEDING

Remove unwanted weeds from the garden by hand. Pull them from the base of the weed to remove the roots. As the garden becomes established, the rain garden plants will spread and out-compete unwanted weeds.

MULCHING

Mulch is used to prevent weeds and retain moisture in the rain garden. During the first year the garden is growing, maintain a 3-inch layer of mulch between plants. As the rain garden plants spread and become denser, you may find mulching the garden more difficult. Mulching beyond the first year is optional. Please be careful not to excessively mulch the garden, and keep mulch away from any drain inlets and outlets.

INSPECTING AND CLEANING INLETS/OUTLETS

Inspect the rain garden's inlets monthly, and be sure to remove any leaves, trash, or debris that may prevent water from passing through. Observe the inlet during rainstorms to make sure stormwater is flowing into the rain garden. After rainstorms, please check the garden to be sure drainage outlet paths are clear and that water is not ponding for more than 48 hours. All structural components should be inspected at least once each year.

MOWING

DO NOT mow or use a line-trimmer inside of the rain garden. This damages the plants and can destroy the rain garden.

VEGETATION AND PLANTINGS

During rain garden establishment, vegetation should be inspected bi-weekly. Vegetated areas must be inspected at least once each year for erosion, scour, and unwanted growth.

Unwanted growth should be removed from the rain garden. Remove and replace any dead plants in the garden as needed.

PRUNING

Prune overgrown material in the garden annually when the plants are dormant. Remove dead plant material and deadhead flowers. This will encourage dense, new vegetative growth.

DRAINAGE

The rain garden is to be inspected twice each year to determine if permeability of the bed has decreased. The rain garden is designed to infiltrate all stormwater runoff within 48 hours. No standing water should be visible 48-72 hours after a storm event. If standing water remains in the rain garden after 72 hours, corrective actions will be needed.

Equipment, tools, and supplies

No specialized equipment is needed for routine rain garden maintenance. A garden shovel, rake, pruning shears, and water hose are all that is required to keep the rain garden working and healthy.

Maintenance Schedule

Each month and following storm events, the rain garden should be inspected. A schedule with specific inspection notes is attached. It is recommended that photographs be taken during inspections to document conditions.

Estimated Costs

Regular maintenance activities can be completed by the property owner at no additional cost. Below are estimated costs for plants and materials that may be needed as the rain garden matures and develops:

Replacement perennial plantings (1 gallon pots)	\$7.00 - \$10.00/plant
Replacement shrub plantings (3 gallon pots)	\$25.00 - \$40.00/plant
Triple-shredded hardwood mulch	\$15.00 - \$25.00/cubic yard

Maintenance and Inspection Checklist

In addition to the schedule, a maintenance and inspection checklist is attached to assist with documenting the condition, function, and establishment of the rain garden. In addition to completing the form, it is recommended that photos be taken and kept on file.

Construction and Planting Plan

For reference purposes, a copy of the construction plans and final planting plan are attached as part of the maintenance plan. These documents provide guidance for all components of the rain garden and the plantings that were installed when the system was constructed.

ATTACHMENTS

Maintenance Schedule

Maintenance and Inspection Checklist

Construction and Planting Plans

Harmony Township School, 2551 Belvidere Road

Schedule for Maintenance and Inspection

	First Quarter (Jan-Mar)	Second Quarter (Apr-June)	Third Quarter (July-Sept)	Fourth Quarter (Oct-Dec)
Year 1	Conduct monthly inspection of plantings. Inspect & clean outlet structures after each significant storm event (> 1"). Conduct annual pruning and removal of dead vegetation. Add mulch as desired. Inspect and clear all gutters, downspouts, and piping.	Conduct monthly inspection of plantings. Inspect and clean outlet structures after each significant storm event (> 1"). Repair erosion and replace plantings as needed.	Conduct monthly inspection of plantings. Inspect and clean outlet structures after each significant storm event (> 1"). Remove invasive species/weeds if needed. Inspect and clear all gutters, downspouts, and piping.	Conduct monthly inspection of plantings. Inspect and clean outlet structures after each significant storm event (> 1"). Repair erosion if necessary.
Year 2	Conduct a single quarterly inspection of plantings. Inspect and clean inlet and outlet structures. Conduct annual pruning and removal of dead vegetation. Add mulch as desired. Inspect and clear all gutters, downspouts, and piping.	Conduct a single quarterly inspection of plantings. Inspect and clean inlet and outlet structures. Repair erosion and replace plantings as needed.	Conduct a single quarterly inspection of plantings. Inspect and clean inlet and outlet structures. Remove invasive species/weeds if needed. Inspect and clear all gutters, downspouts, and piping.	Conduct a single quarterly inspection of plantings. Inspect and clean inlet and outlet structures. Repair erosion if necessary.
Year 3	Conduct a single quarterly inspection of plantings. Inspect and clean inlet and outlet structures. Conduct annual pruning and removal of dead vegetation. Add mulch as desired. Inspect and clear all gutters, downspouts, and piping.	Conduct a single quarterly inspection of plantings. Inspect and clean inlet and outlet structures. Repair erosion and replace plantings as needed.	Conduct a single quarterly inspection of plantings. Inspect and clean inlet and outlet structures. Remove invasive species/weeds if needed. Inspect and clear all gutters, downspouts, and piping.	Inspect and clean inlet and outlet structures. Repair erosion if necessary.
Year 4	Inspect and clean inlet and outlet structures. Conduct annual pruning and removal of dead vegetation. Add mulch as desired. Inspect and clear all gutters, downspouts, and piping.	Repair erosion and replace plantings if necessary.	Inspect and clean inlet and outlet structures. Remove invasive species/weeds if needed. Inspect and clear all gutters, downspouts, and piping.	Inspect and clean inlet and outlet structures. Repair erosion if necessary.
Year 5 & Beyond	Inspect and clean inlet and outlet structures. Conduct annual pruning and removal of dead vegetation. Add mulch as desired. Inspect and clear all gutters, downspouts, and piping.		Inspect and clean inlet and outlet structures. Remove invasive species/weeds if needed. Inspect and clear all gutters, downspouts, and piping.	



William Penn Foundation Green Infrastructure Maintenance Report Form



GENERAL INFORMATION	
Name(s) of person inspecting the green infrastructure system:	Date:
Location (address and cross streets/site location name):	Property Owner / Tax Parcel Block & Lot:
Property owner contact information:	Type of green infrastructure system:
EXISTING CONDITIONS	
Description of the current site conditions and specific condition of the system:	

GENERAL OBSERVATIONS	YES	NO	COMMENTS
1) Any reports of the system not functioning?			
2) Are there any unauthorized or malfunctioning structures located in the system?			
3) Is the system overgrown with vegetation or contain excessive debris/trash?			
4) Is there standing water or evidence of standing water?			
5) Signs of breakage, damage, corrosion or rusting of any structures or components?			
6) Debris or sediment accumulation clogging the system?			
7) Signs of erosion, disturbance, or vandalism?			
8) Is vegetation healthy and thriving?			
9) Is there evidence that anyone has maintained the system in the recent past?			



William Penn Foundation Green Infrastructure Maintenance Report Form



<p>ADDITIONAL OBSERVATIONS</p>

RECOMMENDED MAINTENANCE NEEDS	
<p><i>Circle all that apply:</i></p> <ol style="list-style-type: none"> 1) Remove litter/debris 2) Remove sediment 3) Manage vegetation (weed, prune, water, edge) 4) Clean inlet and/or outlet 5) Vacuum or power wash 6) Replace: mulch - stone - plants 7) Winterize system - spring set up (cisterns/planter boxes) 8) Repairs needed: (indicate specific requirements) 	<p><i>Additional notes for maintenance:</i></p>

MAINTENANCE SUMMARY	
<p>1) Were all recommended maintenance activities noted above completed? Indicate how many staff and how much time was spent to complete all maintenance activities.</p>	<p><i>Description:</i></p>
<p>2) Were new materials placed or installed? (Plants, mulch, or stone). Indicate how much material and/or specific plantings used. Attach invoice or purchase order.</p>	<p><i>Description:</i></p>
<p>3) Are there any indications of the system not functioning properly or any components that need to be repaired or replaced?</p>	<p><i>Description:</i></p>
<p>4) Is there evidence of significant damage due to vandalism that should be noted and addressed with the owner and/or the authorities?</p>	<p><i>Description:</i></p>



**William Penn Foundation
Green Infrastructure Maintenance Report Form**



SUMMARY AND NOTES (briefly describe work completed, effort required, and any contact with property owner, questions, or site specific recommendations for future maintenance):

Be sure to photograph the system before and after maintenance activities!

PLAN NOTES:

1. CONTRACTOR SHALL SCHEDULE MEETING WITH ENGINEER AND PROPERTY OWNER PRIOR TO MOBILIZATION AND CONSTRUCTION.
2. CONTRACTOR SHALL VERIFY ALL INFORMATION INCLUDING ELEVATIONS AND UTILITIES PRIOR TO CONSTRUCTION.
3. CONTRACTOR SHALL VERIFY ALL PROPOSED MATERIALS WITH PROPERTY OWNER AND ENGINEER PRIOR TO CONSTRUCTION.
4. CONTRACTOR SHALL STAKE OUT LOCATIONS OF PROPOSED RAIN GARDENS, STONE CHANNELS, AND TRENCH DRAIN AND OBTAIN APPROVAL FROM ENGINEER PRIOR TO INSTALLATION.
5. CONTRACTOR SHALL INSTALL CONVENTIONAL ASPHALT AS SHOWN ON PLAN. THE ASPHALT AND CONCRETE MIXING PLANT, HAULING AND PLACING EQUIPMENT, AND INSTALLATION SHALL BE IN CONFORMANCE WITH NAPA IS 131 AND THE NJDOT STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION, 2007 OR LATEST VERSION.
6. CONTRACTOR SHALL GRADE SITE AS SHOWN ON PLAN. CUT SOIL SHALL BE REUSED ON SITE FOR FILL LOCATIONS.
7. CONTRACTOR SHALL HAUL EXCESS SOIL OFF SITE UNLESS OTHERWISE NOTED BY PROPERTY OWNER.
8. ALL FINISHED ELEVATIONS SHALL MATCH ADJOINING PAVEMENT ENSURING SMOOTH TRANSITIONS AND NO TRIPPING HAZARDS
9. CONTRACTOR SHALL BE RESPONSIBLE FOR RESTORING ALL AREAS DISTURBED DURING CONSTRUCTION TO ORIGINAL CONDITIONS.

NOTE 1: STONE SHALL BE COMPRISED OF 3'-5" DIAMETER CLEAN, WASHED RIVER STONE. ALL AREAS OF EROSION PROTECTION STONE SHALL BE UNDERLAIN WITH GEOTEXTILE FABRIC (GEOTEX 801 BY PROPEX OR APPROVED EQUIVALENT).

NOTE 2: TESTED INFILTRATION RATE OF 8.25 INHR. DESIGNED WITH RATE OF 4 INHR.

CHRISTOPHER C. OBROPTA, Ph.D., P.E.
 PROFESSIONAL ENGINEER - NJ LICENSE # 37532

Christopher C. Obropta

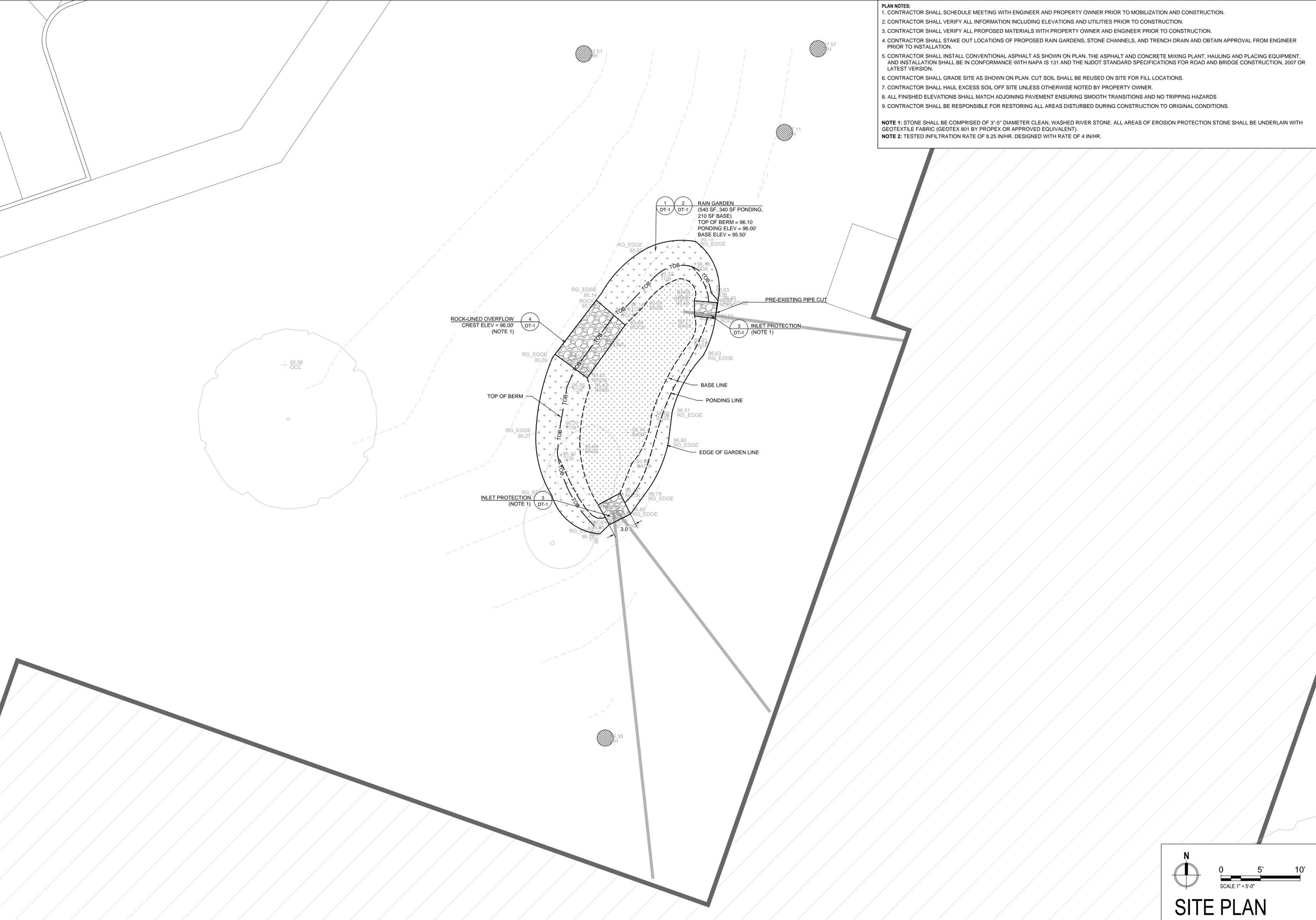
DATE 07/16/18

APPROVED
 COO

CHECKED
 MLH

DRAWN
 MAL

DATE 10/04/17, 07/16/18



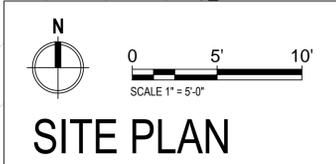
REVISIONS	No.	DATE	DESCRIPTION
	1	7/16/2018	AS-BUILT PLANS

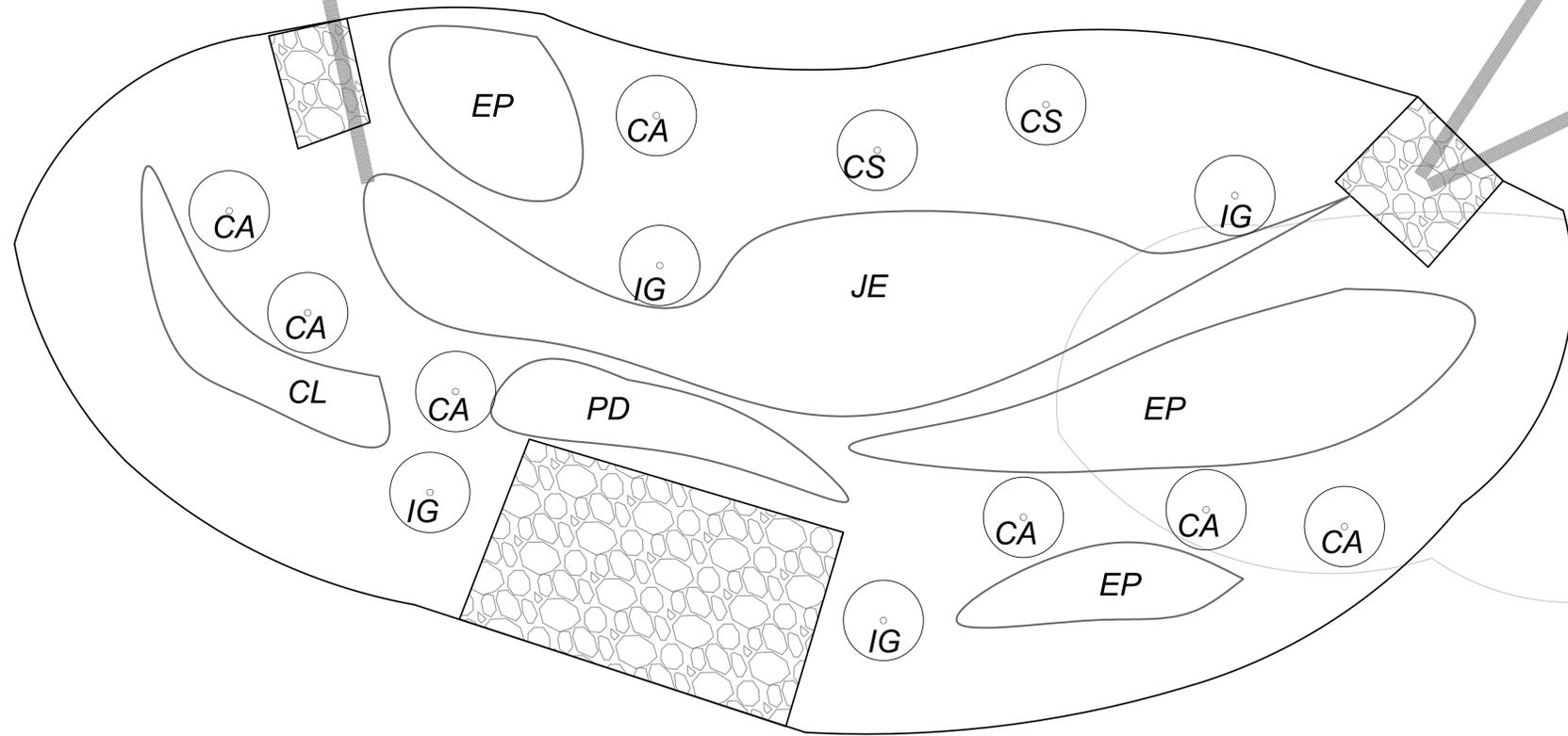
HARMONY TOWNSHIP SCHOOL
 RAIN GARDEN IMPLEMENTATION PROJECT
 2551 BELVIDERE ROAD, PHILLIPSBURG
 WARREN COUNTY, NJ

AS-BUILT SITE PLAN

RUTGERS
 New Jersey Agricultural
 Experiment Station

SHEET NAME
 P-2



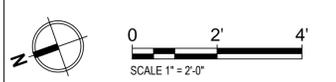


PLANTING SCHEDULE					
PLANT SPECIES				QUANTITY	SIZE
TYPE	KEY	BOTANICAL NAME	COMMON NAME		
RAIN GARDEN/BIOSWALE					
PERENNIALS	CL	<i>Coreopsis lanceolata</i>	LANCELEAF COREOPSIS	15	1 QUART
	EP	<i>Eupatorium purpureum</i>	SWEET JOE PYE WEED	25	1 QUART
	JE	<i>Juncus effusus</i>	SOFT RUSH	20	1 QUART
	PD	<i>Penstemon digitalis</i>	FOXGLOVE BEARDTONGUE	10	1 QUART
SHRUBS	CA	<i>Clethra alnifolia</i>	SWEET PEPPERBUSH	6	#2 CONT.
	CS	<i>Cornus sericea</i>	RED TWIG DOGWOOD	2	#2 CONT.
	IG	<i>Ilex glabra</i>	INKBERRY HOLLY	4	#2 CONT.

CHRISTOPHER C. OBROPTA, Ph.D., P.E.
 PROFESSIONAL ENGINEER - NJ LICENSE # 37532
 DATE 07/16/18
 APPROVED CCO
 CHECKED MLH
 DRAWN MAL

REVISIONS	No.	DATE	DESCRIPTION
	1	7/16/2018	AS-BUILT PLANS

HARMONY TOWNSHIP SCHOOL
 RAIN GARDEN IMPLEMENTATION PROJECT
 2551 BELVIDERE ROAD, PHILLIPSBURG
 WARREN COUNTY, NJ
 AS-BUILT PLANTING PLAN



PLANTING PLAN

SHEET NAME
 P-3



***Concept Drawing, Harmony Township School,
2551 Belvidere Road, Phillipsburg, NJ***



***Before, Harmony Township School,
2551 Belvidere Road, Phillipsburg, NJ***



***After, Rain Garden,
2551 Belvidere Road, Phillipsburg, NJ***