Stormwater Management Report

8 Henry Court, Village of Montebello, Rockland County, NY 10901

SBL 48.10-1-36

February 2025

Prepared by:

Josip Medic, PE

Lic. 103757

Introduction

The project site is located the of Henry Court in the east side of the cul-de-sac.

The project proposes converting an existing garage into a place of worship, proposes an expansion of the parking area to include 5 parking spaces, and proposes a 374 SF Mikvah in the backyard.

Methodology

The Calculation was performed using the NRCS Technical release 20/55 method of calculating runoff volume and rate. The site specifics were input into the HydroCAD Stormwater Modeling System program by HydroCAD Software Solutions LLC.

The inputs and outputs from HydroCAD are attached to this report.

Proposed Drainage System

A drainage collection system is proposed onsite to mitigate stormwater runoff from impervious runoff. A detention/recharge drywell system is proposed in the backyard of the site. The system in the backyard is a 1000-gallon drywell surrounded by 36” of open graded crushed stone with a 36” stone base.

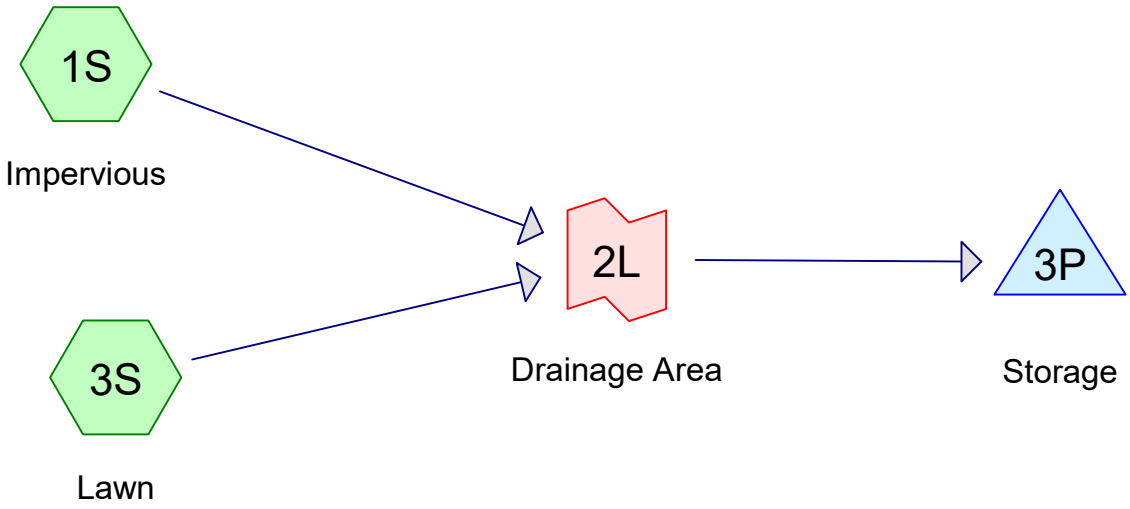
Infiltration Rate

An infiltration rate of 4” per hour was assumed for this report.

Conclusion

In summary, the proposed system ensures a net zero runoff in volume for the proposed flows for a 100-year storm.

Proposed Report



Subcat Reach Pond Link

Routing Diagram for 24135 Prop 8 Henry 2025-02-25

Prepared by HydroCAD SAMPLER 1-800-927-7246 www.hydrocad.net, Printed 2/26/2025
HydroCAD® 10.20-3h Sampler s/n S20567

Project Notes

Rainfall events imported from "NRCS-Rain.txt" for 7096 NY Rockland
Rainfall events imported from "Atlas-14-Rain.txt" for 1426 NY Rockland
Rainfall events imported from "NRCS-Rain.txt" for 7096 NY Rockland

Rainfall Events Listing (selected events)

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	100-Year	NRCC 24-hr	C	Default	24.00	1	9.00	2

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.027	98	(1S)
0.027	61	>75% Grass cover, Good, HSG B (3S)
0.053	**80**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
0.027	HSG B	3S
0.000	HSG C	
0.000	HSG D	
0.027	Other	1S
0.053		**TOTAL AREA**

Ground Covers (all nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.000	0.000	0.000	0.000	0.027	0.027		1S
0.000	0.027	0.000	0.000	0.000	0.027	>75% Grass cover, Good	3S
0.000	**0.027**	**0.000**	**0.000**	**0.027**	**0.053**	**TOTAL AREA**	

Time span=0.00-30.00 hrs, dt=0.01 hrs, 3001 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: Impervious Runoff Area=1,162 sf 100.00% Impervious Runoff Depth=8.76"
Tc=10.0 min CN=98 Runoff=0.21 cfs 0.019 af

Subcatchment 3S: Lawn Runoff Area=1,162 sf 0.00% Impervious Runoff Depth=4.22"
Tc=10.0 min CN=61 Runoff=0.12 cfs 0.009 af

Pond 3P: Storage Peak Elev=333.54' Storage=0.008 af Inflow=0.34 cfs 0.029 af
Discarded=0.03 cfs 0.025 af Primary=0.27 cfs 0.003 af Outflow=0.30 cfs 0.029 af

Link 2L: Drainage Area Inflow=0.34 cfs 0.029 af
Primary=0.34 cfs 0.029 af

Total Runoff Area = 0.053 ac Runoff Volume = 0.029 af Average Runoff Depth = 6.49"
50.00% Pervious = 0.027 ac 50.00% Impervious = 0.027 ac

Summary for Subcatchment 1S: Impervious

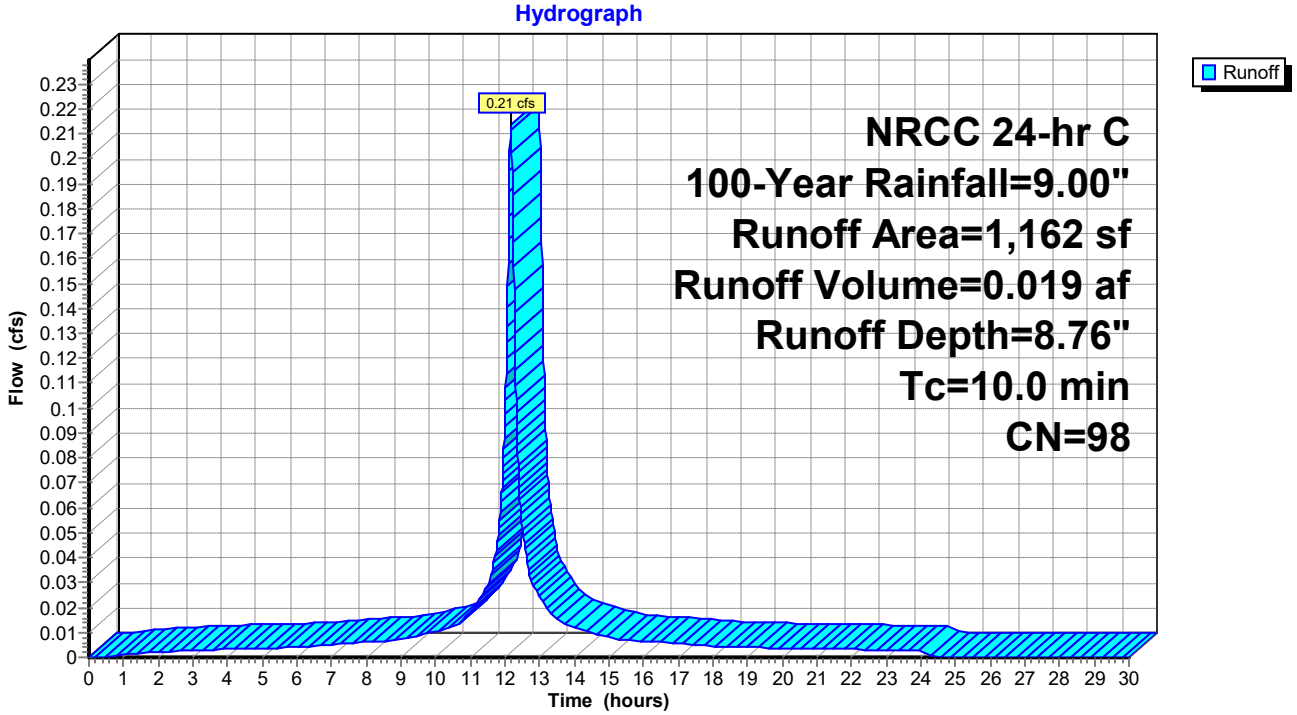
Runoff = 0.21 cfs @ 12.17 hrs, Volume= 0.019 af, Depth= 8.76"
Routed to Link 2L : Drainage Area

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
NRCC 24-hr C 100-Year Rainfall=9.00"

	Area (sf)	CN	Description
*	1,162	98	
	1,162		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					**Direct Entry, Minimum**

Subcatchment 1S: Impervious



Summary for Subcatchment 3S: Lawn

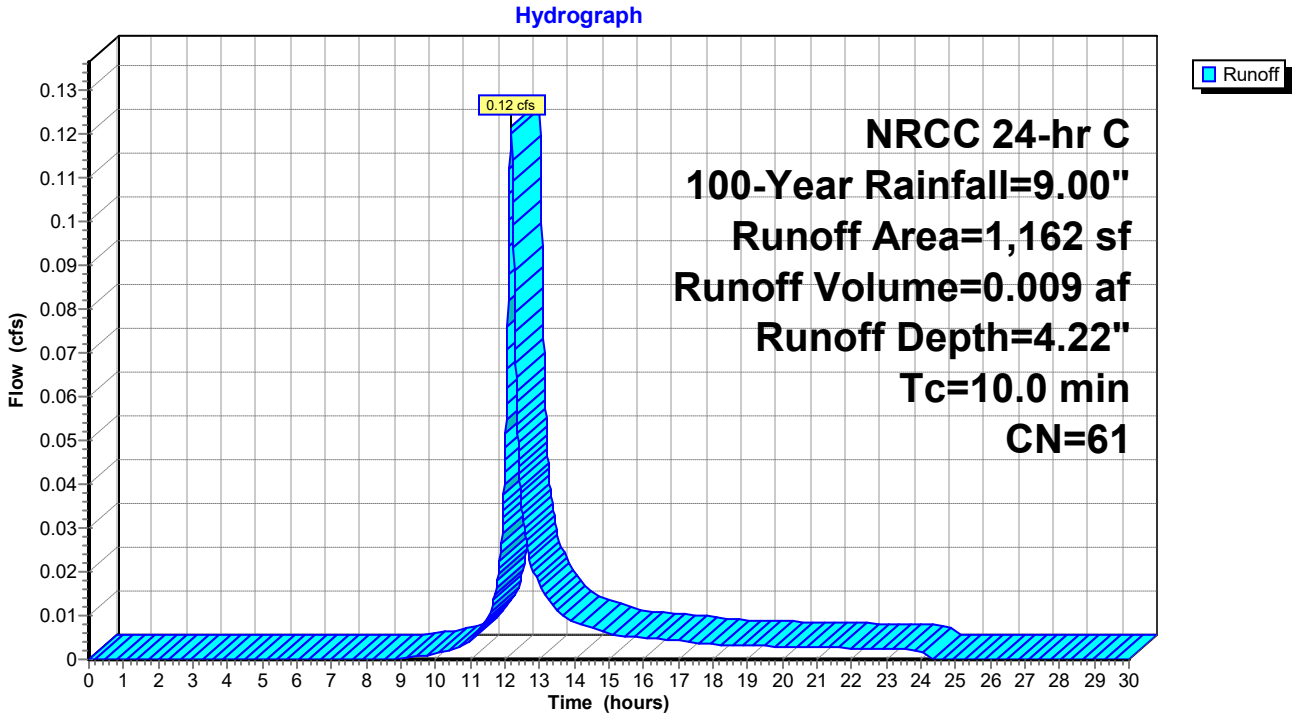
Runoff = 0.12 cfs @ 12.18 hrs, Volume= 0.009 af, Depth= 4.22"
Routed to Link 2L : Drainage Area

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
NRCC 24-hr C 100-Year Rainfall=9.00"

Area (sf)	CN	Description
1,162	61	>75% Grass cover, Good, HSG B
1,162		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					**Direct Entry, Minimum**

Subcatchment 3S: Lawn



Summary for Pond 3P: Storage

Inflow Area = 0.053 ac, 50.00% Impervious, Inflow Depth = 6.49" for 100-Year event
Inflow = 0.34 cfs @ 12.17 hrs, Volume= 0.029 af
Outflow = 0.30 cfs @ 12.25 hrs, Volume= 0.029 af, Atten= 9%, Lag= 4.8 min
Discarded = 0.03 cfs @ 12.25 hrs, Volume= 0.025 af
Primary = 0.27 cfs @ 12.25 hrs, Volume= 0.003 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Peak Elev= 333.54' @ 12.25 hrs Surf.Area= 0.003 ac Storage= 0.008 af

Plug-Flow detention time= 86.2 min calculated for 0.029 af (100% of inflow)
Center-of-Mass det. time= 86.2 min (865.7 - 779.5)

Volume	Invert	Avail.Storage	Storage Description
#1A	328.00'	0.005 af	**11.67'W x 10.50'L x 5.83'H Field A** 0.016 af Overall - 0.004 af Embedded = 0.013 af x 40.0% Voids
#2A	331.00'	0.003 af	**Shea Dry Well 1000gal** Inside #1 Inside= 62.0"W x 30.0"H => 12.86 sf x 10.00'L = 128.6 cf Outside= 68.0"W x 34.0"H => 15.80 sf x 10.50'L = 165.9 cf
		0.008 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	328.00'	**4.000 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 325.00'
#2	Primary	333.50'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.03 cfs @ 12.25 hrs HW=333.54' (Free Discharge)
↑—**1=Exfiltration** (Controls 0.03 cfs)

Primary OutFlow Max=0.23 cfs @ 12.25 hrs HW=333.54' (Free Discharge)
↑—**2=Orifice/Grate** (Weir Controls 0.23 cfs @ 0.67 fps)

Pond 3P: Storage - Chamber Wizard Field A

Chamber Model = Shea Dry Well 1000gal (Shea Jumbo Rectagular Dry Well)
Inside= 62.0"W x 30.0"H => 12.86 sf x 10.00'L = 128.6 cf
Outside= 68.0"W x 34.0"H => 15.80 sf x 10.50'L = 165.9 cf

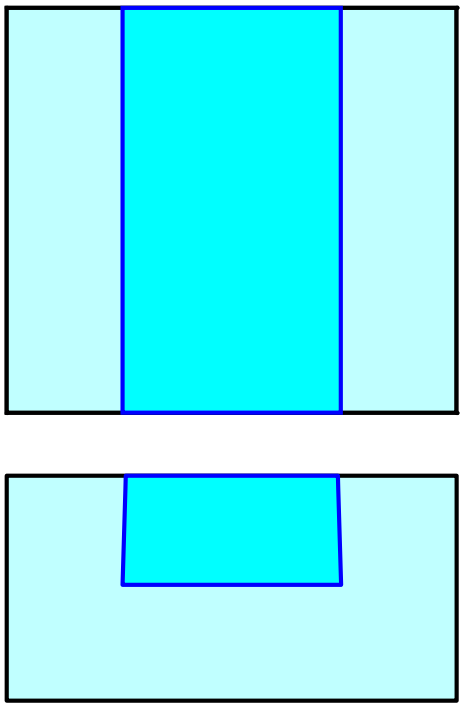
1 Chambers/Row x 10.50' Long = 10.50' Row Length
1 Rows x 68.0" Wide + 36.0" Side Stone x 2 = 11.67' Base Width
36.0" Stone Base + 34.0" Chamber Height = 5.83' Field Height

1 Chambers x 128.6 cf = 128.6 cf Chamber Storage
1 Chambers x 165.9 cf = 165.9 cf Displacement

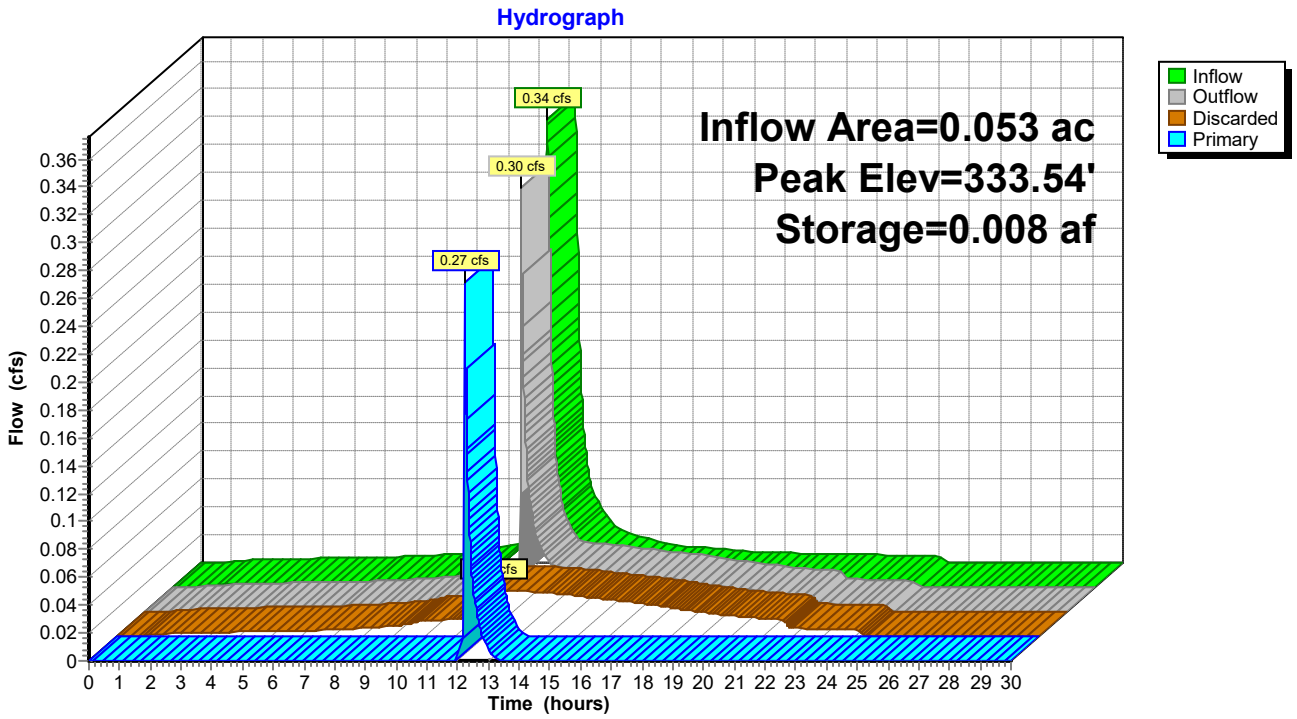
714.2 cf Field - 165.9 cf Chambers = 548.3 cf Stone x 40.0% Voids = 219.3 cf Stone Storage

Chamber Storage + Stone Storage = 347.9 cf = 0.008 af
Overall Storage Efficiency = 48.7%
Overall System Size = 10.50' x 11.67' x 5.83'

1 Chambers
26.5 cy Field
20.3 cy Stone



Pond 3P: Storage

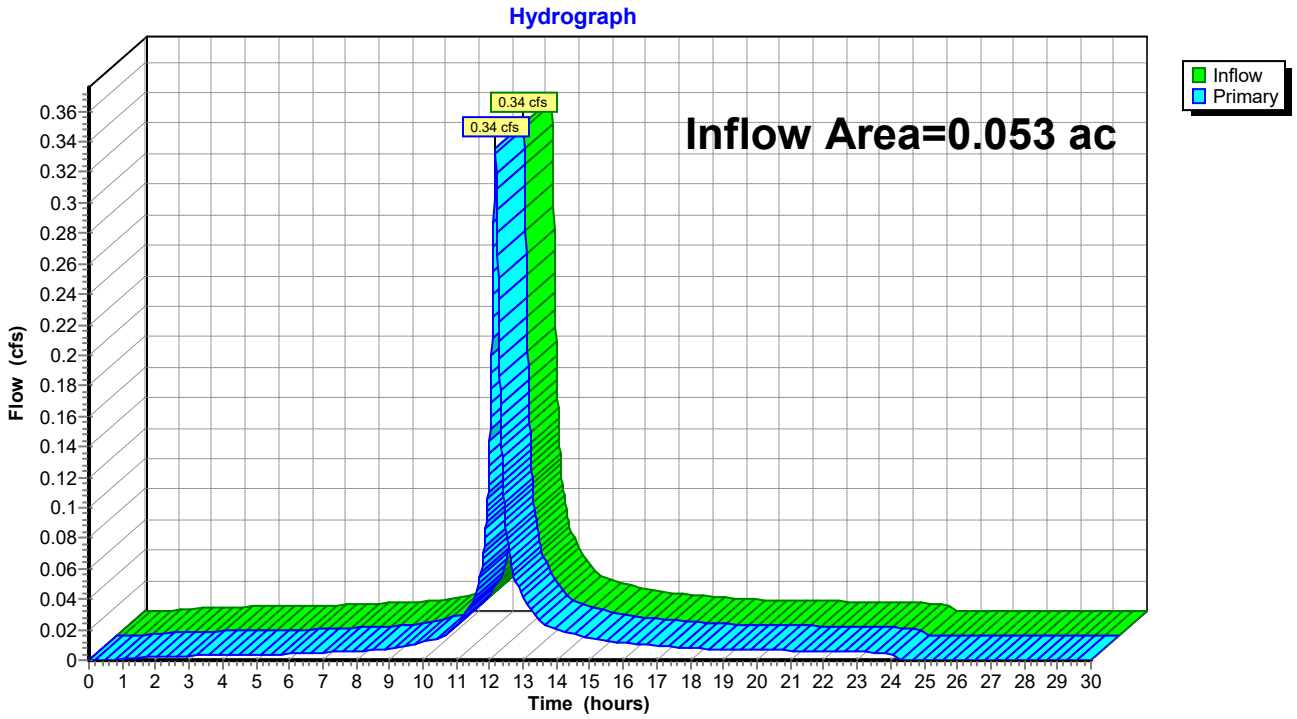


Summary for Link 2L: Drainage Area

Inflow Area = 0.053 ac, 50.00% Impervious, Inflow Depth = 6.49" for 100-Year event
Inflow = 0.34 cfs @ 12.17 hrs, Volume= 0.029 af
Primary = 0.34 cfs @ 12.17 hrs, Volume= 0.029 af, Atten= 0%, Lag= 0.0 min
Routed to Pond 3P : Storage

Primary outflow = Inflow, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs

Link 2L: Drainage Area



Soil Map

Map Scale: 1:560 if printed on A portrait (8.5" x 11") sheet.

N

Meters
0 5 10 20 30

Feet
0 25 50 100 150

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 18N WGS84

MAP LEGEND

Area of Interest (AOI)

- Area of Interest (AOI)

Soils

- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features

- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features

- Streams and Canals

Transportation

- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background

- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Rockland County, New York
Survey Area Data: Version 22, Aug 25, 2024

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: May 31, 2022—Oct 27, 2022

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
HcA	Hinckley loamy sand, 0 to 3 percent slopes	0.9	100.0%
Totals for Area of Interest		**0.9**	**100.0%**

Maintenance Manual

Maintenance Manual

CLEANING AND REPAIR OF CULVERTS AND CLOSED DRAINAGE SYSTEMS

General Principle To maintain culverts and closed drainage systems in a workable condition so as to safely carry away collected surface and subsurface water.

Inspection Inspect large culverts in accordance with the criteria stated in the Culvert Inventory and Inspection Manual. Closed drainage systems and small culverts should be inspected on a attainable schedule based on available resources. Storm events and known problem locations may warrant additional inspections. January, 2009 11 Check catch basins (CB's), man holes (MH's), and drainage inlets (DI's) to determine necessary structural repair work. Check that frames and grates are clear of debris; note any properly seated sumps which need cleaning for scheduled cleaning. Check pipe culverts for the condition of pipe, condition of headwalls, and alignment of entrance and outlet ditches. Inspect pavement over culverts and around drainage structures for distress, which may be an early sign of problems. Check inlet and outlet ends of pipe culverts for obstructions. Bring conditions affecting highway drainage, that are outside the highway ROW, to the Resident Engineer'sattention for evaluation. Subsurface drains should have free flowing outlets. Immediately remove any debris causing severe obstruction to flow. When working with culverts and closed drainage systems it is important to review Department worker safety policies. The Regional Safety Officer can provide the necessary guidance concerning confined space entry, working in proximity to water and personal protective equipment. Additional information may be obtained in the Department's Transportation Maintenance Safety Manual.

Make necessary repairs to concrete and masonry structures as required to provide structurally sound units. All grates and covers should be seated properly. Improperly seated or loose grates and covers may be corrected by application of mortar or asphalt emulsion on the cover seat. Remove and replace defective and broken grates and covers. Frames that support grates and covers should have 100 percent contact with the supporting structure. The sumps for structures should be cleaned to maintain storage so that silt, sand and stones will not be washed into pipes causing possible plugging. Areas that drain to a closed drainage system should be swept annually to limit the amount of debris entering the system. Outlets for subsurface drains should be free flowing. Mark the outlets for french drains and drain tile to make future location of them easier. Culverts that require replacement should be brought to the attention of the Resident Engineer for review. If the culvert passes a regulated stream the Resident Engineer should contact the Maintenance Environmental Coordinator (MEC) for guidance.

It is important to use good environmental practices, particularly sediment control, when cleaning culverts and closed drainage systems. These systems often have outfalls to streams, wetlands and/or coastal waters. It is also important to recognize, and minimize the spread of, invasive plant species located in the work area. Consult with your Maintenance Environmental Coordinator (MEC) for guidance in working in areas with invasive plants.

The Goal is to maintain drainage structures in a safe structural condition and to efficiently carry runoff away from traffic areas. All drainage facilities should be maintained so that there is structural soundness and each facility is clean to allow free flow of water. Culverts should be cleaned when any form of obstruction severely decreases its performance. Natural bottoms in culverts should be preserved to enhance fish habitat and facilitate passage. Sumps should be cleaned when 50 percent filled to allow free and efficient flow with adequate storage for debris.

Maintenance Procedures

Maintenance procedures contained in this section consist of recommended tasks and associated frequencies for routine maintenance activities, as well as general guidance on common problems. While maintenance procedures generally apply to SMPs, the continued implementation of BMPs may also require maintenance practices.

Maintenance comprises those activities that occur on a set frequency or that are otherwise periodically required for SMP upkeep. These activities include tasks such as weeding, watering, sediment, and trash removal for bio-retention SMPs that can often be accomplished during pre-set routine maintenance cycles.

Occasionally, SMPs require non-scheduled maintenance to address performance issues that may arise and cannot be adequately addressed through pre-set maintenance activities. These activities may include replanting, erosion control, and structural repairs and may require specialized equipment and/or skilled expertise to properly implement. The alteration or modification of an approved SMP or of the approved operation and maintenance of SMPs will require prior review and approval of DEP.

Routine Maintenance

Routine maintenance consists of tasks that are performed on a set schedule or undertaken periodically based on the results of the annual inspections. Routine tasks are intended to maintain system performance under normal operating conditions, assuming SMPs have been appropriately sited, designed, and constructed.

Routine maintenance tasks and suggested frequencies are specified by SMP type in Tables 5.2 to 5.14. To help streamline, readers can refer to Table 5.1 for an overview of the applicable maintenance table for each SMP.

Suggested frequencies are guidelines based on normal operating conditions. Generally, frequencies for many tasks will need to increase for high sediment loading and highly exposed SMPs (i.e., SMPs sited adjacent to commercial driveways, parking lots, or other areas with heavy vehicular traffic that receive direct runoff from these surfaces) and may be decreased for lower sediment loading and/or less exposed SMPs (i.e., SMPs sited adjacent to areas of low or no vehicular traffic and receive primarily roof runoff). Frequencies should be adjusted over time based on the results of ongoing and annual SMP inspections.

Table A. Routine Maintenance Tasks and Frequencies for Dry Wells and Subsurface Galleries

Task	Description	Frequency
Pipe Cleaning	Hydraulic cleaning of inflow, distribution and outflow piping	As warranted based on video pipe inspections conducted every three years
Sediment Removal	Vacuum cleaning of accumulated sediment and debris within internal structures	As warranted based on video inspections of subsurface galleries conducted every three years
Inlet Filter Cleaning	Emptying of inlet filter bags and/or baskets	Minimum quarterly or more frequently if debris accumulation is rapid based on ongoing inspections
Inlet Cleaning	Vacuum cleaning of accumulated sediment and debris within inlets sumps and hoods	Minimum annually or more frequently if debris accumulation is rapid based on ongoing and annual inspections
Outlet Cleaning	Removal of accumulated sediment and debris from risers (vacuum cleaning), trash racks, and spillways and clearing sediment from orifices and outlet control structures to prevent clogging	Annually at minimum or more frequently based on ongoing and annual inspections