MEMORANDUM

CITY OF WATERTOWN, NEW YORK
PLANNING AND COMMUNITY DEVELOPMENT DEPARTMENT
245 WASHINGTON STREET, ROOM 305, WATERTOWN, NY 13601
PHONE: 315-785-7741 – FAX: 315-782-9014

TO: Planning Commission Members

FROM: Michael A. Lumbis, Planning and Community Development Director

PRIMARY REVIEWER: Joseph Albinus, Planner

SUBJECT: Site Plan Approval – 268 Bellew Avenue South

DATE: August 27, 2026

Request: Site Plan Approval to construct an 11,865 SF building addition, expanded asphalt storage areas and associated site improvements at **268 Bellew Avenue South**, Parcel Number 9-43-105.000

Applicant: [redacted]

Proposed Use: Expansion of Industrial Use

Property Owners: Roth Industries Inc.

Submitted:	
Property Survey: Yes	Preliminary Architectural Drawings: Yes
Site Plan: Yes	Preliminary Site Engineering Plans: Yes
Vehicle and Pedestrian Circulation Plan: Yes	Construction Time Schedule: Yes
Landscaping and Grading Plan: Yes	Description of Uses, Hours & Traffic Volume: No

SEQRA: Unlisted

Jefferson County 239-m Review: No

Zoning Information:	
District: Industrial	Maximum Lot Coverage: 60
Setback Requirements: F: 25', S: 10+', R: 10+'	Buffer Zones Required: Yes

Project Overview: The applicant proposes to expand the existing Industrial Use at 268 Bellew Avenue South and construct two building additions totaling an aggregate of 11,865 SF, expanded asphalt parking and associated site improvements. The building additions would be to the rear of the current building, the

proposed additional parking would be to the North of the building and the proposed asphalt storage spaces would be to the rear of the current building.

Existing Conditions: The parcels surrounding the property are all zoned Industrial. Abutting the northwest part of the Subject Parcel is a storage facility for Green Mountain Coffee at 1011 Waterman Drive. Abutting the north of the subject parcel is a storage facility for Frito Lay at 997 Waterman Drive. Abutting the northeast of the parcel is a manufacturing facility for 1812 Brewing at 981 Waterman Drive. Across Roundhouse Drive, to the west of the subject parcel, is VL Roundhouse Drive which is vacant. To the subject parcel's south, across Rail Drive, is 901 Rail Drive which contains a warehouse and office facility for US Foods. To the subject parcels east is a manufacturing facility for Current Applications at 275 Bellew Avene South. To the northeast is a United Auto Supply store at 875 Waterman Drive.

Comprehensive Plan: The City's adopted Comprehensive Plan recommends the future land use character area of this block as Light Industry. This character area includes the entire wedge between the current and former rail tracks extending past the industrial park to the edge of the undevelopable wetlands in the southwest corner of the City. The plan describes the Light Industry land use area as follows:

"This Character Area is designed to diversify and strengthen the local economic base by allowing for light manufacturing, assembly, and fabrication, including small scale or specialized industrial operations and offices. These areas recognize Watertown's existing light industrial uses such as the industrial park and are adjacent to the railroad. Buildings are often multi-story with on-site parking for automobiles and/or trucks."

The proposed light manufacturing use is a typical use found in other industrial parks. The additional driveway is expanding an existing curb cut. This proposal is in harmony with the Comprehensive Plan

Zoning: The current use is allowed by right in an Industrial District. The proposed expansion invokes the need for Site Plan Review. The proposal meets all setback requirements of the Industrial District. The proposed new impervious surface would put the lot coverage at 68 percent, above the 60 percent Maximum Lot Coverage in an Industrial District. At its July 15, 2026 meeting, the Zoning Board of Appeals (ZBA) granted the applicant an Area Variance to vary the lot coverage maximum to 68 percent.

Vehicular and Pedestrian Circulation: Primary vehicular access to the site would continue to be via curb cuts providing ingress and egress from Bellew Avenue South. Additionally, there is access to a loading dock via two curb cuts on Rail Drive and access to the storage area via another curb cut on Rail Drive. Currently there are 20 parking spaces and the applicant proposes 6 additional parking spaces for a total of 26. The Industrial zoning district carries no parking space maximum.

There are no sidewalks along Bellew Avenue South and the only sidewalk on site is one that provides access from the parking lot to the main entrance. The nearest sidewalk is on Waterman Drive, to the south of Bellew Avenue South, approximately 300 feet away from the parcel.

Landscaping and Buffers: Section 310-83 of the Zoning Ordinance requires a landscape plan to be submitted with every Site Plan Review application. The landscape plan is included on the site plan, drawing number CS-100. The applicant is proposing a total of seven new trees along the Bellew Avenue South, Rail Drive and Roundhouse Drive rights-of-way in areas where new construction will be occurring. The width of the landscaped strip is approximately 20' and the trees are proposed to be planted 40' on center, which meets the requirements of Section 310-83, C, Landscaped strips along street rights-of-way. While the width of the landscaped area and tree spacing is compliant, the proposed plan does not

meet the species diversity requirement of no one species of tree comprising more than 15 % of the total. The applicant will need to change the species of trees used in the proposed planting plan to meet this requirement.

Industrial Park Covenants and Restrictions: The City of Watertown, at the request of the Watertown Local Development Corporation (WLDC), has placed certain covenants and restrictions on the properties sold within the industrial park. The covenants and restrictions are intended to promote the development of a light industrial park which is attractive to light industry from a functional, geographical, and aesthetic standpoint. The restrictions include limitations on uses, lot sizes, setbacks, parking and landscaping. The covenants and restrictions were conveyed when each of the lots in the park were sold and run with the land.

The current/proposed use is in harmony with the use restrictions found in the covenants and restrictions.

There are several site requirements such as minimum lot area, minimum lot frontage, maximum lot coverage by buildings, and minimum front, side and rear yards. While the lot coverage calculated for the purposes of the Zoning Ordinance is 68 percent and covers all impervious areas, the covenants and restrictions only restrict lot coverage relative to building coverage. The proposed lot coverage by buildings (after the addition) is 26 percent, which is under the maximum of 35 percent.

The minimum front yard allowed is 35'. The existing front yard, measured at the narrowest point along Bellew Avenue South is 31', which does not meet the minimum. Due to the location and angle of the building, most of the front yard meets or exceeds the 35' minimum. Researching old site plan files revealed an approved site plan from 2006 which depicts the original portion of the building approximately 30' from the front street line. Regardless of this non-conformity, this is an existing condition and is not exacerbated by the proposed construction. The project, as proposed, appears to meet all of the other site requirements found in Article 2 of the covenants and restrictions.

There are also several general provisions found in the covenants and restrictions including landscaping and general beautification requirements, parking requirements, and outdoor storage requirements. It appears that the existing and proposed project is in compliance with those provisions as well.

Engineering Comments: The Engineering Department is reviewing the plans and will provide any comments for consideration prior to the Planning Commission meeting.

Lighting: The applicant will be replacing three building mounted LED lights that would be removed for the building addition and will be installing one new site light pole with LED cutoff light fixtures on the north side of the proposed asphalt storage area. The photometric plan is included as part of the site plan. The plan shows the proposed light contours and indicates that light spillage across the nearest property lines will not exceed 0.5 footcandles.

SEQR: This project is considered an Unlisted Action under the State Environmental Quality Review Act (SEQRA). The applicant has submitted a completed Part 1 of a Short Environmental Assessment Form (EAF). The Planning Commission, as Lead Agency, must complete Parts 2 and 3 of the Short Environmental Assessment Form (EAF) and make a determination of significance.

Permits: The applicant must obtain the following permits and other documentation, minimally, prior to construction: Building Permit, and a Zoning Compliance Certificate.

Summary: The following summary items are topics that the Planning Commission may wish to discuss further or that should be included as a condition of approval:

1. The applicant shall revise the landscaping plan so that it conforms to the requirements of Section 310-83 of the Zoning Ordinance.

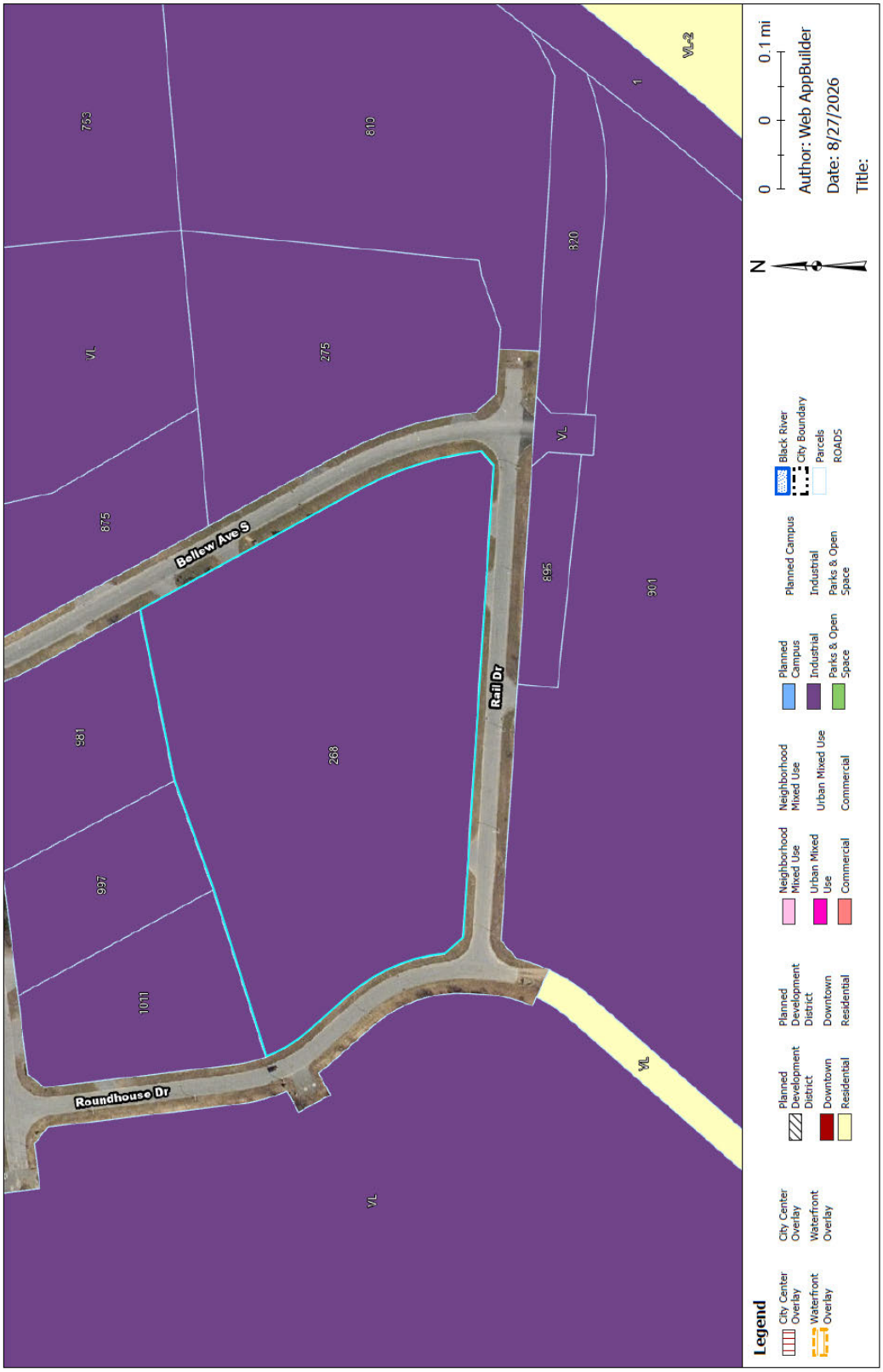
2. The applicant shall submit a revised set of drawings that satisfies all summary items for approval of the Planning and Engineering Departments, prior to the issuance of any permits.

3. The applicant must obtain the following permits, minimally, prior to construction: Building Permit, and a Zoning Compliance Certificate.

cc: Thomas Compo, City Engineer
[redacted]



Above: A satellite view of the parcel highlighted in blue.



Above: The zoning districts surrounding the parcel, highlighted in blue.



Above: Main Entrance to subject Parcel and proposed location of proposed additional parking.



Above: Proposed location of northmost parking.



Above: Proposed location of building additions and asphalt storage.



Above: Proposed location of Sothern storage area.



Above: Existing curb cut.

July 21, 2026

City of Watertown
Michael A Lumbis,
Planning and Community Development Director
Room 304, City Hall
245 Washington Street
Watertown, NY 13601

Re: **Site Plan Review Application**
2026 Expansion Project
Roth Industries and Roth Global Plastics (A&C Proj. #2016-033.007)
268 Bellew Avenue South, Watertown, NY 13601

Dear Mr. Compo:

Aubertine and Currier Architects, Engineers & Land Surveyors, PLLC on behalf of Roth Industries and Roth Global Plastics is requesting to be included on the agenda for the August City of Watertown Planning Commission meeting. This meeting requests for a Site Plan review of the proposed Roth Industries 2026 Expansion Project, tax parcel 9-43105.000. Included in this submission are the Cover Letter, Short SEQR Environmental Assessment Form, Preliminary Engineering Report, Preliminary Stormwater Pollution Prevention Plan, Preliminary Site Plans and Details, and Preliminary Archtectural Plans.

The project includes two (2) additions to the building, expanded asphalt parking lot, reconfigured ADA parking spaces, expanded asphalt shipping drive and connection to Rail Drive, expanded asphalt storage areas, chain link fence, relocated site light poles, and expanded infiltration basins. The infiltration basins will be expanded to treat and attenuate peak runoff to predevelopment levels in accordance with NYSDEC SPDES GP-0-25-001 requirements.

Roth Industries intends to begin construction this summer/fall as soon as approvals are granted. If there are any questions, contact our office at your earliest convenience.

Sincerely,

[redacted]

[redacted]

[redacted]

AUBERTINE and CURRIER
ARCHITECTS, ENGINEERS & LAND SURVEYORS, PLLC

NYS WBE/DBE Certified
SBA Woman Owned
Small Business (WOSB)

aubertinecurrier.com

522 Bradley Street
Watertown, New York 13601

Phone: 315.782.2005
Fax: 315.782.1472

Managing Partner
Annette M. Mason, P.E.
Structural Engineer

Partners
Michael L. Aubertine, R.A.
Architect

Patrick J. Currier, R.A.
Architect

Brian A. Jones, AIA.,
LEED AP BD+C
Architect

Matthew R. Morgia, P.E.
Civil Engineer

Jayson J. Jones, P.L.S.
Land Surveyor

PRELIMINARY ENGINEERING REPORT

ROTH INDUSTRIES, INC
2026 EXPANSION PROJECT
CITY CENTER INDUSTRIAL PARK
268 BELLEW AVE SOUTH
CITY OF WATERTOWN
JEFFERSON COUNTY, NEW YORK

Owner: Roth Industries, Inc.
268 Bellew Ave South
Watertown, NY 13601

August 11, 2026
REVISED: August 26, 2026

[redacted]

The above Engineer states that to the best of his knowledge, information and belief, the plans and specifications are in accordance with applicable requirements of New York State. It is a violation of New York State Law for any person, unless acting under the direction of a licensed professional engineer to alter this document in any way. If altered, such licensee shall affix his or her seal and the notation "altered by" followed by his or her signature, date, and a specific description of alteration.

Aubertine and Currier Architects, Engineers & Land Surveyors, PLLC
522 Bradley Street Watertown, New York 13601 TELE: (315) 782-2005 FAX: (315) 782-1472

Table of Contents

1.0 Site and Project Descriptions
- 1.1 Location
- 1.2 Project Description
- 1.3 Site Topography
- 1.4 Soil Classification

2.0 Water Facilities
- 2.1 Existing Water Facilities
- 2.2 Proposed Water Facilities

3.0 Sanitary Sewer Facilities
- 3.1 Existing Sanitary Sewer Facilities
- 3.2 Proposed Sanitary Sewer Facilities

4.0 Stormwater Facilities
- 4.1 Existing Drainage
- 4.2 Proposed Drainage

5.0 Roads, Drives, Traffic, and Parking
- 5.1 Existing Roads/Drives
- 5.2 Proposed Roads/Drives
- 5.3 Traffic and Parking

6.0 Private Utilities
- 6.1 Existing Gas, Electric, Telephone and Cable
- 6.2 Proposed Gas, Electric, Telephone and Cable

7.0 Lighting
- 7.1 Existing Site Lighting
- 7.2 Proposed Site Lighting

8.0 Landscaping
- 8.1 Existing Landscaping
- 8.2 Proposed Landscaping

Appendices

Appendix 1: Location Map
- City of Watertown Zoning Map
- City of Watertown GIS Floodplain & Wetlands Map
- Soils Map
- Soils Description

Appendix 2: Hydrologic and Hydraulic Analysis

1.0 SITE AND PROJECT DESCRIPTIONS

1.1 Location

The project is located at 268 Bellew Ave South on an industrial property within the City of Watertown's City Center Industrial Park. Roth Industries currently owns and operates the facility on the 8.86 acre parcel. The Industrial Park Lots and associated infrastructure was developed by the City in 2001. The property is located on Tax Map Parcel No. 9-43-105.000. This parcel is zoned Industrial.

1.2 Project Description

The project includes two (2) additions to the building, expanded asphalt parking lot, reconfigured ADA parking spaces, expanded asphalt shipping drive and connection to Rail Drive, expanded asphalt storage areas, chain link fence, relocated site light poles, and expanded infiltration basins. The infiltration basins will be expanded to treat and attenuate peak runoff to predevelopment levels in accordance with NYSDEC SPDES GP-0-25-001 requirements

1.3 Site Topography

The existing 8.86 acre site is comprised of a 76,240 SF manufacturing facility, asphalt parking and storage area, and access drives on the eastern and southern portion of the property. A strip of undeveloped vegetated land lies on the western portion of the property. A chain link fence runs along the perimeter of the asphalt storage yard, separating the developed portion of the property from the undeveloped vegetated lawn area to the west.

The existing manufacturing facility, asphalt parking and storage area, and undeveloped vegetated lawn area all slope north at a slope varying between 1% and 2% via sheet flow towards an existing stormwater infiltration basin located along the northern edge of the storage yard. Runoff that enters the northern stormwater infiltration basin either infiltrates into the existing sandy soils or overflows and discharges east into a 24” SICPP storm pipe that connects to the Bellew Avenue South municipal storm sewer. A rip rap overflow channel is also provided in the northwest corner of the northern infiltration basin. The will provide an outlet to the west below Roundhouse Drive, towards Beaver Meadows marsh, for excess stormwater in the event of an extreme storm event.

The southern truck access drives that permit access to the receiving and shipping area loading docks on the south and southwestern sides of the building drain south to a separate storm water infiltration basin where runoff either infiltrates into the existing sandy soils or overflows and discharges south into the city municipal storm sewer that crosses under Rail Drive. The Bellew Ave City storm sewer discharges into the Black River and ultimately flows to Lake Ontario. The Rail Drive City storm sewer discharges south in the direction of the Beaver Meadows marsh that ultimately

discharges to Mill Creek and Lake Ontario.

The developed area of the project is not located within a 100 year flood plain.

1.4 Soil Classification

The project site is located in the City of Watertown, which is an urban environment and consists primarily of previously developed area. According to the USDA Web Soil Survey for Jefferson County, New York, the project area Primarily includes soils classified as sand of Hydrologic Group A with areas of silt loam classified as Hydrologic Soil Group C/D to the south and Loamy sand classified as Hydrologic soil group A/D to the west.

Soil Symbol	Soil Name	Hydrologic Group
CnB	Collamer Silt Loam	C/D
PoB	Plainfield Sand	A
Sc	Scarboro Mucky Loam Fine Sand	A/D
Ur	Urban Land	A

2.0 WATER FACILITIES

2.1 Existing Water Facilities

There are existing 8” municipal water mains located at the west, south, and east road frontage of the lot, along Roundhouse Drive, Rail Drive and Bellew Avenue South. An 8” water service extends from the Bellew Avenue south water main to the southeastern corner of the building. There are five (5) hydrants located within the Bellew Avenue South, Rail Drive and Roundhouse Drive City rights of ways that provide fire protection for the property. The existing facility is sprinkler system equipped.

2.2 Proposed Water Facilities

No additional water utilities are proposed for this project.

3.0 SANITARY SEWER FACILITIES

3.1 Existing Sanitary Sewer Facilities

There are municipal sanitary sewer mains located within the Roundhouse Drive, Rail Drive, and Bellew Avenue South road right of ways that service the Industrial park. The Roth Industries facility is served by an existing 6” sanitary sewer lateral that exits the east side of the building and connects to the Bellew Avenue South sanitary sewer main.

3.2 Proposed Sanitary Sewer Facilities

No additional sanitary sewer utilities are proposed for this project.

4.0 STORMWATER FACILITIES

4.1 Existing Drainage

The existing manufacturing facility, asphalt parking and storage yard, and undeveloped vegetated lawn area at the east of the property all slope north to an existing infiltration basin located at the northwest portion of the storage yard. Runoff that enters the northern infiltration basin either infiltrates into the existing sandy soils or flows into a control structure and discharges east into a 24" SICPP storm pipe that connects to the Bellew Ave South municipal storm sewer. The southeastern truck access and loading dock area and the southwestern access drive and loading dock drain to the southern infiltration basin. Runoff into this basin either infiltrates into the existing sandy soils or overflows and discharges south into the city municipal storm sewer that crosses under Rail Drive. The infiltrations basins were constructed as part of the 2006 Roth Industries Building Addition project and expanded as part of the 2016 Roth Industries expansion project.

The existing site drainage and runoff conditions were analyzed utilizing the SCS. HydroCAD calculations can be found in Appendix #2. Runoff calculations were completed for the 1, 10, and 100 year, 24 hour storm events. Peak discharge from the 10 year, 24 hour, storm event has been utilized for design and discussion purposes. The pre-development 100-year site discharge is 1.45 CFS.

4.2 Proposed Drainage

The project includes the construction of two (2) building additions and extension of existing asphalt storage and parking lot. Drainage improvements associated with the two (2) proposed additions include regrading asphalt storage area to maintain positive drainage away from the building as well as the addition of roof downspouts on the building additions. The proposed roof downspouts will be connected to the existing roof drain system within the asphalt storage area. Runoff collected within the roof drains is piped into the northern stormwater infiltration basin. Both the north and south infiltration basins must be expanded to accommodate the increased runoff from the two (2) building additions and expanded asphalt storage areas.

The two (2) infiltration basins will be expanded to provide water quality treatment and quantity storage and attenuation of the 1, 10, and 100 year storm events for Drainage Area's DA 1 and DA 2, to less than that of the existing condition. HydroCAD calculations can be found in Appendix #2. Runoff calculations were completed for the 1, 10, and 100 year, 24 hour storm events. Peak discharge from the 100 year, 24 hour, storm event has been utilized for design and discussion purposes. The post-development 100-year site discharge is 0.72 CFS.

5.0 ROADS, DRIVES, TRAFFIC, AND PARKING

5.1 Existing Roads / Drives

The project site is accessed from three (3) access drives, the Bellew Avenue South drive to the east and two drives from Rail Drive to the south. The Bellew Avenue South access drive is used by workers and visitors to the office. The asphalt storage yard can also be accessed through the Bellew Avenue South drive. The southwestern connection to Rail Drive is utilized by delivery trucks to access the shipping area loading dock at the southwest portion of the building as well as the asphalt storage yard. The southeastern connection to Rail Drive is utilized by delivery trucks to access the receiving area loading docks at the southeast portion of the building.

5.2 Proposed Roads / Driveways

An additional driveway is proposed for the southwest loading dock. Currently, trucks and trailers have difficulty accessing the dock, sometimes forced to back down Rail Drive. The additional entrance and expanded maneuvering area will allow much easier access off Rail Drive and prevent any unnecessary maneuvering on the public road.

5.3 Traffic and Parking

The City of Watertown Zoning Laws do not have minimum or maximum parking requirements for the Industrial zoning district. The existing site has twenty (20) parking spaces and two (2) ADA accessible spaces. To accommodate the additional employees and visitors associated with the building additions, the parking area will be expanded to contain twenty-six (26) total spaces. The ADA spaces will also be reconfigured to meet accessibility requirements.

Trip generation calculations were performed utilizing data from the ITE Trip Generation Manual, 7th Edition. Trip generation was calculated for both the existing facility as well as the post-expansion facility. The Weekday AM Peak Hour for the existing building generates approximately 22 trips/hour entering and 5 trips/hour exiting while the post-construction building generates approximately 30 trips/hour entering and 8 trips/hour exiting. The Weekday PM Peak Hour for the existing building generates approximately 13 trips/hour entering and 15 trips/hour exiting while the post-construction building generates approximately 19 trips/hour entering and 20 trips/hour exiting. The Saturday Peak Hour for the existing building generates approximately 6 trips/hour entering and 5 trips/hour exiting while the post-construction building generates approximately 8 trips/hour entering and 8 trips/hour exiting.

6.0 PRIVATE UTILITIES

6.1 Gas, Electric, Telephone and Cable

Existing gas, electric and communication services are connected to the facility from Bellew Avenue South and will be extended through the existing facility as required into the three (3) building additions.

6.2 Proposed Gas, Electric, Telephone and Cable

No new gas, electric, telephone, and cable required for the site.

7.0 LIGHTING

7.1 Existing Site Lighting

The existing site lighting is provided by two (2) pole mounted lights located along the northern and eastern edge of the asphalt parking lot, and one (1) pole mounted light located north of the existing storage yard. Fifteen (15) building mounted lights are located around the existing building. Multiple streetlights on existing utility poles are located along Roundhouse Drive and Bellew Avenue South.

7.2 Proposed Site Lighting

Three (3) proposed building mounted LED wall pack cutoff light fixtures will be installed on the proposed building additions to replace those removed for the building additions. One (1) site light poles with LED cutoff light fixtures will be installed on the north side of the proposed asphalt storage area.

8.0 LANDSCAPING

8.1 Existing Landscaping

Existing landscape trees and shrubs are located along the eastern entrance and parking lot along Bellew Avenue South. Additional landscape trees are also located east of the building along Bellew Avenue South, and three (3) maple trees near the Bellew Avenue south and Rail Drive intersection. Two (2) oak and three maple are located south of the building along Rail Drive.

The entire perimeter of the asphalt storage area is enclosed by a chain link fence, with screens slats along the eastern side.

8.2 Proposed Landscaping

Six (6) large deciduous and evergreen trees are proposed along Roundhouse Drive to provide screening from the expanded asphalt storage areas. One (1) large deciduous tree is proposed along Bellew Ave South to provide screening from the expanded parking area.

Sincerely,

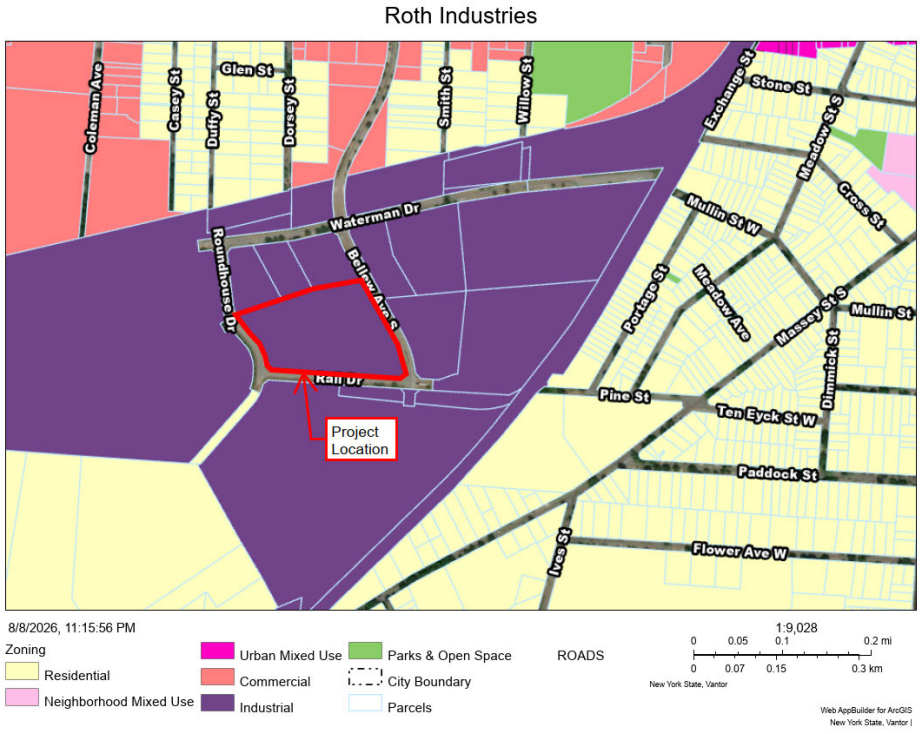
[redacted]

Aubertine and Currier Architects, Engineers & Land Surveyors, PLLC
522 Bradley Street Watertown, New York 13601 TELE: (315) 782-2005 FAX: (315) 782-1472

APPENDIX #1

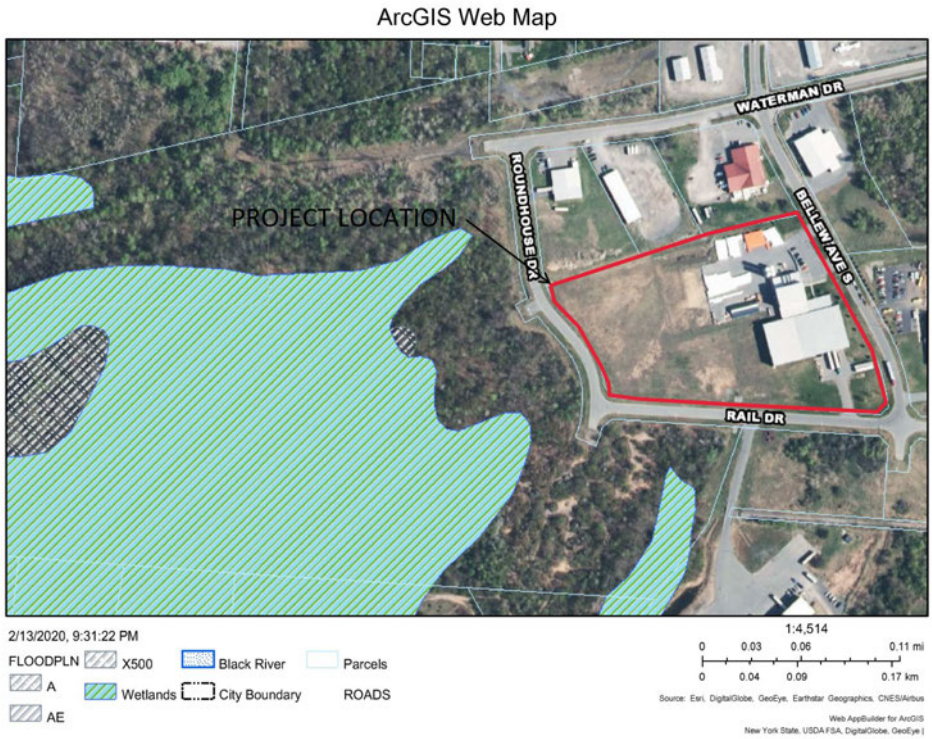


LOCATION MAP

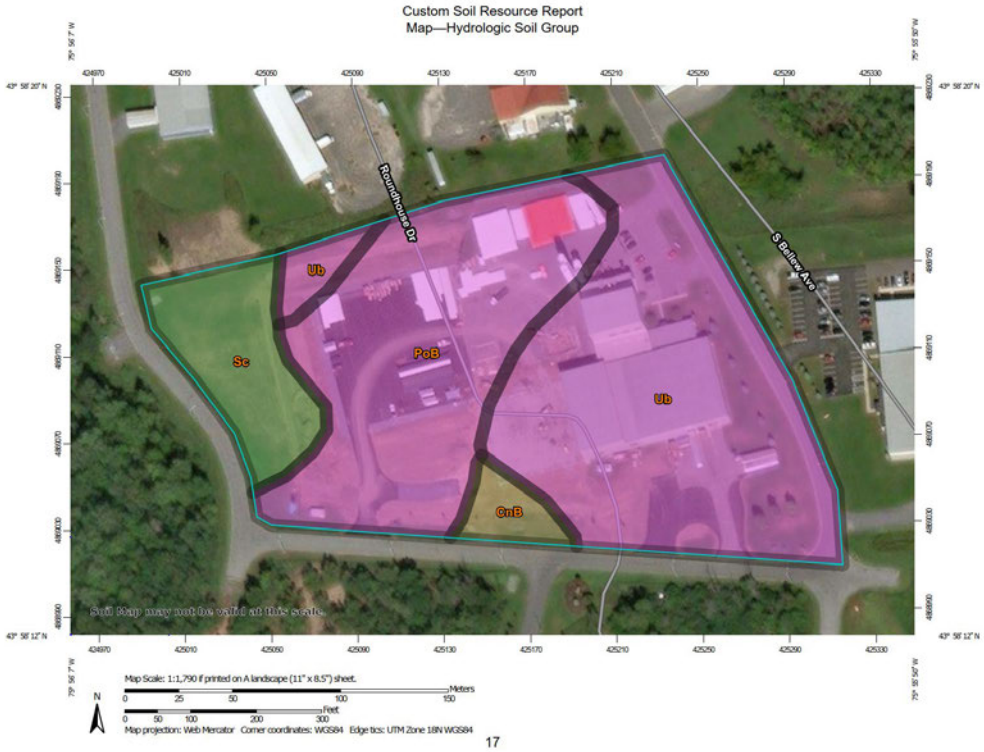


CITY OF WATERTOWN ZONING MAP

Aubertine and Currier Architects, Engineers & Land Surveyors, PLLC
522 Bradley Street Watertown, New York 13601 TELE: (315) 782-2005 FAX: (315) 782-1472



CITY OF WATERTOWN GIS FLOODPLAIN & WETLANDS MAP



SOILS MAP

Aubertine and Currier Architects, Engineers & Land Surveyors, PLLC
522 Bradley Street Watertown, New York 13601 TELE: (315) 782-2005 FAX: (315) 782-1472

Table—Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
CnB	Collamer silt loam, 3 to 8 percent slopes	C/D	0.3	3.1%
PoB	Plainfield sand, 0 to 8 percent slopes	A	3.8	37.0%
Sc	Scarboro mucky loamy fine sand	A/D	1.2	11.6%
Ub	Udorthents,smoothed	A	5.0	48.3%
Totals for Area of Interest			**10.3**	**100.0%**

Rating Options—Hydrologic Soil Group

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

SOILS DESCRIPTION

APPENDIX #2

HYDROLOGIC AND HYDRAULIC ANALYSIS

Aubertine and Currier Architects, Engineers & Land Surveyors, PLLC
522 Bradley Street Watertown, New York 13601 TELE: (315) 782-2005 FAX: (315) 782-1472

STORMWATER MANAGEMENT SUMMARY TABLE ROTH INDUSTRIES 2026 EXPANSION PROJECT		
Total Contributing Drainage Area:	8.86	acres
Acreage of Disturbance:	2.37	acres
Existing Impervious (Pre-Consturction):	2.63	acres
Proposed Impervious (Post-Construction):	5.93	acres
Existing Impervious (Undisturbed by Construction):	2.20	acres
New Impervious:	3.30	acres
WQ Volume Required:	0.140	ac-ft
WQ Volume Provided:	0.140	ac-ft
Min. Runoff Reduction Volume (RRv) Required:	0.060	ac-ft
Runoff Reduction Volume (RRv) Provided:	0.140	ac-ft
Channel Protection Volume Required:	0.324	ac-ft
Channel Protection Volume Provided:	0.434	ac-ft
Channel Protection Flow Max (Existing 1 yr):	0.00	cfs
Channel Protection Flow (Post 1 yr):	0.00	cfs
Overbank Flood Control Qp, max. (Existing 10 yr):	0.00	cfs
Overbank Flood Control Qp (Post 10 yr):	0.00	cfs
Total Extreme Flood Control Qf, max. (Existing 100 yr):	1.45	cfs
Total Extreme Flood Control Qf (Post 100 yr):	0.72	cfs
Preconstruction Impervious Area Percentage (Prior to Area Disconnection Practices):	25	%
Postconstruction Impervious Area Percentage (Prior to Area Disconnection Practices):	68	%

Version 1.1
Last Updated: 7/2/2013

Total Water Quality Volume Calculation
WQv(acre-feet) = [(P)(Rv)(A)] /12

Is this project subject to Chapter 10 of the NYS Design Manual (i.e. WQv is equal to post-development 1 year runoff volume)?.....	No

Design Point:	1	
P=	0.95	*inch*

Manually enter P, Total Area and Impervious Cover.

Breakdown of Subcatchments									
Catchment Number	Total Area *(Acres)*	Impervious Area *(Acres)*	Percent Impervious *%*	Rv	WQv *(ft^3)*	Description			
1	6.33	1.05	17%	0.20	4,347	Infiltration Basin			
2	2.53	0.47	19%	0.22	1,892	Infiltration Basin			
3									
4									
5									
6									
7									
8									
9									
10									
Subtotal (1-30)	8.86	1.52	17%	0.20	6,239	Subtotal 1			
Total	8.86	1.52	17%	0.20	6,239	Initial WQv	0.14	af	

Identify Runoff Reduction Techniques By Area			
Technique	Total Contributing Area *(Acre)*	Contributing Impervious Area *(Acre)*	Notes
Conservation of Natural Areas	0.00	0.00	*minimum 10,000 sf*
Riparian Buffers	0.00	0.00	*maximum contributing length 75 feet to 150 feet*
Filter Strips	0.00	0.00	
Tree Planting	6.33	1.05	*Up to 100 sf directly connected impervious area may be subtracted per*
Total	6.33	1.05	

Recalculate WQv after application of Area Reduction Techniques							
	Total Area *(Acres)*	Impervious Area *(Acres)*	Percent Impervious *%*	Runoff Coefficient Rv	WQv *(ft^3)*		
"<<Initial WQv"	8.86	1.52	17%	0.20	6,239		
Subtract Area	-6.33	-1.05					
WQv adjusted after Area Reductions	2.53	0.47	19%	0.22	1,892		
Disconnection of Rooftops		0.00					
Adjusted WQv after Area Reduction and Rooftop Disconnect	2.53	0.47	19%	0.22	1,892	0.04	af
WQv reduced by Area Reduction techniques					4,347	0.10	af

Minimum RRv

Enter the Soils Data for the site		
Soil Group	Acres	S
A	8.41	55%
B	0.00	40%
C	0.45	30%
D	0.00	20%
Total Area	8.86	
Calculate the Minimum RRv		
S =	0.54	
Impervious =	1.52	*acre*
Precipitation	0.95	*in*
Rv	0.95	
Minimum RRv	2,672	*ft3*
	0.06	af

Infiltration Basin Worksheet

Design Point:	1

Enter Site Data For Drainage Area to be Treated by Practice							
Catchment Number	Total Area *(Acres)*	Impervious Area *(Acres)*	Percent Impervious *%*	Rv	WQv *(ft^3)*	Precipitation *(in)*	Description
1	6.33	1.05	0.17	0.20	4347.18	0.95	Infiltration Basin
Enter Impervious Area Reduced by Disconnection of Rooftops		0.00	17%	0.20	4,347	<<WQv after adjusting for Disconnected Rooftops	
Enter the portion of the WQv that is not reduced for all practices routed to this practice.					0	*ft^3*	

Pretreatment Techniques to Prevent Clogging			
Infiltration Rate	50.00	*in/hour*	*Okay*
Pretreatment Sizing	100	*% WQv*	*25% minimum;* *50% if >2 in/hr* *100% if >5in/hour*
Pretreatment Required Volume	4,347	*ft^3*	
Pretreatment Provided	4,347	*ft^3*	
Pretreatment Techniques utilized	*Other*		

Size An Infiltration Basin			
Design Volume	4,347	*ft^3*	WQv
Basal Area Required	2,174	*ft^2*	*Infiltration practices shall be designed to exfiltrate the entire WQv through the floor of each practice.*
Basal Area Provided	7,241	*ft^2*	
Design Depth	2.00	*ft*	
Volume Provided	14,482	*ft^3*	*Storage Volume provided in infiltration basin area (not including pretreatment.*

Determine Runoff Reduction			
RRv	4,347	*ft^3*	*90% of the storage provided in the basin or WQv whichever is smaller*
Volume Treated	0	*ft^3*	*This is the portion of the WQv that is not reduced/infiltrated*
Sizing √	OK		*The infiltration basin must provide storage equal to or greater than the WQv of the contributing area.*

Infiltration Basin Worksheet

Design Point:	1

Enter Site Data For Drainage Area to be Treated by Practice							
Catchment Number	Total Area *(Acres)*	Impervious Area *(Acres)*	Percent Impervious *%*	Rv	WQv *(ft^3)*	Precipitation *(in)*	Description
2	2.53	0.47	0.19	0.22	1891.85	0.95	Infiltration Basin
Enter Impervious Area Reduced by Disconnection of Rooftops		0.00	19%	0.22	1,892	<<WQv after adjusting for Disconnected Rooftops	
Enter the portion of the WQv that is not reduced for all practices routed to this practice.					0	*ft^3*	

Pretreatment Techniques to Prevent Clogging			
Infiltration Rate	83.00	*in/hour*	*Okay*
Pretreatment Sizing	100	*% WQv*	*25% minimum;* *50% if >2 in/hr* *100% if >5in/hour*
Pretreatment Required Volume	1,892	*ft^3*	
Pretreatment Provided	1,892	*ft^3*	
Pretreatment Techniques utilized	*Other*		

Size An Infiltration Basin			
Design Volume	1,892	*ft^3*	WQv
Basal Area Required	631	*ft^2*	*Infiltration practices shall be designed to exfiltrate the entire WQv through the floor of each practice.*
Basal Area Provided	1,970	*ft^2*	
Design Depth	3.00	*ft*	
Volume Provided	5,910	*ft^3*	*Storage Volume provided in infiltration basin area (not including pretreatment.*

Determine Runoff Reduction			
RRv	1,892	*ft^3*	*90% of the storage provided in the basin or WQv whichever is smaller*
Volume Treated	0	*ft^3*	*This is the portion of the WQv that is not reduced/infiltrated*
Sizing √	OK		*The infiltration basin must provide storage equal to or greater than the WQv of the contributing area.*

Chapter 4: Unified Stormwater Sizing Criteria

Section 4.1 Introduction

This Chapter presents a unified approach for sizing runoff reduction techniques and standard SMPs to meet pollutant removal goals, reduce channel erosion, prevent overbank flooding, and help control extreme floods. For a summary, please consult **Table 4.1** below. The remaining sections describe the sizing criteria in detail and present guidance on how to properly compute and apply the required reduction and storage volumes. The Department has prepared worksheets to assist with these calculations that are available on our website: https://www.dec.ny.gov/index.html.

Table 4.1 New York Stormwater Sizing Criteria

Water Quality Volume (WQ_v)	90% Rule: WQ_v (acre-feet) = (P · Rv · A) / 12 Rv = 0.05+0.009(I) I = Impervious Cover (Percent) P(inches) = 90% Rainfall Event Number (See **Figure 4.1**) [2] A = Contributing Area (acres)
Runoff Reduction Volume (RRv)	RRv (acre-feet) = Reduction of the total WQ_v by application of runoff reduction techniques and standard SMPs with RRv capacity to replicate pre-development hydrology. The minimum required RRv is defined by the Specific Reduction Factor (S), provided objective technical justification is documented.
Channel Protection Volume (CPv)[1]	Default Criterion: CPv (acre-feet) = 24-hr extended detention of post-developed 1-year, 24-hr design storm; remaining after runoff reduction. Where site conditions allow, Runoff reduction of total CPv, is encouraged for Sites Larger than 50 Acres: Distributed Runoff Control - geomorphic assessment to determine the bank full channel characteristics and thresholds for channel stability and bedload movement.
Overbank Flood (Qp)[1]	Qp(cfs)=Control the peak discharge from the 10-year storm to 10-year pre-development rates.
Extreme Flood (Qf)[1]	Qf(cfs)=Control the peak discharge from the 100-year storm to 100-year pre-development rates. Safely pass the 100-year design storm.
Alternative method	Design, construct, and maintain systems sized to capture, reduce, reuse, treat, and manage rainfall on-site, and prevent the off-site discharge of the precipitation from all rainfall events less than or equal to the 95th percentile rainfall event, computed by an acceptable continuous simulation model.

[1]Channel protection, overbank flood, and extreme flood requirements may be waived in some instances if the conditions specified in this Chapter are met. For SMPs involving dams, follow **Appendix A**, Guidelines for Design of Dams for safe passage of the design flood.

[2]For required sizing criteria in redevelopment projects and phosphorus limited watersheds refer to **Chapter 9** and **Section 4.3**, respectively.

Section 4.2 Water Quality Volume (WQ_v)

The Water Quality Volume (WQ_v) is intended to improve water quality by capturing and treating runoff from small, frequent design storms that tend to contain higher pollutant levels. New York has defined the WQ_v as the volume of stormwater runoff, generated from the 90th percentile rain event (90% of all 24-hr design storms, in a given year), that shall be captured and treated by stormwater management practice(s). The WQ_v is directly related to the amount of impervious cover constructed at a site. Contour lines of the 90% rainfall event are presented in **Figure 4.1**. The minimum 90% rainfall value shall be 1.0 inch.

The following equation shall be used to determine the water quality storage volume WQ_v (in acre-feet of storage):

$$WQv = \frac{P \cdot R_v \cdot A}{12}$$

Where:

WQ_v = water quality volume (in acre-feet)

P = 90% Rainfall Event Number (see **Figure 4.1**)

R_v = 0.05 + 0.009(I), where I is percent impervious cover

A = contributing area (acres)

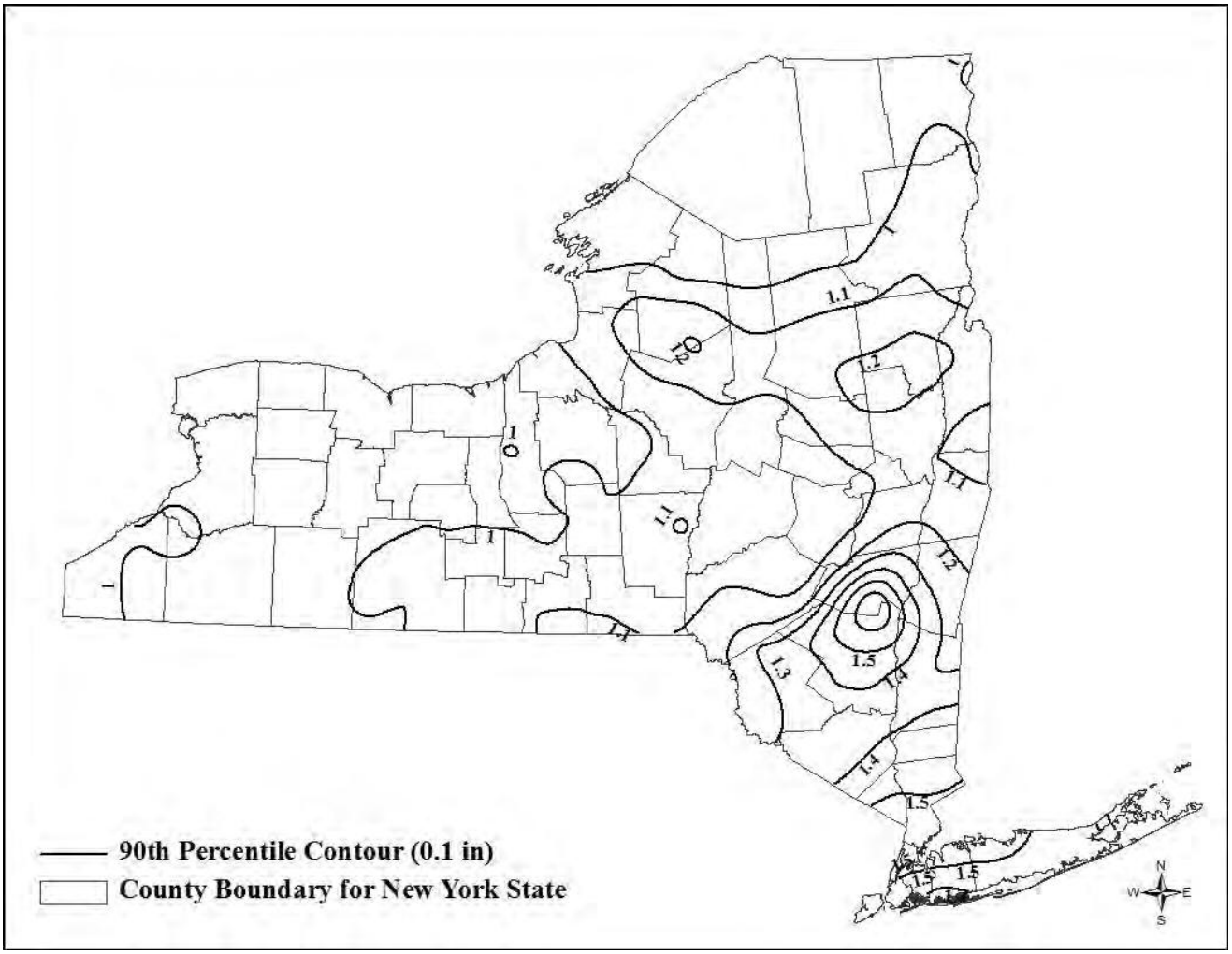


Figure 4.1 90th Percentile Rainfall in New York State (NYSDEC, 2013)

Basis of Design for Water Quality

As a basis for design, the following assumptions may be made:

Measuring Impervious Cover: the measured area of a site plan that does not have permanent vegetative or permeable cover shall be considered total impervious cover. Where site size makes direct measurement of impervious cover impractical, the land use/impervious cover relationships presented in **Table 4.2** can be used to initially estimate impervious cover. In site specific planning impervious cover must be calculated based the specific proposed impervious cover.

Table 4.2 Land Use and Impervious Cover
(Source: Cappiella and Brown, 2001)

Land Use Category	Mean Impervious Cover (%)
Agriculture	2
Open Urban Land*	9
2 Acre Lot Residential	11
1 Acre Lot Residential	14
1/2 Acre Lot Residential	21
1/4Acre Lot Residential	28
1/8 Acre Lot Residential	33
Townhome Residential	41
Multifamily Residential	44
Institutional**	28-41
Light Industrial	48-59
Commercial	68-76

* Open urban land includes developed park land, recreation areas, golf courses, & cemeteries.

** Institutional is defined as places of worship, schools, hospitals, government offices, & police and fire stations.

- *Aquatic Resources:* More stringent local regulations may be in place or may be required to protect drinking water reservoirs, lakes, or other sensitive aquatic resources. Consult the local authority to determine the full requirements for these resources.
- *SMP Treatment:* The final WQ_v, remaining after application of runoff reduction sizing criterion, shall be treated by an acceptable practice from the list presented in this manual. Please consult **Chapter 3** for a list of acceptable practices.
- *Determining Peak Discharge for WQ_v Storm:* When designing flow splitters for off-line practices, consult the small storm hydrology method provided in **Chapter 9.**
- *Extended Detention for Water Quality Volume:* The water quality requirement for storage systems can be met by providing 24-hrs of the WQ_v (provided a micropool is specified) extended detention. A local jurisdiction may reduce this requirement to as little as 12-hrs in trout waters to prevent stream warming.
- *Off-site Areas:* Where off-site areas will drain to the SMP, calculate imperviousness of the off-site contributing drainage area based on its current condition. If water quality treatment is provided off-line, the practice must only treat on-site runoff.

Section 4.3 Water Quality Volume (WQ_v) for Enhanced Phosphorus Removal Watersheds

For watersheds requiring enhanced phosphorus removal, the WQ_v shall be sized to capture and treat the 1-yr 24-hr design storm. Refer to **Chapter 10** for additional information regarding pollutants of concern. The following equation shall be used to determine the water quality storage volume WQ_v (in acre-feet of storage):

$$WQv = \frac{P_1 \cdot R_v \cdot A}{12}$$

Where:

WQ_v = water quality volume (in acre-feet)

P_1 = 1-yr 24-hr design storm (inches)

R_v = 0.05 + 0.009(I), where I is percent impervious cover

A = Contributing area (acres)

Section 4.4 Runoff Reduction Volume (RRv)

Runoff reduction shall be achieved by infiltration, groundwater recharge, reuse, recycle, evaporation/evapotranspiration of 100 percent of the post-development water quality volume. The goal of runoff reduction is to replicate pre-development hydrology by maintaining pre-construction infiltration, peak runoff flow, and discharge volume, as well as minimizing concentrated flow, by application of practices that provide source control treatment in a distributed manner before runoff reaches the collection system. This requirement shall be accomplished by application of on-site runoff reduction techniques and/or standard SMPs with runoff reduction capacity.

Runoff reduction volume (RRv) shall be calculated using one of the following methods:

- Area reduction (contributing area or contributing impervious area) in WQ_v computation (as defined in **Chapter 5**)
- Volume reduction using runoff reduction techniques (as defined in **Chapter 3, Table 3.6**)
- Volume reduction using standard SMPs with runoff reduction capacity (as defined in **Chapter 3, Table 3.7**)

For practices with underdrains that require sizing the surface area of the filter bed using Darcy's Law, the designer can elect to oversize the surface area of the filter bed to provide additional storage volume and receive additional RRv credit up to 100% of the WQv required. The total RRv credit shall be the percentage, as noted in **Tables 3.6 and 3.7**, applied to the storage volume provided. The storage volume provided shall be considered the volume within the filter media and the volume of ponding occurring during the WQv event.

Volume reduction practices can be designed in series to meet the RRv requirement if the following criteria are met.

- The first practice in series is sized to capture and treat a portion of the tributary required WQv.
- The first practice shall be designed with an appropriate overflow to convey runoff above the partial WQv to the next practice in series.
- The second practice in series must be designed to capture and treat the untreated WQv from the first practice, as well as any additional required WQv from other tributary subcatchments.
- If the above criteria are met, credit can be taken for the portion of the required WQv that is treated by the first practice. In addition, credit can be taken for RRv, within the first practice, based on the practice's RRv capacity and applied to the portion of WQv provided. For the second practice in series, both RRv and WQv credit can be taken based on the full tributary WQv and practice RRv capacity.

Projects that cannot meet 100% of the runoff reduction requirement, due to site limitations that prevent the use of an infiltration practice and/or infiltration of the total WQ_v, shall identify the specific site limitations in the SWPPP. Typical site limitations include: seasonal high water table, shallow depth to bedrock, and soils with an infiltration rate less than 0.5 in/hr.

In no case shall the runoff reduction achieved from the newly constructed impervious areas be less than the minimum runoff reduction volume (RRv_{min}) determined by the following equation:

$$RRv_{min} = \frac{P \cdot R_v \cdot Aic \cdot S}{12}$$

Where:

P = 90% Rainfall Event Number (see **Figure 4.1**)

RRv_{min} = Minimum runoff reduction volume required from impervious area (acre-ft)

R_v = 0.05+0.009(I) where I is 100% impervious

Aic = Total area of new impervious cover

S = Hydrologic Soil Group (HSG) Specific Reduction Factor (*S*)

The specific reduction factor (S) is based on the HSGs present at a site. The following lists the specific reduction factors for the HSGs:

- HSG A = 0.55
- HSG B = 0.40
- HSG C = 0.30
- HSG D = 0.20

Runoff reduction techniques are intended to be applied for source control treatment. As such, multiple runoff reduction techniques may be utilized on a site to maximize storage volume and achieve greater reduction. However, reduction cannot be claimed twice for an identical area of the site (e.g., claiming the stream buffers and disconnecting rooftops over the same site area).

Section 4.5 Runoff Reduction Volume (RRv) for Enhanced Phosphorus Removal Watersheds

For watersheds requiring enhanced phosphorus removal, runoff reduction shall apply the WQv resulting from the 1-yr 24-hr design storm, as calculated in **Section 4.3**. Similarly, the minimum RRv is calculated using the 1-yr 24-hr design storm and Specified Reduction Factors outlined in **Section 4.4**.

Section 4.6 Stream Channel Protection Volume Requirements (CPv)

Stream Channel Protection Volume Requirements (CPv) are designed to protect stream channels from erosion. This goal is accomplished by providing 24-hr extended detention of the 1-year, 24-hr design storm, that remains after runoff reduction.

Meeting stream channel protection objectives through runoff reduction is encouraged and the volume reduction achieved through runoff reduction techniques and/or standard SMPs with RRv capacity can be deducted from CPv. Trout waters may be exempt from the 24-hr extended detention requirement, requiring only 12 hrs of extended detention, when there is a direct discharge to the trout water. Detention time shall be calculated using either the center of mass method or plug flow calculation method.

For developments greater than 50 acres, with impervious cover greater than 25%, it is recommended that a detailed geomorphic assessment be performed to determine the appropriate level of control. **Appendix I** provides guidance on how to conduct this assessment.

Detention ponds or underground detention systems and vaults are methods to meet the CPv requirement (and subsequent Qp and Qf criteria). Note that, although these practices meet water quantity goals, they are unacceptable for water quality because of poor pollutant removal and need to be coupled with a practice listed in **Table 3.2** and **Table 3.3**. The CPv requirement may also be provided above the water quality (WQ_v) storage in a wet pond or stormwater wetland.

Basis for Determining Channel Protection Storage Volume

The following represent the minimum basis for design:

- TR-55 and TR-20 (or approved equivalent) shall be used to determine peak discharge rates.

- Rainfall data and distribution curves shall be established for the 1-year 24-hr design storm, using the process outlined in **Section 4.9.**
- When the pre-development land use is agriculture, the curve number for the pre-developed condition shall be taken as “meadow”.
- Off-site areas shall be modeled as "present condition".
- The length of sheet flow used in T_c calculations is limited to no more than 150 ft for pre-development conditions and no more than 100 ft for post-development conditions. On areas of extremely flat terrain (<1% average slope), this maximum distance is extended to 250 ft for pre-development conditions and 150 ft for post-development conditions. If the start of a T_c flow path is unchanged (undisturbed) from pre- to post-development conditions, then the sheet flow length shall be identical.
- The CPv storage volume shall be computed using one of the following methods:
  - Center-of-mass detention time: time difference between the center of mass of the inflow hydrograph (entering the SMP) and the center of mass of the outflow hydrograph (leaving the SMP).
  - Plug flow detention time: theoretical average detention time.
- When CPv is required, the storage volume must be provided. Where a CPv control orifice is provided, the minimum orifice size shall be 3 inches, with acceptable external trash rack or orifice protection (See **Appendix C** for details of a low flow orifice and trash rack options).
- CPv shall be addressed for the entire site. If a site consists of multiple design points, CPv shall be determined and provided for each design point.
- Extended detention storage provided for the CPv does not meet the WQv requirement (that is CPv and WQv shall be treated separately). However, both water quality and channel protection storage may be provided in the same SMP.

The Channel Protection Requirements may be waived if:

- Reduction of the entire CPv is achieved at a site through runoff reduction or infiltration systems.
- CPv is not required at sites where the 1-year post-development peak discharge is less than or equal to 2.0 cfs without detention or velocity controls.
- The site directly discharges into a fifth order or larger water body (streams, rivers, or lakes) or tidal waters, where the increase in smaller flows will not impact the stream bank or channel integrity. However, the point of discharge must be adequately protected against scour and erosion by the increased peak discharge.

Streams are classified using the New York State Codes Rules and Regulations (NYCRR), Volumes B-F, Parts 800-941. However, this classification system does not provide a numeric stream order. The methodology identified in this Manual is consistence with Strahler-Horton methodology. For an example of stream order identification see **Section 4.12**.

Section 4.7 Overbank Flood Control Criteria (Qp)

The primary purpose of the overbank flood control sizing criterion is to prevent an increase in the frequency and magnitude of out-of-bank flooding generated by urban development (i.e., flow events that exceed the bank full capacity of the channel, and therefore must spill over into the floodplain).

Basis for Design of Overbank Flood Control

When addressing the overbank flooding design criteria, the following represent the minimum basis for design:

- TR-55 and TR-20 (or approved equivalent) will be used to determine peak discharge rates.
- Rainfall data and distribution curves shall be established for the 10-year 24-hr design storm, using the process outlined in **Section 4.9.**

- When the pre-development land use is agriculture, the curve number for the pre-developed condition shall be taken as “meadow”.
- Off-site areas shall be modeled as "present condition" for the 10-year design storm.
- The length of sheet flow used in T_c calculations is limited to no more than 150 ft for pre-development conditions and no more than 100 ft for post-development conditions. On areas of extremely flat terrain (<1% average slope), this maximum distance is extended to 250 ft for pre-development conditions and 150 ft for post-development conditions. If the start of T_c flow path is unchanged (undisturbed) from pre- to post-development conditions, then the sheet flow length shall be identical.
- Overbank Flood Control shall be addressed for the entire site. If a site consists of multiple design points, Overbank Flood Control shall be determined and provided for each design point.

Overbank Flood Control requires storage to attenuate the post-development 10-year, 24-hr peak discharge rate (Qp) to pre-development rates.

The Overbank Flood Control requirement may be waived if:

- The site directly discharges into a fifth order or larger water body (streams, rivers, or lakes) or tidal waters, where the increase in smaller flows will not impact the stream bank or channel integrity. However, the point of discharge must be adequately protected against scour and erosion by the increased peak discharge. Refer to **Section 4.12** for instructions.
- A downstream analysis reveals that overbank control is not needed (see **Section 4.13**).

Section 4.8 Extreme Flood Control Criteria (Qf)

The intent of the extreme flood criteria is to (a) prevent the increased risk of flood damage from large design storms, (b) maintain the boundaries of the pre-development 100-year floodplain, and (c) protect the physical integrity of stormwater management practices.

Basis of Design for Extreme Flood Control Criteria

When addressing the extreme flood design criteria, the following represent the minimum basis for design:

- TR-55 and TR-20 (or approved equivalent) will be used to determine peak discharge rates.
- Rainfall data and distribution curves shall be established for the 100-year 24-hr design storm, using the process outlined in **Section 4.9.**
- When the pre-development land use is agriculture, the curve number for the pre-developed condition shall be taken as “meadow”.
- Off-site areas shall be modeled as "present condition" for the 100-year design storm.
- The length of sheet flow used in T_c calculations is limited to no more than 150 ft for pre-development conditions and no more than 100 ft for post-development conditions. On areas of extremely flat terrain (<1% average slope), this maximum distance is extended to 250 ft for pre-development conditions and 150 ft for post-development conditions. If the start of T_c flow path is unchanged (undisturbed) from pre- to post-development conditions, then the sheet flow length shall be identical.
- Extreme Flood Control shall be addressed for the entire site. If a site consists of multiple design points, Extreme Flood Control shall be determined and provided for each design point.

Extreme Flood Control requires storage to attenuate the post-development 100-year, 24-hr peak discharge rate (Qf) to pre-development rates.

The Extreme Flood Control requirement may be waived if:

- The site directly discharges into a fifth order or larger water body (streams, rivers, or lakes) or tidal waters, where the increase in smaller flows will not impact the stream bank or channel integrity. However, the point of discharge

must be adequately protected against scour and erosion by the increased peak discharge. Refer to **Section 4.12** for instructions.

- A downstream analysis reveals that 100-year control is not needed (see **Section 4.13**)

Section 4.9 Rainfall Data, Distribution Curves and Hydrologic Modeling

Rainfall distribution curves are developed from rainfall data and describe how a storm's total rainfall amount will be distributed over a specific length of time, such as 24 hours. It is based on historic rainfall values, over a wide range of time intervals, for various frequency storms. Properly calculated rainfall distribution curves are critical when evaluating the hydrologic character of a drainage area and when sizing hydraulic structures. Pre- and post-development models should use the same precipitation data source.

Rainfall data for the Stream Channel Protection Volume, Overbank Flood Control and Extreme Flood Control design storms shall be taken from:

- NRCC and NRCS joint collaborative website (http://precip.eas.cornell.edu); or
- National Oceanic and Atmospheric Administration (NOAA) Precipitation Frequency Data Server (PFDS) (https://hdsc.nws.noaa.gov/hdsc/pfds/).

Hydraulic and hydrologic modeling software, such as USDA NRCS TR20, HydroCAD, Pond Pack, StormCAD, Hydraflow, and Hydrologic Engineering Center Hydrologic Modeling System (HEC-HMS) and others, shall be used to extract rainfall frequency and duration data, for the project location, to create intensity-duration-frequency (IDF) curves, and then convert into rainfall distribution curves.

The following provides the step-by-step process to generate rainfall distribution curves using the NRCC and NRCS website and HydroCAD. This process is similar for both rainfall data sources listed above.

1. Go to the NRCC and NRCS website and select the tab "Data and Products.
2. Use the location map to zoom into the project site. If the marker is not located on the project site, double click on the map to relocate the marker.
3. From the Products list, select "Extreme Precipitation Tables – Text/CSV". At the bottom of the page, set smoothing to "No", then click "Submit".
4. Select "Save As", navigate to the project folder. Rename the file starting with NY- (example: NY-Cicero.txt) and save the file into you project folder. The NY- in the project name is required in order for HydroCAD to place the IDF file in the correct location.
5. Once the file is in the project folder, rename the file to change the ".txt" extension to a ".hci" extension (example: NY-Cicero.hci). This ".hci" extension is required in order for HydroCAD to recognize this as an IDF file.
6. Open or create a model using HydroCAD in the project folder where the IDF file, created above, is located.
7. From the "Settings" drop down select "Calculations", pick the "Rainfall" tab. Click on the "Import Events From…" and select "IDF file". The ".hci" file, saved previously, should be listed in the "Rainfall IDF File:" drop down under the "NY-" tab.
8. Click "View IDF".
9. Click "More IDF data".
10. Select "Convert" tab and under "Rainfall IDF File" select the correct IDF file.
11. Click "Create Mass Curves". Click "OK" to close out of all menus. If prompted click "yes" to overwrite all storm events.
12. From the "Settings" drop down select "Calculations", pick the "Rainfall" tab. In the "Storm Type" drop down navigate to the "NY-" tab and select the newly created mass curve file.
13. If prompted click "yes" to overwrite all storm events. Rainfall data, using the newly created mass curve file, should auto populate into the rainfall data settings.

Section 4.10 Alternative Method

New development causes changes to runoff volume, flow rates, timing of runoff and, most importantly, habitat destruction and degradation of the physical and chemical quality of the receiving waterbody. Traditionally, TR-55 and TR-20 (or approved equivalent) are used for evaluation of hydrology and sizing of stormwater management practices. With an increasing need for assessment of the long-term effects of development and maintenance of pre-development hydrology, continuous simulation modeling is an effective alternative method for analysis and evaluation of flow-duration, downstream quality, quantity, biological, and hydro-habitat sustainability.

Continuous simulation models utilize historical precipitation records for estimating runoff volumes, duration, and pollutant loading. This method allows for examination of a watershed parameters' response to long term effects of design storms, instead of the response to a site level single theoretical design storm provided by single event-based models. Calculation of WQ_v using continuous simulation modeling accounts for infiltration, evapotranspiration, depression storage, and system storage, which allows a detailed and objective comparison of alternative treatments to determine if watershed characteristics are maintained by those treatments. Consequently, continuous simulation modeling allows for simulation of runoff reduction techniques and performance of flow duration analyses. An objective application of a continuous simulation model involves a calibrated model for a watershed on interest and incorporation of regional goals.

The following lists the guidelines for the design of stormwater management systems using a continuous simulation model:

- Design, construct, and maintain systems sized to capture, reduce, reuse, treat, and manage rainfall on-site, and prevent the off-site discharge of the precipitation from all rainfall events less than or equal to the 95th percentile rainfall event.
- The 95th percentile rainfall event is the event whose precipitation total is greater than or equal to 95 percent of all design storms over a given period of record.
- A minimum period of 20 years precipitation records is required to determine the 95^{th} percentile storm and derive the corresponding design storm.
- Select a practice(s) that provides infiltration, evapotranspiration, reuse, or recycle of this volume.
- 100% of the volume of water from storms less than or equal to the 95th percentile event shall not be discharged to surface water.
- Perform an analysis that shows post-construction flow-duration, shape of the hydrograph, and downstream quality and quantity does not exceed pre-construction hydrology.
- Site evaluation and soils analysis must conform to the standards provided in this Manual.
- The stormwater management practices employed must conform to the standards provided in this Manual.

Some examples of continuous simulation modeling tools include:

Stormwater Management Model (SWMM)

is an EPA supported urban runoff hydrology, hydraulics, and runoff quality model with detailed design tools capable of flow routing and storage for surface, sub-surface, stormwater and combined sewer overflow conveyance and groundwater systems, as well as determining the treatment capacity of stormwater management practices. Various applications of SWMM have utilized the detailed features of this model for simulating runoff reduction design features.

Source Loading and Management Model for Windows (WinSLAMM)

is a mid-range empirical model for evaluation of stormwater runoff loading in urban watersheds. This modeling tool uses small storm hydrology methods and calculates the runoff from historical precipitation data for a given period of time, pollutant loading from various land uses, and allows the user to simulate the stormwater load reduction effected by incorporating control devices. The stormwater management practices provided in WinSLAMM include several SMPs, runoff reduction design details and maintenance BMPs.

Hydrologic Simulation Program Fortran (HSPF)

is an EPA supported program for simulation of watershed hydrology and water quality. The HSPF model uses information such as the time history of rainfall, temperature, soil, land surface such as land cover and land-use patterns; and land

management practices to simulate the processes that occur in a watershed. The result of this simulation is a time history of the quantity and quality of runoff from an urban or agricultural watershed. The model also predicts flow rate, sediment load, and nutrient concentrations.

A successful example of the use of HSPF for stormwater applications is the Western Washington Hydrologic Model (WWHM). Similar adaptation of the models for applications in New York State will require several verifications such as validation of input variables, accurate precipitation data, and calibration of the model.

Section 4.11 Conveyance Criteria

In addition to the stormwater treatment volumes described above, this manual also provides guidance on safe and non-erosive conveyance to, from, and through SMPs. Typically, the targeted storm frequencies for safe conveyance to SMPs are the 2-year and 10-year design storms. The 2-year design storm is used to ensure non-erosive flows through roadside swales, overflow channels, over berms within practices. Rainfall depths for the 2-year, 24-hr design storm throughout New York State shall be taken from the NRCC and NRCS joint collaborative website or NOAA - Atlas 14, as outlined in **Section 4.9**.

The 10-year design storm is typically used as a target sizing for outfalls, and as a safe conveyance criterion for open channel practices and overflow channels. The 10-year design storm is recommended as a minimum sizing criterion for closed conveyance systems. Note that some agencies or municipalities may use a different design storm for this purpose.

Section 4.12 Stream Order Identification

This section provides an example to help identify stream order based on Strahler-Horton Method. A network of streams drain each watershed. Streams can be classified according to their order in that network. A stream that has no tributaries or branches is defined as a first-order stream. When two first-order streams combine, a second-order stream is created, and so on. **Figure 4.2** illustrates the stream order concept (Schueler, T. 1995).

Evaluation of stream order must be performed using the Watershed Assessment, Tracking and Environmental Results System (WATERS) GeoViewer to determine if quantity controls do not apply. WATERS was developed by the USEPA and utilizes data from the National Hydrography Dataset Plus (NHDPlus). NHDPlus is an integrated suite of geospatial datasets that incorporate features of the National Hydrography Dataset (NHD) and the National Elevation Dataset (NED) at 1:100K scale. This application-ready data set is an outcome of a multi-agency effort aimed at developing many useful variables for water quality and quantity evaluation including stream order. Use the link below to access the WATERS GeoViewer.

Link: https://epa.maps.arcgis.com/apps/webappviewer/index.html?id=ada349b90c26496ea52aab66a092593b

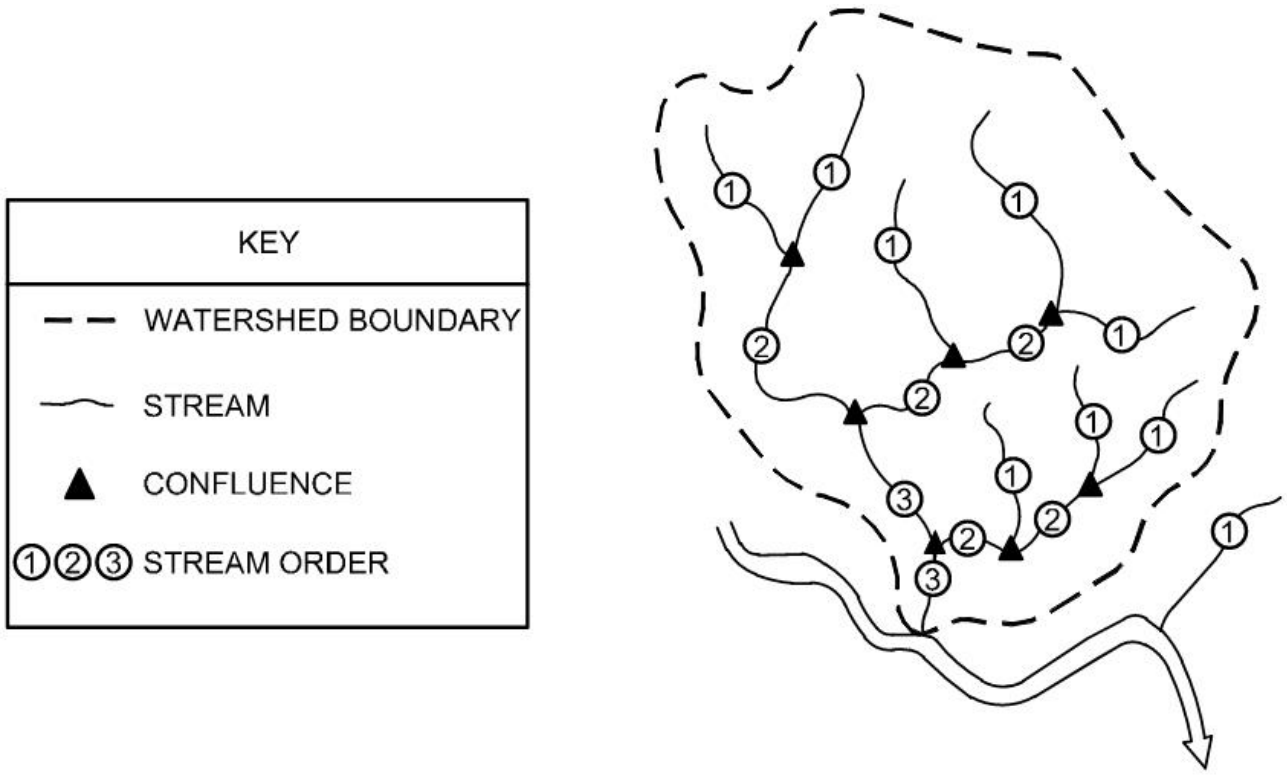


Figure 4.2 A Network of Headwater and Third-order Streams (Source: Schueler, 1995)

Section 4.13 Downstream Analysis

Overbank, and extreme flood requirements may be waived based on the results of a downstream analysis. However, all local overbank and extreme flood requirements must be met regardless of the analysis. In addition, such an analysis for overbank and extreme flood control is recommended for larger sites (i.e., greater than 50 acres) to size facilities in the context of a larger watershed. The analysis will help ensure that storage provided at a site is appropriate when combined with upstream and downstream flows. For example, detention at a site may in some instances exacerbate flooding problems within a watershed. This section provides brief guidance for conducting this analysis, including the specific points along the downstream channel to be evaluated and minimum elements to be included in the analysis.

Downstream analysis can be conducted using the 10% rule, meaning the analysis should extend from the point of discharge downstream to the point on the stream where the site represents 10% of the total drainage area. For example, the analysis points for a 10-acre area would include points on the stream from the points of discharge to the nearest downstream point with a drainage area of 100 acres. The required elements of the downstream analysis are as follows:

- Compute pre-development and post-development peak flows and velocities for design storms (e.g., 10-year and 100-year), at all downstream confluences with first order or higher streams up to and including the point where the 10% rule is met. These analyses shall include scenarios both with and without stormwater treatment practices in place, where applicable.
- Evaluate hydrologic and hydraulic effects of all culverts and/or obstructions within the downstream channel.
- Assess water surface elevations to determine if an increase in water surface elevations will impact existing buildings and other structures.

Alternatively, if a regional H&H model is implemented and approved by a municipality or regional entity, this model can be used to complete the downstream analysis.

The design, or exemption, at a site level can be approved if both of the following criteria are met:

- Peak flow rates increase by less than 5% of the pre-developed condition for the design storm (e.g., 10-year or 100-year)
- No downstream structures or buildings are impacted.

Section 4.14 Stormwater Hotspots

Stormwater Hotspots are defined as areas where land use or activities generate highly contaminated runoff, with concentrations of pollutants in excess of those typically found in stormwater. These areas can include commercial, industrial, institutional, municipal, or transportation activities that, in addition to generating higher concentrations of pollutants, can present a higher risk for spills, leaks or illicit discharges. If a site is designated as a hotspot, a range of stormwater treatment and pollution prevention measures shall be applied to protect surface waters and groundwater.

When a development or redevelopment project includes an activity that is designated as a stormwater hotspot, consideration shall be taken to isolate the hotspot from the remaining watershed. To achieve isolation of a stormwater hotspot, the following criteria shall be met:

- Upgradient flow shall be diverted around the hotspot area and shall be conveyed to a separate stormwater practice (if treatment is required).
- The hotspot area shall be captured at the source and conveyed to a suitable stormwater practice.
- All tributary area that is conveyed to the stormwater practice treating the hotspot area, shall be subject to the same treatment requirements as the hotspot.

Table 4.3 provides a list of designated stormwater hotspots for the State of New York. The table looks at the illicit discharge potential of each of the activities listed. The potential for an activity to produce an illicit discharge is rated as either high, medium or low. This rating is based on the likelihood that is has a direct connection to a storm drain system (closed system) or that it can produce a transitory discharge (overland flow). These activities are further categorized as:

- Level 1: Hotspots with anticipated moderate pollutant concentration. Application of infiltration practices shall be restricted to provide two treatment practices in series (i.e. non-infiltration standard SMP, followed by an infiltration practice), both of which are sized to treat the entire WQv. Credit for RRv and WQv treated cannot be taken for the first practice in series.
- Level 2: Hotspots with anticipated severe pollutant concentrations. Application of infiltration practices is prohibited, and non-infiltration practices shall be applied to meet the RRv criteria.

It shall be noted that large highways (average daily traffic (ADT) volume greater than 25,000) are not designated as stormwater hotspots. However, based on the potential for contaminants within stormwater runoff as ADT increases, it is important to ensure that highway stormwater management plans adequately protect groundwater.

Not all practices are suitable for treatment of stormwater hotspots. In addition, the design of some practices may need modification to accommodate higher concentrations of pollutants. Refer to **Chapters 5** and **6** for practice suitability and design modifications to treat stormwater hotspots.

Table 4.3 Designated Stormwater Hotspots

Activities		Illicit Discharge Potential		Level 1 (Infiltration Restricted)	Level 2 (Infiltration Prohibited)
		Closed System	Overland Flow		
Industrial activities that are eligible for coverage under the Multi-Sector General Permit for Stormwater Discharges Associated with Industrial Activities (MSGP) [1]	Industrial activities subject to effluent limitation guidelines	Medium	High		✓
	Industrial activities within Sectors C, J, L or U that are located within watersheds requiring enhanced phosphorus removal	Medium	High		✓
	All other industrial activities	Medium	Medium	✓	
Fueling stations		Medium	High		✓
Petroleum storage facilities		High	High		✓
Uncovered vehicle, aircraft, boat, and heavy equipment maintenance facilities		Low	Medium	✓	
Uncovered vehicle, aircraft, boat, and heavy equipment cleaning facilities		Low	Low	✓	
Uncovered vehicle, aircraft, boat, and heavy equipment storage areas		Low	Medium	✓	
Uncovered loading/unloading facilities and recessed loading areas		Low	Medium	✓	
Public works yard with salt storage		Medium	High		✓
Public works yard without salt storage		Medium	Medium	✓	
Facilities that generate or store hazardous materials		Low	High		✓
Wastewater treatment/disposal, solid waste, and composting facilities		Low	High		✓
Nurseries/garden centers		Low	Medium	✓	

[1]At a minimum, infiltration shall be restricted for all industrial activities within the MSGP. However, certain activities with greater pollutant thresholds may prohibit the use of infiltration

Chapter 6: Standard Stormwater Management Practices

This Chapter outlines performance criteria for five groups of standard stormwater management practices (SMPs) to meet water quality treatment goals. These include ponds, wetlands, infiltration practices, filtering practices and open channel systems. Each group of SMPs have six performance criteria:

1. *Feasibility:* Identify site considerations that may restrict use of a practice.
2. *Conveyance:* Convey runoff to and from the practice in a manner that is safe, minimizes erosion, maximizes pretreatment, mimics existing hydrology to the greatest extent practical, and prevents disruption to natural channels. Convey runoff through the practice in a manner that promotes maximum treatment, and detention/infiltration.
3. *Pretreatment:* Trap coarse sediments and debris before they enter the practice, to reduce the maintenance burden and ensure long-term performance of the practice.
4. *Treatment:* Provide water quality treatment through design elements that maximize pollutant removal.
5. *Landscaping:* Reduce secondary environmental impacts through landscaping design that minimizes disturbance of natural stream systems, complies with environmental regulations, and enhances the pollutant removal and aesthetic value of the practice. For planting guidance for stormwater management facilities, refer to **Chapter 11**.
6. *Maintenance:* Preserve the long-term performance of a practice through regular inspection and maintenance activities, as well as design elements that ease the maintenance burden. Refer to **Chapter 12** for guidance on inspection and maintenance activities.

IMPORTANT NOTES:

1. THIS CHAPTER PRESENTS REQUIRED PERFORMANCE CRITERIA BY USE OF DEFINITIVE LANGUAGE LIKE “SHALL” OR “MUST,” WHICH MEANS THAT THOSE CRITERIA SHALL BE USED IN ALL APPLICATIONS.
2. FACT SHEETS FOR EACH DESIGN VARIANT WITHIN THE FIVE SMP GROUPS ARE PRESENTED AT THE END OF EACH SECTION AND SUMMARIZE THE KEY PERFORMANCE CRITERIA FOR EACH PRACTICE. THESE FACT SHEETS ARE FOR REFERENCE AND MAY NOT BE INCLUSIVE OF ALL REQUIREMENTS.
3. ANY PRACTICE THAT CREATES A DAM IS REQUIRED TO FOLLOW THE GUIDANCE PRESENTED IN THE *GUIDELINES FOR DESIGN OF DAMS* (**APPENDIX A**) AND MAY REQUIRE A PERMIT FROM THE NYSDEC. FOR THE MOST RECENT COPY OF THIS DOCUMENT, CONTACT THE NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION, DAM SAFETY SECTION. AN EVALUATION OF HAZARD CLASSIFICATION MUST BE INCLUDED IN THE DESIGN REPORT FOR STORMWATER PONDS OR WETLANDS CREATED BY A DAM.

The following table allows designers to evaluate each standard SMP and determine which practice(s) are feasible for application to a specific site. Feasibility is based on thresholds that shall be met for four key site conditions:

1. *Soil Permeability*: This column outlines the permeability requirements for underlying soils at the location of a proposed SMP. The designer should perform an initial investigation of the NRCS hydrologic soil groups at the site to determine soil characteristics. Please note that more detailed geotechnical tests are usually required, in accordance with **Appendix D**.
2. *Depth to Seasonal High Water Table*: This column indicates the minimum depth to the seasonally high water table from the bottom elevation of the SMP section.
3. *Contributing Area*: This column indicates the minimum or maximum contributing area that is considered optimal for a practice. The minimum contributing area shall not be reduced, and the maximum shall not be increased, except where specific design criteria are met or additional engineering analysis is performed to support an adjusted area.
4. *Max Site Slope*: This column indicates the preferred maximum slope of the area proposed for installation of a practice. Existing slopes may exceed these values with proper engineering to ensure slope stability and non-erosive runoff velocities from the contributing area.

Table 6.1 Standard SMP Feasibility Matrix

SMP Group	SMP Design	Soil Permeability	Separation to Water Table (ft)	Contributing Area (acres)	Max Site Slope
Ponds	Micropool ED	fc ≤0.014 inch/hr, unless impermeable liner provided (see **Section 6.1.4.1**)	0[1,2]	10 (min)[4]	15%
	Wet Pond			25 (min) [4]	
	Wet ED Pond				
	Multiple Pond				
Wetlands	Shallow Wetland	fc ≤0.014 inch/hr, unless impermeable liner provided (see **Section 6.2.4.1**)	0[1,2]	25 (min)	15%
	ED Shallow Wetland				
	Pond/Wetland System				
	Pocket Wetland		0[2]	5 (min)	
	Gravel Wetland		0[1,2]	5 (max)	
Infiltration	Infiltration Trench	f_c > 0.5 inch/hr	2[3]	5 (max)	15%
	Infiltration Basin			Varies (10/25/50 max)	
	Dry Well			1 (max)	
	Underground Infiltration			10 (max)	
Filters	Surface Sand Filter	No Restriction	2	10 (max)	10%
	Underground Sand Filter			2 (max)	
	Perimeter Sand Filter				
	Infiltration Bioretention	f_c > 0.5 inch/hr		5 (max)	
	Filtration Bioretention	No Restriction			
	Bioslope			150 ft (max)	3:1 (h:v)
Open Channels	Dry Swale	No Restriction	2	5 (max)	4% longitudinal
	Wet Swale		below water table		

[1] When treating stormwater hotspots, increase separation to 2 ft.

[2] When located in a sole source aquifer, increase separation to 2 ft.

[3] When located in a sole source aquifer, increase separation to 4 ft.

[4] Minimum contributing area for ponds can be reduced if a water balance analysis is performed in accordance with **Section 6.1.4.2**.

.

Section 6.3 Stormwater Infiltration Practices

Stormwater infiltration practices capture and temporarily store the WQ_v allowing it to infiltrate into the soil over a maximum two-day period. Design variants include the following:

I-1 Infiltration Trench (**Figure 6.11**)

I-2 Infiltration Basin (**Figure 6.12**)

I-3 Dry Well (**Figure 6.13**)

I-4 Underground Infiltration (**Figure 6.14**)

Refer to the **Fact Sheets** at the end of this section for key considerations of each infiltration practice design variant, including performance criteria, practice suitability, implementation considerations, pollutant removal capability, and runoff reduction credit.

IMPORTANT NOTES:

1. PROVIDING ADEQUATE PRETREATMENT IS CRITICAL TO LONG-TERM PERFORMANCE OF INFILTRATION PRACTICES.
2. TO ASSUE THAT INFILTRATION RATES ARE PRESERVED LONG-TERM, POST-CONSTRUCTION INSPECTION AND MAINTENANCE ACTIVITIES MUST BE CLEARLY DEFINED IN ACCORDANCE WITH **CHAPTER 12**.

.

Infiltration Basin (I-2)

Infiltration basins are vegetated excavations designed to capture and temporarily store stormwater runoff to promote infiltration into the surrounding native soils.

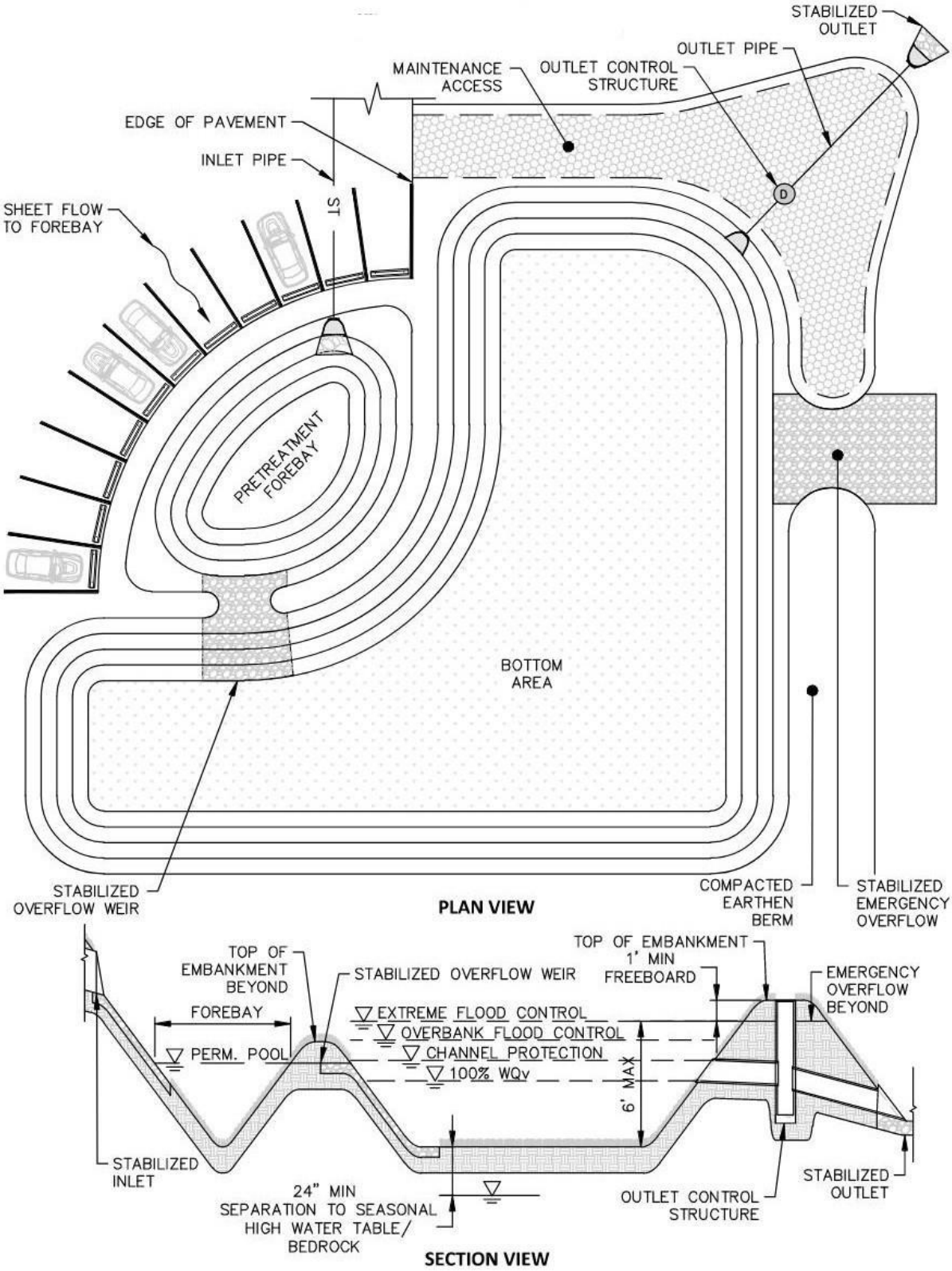


Figure 6.12 Infiltration Basin (I-2)

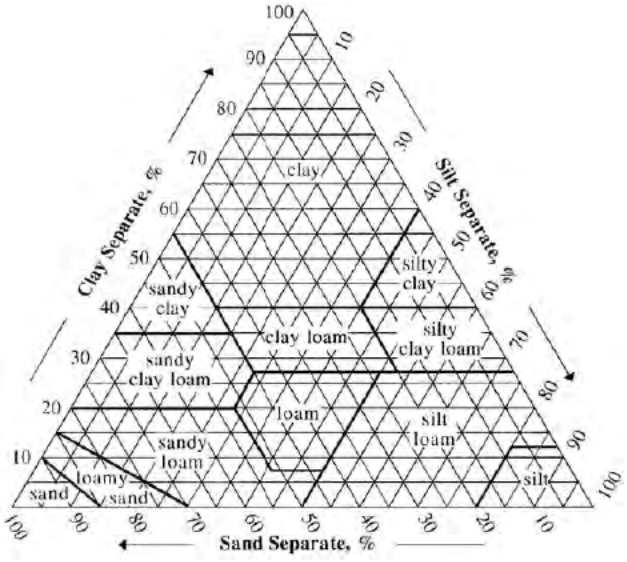
6.3.1 Feasibility

- To be suitable for infiltration, underlying soils shall have an infiltration rate (f_c) of at least 0.5 in/hr, as confirmed by field geotechnical tests. The minimum geotechnical testing shall be consistent with **Appendix D.**
- Underground infiltration systems likely qualify as a Class V injection well based upon the definition of a subsurface fluid distribution system (i.e. "an assemblage of perforated pipes, drain tiles, or other similar mechanisms intended to distribute fluids below the surface of the ground"). Refer to the EPA UIC Program for system registration requirements.
- Designers must be selective with the design of infiltration on sites with karst geology, shallow bedrock and soils, and hotspot land uses. Projects located over karst geology must provide runoff reduction by techniques that do not involve large infiltration basins and deep, concentrated recharge to the ground. A geotechnical assessment is recommended for infiltration and recharge at small scales.
- Infiltration practices shall not be located on areas with natural slopes greater than 15%, unless a slope stability analysis is performed by a qualified geotechnical engineer.
- Underground infiltration systems may be applied as a practice for urban stormwater management (**Chapter 8**).
- Urban fill soils shall not be used for infiltration practices. Urban fill in considered soil that includes unsuitable materials such as brick, cement, asphalt, demolition debris, etc.
- If infiltration practices are constructed in engineered fill soils, then the following criteria shall be met:
  - In-situ/natural soil layer below the infiltration system shall have an infiltration rate greater or equal to the engineered fill soils, as determined by geotechnical testing (**Appendix D**);
  - Soils proposed for engineered fill shall be classified as suitable using **Table 6.9** and **Figure 6.15**;
  - Soils proposed for engineered fill shall have a minimum infiltration rate of 0.50 inch/hr and a material gradation similar to the in-situ/natural soils, as determined by geotechnical testing;
  - After placement of engineered fill, permeability testing (**Appendix D**) shall be performed to confirm the infiltration rate. If engineered fill material requirements are not met, the material shall be removed;
  - The required vertical separation shall be measured from the existing grade of in-situ/natural soil. Engineered fill soils shall not be used to meet separation requirements; and
  - Construction of infiltration practices on slopes, through cut and fill operations, shall utilize the existing cut material to the greatest extent possible. The downhill berm shall be designed to prevent seeps, breakouts and slippage through the berm and at the interface of the in-situ/natural and fill material. A slope stability analysis shall be performed by a qualified geotechnical engineer.

Table 6.9 Hydrologic Soil Properties Classified by Soil Texture

Soil Texture Class	Hydrologic Soil Group	Minimum Infiltration Rate (inch/hr)	Suitability
Sand	A	8.27	Suitable for engineered fill for infiltration practice design
Loamy sand	A	2.41	
Sandy loam	B	1.02	
Loam	B	0.52	
Silt loam	C	0.27	Not suitable for engineered fill for infiltration practice design
Sandy clay loam	C	0.17	
Clay loam	D	0.09	
Silt clay loam	D	0.06	
Sandy clay	D	0.05	
Silty clay	D	0.04	
Clay	D	0.02	

Figure 6.15 USDA Soil Textural Classification



- Runoff from designated stormwater hotspots shall not be directed to an infiltration practice, unless two treatment practices are provided in series (i.e. non-infiltration standard SMP followed by an infiltration practice), both of which shall be sized to treat the entire WQ_v.
- In areas of known contamination, or if contamination is discovered during excavation, contamination levels must be evaluated by a qualified professional and the state remediation program to determine if infiltration is permitted.
- Infiltration practices shall meet the minimum separation requirements listed in **Table 6.10.** Vertical separation shall be taken from the bottom of practice, or stone reservoir where applicable. Horizontal separations shall be taken from the maximum water surface elevation (Extreme Flood peak water surface elevation) of the practice.

Table 6.10 Infiltration Practice Minimum Separation Requirements

	Vertical Separation		Horizontal Separation				
Design Variant	**Seasonal High Water Table[1,2]**	**Sound Bedrock[1]**	**Structures Without Foundation Waterproofing[4]**	**Structures With Foundation Waterproofing[4]**	**Water Supply Well/ Reservoir**	**Septic System[3,4]**	**Sanitary Sewer Main**
Infiltration Trench (I-1)	2 ft	2 ft	25 ft	0 ft	100 ft	50 ft	25 ft
Infiltration Basin (I-2)			25 ft				
Dry Well (I-3)			10 ft (single dry well) 25 ft (multiple dry wells in series)				
Underground Infiltration System (I-4)			25 ft				
Infiltration Bioretention (F-4)			25 ft	10 ft			

[1] Sound bedrock, fractured bedrock or karst geology as documented by on-site geotechnical testing
[2] Separation shall be increased to 4 ft in sole source aquifer
[3] Septic systems are inclusive of septic tanks, distribution boxes, absorption fields
[4] Infiltration practices shall be located downgradient of structures and septic systems

- The maximum contributing area shall meet the requirements listed in **Table 6.11.**

Table 6.11 Infiltration Practice Maximum Contributing Area Requirements

Design Variant	Maximum Contributing Area
Infiltration Trench (I-1)	5 ac
Infiltration Basin (I-2)	10 ac (where f_c of underlying soils 0.50 to 5.0 in/hr OR Contributing Impervious Area ≤ 10 acres) 25 ac (where f_c of underlying soils > 5.0 to 10.0 in/hr AND Contributing Impervious Area ≤ 15 acres) 50 ac (where f_c of underlying soils > 10 in/hr AND Contributing Impervious Area ≤ 20 acres)
Dry Well (I-3)	0.50 ac (for larger contributing areas, use multiple dry wells in series)
Underground Infiltration (I-4)	10 ac

Infiltration Basin Example 1:

Contributing Area = 13 acres
Contributing Impervious Area = 13 acres
Infiltration Rate = 6 in/hr

Under these design criteria, the maximum contributing area is 25 acres, and the designer can convey the entire contributing area to one infiltration basin.

Infiltration Basin Example 2:

Contributing Area = 23 acres
Contributing Impervious Area = 17 acres
Infiltration Rate = 4 in/hr

Under these design criteria, the maximum contributing area is 10 acres to one basin, since the infiltration rate and contributing impervious area do not meet the criteria for a maximum contributing area of 25 acres. Therefore, designer must convey the contributing area to at least three separate infiltration basins.

Construction Requirements

- Practice areas shall be clearly marked before any site work begins and heavy equipment traffic shall be restricted to avoid soil disturbance and compaction. The Erosion and Sediment Control plan shall clearly indicate how sediment will be prevented from entering the practice areas.
- For Design I-1, large tree roots shall be trimmed flush with the trench sides to prevent puncturing or tearing of the filter fabric. The side walls shall be roughened where sheared and sealed by heavy equipment.
- Permanent vegetative cover with 80% uniform density shall be established over the entire contributing pervious drainage area before runoff is directed into the facility.
- Infiltration practices shall never serve as a sediment control device during site construction phase and shall be installed at the end of the construction sequence, to the greatest extent practical.

6.3.2 Conveyance

- Infiltration practices shall be sized to store and infiltrate the required WQ_v. If inflow exceeds the storage capacity under larger storm events, then an adequate outlet pipe or overflow shall be designed to provide safe conveyance. If computed flow velocities exceed erosive velocities, the overflow shall be properly stabilized.
- Runoff conveyed to an infiltration practice by pipe or concentrated flow, under all storm events, shall utilize a pretreatment device or flow dissipator to reduce flow velocity prior to entering the practice. If flow velocity cannot be reduced to non-erosive conditions, then the practice shall be designed off-line (refer to **Appendix C**) by use of a flow regulator or flow splitter diversion structure to divert the WQ_v to the practice and allow larger flows to bypass the practice.
- An emergency spillway shall be provided to safely convey stormwater exceeding the Extreme Flood at non-erosive velocities.

6.3.3 Pretreatment

- Prior to entering an infiltration practice, the following pretreatment volume shall be provided:
  - 25% of the WQv for $f_c \leq 10.00$ in/hr.
  - 50% of the WQv for $f_c > 10.00$ in/hr.
- Adequate pretreatment for Designs I-1, I-2, I-3, and I-4 shall include one of the following:
  - Sedimentation chamber, plunge pool, or forebay, sized in accordance with **Section 6.4.3**; or
  - Vegetated swale with check dams (Maximum velocity of 1 fps for water quality flow).
  - Approved proprietary pretreatment device (Refer to **Chapter 9**).
- For Design I-1: when runoff is conveyed to the practice via sheet flow, adequate pretreatment also includes a grass filter strip sized in accordance with **Table 6.13.**
- For Design I-4: a manufacturer approved pretreatment system.
- Exit velocities from pretreatment devices shall be designed to ensure non-erosive outlet conditions.

6.3.4 Treatment

6.3.4.1 Design Criteria

Table 6.12 Infiltration Practice Design Specifications

		I-1	I-2	I-3	I-4
Freeboard	**Applicability**	N/A	Required	N/A	N/A
	Depth	1 ft. min. measured from top of Extreme Flood elevation to top of embankment			
Pea Gravel	**Applicability**	Required	N/A	N/A	N/A
	Depth	4 inch			
	Material	ASTM D448 No. 6 stone, Porosity = 32%			
Stone Reservoir	**Applicability**	Required	N/A	Required	As Required
	Depth	4 ft. max.	N/A	1 ft. min. on all sides & bottom	Per proprietary requirements
	Material	No. 2 stone, washed, no fines; Porosity=40%			
Storage[1]	**Depth**	Within reservoir	6 ft. max.	As Required[2]	As Required
	Side Slope	N/A	3:1 (h:v) max.	N/A	N/A
Observation Well	**Applicability**	Required	N/A	Required	N/A
	Material	6 inch min. perforated PVC or HDPE pipe with lockable cap			
Drainage Filter Fabric	**Applicability**	Required	N/A	Required	Required
	Material[3]	Non-woven, polypropylene geotextile with flow rate greater than 125 gpm/sf (ASTM D4491) and Apparent Opening Size US #70 sieve (ASTM D4751)			
Maintenance Access[1]	**Applicability**	As Required	Required	As Required	As Required
	Slope	15% max.			
	Width	12 ft. min.			
	Material	Able to withstand loading of maintenance equipment and vehicles			

Footnotes:

[1]Required for all Design Variants

[2] An Underground Injection Control Permit may be required when certain conditions are met. Designer must Consult EPA's Underground Injection Control Program Fact Sheet for further information.

[3]Or acceptable alternatives, such as a 3 inch minimum layer of pea gravel

.

General

- All infiltration practices shall be designed to fully drain within 48-hrs of the maximum storm event for which it was designed.
- Designs I-1 and I-2 shall account for reduced infiltration rates under frozen conditions.
- All infiltration practices shall be designed such that the length, width, or diameter is greater than the depth in order to satisfy the UIC criteria. Refer to **Section 6.3.1**.

Maintenance Access

- A maintenance access easement shall extend to the practices from a public or private road.
- Adequate maintenance access must extend to the pretreatment device, outlet structure/overflow, emergency spillway, and must have sufficient area to allow vehicles to turn around.
- Where applicable, access to the outlet structure shall be provided by lockable manhole cover or grate.

6.3.4.2 Sizing Criteria

- Infiltration practices shall be designed to exfiltrate the entire WQ_v through the bottom surface area of the practice (vertical sides are not considered in sizing).
- Design I-1: calculate the minimum surface area of an infiltration trench using the following equation:

$$A_T = \frac{WQ_V}{\Phi \cdot d_t}$$

Where:

A_T = Surface area of the infiltration trench (sf)

WQ_V = Water Quality Volume (cf)

Φ = Porosity (assume 0.4)

d_t = Depth of trench (ft)

- Design I-2: calculate the minimum bottom area of an infiltration basin using the following equation:

$$A_b = \frac{WQ_V}{d_b}$$

Where:

A_b = Bottom area of the infiltration basin (sf)

WQ_V = Water Quality Volume (cf)

d_b = Depth of basin (ft) (measured from bottom to first outlet)

- Design I-3: calculate the Water Quality Volume provided by dry wells using the following equation:

$$WQ_V = N \cdot V_W$$
$$V_W = V_i + V_s$$
$$V_i = \pi \cdot r^2 \cdot H$$
$$V_s = (\pi \cdot [(r + t + t_s)^2 - (r + t)^2]) \cdot H \cdot 0.40$$

Where:

WQ_V = Water Quality Volume (cf)

N = Number of dry wells

V_w = Volume provided per dry well (cf)

V_i = Inside volume of dry well (cf)

V_s = Volume of stone reservoir (cf)

r = Inside radius of dry well (ft)

H = Inside height of dry well (ft)

t = Thickness of dry well wall (ft)

t_s = Thickness of stone reservoir (ft)

- Design I-4: calculate the minimum stone area of underground infiltration systems using the following equation:

$$A_b = \frac{WQ_V}{d_p}$$

Where:

A_b = Bottom area of the infiltration basin (sf)

WQ_V = Water Quality Volume (cf)

d_p = Depth of bottom stone (ft) (measured from bottom of stone to bottom of chambers)

- Design I-4: calculate the Water Quality Volume provided by underground infiltration systems using the following equation:

$$WQ_V = V_{st} + V_{sys}$$

Where:

WQ_V =Water Quality Volume (cf)

V_{st} = Volume of stone reservoir (cf) (assume 40% voids)

V_{sys} = Volume of system (cf) (excluding volume of stone)

- For Design I-4, the system shall be sized using hydrologic modeling, hydrologic calculations or calculations provided by the manufacturer, to demonstrate that the water quality and quantity control objectives have been met.
- For Designs I-1, I-3, and I-4, the bottom of the stone reservoir shall be laid level, so that runoff will infiltrate through the entire bottom surface area.

6.3.5 Landscaping

- For planting guidance for stormwater management facilities, refer to **Chapter 11**.
- Permanent vegetative cover shall achieve 80% uniform density established over the entire contributing pervious area, before runoff is directed into the facility.
- For Design I-2 stabilizing vegetation shall be provided throughout the practice.

Fact Sheet: Infiltration Basin (I-2)



Description: Vegetated excavations designed to capture and temporarily store stormwater runoff to promote infiltration into the surrounding native soils.

(Photo Source: Clark County, Washington)

Key Considerations

PERFORMANCE CRITERIA

FEASIBILITY

- Underlying soils shall have an min. infiltration rate of 0.50 inch/hr
- Practices shall not be located on areas with natural slopes > 15%
- Urban fill soils shall not be used for infiltration practices
- Max contributing area is 10 acres, 25 acres or 50 acres depending on underlying soil infiltration rates and contributing impervious area
- Min 2 ft separation to seasonal high-water table or bedrock
- Two treatment practices in series both sized to treat the entire WQv (non-infiltration standard SMP followed by an infiltration practice) shall be provided for hotspot treatment

CONVEYANCE

- Practice shall be size to store and infiltrate the WQv
- An outlet pipe or overflow for safe conveyance shall be provided in the event inflow exceeds the storage capacity under larger storm events
- An emergency spillway shall be provided
- Runoff conveyed by pipe or concentrated flow shall utilize a pretreatment device or flow dissipator to reduce velocity prior to entering the practice

PRETREATMENT

- Pretreatment volume shall be 25% WQv for fc ≤ 10.00 inch/hr or 50% WQv for fc > 10.00 inch/hr

TREATMENT

- 1 ft min. freeboard shall be provided
- 6 ft max. basin depth
- Provide a min. 12 ft wide maintenance access at a max. 15% slope
- Design to fully drain within 48 hrs of max. storm event for which it was designed
- Design shall account for reduced infiltration rates under frozen conditions
- Length or width of the practice shall be greater than the depth

TREATMENT

- Stabilizing vegetation shall be provided throughout practice

STORMWATER MANAGEMENT SUITABILITY

✓	Water Quality
✓	Channel Protection
✓	Overbank Flood Protection
✓	Extreme Flood Protection
✓	Runoff Reduction
*	Treatment of Hotspots
✓	Linear Applications

✓ suitable for this practice
* suitable with exceptions

IMPLEMENTATION CONSIDERATIONS

M	Capital Cost
M	Maintenance Burden
M	Safety Risk
M	Landscaping

L = Low **M** = Moderate **H** = High
NA = Not Applicable

POLLUTANT REMOVAL (*See Table 10.3*)

G	Phosphorus
G	Nitrogen
G	Metals
G	Pathogens
G	Total Suspended Solids

G = Good **F** = Fair **P** = Poor

RUNOFF REDUCTION CREDIT

- 100% RRv provided

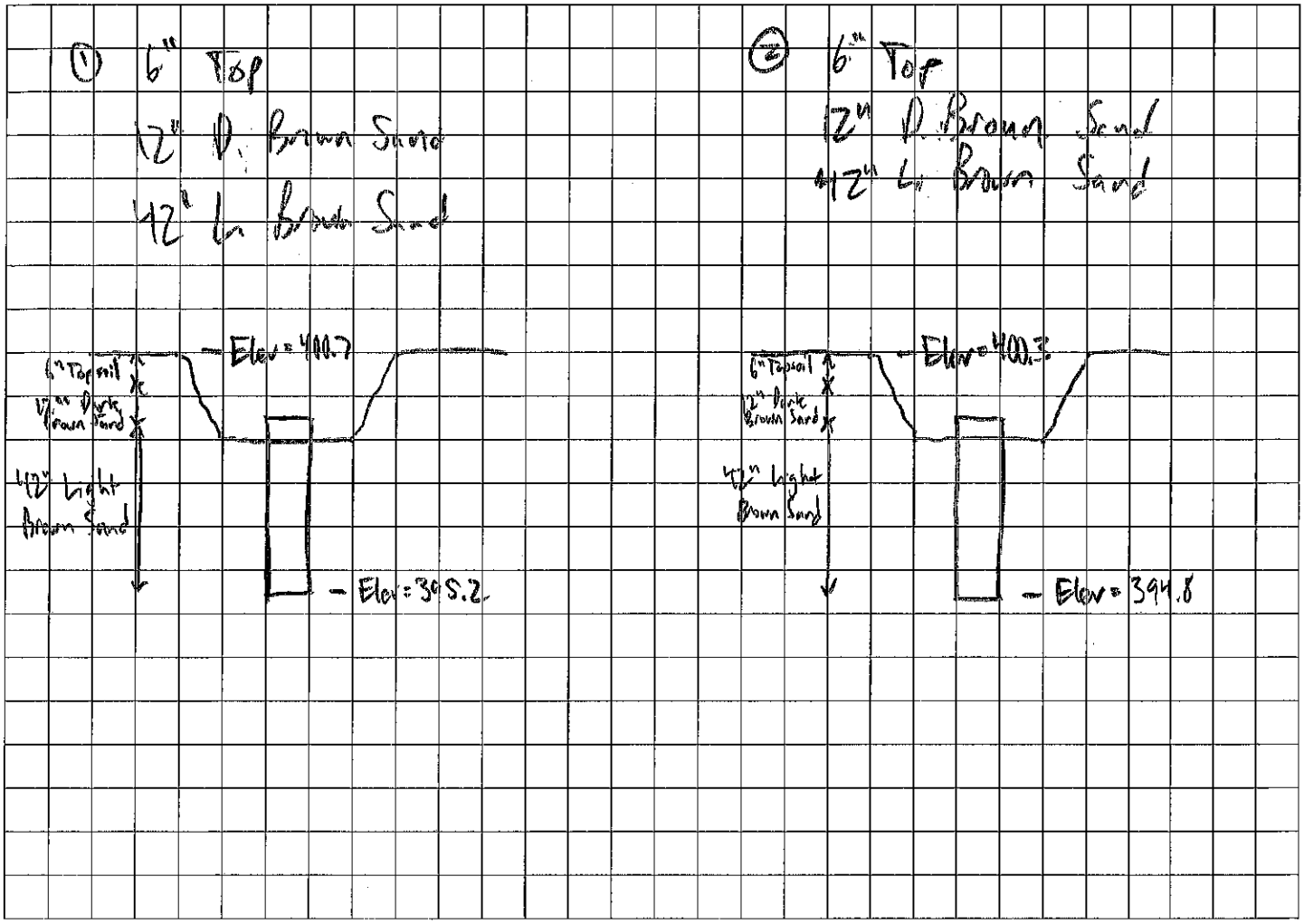
522 BRADLEY STREET
WATERTOWN, NY 13601
TEL: (315) 782-2005
FAX: (315) 782-1472
www.AubertineCurrier.com

Project Number: 2016-033 Date: 6/8/16

Project Name: Cath Industries Bldg Addition

Location: Watertown, NY Observed By: CWT

INFILTRATION TEST SUMMARY



South Basin

Location	Ground Elevation (ft)	Bottom of Pipe Depth (ft)	Bottom of Pipe Elev (ft)	Trial			
				Initial Water Level (ft)	Final Water Level (ft)	Infiltration Rate (in/hr)	
1	400.7'	5.5'	395.2'	9:43 - 2'	9:59 - 0'	90	83
1	-	-	-	10:02 - 2'	10:19 - 0'	85	
1	-	-	-	10:20 - 2'	10:39 - 0'	77	
1	-	-	-	10:40 - 2'	10:58 - 0'	80	
2	400.3'	5.5'	394.8'	9:43 - 2'	10:03 - 0'	72	67
2	-	-	-	10:05 - 2'	10:27 - 0'	65	
2	-	-	-	10:30 - 2'	10:52 - 0'	65	
2	-	-	-	10:55 - 2'	11:17 - 0'	65	

AUBERTINE CURRIER
ARCHITECTS, ENGINEERS & LAND SURVEYORS, P.C.

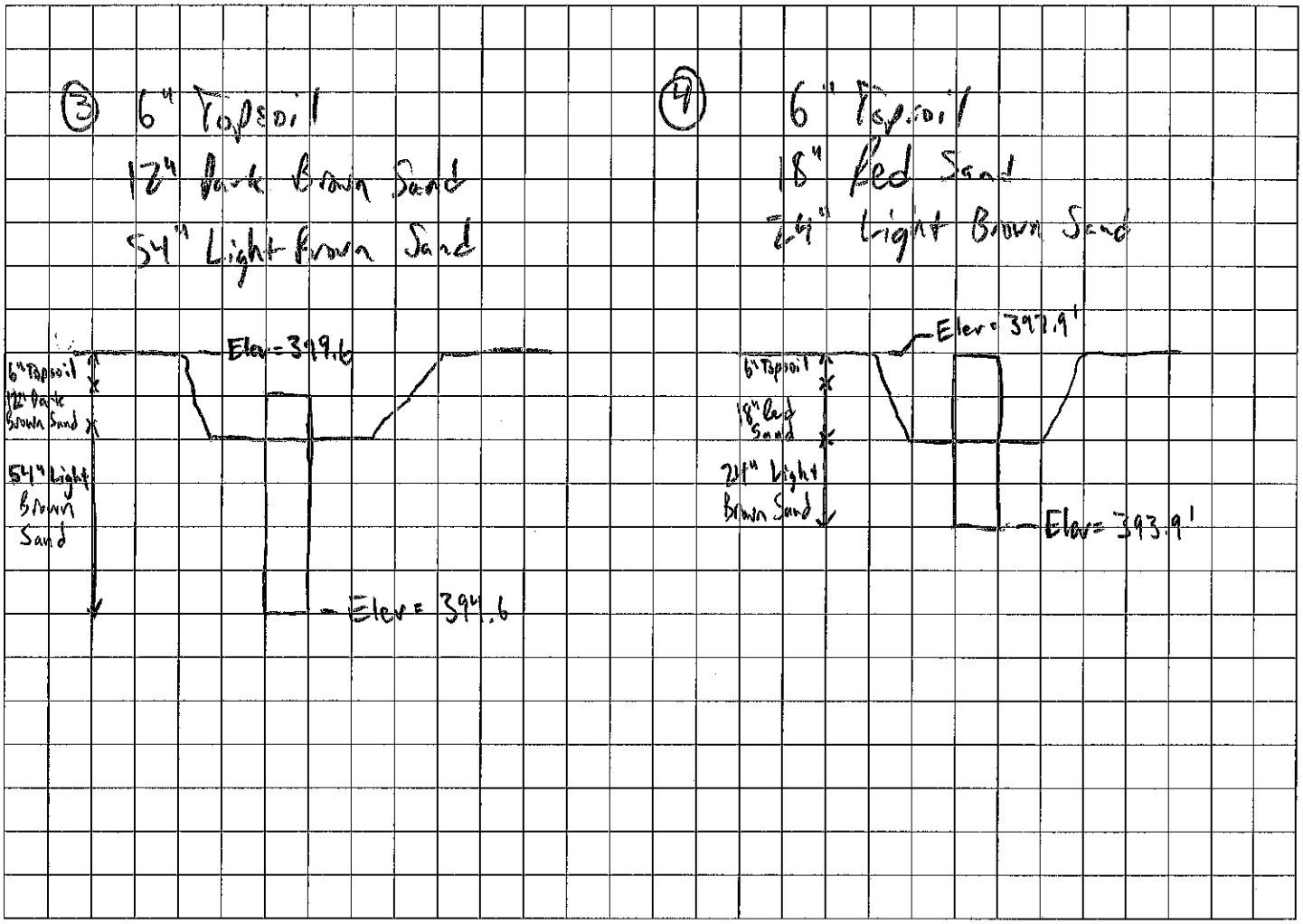
522 BRADLEY STREET
WATERTOWN, NY 13601
TEL: (315) 782-2005
FAX: (315) 782-1472
www.AubertineCurrier.com

Project Number: 2016-033 Date: 6/8/16

Project Name: Roth Industries Bldg Addition

Location: Watertown, NY Observed By: CWT

INFILTRATION TEST SUMMARY



North Basin

Location	Ground Elevation (ft)	Bottom of Pipe Depth (ft)	Bottom of Pipe Elev (ft)	Trial			
				Initial Water Level (ft)	Final Water Level (ft)	Infiltration Rate (in/hr)	
3	399.6'	5'	394.6'	11:13 - 2'	11:31 - 0'	69	64
3				11:35 - 2'	11:57 - 0'	65	
3				11:59 - 2'	12:23 - 0'	60	
3				12:25 - 2'	12:49 - 0'	63	
4	397.9'	4'	393.9'	11:15 - 2'	11:43 - 0'	51	51
4				11:45 - 2'	12:12 - 0'	53	
4				12:14 - 2'	12:43 - 0	50	
4				12:44 - 2'	1:14 - 0	50	

AUBERTINE CURRIER ENGINEERING ARCHITECTURE SURVEYING
522 BRADLEY STREET
WATERTOWN, NY 13601
TEL: (315) 782-2005
FAX: (315) 782-1472
www.AubertineCurrier.com

Project Number: 2016-033 Date: 6/18/16

Project Name: Roth Industries Bldg Addition

Location: Watertown, NY Observed By: CWT

INFILTRATION TEST PIT LOGS

Client Roth Date 6/18/16

Weather Cloudy, Rainy Datum –

Observer CWT

Test Pit No. 1 Elevation 400.3 Water –

Depth	Moisture	W	Description
5"	Wet	–	Topsoil
5-18"	Wet	–	Dark Brown Sandy Soil
18"-84"	Wet	–	Light Brown Sandy Soil
			* No water table encountered
Bottom	Elev = 393.3		

7' Deep

Test Pit No. 2 Elevation 397.9' Water 391.2'

Depth	Moisture	W	Description
6"	Wet	–	Topsoil
6"-24"	Wet	–	Red Sandy Soil
24"-80"	Wet	–	Light Brown Sandy Soil
>80"	Saturated	Water Table = 391.2'	

6.7' Deep

LEGEND	EXISTING	PROPOSED
5' CONTOUR	155	155
1' CONTOUR	154	154
PROPERTY LINE	PL PL	PL PL
RIGHT OF WAY		
SETBACK		
BUILDING		
ASPHALT PAVEMENT		
CURB		
SIDEWALK		
EDGE OF GRAVEL		
FENCE	- o - o - o -	
WATERLINE	W_x W_x	W W
SANITARY SEWER	SS_x SS_x	SS SS
STORM SEWER	SD_x SD_x	SD SD
OVERHEAD UTILITIES	OU_x OU_x	OU OU
UNDERGROUND ELECTRIC	E_x E_x	E E
GAS	G_x G_x	G G
FIRE HYDRANT		
WATER VALVE	W	
SANITARY MANHOLE	S	
STORM MANHOLE	D	D
CATCH BASIN		S
UTILITY POLE AND GUY		
LIGHT POLE		

PROGRESS PRINT
NOT FOR CONSTRUCTION

GRAPHIC SCALE

40 0 20 40 80 160

(IN FEET)
1 inch = 40 ft.

AUBERTINE CURRIER
ARCHITECTS, ENGINEERS & LAND SURVEYORS, PLLC

522 Bradley Street
Watertown, New York 13601

aubertinecurrier.com

Phone: (315)782-2005
Fax: (315)782-1472

The above Architect, Engineer or Land Surveyor states that to the best of his or her knowledge, information and belief, the plans and specifications are in accordance with applicable regulations of New York State. It is a violation of New York State Law for any person, unless acting under the direct supervision of a Registered Architect, Licensed Professional Engineer or Licensed Land Surveyor to alter this document in any way. If altered, such licensee shall affix to his or her seal and the notation "altered by" followed by his or her signature, date and a specific description of the alteration.

© COPYRIGHT 2018
AUBERTINE and CURRIER ARCHITECTS, ENGINEERS & LAND SURVEYORS, PLLC

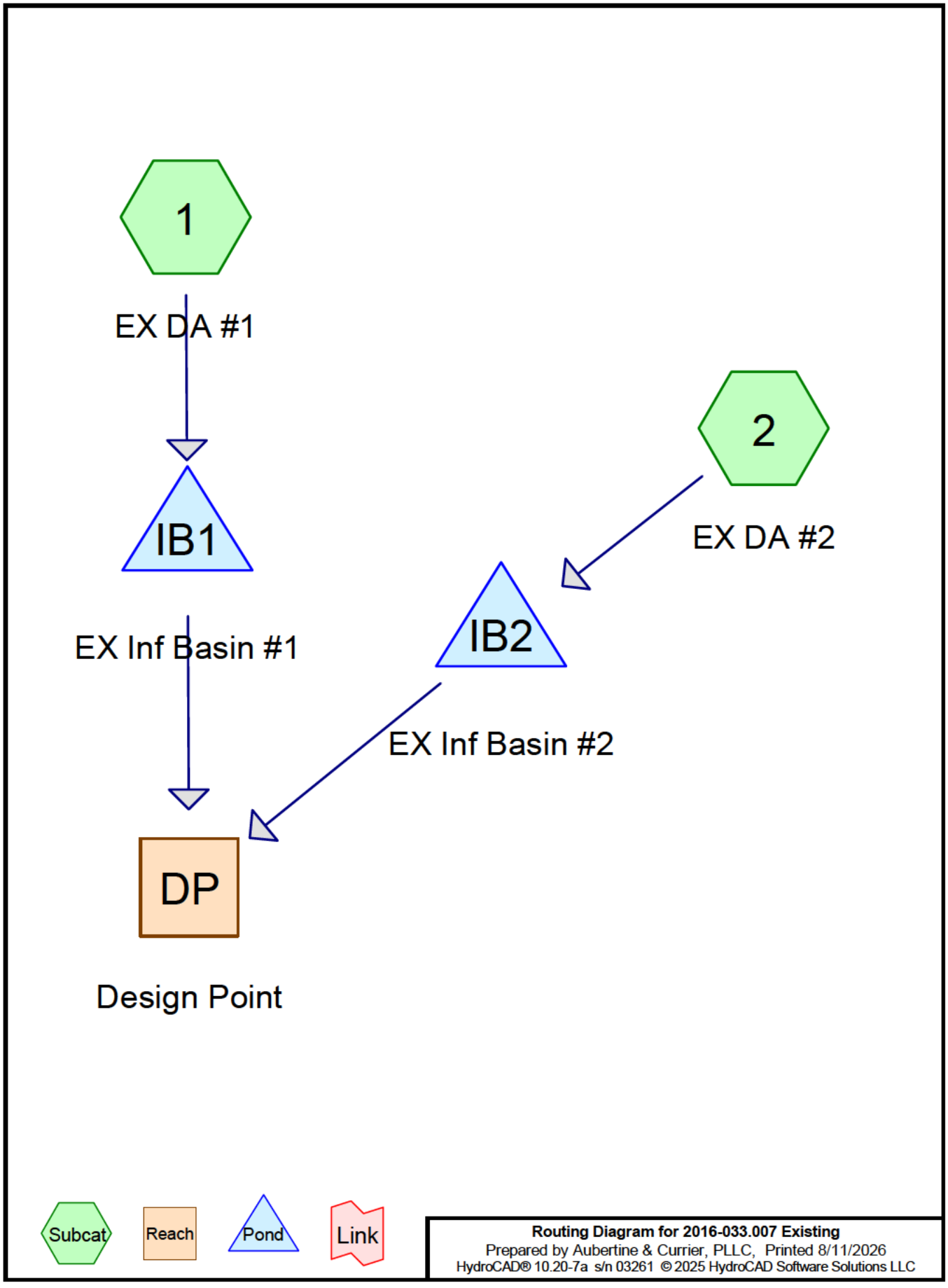
ADDITION FOR ROTH INDUSTRIES AND ROTH GLOBAL PLASTICS

268 BELLEW AVE SOUTH
WATERTOWN, NEW YORK 13601
JEFFERSON COUNTY

PROJECT NO:	2018-035
SCALE:	1"=40'
DRAWN BY:	CWT
CHECKED BY:	MPM
ISSUE DATES:	

INF TESTING LOCATION MAP

V-100



Routing Diagram for 2016-033.007 Existing
Prepared by Aubertine & Currier, PLLC, Printed 8/11/2026
HydroCAD® 10.20-7a s/n 03261 © 2025 HydroCAD Software Solutions LLC

Rainfall Events Listing (selected events)

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	1-Year A	NRCC 24-hr	A	Default	24.00	1	2.00	2
2	10-Year A	NRCC 24-hr	A	Default	24.00	1	3.33	2
3	100-Year A	NRCC 24-hr	A	Default	24.00	1	5.54	2

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
5.960	30	Meadow, non-grazed, HSG A (1, 2)
0.270	71	Meadow, non-grazed, HSG C (2)
2.630	98	Paved parking, HSG A (1, 2)
8.860	**51**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
8.590	HSG A	1, 2
0.000	HSG B	
0.270	HSG C	2
0.000	HSG D	
0.000	Other	
8.860		**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
5.960	0.000	0.270	0.000	0.000	6.230	Meadow, non-grazed	1, 2
2.630	0.000	0.000	0.000	0.000	2.630	Paved parking	1, 2
8.590	**0.000**	**0.270**	**0.000**	**0.000**	**8.860**	**TOTAL AREA**	

Pipe Listing (all nodes)

Line#	Node Number	In-Invert (feet)	Out-Invert (feet)	Length (feet)	Slope (ft/ft)	n	Width (inches)	Diam/Height (inches)	Inside-Fill (inches)	Node Name
1	IB1	397.79	397.43	18.5	0.0195	0.013	0.0	18.0	0.0	
2	IB1	398.11	398.05	6.0	0.0100	0.013	0.0	8.0	0.0	
3	IB2	401.35	401.30	25.0	0.0020	0.013	0.0	15.0	0.0	
4	IB2	401.35	401.30	25.0	0.0020	0.013	0.0	15.0	0.0	
5	IB2	401.35	401.30	25.0	0.0020	0.013	0.0	15.0	0.0	

Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 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 1: EX DA #1 Runoff Area=6.690 ac 35.43% Impervious Runoff Depth>0.00"
Flow Length=450' Tc=36.3 min CN=54 Runoff=0.01 cfs 0.003 af

Subcatchment 2: EX DA #2 Runoff Area=2.170 ac 11.98% Impervious Runoff Depth=0.00"
Flow Length=238' Tc=42.7 min CN=43 Runoff=0.00 cfs 0.000 af

Reach DP: Design Point Inflow=0.00 cfs 0.000 af
Outflow=0.00 cfs 0.000 af

Pond IB1: EX Inf Basin #1 Peak Elev=397.01' Storage=24 cf Inflow=0.01 cfs 0.003 af
Discarded=0.01 cfs 0.002 af Primary=0.00 cfs 0.000 af Outflow=0.01 cfs 0.002 af

Pond IB2: EX Inf Basin #2 Peak Elev=399.00' Storage=0 cf Inflow=0.00 cfs 0.000 af
Discarded=0.00 cfs 0.000 af Primary=0.00 cfs 0.000 af Outflow=0.00 cfs 0.000 af

Total Runoff Area = 8.860 ac Runoff Volume = 0.003 af Average Runoff Depth = 0.00"
70.32% Pervious = 6.230 ac 29.68% Impervious = 2.630 ac

Summary for Subcatchment 1: EX DA #1

[73] Warning: Peak may fall outside time span

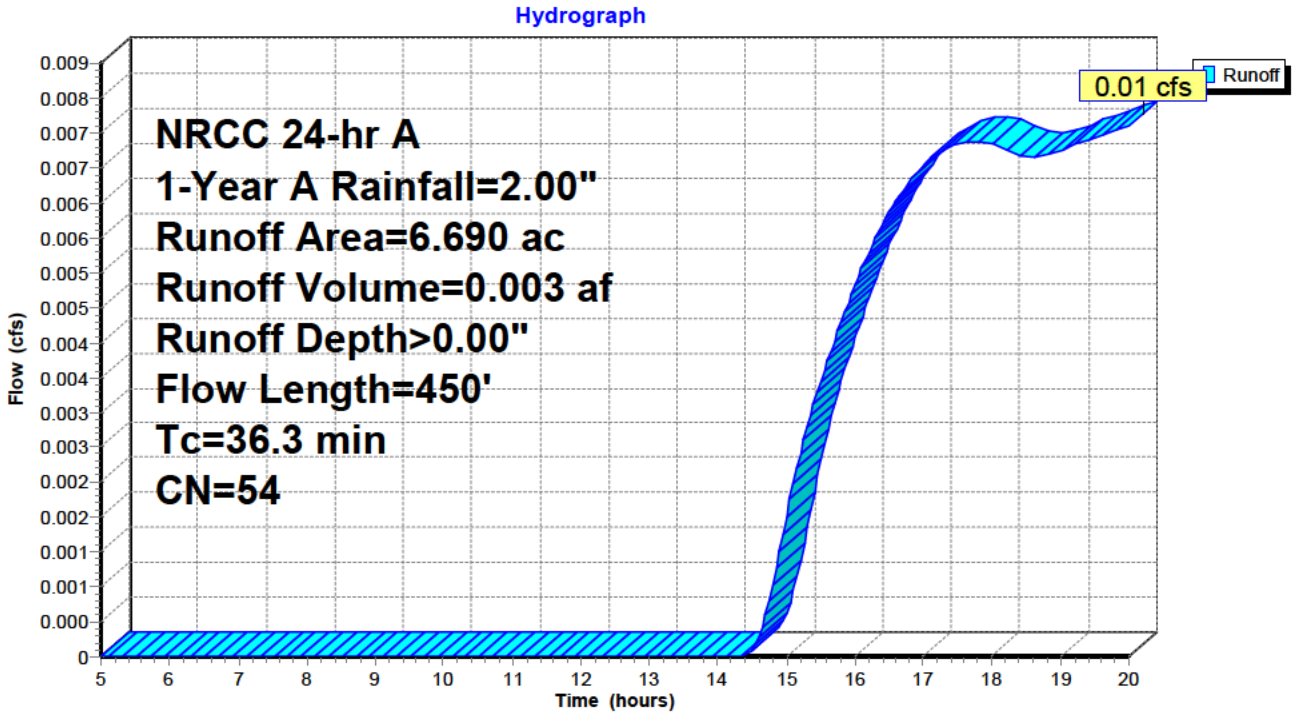
Runoff = 0.01 cfs @ 20.00 hrs, Volume= 0.003 af, Depth> 0.00"
Routed to Pond IB1 : EX Inf Basin #1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NRCC 24-hr A 1-Year A Rainfall=2.00"

Area (ac)	CN	Description
4.320	30	Meadow, non-grazed, HSG A
2.370	98	Paved parking, HSG A
6.690	54	Weighted Average
4.320		64.57% Pervious Area
2.370		35.43% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
28.8	100	0.0150	0.06		**Sheet Flow, Lawn** Grass: Bermuda n= 0.410 P2= 2.33"
7.5	350	0.0125	0.78		**Shallow Concentrated Flow, Lawn** Short Grass Pasture Kv= 7.0 fps
36.3	450	Total			

Subcatchment 1: EX DA #1



Summary for Subcatchment 2: EX DA #2

[45] Hint: Runoff=Zero

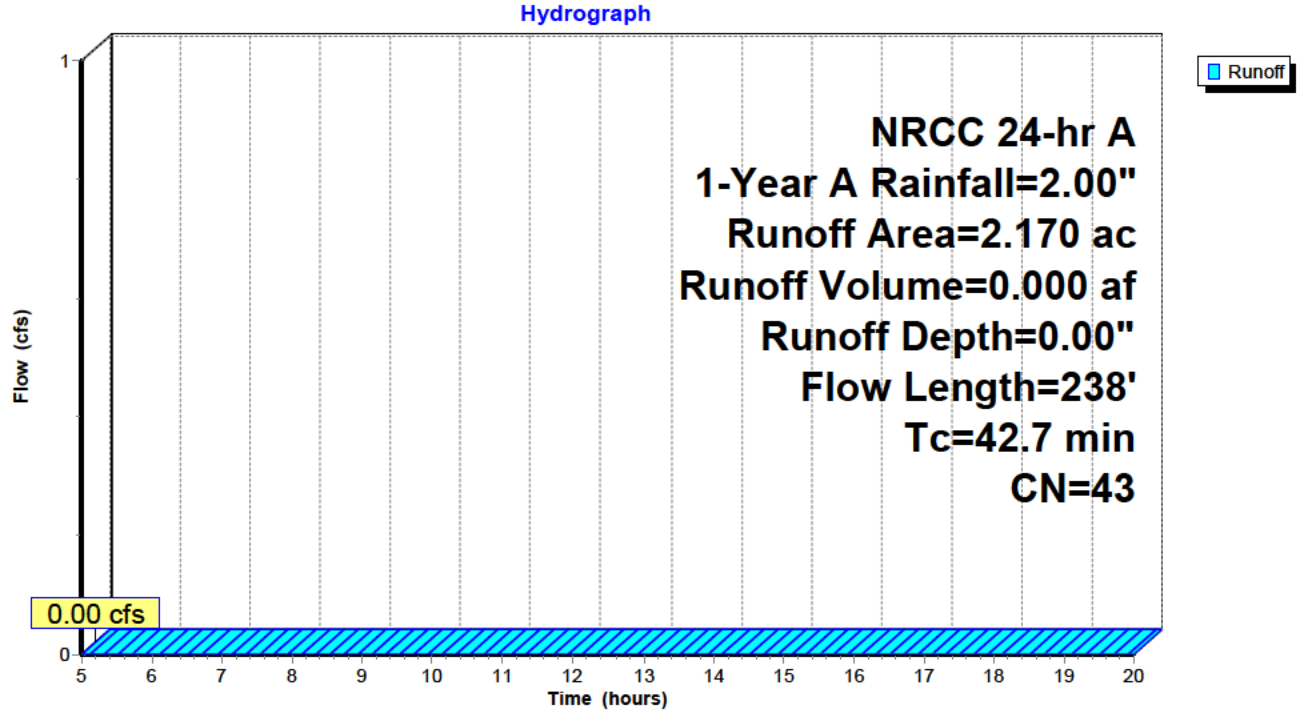
Runoff = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Depth= 0.00"
Routed to Pond IB2 : EX Inf Basin #2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NRCC 24-hr A 1-Year A Rainfall=2.00"

Area (ac)	CN	Description
1.640	30	Meadow, non-grazed, HSG A
0.260	98	Paved parking, HSG A
0.270	71	Meadow, non-grazed, HSG C
2.170	43	Weighted Average
1.910		88.02% Pervious Area
0.260		11.98% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
40.2	100	0.0065	0.04		**Sheet Flow, Lawn** Grass: Bermuda n= 0.410 P2= 2.33"
2.5	138	0.0170	0.91		**Shallow Concentrated Flow, Lawn** Short Grass Pasture Kv= 7.0 fps
42.7	238	Total			

Subcatchment 2: EX DA #2



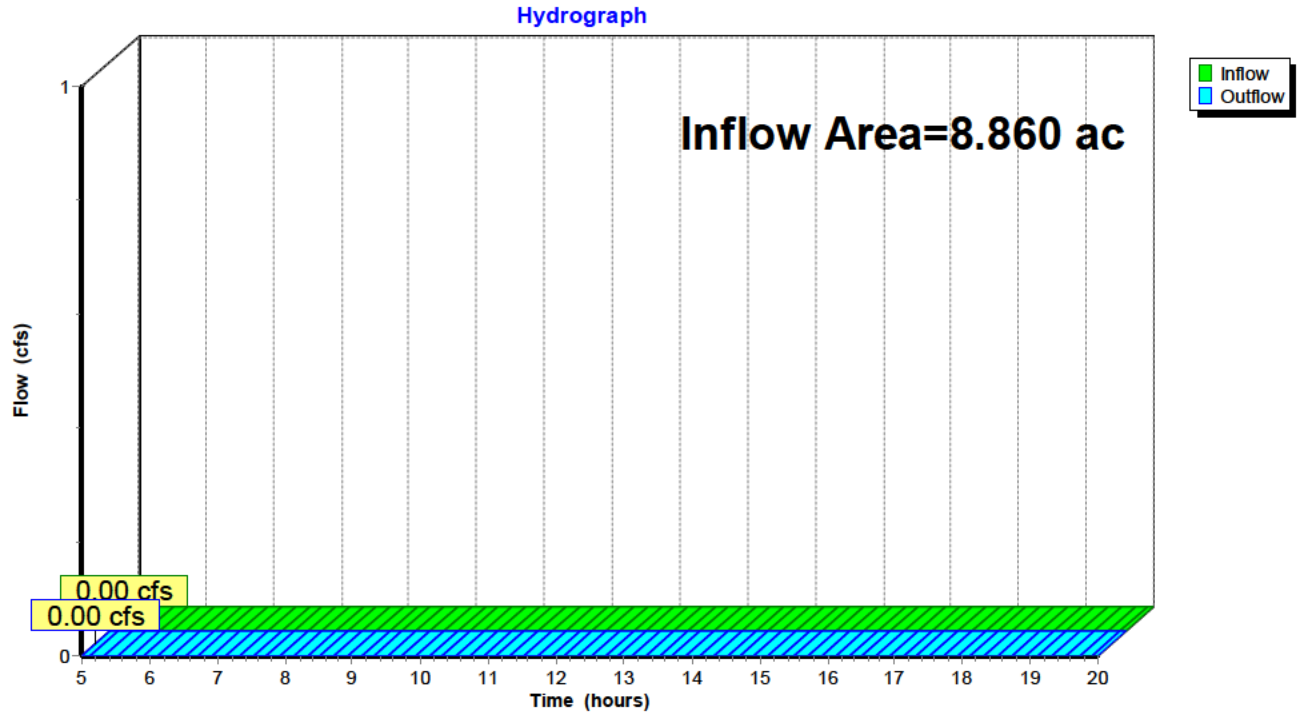
Summary for Reach DP: Design Point

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 8.860 ac, 29.68% Impervious, Inflow Depth = 0.00" for 1-Year A event
Inflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
Outflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach DP: Design Point



Summary for Pond IB1: EX Inf Basin #1

Inflow Area = 6.690 ac, 35.43% Impervious, Inflow Depth > 0.00" for 1-Year A event
Inflow = 0.01 cfs @ 20.00 hrs, Volume= 0.003 af
Outflow = 0.01 cfs @ 20.00 hrs, Volume= 0.002 af, Atten= 4%, Lag= 0.0 min
Discarded = 0.01 cfs @ 20.00 hrs, Volume= 0.002 af
Primary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
Routed to Reach DP : Design Point

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 397.01' @ 20.00 hrs Surf.Area= 1,848 sf Storage= 24 cf

Plug-Flow detention time= 47.6 min calculated for 0.002 af (79% of inflow)
Center-of-Mass det. time= 19.5 min (1,083.8 - 1,064.3)

Volume	Invert	Avail.Storage	Storage Description
#1	397.00'	20,048 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

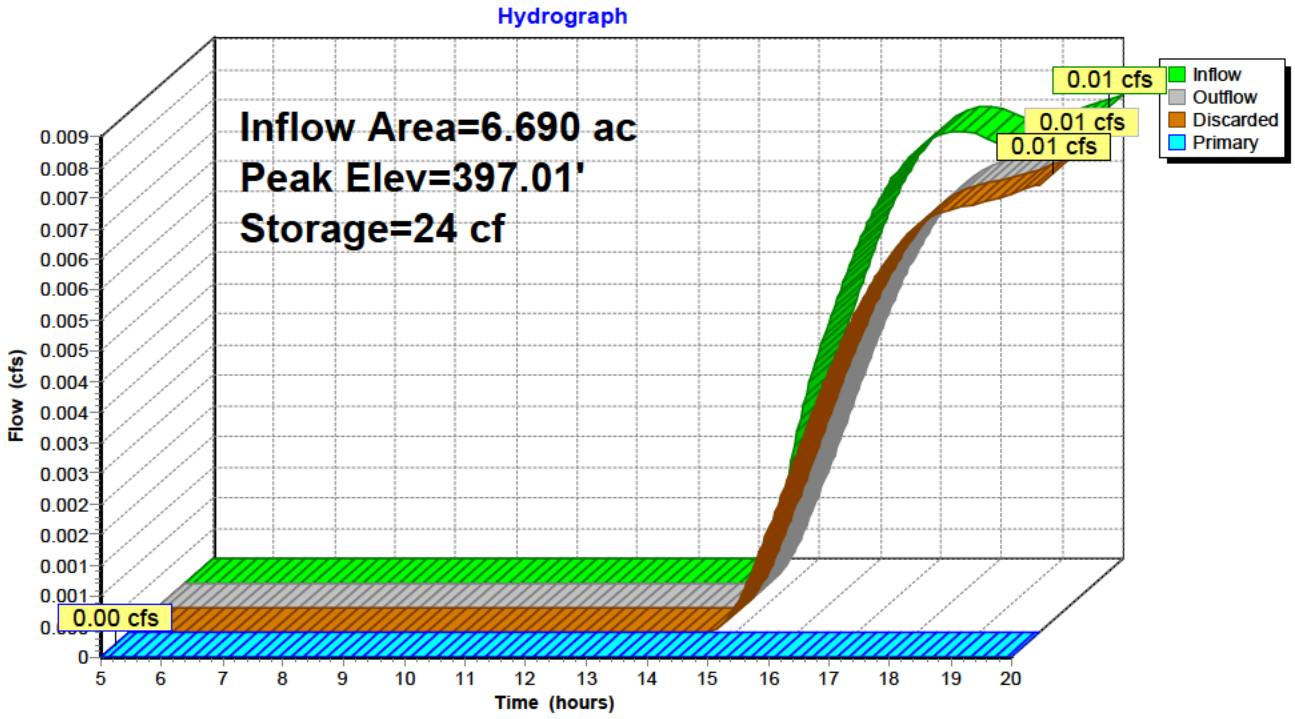
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
397.00	1,835	0	0
398.00	2,820	2,328	2,328
399.00	3,745	3,283	5,610
400.00	5,065	4,405	10,015
401.00	15,000	10,033	20,048

Device	Routing	Invert	Outlet Devices
#1	Discarded	397.00'	**25.000 in/hr Exfiltration over Surface area above 397.00'** Conductivity to Groundwater Elevation = 391.21' Excluded Surface area = 1,835 sf
#2	Primary	397.79'	**18.0" Round Culvert** L= 18.5' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 397.79' / 397.43' S= 0.0195 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf
#3	Device 2	398.11'	**8.0" Round Culvert** L= 6.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 398.11' / 398.05' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.35 sf
#4	Device 2	399.41'	**18.0" W x 12.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#5	Device 2	400.64'	**24.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.01 cfs @ 20.00 hrs HW=397.01' (Free Discharge)
└**1=Exfiltration** (Controls 0.01 cfs)

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=397.00' (Free Discharge)
└**2=Culvert** (Controls 0.00 cfs)
  └**3=Culvert** (Controls 0.00 cfs)
  └**4=Orifice/Grate** (Controls 0.00 cfs)
  └**5=Orifice/Grate** (Controls 0.00 cfs)

Pond IB1: EX Inf Basin #1



Summary for Pond IB2: EX Inf Basin #2

Inflow Area = 2.170 ac, 11.98% Impervious, Inflow Depth = 0.00" for 1-Year A event
Inflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
Outflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min
Discarded = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
Primary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
Routed to Reach DP : Design Point

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 399.00' @ 5.00 hrs Surf.Area= 42 sf Storage= 0 cf

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= (not calculated: no inflow)

Volume	Invert	Avail.Storage	Storage Description
#1	399.00'	4,839 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

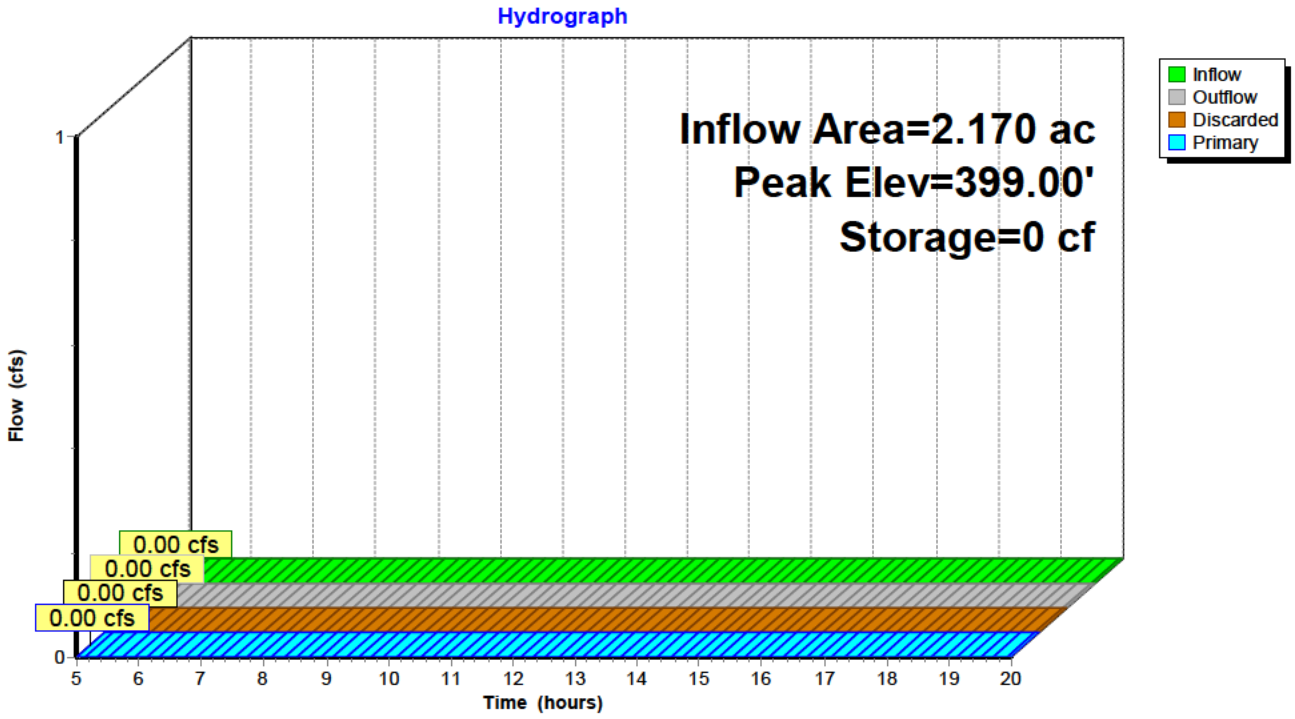
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
399.00	42	0	0
400.00	850	446	446
401.00	1,730	1,290	1,736
402.00	4,475	3,103	4,839

Device	Routing	Invert	Outlet Devices
#1	Discarded	399.00'	**25.000 in/hr Exfiltration over Surface area above 399.00'** Conductivity to Groundwater Elevation = 391.21' Excluded Surface area = 42 sf
#2	Primary	401.35'	**15.0" Round Culvert** L= 25.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 401.35' / 401.30' S= 0.0020 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf
#3	Primary	401.35'	**15.0" Round Culvert** L= 25.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 401.35' / 401.30' S= 0.0020 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf
#4	Primary	401.35'	**15.0" Round Culvert** L= 25.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 401.35' / 401.30' S= 0.0020 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf

Discarded OutFlow Max=0.00 cfs @ 5.00 hrs HW=399.00' (Free Discharge)
└**1=Exfiltration** (Controls 0.00 cfs)

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=399.00' (Free Discharge)
├**2=Culvert** (Controls 0.00 cfs)
├**3=Culvert** (Controls 0.00 cfs)
└**4=Culvert** (Controls 0.00 cfs)

Pond IB2: EX Inf Basin #2



Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 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 1: EX DA #1 Runoff Area=6.690 ac 35.43% Impervious Runoff Depth>0.22"
Flow Length=450' Tc=36.3 min CN=54 Runoff=0.61 cfs 0.121 af

Subcatchment 2: EX DA #2 Runoff Area=2.170 ac 11.98% Impervious Runoff Depth>0.02"
Flow Length=238' Tc=42.7 min CN=43 Runoff=0.01 cfs 0.004 af

Reach DP: Design Point Inflow=0.00 cfs 0.000 af
Outflow=0.00 cfs 0.000 af

Pond IB1: EX Inf Basin #1 Peak Elev=397.57' Storage=1,208 cf Inflow=0.61 cfs 0.121 af
Discarded=0.34 cfs 0.115 af Primary=0.00 cfs 0.000 af Outflow=0.34 cfs 0.115 af

Pond IB2: EX Inf Basin #2 Peak Elev=399.02' Storage=1 cf Inflow=0.01 cfs 0.004 af
Discarded=0.01 cfs 0.004 af Primary=0.00 cfs 0.000 af Outflow=0.01 cfs 0.004 af

Total Runoff Area = 8.860 ac Runoff Volume = 0.125 af Average Runoff Depth = 0.17"
70.32% Pervious = 6.230 ac 29.68% Impervious = 2.630 ac

Summary for Subcatchment 1: EX DA #1

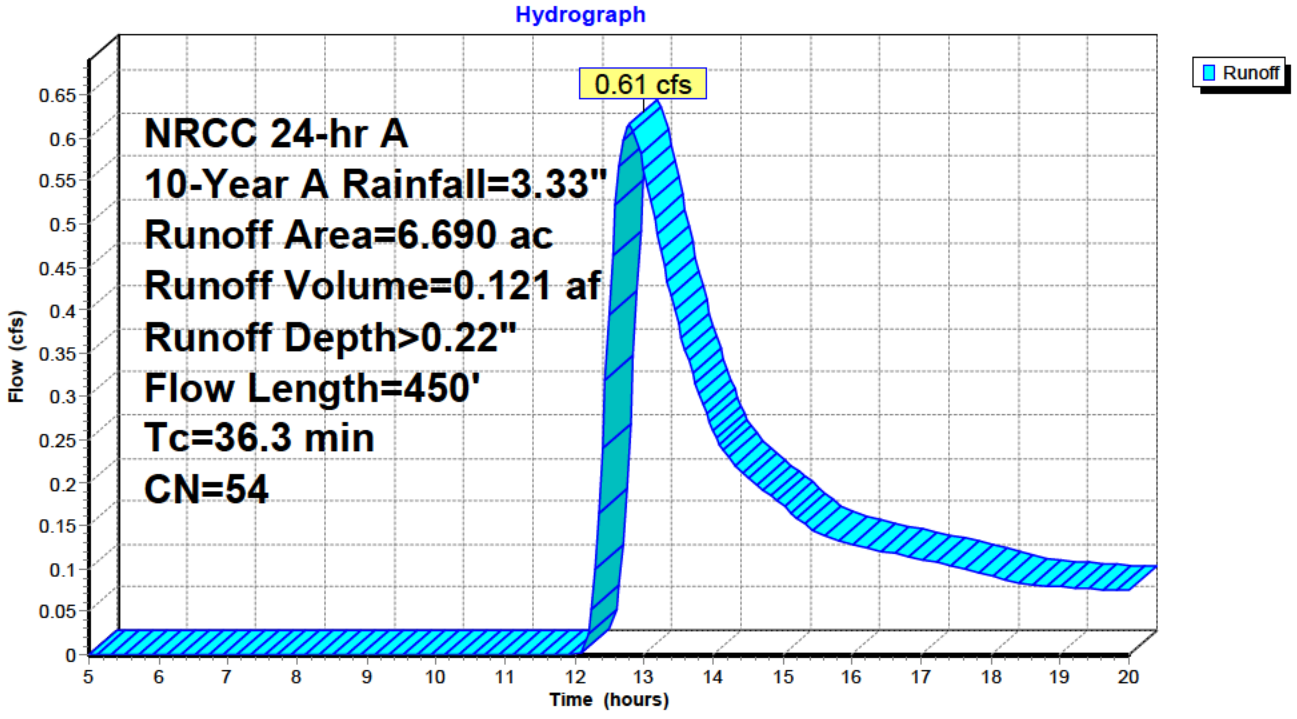
Runoff = 0.61 cfs @ 12.79 hrs, Volume= 0.121 af, Depth> 0.22"
Routed to Pond IB1 : EX Inf Basin #1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NRCC 24-hr A 10-Year A Rainfall=3.33"

Area (ac)	CN	Description
4.320	30	Meadow, non-grazed, HSG A
2.370	98	Paved parking, HSG A
6.690	54	Weighted Average
4.320		64.57% Pervious Area
2.370		35.43% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
28.8	100	0.0150	0.06		**Sheet Flow, Lawn** Grass: Bermuda n= 0.410 P2= 2.33"
7.5	350	0.0125	0.78		**Shallow Concentrated Flow, Lawn** Short Grass Pasture Kv= 7.0 fps
36.3	450	Total			

Subcatchment 1: EX DA #1



Summary for Subcatchment 2: EX DA #2

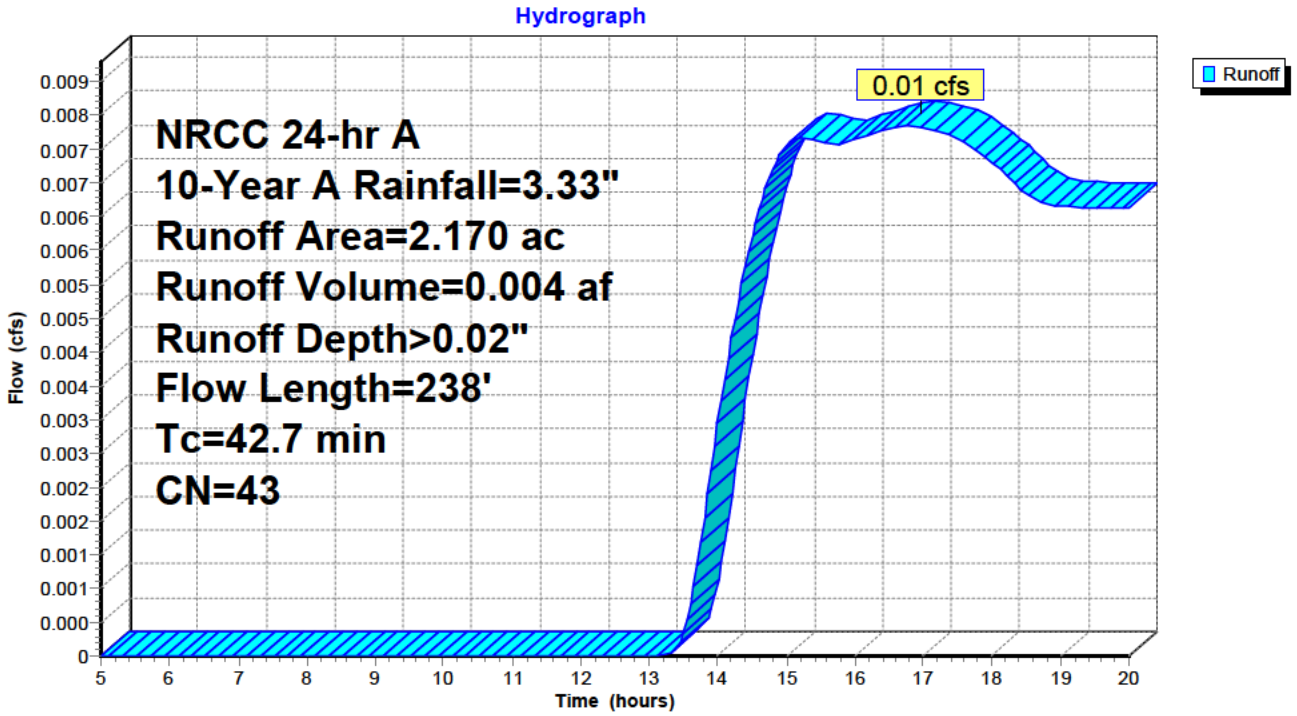
Runoff = 0.01 cfs @ 16.76 hrs, Volume= 0.004 af, Depth> 0.02"
Routed to Pond IB2 : EX Inf Basin #2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NRCC 24-hr A 10-Year A Rainfall=3.33"

Area (ac)	CN	Description
1.640	30	Meadow, non-grazed, HSG A
0.260	98	Paved parking, HSG A
0.270	71	Meadow, non-grazed, HSG C
2.170	43	Weighted Average
1.910		88.02% Pervious Area
0.260		11.98% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
40.2	100	0.0065	0.04		**Sheet Flow, Lawn** Grass: Bermuda n= 0.410 P2= 2.33"
2.5	138	0.0170	0.91		**Shallow Concentrated Flow, Lawn** Short Grass Pasture Kv= 7.0 fps
42.7	238	Total			

Subcatchment 2: EX DA #2



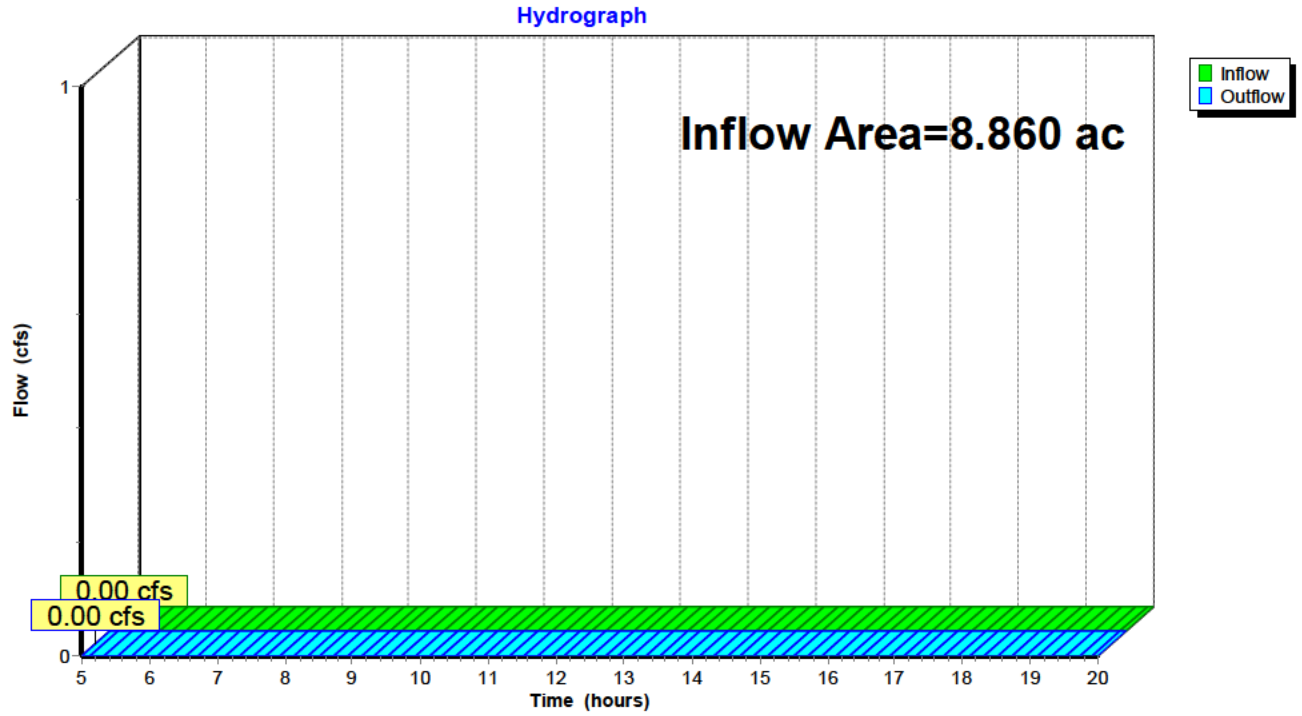
Summary for Reach DP: Design Point

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 8.860 ac, 29.68% Impervious, Inflow Depth = 0.00" for 10-Year A event
Inflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
Outflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach DP: Design Point



Summary for Pond IB1: EX Inf Basin #1

Inflow Area = 6.690 ac, 35.43% Impervious, Inflow Depth > 0.22" for 10-Year A event
Inflow = 0.61 cfs @ 12.79 hrs, Volume= 0.121 af
Outflow = 0.34 cfs @ 13.65 hrs, Volume= 0.115 af, Atten= 45%, Lag= 51.6 min
Discarded = 0.34 cfs @ 13.65 hrs, Volume= 0.115 af
Primary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
Routed to Reach DP : Design Point

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 397.57' @ 13.65 hrs Surf.Area= 2,397 sf Storage= 1,208 cf

Plug-Flow detention time= 55.8 min calculated for 0.115 af (95% of inflow)
Center-of-Mass det. time= 40.3 min (925.7 - 885.4)

Volume	Invert	Avail.Storage	Storage Description
#1	397.00'	20,048 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

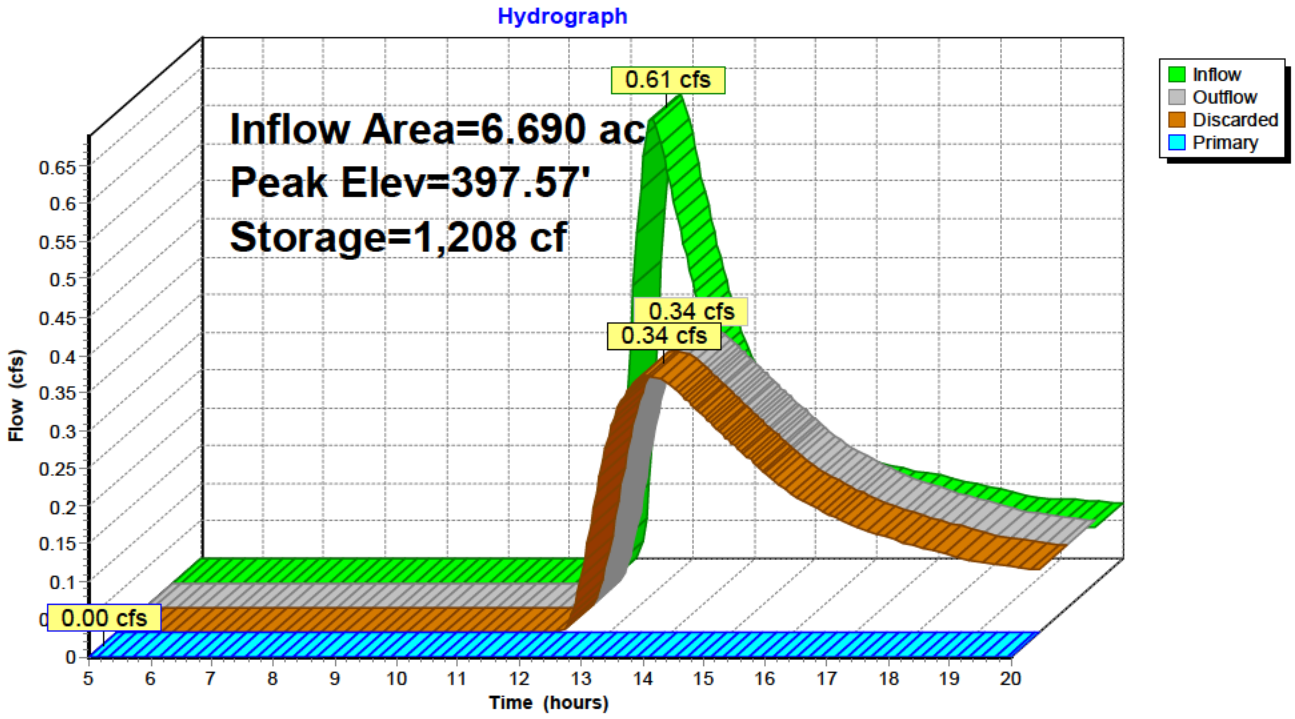
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
397.00	1,835	0	0
398.00	2,820	2,328	2,328
399.00	3,745	3,283	5,610
400.00	5,065	4,405	10,015
401.00	15,000	10,033	20,048

Device	Routing	Invert	Outlet Devices
#1	Discarded	397.00'	**25.000 in/hr Exfiltration over Surface area above 397.00'** Conductivity to Groundwater Elevation = 391.21' Excluded Surface area = 1,835 sf
#2	Primary	397.79'	**18.0" Round Culvert** L= 18.5' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 397.79' / 397.43' S= 0.0195 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf
#3	Device 2	398.11'	**8.0" Round Culvert** L= 6.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 398.11' / 398.05' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.35 sf
#4	Device 2	399.41'	**18.0" W x 12.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#5	Device 2	400.64'	**24.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.34 cfs @ 13.65 hrs HW=397.57' (Free Discharge)
└**1=Exfiltration** (Controls 0.34 cfs)

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=397.00' (Free Discharge)
└**2=Culvert** (Controls 0.00 cfs)
  └**3=Culvert** (Controls 0.00 cfs)
  └**4=Orifice/Grate** (Controls 0.00 cfs)
  └**5=Orifice/Grate** (Controls 0.00 cfs)

Pond IB1: EX Inf Basin #1



Summary for Pond IB2: EX Inf Basin #2

Inflow Area = 2.170 ac, 11.98% Impervious, Inflow Depth > 0.02" for 10-Year A event
Inflow = 0.01 cfs @ 16.76 hrs, Volume= 0.004 af
Outflow = 0.01 cfs @ 16.83 hrs, Volume= 0.004 af, Atten= 0%, Lag= 4.2 min
Discarded = 0.01 cfs @ 16.83 hrs, Volume= 0.004 af
Primary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
Routed to Reach DP : Design Point

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 399.02' @ 16.83 hrs Surf.Area= 56 sf Storage= 1 cf

Plug-Flow detention time= 2.0 min calculated for 0.004 af (99% of inflow)
Center-of-Mass det. time= 1.1 min (1,018.8 - 1,017.7)

Volume	Invert	Avail.Storage	Storage Description
#1	399.00'	4,839 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

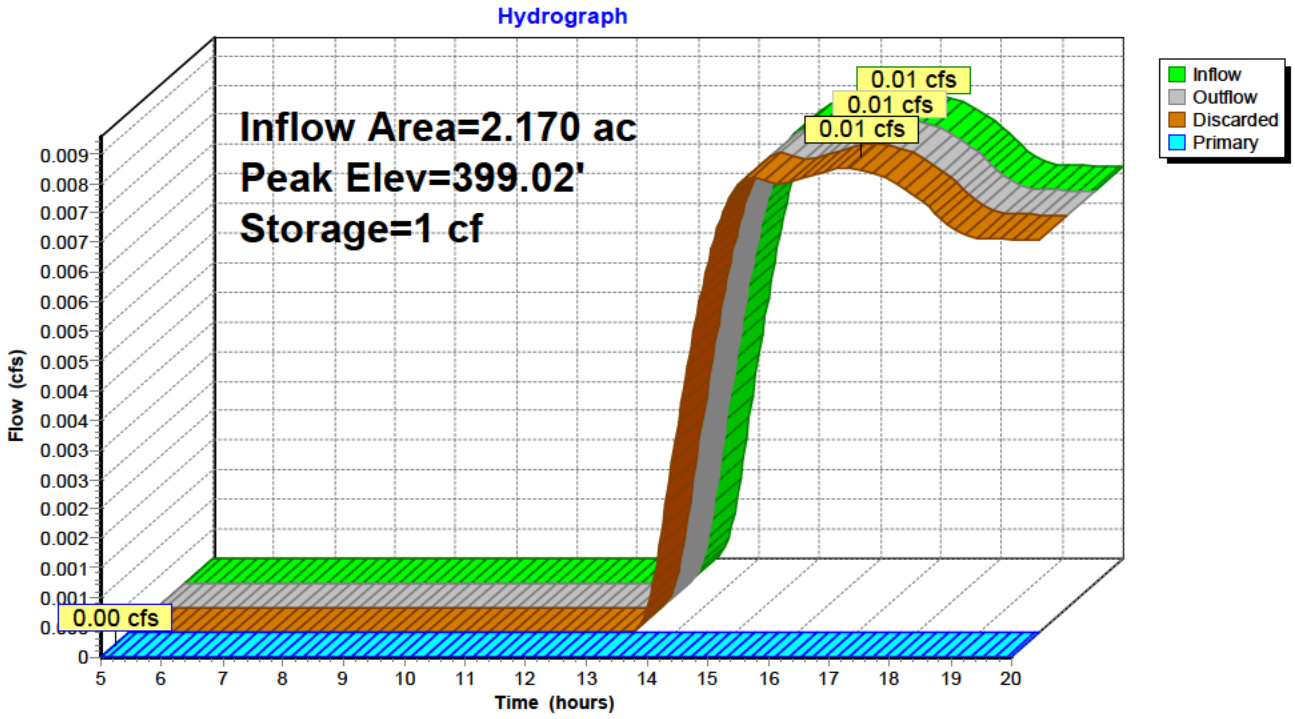
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
399.00	42	0	0
400.00	850	446	446
401.00	1,730	1,290	1,736
402.00	4,475	3,103	4,839

Device	Routing	Invert	Outlet Devices
#1	Discarded	399.00'	**25.000 in/hr Exfiltration over Surface area above 399.00'** Conductivity to Groundwater Elevation = 391.21' Excluded Surface area = 42 sf
#2	Primary	401.35'	**15.0" Round Culvert** L= 25.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 401.35' / 401.30' S= 0.0020 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf
#3	Primary	401.35'	**15.0" Round Culvert** L= 25.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 401.35' / 401.30' S= 0.0020 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf
#4	Primary	401.35'	**15.0" Round Culvert** L= 25.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 401.35' / 401.30' S= 0.0020 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf

Discarded OutFlow Max=0.01 cfs @ 16.83 hrs HW=399.02' (Free Discharge)
└**1=Exfiltration** (Controls 0.01 cfs)

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=399.00' (Free Discharge)
├**2=Culvert** (Controls 0.00 cfs)
├**3=Culvert** (Controls 0.00 cfs)
└**4=Culvert** (Controls 0.00 cfs)

Pond IB2: EX Inf Basin #2



Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 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 1: EX DA #1 Runoff Area=6.690 ac 35.43% Impervious Runoff Depth>1.06"
Flow Length=450' Tc=36.3 min CN=54 Runoff=4.79 cfs 0.592 af

Subcatchment 2: EX DA #2 Runoff Area=2.170 ac 11.98% Impervious Runoff Depth>0.44"
Flow Length=238' Tc=42.7 min CN=43 Runoff=0.42 cfs 0.079 af

Reach DP: Design Point Inflow=1.45 cfs 0.147 af
Outflow=1.45 cfs 0.147 af

Pond IB1: EX Inf Basin #1 Peak Elev=399.21' Storage=6,416 cf Inflow=4.79 cfs 0.592 af
Discarded=1.47 cfs 0.424 af Primary=1.45 cfs 0.147 af Outflow=2.92 cfs 0.571 af

Pond IB2: EX Inf Basin #2 Peak Elev=399.73' Storage=247 cf Inflow=0.42 cfs 0.079 af
Discarded=0.36 cfs 0.079 af Primary=0.00 cfs 0.000 af Outflow=0.36 cfs 0.079 af

Total Runoff Area = 8.860 ac Runoff Volume = 0.671 af Average Runoff Depth = 0.91"
70.32% Pervious = 6.230 ac 29.68% Impervious = 2.630 ac

Summary for Subcatchment 1: EX DA #1

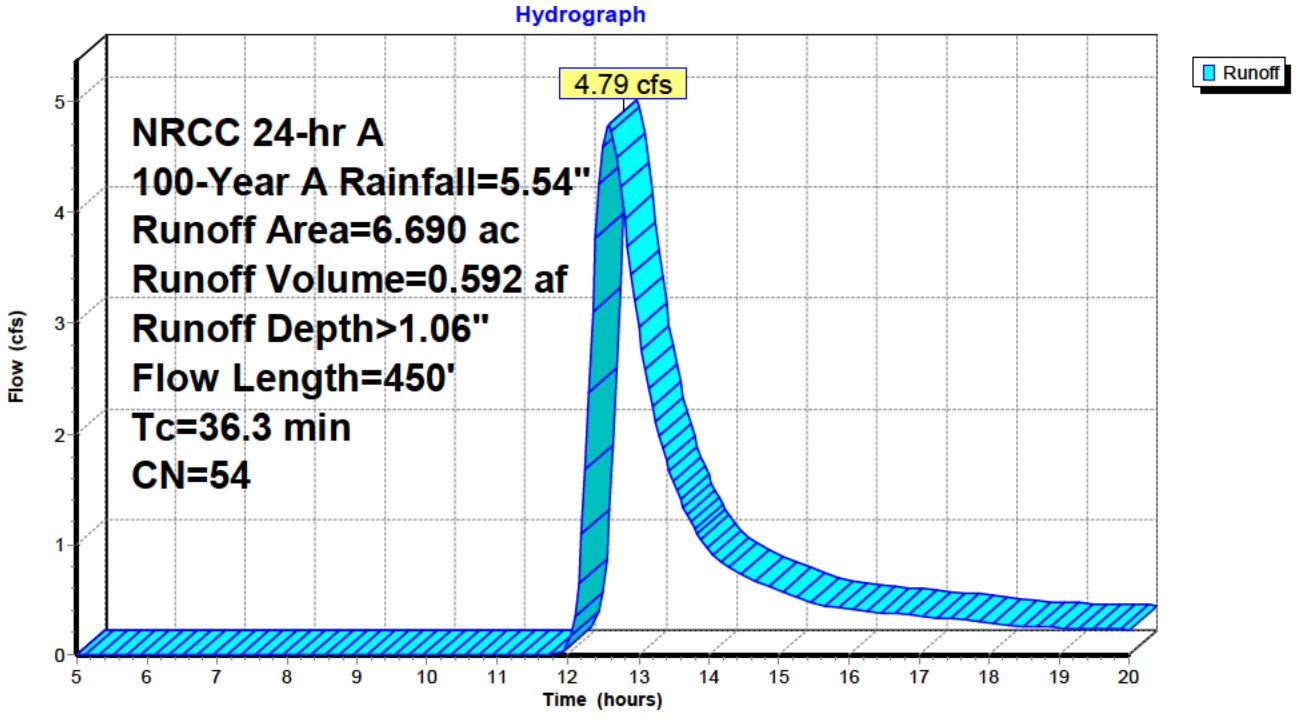
Runoff = 4.79 cfs @ 12.58 hrs, Volume= 0.592 af, Depth> 1.06"
Routed to Pond IB1 : EX Inf Basin #1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NRCC 24-hr A 100-Year A Rainfall=5.54"

Area (ac)	CN	Description
4.320	30	Meadow, non-grazed, HSG A
2.370	98	Paved parking, HSG A
6.690	54	Weighted Average
4.320		64.57% Pervious Area
2.370		35.43% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
28.8	100	0.0150	0.06		**Sheet Flow, Lawn** Grass: Bermuda n= 0.410 P2= 2.33"
7.5	350	0.0125	0.78		**Shallow Concentrated Flow, Lawn** Short Grass Pasture Kv= 7.0 fps
36.3	450	Total			

Subcatchment 1: EX DA #1



Summary for Subcatchment 2: EX DA #2

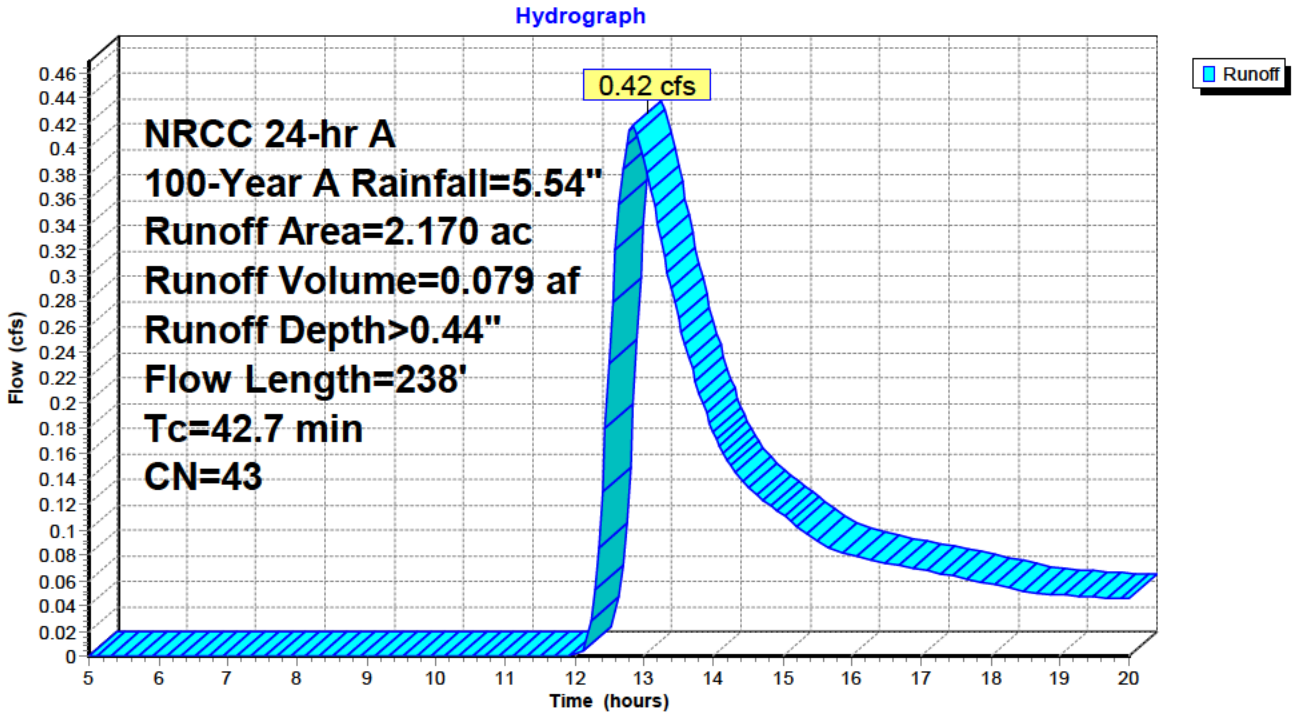
Runoff = 0.42 cfs @ 12.84 hrs, Volume= 0.079 af, Depth> 0.44"
Routed to Pond IB2 : EX Inf Basin #2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NRCC 24-hr A 100-Year A Rainfall=5.54"

Area (ac)	CN	Description
1.640	30	Meadow, non-grazed, HSG A
0.260	98	Paved parking, HSG A
0.270	71	Meadow, non-grazed, HSG C
2.170	43	Weighted Average
1.910		88.02% Pervious Area
0.260		11.98% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
40.2	100	0.0065	0.04		**Sheet Flow, Lawn** Grass: Bermuda n= 0.410 P2= 2.33"
2.5	138	0.0170	0.91		**Shallow Concentrated Flow, Lawn** Short Grass Pasture Kv= 7.0 fps
42.7	238	Total			

Subcatchment 2: EX DA #2



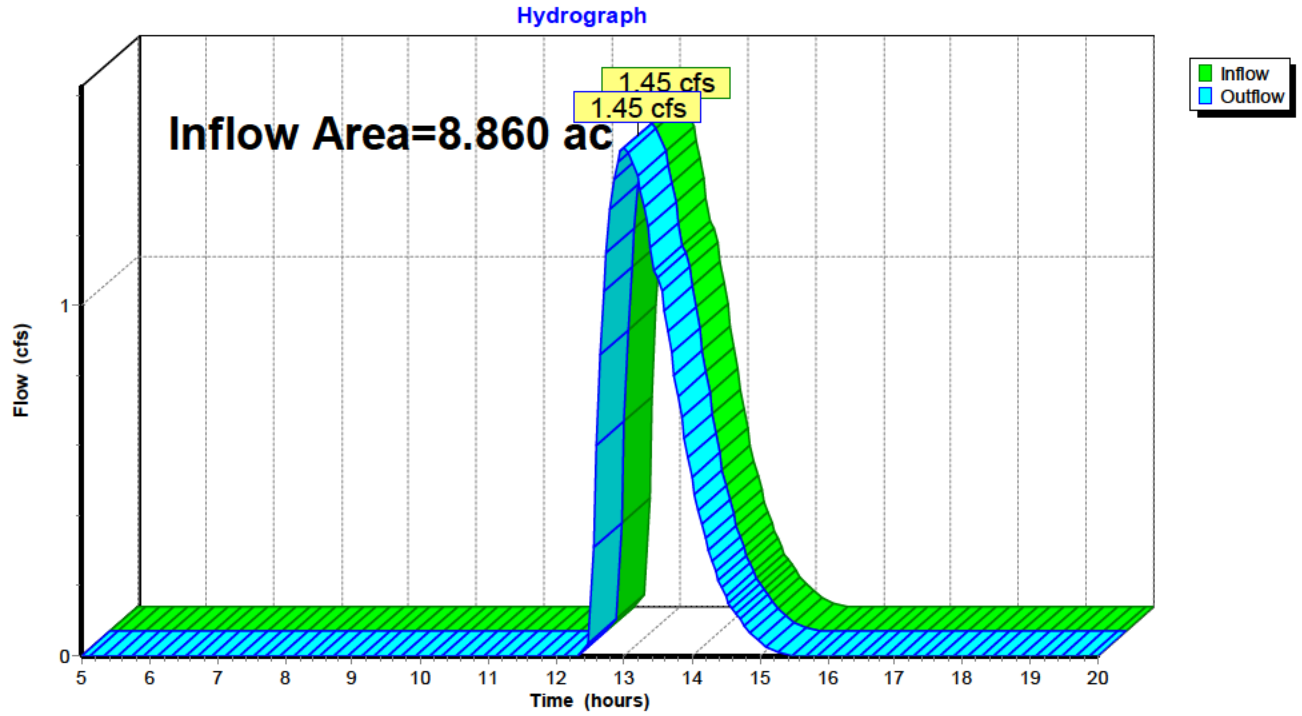
Summary for Reach DP: Design Point

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 8.860 ac, 29.68% Impervious, Inflow Depth = 0.20" for 100-Year A event
Inflow = 1.45 cfs @ 13.01 hrs, Volume= 0.147 af
Outflow = 1.45 cfs @ 13.01 hrs, Volume= 0.147 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach DP: Design Point



Summary for Pond IB1: EX Inf Basin #1

Inflow Area = 6.690 ac, 35.43% Impervious, Inflow Depth > 1.06" for 100-Year A event
Inflow = 4.79 cfs @ 12.58 hrs, Volume= 0.592 af
Outflow = 2.92 cfs @ 13.01 hrs, Volume= 0.571 af, Atten= 39%, Lag= 25.8 min
Discarded = 1.47 cfs @ 13.01 hrs, Volume= 0.424 af
Primary = 1.45 cfs @ 13.01 hrs, Volume= 0.147 af
Routed to Reach DP : Design Point

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 399.21' @ 13.01 hrs Surf.Area= 4,019 sf Storage= 6,416 cf

Plug-Flow detention time= 48.1 min calculated for 0.569 af (96% of inflow)
Center-of-Mass det. time= 36.2 min (879.6 - 843.5)

Volume	Invert	Avail.Storage	Storage Description
#1	397.00'	20,048 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

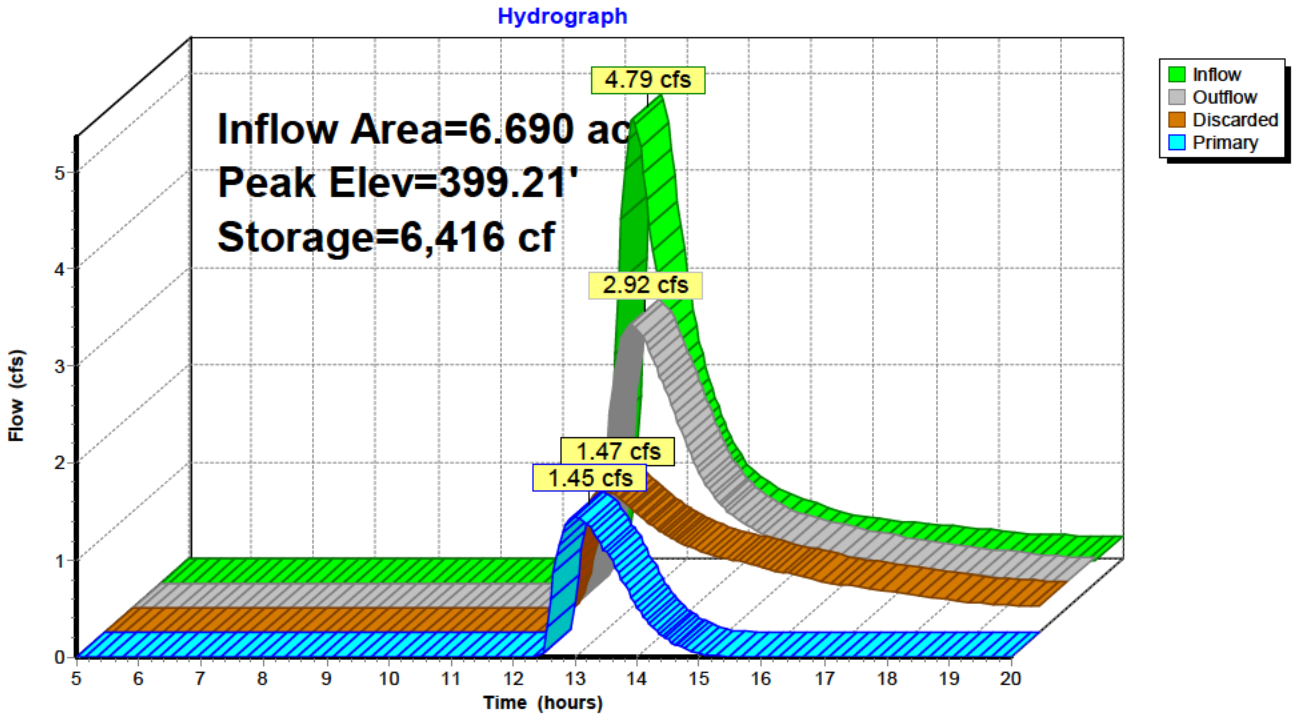
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
397.00	1,835	0	0
398.00	2,820	2,328	2,328
399.00	3,745	3,283	5,610
400.00	5,065	4,405	10,015
401.00	15,000	10,033	20,048

Device	Routing	Invert	Outlet Devices
#1	Discarded	397.00'	**25.000 in/hr Exfiltration over Surface area above 397.00'** Conductivity to Groundwater Elevation = 391.21' Excluded Surface area = 1,835 sf
#2	Primary	397.79'	**18.0" Round Culvert** L= 18.5' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 397.79' / 397.43' S= 0.0195 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf
#3	Device 2	398.11'	**8.0" Round Culvert** L= 6.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 398.11' / 398.05' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.35 sf
#4	Device 2	399.41'	**18.0" W x 12.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#5	Device 2	400.64'	**24.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=1.47 cfs @ 13.01 hrs HW=399.21' (Free Discharge)
└**1=Exfiltration** (Controls 1.47 cfs)

Primary OutFlow Max=1.45 cfs @ 13.01 hrs HW=399.21' (Free Discharge)
└**2=Culvert** (Passes 1.45 cfs of 6.83 cfs potential flow)
  └**3=Culvert** (Barrel Controls 1.45 cfs @ 4.16 fps)
  └**4=Orifice/Grate** (Controls 0.00 cfs)
  └**5=Orifice/Grate** (Controls 0.00 cfs)

Pond IB1: EX Inf Basin #1



Summary for Pond IB2: EX Inf Basin #2

Inflow Area = 2.170 ac, 11.98% Impervious, Inflow Depth > 0.44" for 100-Year A event
Inflow = 0.42 cfs @ 12.84 hrs, Volume= 0.079 af
Outflow = 0.36 cfs @ 13.14 hrs, Volume= 0.079 af, Atten= 14%, Lag= 17.8 min
Discarded = 0.36 cfs @ 13.14 hrs, Volume= 0.079 af
Primary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
Routed to Reach DP : Design Point

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 399.73' @ 13.14 hrs Surf.Area= 633 sf Storage= 247 cf

Plug-Flow detention time= 7.1 min calculated for 0.078 af (99% of inflow)
Center-of-Mass det. time= 6.4 min (888.0 - 881.7)

Volume	Invert	Avail.Storage	Storage Description
#1	399.00'	4,839 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
399.00	42	0	0
400.00	850	446	446
401.00	1,730	1,290	1,736
402.00	4,475	3,103	4,839

Device	Routing	Invert	Outlet Devices
#1	Discarded	399.00'	**25.000 in/hr Exfiltration over Surface area above 399.00'** Conductivity to Groundwater Elevation = 391.21' Excluded Surface area = 42 sf
#2	Primary	401.35'	**15.0" Round Culvert** L= 25.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 401.35' / 401.30' S= 0.0020 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf
#3	Primary	401.35'	**15.0" Round Culvert** L= 25.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 401.35' / 401.30' S= 0.0020 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf
#4	Primary	401.35'	**15.0" Round Culvert** L= 25.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 401.35' / 401.30' S= 0.0020 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf

Discarded OutFlow Max=0.36 cfs @ 13.14 hrs HW=399.73' (Free Discharge)
└**1=Exfiltration** (Controls 0.36 cfs)

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=399.00' (Free Discharge)
├**2=Culvert** (Controls 0.00 cfs)
├**3=Culvert** (Controls 0.00 cfs)
└**4=Culvert** (Controls 0.00 cfs)

Pond IB2: EX Inf Basin #2

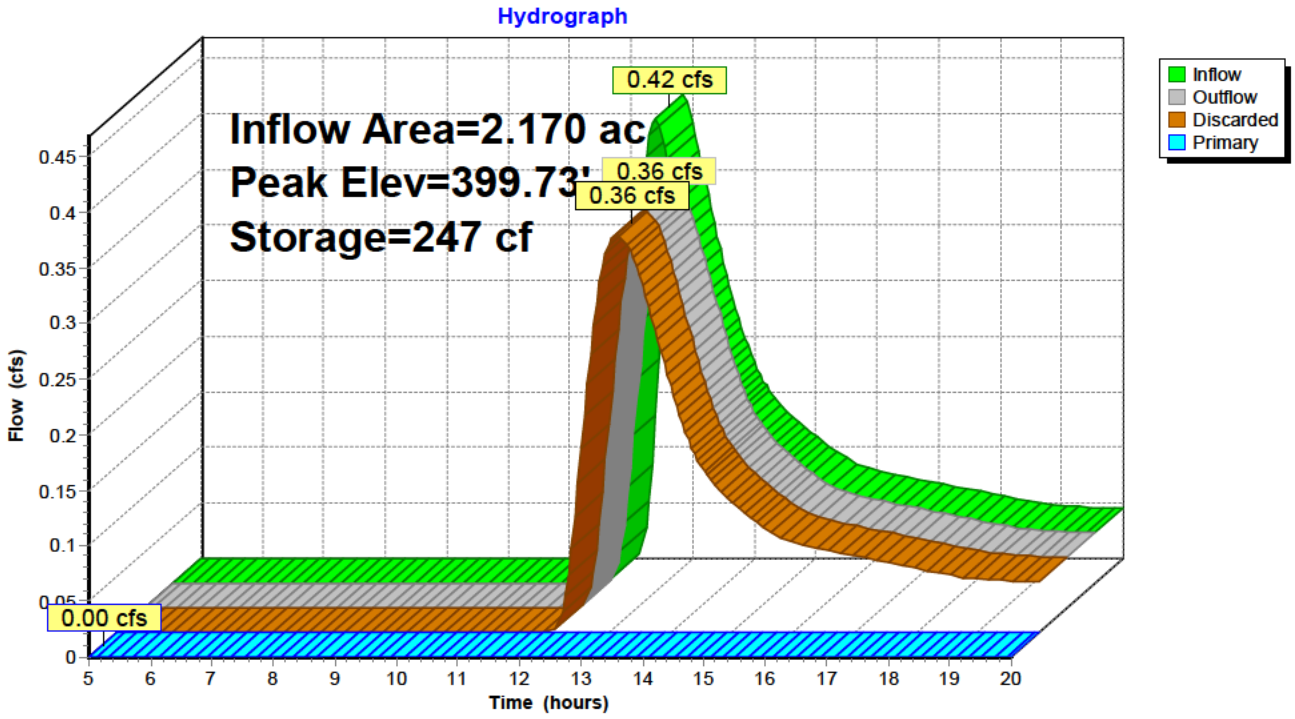


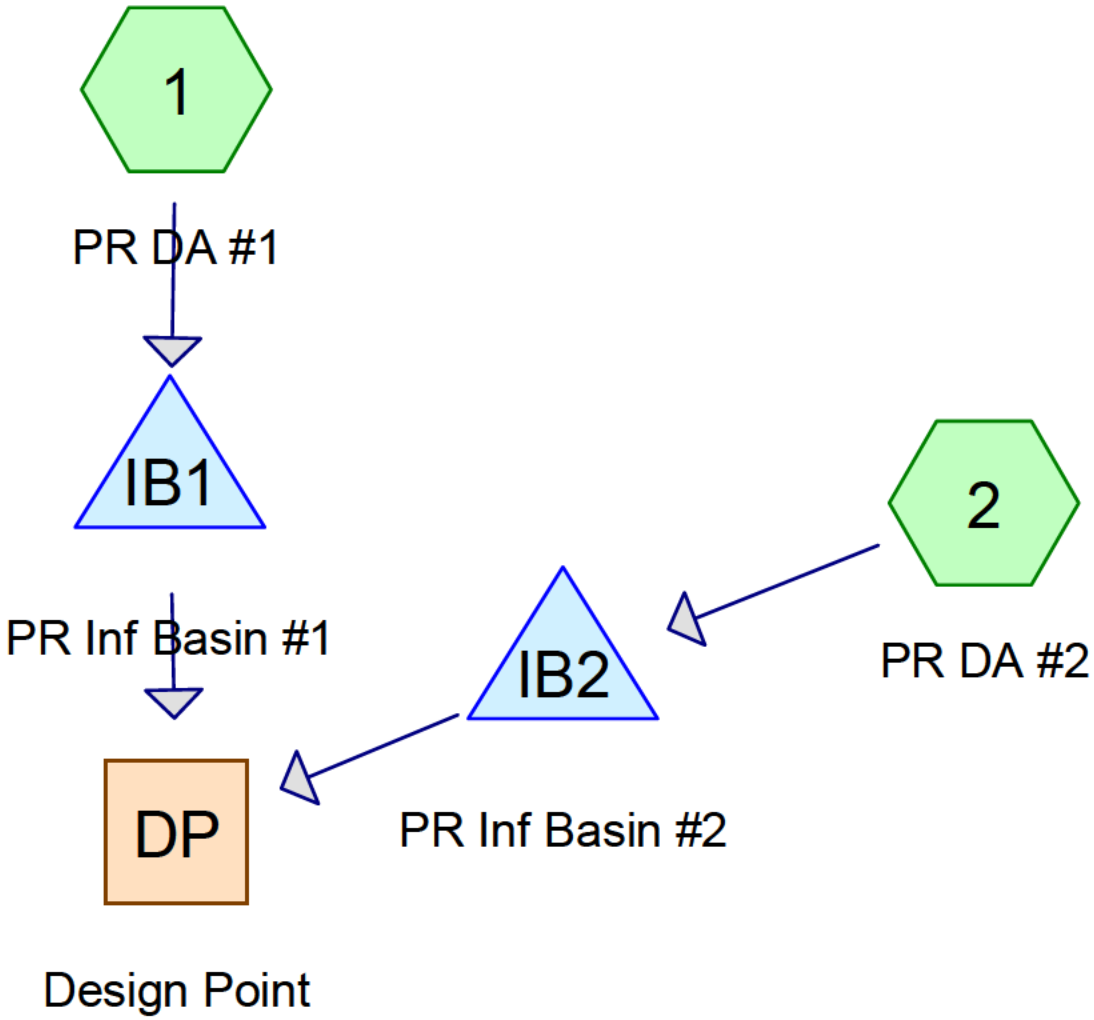
TABLE OF CONTENTS

Project Reports
1 Routing Diagram
2 Rainfall Events Listing (selected events)
3 Area Listing (all nodes)
4 Soil Listing (all nodes)
5 Ground Covers (all nodes)
6 Pipe Listing (all nodes)

1-Year A Event
7 Node Listing
8 Subcat 1: EX DA #1
9 Subcat 2: EX DA #2
10 Reach DP: Design Point
11 Pond IB1: EX Inf Basin #1
13 Pond IB2: EX Inf Basin #2

10-Year A Event
15 Node Listing
16 Subcat 1: EX DA #1
17 Subcat 2: EX DA #2
18 Reach DP: Design Point
19 Pond IB1: EX Inf Basin #1
21 Pond IB2: EX Inf Basin #2

100-Year A Event
23 Node Listing
24 Subcat 1: EX DA #1
25 Subcat 2: EX DA #2
26 Reach DP: Design Point
27 Pond IB1: EX Inf Basin #1
29 Pond IB2: EX Inf Basin #2



Subcat Reach Pond Link

Routing Diagram for 2016-033.007 Proposed
Prepared by Aubertine & Currier, PLLC, Printed 8/11/2026
HydroCAD® 10.20-7a s/n 03261 © 2025 HydroCAD Software Solutions LLC

Rainfall Events Listing (selected events)

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	1-Year A	NRCC 24-hr	A	Default	24.00	1	2.00	2
2	10-Year A	NRCC 24-hr	A	Default	24.00	1	3.33	2
3	100-Year A	NRCC 24-hr	A	Default	24.00	1	5.54	2

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
2.500	30	Meadow, non-grazed, HSG A (1, 2)
0.430	71	Meadow, non-grazed, HSG C (2)
3.590	98	Paved parking, HSG A (1, 2)
0.020	98	Paved parking, HSG C (2)
2.240	98	Roofs, HSG A (1)
0.083	98	Unconnected pavement, HSG A (1, 2)
8.863	**78**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
8.413	HSG A	1, 2
0.000	HSG B	
0.450	HSG C	2
0.000	HSG D	
0.000	Other	
8.863		**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
2.500	0.000	0.430	0.000	0.000	2.930	Meadow, non-grazed	1, 2
3.590	0.000	0.020	0.000	0.000	3.610	Paved parking	1, 2
2.240	0.000	0.000	0.000	0.000	2.240	Roofs	1
0.083	0.000	0.000	0.000	0.000	0.083	Unconnected pavement	1, 2
8.413	**0.000**	**0.450**	**0.000**	**0.000**	**8.863**	**TOTAL AREA**	

Pipe Listing (all nodes)

Line#	Node Number	In-Invert (feet)	Out-Invert (feet)	Length (feet)	Slope (ft/ft)	n	Width (inches)	Diam/Height (inches)	Inside-Fill (inches)	Node Name
1	IB1	397.79	397.43	18.5	0.0195	0.013	0.0	18.0	0.0	
2	IB1	398.11	398.05	6.0	0.0100	0.013	0.0	8.0	0.0	
3	IB2	401.23	400.87	25.0	0.0144	0.013	0.0	15.0	0.0	
4	IB2	401.06	400.85	25.0	0.0084	0.013	0.0	15.0	0.0	
5	IB2	401.17	400.96	25.0	0.0084	0.013	0.0	15.0	0.0	

Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 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 1: PR DA #1 Runoff Area=6.333 ac 75.37% Impervious Runoff Depth>0.55"
Flow Length=499' Tc=14.2 min CN=81 Runoff=4.13 cfs 0.292 af

Subcatchment 2: PR DA #2 Runoff Area=2.530 ac 45.85% Impervious Runoff Depth>0.17"
Flow Length=168' Tc=18.2 min CN=68 Runoff=0.26 cfs 0.035 af

Reach DP: Design Point Inflow=0.00 cfs 0.000 af
Outflow=0.00 cfs 0.000 af

Pond IB1: PR Inf Basin #1 Peak Elev=397.05' Storage=386 cf Inflow=4.13 cfs 0.292 af
Discarded=4.06 cfs 0.292 af Primary=0.00 cfs 0.000 af Outflow=4.06 cfs 0.292 af

Pond IB2: PR Inf Basin #2 Peak Elev=397.18' Storage=43 cf Inflow=0.26 cfs 0.035 af
Discarded=0.24 cfs 0.035 af Primary=0.00 cfs 0.000 af Outflow=0.24 cfs 0.035 af

Total Runoff Area = 8.863 ac Runoff Volume = 0.327 af Average Runoff Depth = 0.44"
33.06% Pervious = 2.930 ac 66.94% Impervious = 5.933 ac

Summary for Subcatchment 1: PR DA #1

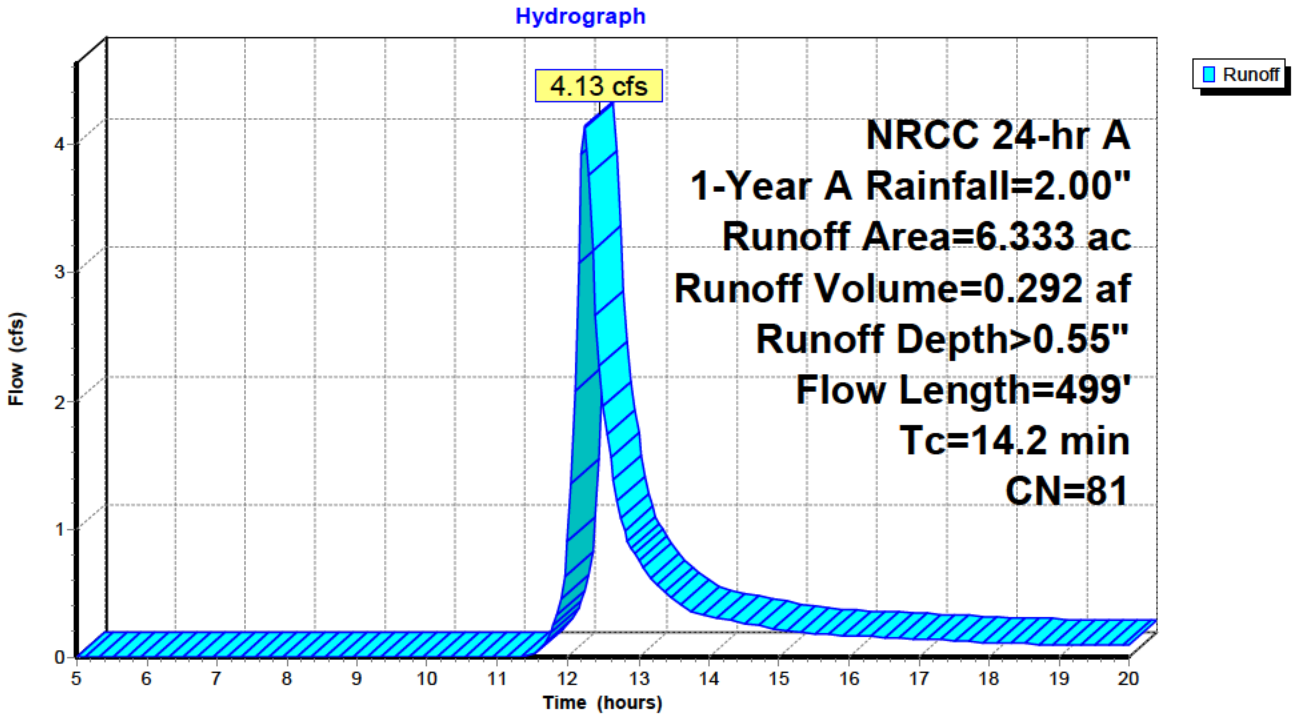
Runoff = 4.13 cfs @ 12.24 hrs, Volume= 0.292 af, Depth> 0.55"
Routed to Pond IB1 : PR Inf Basin #1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NRCC 24-hr A 1-Year A Rainfall=2.00"

Area (ac)	CN	Description
1.560	30	Meadow, non-grazed, HSG A
2.480	98	Paved parking, HSG A
2.240	98	Roofs, HSG A
0.053	98	Unconnected pavement, HSG A
6.333	81	Weighted Average
1.560		24.63% Pervious Area
4.773		75.37% Impervious Area
0.053		1.11% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.5	31	0.0210	0.05		**Sheet Flow, Lawn**
					Grass: Bermuda n= 0.410 P2= 2.50"
1.1	69	0.0181	1.08		**Sheet Flow, Concrete Walk to Asphalt Parking**
					Smooth surfaces n= 0.011 P2= 2.50"
1.7	157	0.0058	1.55		**Shallow Concentrated Flow, Asphalt Parking**
					Paved Kv= 20.3 fps
1.9	242	0.0195	2.09		**Shallow Concentrated Flow, Lawn Area to Infiltration Basin**
					Grassed Waterway Kv= 15.0 fps
14.2	499	Total			

Subcatchment 1: PR DA #1



Summary for Subcatchment 2: PR DA #2

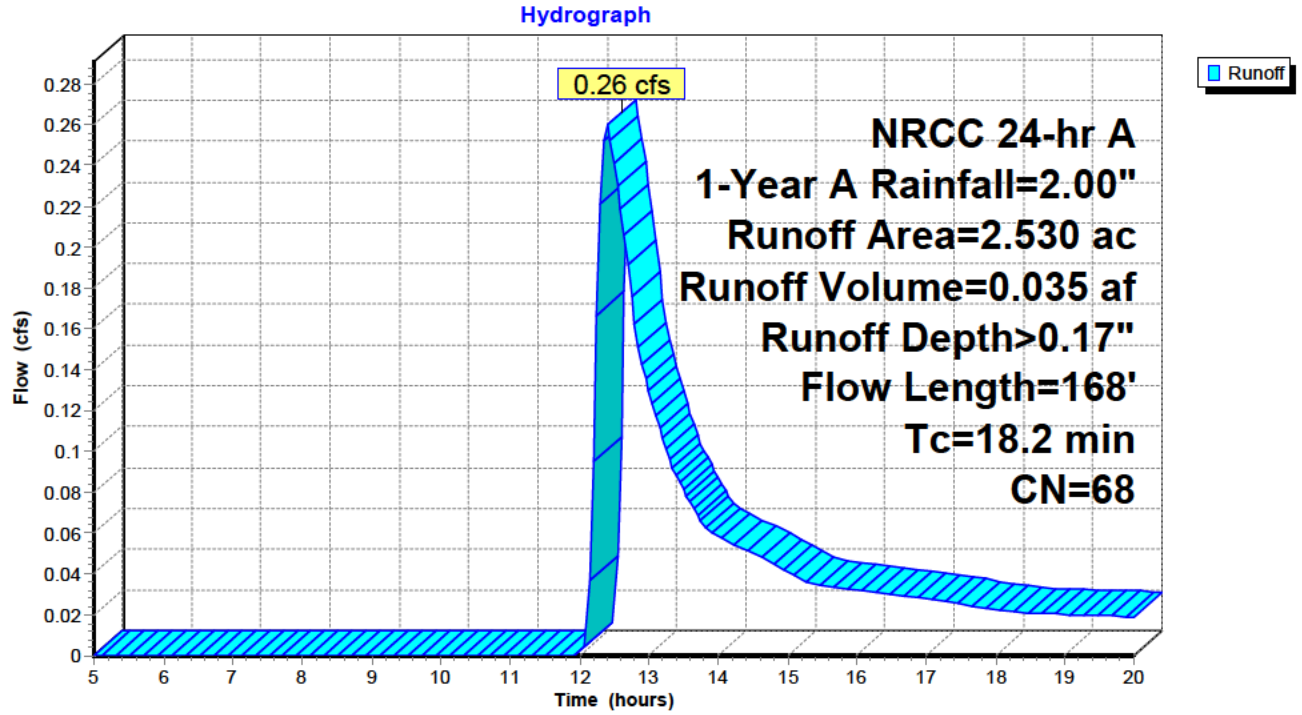
Runoff = 0.26 cfs @ 12.40 hrs, Volume= 0.035 af, Depth> 0.17"
Routed to Pond IB2 : PR Inf Basin #2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NRCC 24-hr A 1-Year A Rainfall=2.00"

Area (ac)	CN	Description
0.940	30	Meadow, non-grazed, HSG A
1.110	98	Paved parking, HSG A
0.430	71	Meadow, non-grazed, HSG C
0.020	98	Paved parking, HSG C
0.030	98	Unconnected pavement, HSG A
2.530	68	Weighted Average
1.370		54.15% Pervious Area
1.160		45.85% Impervious Area
0.030		2.59% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
17.5	100	0.0163	0.10		**Sheet Flow, Lawn** Grass: Dense n= 0.240 P2= 2.50"
0.7	68	0.0572	1.67		**Shallow Concentrated Flow, Lawn to Infiltration Basin** Short Grass Pasture Kv= 7.0 fps
18.2	168	Total			

Subcatchment 2: PR DA #2



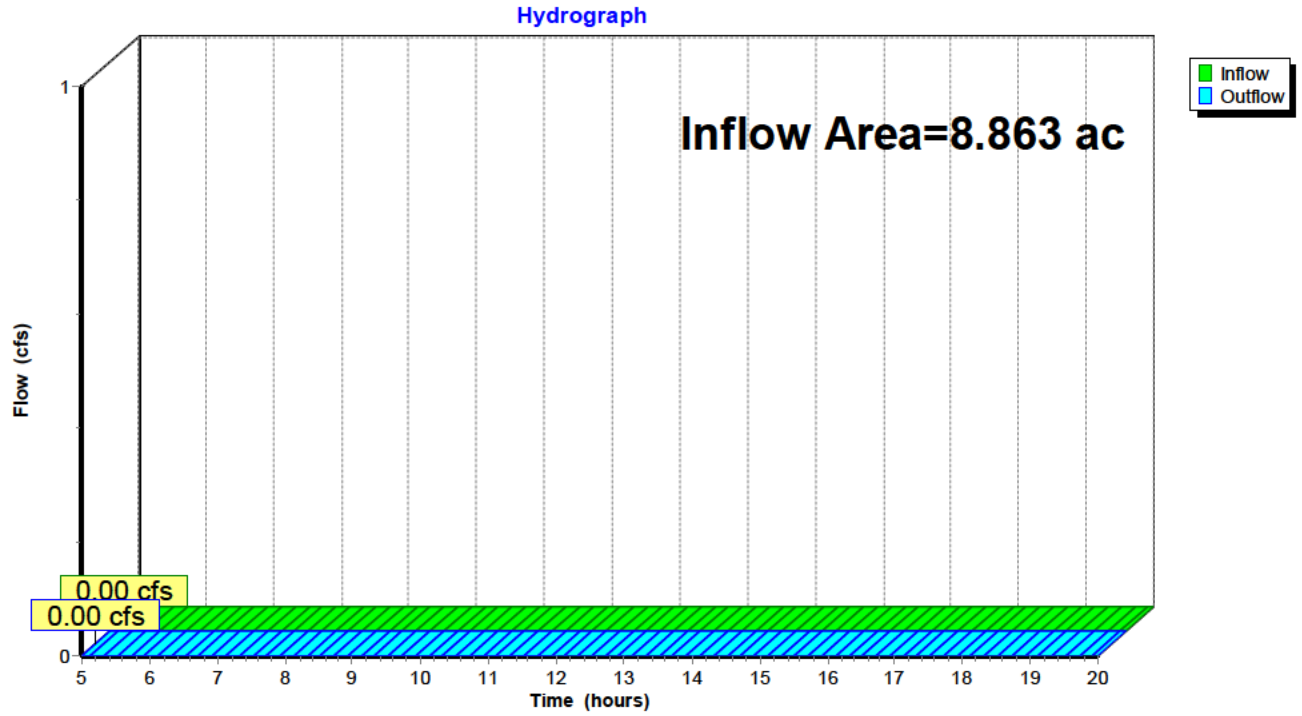
Summary for Reach DP: Design Point

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 8.863 ac, 66.94% Impervious, Inflow Depth = 0.00" for 1-Year A event
Inflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
Outflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach DP: Design Point



Summary for Pond IB1: PR Inf Basin #1

[92] Warning: Device #4 is above defined storage
[92] Warning: Device #5 is above defined storage

Inflow Area = 6.333 ac, 75.37% Impervious, Inflow Depth > 0.55" for 1-Year A event
Inflow = 4.13 cfs @ 12.24 hrs, Volume= 0.292 af
Outflow = 4.06 cfs @ 12.27 hrs, Volume= 0.292 af, Atten= 2%, Lag= 1.6 min
Discarded = 4.06 cfs @ 12.27 hrs, Volume= 0.292 af
Primary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
Routed to Reach DP : Design Point

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 397.05' @ 12.27 hrs Surf.Area= 7,433 sf Storage= 386 cf

Plug-Flow detention time= 1.6 min calculated for 0.292 af (100% of inflow)
Center-of-Mass det. time= 1.3 min (815.6 - 814.3)

Volume	Invert	Avail.Storage	Storage Description
#1	397.00'	21,878 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

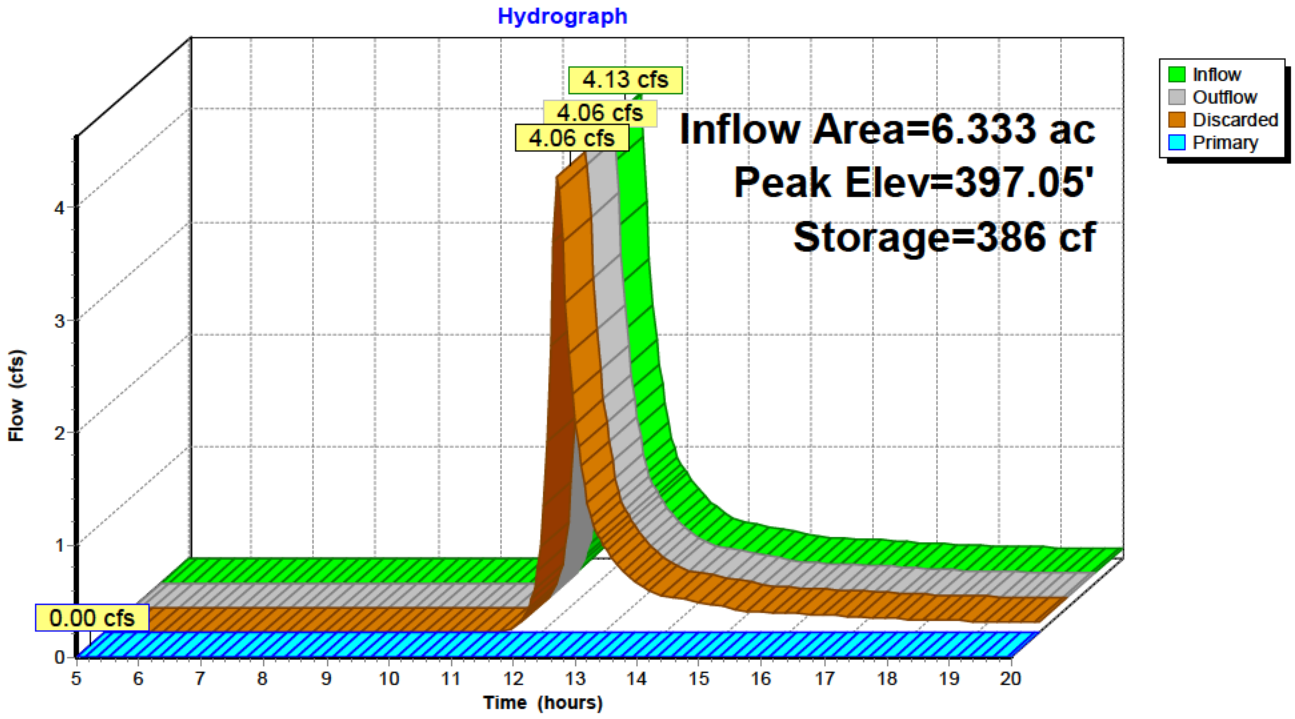
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
397.00	7,241	0	0
398.00	10,888	9,065	9,065
399.00	14,738	12,813	21,878

Device	Routing	Invert	Outlet Devices
#1	Discarded	397.00'	**25.000 in/hr Exfiltration over Surface area above 396.66'** Conductivity to Groundwater Elevation = 391.21' Excluded Surface area = 0 sf
#2	Primary	397.79'	**18.0" Round Culvert** L= 18.5' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 397.79' / 397.43' S= 0.0195 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf
#3	Device 2	398.11'	**8.0" Round Culvert** L= 6.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 398.11' / 398.05' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.35 sf
#4	Device 2	399.41'	**18.0" W x 12.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#5	Device 2	400.64'	**24.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=4.34 cfs @ 12.27 hrs HW=397.05' (Free Discharge)
└**1=Exfiltration** (Controls 4.34 cfs)

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=397.00' (Free Discharge)
└**2=Culvert** (Controls 0.00 cfs)
  ├**3=Culvert** (Controls 0.00 cfs)
  ├**4=Orifice/Grate** (Controls 0.00 cfs)
  └**5=Orifice/Grate** (Controls 0.00 cfs)

Pond IB1: PR Inf Basin #1



Summary for Pond IB2: PR Inf Basin #2

Inflow Area = 2.530 ac, 45.85% Impervious, Inflow Depth > 0.17" for 1-Year A event
Inflow = 0.26 cfs @ 12.40 hrs, Volume= 0.035 af
Outflow = 0.24 cfs @ 12.51 hrs, Volume= 0.035 af, Atten= 7%, Lag= 6.4 min
Discarded = 0.24 cfs @ 12.51 hrs, Volume= 0.035 af
Primary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
Routed to Reach DP : Design Point

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 397.18' @ 12.51 hrs Surf.Area= 410 sf Storage= 43 cf

Plug-Flow detention time= 1.6 min calculated for 0.035 af (100% of inflow)
Center-of-Mass det. time= 1.4 min (864.2 - 862.9)

Volume	Invert	Avail.Storage	Storage Description
#1	397.00'	18,212 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

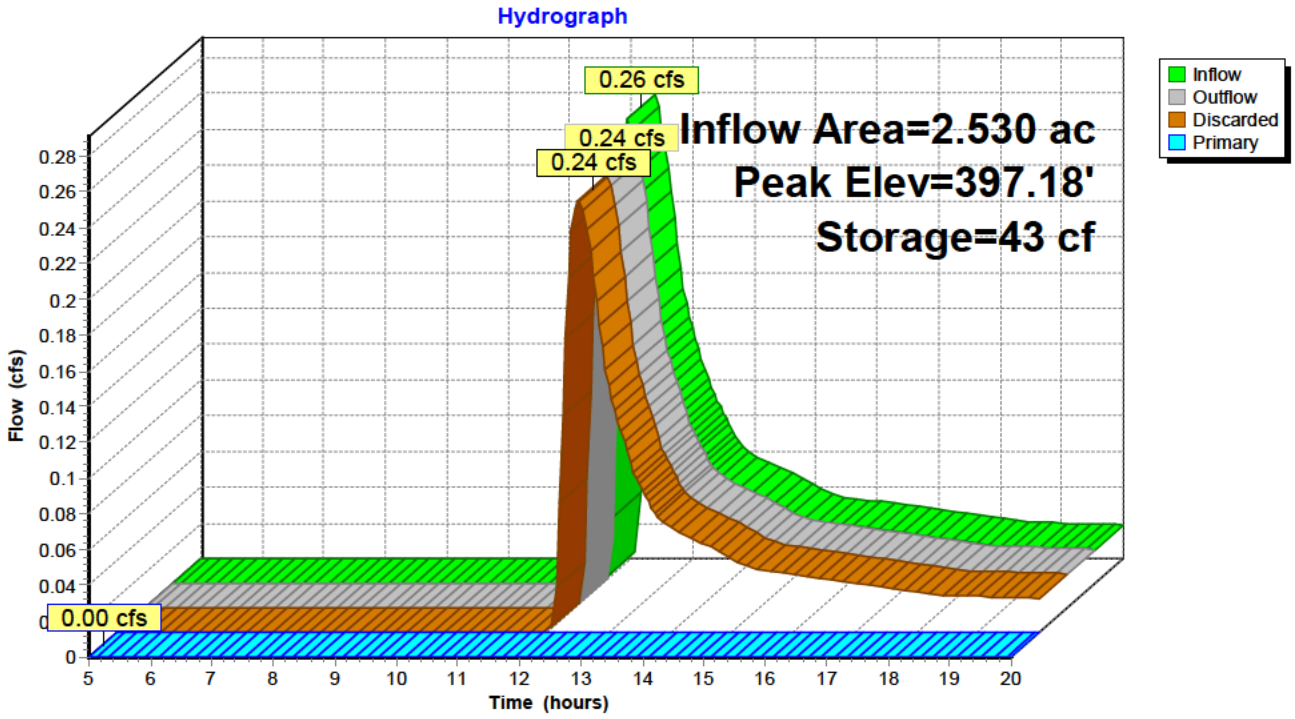
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
397.00	66	0	0
398.00	1,969	1,018	1,018
399.00	3,057	2,513	3,531
400.00	4,183	3,620	7,151
401.00	5,379	4,781	11,932
402.00	7,181	6,280	18,212

Device	Routing	Invert	Outlet Devices
#1	Discarded	397.00'	**25.000 in/hr Exfiltration over Surface area above 396.00'** Conductivity to Groundwater Elevation = 391.21' Excluded Surface area = 0 sf
#2	Primary	401.23'	**15.0" Round Culvert** L= 25.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 401.23' / 400.87' S= 0.0144 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf
#3	Primary	401.06'	**15.0" Round Culvert** L= 25.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 401.06' / 400.85' S= 0.0084 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf
#4	Primary	401.17'	**15.0" Round Culvert** L= 25.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 401.17' / 400.96' S= 0.0084 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf

Discarded OutFlow Max=0.24 cfs @ 12.51 hrs HW=397.18' (Free Discharge)
└**1=Exfiltration** (Controls 0.24 cfs)

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=397.00' (Free Discharge)
├**2=Culvert** (Controls 0.00 cfs)
├**3=Culvert** (Controls 0.00 cfs)
└**4=Culvert** (Controls 0.00 cfs)

Pond IB2: PR Inf Basin #2



Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 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 1: PR DA #1 Runoff Area=6.333 ac 75.37% Impervious Runoff Depth>1.46"
Flow Length=499' Tc=14.2 min CN=81 Runoff=11.30 cfs 0.772 af

Subcatchment 2: PR DA #2 Runoff Area=2.530 ac 45.85% Impervious Runoff Depth>0.73"
Flow Length=168' Tc=18.2 min CN=68 Runoff=1.85 cfs 0.153 af

Reach DP: Design Point Inflow=0.00 cfs 0.000 af
Outflow=0.00 cfs 0.000 af

Pond IB1: PR Inf Basin #1 Peak Elev=397.61' Storage=5,068 cf Inflow=11.30 cfs 0.772 af
Discarded=5.97 cfs 0.772 af Primary=0.00 cfs 0.000 af Outflow=5.97 cfs 0.772 af

Pond IB2: PR Inf Basin #2 Peak Elev=397.96' Storage=946 cf Inflow=1.85 cfs 0.153 af
Discarded=1.18 cfs 0.153 af Primary=0.00 cfs 0.000 af Outflow=1.18 cfs 0.153 af

Total Runoff Area = 8.863 ac Runoff Volume = 0.926 af Average Runoff Depth = 1.25"
33.06% Pervious = 2.930 ac 66.94% Impervious = 5.933 ac

Summary for Subcatchment 1: PR DA #1

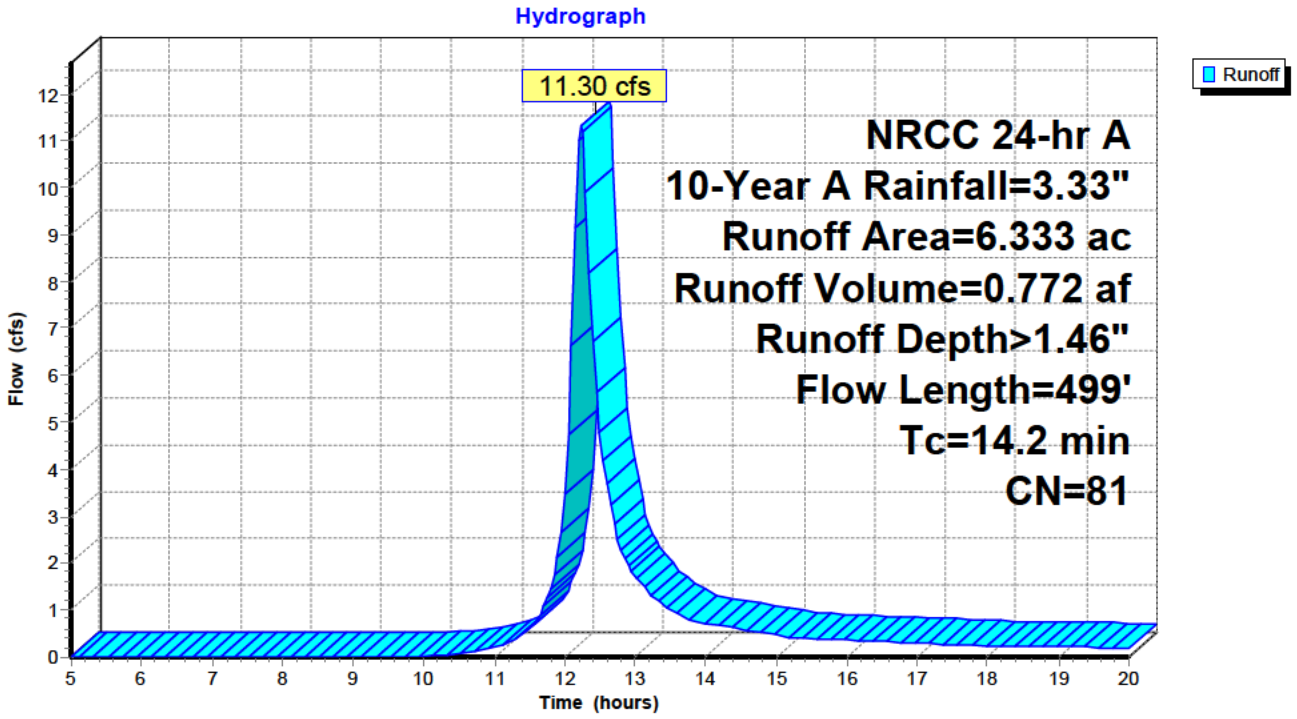
Runoff = 11.30 cfs @ 12.23 hrs, Volume= 0.772 af, Depth> 1.46"
Routed to Pond IB1 : PR Inf Basin #1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NRCC 24-hr A 10-Year A Rainfall=3.33"

Area (ac)	CN	Description
1.560	30	Meadow, non-grazed, HSG A
2.480	98	Paved parking, HSG A
2.240	98	Roofs, HSG A
0.053	98	Unconnected pavement, HSG A
6.333	81	Weighted Average
1.560		24.63% Pervious Area
4.773		75.37% Impervious Area
0.053		1.11% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.5	31	0.0210	0.05		**Sheet Flow, Lawn**
					Grass: Bermuda n= 0.410 P2= 2.50"
1.1	69	0.0181	1.08		**Sheet Flow, Concrete Walk to Asphalt Parking**
					Smooth surfaces n= 0.011 P2= 2.50"
1.7	157	0.0058	1.55		**Shallow Concentrated Flow, Asphalt Parking**
					Paved Kv= 20.3 fps
1.9	242	0.0195	2.09		**Shallow Concentrated Flow, Lawn Area to Infiltration Basin**
					Grassed Waterway Kv= 15.0 fps
14.2	499	Total			

Subcatchment 1: PR DA #1



Summary for Subcatchment 2: PR DA #2

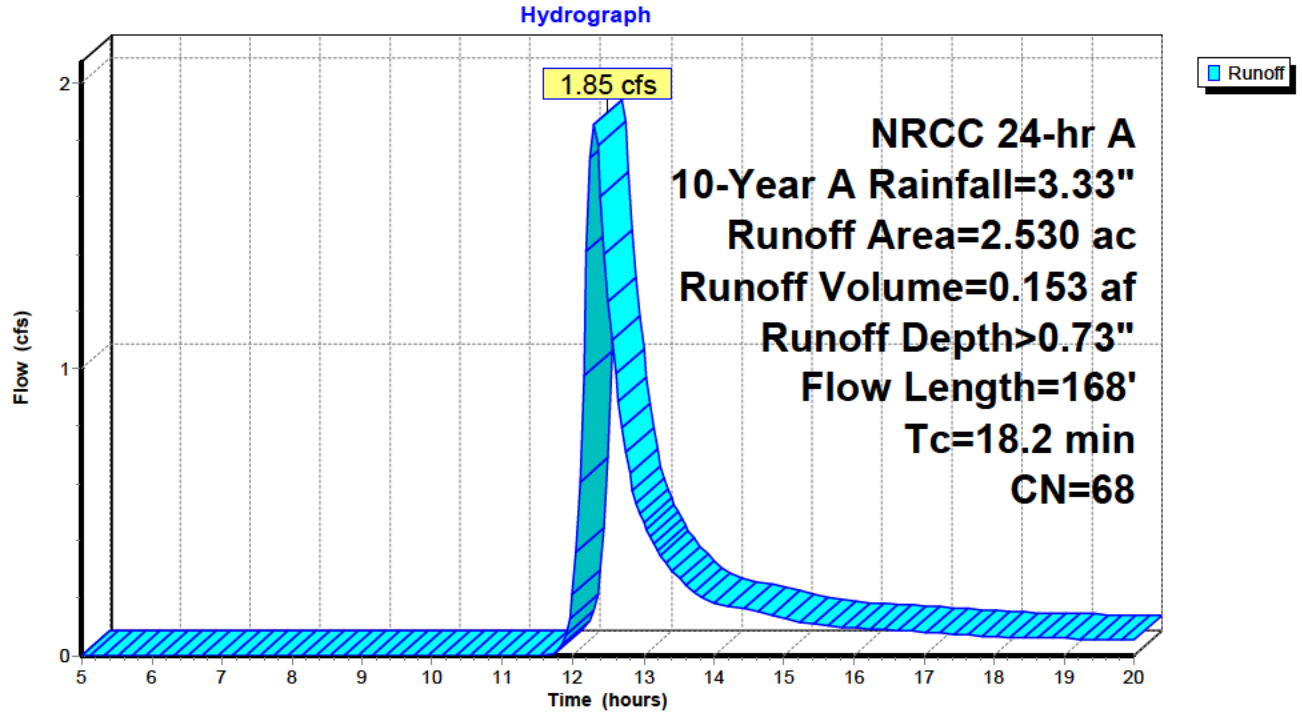
Runoff = 1.85 cfs @ 12.31 hrs, Volume= 0.153 af, Depth> 0.73"
Routed to Pond IB2 : PR Inf Basin #2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NRCC 24-hr A 10-Year A Rainfall=3.33"

Area (ac)	CN	Description
0.940	30	Meadow, non-grazed, HSG A
1.110	98	Paved parking, HSG A
0.430	71	Meadow, non-grazed, HSG C
0.020	98	Paved parking, HSG C
0.030	98	Unconnected pavement, HSG A
2.530	68	Weighted Average
1.370		54.15% Pervious Area
1.160		45.85% Impervious Area
0.030		2.59% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
17.5	100	0.0163	0.10		**Sheet Flow, Lawn** Grass: Dense n= 0.240 P2= 2.50"
0.7	68	0.0572	1.67		**Shallow Concentrated Flow, Lawn to Infiltration Basin** Short Grass Pasture Kv= 7.0 fps
18.2	168	Total			

Subcatchment 2: PR DA #2



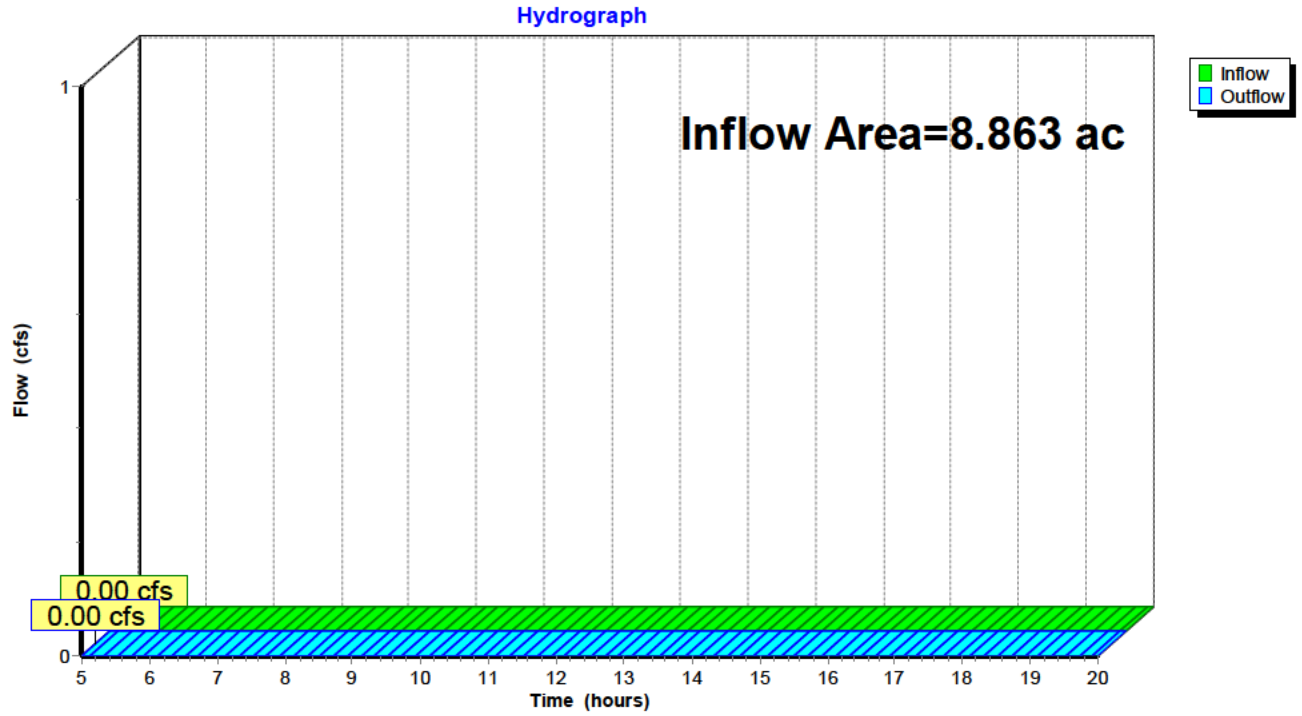
Summary for Reach DP: Design Point

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 8.863 ac, 66.94% Impervious, Inflow Depth = 0.00" for 10-Year A event
Inflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
Outflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach DP: Design Point



Summary for Pond IB1: PR Inf Basin #1

[92] Warning: Device #4 is above defined storage
[92] Warning: Device #5 is above defined storage

Inflow Area = 6.333 ac, 75.37% Impervious, Inflow Depth > 1.46" for 10-Year A event
Inflow = 11.30 cfs @ 12.23 hrs, Volume= 0.772 af
Outflow = 5.97 cfs @ 12.44 hrs, Volume= 0.772 af, Atten= 47%, Lag= 12.3 min
Discarded = 5.97 cfs @ 12.44 hrs, Volume= 0.772 af
Primary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
Routed to Reach DP : Design Point

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 397.61' @ 12.44 hrs Surf.Area= 9,455 sf Storage= 5,068 cf

Plug-Flow detention time= 5.9 min calculated for 0.772 af (100% of inflow)
Center-of-Mass det. time= 5.7 min (802.3 - 796.6)

Volume	Invert	Avail.Storage	Storage Description
#1	397.00'	21,878 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

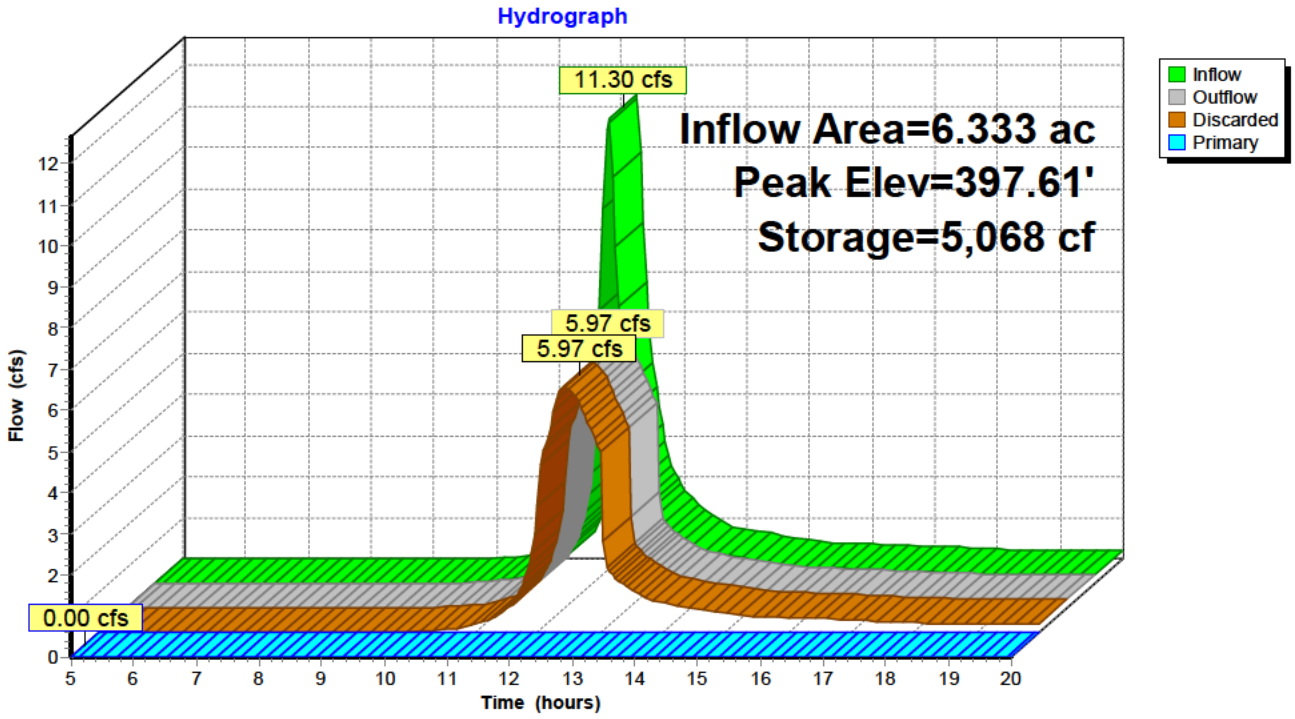
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
397.00	7,241	0	0
398.00	10,888	9,065	9,065
399.00	14,738	12,813	21,878

Device	Routing	Invert	Outlet Devices
#1	Discarded	397.00'	**25.000 in/hr Exfiltration over Surface area above 396.66'** Conductivity to Groundwater Elevation = 391.21' Excluded Surface area = 0 sf
#2	Primary	397.79'	**18.0" Round Culvert** L= 18.5' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 397.79' / 397.43' S= 0.0195 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf
#3	Device 2	398.11'	**8.0" Round Culvert** L= 6.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 398.11' / 398.05' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.35 sf
#4	Device 2	399.41'	**18.0" W x 12.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#5	Device 2	400.64'	**24.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=5.97 cfs @ 12.44 hrs HW=397.61' (Free Discharge)
└**1=Exfiltration** (Controls 5.97 cfs)

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=397.00' (Free Discharge)
└**2=Culvert** (Controls 0.00 cfs)
  ├**3=Culvert** (Controls 0.00 cfs)
  ├**4=Orifice/Grate** (Controls 0.00 cfs)
  └**5=Orifice/Grate** (Controls 0.00 cfs)

Pond IB1: PR Inf Basin #1



Summary for Pond IB2: PR Inf Basin #2

Inflow Area = 2.530 ac, 45.85% Impervious, Inflow Depth > 0.73" for 10-Year A event
Inflow = 1.85 cfs @ 12.31 hrs, Volume= 0.153 af
Outflow = 1.18 cfs @ 12.52 hrs, Volume= 0.153 af, Atten= 36%, Lag= 12.9 min
Discarded = 1.18 cfs @ 12.52 hrs, Volume= 0.153 af
Primary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
Routed to Reach DP : Design Point

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 397.96' @ 12.52 hrs Surf.Area= 1,898 sf Storage= 946 cf

Plug-Flow detention time= 7.1 min calculated for 0.153 af (100% of inflow)
Center-of-Mass det. time= 6.9 min (832.5 - 825.7)

Volume	Invert	Avail.Storage	Storage Description
#1	397.00'	18,212 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

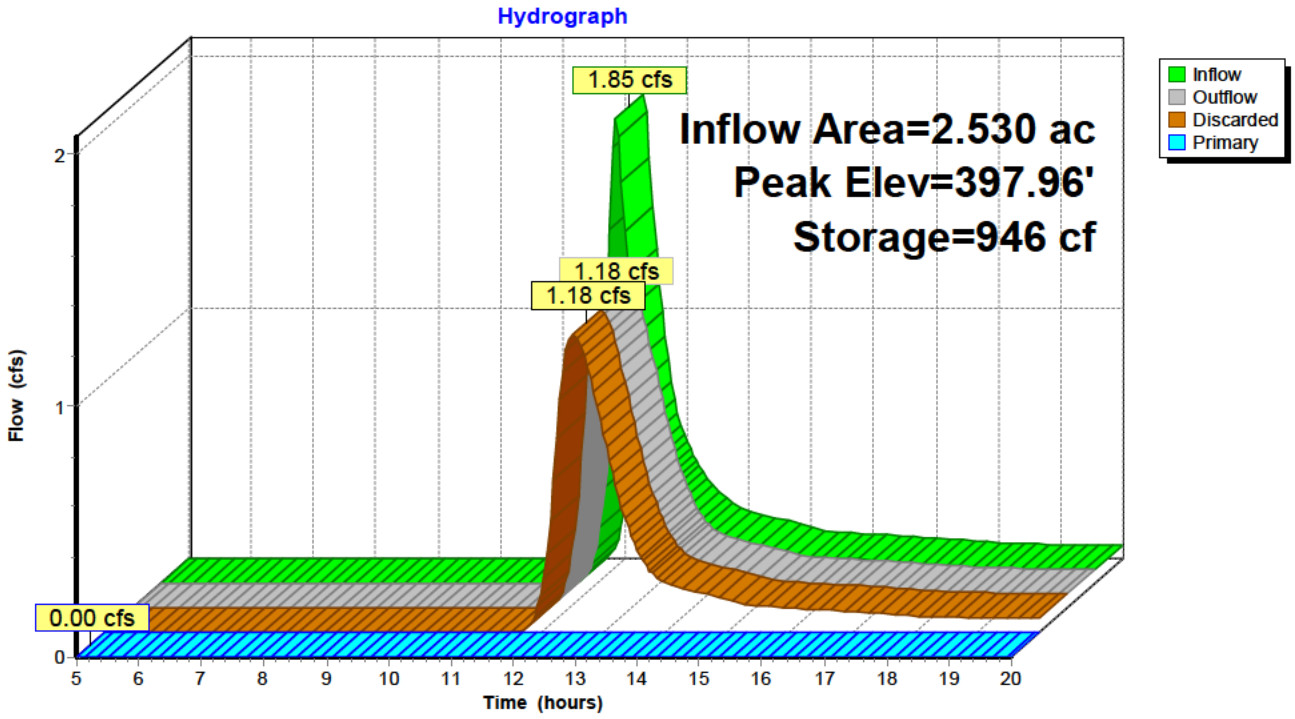
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
397.00	66	0	0
398.00	1,969	1,018	1,018
399.00	3,057	2,513	3,531
400.00	4,183	3,620	7,151
401.00	5,379	4,781	11,932
402.00	7,181	6,280	18,212

Device	Routing	Invert	Outlet Devices
#1	Discarded	397.00'	**25.000 in/hr Exfiltration over Surface area above 396.00'** Conductivity to Groundwater Elevation = 391.21' Excluded Surface area = 0 sf
#2	Primary	401.23'	**15.0" Round Culvert** L= 25.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 401.23' / 400.87' S= 0.0144 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf
#3	Primary	401.06'	**15.0" Round Culvert** L= 25.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 401.06' / 400.85' S= 0.0084 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf
#4	Primary	401.17'	**15.0" Round Culvert** L= 25.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 401.17' / 400.96' S= 0.0084 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf

Discarded OutFlow Max=1.18 cfs @ 12.52 hrs HW=397.96' (Free Discharge)
└**1=Exfiltration** (Controls 1.18 cfs)

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=397.00' (Free Discharge)
├**2=Culvert** (Controls 0.00 cfs)
├**3=Culvert** (Controls 0.00 cfs)
└**4=Culvert** (Controls 0.00 cfs)

Pond IB2: PR Inf Basin #2



Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 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 1: PR DA #1 Runoff Area=6.333 ac 75.37% Impervious Runoff Depth>3.26"
Flow Length=499' Tc=14.2 min CN=81 Runoff=24.90 cfs 1.722 af

Subcatchment 2: PR DA #2 Runoff Area=2.530 ac 45.85% Impervious Runoff Depth>2.10"
Flow Length=168' Tc=18.2 min CN=68 Runoff=5.78 cfs 0.443 af

Reach DP: Design Point Inflow=0.72 cfs 0.027 af
Outflow=0.72 cfs 0.027 af

Pond IB1: PR Inf Basin #1 Peak Elev=398.72' Storage=17,959 cf Inflow=24.90 cfs 1.722 af
Discarded=9.66 cfs 1.694 af Primary=0.72 cfs 0.027 af Outflow=10.37 cfs 1.721 af

Pond IB2: PR Inf Basin #2 Peak Elev=399.44' Storage=4,977 cf Inflow=5.78 cfs 0.443 af
Discarded=2.49 cfs 0.443 af Primary=0.00 cfs 0.000 af Outflow=2.49 cfs 0.443 af

Total Runoff Area = 8.863 ac Runoff Volume = 2.165 af Average Runoff Depth = 2.93"
33.06% Pervious = 2.930 ac 66.94% Impervious = 5.933 ac

Summary for Subcatchment 1: PR DA #1

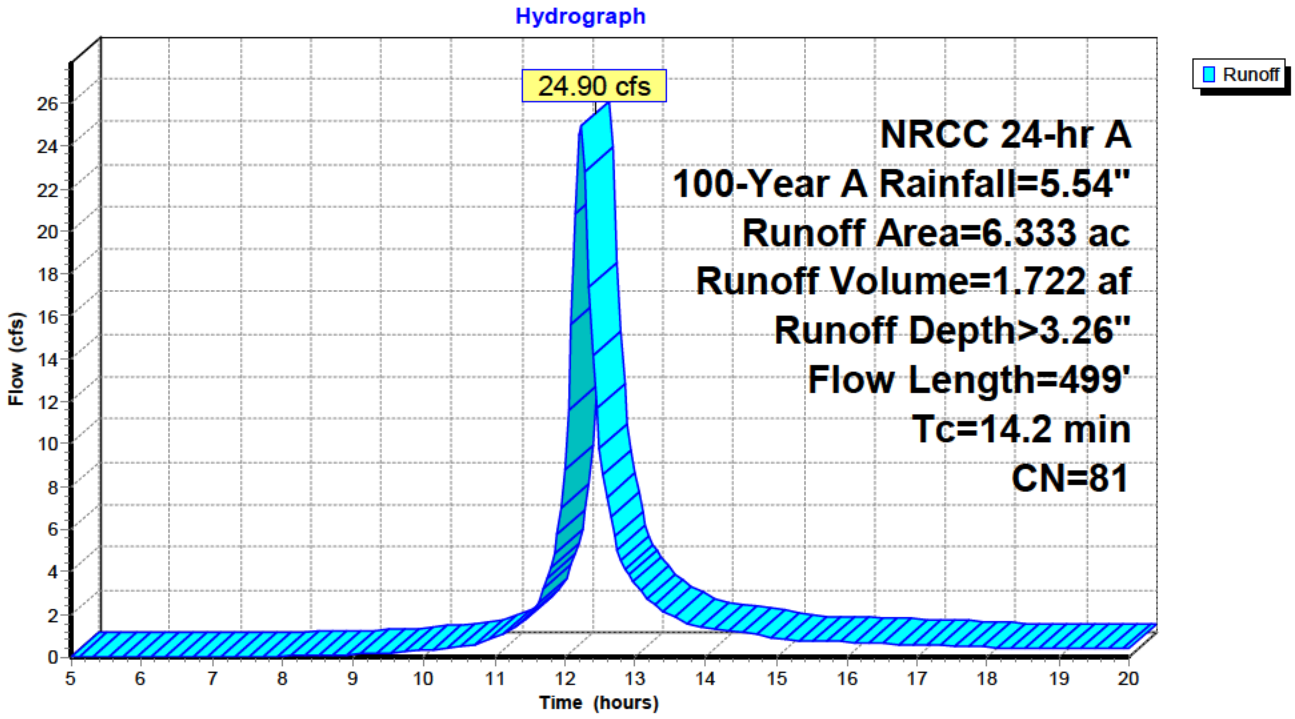
Runoff = 24.90 cfs @ 12.22 hrs, Volume= 1.722 af, Depth> 3.26"
Routed to Pond IB1 : PR Inf Basin #1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NRCC 24-hr A 100-Year A Rainfall=5.54"

Area (ac)	CN	Description
1.560	30	Meadow, non-grazed, HSG A
2.480	98	Paved parking, HSG A
2.240	98	Roofs, HSG A
0.053	98	Unconnected pavement, HSG A
6.333	81	Weighted Average
1.560		24.63% Pervious Area
4.773		75.37% Impervious Area
0.053		1.11% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.5	31	0.0210	0.05		**Sheet Flow, Lawn**
					Grass: Bermuda n= 0.410 P2= 2.50"
1.1	69	0.0181	1.08		**Sheet Flow, Concrete Walk to Asphalt Parking**
					Smooth surfaces n= 0.011 P2= 2.50"
1.7	157	0.0058	1.55		**Shallow Concentrated Flow, Asphalt Parking**
					Paved Kv= 20.3 fps
1.9	242	0.0195	2.09		**Shallow Concentrated Flow, Lawn Area to Infiltration Basin**
					Grassed Waterway Kv= 15.0 fps
14.2	499	Total			

Subcatchment 1: PR DA #1



Summary for Subcatchment 2: PR DA #2

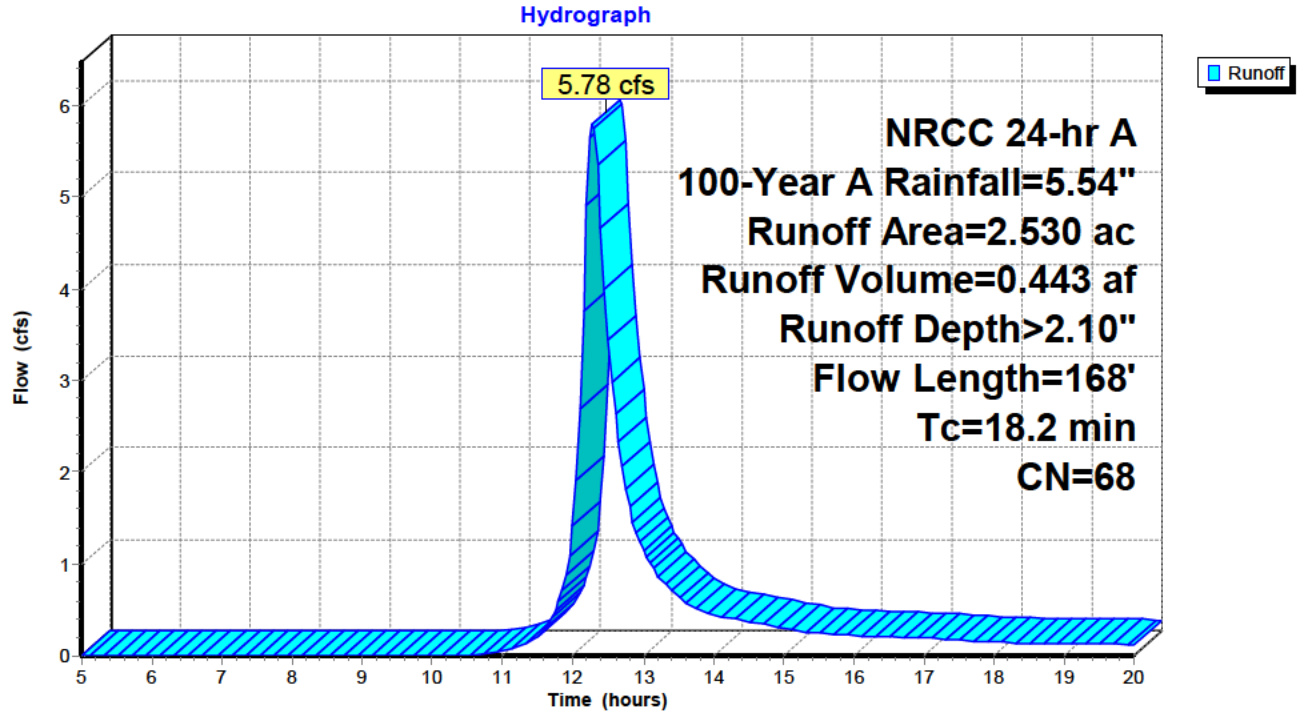
Runoff = 5.78 cfs @ 12.28 hrs, Volume= 0.443 af, Depth> 2.10"
Routed to Pond IB2 : PR Inf Basin #2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NRCC 24-hr A 100-Year A Rainfall=5.54"

Area (ac)	CN	Description
0.940	30	Meadow, non-grazed, HSG A
1.110	98	Paved parking, HSG A
0.430	71	Meadow, non-grazed, HSG C
0.020	98	Paved parking, HSG C
0.030	98	Unconnected pavement, HSG A
2.530	68	Weighted Average
1.370		54.15% Pervious Area
1.160		45.85% Impervious Area
0.030		2.59% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
17.5	100	0.0163	0.10		**Sheet Flow, Lawn** Grass: Dense n= 0.240 P2= 2.50"
0.7	68	0.0572	1.67		**Shallow Concentrated Flow, Lawn to Infiltration Basin** Short Grass Pasture Kv= 7.0 fps
18.2	168	Total			

Subcatchment 2: PR DA #2



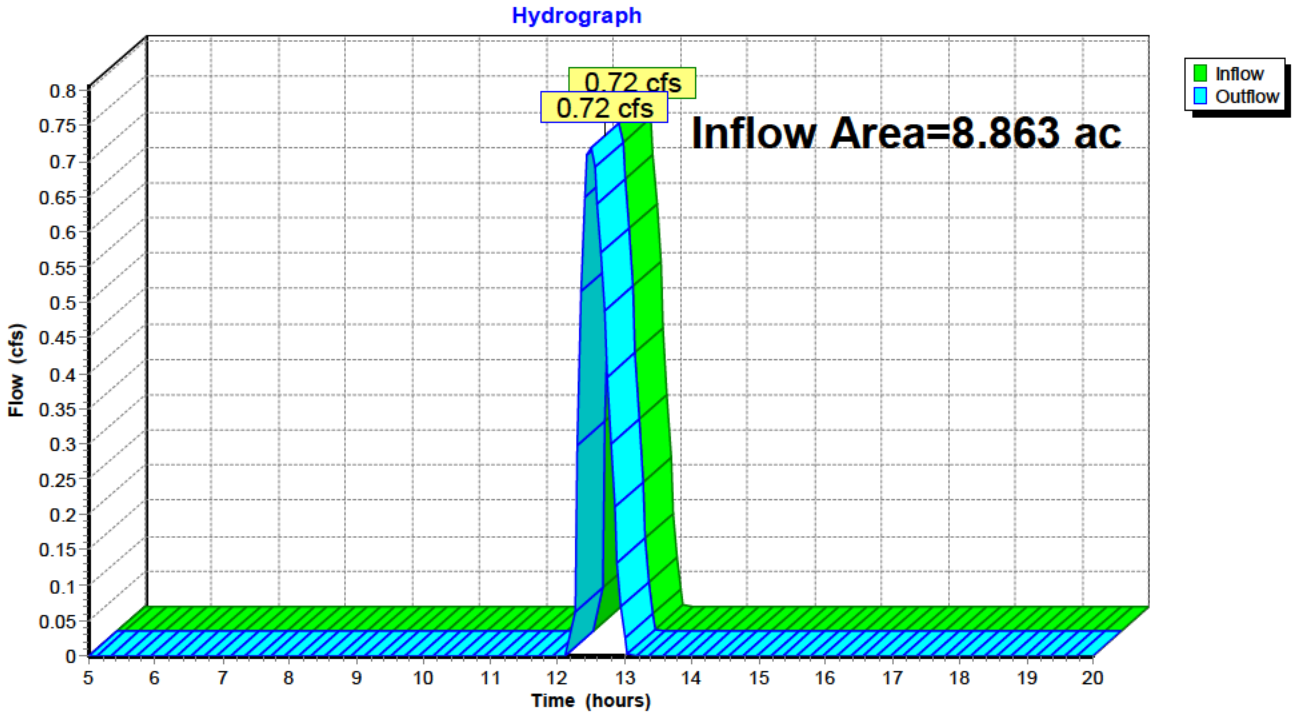
Summary for Reach DP: Design Point

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 8.863 ac, 66.94% Impervious, Inflow Depth = 0.04" for 100-Year A event
Inflow = 0.72 cfs @ 12.49 hrs, Volume= 0.027 af
Outflow = 0.72 cfs @ 12.49 hrs, Volume= 0.027 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach DP: Design Point



Summary for Pond IB1: PR Inf Basin #1

[92] Warning: Device #4 is above defined storage
[92] Warning: Device #5 is above defined storage

Inflow Area = 6.333 ac, 75.37% Impervious, Inflow Depth > 3.26" for 100-Year A event
Inflow = 24.90 cfs @ 12.22 hrs, Volume= 1.722 af
Outflow = 10.37 cfs @ 12.49 hrs, Volume= 1.721 af, Atten= 58%, Lag= 15.8 min
Discarded = 9.66 cfs @ 12.49 hrs, Volume= 1.694 af
Primary = 0.72 cfs @ 12.49 hrs, Volume= 0.027 af
Routed to Reach DP : Design Point

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 398.72' @ 12.49 hrs Surf.Area= 13,676 sf Storage= 17,959 cf

Plug-Flow detention time= 14.6 min calculated for 1.715 af (100% of inflow)
Center-of-Mass det. time= 14.3 min (796.2 - 781.9)

Volume	Invert	Avail.Storage	Storage Description
#1	397.00'	21,878 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

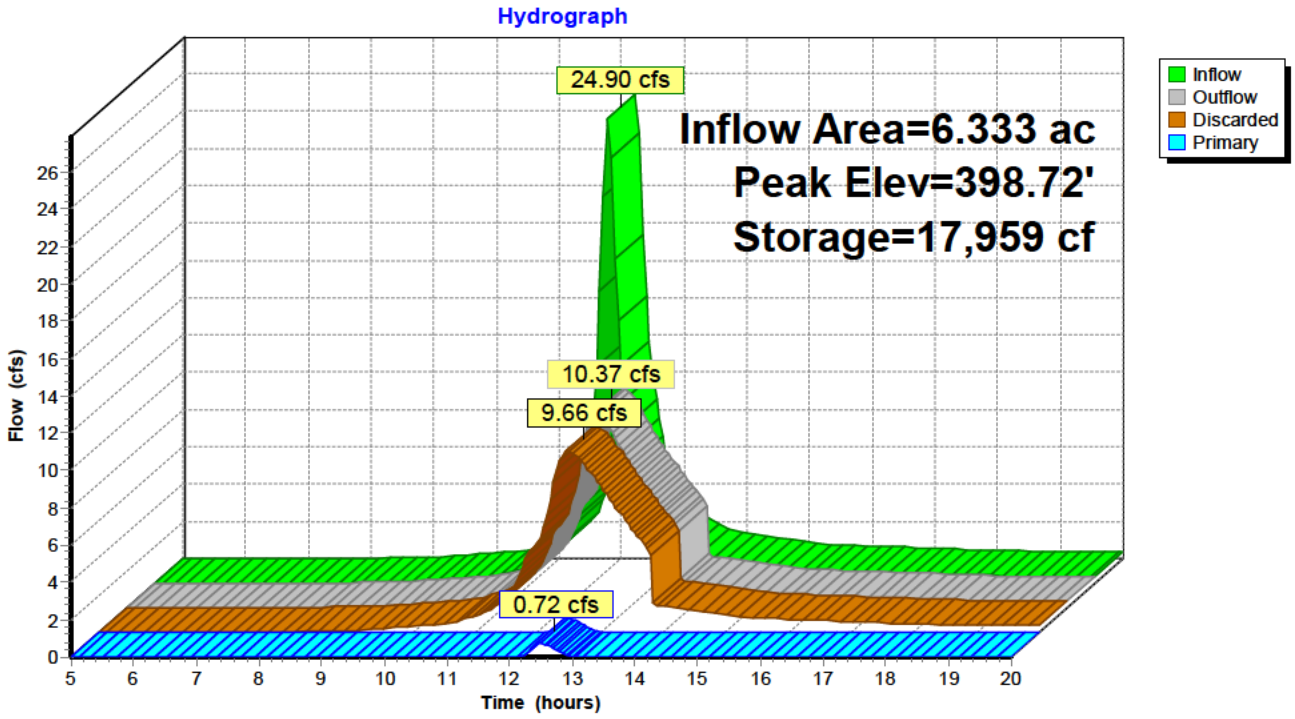
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
397.00	7,241	0	0
398.00	10,888	9,065	9,065
399.00	14,738	12,813	21,878

Device	Routing	Invert	Outlet Devices
#1	Discarded	397.00'	**25.000 in/hr Exfiltration over Surface area above 396.66'** Conductivity to Groundwater Elevation = 391.21' Excluded Surface area = 0 sf
#2	Primary	397.79'	**18.0" Round Culvert** L= 18.5' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 397.79' / 397.43' S= 0.0195 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf
#3	Device 2	398.11'	**8.0" Round Culvert** L= 6.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 398.11' / 398.05' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.35 sf
#4	Device 2	399.41'	**18.0" W x 12.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#5	Device 2	400.64'	**24.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=9.65 cfs @ 12.49 hrs HW=398.72' (Free Discharge)
└**1=Exfiltration** (Controls 9.65 cfs)

Primary OutFlow Max=0.72 cfs @ 12.49 hrs HW=398.72' (Free Discharge)
└**2=Culvert** (Passes 0.72 cfs of 3.66 cfs potential flow)
  └**3=Culvert** (Barrel Controls 0.72 cfs @ 2.79 fps)
  └**4=Orifice/Grate** (Controls 0.00 cfs)
  └**5=Orifice/Grate** (Controls 0.00 cfs)

Pond IB1: PR Inf Basin #1



Summary for Pond IB2: PR Inf Basin #2

Inflow Area = 2.530 ac, 45.85% Impervious, Inflow Depth > 2.10" for 100-Year A event
Inflow = 5.78 cfs @ 12.28 hrs, Volume= 0.443 af
Outflow = 2.49 cfs @ 12.62 hrs, Volume= 0.443 af, Atten= 57%, Lag= 20.4 min
Discarded = 2.49 cfs @ 12.62 hrs, Volume= 0.443 af
Primary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
Routed to Reach DP : Design Point

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 399.44' @ 12.62 hrs Surf.Area= 3,550 sf Storage= 4,977 cf

Plug-Flow detention time= 19.2 min calculated for 0.441 af (100% of inflow)
Center-of-Mass det. time= 18.9 min (824.6 - 805.7)

Volume	Invert	Avail.Storage	Storage Description
#1	397.00'	18,212 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
397.00	66	0	0
398.00	1,969	1,018	1,018
399.00	3,057	2,513	3,531
400.00	4,183	3,620	7,151
401.00	5,379	4,781	11,932
402.00	7,181	6,280	18,212

Device	Routing	Invert	Outlet Devices
#1	Discarded	397.00'	**25.000 in/hr Exfiltration over Surface area above 396.00'** Conductivity to Groundwater Elevation = 391.21' Excluded Surface area = 0 sf
#2	Primary	401.23'	**15.0" Round Culvert** L= 25.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 401.23' / 400.87' S= 0.0144 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf
#3	Primary	401.06'	**15.0" Round Culvert** L= 25.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 401.06' / 400.85' S= 0.0084 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf
#4	Primary	401.17'	**15.0" Round Culvert** L= 25.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 401.17' / 400.96' S= 0.0084 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf

Discarded OutFlow Max=2.49 cfs @ 12.62 hrs HW=399.44' (Free Discharge)
└**1=Exfiltration** (Controls 2.49 cfs)

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=397.00' (Free Discharge)
├**2=Culvert** (Controls 0.00 cfs)
├**3=Culvert** (Controls 0.00 cfs)
└**4=Culvert** (Controls 0.00 cfs)

Pond IB2: PR Inf Basin #2

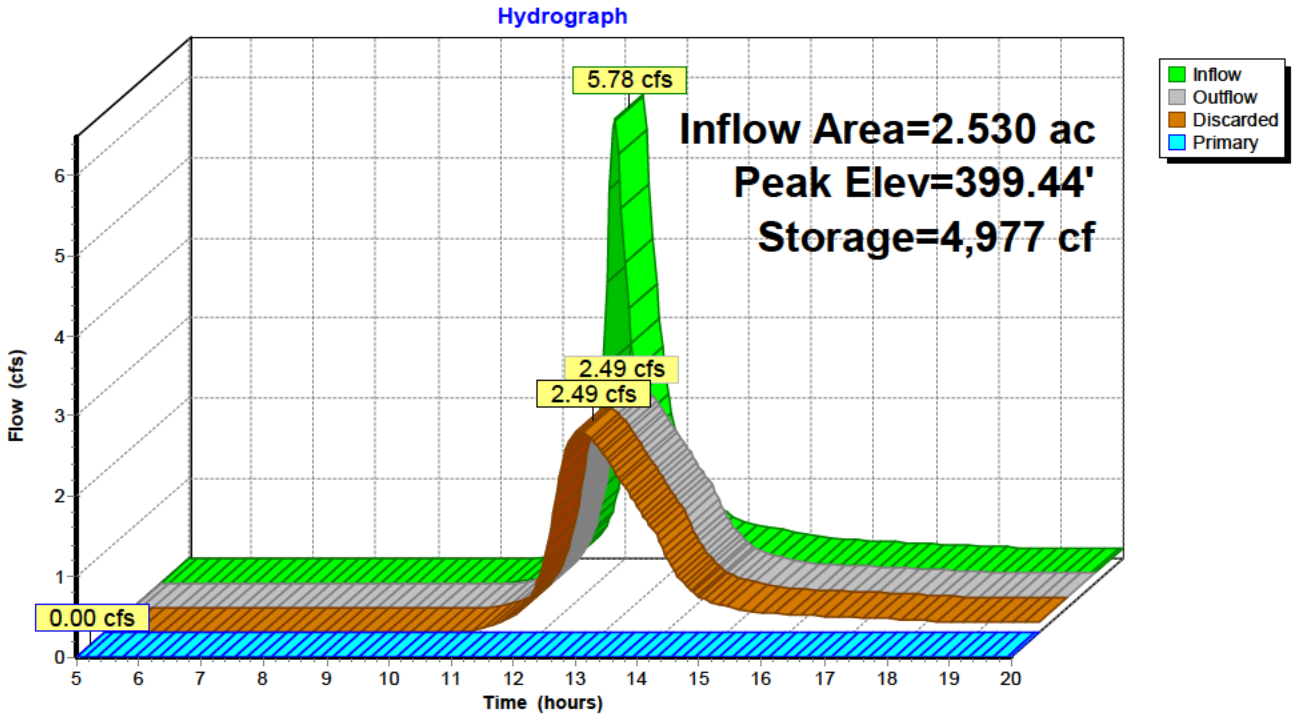


TABLE OF CONTENTS

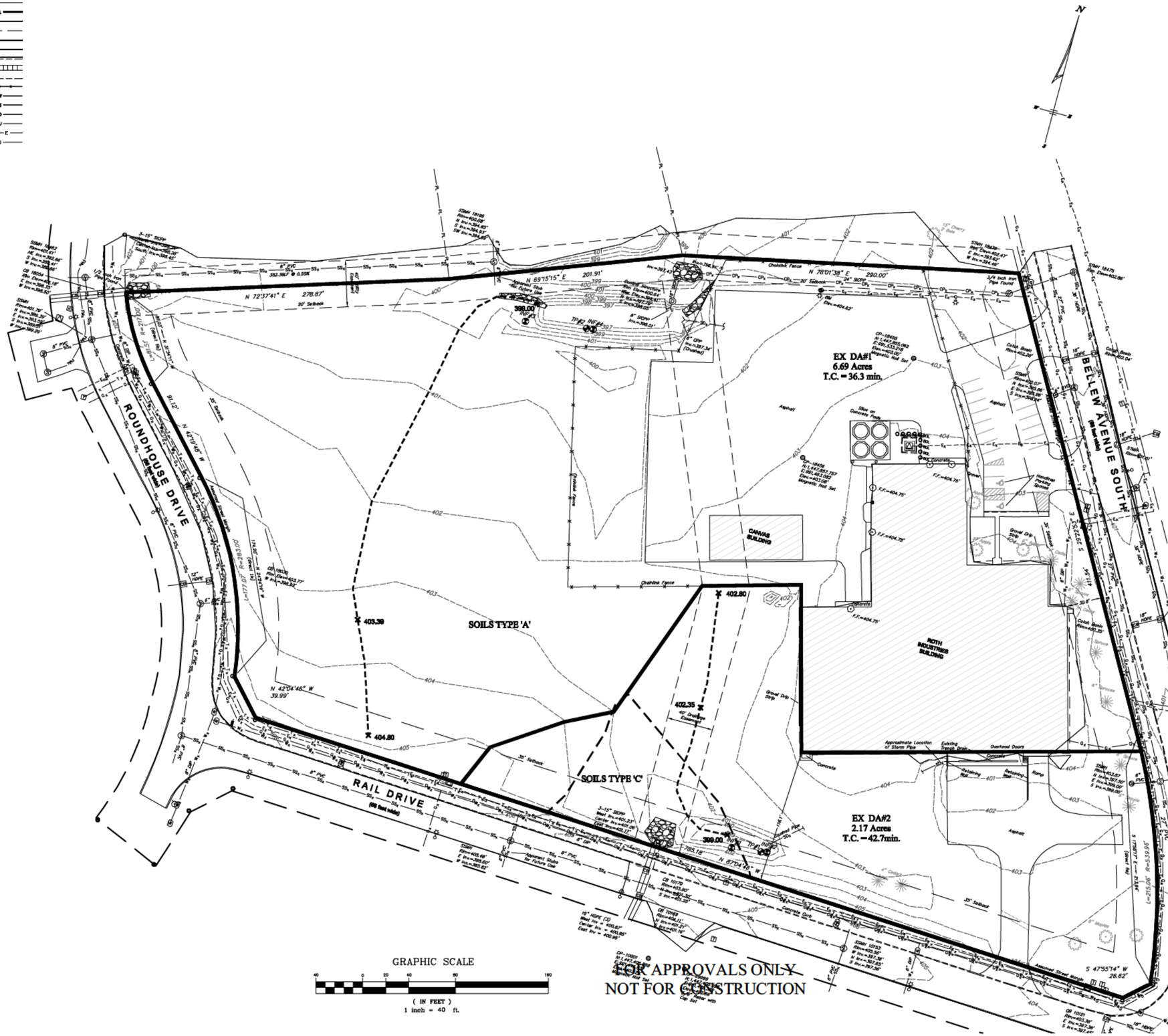
Project Reports
1 Routing Diagram
2 Rainfall Events Listing (selected events)
3 Area Listing (all nodes)
4 Soil Listing (all nodes)
5 Ground Covers (all nodes)
6 Pipe Listing (all nodes)

1-Year A Event
7 Node Listing
8 Subcat 1: PR DA #1
10 Subcat 2: PR DA #2
11 Reach DP: Design Point
12 Pond IB1: PR Inf Basin #1
14 Pond IB2: PR Inf Basin #2

10-Year A Event
16 Node Listing
17 Subcat 1: PR DA #1
19 Subcat 2: PR DA #2
20 Reach DP: Design Point
21 Pond IB1: PR Inf Basin #1
23 Pond IB2: PR Inf Basin #2

100-Year A Event
25 Node Listing
26 Subcat 1: PR DA #1
28 Subcat 2: PR DA #2
29 Reach DP: Design Point
30 Pond IB1: PR Inf Basin #1
32 Pond IB2: PR Inf Basin #2

LEGEND	EXISTING	PROPOSED
5' CONTOUR	155	155
1' CONTOUR	154	154
PROPERTY LINE	PL PL	PL PL
RIGHT OF WAY		
SETBACK		
BUILDING		
ASPHALT PAVEMENT		
CURB		
SIDEWALK		
EDGE OF GRAVEL		
FENCE	- o - o - o -	
WATERLINE	W_x W_x	W W
SANITARY SEWER	SS_x SS_x	SS SS
STORM SEWER	SD_x SD_x	SD SD
OVERHEAD UTILITIES	OU_x OU_x	OU OU
UNDERGROUND ELECTRIC	E_x E_x	E E
GAS	G_x G_x	G G
FIRE HYDRANT		
WATER VALVE	W	
SANITARY MANHOLE	S	
STORM MANHOLE	D	D
CATCH BASIN		S
UTILITY POLE AND GUY		
LIGHT POLE		


N
ROUNDHOUSE DRIVE
(66 feet wide)
RAIL DRIVE
(66 feet wide)
BELLEW AVENUE SOUTH
(66 feet wide)
EX DA#1
6.69 Acres
T.C. = 36.3 min.
EX DA#2
2.17 Acres
T.C. = 42.7min.
SOILS TYPE 'A'
SOILS TYPE 'C'
ROTH INDUSTRIES BUILDING
CANVAS BUILDING
N 69°15'15" E 201.91'
N 72°37'41" E 278.87'
N 78°01'38" E 290.00'
N 42°04'46" W 39.99'
N 87°04'20" W 785.18'
S 47°55'14" W 26.62'
S 39°39'52" E 215.96'
L=177.70'
R=283.00'
Delta=35°58'47"
Chord=N 24°34'14" W
403.39
404.80
402.80
402.35
399.00
398.00
30' Setback
35' Setback
Chainlink Fence
Concrete
Asphalt
Gravel Drip Strip
Overhead Doors
Approximate Location of Storm Pipe
Existing Trench Drain
Retaining Wall
Ramp
Handicap Parking Spaces
Site Pre Cast Concrete Pads
Cobble Swale
Grass Swale
Approximate Street Marking
Approximate Location of Future Line
Existing Drainage Flow Direction
Set Magnetic Nail Set
Found Pipe
Found Iron Pipe
3/4 Inch Iron Pipe Found
Set Iron Pipe
Set Chiseled X
Set Chiseled X with Concrete Nail
Set Drill Hole
Found Drill Hole
Found Concrete Monument
Found Chiseled X
Found Chiseled X with Concrete Nail
Found Drill Hole
Found Magnetic Nail
Found Magnetic Nail Set
Found Iron Rod
Found Iron Rod with Cap
Found Iron Rod with Concrete Nail
Found Iron Rod with Plastic Cap
Found Iron Rod with Yellow Plastic

PR DA#1
6.33 Acres
T.C.= 14.2 min.

PR DA#2
2.53 Acres
T.C.= 18.2 min.

BUILDING ADDITION (4,665 SF)

BUILDING ADDITION (7,220 SF)

LED-2

ROTH INDUSTRIES BUILDING

STORAGE BUILDING

ROUNDHOUSE DRIVE

BELLEW AVENUE SOUTH

RAIL DRIVE

397.00'
401.72'
402.63'
403.88'
404.53'
403.85'
398.33'
402.22'

GRAPHIC SCALE

40 0 20 40 80 160

(IN FEET)
1 inch = 40 ft.

PROGRESS PRINT
NOT FOR CONSTRUCTION

DRAINAGE MAP LEGEND (PROPOSED)

- DRAINAGE AREA BOUNDARY
- TIME OF CONCENTRATION PATH

LEGEND	EXISTING	PROPOSED
5' CONTOUR	155	155
1' CONTOUR	154	154
PROPERTY LINE	PL PL PL	
RIGHT OF WAY		
SETBACK		
BUILDING		
ASPHALT PAVEMENT		
CURB		
SIDEWALK		
EDGE OF GRAVEL		
FENCE	o o o	
WATERLINE	W_X W_X W_X	
SANITARY SEWER	SS_X SS_X SS_X	
STORM SEWER	SD_X SD_X SD_X	
OVERHEAD UTILITIES	OU_X OU_X OU_X	
UNDERGROUND ELECTRIC	E_X E_X E_X	E E E
GAS	G_X G_X G_X	G G G
ROOF DRAIN PIPE	RD_X RD_X	RD RD RD
FIRE HYDRANT		
WATER VALVE	W	
SANITARY MANHOLE	S	
STORM MANHOLE	D	
CATCH BASIN	CB CB	
UTILITY POLE AND GUY		
LIGHT POLE		

AUBERTINE and CURRIER
ARCHITECTS, ENGINEERS & LAND SURVEYORS, PLLC

522 Bradley Street
Watertown, New York 13601

aubertinecurrier.com

Phone: (315)782-2005
Fax: (315)782-1472

The above Architect, Engineer or Land Surveyor states that to the best of his or her knowledge, information and belief, the plans and specifications are in accordance with applicable requirements of New York State. It is a violation of New York State Law for any person, unless acting under the direct supervision of a Registered Architect, Licensed Professional Engineer or Licensed Land Surveyor to alter this document in any way. If altered, such licensee shall affix his or her seal and the notification "altered by" followed by his or signature, date and a specific description of the alteration.
© COPYRIGHT 2026
AUBERTINE and CURRIER ARCHITECTS, ENGINEERS & LAND SURVEYORS, PLLC

ROTH INDUSTRIES AND ROTH GLOBAL PLASTICS
2026 EXPANSION PROJECT

268 BELLEW AVENUE SOUTH
CITY OF WATERTOWN
JEFFERSON COUNTY, STATE OF NEW YORK

PROJECT NO:	2016-033.007
SCALE:	1"=40'
DRAWN BY:	CWT
CHECKED BY:	MRM
ISSUE DATES:	08/11/2026

PROPOSED DRAINAGE AREA MAP

PR-1

PR DA#1
6.33 Acres
T.C.= 14.2 min.

PR DA#2
2.53 Acres
T.C.= 18.2 min.

BUILDING ADDITION (4,665 SF)

BUILDING ADDITION (7,220 SF)

LED-2

ROTH INDUSTRIES BUILDING

STORAGE BUILDING

ROUNDHOUSE DRIVE

BELLEW AVENUE SOUTH

RAIL DRIVE

397.00'
401.72'
402.63'
403.88'
404.53'
403.85'
398.33'
402.22'

GRAPHIC SCALE

40 0 20 40 80 160

(IN FEET)
1 inch = 40 ft.

PROGRESS PRINT
NOT FOR CONSTRUCTION

DRAINAGE MAP LEGEND (PROPOSED)

- DRAINAGE AREA BOUNDARY
- TIME OF CONCENTRATION PATH

LEGEND	EXISTING	PROPOSED
5' CONTOUR	155	155
1' CONTOUR	154	154
PROPERTY LINE	PL PL PL	
RIGHT OF WAY		
SETBACK		
BUILDING		
ASPHALT PAVEMENT		
CURB		
SIDEWALK		
EDGE OF GRAVEL		
FENCE	o o o	
WATERLINE	W_X W_X W_X	
SANITARY SEWER	SS_X SS_X SS_X	
STORM SEWER	SD_X SD_X SD_X	
OVERHEAD UTILITIES	OU_X OU_X OU_X	
UNDERGROUND ELECTRIC	E_X E_X E_X	E E E
GAS	G_X G_X G_X	G G G
ROOF DRAIN PIPE	RD_X RD_X	RD RD RD
FIRE HYDRANT		
WATER VALVE	W	
SANITARY MANHOLE	S	
STORM MANHOLE	D	
CATCH BASIN	CB CB	
UTILITY POLE AND GUY		
LIGHT POLE		

AUBERTINE and CURRIER
ARCHITECTS, ENGINEERS & LAND SURVEYORS, PLLC

522 Bradley Street
Watertown, New York 13601

aubertinecurrier.com

Phone: (315)782-2005
Fax: (315)782-1472

The above Architect, Engineer or Land Surveyor states that to the best of his or her knowledge, information and belief, the plans and specifications are in accordance with applicable requirements of New York State. It is a violation of New York State Law for any person, unless acting under the direct supervision of a Registered Architect, Licensed Professional Engineer or Licensed Land Surveyor to alter this document in any way. If altered, such licensee shall affix his or her seal and the notification "altered by" followed by his or signature, date and a specific description of the alteration.
© COPYRIGHT 2026
AUBERTINE and CURRIER ARCHITECTS, ENGINEERS & LAND SURVEYORS, PLLC

ROTH INDUSTRIES AND ROTH GLOBAL PLASTICS
2026 EXPANSION PROJECT

268 BELLEW AVENUE SOUTH
CITY OF WATERTOWN
JEFFERSON COUNTY, STATE OF NEW YORK

PROJECT NO:	2016-033.007
SCALE:	1"=40'
DRAWN BY:	CWT
CHECKED BY:	MRM
ISSUE DATES:	08/11/2026

PROPOSED DRAINAGE AREA MAP

PR-1

PRELIMINARY
STORMWATER POLLUTION PREVENTION PLAN

ROTH INDUSTRIES, INC
2026 EXPANSION PROJECT
CITY CENTER INDUSTRIAL PARK, LOTS 2,3,4,5
268 BELLEW AVE SOUTH
CITY OF WATERTOWN
JEFFERSON COUNTY, NEW YORK

Owner: Roth Industries, Inc.
268 Bellew Ave South
Watertown, NY 13601

August 11, 2026

[redacted]

A&C Project #2016-033.007

The above Engineer states that to the best of his knowledge, information and belief, the plans and specifications are in accordance with applicable requirements of New York State. It is a violation of New York State Law for any person, unless acting under the direction of a licensed professional engineer to alter this document in any way. If altered, such licensee shall affix his or her seal and the notation "altered by" followed by his or her signature, date, and a specific description of alteration

TABLE OF CONTENTS

SECTION

1.0	INTRODUCTION	4
	A. LOCATION	5
	LOCATION MAP (FIGURE #1)	5
	B. PROJECT DESCRIPTION	6
	C. SCOPE OF WORK	6
2.0	STORMWATER EROSION AND SEDIMENT CONTROL	7
	A. SEQUENCE OF CONSTRUCTION	7
	B. MATERIALS AND SUBSTANCE MANAGEMENT	8
	C. CONSTRUCTION EROSION AND SEDIMENT CONTROLS	10
	D. BEST MANAGEMENT PRACTICES	13
	E. SPILL PREVENTION PRACTICES	14
3.0	EXISTING TOPOGRAPHIC AND SOIL DATA	15
	A. SITE TOPOGRAPHY	15
	B. SOIL CLASSIFICATION	15
	SOIL SURVEY DATA (FIGURES #2A-2C)	16-18
	C. RECEIVING WATERS	19
	D. FLOOD PLAINS	19
	E. STATE WETLANDS	19
	F. FEDERAL WETLANDS	19
	FEMA MAP (FIGURE #3)	20
	STATE WETLAND MAP (FIGURE #4)	21
	FEDERAL WETLAND MAP (FIGURE #5)	22
4.0	STORM WATER CONDITIONS AND ANALYSIS	23
	A. RAINFALL DATA AND SIZING CRITERIA	23
	B. PRE-DEVELOPMENT STORMWATER CONDITIONS	24
	EXISTING DRAINAGE AREA SUMMARY TABLE	25
	C. POST-DEVELOPMENT STORMWATER CONDITIONS	25
	PROPOSED DRAINAGE AREA SUMMARY TABLE	26
	D. HYDROLOGIC AND HYDRAULIC ANALYSIS	26
	STORMWATER MANAGEMENT SUMMARY TABLE	28
	E. RUNOFF REDUCTION/GREEN INFRASTRUCTURE	28
	F. PRE AND POST DEVELOPMENT STORMWATER COMPARISON	30
	EXISTING VS PROPOSED RUNOFF COMPARISON TABLES	30
	G. COLD CLIMATE CONSIDERATIONS	31
	H. STORMWATER MANAGEMENT SUMMARY/CONCLUSION	32
5.0	CONSTRUCTION INSPECTION AND MAINTENANCE REQUIREMENTS	33
	A. GENERAL SITE INSPECTION AND MAINTENANCE REQUIREMENTS	33
	B. OWNER OR OPERATOR INSPECTION REQUIREMENTS	33
	C. QUALIFIED INSPECTOR INSPECTION REQUIREMENTS	33
6.0	TERMINATION OF PERMIT COVERAGE	37
7.0	POST CONSTRUCTION MAINTENANCE	39

APPENDICES

APPENDIX A: SWPPP CERTIFICATIONS
APPENDIX B: CONSTRUCTION SITE LOG BOOK
APPENDIX C: EROSION AND SEDIMENT CONTROL SITE PLANS AND DETAILS
APPENDIX D: STORMWATER CALCULATIONS
APPENDIX E: PRE DEVELOPMENT DRAINAGE CONDITIONS (HYDROCAD)
APPENDIX F: POST DEVELOPMENT DRAINAGE CONDITIONS (HYDROCAD)
APPENDIX G: DRAINAGE AREA MAPS
APPENDIX H: SPDES GENERAL PERMIT (GP-0-25-001)
APPENDIX I: NOTICE OF INTENT
APPENDIX J: MS4 SWPPP ACCEPTANCE FORM
APPENDIX K: NOTICE OF TERMINATION

1.0 INTRODUCTION

The Storm Water Pollution Prevention Plan (SWPPP) has been created specifically for the Proposed Roth Industries 2026 Expansion Project to address stormwater runoff, GP-0-25-001 permit requirements, grading, temporary and permanent Stormwater Treatment measures, and construction inspection and maintenance requirements. The project meets the conditions of a redevelopment project, which includes the reconstruction of existing impervious and an increase in newly developed impervious surfaces. The SWPPP was created in accordance with the most current applicable NYS DEC SPDES General Permit for Stormwater Discharges from Construction Activity Permit GP-0-25-001, January 29, 2025. It has been prepared in accordance with the New York State Stormwater Management Design Manual. The required Water Quality Volume (WQv), Runoff Reduction Volume (RRv), and Water Quantity Treatment requirements of the GP-0-25-001 permit have been met. An Electronic Notice of Intent (eNOI) is required to be submitted to the New York State Department of Conservation (NYSDEC) to obtain coverage under the SPDES permit. In accordance with the SPDES permit, the preparation of a full SWPPP is required for any project that includes construction activities that include soil disturbance of one or more acres of land.

The SWPPP was developed to provide project planning to minimize soil disturbance and areas of clearing and grubbing. The SWPPP incorporates measures to protect natural features such as water bodies, wetlands and wildlife and avoid or limit the disturbance of sensitive areas and any valuable resources. Soils were evaluated during the design to avoid areas that had the potential to disturb steep slopes, minimize impacts within areas of low depth to bedrock, or disturb areas of highly erodible soils when practical. The design of the project attempts to maintain the existing drainage patterns to an extent practicable. The SWPPP provides measures to prevent potential stormwater impacts and erosion and sedimentation from the project site to any downstream areas.

This SWPPP includes a detailed written explanation of all Best Management Practices (BMP's), activities or structural improvements that help reduce the quantity and improve the quality of stormwater runoff at the project site.

The prime contractor and sub-contractors performing any construction activities that include soil disturbance will be responsible to implement measures outlined in this SWPPP. The contractor(s) must provide and sign a certification that they understand and agree to comply with the terms and conditions of the SWPPP.

A. Location

The Roth Industries 2026 Expansion Project is located at 268 Bellew Ave South on an industrial property within the City of Watertown's City Center Industrial Park, Jefferson County, NY. NYS Plane Coordinates: 1,447,868 North, 991,388 East (UTM: Longitude W 75.933, Latitude N 43.972).

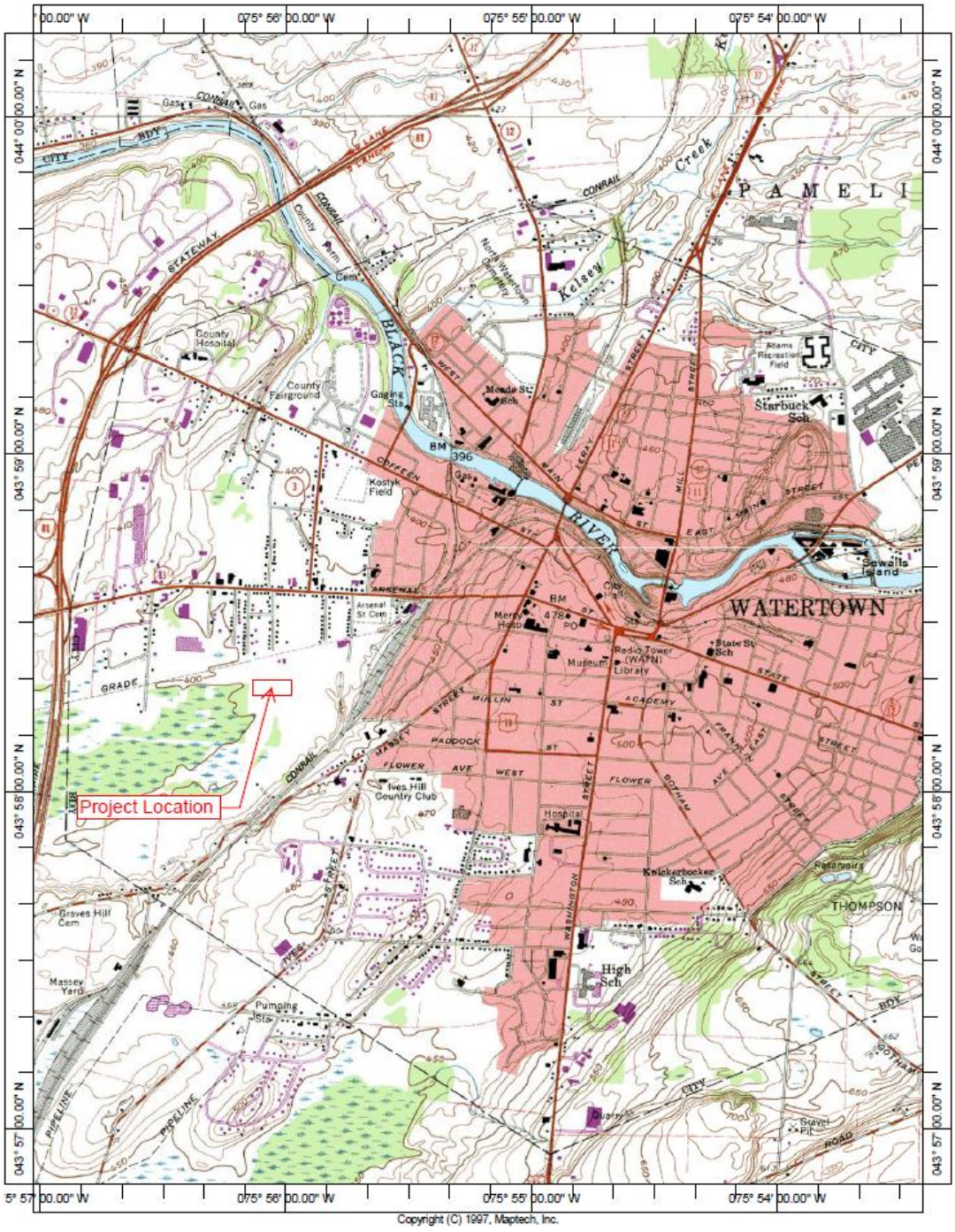


Figure #1 USGS Location Map

B. Project Description

The project consists of an 11,885 SF building addition on the west side of the existing manufacturing facility and associated site improvements. Site improvements include a 28,287 SF asphalt storage area expansion west of the existing asphalt storage area, 5,980 SF asphalt storage area expansion southwest of the existing storage building, 3,938 SF asphalt parking expansion northeast of the building, reconstruction of ADA parking and concrete walk, chain link fence to enclose the expanded storage area, an additional southern entrance drive from Rail Drive, to access the expanded storage yard shipping area loading dock, an additional truck access drive and expansion of the receiving area access, site lighting, grading and drainage.

C. Scope of Work

The Roth Industries 2026 Expansion Project SWPPP includes the following:

- An Erosion and Sediment Control Plan for on-site project construction.
- Drainage evaluation of the existing conditions within the project drainage area.
- The projects includes on-site building, parking, and related impervious site infrastructure construction which requires storm water quality and quantity treatment of associated runoff, and appropriate erosion and sediment controls.
- Runoff Reduction (RRv) calculations and design.
- Water Quality and Water Quantity Treatment calculations and design.
- Hydrology and Hydraulic modeling for the pre and post construction conditions.
- Stormwater quantity mitigation calculations and design for the CPv 1-year, Qp 10-year and Qf 100-year storm events.

2.0 STORMWATER EROSION AND SEDIMENT CONTROLS

A. Sequence of Construction

Work areas will be limited to a maximum of 5 acres of disturbance at any one time. Additionally, temporary stabilization must be placed over areas in which construction activities have ceased, or where activities are anticipated to cease for more than 14 days.

1. Construction will begin with the proper installation and placement of erosion and sediment control measures. At a minimum this would include the installation of a stabilized construction entrance, silt fence, check dams, construction fence, etc. to protect the intended work area disturbance.
2. Following the proper placement of erosion and sediment control measures, clearing of remaining vegetation, grubbing, topsoil removal, and grading activities will commence.
3. Construction staging and stockpile areas will be established. Protect stockpile areas with silt fence and appropriate erosion controls. Maintain adequate separation from drainage channels.
4. Initial grading and earthwork activities would include the establishment of temporary and permanent drainage channels intended to direct runoff away from work areas, and maintain positive drainage. Runoff diversion shall include the channeling of runoff to temporary basins, slope protection, check dam installation, etc. to minimize any unnecessary potential erosion. The stormwater swales will need to be constructed to establish a drainage route.
5. Earthwork for site grading and building foundation excavation shall begin following the removal and stockpiling of topsoil. Cut and fill earthwork activities will be ongoing at various areas of the site as utility and parking area construction begin.
6. The stormwater management areas to include the infiltration basins shall be protected from heavy construction equipment and disturbance activities during building and site construction. Infiltration basins shall be constructed only after the site has been permanently stabilized and vegetation has been established.
7. Excavation for utilities and parking area construction will progress following site grading operations.
8. Construction of parking area stone and asphalt will take place following utility excavation activities.
9. As utility construction proceeds, areas completed will be rough graded and temporarily stabilized.
10. The construction of the building will likely take place during and following the completion of parking areas and utility construction.
11. The entire disturbed areas, which are not paved, concrete, stone or contain buildings will have soils restored, de-compacted, topsoil placed, and be seeded and stabilized as lawn areas.
12. Upon completion of earthwork, stabilization of hard surface areas, and the establishment of lawn areas, the stormwater infiltration basin areas will be

excavated, rough graded, inspection risers installed, topsoil placed, jute mesh stabilization fabric installed, and area seeded and permanently restored.

13. Upon final stabilization of the site and establishment of a minimum of 80% grass growth, any sediment buildup within the stormwater infiltration basin and storm drainage system will be removed to design elevations.
14. Once grass growth is established and permanent stormwater treatment measures are in place, a Notice of Termination (NOT) will be issued allowing the erosion and sediment control to then be removed.

B. Materials and Substance Management

The following common construction materials and substances may be present on site during construction:

- Concrete/Additives/Wastes
- Detergents
- Paints/Solvents
- Acids
- Sanitary Wastes
- Cleaning Solvents
- Petroleum Based Products
- Pesticides
- Solid and Construction Waste
- Soil Stabilization Additives

The following are the material management practices used to reduce the risk of spills or other accidental exposure of materials and substances to stormwater runoff. The job site superintendent will be responsible for ensuring that these procedures are followed.

1. Materials Storage and Disposal

   a. An effort will be made to store only enough products required to do the job.
   b. All materials stored onsite will be stored in a neat, orderly manner and, if possible, under a roof or in a containment area. At a minimum, all containers will be stored with lids on when not in use. Drip pans shall be provided for all dispensers.
   c. Products will be kept in their original containers with the original manufacturer's label in legible condition
   d. Manufacturer's or local/state/federal recommended methods for proper use and disposal will be followed.
   e. Material Safety Data Sheets (MSDS's) for each substance with hazardous properties that is used on the job site will be obtained and used for the proper management of potential wastes that may result

from these products. MSDS's will be posted in the immediate area where such products are stored and/or used.

f. All hazardous waste materials will be disposed of by the contractor in the manner specified by local, state, and/or federal regulations and by the manufacturer of such products.

g. Machinery left on site unattended and/or at night will be parked away from drainage channels.

2. Solid and Construction Wastes

   All waste materials will be collected and stored in a secure, covered, metal dumpster rented from a local waste management company which must be a solid waste management company licensed to do business in New York State. The dumpster will comply with all local and state solid waste regulations.

   All trash and construction debris from the site will be deposited in the dumpster. The dumpster will be emptied once per week or more often if necessary, and the trash will be hauled to a landfill approved by New York State. No construction waste materials will be buried on site.

   All waste dumpsters and roll-off containers will be located in an area where the likelihood of the containers contributing to stormwater discharges is negligible. If required, additional BMPs must be implemented, such as sandbags around the base, to prevent wastes from contributing to stormwater discharges.

3. Sanitary Waste

   All sanitary waste will be collected from the portable units a minimum of once per week by a licensed portable facility provider, in compliance with local and state regulations.

   All sanitary waste units will be located in an area where the likelihood of the containers contributing to stormwater discharges is negligible. If required, additional BMPs must be implemented, such as sandbags around the base, to prevent wastes from contributing to stormwater discharges.

4. Excavated Materials Storage

   Excavated areas will be backfilled and compacted the day of excavation. The majority of material excavated for utility work will be backfilled in the trench immediately after the pipe is installed.

   Any earthwork material to be removed from the site will be separated to satisfactory and unsatisfactory soil materials and satisfactory material shall be used as backfill material. All unsatisfactory material shall be loaded into a dump truck and hauled to a NYSDEC acceptable fill disposal location.

Excess excavated material is not anticipated.

C. Construction Erosion and Sediment Controls

1. Erosion and Sediment Control Practices

Erosion and sediment control installation will begin prior to the start of any earthwork activities. Silt fence shall be installed along the down slope extent of planned earthwork activities. Primary silt fence locations are where there is the potential for runoff to leave the site or impact downstream waterways. During trench excavation, a temporary low point will be created and any runoff will be contained within these areas. Extreme care should be taken to protect the down slope ends of these excavations in the event of a rainstorm. Protection should include silt fencing along the lower portions of the excavation to prevent overflowing sediment from reaching the natural drainage channels. However, these protection measures are expected to be only short term as the excavation will be initially backfilled the same day. Backfilling will not only prevent erosion of the underlying soils should a storm occur after working hours, but also provide for a safer project site. Additionally, stone check dams will be placed along and/or within the existing drainage channels to filter and contain any sediment that may runoff. Stone check dams should be placed at the entrance to all immediate downstream culverts and inlet protection around catch basins for additional protection from siltation and further movement of sediment downstream. All silt fence, stone check dams and inlet protection shall remain in place and be maintained until construction activity in the area is complete and vegetation is established.

Permanent stabilization will be provided following the placement of the asphalt and concrete and establishment of vegetation along the project area which may have been disturbed by construction operations.

An Erosion and Sediment Control Plan and Details have been developed for the limits of the project. (See Appendix C)

2. Pollution Prevention Measures

Step 1: Pre-Construction Actions

<u>Stabilized Construction Entrance</u>

- Establish a temporary construction entrance to capture mud and debris from construction vehicles before they enter the public highway.
- Stabilize bare areas (entrances, construction routes, equipment parking areas) immediately as work takes place. Top these areas with gravel or maintain vegetative cover.
- Sediment tracked onto public streets should be removed or cleaned

on a daily basis.

Perimeter Sediment Controls

- Install silt fences based on appropriate spacing intervals. Decrease this interval as the slope increases. Silt fence should be placed on or parallel to contours where there is no concentration of water flowing to the silt fence and where erosion occurs in the form of sheet erosion. The area below the silt fence should be undisturbed ground.
- Install additional silt fences and barriers as needed during grading.
- Install silt fences, at the toe of slope, surrounding all soil stockpiles.

Step 2: Runoff and Drainage Control

Runoff Control

- Install stone check dams and stone inlet protection at culverts before land grading starts.

Runoff Conveyance System

- Channels and stream banks need to be seeded at the outlet points.
- Install check dams to slow down the velocity of concentrated flow.

Outlet Stabilization

- Install rock outlet protection to prevent erosion at discharge points.

Step 3: Grading

- Limit the initial clearing and earth disturbance to that necessary to install sediment control measures. Excavation for utilities, footings, clearing, or other earth disturbance may only take place after the sediment and erosion controls are installed.
- Stockpile the topsoil removed from the site. The topsoil should be protected, stabilized and sited in a location away from the storm drains and water bodies.
- As grading continues, soil restoration shall be performed in all areas impacted by construction that will not be impervious surfaces. Soil restoration includes the loosening and decompaction of over compacted subgrade and topsoil to promote infiltration and plant root growth, and reduce runoff.

Step 4: Erosion Control (Stabilization)

- Implement seeding, mulching, top soiling or other appropriate measures to keep the soil in place.
- Stabilization should be completed immediately for the surface of all perimeter controls and perimeter slopes.
- When activities temporarily cease during construction, soil stockpiles and

exposed soil should be stabilized by seed, mulch or other appropriate measures as soon as possible, but in no case more than 14 days after construction activity has ceased.

- Following initial soil disturbance or re-disturbance, permanent or temporary, stabilization should be completed within 14 days or as soon as possible.
- Apply temporary or permanent stabilization measures immediately in all disturbed areas where work is delayed or completed.
- Excavated areas will be initially backfilled and compacted the same way as excavation. All other erosion and sediment control measures remain in place until the asphalt or concrete is placed, topsoil, seeding and mulching is complete, and grass is fully established in all areas disturbed by construction activities.
- Temporary stabilization shall take place as soon as practical in areas where work activities have temporarily or permanently ceased, but in no case more than 14 days after construction activity in that portion of the site has ceased.

Step 5: Sediment Control

- At any location where surface runoff from disturbed or graded areas may flow off the construction area, sediment control measures must be installed to prevent sediment from being transported off site. No grading, filling or other disturbance is allowed within existing drainage swales.
- Swales or other areas that transport concentrated flow should be appropriately stabilized.

Step 6: Maintenance and Inspection

- Trenches should be backfilled the same day as excavation.
- Silt fence, stone check dams, eroded channels, etc. should be inspected and repaired at a minimum of every 7 calendar days and within 24 hours after periods of rainfalls greater than 0.5 inch.
- Sediment buildup at silt fences, check dams and inlet protection should be removed when buildup reaches 2-inches or more.
- Sediment buildup at any sediment traps or sediment ponds should be removed whenever their capacity has been reduced by fifty percent of the design capacity.
- Buildup of sand and debris in ditches and low areas should be checked and removed annually to provide maximum available flow capacity and minimize transport of sediments.
- Grass areas surrounding maneuvering areas should be maintained to slow runoff and the transport of sediments.
- Buildup of sand and debris within the pretreatment and treatment areas of the dry swale and pocket pond should be checked annually each spring. Sediment should be cleaned when buildup reaches one inch or when water ponds on the surface for more than 48 hours.

- Inspection must verify that all practices are adequately operational, maintained properly and that sediment is removed from all control structures.
- Inspection must look for evidence of the soil erosion on the site, potential of pollutants entering drainage systems, problems at discharge points (such as turbidity in receiving water), and signs of soil and mud transport from the site to the public road at the entrance.

Step 7: Finalize Grading & Landscaping

- All open areas, including borrow and spoiled areas, must be stabilized.
- Permanent topsoil, seed, sod, mulch, riprap or other stabilization practices must be placed in the remaining disturbed areas as appropriate.
- Stabilization must be undertaken no later than 14 days after construction activity has ceased except as noted in the GP-0-25-001.
- Remove the temporary control measures.

Step 8: Post Construction Controls

- Any disturbed areas will be stabilized and vegetation established.
- The infiltration trenches and basin will be dredged of all sediment above design elevations and stabilized according to the plans and specifications.

D. Best Management Practices

1. Equipment cleaning, maintenance, and repair will be conducted in designated areas protected by berms.
2. Sediment and erosion controls will be checked weekly by a qualified professional for sediment build-up and failure. The controls will be cleaned at the discretion of the qualified professional responsible for the stormwater inspections.
3. Cleared brush, debris, gravel, stone, and soils will be stockpiled up slope from and protected by erosion and sedimentation controls.
4. Materials brought on-site shall be in the minimum quantities required.
5. All materials brought on-site will be stored in a neat, orderly manner in their appropriate containers, and if possible, under a roof or other enclosure.
6. Products will be kept in their original containers with the original manufacturer's labels and material safety data sheets retained.
7. Substances will not be mixed with one another unless recommended by the manufacturer.
8. Whenever possible, the entire product will be used up before the container disposal. Recycle empty containers as applicable.
9. Manufacturer's recommendations for proper use and disposal shall be followed.
10. The contractor shall prohibit washing of tools, equipment and machinery

in or 100 feet of any watercourse or wetland.

11. All above grade storage tanks are to be protected from vehicle damage by temporary barriers.

E. Spill Prevention Practices

The following practices will be followed for spill prevention and cleanup. The site contractor responsible for the day-to-day site operations will be the spill prevention and cleanup coordinator. The Coordinator will designate at least one other site personnel who will receive spill prevention and cleanup training. These individuals will each become responsible for a particular phase of prevention and cleanup. The names of responsible spill personnel will be posted in the material storage area and in the on-site construction office or trailer.

1. Manufacturers' recommended methods for spill cleanup will be clearly posted, and site personnel will be made aware of the procedures and the location of the information and cleanup supplies. All spills are reportable to the NYS Department of Environmental Conservation. Notification must be completed within **two hours** of the discovery of the spill. **This is a legal requirement that must be complied with.**

2. Materials and equipment necessary for spill cleanup will be kept in the material storage area on-site. Equipment and materials will include but not limited to absorbent pads, brooms, dust pans, mops, rags, gloves, goggles, activated clay, sand, sawdust, and plastic and metal trash containers specifically for this purpose.

3. All spills will be cleaned up immediately after discovery.

4. The spill area will be kept well ventilated, and personnel will wear appropriate protective clothing to prevent injury from contact with a spilled substance.

5. Spills of toxic or hazardous material will be reported to the appropriate State or local government agency, regardless of size.

6. Concrete trucks will not be allowed to wash out or discharge surplus concrete or drum wash water on-site, except in areas specified by the Engineer in charge.

7. Asphalt trucks shall not discharge surplus asphalt on-site, except in areas specified by the Engineer in charge.

3.0 EXISTING TOPOGRAPHY AND SOIL DATA

A. Site Topography

The existing 8.86 acre site is comprised of a 85,700 SF manufacturing facility and 80,000 SF parking and storage area. A chain link fence runs along the perimeter of the asphalt storage yard, separating the developed portion of the property from the undeveloped vegetated lawn area to the west.

The existing manufacturing facility, asphalt parking and storage area, and undeveloped vegetated lawn area all slope north at a slope varying between 1% and 2% via sheet flow to an existing stormwater infiltration basin located at the northwest corner of the storage yard. Runoff that enters the northern stormwater infiltration basin either infiltrates into the existing sandy soils or overflows and discharges east into a 36" SICPP storm pipe that connects to the Bellew Avenue South municipal storm sewer. The Bellew Avenue South storm sewer flows north toward Arsenal Street. The southeast truck access drive that permits access to the receiving area loading dock on the south side of the building drains south to a separate storm water infiltration basin where runoff either infiltrates into the existing sandy soils or discharges south of Rail Drive via (3) 15" HDPE culverts into an existing drainage swale.

B. Soil Classification

The project site is located in the City of Watertown, which is an urban environment and consists primarily of previously developed area. According to the USDA Web Soil Survey for Jefferson County, New York, the project area includes soils classified as silt loam of Hydrologic Group C/D to the east and sands of Hydrologic Group A to the west.

Soil Symbol	Soil Name	Hydrologic Group
CnB	Collamer Silt Loam	C/D
PoB	Plainfield Sand	A
Sc	Scarboro Mucky Loam Fine Sand	A/D
Ub	Urban Land	A

A copy of the NRCS Web Soil Survey and Jefferson County Soils data are attached.

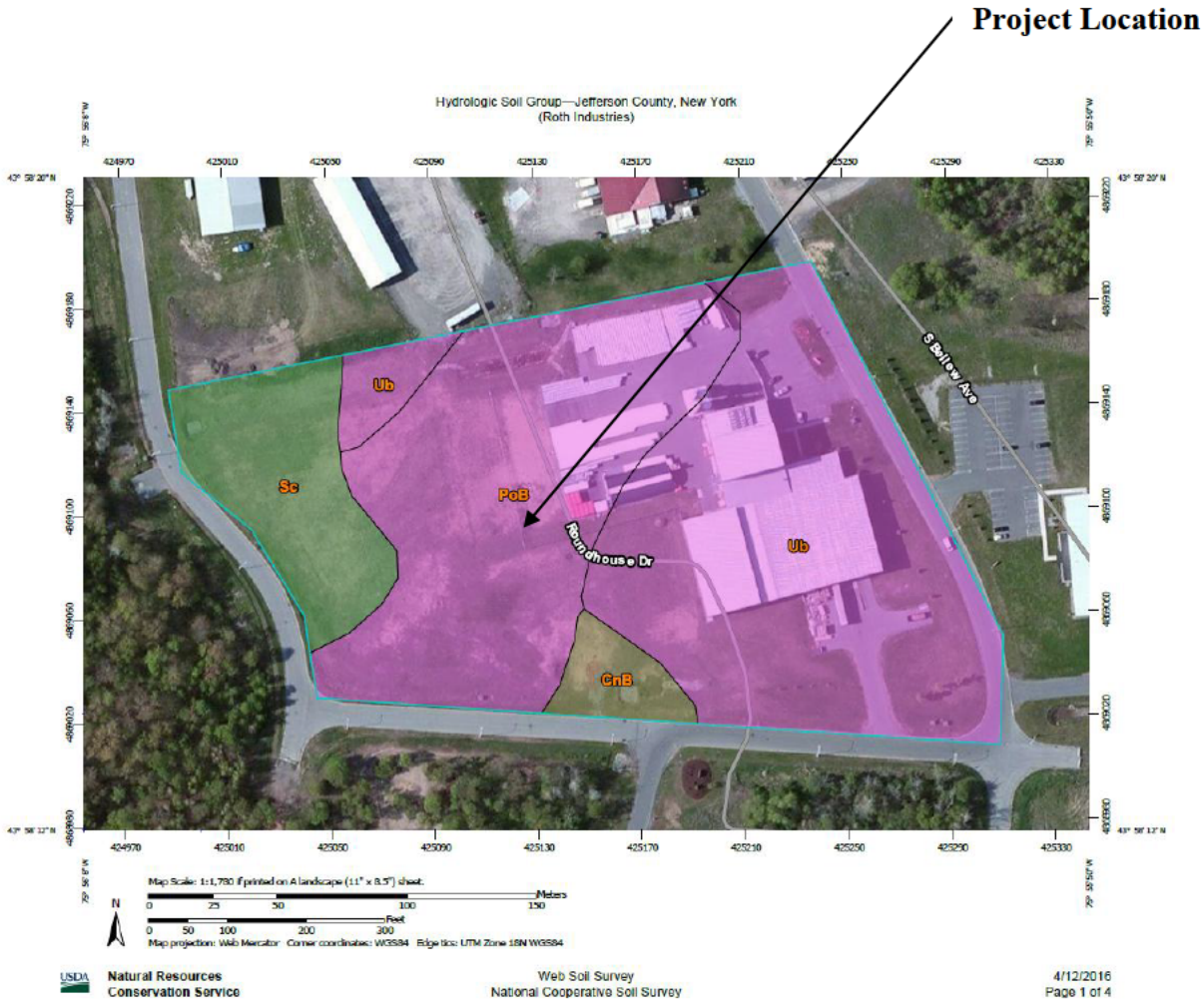


Figure #2A – USGS Soils Map

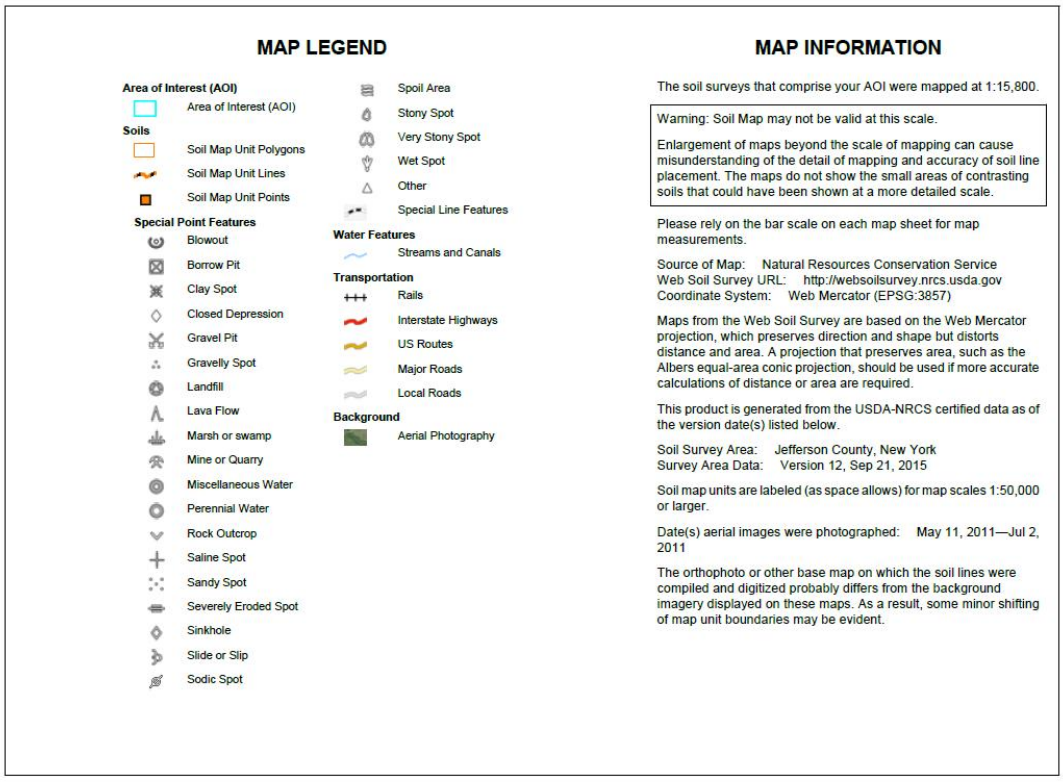


Figure #2B – USGS Soils Map Legend

Hydrologic Soil Group

Hydrologic Soil Group— Summary by Map Unit — Jefferson County, New York (NY045)				
Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
CnB	Collamer silt loam, 3 to 8 percent slopes	C/D	0.4	3.5%
PoB	Plainfield sand, 0 to 8 percent slopes	A	3.8	36.4%
Sc	Scarboro mucky loamy fine sand	A/D	1.3	12.8%
Ub	Udorthents,smoothed	A	4.9	47.3%
Totals for Area of Interest			10.3	100.0%

Description

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

Figure #2C – USGS Soils Data

C. Receiving Waters

The Roth Industries facility drainage generally drains via sheetflow in two directions, south to an existing infiltration basin or north to a separate infiltration basin. The majority of site runoff infiltrates into the existing sandy soils or infiltrates within the basins. During a major storm event, runoff will collect within one of the two (2) existing basins and eventually discharge into the City storm sewer. The southern infiltration basin discharges into three (3) existing culverts which flow south to a catch basin located along Rail Drive. The northern infiltration basin discharges through an outlet pipe and riser structure which is piped into a storm manhole located within Bellew Avenue South storm sewers. The Bellew Ave City storm sewer discharges into the Black River and ultimately flows to Lake Ontario. The Rail Drive City storm sewer discharges south in the direction of the Beaver Meadows marsh that ultimately discharges to Mill Creek and Lake Ontario.

D. Flood Plains

Flood Hazard Boundary maps are available through the FEMA online website for the project area. The FEMA Flood Hazard Boundary map delineates the project site as Zone X, an area of minimal flood hazard. Therefore, no measures will need to be taken to prevent from flood damage. See attached FEMA map.

E. State Wetlands

No wetlands have been indicated on the New York State Freshwater Wetlands map provided by the New York State Department of Environmental Conservation for the project area. See attached State Wetland map.

F. Federal Wetlands

No wetlands have been indicated on the National Wetlands Inventory map provided by the United States Department of the Interior for the project area. See attached Federal Wetland map.

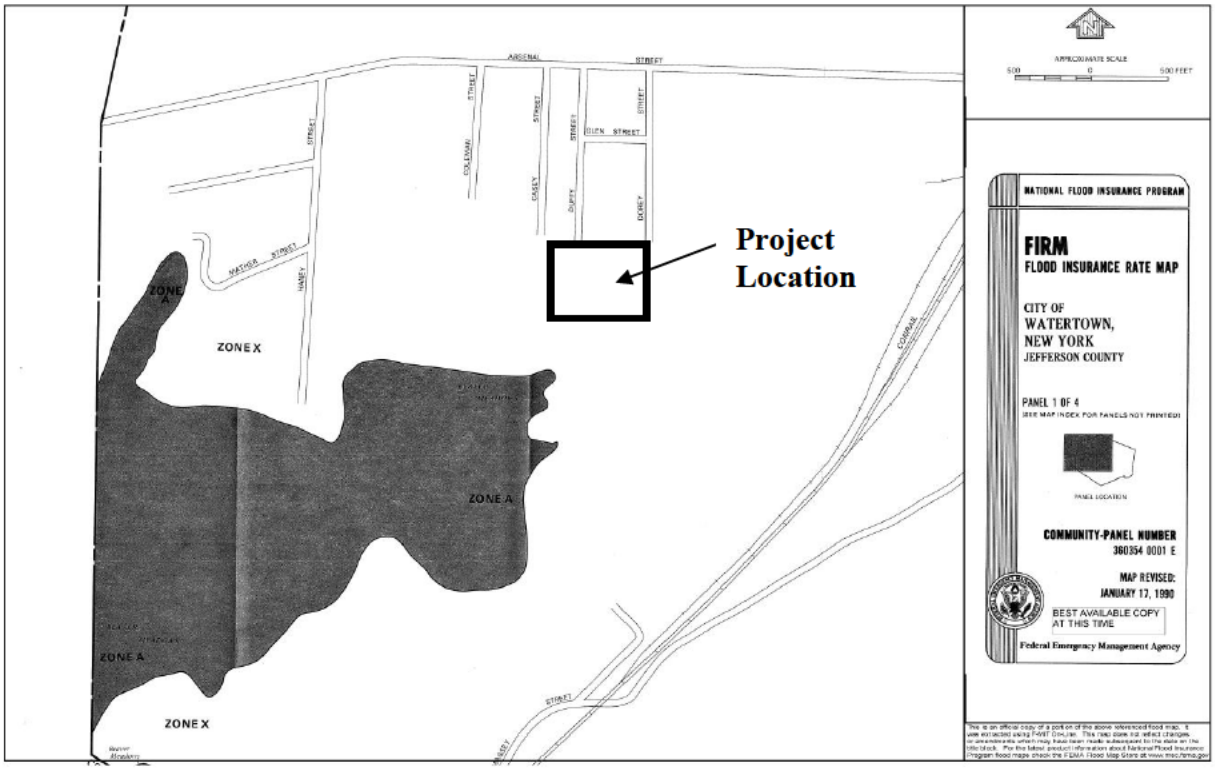


Figure #3 – FEMA Map

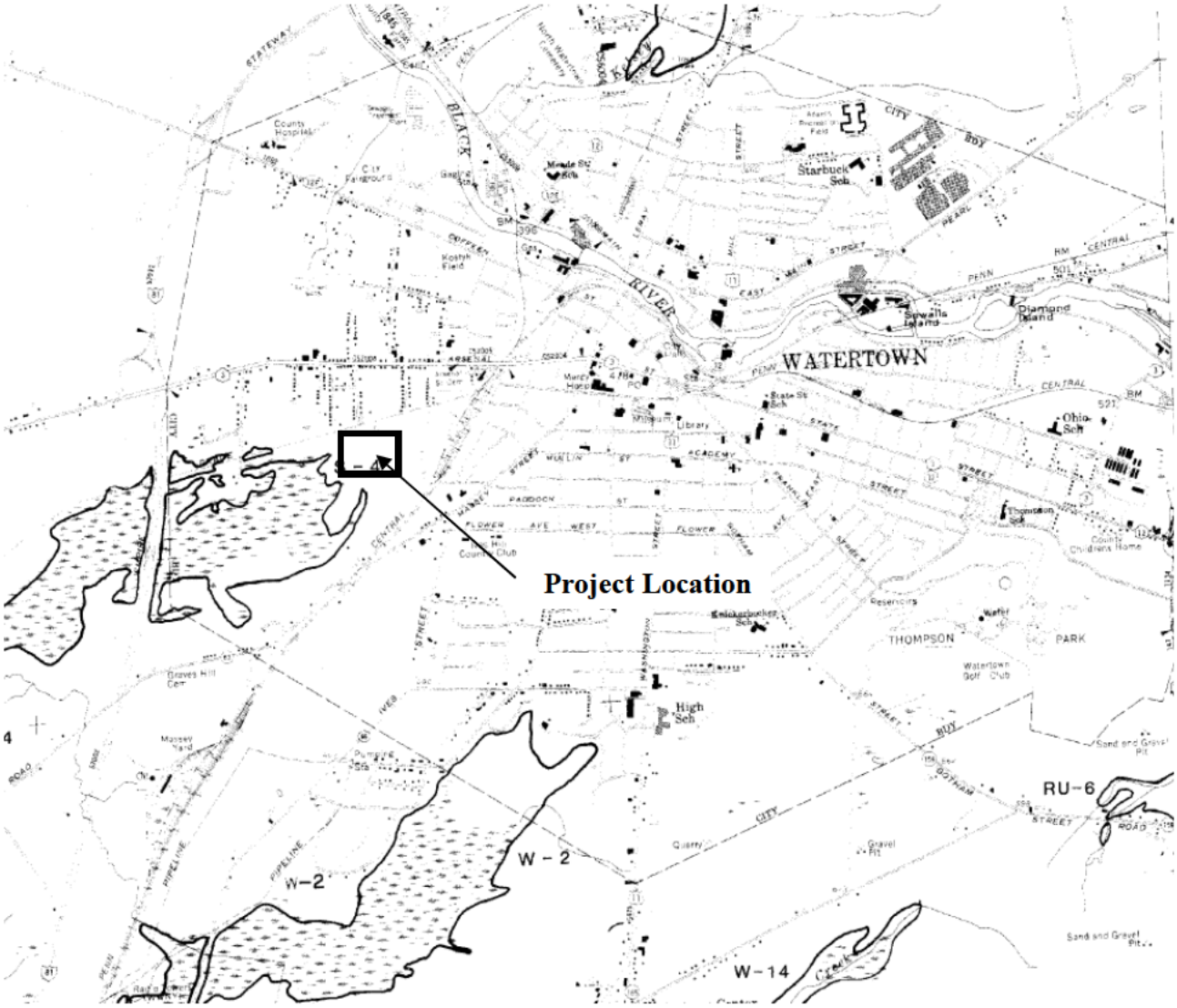


Figure #4 – State Wetland Map

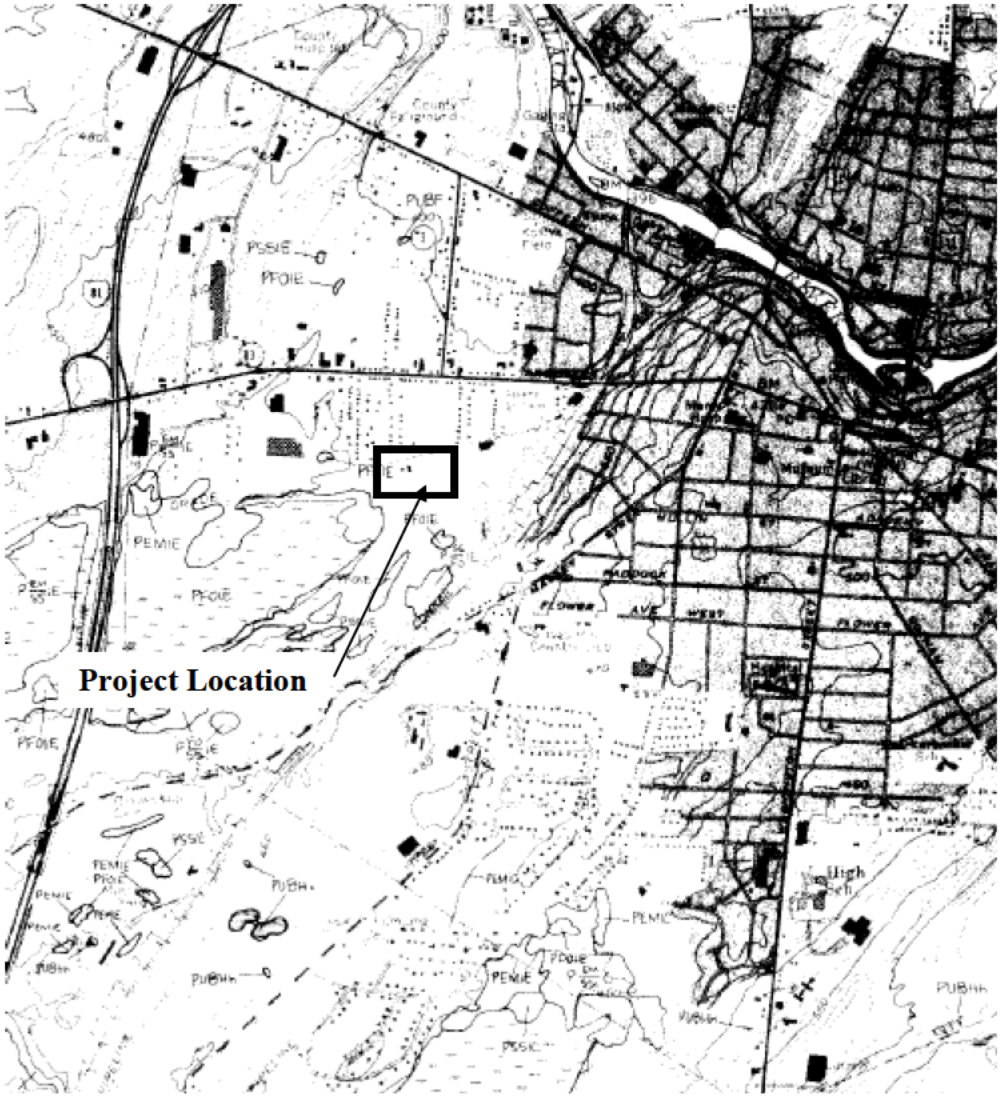


Figure #5 – Federal Wetland Map

4.0 STORMWATER CONDITIONS AND ANALYSIS

A. Rainfall Data and Sizing Criteria

The rainfall data utilized for hydrologic and hydraulic modeling was obtained from New York EFH-2 Supplement Number 2012-1. This rainfall data is collected, maintained and republished for each County of New York State by the Northeast Regional Climate Center (NRCC). The 2012 NRCC rainfall data and rainfall distributions replaced rainfall data from Weather Bureau Technical Paper 40 (TP-40) and the standard NRCS rainfall distributions Type II and Type III. Jefferson County rainfall data has been separated into two subdivisions: NW Jefferson County and SE Jefferson County. The project location is located within the SE Jefferson County rainfall subdivision. The rainfall frequency values for SE Jefferson County, NY are as follows:

Rainfall Frequency Storm Event	**24 Hour Event (Inches)**
1 – Year	2.00
2 – Year	2.33
5 – Year	2.86
10 – Year	3.33
25 – Year	4.07
50 – Year	4.75
100 – Year	5.54

(Ref: New York EFH-2 Supplement Number 2012-1, Dec. 18, 2012)

Rainfall distribution for SE Jefferson County, NY is NRCC Type A rainfall distribution.

Stormwater hydrologic and hydraulic analysis for the Roth Industries 2026 Expansion Project has been conducted in accordance with the United Stormwater Sizing Criteria. NYS DEC SPDES General Permit for Stormwater Discharges from Construction Activity GP-0-25-001 requires analysis of the following stormwater events:

Sizing Criteria	**Design Event**
Runoff Reduction Volume (RRv)	Replicate predevelopment hydrology
Water Quality Volume (WQv)	90% Rainfall
Channel Protection Volume (Cpv)	1 – year 24 hour
Overbank Flood (Qp)	10 – year 24 hour
Extreme Flood (Qf)	100 – year 24 hour

Stormwater analysis of the above events has been conducted utilizing TR – 55 and TR – 20, SCS methodology modeled within HydroCAD Stormwater modeling software. The watershed surface topography and characteristics are based upon USGS topographic maps, state aerial imagery, field topographic survey of the project area, and site investigations.

B. Pre-Development Stormwater Condition (Existing)

The existing contributing watershed impacted by the Roth Industries 2026 Expansion Project includes approximately 8.86 acres of previously developed residential and health service areas. Refer to the existing drainage area map within Appendix G. The watershed consists of a manufacturing facility, asphalt parking and storage yard, an asphalt receiving area and loading dock, and undeveloped vegetated lawn area. The soil conditions are A and C soils.

For analysis, the existing watershed has been divided into two (2) drainage areas. Each drainage area was assigned based upon the direction of the drainage flow off project site. USGS, topographic survey mapping and site investigation were utilized to determine the existing discharge points from the contributing watershed.

Drainage Area DA 1 encompasses the majority of the project site. Existing DA 1 consists of the manufacturing facility, asphalt parking and storage yard, and undeveloped vegetated lawn area. DA 1 drains north to an existing stormwater infiltration basin located at the northwest corner of the storage yard via sheet flow and shallow concentrated flow. Runoff that enters the northern stormwater infiltration basin either infiltrates into the existing sandy soils or overflows and discharges east into a 24” SICPP storm pipe that connects to the Bellew Ave South municipal storm sewer.

Drainage Area DA 2 encompasses the southern receiving area truck access to the loading dock on the south side of the building. DA 2 drains south to a separate storm water infiltration basin via sheet flow. Runoff either infiltrates into the existing sandy soils or overflows and discharges south into the city municipal storm sewer that crosses under Rail Drive.

The infiltration basins were constructed as part of the 2006 Roth Industries Building Addition project.

Hydrologic and hydraulic analysis of the existing contributing watershed and two (2) drainage areas was completed utilizing HydroCAD modeling. The following summary table illustrates the surface, soil, and time of concentration of the existing drainage areas.

EXISTING DRAINAGE AREA SUMMARY TABLE ROTH INDUSTRIES 2026 EXPANSION PROJECT							
Drainage Area	Surface Description	Soil Type	CN	Area (Acre)	Composite CN	Composite Area (Acre)	Tc (Min.)
EX DA 1	Meadow, Grass, Non-Grazed	A	30	4.32	54	6.69	36.3
	Paved Roads, Buildings	A	98	2.37			
EX DA 2	Meadow, Grass, Non-Grazed	A	30	1.64	43	2.17	42.7
	Paved Roads, Buildings	A	98	0.26			
	Meadow, Grass, Non-Grazed	C	71	0.27			
DESIGN POINT DRAINAGE AREA TOTAL					**51**	**8.86**	

Table #1 – Existing Drainage Table

C. Post-Development Stormwater Condition (Proposed)

The post developed project would be classified as a redevelopment project with an increase in impervious area. Post development analysis was completed utilizing the same general existing contributing watershed of approximately 8.86 acres. Refer to the proposed drainage area map within Appendix G. The proposed watershed has been divided into two (2) drainage areas. The proposed development discharge points from Drainage Areas DA 1 and DA 2 did not change from the existing conditions.

DA 1 drains north to an expanded Infiltration Basin #1 located at the northwest corner of the storage yard via sheet flow and shallow concentrated flow. Runoff that enters the expanded northern stormwater infiltration basin either infiltrates into the existing sandy soils or overflows and discharges east into a 24” SICPP storm pipe that connects to the Bellew Ave South municipal storm sewer.

DA 2 drains south to expanded Infiltration Basin #2 via sheet flow. Runoff either infiltrates into the existing sandy soils or overflows and discharges south into the city municipal storm sewer that crosses under Rail Drive.

Hydrologic and hydraulic analysis of the post-development contributing watershed and two (2) drainage areas was completed utilizing HydroCAD modeling. The following summary table illustrates the surface condition, soil, and time of concentration of the proposed drainage areas.

PROPOSED DRAINAGE AREA SUMMARY TABLE ROTH INDUSTRIES 2026 EXPANSION PROJECT							
Drainage Area	Surface Description	Soil Type	CN	Area (Acre)	Composite CN	Composite Area (Acre)	Tc (Min.)
PR DA 1	Meadow, Grass, Non-Grazed	A	30	1.56	81	6.33	14.2
	Roofs, Buildings	A	98	2.24			
	Paved Roads, Concrete Walk	A	98	2.53			
PR DA 2	Meadow, Grass, Non-Grazed	A	30	0.94	68	2.53	18.2
	Paved Roads, Concrete Walk	A	98	1.14			
	Meadow, Grass, Non-Grazed	C	71	0.43			
	Paved Roads	C	98	0.02			
DESIGN POINT DRAINAGE AREA TOTAL					**78**	**8.86**	

Table #2 – Proposed Drainage Table

D. Hydrologic and Hydraulic Analysis

The project watershed was analyzed for the following SPDES GP-0-25-001 requirements:

Runoff Reduction Volume (RRv) is to provide the reduction of the total WQv by applications of green infrastructure techniques and SMP's to replicate pre-development hydrology.

Water Quality Volume (WQv) is designed to improve water quality sizing to capture and treat 90% of the average annual stormwater runoff volume.

Channel Protection Volume (CPv) is designed to protect stream channels from erosion. CPv is intended to provide 24-hour extended detention of the one-year, 24-hour storm event.

Overbank Flood Control (Qp) sizing is to prevent an increase in the frequency and magnitude of out-of-bank flooding generated by post-development. Qp is intended to provide storage to attenuate the post development 10-year, 24-hour peak discharge rate to pre development rates.

Total Extreme Flood Control (Qf) is intended to (a) prevent the increased risk of flood damage from large storm events, (b) maintain the boundaries of the predevelopment 100-year floodplain and (c) protect the physical integrity of stormwater management practices.

The project site was analyzed using conditions for a redevelopment project with an increase in impervious area. Water Quality treatment criteria have been applied utilizing 25% WQv treatment from disturbed impervious areas and 100% WQv treatment for the new increase in impervious areas. With the 2016 and the 2026

Roth Industries Expansion Projects, there is a total of 3.30 acre increase in impervious area for the project site resulting in an increase in CN from 51 to 78.

The existing site soils were analyzed for selection suitability for available stormwater management practices (SMP's). Physical characteristics of the soils were determined via test holes. Test holes and infiltration testing were completed by A&C on 06/08/2016. Soil and infiltration testing results indicated suitable soils conditions for the utilization of infiltration SMP's. Soil testing results indicated consistent sandy soils. A water table was encountered approximately 6.67' below the surface at Test Pit #2, near the north infiltration basin, at an elevation of 391.21'. Infiltration rates ranged from 67 to 83 inches/hour near the south infiltration basin and ranged from 51 to 64 inches/hour near the north infiltration basin. Further information on infiltration testing can be found within Appendix D.

A 25 inches/ hour infiltration rate has been utilized for calculations and modeling of proposed stormwater infiltration basins.

Two (2) infiltration basins have been expanded to provide the required Runoff Reduction Volume (RRv) and Water Quantity Volume (WQv) treatment of stormwater runoff from the new and redeveloped impervious surfaces.

Due to the suitability of the soils, the infiltration basins have been designed to provide both water quality and water quantity storage and infiltration for the attenuation of peak runoff from the 1-year, 10-year, and 100-year storms.

Refer to the Stormwater Management Summary Table (Table #3) and the Stormwater Calculations included in Appendix D.

STORMWATER MANAGEMENT SUMMARY TABLE ROTH INDUSTRIES 2026 EXPANSION PROJECT		
Total Contributing Drainage Area:	8.86	acres
Acreage of Disturbance:	2.37	acres
Existing Impervious (Pre-Consturction):	2.63	acres
Proposed Impervious (Post-Construction):	5.93	acres
Existing Impervious (Undisturbed by Construction):	2.20	acres
New Impervious:	3.30	acres
WQ Volume Required:	0.140	ac-ft
WQ Volume Provided:	0.140	ac-ft
Min. Runoff Reduction Volume (RRv) Required:	0.060	ac-ft
Runoff Reduction Volume (RRv) Provided:	0.140	ac-ft
Channel Protection Volume Required:	0.324	ac-ft
Channel Protection Volume Provided:	0.434	ac-ft
Channel Protection Flow Max (Existing 1 yr):	0.00	cfs
Channel Protection Flow (Post 1 yr):	0.00	cfs
Overbank Flood Control Qp, max. (Existing 10 yr):	0.00	cfs
Overbank Flood Control Qp (Post 10 yr):	0.00	cfs
Total Extreme Flood Control Qf, max. (Existing 100 yr):	1.45	cfs
Total Extreme Flood Control Qf (Post 100 yr):	0.72	cfs
Preconstruction Impervious Area Percentage (Prior to Area Disconnection Practices):	25	%
Postconstruction Impervious Area Percentage (Prior to Area Disconnection Practices):	68	%

Table #3 – Stormwater Management Summary Table

E. Runoff Reduction/Green Infrastructure

Runoff reduction can be accomplished with the use of green infrastructure techniques and standard stormwater management practices that have RRv capacity. The implementation of practices to reduce runoff is a required component of stormwater management per the New York State Stormwater Management Design Manual. Green infrastructure when utilized for stormwater management can reduce runoff volumes and peak flows, increase time of concentration, promote infiltration and evapotranspiration, improve groundwater recharge, reduce pollution and improve wildlife habitat while providing water quality improvements. Provided below is the list of green infrastructure techniques acceptable for runoff reduction.

1. Conservation of natural areas
2. Sheet flow to riparian buffers or filter strips
3. Vegetated open swales
4. Tree planting/tree box
5. Disconnection of rooftop runoff
6. Stream day lighting for redevelopment projects

7. Rain gardens
8. Green roofs
9. Stormwater planters
10. Rain tank/cisterns
11. Porous pavement

These techniques have been examined for applicability to the project as noted below:

1. Conservation of natural areas: No natural areas exist within the project limits. The project area has been previously developed as an industrial park.

2. Sheet flow to riparian buffers or filter strips: Sheet flow was applied where feasible, but the use was limited due to project area constraints. There are no perennial streams, rivers, shorelines, or wetlands on-site to apply riparian buffer preservation techniques. No filter strips were utilized due to project area constraints.

3. Vegetated open swales: No vegetated open swales are utilized for this project. Runoff is directed to the infiltration basins via sheet flow thru grass filter strips or roof drains.

4. Tree planting/tree box: Tree conservation could not be considered because there are no suitable trees remaining along the perimeter of the developed site. No reduction from tree planting will be taken.

5. Disconnection of rooftop runoff: Disconnection of rooftop runoff was not utilized. Building type, roof type, soil conditions and the need to provide adequate positive drainage restricted the application of the practice.

6. Stream daylighting for redevelopment projects: There are no natural stream channels that were artificially closed as part of this project. Stream daylighting would require additional grading that would require additional area that is not feasible with the area constraints.

7. Rain gardens: Rain gardens were not utilized on site for runoff reduction purposes. Rain gardens are not applicable to this project scope/type.

8. Green roofs: This project does not involve any buildings with a green roof.

9. Stormwater planters: Stormwater planters were not utilized on site for runoff reduction purposes.

10. Rain tank/cisterns: A cistern rainwater collection system is not applicable to this project scope/type.

11. Porous pavement: Porous Pavement will not be utilized due to cold climate conditions.

Standard stormwater management practices with RRv capabilities are infiltration practices, bioretention practices, and dry swales. The expansion of the two (2) existing infiltration basins has been designed to meet the minimum RRv requirements.

F. Pre and Post Development Stormwater Comparison

Construction of the Roth Industries 2026 Expansion Project results in a net decrease in runoff from the pre- to post- development condition at the discharge point of the project site. The expansion of the two (2) existing infiltration basins is designed to attenuate the post development peak runoff to no more than the pre development condition for both Drainage Area's DA 1 and DA 2. Summary tables of the existing to proposed runoff comparison follow.

EXISTING VS. PROPOSED RUNOFF COMPARISON ROTH INDUSTRIES 2026 EXPANSION PROJECT						
24 HOUR STORM EVENT PEAK DISCHARGE - (CFS)						
DRAINAGE AREAS	EXIST. 1 YR	PROP. 1 YR	EXIST. 10 YR	PROP. 10 YR	EXIST. 100 YR	PROP. 100 YR
1	0.01	4.13	0.61	11.30	4.79	24.90
INF BASIN #1	0.00	0.00	0.00	0.00	1.45	0.72
2	0.00	0.26	0.01	1.85	0.42	5.78
INF BASIN #2	0.00	0.00	0.00	0.00	0.00	0.00
DESIGN POINT	**0.00**	**0.00**	**0.00**	**0.00**	**1.45**	**0.72**

Table #4 – Existing Vs. Proposed Runoff Table

G. Cold Climate Considerations

Various cold climate considerations were reviewed during the design of the storm drainage system and stormwater management treatment measures selected for the project site. Considerations included those outlined within the NYS Stormwater Design Manual as it relates to the design of various treatment system components, such as reduced infiltration into frozen soils and chlorides.

Reduced Infiltration into Frozen Soils:

- Application of an underdrain to drain the ground beneath to increase soil infiltration
    - Based upon the highly permeable existing soil conditions in the vicinity of the project, an underdrain is not warranted.
- Utilize an alternate SMP other than infiltration to divide the treatment volume and provide some treatment during winter months –
    - Soil conditions limit the suitability of alternate SMP's for water quality treatment.
    - Additional storage capacity has been designed to provide quantity storage within the infiltration basin.

Chlorides:

- Diversion of snowmelt runoff to avoid high chloride concentration into groundwater –
    - Not warranted, excessively high chloride runoff resulting from heavy road salting and melting is not anticipated. Groundwater wells are not located nearby to create a high chloride concern.
- Incorporate mulch for soil fertility –
    - Item is addressed by topsoiling, seeding, fertilizing and mulching requirement for grass areas including the infiltration basin
- Use of salt tolerant grasses –
    - Excessively high chloride concentrations are not anticipated. Asphalt lot is for primarily materials storage, not highway vehicles. Grasses have been selected for regional climate conditions.

H. Stormwater Management Summary / Conclusion

The design of the Roth Industries 2026 Expansion Project has been completed. Design includes the preparation of Grading and Drainage Plans, Erosion and Sediment Control Plans, Cross Sections and Details.

A Storm Water Pollution Prevention Plan (SWPPP) was created specifically for the Roth Industries 2026 Expansion Project site to address stormwater runoff, GP-0-25-001 permit requirements, grading, temporary and permanent Stormwater Treatment measures, and construction inspection and maintenance requirements. The SWPPP was created in accordance with the most current applicable NYS DEC SPDES General Permit for Stormwater Discharges from Construction Activity Permit GP-0-25-001, January 29, 2025. Design has been completed utilizing the sizing criteria for a redevelopment project with an increase in impervious area. The required Runoff Reduction Volume (RRv), Water Quality Volume (WQv), and Water Quantity Treatment requirements of the GP-0-25-001 permit have been met.

The Roth Industries Building Addition project site drainage area includes 8.86 acres. Expansion of the two (2) existing infiltration basins have been designed to provide 100% Water Quality (WQv) and Runoff Reduction Volume (RRv) treatment of newly constructed impervious surfaces and 25% WQv treatment for the redeveloped impervious surfaces within the project areas.

The expansion of the infiltration basins also has the capacity to provide peak flow quantity storage and infiltration attenuation of the 1-year, 10-year, and 100-year storm events, to less than that of the existing condition. The existing sands soils have infiltration rates greater than 5.0 in/hr. The high permeability allows the infiltration basin to infiltrate and provide quantity attenuation of the peak storm events.

The Roth Industries 2026 Expansion Project design has been designed in conformance with the GP-0-25-001 technical standards. Therefore, it will be available for permit within 5 days of submission of the Electronic Notice of Intent (eNOI) to the NYS DEC.

5.0 INSPECTION AND MAINTENANCE REQUIREMENTS

A. General Construction Site Inspection and Maintenance Requirements

1. The *owner or operator* must ensure that all erosion and sediment control practices identified in the SWPPP are always maintained in effective operating condition.

2. The terms of this permit shall not be construed to prohibit the State of New York from exercising any authority pursuant to the Environmental Conservation Law, common law or federal law, or prohibit New York State from taking any measures, whether civil or criminal, to prevent violations of the laws of the State of New York or protect the public health and safety and/or the environment.

B. Owner or Operator Inspection Requirements

1. An *owner or operator* shall, in accordance with the requirements in the most current version of the technical standard, New York Standards and Specifications for Erosion and Sediment Control, inspect the erosion and sediment controls identified in the SWPPP to ensure that they are always maintained in effective operating condition.

2. For construction sites where soil disturbance activities have been temporarily suspended (e.g. winter shutdown) and temporary stabilization measures have been applied to all disturbed areas, the *owner or operator* can stop conducting inspections. The *owner or operator* shall begin conducting inspections in accordance with Part IV.B.1. as soon as soil disturbance activities resume.

3. For construction sites where soil disturbance activities have been shut down with partial project completion, the *owner or operator* can stop conducting inspections if all areas disturbed as of the project shutdown date have achieved *final stabilization* and all post-construction stormwater management practices required for the completed portion of the project have been constructed in conformance with the SWPPP and are operational.

C. Qualified Inspector Inspection Requirements

1. The *owner or operator* shall have a *qualified inspector* conduct site inspections in conformance with the following requirements: [Note: The *trained contractor* identified in Part III.A.6. **cannot** conduct the *qualified inspector* site inspections unless they meet the *qualified inspector* qualifications included in Appendix A. In order to perform these inspections, the *trained contractor* would have to be

• Licensed Professional Engineer,
• Certified Professional in Erosion and Sediment Control (CPESC),
• Registered Landscape Architect, or
• Someone working under the direct supervision of, and at the same company as, the licensed Professional Engineer or Registered Landscape Architect, provided they have received four (4) hours of Department endorsed training in proper erosion and sediment control principles from a Soil and Water Conservation District, or other Department endorsed entity].

a.) A *qualified inspector* shall conduct site inspections for all *construction activities* identified in Tables 1 and 2 of Appendix B, with the exception of:

i.) the construction of a single-family residential subdivision with 25% or less *impervious cover* at total site build-out that involves a soil disturbance of one (1) or more acres of land but less than five (5) acres and is not located in one of the watersheds listed in Appendix C and not directly discharging to one of the 303(d) segments listed in Appendix E;
ii.) the construction of a single-family home that involves a soil disturbance of one (1) or more acres of land but less than five (5) acres and is not located in one of the watersheds listed in Appendix C and not directly discharging to one of the 303(d) segments listed in Appendix D;
iii.) construction on agricultural property that involves a soil disturbance of one (1) or more acres of land but less than five (5) acres; and
iv.) construction activities located in the New York City Watershed located east of the Hudson River, identified in Appendix C Figure 1, that involve soil disturbances between five thousand (5000) square feet and one (1) acre of land.

2. Unless otherwise notified by the Department, the *qualified inspector* shall conduct site inspections in accordance with the following timetable:
   a.) For construction sites where soil disturbance activities are on-going, the *qualified inspector* shall conduct a site inspection at least once every seven (7) calendar days; or
   b.) For construction sites where soil disturbance activities are on-going and the *owner or operator* has received authorization in accordance with Part I.E.6 to disturb greater than five (5) acres of soil at any one time, the *qualified inspector* shall conduct at least two (2) site inspections every seven (7) calendar days. The two (2) inspections shall be separated by a minimum of two (2) full calendar days; or
   c.) For construction sites where soil disturbance activities have been temporarily suspended (e.g. winter shutdown) and temporary stabilization measures have been applied to all disturbed areas, the *qualified inspector* shall conduct a site inspection at least once every

thirty (30) calendar days. The *owner or operator* shall notify the Regional Office stormwater contact person (see contact information in Appendix E) or, in areas under the jurisdiction of a *regulated, traditional land use control MS4,* the MS4 (provided the MS4 is not the *owner or operator* of the construction activity) in writing prior to reducing the frequency of inspections and again in writing prior to recommencing construction; or

d.) For construction sites where soil disturbance activities have been shut down with partial project completion, the *qualified inspector* can stop conducting inspections if all areas disturbed as of the project shutdown date have achieved *final stabilization* and all post-construction stormwater management practices required for the completed portion of the project have been constructed in conformance with the SWPPP and are operational. The *owner or operator* shall notify the Regional Office stormwater contact person (see contact information in Appendix E) or, in areas under the jurisdiction of a *regulated, traditional land use control MS4,* the MS4 operator(s) in accordance with Part I.D.2.b.ii.1., (provided the MS4 is not the *owner or operator* of the construction activity) in writing prior to the shutdown. If soil disturbance activities are not resumed within 2 years from the date of shutdown, the *owner or operator* shall terminate coverage by meeting the requirements of Part V; or

e.) For *construction sites* involving soil disturbance of one (1) or more acres that *directly discharge* to one of the 303(d) segments listed in Appendix D or is located in one of the watersheds listed in Appendix C, the *qualified inspector* must conduct at least two (2) site inspections every seven (7) calendar days. The two (2) inspections must be separated by a minimum of two (2) full calendar days.

3. At a minimum, the *qualified inspector* shall inspect all erosion and sediment control practices to ensure integrity and effectiveness, all post-construction stormwater management practices under construction to ensure that they are constructed in conformance with the SWPPP, all areas of disturbance that have not achieved *final stabilization,* all points of discharge to natural surface water bodies located within, or immediately adjacent to, the property boundaries of the construction site, and all points of discharge from the construction site.

4. The *qualified inspector* shall prepare an inspection report subsequent to each and every inspection. At a minimum, the inspection report shall include all of the following, for all *construction activities* except those listed in Part IV.C.1.:
   a.) Permit identification number;
   b.) Date and time of inspection;
   c.) Name and title of person(s) performing inspection;
   d.) A description of the weather and soil conditions (e.g. dry, wet, saturated) at the time of the inspection; including the temperature at the time of the inspection;

e.) A description of the condition of the runoff at all points of discharge from the construction site. This shall include identification of any discharges of sediment from the construction site. Include discharges from conveyance systems (i.e. pipes, culverts, ditches, etc.) and overland flow;
f.) A description of the condition of all-natural surface water bodies located within, or immediately adjacent to, the property boundaries of the construction site which receive runoff from disturbed areas. This shall include identification of any discharges of sediment to the surface water body;
g.) Identification of all erosion and sediment control practices that need repair or maintenance;
h.) Identification of all erosion and sediment control practices that were not installed properly or are not functioning as designed and need to be reinstalled or replaced;
i.) Description and sketch of areas that are disturbed at the time of the inspection and areas that have been stabilized (temporary and/or final) since the last inspection;
j.) Estimates, in square feet or acres, of the following areas:
    i. Total area with active soil disturbance (not requiring either *temporary stabilization* or *final stabilization*);
    ii. Total area with inactive soil disturbance (requiring either *temporary stabilization* or *final stabilization*);
    iii. Total area that has achieved *temporary stabilization*;
    iv. Total area that has achieved *final stabilization*;
k.) Current phase of all post-construction stormwater management practices and identification of all construction that is not in conformance with the SWPPP and technical standards;
l.) Corrective action(s) that must be taken to install, repair, replace or maintain erosion and sediment control practices; and to correct deficiencies identified with the construction of the post-construction stormwater management practice(s);
m.) Identification and status of all corrective actions that were required by previous inspection; and
n.) Digital photographs, with date stamp, that clearly show the condition of all practices that have been identified as needing corrective actions. The *qualified inspector* shall attach paper color copies of the digital photographs to the inspection report being maintained onsite within seven (7) calendar days of the date of the inspection. The *qualified inspector* shall also take digital photographs, with date stamp, that clearly show the condition of the practice(s) after the corrective action has been completed. The *qualified inspector* shall attach paper color copies of the digital photographs to the inspection report that documents the completion of the corrective action work within seven (7) calendar days of that inspection.

5. Within one business day of the completion of an inspection, the *qualified inspector* shall notify the *owner or operator* and appropriate contractor or

subcontractor identified in Part III.A.7. of any corrective actions that need to be taken. If the corrective action does not require engineering design, the contractor or subcontractor shall begin implementing the corrective actions within one (1) business day of this notification and shall complete the corrective actions within five business days. If the corrective action requires engineering design, the contractor or subcontractor must begin the engineering design process within five (5) business days of this notification and shall complete the corrective action in a reasonable time frame but no later than within sixty (60) calendar days.

6. All inspection reports shall be signed by the *qualified inspector.* Pursuant to Part I.E.3., the inspection reports shall be maintained on site with the SWPPP.

6.0 TERMINATION OF PERMIT COVERAGE

A. Termination of Coverage

1. An *owner or operator* that is eligible to terminate coverage under this permit must submit a completed NOT form to the address in Part II.A.1. The NOT form shall be one which is associated with this general permit, signed in accordance with Part VII.H.

2. An *owner or operator* may terminate coverage when one or more of the following conditions have been met:
   a.) Total project completion - All construction activity identified in the SWPPP has been completed; and all areas of disturbance have achieved *final stabilization*; and all temporary, structural erosion and sediment control measures have been removed; and all post-construction stormwater management practices have been constructed in conformance with the SWPPP and are operational;
   b.) Planned shutdown with partial project completion - All soil disturbance activities have ceased; and all areas disturbed as of the project shutdown date have achieved *final stabilization*; and all temporary, structural erosion and sediment control measures have been removed; and all post-construction stormwater management practices required for the completed portion of the project have been constructed in conformance with the SWPPP and are operational;
   c.) A new *owner or operator* has obtained coverage under this permit in accordance with Part II.E.

3. For *construction activities* meeting subdivision 2a. or 2b. of this Part, the *owner or operator* shall have the *qualified inspector* perform a final site inspection prior to submitting the NOT. The *qualified inspector* shall, by

signing the “Final Stabilization” and “Post-Construction Stormwater Management Practice” certification statements on the NOT, certify that all disturbed areas have achieved *final stabilization;* and all temporary, structural erosion and sediment control measures have been removed; and that all post-construction stormwater management practices have been constructed in conformance with the SWPPP.

4. For *construction activities* that are subject to the requirements of a *regulated, traditional land use control MS4* and meet subdivision 2a. or 2b. of this Part*,* the *owner or operator* shall also have the MS4 sign the “MS4 Acceptance” statement on the NOT. The *owner or operator* shall have the principal executive officer, ranking elected official, or duly authorized representative from the *regulated, traditional land use control MS4*, sign the “MS4 Acceptance” statement. The MS4 official, by signing this statement, has determined that it is acceptable for the *owner or operator* to submit the NOT in accordance with the requirements of this Part. The MS4 can make this determination by performing a final site inspection themselves or by accepting the *qualified inspector’s* final site inspection certification(s) required in Part V.3.

5. For *construction activities* that require post-construction stormwater management practices and meets subdivision 2a. of this Part, the *owner or operator* must, prior to submitting the NOT, ensure one of the following:

    a.) the post-construction stormwater management practice(s) and any right-of-way(s) needed to maintain such practice(s) have been deeded to the municipality in which the practice(s) is located,
    b.) an executed maintenance agreement is in place with the municipality that will maintain the post-construction stormwater management practice(s),
    c.) for post-construction stormwater management practices that are privately owned, the *owner or operator* has modified their deed of record to include a deed covenant that requires operation and maintenance of the practice(s) in accordance with the operation and maintenance plan,
    d.) for post-construction stormwater management practices that are owned by a public or private institution (e.g. school, college, university), or government agency or authority, the *owner or operator* has policy and procedures in place that ensures operation and maintenance of the practices in accordance with the operation and maintenance plan.

7.0 POST CONSTRUCTION MAINTENANCE

A. Maintenance

The property owner (Roth Industries, LLC) shall be responsible for all post construction long-term maintenance of the Storm Drainage System and Stormwater Management System on the property.

1. To ensure long term operation and maintenance by the Owner, the deed of record will be modified to include a deed covenant. The deed covenant will require operation and maintenance of the practices in accordance with the operation and maintenance plan described herein. The deed covenant shall be created and filed prior to issuance of the Notice of Termination for the stormwater SPDES General Permit.
2. The upstream channels, culverts, inlets and outlets, and piping require regular maintenance and inspection to maximize effective runoff reduction and water quality treatment. Effective treatment can be maintained only when proper maintenance and regular cleaning of the pretreatment systems are completed.
3. At least twice yearly, grass areas surrounding maneuvering areas should be maintained to slow runoff and the transport of sediment. Grass in drainage channels and swales should be maintained at a height of 4 to 6 inches.
4. Buildup of sand, silt, sediment and debris on pavement and low areas should be checked annually and buildup removed to provide maximum flow capacity and minimize the chances of sediment being washed downstream.
5. Lawn areas and drainage channels adjacent to roadways and parking areas should be inspected after the spring melt. Residual sand and damaged vegetation should be removed, and the area replanted. Areas may require re-mulching to restore soils moisture capacity.
6. Vegetated swales shall be inspected annually each spring. When sediments reach 2” in depth, sediments should be excavated and areas re-vegetated and stabilized. If standing water is present or riling occurs, repair/re-grade the swale and stabilize as necessary. Mow all vegetated swales to maintain a grass height of 4”-6”.
7. Lawn areas and drainage channels adjacent to driveways and parking areas should be inspected after the spring melt. Residual sand and damaged vegetation should be removed, and the area replanted. Areas may require re-mulching to restore soils moisture capacity.
8. Buildup of sand and debris within the infiltration basins should be checked semi-annually, each spring and fall. Silt/sediment shall be removed from the treatment areas when accumulation reaches 1”. When filtering capacity is reduced (water ponds on surface for 48 hours) the top layer of discolored material shall be removed and replaced with fresh material.
9. Access to the perimeter of the infiltration basins have been provided for inspection maintenance and cleaning. Proper maintenance of upstream pretreatment measures should minimize the need for excavation and cleaning of sediment accumulation within the pretreatment sediment basin and infiltration basin. Any sediment accumulation within the pretreatment

sediment basin and infiltration basin exceeding 25% of the design capacity shall be excavated, and area restored to design elevations.

10. Outflow areas should be inspected twice annually (spring and fall) to ensure that no sediment is being washed downstream.

Appendix A

SWPPP Certifications

Aubertine and Currier Architects, Engineers and Land Surveyors, PLLC
522 Bradley Street, Watertown, New York 13601 TELE: (315) 782-2005 FAX: (315) 782-1472

Page left intentionally blank for duplex printing

Roth Industries 2026 Expansion Project

STORMWATER POLLUTION PREVENTION PLAN
OWNER/OPERATOR CERTIFICATION

The Owner/Operator that will implement the pollutant control measures described in the SWPPP must be indentified below. Each must sign a statement certifying that they understand the NPDES and NYSDEC general permit authorizing storm water discharges during construction. These statements must be maintained in the SWPPP file on site.

OWNER/OPERATOR:

Business Name: _____

Business Address: _____

Telephone No. _____

Name of Signatory: _____

Title of Signatory: _____

Signature: _____

Date: _____

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. Further, I hereby certify that the SWPPP meets all Federal, State, and local erosion and sediment control requirements. I am aware that false statements made herein are punishable as a class A misdemeanor pursuant to Section 210.45 of the Penal Law.

Roth Industries 2026 Expansion Project

STORMWATER POLLUTION PREVENTION PLAN
CONTRACTOR/SUBCONTRACTOR CERTIFICATION

The Contractor and/or Subcontractor(s) that will implement the pollutant control measures described in the SWPPP must be indentified below. Each must sign a statement certifying that they understand the NPDES and NYSDEC general permit authorizing storm water discharges during construction. These statements must be maintained in the SWPPP file on site.

CONTRACTOR IMPLEMENTING THE SWPPP:

Business Name: _____

Business Address: _____

Telephone No. _____

Name of Signatory: _____

Title of Signatory: _____

Signature: _____

Date: _____

Trained Contractor _____

Contractor Responsibility: _____

_____

"I hereby certify that I understand and agree to comply with the terms and conditions of the SWPPP and agree to implement any corrective actions identified by the *qualified inspector* during a site inspection. I also understand that the *owner or operator* must comply with the terms and conditions of the most current version of the New York State Pollutant Discharge Elimination System ("SPDES") general permit for stormwater discharges from construction activities and that it is unlawful for any person to cause or contribute to a violation of water quality standards. Furthermore, I understand that certifying false, incorrect or inaccurate information is a violation of the referenced permit and the laws of the State of New York and could subject me to criminal, civil and/or administrative proceedings."

Roth Industries 2026 Expansion Project

STORMWATER POLLUTION PREVENTION PLAN
QUALIFIED INSPECTOR/PROFESSIONAL CERTIFICATION

The Qualified Inspector/Professional has been contracted to conduct an assessment of the site prior to the commencement of construction and certify in an inspection report that the appropriate erosion and sediment controls described in the SWPPP are required by Part III.B. of General Permit GP-0-25-001 have been adequately installed or implemented to ensure overall preparedness of the site for the commencement of construction. Following the commencement of construction, site inspections shall be conducted by the qualified professional at least every 7 calendar days. Each must sign a statement certifying that they understand the NPDES and NYSDEC general permit authorizing storm water discharges during construction. These statements must be maintained in the SWPPP file on site.

QUALIFIED INSPECTOR/PROFESSIONAL:

Business Name: Aubertine and Currier Architects, Engineers & Land Surveyors, PLLC

Business Address: 522 Bradley Street, Watertown, NY 13601

Telephone No. 315-782-2005

Name of Signatory: [redacted]

Title of Signatory:

Signature:

Date: _____

"I certify that I understand and agree to comply with the terms and conditions of the SWPPP and agree to implement any corrective actions identified by the qualified inspector during a site inspection. I also understand that the owner or operator must comply with the terms and conditions of the New York State Pollution Discharge Elimination System (SPDES) general permit for stormwater discharges from construction activities and that it is unlawful for any person to cause or contribute to a violation of water quality standards. Furthermore, I understand that certifying false, incorrect or inaccurate information is a violation of the referenced permit and the laws of the State of New York an could subject me to a criminal, civil and/or administrative proceedings."

Roth Industries Building Addition

STORMWATER POLLUTION PREVENTION PLAN
QUALIFIED INSPECTOR/PROFESSIONAL CERTIFICATION

The Qualified Inspector/Professional has been contracted to conduct an assessment of the site prior to the commencement of construction and certify in an inspection report that the appropriate erosion and sediment controls described in the SWPPP are required by Part III.B. of General Permit GP-0-25-001 have been adequately installed or implemented to ensure overall preparedness of the site for the commencement of construction. Following the commencement of construction, site inspections shall be conducted by the qualified professional at least every 7 calendar days. Each must sign a statement certifying that they understand the NPDES and NYSDEC general permit authorizing storm water discharges during construction. These statements must be maintained in the SWPPP file on site.

QUALIFIED INSPECTOR/PROFESSIONAL:

Business Name: Aubertine and Currier Architects, Engineers & Land Surveyors, PLLC

Business Address: 522 Bradley Street, Watertown, NY 13601

Telephone No. 315-782-2005

Name of Signatory: Christopher Todd

Title of Signatory: Qualified Inspector

Signature: _____

Date: _____

"I certify that I understand and agree to comply with the terms and conditions of the SWPPP and agree to implement any corrective actions identified by the qualified inspector during a site inspection. I also understand that the owner or operator must comply with the terms and conditions of the New York State Pollution Discharge Elimination System (SPDES) general permit for stormwater discharges from construction activities and that it is unlawful for any person to cause or contribute to a violation of water quality standards. Furthermore, I understand that certifying false, incorrect or inaccurate information is a violation of the referenced permit and the laws of the State of New York an could subject me to a criminal, civil and/or administrative proceedings."

Appendix B

Construction Site Log Book

Aubertine and Currier Architects, Engineers and Land Surveyors, PLLC
522 Bradley Street, Watertown, New York 13601 TELE: (315) 782-2005 FAX: (315) 782-1472

Page left intentionally blank for duplex printing

STATE POLLUTANT DISCHARGE ELIMINATION SYSTEM FOR CONSTRUCTION ACTIVITIES

CONSTRUCTION SITE LOG BOOK

Table of Contents

I. Pre-Construction Meeting Documents
- a. Preamble to Site Assessment and Inspections
- b. Operator's Certification
- c. Contractor/Subcontractor Certification
- d. Qualified Professional's Certification and Credentials
- e. Pre-Construction Site Assessment Checklist

II. Construction Duration Inspections
- a. Directions
- b. Construction Duration Inspection Form

Aubertine and Currier Architects, Engineers and Land Surveyors, PLLC
522 Bradley Street, Watertown, New York 13601 TELE: (315) 782-2005 FAX: (315) 782-1472

PRE-CONSTRUCTION MEETING DOCUMENTS

Project Name_____
Permit No. _____ **Date of Authorization**_____
Name of Operator _____
Prime Contractor _____

Preamble to Site Assessment and Inspections
The Following Information to Be Read by All Person's involved in The Construction of Stormwater Related Activities:

The Operator agrees to have a qualified professional[1] conduct an assessment of the site prior to the commencement of construction[2] and certify in this inspection report that the appropriate erosion and sediment controls described in the SWPPP have been adequately installed or implemented to ensure overall preparedness of the site for the commencement of construction.

Prior to the commencement of construction, the Operator shall certify in this site logbook that the SWPPP has been prepared in accordance with the State's standards and meets all Federal, State and local erosion and sediment control requirements.

When construction starts, site inspections shall be conducted by the qualified professional every 7 calendar days. The Operator shall maintain a record of all inspection reports in this site logbook. The site logbook shall be maintained on site and be made available to the permitting authorities upon request. The Operator shall post at the site, in a publicly accessible location, a summary of the site inspection activities on a monthly basis (Monthly Summary Report).

The operator shall also prepare a written summary of compliance with this general permit at a minimum frequency of every three months (Operator's Compliance Response Form), while coverage exists. The summary should address the status of achieving each component of the SWPPP.

Prior to filing the Notice of Termination or the end of permit term, the Operator shall have a qualified professional perform a final site inspection. The qualified professional shall certify that the site has undergone final stabilization[3] using either vegetative or structural stabilization methods and that all temporary erosion and sediment controls (such as silt fencing) not needed for long-term erosion control have been removed.
In addition, the Operator must identify and certify that all permanent structures described in the SWPPP have been constructed and provide the owner(s) with an operation and maintenance plan that ensures the structure(s) continuously functions as designed.

1 "Qualified Professional means a person knowledgeable in the principles and practice of erosion and sediment controls, such as a Certified Professional in Erosion and Sediment Control (CPESC), soil scientist, licensed engineer or someone working under the direction and supervision of a licensed engineer (person must have experience in the principles and practices of erosion and sediment control).
2 "Commencement of construction" means the initial removal of vegetation and disturbance of soils associated with clearing, grading or excavating activities or other construction activities.
3 "Final stabilization" means that all soil-disturbing activities at the site have been completed and a uniform, perennial vegetative cover with a density of eighty (80) percent has been established or equivalent stabilization measures (such as the use of mulches or geotextiles) have been employed on all unpaved areas and areas not covered by permanent structures.

PRE-CONSTRUCTION SITE ASSESSMENT CHECKLIST

(NOTE: Provide comments below as necessary)

1. Notice of Intent, SWPPP, and Contractors Certification:

Yes No NA

[ ] [ ] [ ] Has a Notice of Intent been filed with the NYS Department of Conservation?
[ ] [ ] [ ] Is the SWPPP on-site? Where? _____
[ ] [ ] [ ] Is the Plan current? What is the latest revision date? _____
[ ] [ ] [ ] Is a copy of the NOI (with brief description) onsite? Where?_____
[ ] [ ] [ ] Have all contractors involved with stormwater related activities signed a contractor's certification?

2. Resource Protection

Yes No NA

[ ] [ ] [ ] Are construction limits clearly flagged or fenced?
[ ] [ ] [ ] Important trees and associated rooting zones, on-site septic system absorption fields, existing vegetated areas suitable for filter strips, especially in perimeter areas, have been flagged for protection.
[ ] [ ] [ ] Creek crossings installed prior to land-disturbing activity, including clearing and blasting.

3. Surface Water Protection

Yes No NA

[ ] [ ] [ ] Clean stormwater runoff has been diverted from areas to be disturbed.
[ ] [ ] [ ] Bodies of water located either on site or in the vicinity of the site have been identified and protected.
[ ] [ ] [ ] Appropriate practices to protect on-site or downstream surface water are installed.
[ ] [ ] [ ] Are clearing and grading operations divided into areas <5 acres?

4. Stabilized Construction Entrance

Yes No NA

[ ] [ ] [ ] A temporary construction entrance to capture mud and debris from construction vehicles before they enter the public highway has been installed.
[ ] [ ] [ ] Other access areas (entrances, construction routes, equipment parking areas) are stabilized immediately as work takes place with gravel or other cover.
[ ] [ ] [ ] Sediment tracked onto public streets is removed or cleaned on a regular basis.

5. Perimeter Sediment Controls

Yes No NA

[ ] [ ] [ ] Silt fence material and installation comply with the standard drawing and specifications.
[ ] [ ] [ ] Silt fences are installed at appropriate spacing intervals
[ ] [ ] [ ] Sediment/detention basin was installed as first land disturbing activity.
[ ] [ ] [ ] Sediment traps and barriers are installed.

6. Pollution Prevention for Waste and Hazardous Materials

Yes No NA

[ ] [ ] [ ] The Operator or designated representative has been assigned to implement the spill prevention avoidance and response plan.
[ ] [ ] [ ] The plan is contained in the SWPPP on page _____
[ ] [ ] [ ] Appropriate materials to control spills are onsite. Where? _____

CONSTRUCTION DURATION INSPECTIONS

Directions:
Inspection Forms will be filled out during the entire construction phase of the project.
Required Elements:

(1) On a site map, indicate the extent of all disturbed site areas and drainage pathways. Indicate site areas that are expected to undergo initial disturbance or significant site work within the next 14-day period;

(2) Indicate on a site map all areas of the site that have undergone temporary or permanent stabilization;

(3) Indicate all disturbed site areas that have not undergone active site work during the previous 14-day period;

(4) Inspect all sediment control practices and record the approximate degree of sediment accumulation as a percentage of sediment storage volume (for example, 10 percent, 20 percent, 50 percent);

(5) Inspect all erosion and sediment control practices and record all maintenance requirements such as verifying the integrity of barrier or diversion systems (earthen berms or silt fencing) and containment systems (sediment basins and sediment traps). Identify any evidence of rill or gully erosion occurring on slopes and any loss of stabilizing vegetation or seeding/mulching. Document any excessive deposition of sediment or ponding water along barrier or diversion systems. Record the depth of sediment within containment structures, any erosion near outlet and overflow structures, and verify the ability of rock filters around perforated riser pipes to pass
water; and

(6) Immediately report to the Operator any deficiencies that are identified with the implementation of the SWPPP.

Project Name: _____ **Date:**_____

Time:_____

Weather: _____ **Temp:** _____

Identify the contractor's activity and stage(s) of construction:

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____ _____

On-Site Contractor Sign-Off **Operator / Contractor**

_____ _____

Qualified Inspector (print name) **Date of Inspection**

_____ _____

Qualified Professional (print name) **Qualified Professional Signature**

The above signed acknowledges that, to the best of his/her knowledge, all information provided on the forms is accurate and complete. Owner/Operator acknowledges the corrective actions noted herein, and shall begin implementation within one business day of this notification.

	Y	N	N/A
1. Approved SWPPP, ESC Plan and Permit present on site?	☐	☐	☐

Corrective Action / Comments (if applicable):_____

_____

2. Are the general site conditions in accordance with the SWPPP?	☐	☐	☐
a. Are there activities occurring outside of the limits of disturbance shown on the plans?	☐	☐	☐
b. Is construction site litter and debris appropriately managed?	☐	☐	☐
c. Are facilities and equipment necessary for implementation of erosion and sediment control in working order and/or properly maintained?	☐	☐	☐
d. Is dust adequately controlled?	☐	☐	☐
e. Is there any residue from oil and floating substances, visible oil film, of grease?	☐	☐	☐
f. Are washout facilities used and maintained?	☐	☐	☐

Corrective Action / Comments (if applicable):_____

_____

3. Are areas intended for post construction stormwater management BMP's protected from compaction?	☐	☐	☐

Corrective Action / Comments (if applicable):_____

_____

4. Construction Entrance(s) installed correctly at locations shown on drawings?	☐	☐	☐
a. Construction entrance(s) installed as per the plan detail(s)?	☐	☐	☐
b. Construction entrance(s) properly maintained?	☐	☐	☐
c. Does all traffic use Construction Entrance to enter and exit site?	☐	☐	☐
d. Public roadways kept clean of tracked mud?	☐	☐	☐

Corrective Action / Comments (if applicable):_____

_____

	Y	N	N/A
5. Condition of Discharge Point(s)			
a. Is stormwater being discharged?	☐	☐	☐
• If so, list method of discharge: (overland, pipe, culvert, ditch) _____			
b. Is turbid water leaving site?	☐	☐	☐
c. Is turbid water entering a surface water?	☐	☐	☐
d. Evidence of sediment pollution from accelerated erosion entering surface water?	☐	☐	☐
e. Evidence of previous undocumented sediment pollution to surface water?	☐	☐	☐
f. Have receiving lake/bay, stream, and/or wetland been impacted by silt from the project?	☐	☐	☐

Corrective Action / Comments (if applicable):_____

_____

6. Condition of Downstream Natural Surface water body			
a. Is stormwater being discharged from site to water body?	☐	☐	☐
• If so, list method of discharge: (overland, pipe, culvert, ditch) _____			
b. Is turbid water entering water body?	☐	☐	☐
• From project site?	☐	☐	☐
• From other (non-project) location	☐	☐	☐
c. Evidence of previous undocumented sediment pollution discharge:	☐	☐	☐
• Describe: _____			
7. Clearing and Grubbing	☐	☐	☐
a. Perimeter BMP's installed concurrently with clearing operations?	☐	☐	☐
b. Are perimeter BMP's installed prior to general site clearing and grubbing?	☐	☐	☐
c. Are/were stabilized crossings (as specified in the plan) used at all stream/wetland crossings?	☐	☐	☐

Corrective Action / Comments (if applicable):_____

_____

8. Work within stream channel//wetlands being conducted as specified in the plans? ☐ ☐ ☐
    a. Base flow bypassing work area as per plans? ☐ ☐ ☐
    b. Disturbed areas returned to original contours and stabilized as per plan upon completion of work? ☐ ☐ ☐

Corrective Action / Comments (if applicable):_____

_____

9. Water pumped from work areas treated in the manner prescribed by the plan prior to discharge to surface water? ☐ ☐ ☐
    a. Filter bags installed, used and maintained properly? ☐ ☐ ☐
    b. Vegetated filter strips functioning properly and maintained properly? ☐ ☐ ☐
    c. Other devises installed, used and maintained properly? ☐ ☐ ☐

Corrective Action / Comments (if applicable):_____

_____

10. Silt fence installed where shown on plans? ☐ ☐ ☐
    a. Installed on existing level grade? ☐ ☐ ☐
    b. Joints constructed by wrapping two ends together for support? ☐ ☐ ☐
    c. Properly anchored? (min. 6" buried) ☐ ☐ ☐
    d. Stakes are stable and installed per specifications? ☐ ☐ ☐
    e. Fence properly maintained? ☐ ☐ ☐
        i. Sediment accumulation is _____% of design capacity
        ii. Sediment removed when accumulation is greater than 50% ☐ ☐ ☐
        iii. Undercut or overtopped fence has been replaced with stone check dam? ☐ ☐ ☐
        iv. Torn or weathered fence replaced? ☐ ☐ ☐

Corrective Action / Comments (if applicable):_____

_____

11. Topsoil and spoil stockpiles are stored on site? ☐ ☐ ☐
    a. Stockpiles are temporarily stabilized with vegetation and/or mulch? ☐ ☐ ☐
    b. Sediment control is installed at the toe of slope? ☐ ☐ ☐

Corrective Action / Comments (if applicable):_____

_____

	Y	N	N/A
12. Stabilized access provided to trap and/or basin locations as shown on plans?	☐	☐	☐
a. Any evidence of runoff problems due to the access roads?	☐	☐	☐

Corrective Action / Comments (if applicable):_____

_____

13. Sediment traps installed where shown on the plans?	☐	☐	☐
a. Embankment properly constructed?	☐	☐	☐
i. Does the embankment lack compaction?	☐	☐	☐
ii. Are side slopes overly steep?	☐	☐	☐
iii. Any low points?	☐	☐	☐
iv. Is embankment vegetated or blanketed? (if newly constructed)	☐	☐	☐
v. Any tension cracks evident along the top?	☐	☐	☐
vi. Any evidence of soil piping? (holes in embankment)	☐	☐	☐
b. Barrel/Riser spillway located where shown on plans?	☐	☐	☐
i. Any elevation problems?	☐	☐	☐
ii. Any perforation problems? (No., size, location of holes)	☐	☐	☐
iii. Trash rack& Antivortex device provided as shown on plans?	☐	☐	☐
iv. Riser has watertight connection to outlet barrel?	☐	☐	☐
v. Any leaking problems? (scouring, sound of running water)	☐	☐	☐
vi. Any piping problems?	☐	☐	☐
vii. Spillway properly maintained?	☐	☐	☐
1) Holes not plugged?	☐	☐	☐
2) Damage to riser repaired/replaced?	☐	☐	☐

Corrective Action / Comments (if applicable):_____

_____

c. Embankment spillways located as shown on plans?	☐	☐	☐
i. Stone is the correct size per the detail?	☐	☐	☐
ii. Stone lower in center than at sides?	☐	☐	☐
iii. Layer of stone on inside face of spillway?	☐	☐	☐
iv. Spillway properly maintained?	☐	☐	☐
1) Clogged spillway repaired/replaced?	☐	☐	☐
2) Damaged/displaced filter cloth replaced/restaked?	☐	☐	☐

	Y	N	N/A
d. Skimmers installed as shown on plans?	☐	☐	☐
i. Attachment to perm. riser/barrel appears to be watertight?	☐	☐	☐
ii. Skimmer has a stable landing place?	☐	☐	☐
iii. Any problems with flexible hose?	☐	☐	☐
e. Outlet protection installed as shown on plans?	☐	☐	☐
i. Stone is correct size per the plan?	☐	☐	☐
ii. Discharges are safely conveyed to receiving surface waters?	☐	☐	☐
iii. Outlet protection properly maintained?	☐	☐	☐
1) Any signs of rock displacement?	☐	☐	☐
2) Any sediment deposits on apron?	☐	☐	☐
3) Any erosion around or below apron	☐	☐	☐
f. Trap interior stabilized?	☐	☐	☐
g. Any evidence of slope failure inside the trap?	☐	☐	☐
h. Any evidence of sink holes developing inside the trap?	☐	☐	☐
i. Are baffles, silt curtains, forebays provided as shown on the plan drawings?	☐	☐	☐
j. Has suitable protection been provided at the inflows as shown on plans?	☐	☐	☐

Corrective Action / Comments (if applicable):_____

_____

14. Sediment basins installed where shown on the plans?	☐	☐	☐
a. Embankment properly constructed?	☐	☐	☐
i. Does the embankment lack compaction?	☐	☐	☐
ii. Are side slopes overly steep?	☐	☐	☐
iii. Any low points?	☐	☐	☐
iv. Is embankment vegetated or blanketed? (if newly constructed)	☐	☐	☐
v. Any tension cracks evident along the top?	☐	☐	☐
vi. Any evidence of piping? (holes in embankment)	☐	☐	☐
b. Barrel/Riser spillway located where shown on plans?	☐	☐	☐
i. Any elevation problems?	☐	☐	☐
ii. Any perforation problems? (No., size, location of holes)	☐	☐	☐
iii. Trash rack& Antivortex device provided as shown on plans?	☐	☐	☐
iv. Riser has watertight connection to outlet barrel?	☐	☐	☐
v. Any leaking problems? (scouring, sound of running water)	☐	☐	☐

	Y	N	N/A
vi. Any piping problems?	☐	☐	☐
vii. Riser properly maintained?	☐	☐	☐
1) Holes not plugged?	☐	☐	☐
2) Damage to riser repaired/replaced?	☐	☐	☐

Corrective Action / Comments (if applicable):_____

_____

c. Skimmers installed as shown on plans?	☐	☐	☐
i. Attachment to perm. riser/barrel appears to be watertight?	☐	☐	☐
ii. Skimmer has a stable landing place?	☐	☐	☐
iii. Any problems with flexible hose?	☐	☐	☐
d. Emergency spillway located as shown on plans?	☐	☐	☐
i. Any dimension problems? (width, depth, etc.)	☐	☐	☐
ii. Stone is the correct size per the detail?	☐	☐	☐
iii. Was the spillway choked with rock?	☐	☐	☐
iv. Has and outlet channel been provided for the emergency spillway as shown on the plans?	☐	☐	☐
v. Stone is correct size per the plan?	☐	☐	☐
vi. Discharges are safely conveyed to receiving surface waters?	☐	☐	☐
vii. Outlet protection properly maintained?	☐	☐	☐
1) Any signs of rock displacement?	☐	☐	☐
2) Any sediment deposits on apron?	☐	☐	☐
3) Any erosion around or below apron?	☐	☐	☐
f. Basin interior stabilized?	☐	☐	☐
g. Any evidence of slope failure inside the basin?	☐	☐	☐
h. Any evidence of sink holes developing inside the basin?	☐	☐	☐
i. Are baffles, silt curtains, forebays provided as shown on the plan drawings?	☐	☐	☐
j. Has suitable protection been provided at the inflows as shown on plans?	☐	☐	☐

Corrective Action / Comments (if applicable):_____

_____

	Y	N	N/A
15. Are all channels constructed at the locations shown on the plans?	☐	☐	☐
a. Any dimension or shape problems? (width, depth, etc.)?	☐	☐	☐
b. Has the protective linings been installed as specified?	☐	☐	☐
c. Are there any gradient problems?	☐	☐	☐
d. Are there any flow obstructions?	☐	☐	☐
e. Any erosion problems?	☐	☐	☐
f. Any out-of-channel problems? (erosion leading away downslope from the channel)	☐	☐	☐
g. Any failures to the channel linings?	☐	☐	☐
h. Do collector channels enter basins/traps on the upslope sides?	☐	☐	☐
i. Any disturbed areas above diversion channels?	☐	☐	☐
j. Any disturbed areas below the collector channels with no BMP's?	☐	☐	☐

Corrective Action / Comments (if applicable):_____

_____

16. Are slope pipes installed where shown on plans?	☐	☐	☐
a. Are they water tight?	☐	☐	☐
b. Are they anchored?	☐	☐	☐
c. Has runoff been directed to the head of the pipe?	☐	☐	☐
d. Has outlet protection been provided as per the plans?	☐	☐	☐

Corrective Action / Comments (if applicable):_____

_____

17. Are trenching operations being conducted at the locations and in a manner shown on the plans?	☐	☐	☐
a. Area limitations being followed?	☐	☐	☐
b. Are stream crossings being conducted in the proscribed manner?	☐	☐	☐
i. Base flow bypassed as specified?	☐	☐	☐
ii. Disturbed areas within 50' of top of bank blanketed?	☐	☐	☐
c. Has runoff been directed to the head of the pipe?	☐	☐	☐
d. Has outlet protection been provided as per the plans?	☐	☐	☐

Corrective Action / Comments (if applicable):_____

_____

	Y	N	N/A
18. Are the stone check dams been installed at the locations shown on the plans?	☐	☐	☐
a. Stone is the correct size per the detail?	☐	☐	☐
b. Any accumulated sediment need to be removed?	☐	☐	☐
c. Any erosion around or below check dam?	☐	☐	☐

Corrective Action / Comments (if applicable):_____

_____

19. Has inlet protection been installed at the locations shown on the plans?	☐	☐	☐
a. Is the type of inlet protection at the locations shown on the plans?	☐	☐	☐
b. Was it installed according to the details?	☐	☐	☐
c. Does any of the inlet protection need to be cleaned or repaired?	☐	☐	☐

Corrective Action / Comments (if applicable):_____

_____

20. Is stabilization being kept current with final grade?	☐	☐	☐
a. Cut and fill slopes stabilized in regular vertical increments?	☐	☐	☐
b. Erosion control blanketing installed where shown on the plans and according to the plans details?	☐	☐	☐
c. Erosion gullies addressed and stabilized in a timely manner?	☐	☐	☐
d. Poorly vegetated areas reseeded?	☐	☐	☐

Corrective Action / Comments (if applicable):_____

_____

21. Final stabilization achieved?	☐	☐
a. Vegetated areas meet "uniform 80%, perennial vegetation" requirement?	☐	☐
b. Non vegetated areas have a stable erosion-resistant surface?	☐	☐

Corrective Action / Comments (if applicable):_____

_____

22. Pictures taken to document findings of the inspection?	☐	☐

Corrective Action / Comments (if applicable):_____

_____

	Y	N
23. Inspection report completed on site?	☐	☐
a. Site plan marked up with construction activities and BMP's installed?	☐	☐
b. Site representative signed off on the report and contents were discussed with possible means to correct deficiencies, when needed?	☐	☐

Corrective Action / Comments (if applicable):_____

_____

Modifications to the SWPPP (To be completed as described below)

The Operator shall amend the SWPPP whenever:
1. There is a significant change in design, construction, operation, or maintenance which may have a significant effect on the potential for the discharge of pollutants to the waters of the United States and which has not otherwise been addressed in the SWPPP; or
2. The SWPPP proves to be ineffective in:
   a. Eliminating or significantly minimizing pollutants from sources identified in the SWPPP and as required by this permit; or
   b. Achieving the general objectives of controlling pollutants in stormwater discharges from permitted construction activity; and
1. Additionally, the SWPPP shall be amended to identify any new contractor or subcontractor that will implement any measure of the SWPPP.

Modification & Reason:

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

Appendix C

Erosion and Sediment Control Plan and Details

Aubertine and Currier Architects, Engineers and Land Surveyors, PLLC
522 Bradley Street, Watertown, New York 13601 TELE: (315) 782-2005 FAX: (315) 782-1472

Page left intentionally blank for duplex printing

Appendix D

Stormwater Calculations

Aubertine and Currier Architects, Engineers and Land Surveyors, PLLC
522 Bradley Street, Watertown, New York 13601 TELE: (315) 782-2005 FAX: (315) 782-1472

Page left intentionally blank for duplex printing

Version 1.1
Last Updated: 7/2/2013

Total Water Quality Volume Calculation
WQv(acre-feet) = [(P)(Rv)(A)] /12

Is this project subject to Chapter 10 of the NYS Design Manual (i.e. WQv is equal to post-development 1 year runoff volume)?.....	No

Design Point:	1	
P=	0.95	*inch*

Manually enter P, Total Area and Impervious Cover.

Breakdown of Subcatchments									
Catchment Number	Total Area *(Acres)*	Impervious Area *(Acres)*	Percent Impervious *%*	Rv	WQv *(ft^3)*	Description			
1	6.33	1.05	17%	0.20	4,347	Infiltration Basin			
2	2.53	0.47	19%	0.22	1,892	Infiltration Basin			
3									
4									
5									
6									
7									
8									
9									
10									
Subtotal (1-30)	8.86	1.52	17%	0.20	6,239	Subtotal 1			
Total	8.86	1.52	17%	0.20	6,239	Initial WQv	0.14	af	

Identify Runoff Reduction Techniques By Area			
Technique	Total Contributing Area *(Acre)*	Contributing Impervious Area *(Acre)*	Notes
Conservation of Natural Areas	0.00	0.00	*minimum 10,000 sf*
Riparian Buffers	0.00	0.00	*maximum contributing length 75 feet to 150 feet*
Filter Strips	0.00	0.00	
Tree Planting	6.33	1.05	*Up to 100 sf directly connected impervious area may be subtracted per*
Total	6.33	1.05	

Recalculate WQv after application of Area Reduction Techniques							
	Total Area *(Acres)*	Impervious Area *(Acres)*	Percent Impervious *%*	Runoff Coefficient Rv	WQv *(ft^3)*		
"<<Initial WQv"	8.86	1.52	17%	0.20	6,239		
Subtract Area	-6.33	-1.05					
WQv adjusted after Area Reductions	2.53	0.47	19%	0.22	1,892		
Disconnection of Rooftops		0.00					
Adjusted WQv after Area Reduction and Rooftop Disconnect	2.53	0.47	19%	0.22	1,892	0.04	af
WQv reduced by Area Reduction techniques					4,347	0.10	af

Minimum RRv

Enter the Soils Data for the site		
Soil Group	Acres	S
A	8.41	55%
B	0.00	40%
C	0.45	30%
D	0.00	20%
Total Area	8.86	
Calculate the Minimum RRv		
S =	0.54	
Impervious =	1.52	*acre*
Precipitation	0.95	*in*
Rv	0.95	
Minimum RRv	2,672	*ft3*
	0.06	af

Infiltration Basin Worksheet

Design Point:	1

Enter Site Data For Drainage Area to be Treated by Practice							
Catchment Number	Total Area *(Acres)*	Impervious Area *(Acres)*	Percent Impervious *%*	Rv	WQv *(ft^3)*	Precipitation *(in)*	Description
1	6.33	1.05	0.17	0.20	4347.18	0.95	Infiltration Basin
Enter Impervious Area Reduced by Disconnection of Rooftops		0.00	17%	0.20	4,347	<<WQv after adjusting for Disconnected Rooftops	
Enter the portion of the WQv that is not reduced for all practices routed to this practice.					0	*ft^3*	

Pretreatment Techniques to Prevent Clogging			
Infiltration Rate	50.00	*in/hour*	*Okay*
Pretreatment Sizing	100	*% WQv*	*25% minimum;* *50% if >2 in/hr* *100% if >5in/hour*
Pretreatment Required Volume	4,347	*ft^3*	
Pretreatment Provided	4,347	*ft^3*	
Pretreatment Techniques utilized	*Other*		

Size An Infiltration Basin			
Design Volume	4,347	*ft^3*	WQv
Basal Area Required	2,174	*ft^2*	*Infiltration practices shall be designed to exfiltrate the entire WQv through the floor of each practice.*
Basal Area Provided	7,241	*ft^2*	
Design Depth	2.00	*ft*	
Volume Provided	14,482	*ft^3*	*Storage Volume provided in infiltration basin area (not including pretreatment.*

Determine Runoff Reduction			
RRv	4,347	*ft^3*	*90% of the storage provided in the basin or WQv whichever is smaller*
Volume Treated	0	*ft^3*	*This is the portion of the WQv that is not reduced/infiltrated*
Sizing √	OK		*The infiltration basin must provide storage equal to or greater than the WQv of the contributing area.*

Infiltration Basin Worksheet

Design Point:	1

Enter Site Data For Drainage Area to be Treated by Practice							
Catchment Number	Total Area *(Acres)*	Impervious Area *(Acres)*	Percent Impervious *%*	Rv	WQv *(ft^3)*	Precipitation *(in)*	Description
2	2.53	0.47	0.19	0.22	1891.85	0.95	Infiltration Basin
Enter Impervious Area Reduced by Disconnection of Rooftops		0.00	19%	0.22	1,892	<<WQv after adjusting for Disconnected Rooftops	
Enter the portion of the WQv that is not reduced for all practices routed to this practice.					0	*ft^3*	

Pretreatment Techniques to Prevent Clogging			
Infiltration Rate	83.00	*in/hour*	*Okay*
Pretreatment Sizing	100	*% WQv*	*25% minimum;* *50% if >2 in/hr* *100% if >5in/hour*
Pretreatment Required Volume	1,892	*ft^3*	
Pretreatment Provided	1,892	*ft^3*	
Pretreatment Techniques utilized	*Other*		

Size An Infiltration Basin			
Design Volume	1,892	*ft^3*	WQv
Basal Area Required	631	*ft^2*	*Infiltration practices shall be designed to exfiltrate the entire WQv through the floor of each practice.*
Basal Area Provided	1,970	*ft^2*	
Design Depth	3.00	*ft*	
Volume Provided	5,910	*ft^3*	*Storage Volume provided in infiltration basin area (not including pretreatment.*

Determine Runoff Reduction			
RRv	1,892	*ft^3*	*90% of the storage provided in the basin or WQv whichever is smaller*
Volume Treated	0	*ft^3*	*This is the portion of the WQv that is not reduced/infiltrated*
Sizing √	OK		*The infiltration basin must provide storage equal to or greater than the WQv of the contributing area.*

Chapter 4: Unified Stormwater Sizing Criteria

Section 4.1 Introduction

This Chapter presents a unified approach for sizing runoff reduction techniques and standard SMPs to meet pollutant removal goals, reduce channel erosion, prevent overbank flooding, and help control extreme floods. For a summary, please consult **Table 4.1** below. The remaining sections describe the sizing criteria in detail and present guidance on how to properly compute and apply the required reduction and storage volumes. The Department has prepared worksheets to assist with these calculations that are available on our website: https://www.dec.ny.gov/index.html.

Table 4.1 New York Stormwater Sizing Criteria

Water Quality Volume (WQ_v)	90% Rule: WQ_v (acre-feet) = (P · Rv · A) / 12 Rv = 0.05+0.009(I) I = Impervious Cover (Percent) P(inches) = 90% Rainfall Event Number (See **Figure 4.1**) [2] A = Contributing Area (acres)
Runoff Reduction Volume (RRv)	RRv (acre-feet) = Reduction of the total WQ_v by application of runoff reduction techniques and standard SMPs with RRv capacity to replicate pre-development hydrology. The minimum required RRv is defined by the Specific Reduction Factor (S), provided objective technical justification is documented.
Channel Protection Volume (CPv)[1]	Default Criterion: CPv (acre-feet) = 24-hr extended detention of post-developed 1-year, 24-hr design storm; remaining after runoff reduction. Where site conditions allow, Runoff reduction of total CPv, is encouraged for Sites Larger than 50 Acres: Distributed Runoff Control - geomorphic assessment to determine the bank full channel characteristics and thresholds for channel stability and bedload movement.
Overbank Flood (Qp)[1]	Qp(cfs)=Control the peak discharge from the 10-year storm to 10-year pre-development rates.
Extreme Flood (Qf)[1]	Qf(cfs)=Control the peak discharge from the 100-year storm to 100-year pre-development rates. Safely pass the 100-year design storm.
Alternative method	Design, construct, and maintain systems sized to capture, reduce, reuse, treat, and manage rainfall on-site, and prevent the off-site discharge of the precipitation from all rainfall events less than or equal to the 95th percentile rainfall event, computed by an acceptable continuous simulation model.

[1]Channel protection, overbank flood, and extreme flood requirements may be waived in some instances if the conditions specified in this Chapter are met. For SMPs involving dams, follow **Appendix A**, Guidelines for Design of Dams for safe passage of the design flood.

[2]For required sizing criteria in redevelopment projects and phosphorus limited watersheds refer to **Chapter 9** and **Section 4.3**, respectively.

Section 4.2 Water Quality Volume (WQ_v)

The Water Quality Volume (WQ_v) is intended to improve water quality by capturing and treating runoff from small, frequent design storms that tend to contain higher pollutant levels. New York has defined the WQ_v as the volume of stormwater runoff, generated from the 90th percentile rain event (90% of all 24-hr design storms, in a given year), that shall be captured and treated by stormwater management practice(s). The WQ_v is directly related to the amount of impervious cover constructed at a site. Contour lines of the 90% rainfall event are presented in **Figure 4.1**. The minimum 90% rainfall value shall be 1.0 inch.

The following equation shall be used to determine the water quality storage volume WQ_v (in acre-feet of storage):

$$WQv = \frac{P \cdot R_v \cdot A}{12}$$

Where:

WQ_v = water quality volume (in acre-feet)

P = 90% Rainfall Event Number (see **Figure 4.1**)

R_v = 0.05 + 0.009(I), where I is percent impervious cover

A = contributing area (acres)

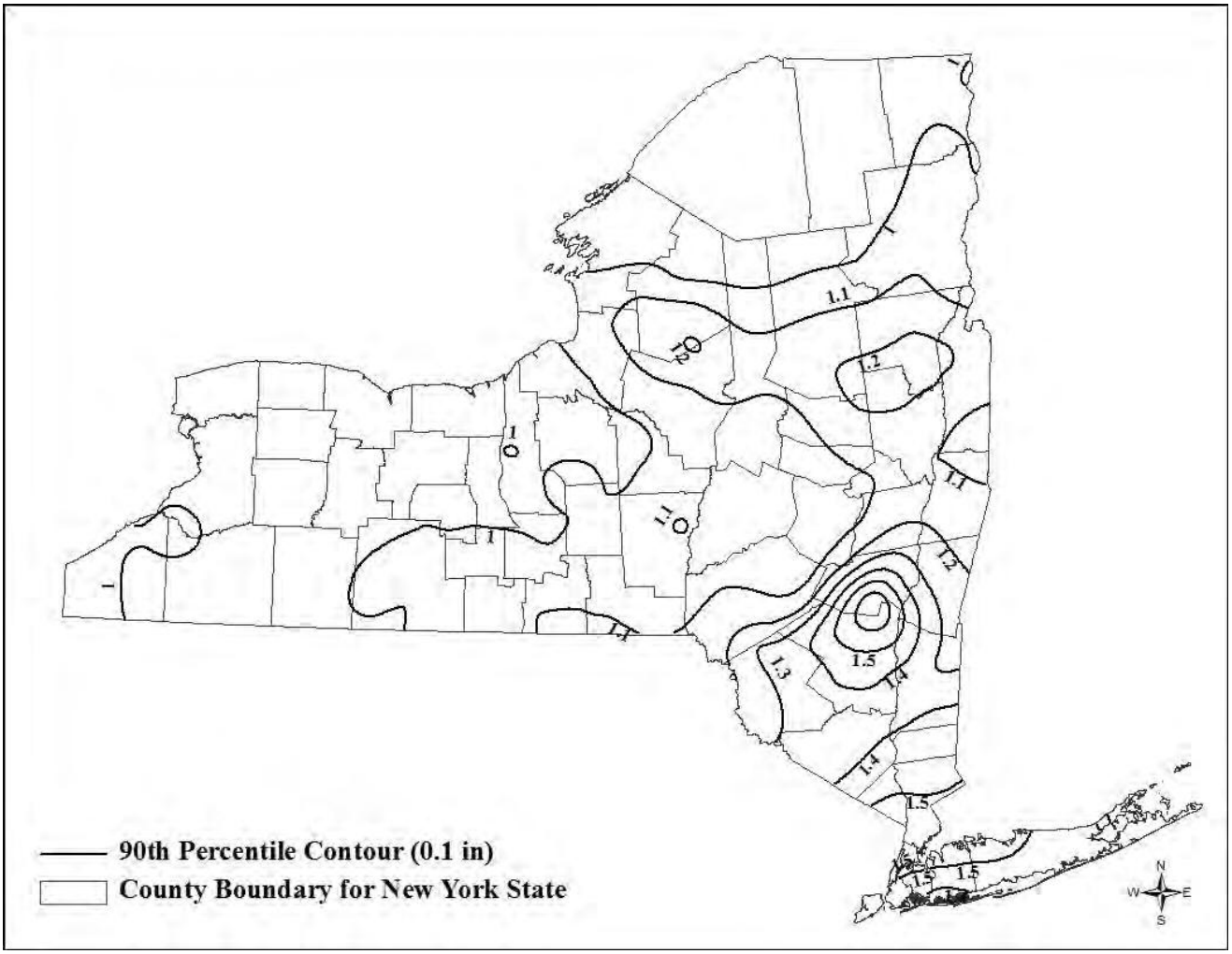


Figure 4.1 90th Percentile Rainfall in New York State (NYSDEC, 2013)

Basis of Design for Water Quality

As a basis for design, the following assumptions may be made:

Measuring Impervious Cover: the measured area of a site plan that does not have permanent vegetative or permeable cover shall be considered total impervious cover. Where site size makes direct measurement of impervious cover impractical, the land use/impervious cover relationships presented in **Table 4.2** can be used to initially estimate impervious cover. In site specific planning impervious cover must be calculated based the specific proposed impervious cover.

Table 4.2 Land Use and Impervious Cover
(Source: Cappiella and Brown, 2001)

Land Use Category	Mean Impervious Cover (%)
Agriculture	2
Open Urban Land*	9
2 Acre Lot Residential	11
1 Acre Lot Residential	14
1/2 Acre Lot Residential	21
1/4Acre Lot Residential	28
1/8 Acre Lot Residential	33
Townhome Residential	41
Multifamily Residential	44
Institutional**	28-41
Light Industrial	48-59
Commercial	68-76

* Open urban land includes developed park land, recreation areas, golf courses, & cemeteries.

** Institutional is defined as places of worship, schools, hospitals, government offices, & police and fire stations.

- *Aquatic Resources:* More stringent local regulations may be in place or may be required to protect drinking water reservoirs, lakes, or other sensitive aquatic resources. Consult the local authority to determine the full requirements for these resources.
- *SMP Treatment:* The final WQ_v, remaining after application of runoff reduction sizing criterion, shall be treated by an acceptable practice from the list presented in this manual. Please consult **Chapter 3** for a list of acceptable practices.
- *Determining Peak Discharge for WQ_v Storm:* When designing flow splitters for off-line practices, consult the small storm hydrology method provided in **Chapter 9.**
- *Extended Detention for Water Quality Volume:* The water quality requirement for storage systems can be met by providing 24-hrs of the WQ_v (provided a micropool is specified) extended detention. A local jurisdiction may reduce this requirement to as little as 12-hrs in trout waters to prevent stream warming.
- *Off-site Areas:* Where off-site areas will drain to the SMP, calculate imperviousness of the off-site contributing drainage area based on its current condition. If water quality treatment is provided off-line, the practice must only treat on-site runoff.

Section 4.3 Water Quality Volume (WQ_v) for Enhanced Phosphorus Removal Watersheds

For watersheds requiring enhanced phosphorus removal, the WQ_v shall be sized to capture and treat the 1-yr 24-hr design storm. Refer to **Chapter 10** for additional information regarding pollutants of concern. The following equation shall be used to determine the water quality storage volume WQ_v (in acre-feet of storage):

$$WQv = \frac{P_1 \cdot R_v \cdot A}{12}$$

Where:

WQ_v = water quality volume (in acre-feet)

P_1 = 1-yr 24-hr design storm (inches)

R_v = 0.05 + 0.009(I), where I is percent impervious cover

A = Contributing area (acres)

Section 4.4 Runoff Reduction Volume (RRv)

Runoff reduction shall be achieved by infiltration, groundwater recharge, reuse, recycle, evaporation/evapotranspiration of 100 percent of the post-development water quality volume. The goal of runoff reduction is to replicate pre-development hydrology by maintaining pre-construction infiltration, peak runoff flow, and discharge volume, as well as minimizing concentrated flow, by application of practices that provide source control treatment in a distributed manner before runoff reaches the collection system. This requirement shall be accomplished by application of on-site runoff reduction techniques and/or standard SMPs with runoff reduction capacity.

Runoff reduction volume (RRv) shall be calculated using one of the following methods:

- Area reduction (contributing area or contributing impervious area) in WQ_v computation (as defined in **Chapter 5**)
- Volume reduction using runoff reduction techniques (as defined in **Chapter 3, Table 3.6**)
- Volume reduction using standard SMPs with runoff reduction capacity (as defined in **Chapter 3, Table 3.7**)

For practices with underdrains that require sizing the surface area of the filter bed using Darcy's Law, the designer can elect to oversize the surface area of the filter bed to provide additional storage volume and receive additional RRv credit up to 100% of the WQv required. The total RRv credit shall be the percentage, as noted in **Tables 3.6 and 3.7**, applied to the storage volume provided. The storage volume provided shall be considered the volume within the filter media and the volume of ponding occurring during the WQv event.

Volume reduction practices can be designed in series to meet the RRv requirement if the following criteria are met.

- The first practice in series is sized to capture and treat a portion of the tributary required WQv.
- The first practice shall be designed with an appropriate overflow to convey runoff above the partial WQv to the next practice in series.
- The second practice in series must be designed to capture and treat the untreated WQv from the first practice, as well as any additional required WQv from other tributary subcatchments.
- If the above criteria are met, credit can be taken for the portion of the required WQv that is treated by the first practice. In addition, credit can be taken for RRv, within the first practice, based on the practice's RRv capacity and applied to the portion of WQv provided. For the second practice in series, both RRv and WQv credit can be taken based on the full tributary WQv and practice RRv capacity.

Projects that cannot meet 100% of the runoff reduction requirement, due to site limitations that prevent the use of an infiltration practice and/or infiltration of the total WQ_v, shall identify the specific site limitations in the SWPPP. Typical site limitations include: seasonal high water table, shallow depth to bedrock, and soils with an infiltration rate less than 0.5 in/hr.

In no case shall the runoff reduction achieved from the newly constructed impervious areas be less than the minimum runoff reduction volume (RRv_{min}) determined by the following equation:

$$RRv_{min} = \frac{P \cdot R_v \cdot Aic \cdot S}{12}$$

Where:

P = 90% Rainfall Event Number (see **Figure 4.1**)

RRv_{min} = Minimum runoff reduction volume required from impervious area (acre-ft)

R_v = 0.05+0.009(I) where I is 100% impervious

Aic = Total area of new impervious cover

S = Hydrologic Soil Group (HSG) Specific Reduction Factor (*S*)

The specific reduction factor (S) is based on the HSGs present at a site. The following lists the specific reduction factors for the HSGs:

- HSG A = 0.55
- HSG B = 0.40
- HSG C = 0.30
- HSG D = 0.20

Runoff reduction techniques are intended to be applied for source control treatment. As such, multiple runoff reduction techniques may be utilized on a site to maximize storage volume and achieve greater reduction. However, reduction cannot be claimed twice for an identical area of the site (e.g., claiming the stream buffers and disconnecting rooftops over the same site area).

Section 4.5 Runoff Reduction Volume (RRv) for Enhanced Phosphorus Removal Watersheds

For watersheds requiring enhanced phosphorus removal, runoff reduction shall apply the WQv resulting from the 1-yr 24-hr design storm, as calculated in **Section 4.3**. Similarly, the minimum RRv is calculated using the 1-yr 24-hr design storm and Specified Reduction Factors outlined in **Section 4.4**.

Section 4.6 Stream Channel Protection Volume Requirements (CPv)

Stream Channel Protection Volume Requirements (CPv) are designed to protect stream channels from erosion. This goal is accomplished by providing 24-hr extended detention of the 1-year, 24-hr design storm, that remains after runoff reduction.

Meeting stream channel protection objectives through runoff reduction is encouraged and the volume reduction achieved through runoff reduction techniques and/or standard SMPs with RRv capacity can be deducted from CPv. Trout waters may be exempt from the 24-hr extended detention requirement, requiring only 12 hrs of extended detention, when there is a direct discharge to the trout water. Detention time shall be calculated using either the center of mass method or plug flow calculation method.

For developments greater than 50 acres, with impervious cover greater than 25%, it is recommended that a detailed geomorphic assessment be performed to determine the appropriate level of control. **Appendix I** provides guidance on how to conduct this assessment.

Detention ponds or underground detention systems and vaults are methods to meet the CPv requirement (and subsequent Qp and Qf criteria). Note that, although these practices meet water quantity goals, they are unacceptable for water quality because of poor pollutant removal and need to be coupled with a practice listed in **Table 3.2** and **Table 3.3**. The CPv requirement may also be provided above the water quality (WQ_v) storage in a wet pond or stormwater wetland.

Basis for Determining Channel Protection Storage Volume

The following represent the minimum basis for design:

- TR-55 and TR-20 (or approved equivalent) shall be used to determine peak discharge rates.

- Rainfall data and distribution curves shall be established for the 1-year 24-hr design storm, using the process outlined in **Section 4.9.**
- When the pre-development land use is agriculture, the curve number for the pre-developed condition shall be taken as “meadow”.
- Off-site areas shall be modeled as "present condition".
- The length of sheet flow used in T_c calculations is limited to no more than 150 ft for pre-development conditions and no more than 100 ft for post-development conditions. On areas of extremely flat terrain (<1% average slope), this maximum distance is extended to 250 ft for pre-development conditions and 150 ft for post-development conditions. If the start of a T_c flow path is unchanged (undisturbed) from pre- to post-development conditions, then the sheet flow length shall be identical.
- The CPv storage volume shall be computed using one of the following methods:
  - Center-of-mass detention time: time difference between the center of mass of the inflow hydrograph (entering the SMP) and the center of mass of the outflow hydrograph (leaving the SMP).
  - Plug flow detention time: theoretical average detention time.
- When CPv is required, the storage volume must be provided. Where a CPv control orifice is provided, the minimum orifice size shall be 3 inches, with acceptable external trash rack or orifice protection (See **Appendix C** for details of a low flow orifice and trash rack options).
- CPv shall be addressed for the entire site. If a site consists of multiple design points, CPv shall be determined and provided for each design point.
- Extended detention storage provided for the CPv does not meet the WQv requirement (that is CPv and WQv shall be treated separately). However, both water quality and channel protection storage may be provided in the same SMP.

The Channel Protection Requirements may be waived if:

- Reduction of the entire CPv is achieved at a site through runoff reduction or infiltration systems.
- CPv is not required at sites where the 1-year post-development peak discharge is less than or equal to 2.0 cfs without detention or velocity controls.
- The site directly discharges into a fifth order or larger water body (streams, rivers, or lakes) or tidal waters, where the increase in smaller flows will not impact the stream bank or channel integrity. However, the point of discharge must be adequately protected against scour and erosion by the increased peak discharge.

Streams are classified using the New York State Codes Rules and Regulations (NYCRR), Volumes B-F, Parts 800-941. However, this classification system does not provide a numeric stream order. The methodology identified in this Manual is consistence with Strahler-Horton methodology. For an example of stream order identification see **Section 4.12**.

Section 4.7 Overbank Flood Control Criteria (Qp)

The primary purpose of the overbank flood control sizing criterion is to prevent an increase in the frequency and magnitude of out-of-bank flooding generated by urban development (i.e., flow events that exceed the bank full capacity of the channel, and therefore must spill over into the floodplain).

Basis for Design of Overbank Flood Control

When addressing the overbank flooding design criteria, the following represent the minimum basis for design:

- TR-55 and TR-20 (or approved equivalent) will be used to determine peak discharge rates.
- Rainfall data and distribution curves shall be established for the 10-year 24-hr design storm, using the process outlined in **Section 4.9.**

- When the pre-development land use is agriculture, the curve number for the pre-developed condition shall be taken as “meadow”.
- Off-site areas shall be modeled as "present condition" for the 10-year design storm.
- The length of sheet flow used in T_c calculations is limited to no more than 150 ft for pre-development conditions and no more than 100 ft for post-development conditions. On areas of extremely flat terrain (<1% average slope), this maximum distance is extended to 250 ft for pre-development conditions and 150 ft for post-development conditions. If the start of T_c flow path is unchanged (undisturbed) from pre- to post-development conditions, then the sheet flow length shall be identical.
- Overbank Flood Control shall be addressed for the entire site. If a site consists of multiple design points, Overbank Flood Control shall be determined and provided for each design point.

Overbank Flood Control requires storage to attenuate the post-development 10-year, 24-hr peak discharge rate (Qp) to pre-development rates.

The Overbank Flood Control requirement may be waived if:

- The site directly discharges into a fifth order or larger water body (streams, rivers, or lakes) or tidal waters, where the increase in smaller flows will not impact the stream bank or channel integrity. However, the point of discharge must be adequately protected against scour and erosion by the increased peak discharge. Refer to **Section 4.12** for instructions.
- A downstream analysis reveals that overbank control is not needed (see **Section 4.13**).

Section 4.8 Extreme Flood Control Criteria (Qf)

The intent of the extreme flood criteria is to (a) prevent the increased risk of flood damage from large design storms, (b) maintain the boundaries of the pre-development 100-year floodplain, and (c) protect the physical integrity of stormwater management practices.

Basis of Design for Extreme Flood Control Criteria

When addressing the extreme flood design criteria, the following represent the minimum basis for design:

- TR-55 and TR-20 (or approved equivalent) will be used to determine peak discharge rates.
- Rainfall data and distribution curves shall be established for the 100-year 24-hr design storm, using the process outlined in **Section 4.9.**
- When the pre-development land use is agriculture, the curve number for the pre-developed condition shall be taken as “meadow”.
- Off-site areas shall be modeled as "present condition" for the 100-year design storm.
- The length of sheet flow used in T_c calculations is limited to no more than 150 ft for pre-development conditions and no more than 100 ft for post-development conditions. On areas of extremely flat terrain (<1% average slope), this maximum distance is extended to 250 ft for pre-development conditions and 150 ft for post-development conditions. If the start of T_c flow path is unchanged (undisturbed) from pre- to post-development conditions, then the sheet flow length shall be identical.
- Extreme Flood Control shall be addressed for the entire site. If a site consists of multiple design points, Extreme Flood Control shall be determined and provided for each design point.

Extreme Flood Control requires storage to attenuate the post-development 100-year, 24-hr peak discharge rate (Qf) to pre-development rates.

The Extreme Flood Control requirement may be waived if:

- The site directly discharges into a fifth order or larger water body (streams, rivers, or lakes) or tidal waters, where the increase in smaller flows will not impact the stream bank or channel integrity. However, the point of discharge

must be adequately protected against scour and erosion by the increased peak discharge. Refer to **Section 4.12** for instructions.

- A downstream analysis reveals that 100-year control is not needed (see **Section 4.13**)

Section 4.9 Rainfall Data, Distribution Curves and Hydrologic Modeling

Rainfall distribution curves are developed from rainfall data and describe how a storm's total rainfall amount will be distributed over a specific length of time, such as 24 hours. It is based on historic rainfall values, over a wide range of time intervals, for various frequency storms. Properly calculated rainfall distribution curves are critical when evaluating the hydrologic character of a drainage area and when sizing hydraulic structures. Pre- and post-development models should use the same precipitation data source.

Rainfall data for the Stream Channel Protection Volume, Overbank Flood Control and Extreme Flood Control design storms shall be taken from:

- NRCC and NRCS joint collaborative website (http://precip.eas.cornell.edu); or
- National Oceanic and Atmospheric Administration (NOAA) Precipitation Frequency Data Server (PFDS) (https://hdsc.nws.noaa.gov/hdsc/pfds/).

Hydraulic and hydrologic modeling software, such as USDA NRCS TR20, HydroCAD, Pond Pack, StormCAD, Hydraflow, and Hydrologic Engineering Center Hydrologic Modeling System (HEC-HMS) and others, shall be used to extract rainfall frequency and duration data, for the project location, to create intensity-duration-frequency (IDF) curves, and then convert into rainfall distribution curves.

The following provides the step-by-step process to generate rainfall distribution curves using the NRCC and NRCS website and HydroCAD. This process is similar for both rainfall data sources listed above.

1. Go to the NRCC and NRCS website and select the tab "Data and Products.
2. Use the location map to zoom into the project site. If the marker is not located on the project site, double click on the map to relocate the marker.
3. From the Products list, select "Extreme Precipitation Tables – Text/CSV". At the bottom of the page, set smoothing to "No", then click "Submit".
4. Select "Save As", navigate to the project folder. Rename the file starting with NY- (example: NY-Cicero.txt) and save the file into you project folder. The NY- in the project name is required in order for HydroCAD to place the IDF file in the correct location.
5. Once the file is in the project folder, rename the file to change the ".txt" extension to a ".hci" extension (example: NY-Cicero.hci). This ".hci" extension is required in order for HydroCAD to recognize this as an IDF file.
6. Open or create a model using HydroCAD in the project folder where the IDF file, created above, is located.
7. From the "Settings" drop down select "Calculations", pick the "Rainfall" tab. Click on the "Import Events From…" and select "IDF file". The ".hci" file, saved previously, should be listed in the "Rainfall IDF File:" drop down under the "NY-" tab.
8. Click "View IDF".
9. Click "More IDF data".
10. Select "Convert" tab and under "Rainfall IDF File" select the correct IDF file.
11. Click "Create Mass Curves". Click "OK" to close out of all menus. If prompted click "yes" to overwrite all storm events.
12. From the "Settings" drop down select "Calculations", pick the "Rainfall" tab. In the "Storm Type" drop down navigate to the "NY-" tab and select the newly created mass curve file.
13. If prompted click "yes" to overwrite all storm events. Rainfall data, using the newly created mass curve file, should auto populate into the rainfall data settings.

Section 4.10 Alternative Method

New development causes changes to runoff volume, flow rates, timing of runoff and, most importantly, habitat destruction and degradation of the physical and chemical quality of the receiving waterbody. Traditionally, TR-55 and TR-20 (or approved equivalent) are used for evaluation of hydrology and sizing of stormwater management practices. With an increasing need for assessment of the long-term effects of development and maintenance of pre-development hydrology, continuous simulation modeling is an effective alternative method for analysis and evaluation of flow-duration, downstream quality, quantity, biological, and hydro-habitat sustainability.

Continuous simulation models utilize historical precipitation records for estimating runoff volumes, duration, and pollutant loading. This method allows for examination of a watershed parameters' response to long term effects of design storms, instead of the response to a site level single theoretical design storm provided by single event-based models. Calculation of WQ_v using continuous simulation modeling accounts for infiltration, evapotranspiration, depression storage, and system storage, which allows a detailed and objective comparison of alternative treatments to determine if watershed characteristics are maintained by those treatments. Consequently, continuous simulation modeling allows for simulation of runoff reduction techniques and performance of flow duration analyses. An objective application of a continuous simulation model involves a calibrated model for a watershed on interest and incorporation of regional goals.

The following lists the guidelines for the design of stormwater management systems using a continuous simulation model:

- Design, construct, and maintain systems sized to capture, reduce, reuse, treat, and manage rainfall on-site, and prevent the off-site discharge of the precipitation from all rainfall events less than or equal to the 95th percentile rainfall event.
- The 95th percentile rainfall event is the event whose precipitation total is greater than or equal to 95 percent of all design storms over a given period of record.
- A minimum period of 20 years precipitation records is required to determine the 95^{th} percentile storm and derive the corresponding design storm.
- Select a practice(s) that provides infiltration, evapotranspiration, reuse, or recycle of this volume.
- 100% of the volume of water from storms less than or equal to the 95th percentile event shall not be discharged to surface water.
- Perform an analysis that shows post-construction flow-duration, shape of the hydrograph, and downstream quality and quantity does not exceed pre-construction hydrology.
- Site evaluation and soils analysis must conform to the standards provided in this Manual.
- The stormwater management practices employed must conform to the standards provided in this Manual.

Some examples of continuous simulation modeling tools include:

Stormwater Management Model (SWMM)

is an EPA supported urban runoff hydrology, hydraulics, and runoff quality model with detailed design tools capable of flow routing and storage for surface, sub-surface, stormwater and combined sewer overflow conveyance and groundwater systems, as well as determining the treatment capacity of stormwater management practices. Various applications of SWMM have utilized the detailed features of this model for simulating runoff reduction design features.

Source Loading and Management Model for Windows (WinSLAMM)

is a mid-range empirical model for evaluation of stormwater runoff loading in urban watersheds. This modeling tool uses small storm hydrology methods and calculates the runoff from historical precipitation data for a given period of time, pollutant loading from various land uses, and allows the user to simulate the stormwater load reduction effected by incorporating control devices. The stormwater management practices provided in WinSLAMM include several SMPs, runoff reduction design details and maintenance BMPs.

Hydrologic Simulation Program Fortran (HSPF)

is an EPA supported program for simulation of watershed hydrology and water quality. The HSPF model uses information such as the time history of rainfall, temperature, soil, land surface such as land cover and land-use patterns; and land

management practices to simulate the processes that occur in a watershed. The result of this simulation is a time history of the quantity and quality of runoff from an urban or agricultural watershed. The model also predicts flow rate, sediment load, and nutrient concentrations.

A successful example of the use of HSPF for stormwater applications is the Western Washington Hydrologic Model (WWHM). Similar adaptation of the models for applications in New York State will require several verifications such as validation of input variables, accurate precipitation data, and calibration of the model.

Section 4.11 Conveyance Criteria

In addition to the stormwater treatment volumes described above, this manual also provides guidance on safe and non-erosive conveyance to, from, and through SMPs. Typically, the targeted storm frequencies for safe conveyance to SMPs are the 2-year and 10-year design storms. The 2-year design storm is used to ensure non-erosive flows through roadside swales, overflow channels, over berms within practices. Rainfall depths for the 2-year, 24-hr design storm throughout New York State shall be taken from the NRCC and NRCS joint collaborative website or NOAA - Atlas 14, as outlined in **Section 4.9**.

The 10-year design storm is typically used as a target sizing for outfalls, and as a safe conveyance criterion for open channel practices and overflow channels. The 10-year design storm is recommended as a minimum sizing criterion for closed conveyance systems. Note that some agencies or municipalities may use a different design storm for this purpose.

Section 4.12 Stream Order Identification

This section provides an example to help identify stream order based on Strahler-Horton Method. A network of streams drain each watershed. Streams can be classified according to their order in that network. A stream that has no tributaries or branches is defined as a first-order stream. When two first-order streams combine, a second-order stream is created, and so on. **Figure 4.2** illustrates the stream order concept (Schueler, T. 1995).

Evaluation of stream order must be performed using the Watershed Assessment, Tracking and Environmental Results System (WATERS) GeoViewer to determine if quantity controls do not apply. WATERS was developed by the USEPA and utilizes data from the National Hydrography Dataset Plus (NHDPlus). NHDPlus is an integrated suite of geospatial datasets that incorporate features of the National Hydrography Dataset (NHD) and the National Elevation Dataset (NED) at 1:100K scale. This application-ready data set is an outcome of a multi-agency effort aimed at developing many useful variables for water quality and quantity evaluation including stream order. Use the link below to access the WATERS GeoViewer.

Link: https://epa.maps.arcgis.com/apps/webappviewer/index.html?id=ada349b90c26496ea52aab66a092593b

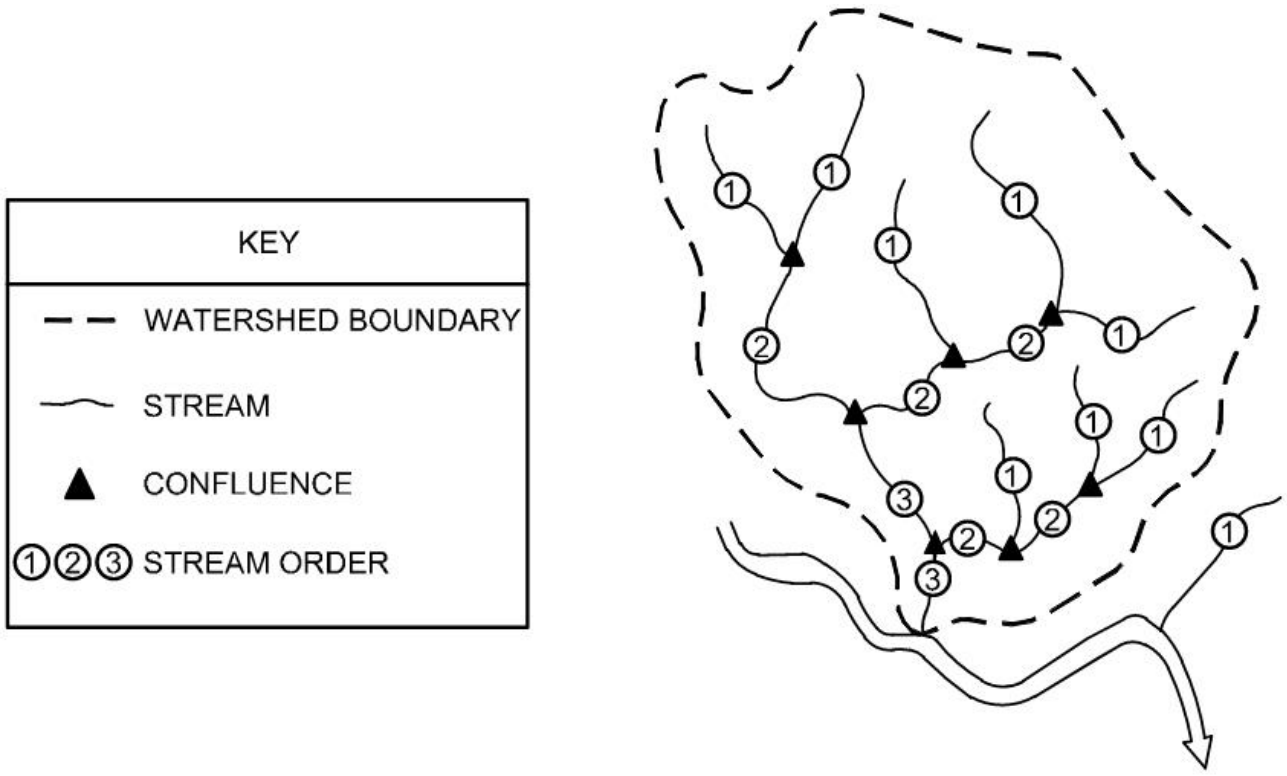


Figure 4.2 A Network of Headwater and Third-order Streams (Source: Schueler, 1995)

Section 4.13 Downstream Analysis

Overbank, and extreme flood requirements may be waived based on the results of a downstream analysis. However, all local overbank and extreme flood requirements must be met regardless of the analysis. In addition, such an analysis for overbank and extreme flood control is recommended for larger sites (i.e., greater than 50 acres) to size facilities in the context of a larger watershed. The analysis will help ensure that storage provided at a site is appropriate when combined with upstream and downstream flows. For example, detention at a site may in some instances exacerbate flooding problems within a watershed. This section provides brief guidance for conducting this analysis, including the specific points along the downstream channel to be evaluated and minimum elements to be included in the analysis.

Downstream analysis can be conducted using the 10% rule, meaning the analysis should extend from the point of discharge downstream to the point on the stream where the site represents 10% of the total drainage area. For example, the analysis points for a 10-acre area would include points on the stream from the points of discharge to the nearest downstream point with a drainage area of 100 acres. The required elements of the downstream analysis are as follows:

- Compute pre-development and post-development peak flows and velocities for design storms (e.g., 10-year and 100-year), at all downstream confluences with first order or higher streams up to and including the point where the 10% rule is met. These analyses shall include scenarios both with and without stormwater treatment practices in place, where applicable.
- Evaluate hydrologic and hydraulic effects of all culverts and/or obstructions within the downstream channel.
- Assess water surface elevations to determine if an increase in water surface elevations will impact existing buildings and other structures.

Alternatively, if a regional H&H model is implemented and approved by a municipality or regional entity, this model can be used to complete the downstream analysis.

The design, or exemption, at a site level can be approved if both of the following criteria are met:

- Peak flow rates increase by less than 5% of the pre-developed condition for the design storm (e.g., 10-year or 100-year)
- No downstream structures or buildings are impacted.

Section 4.14 Stormwater Hotspots

Stormwater Hotspots are defined as areas where land use or activities generate highly contaminated runoff, with concentrations of pollutants in excess of those typically found in stormwater. These areas can include commercial, industrial, institutional, municipal, or transportation activities that, in addition to generating higher concentrations of pollutants, can present a higher risk for spills, leaks or illicit discharges. If a site is designated as a hotspot, a range of stormwater treatment and pollution prevention measures shall be applied to protect surface waters and groundwater.

When a development or redevelopment project includes an activity that is designated as a stormwater hotspot, consideration shall be taken to isolate the hotspot from the remaining watershed. To achieve isolation of a stormwater hotspot, the following criteria shall be met:

- Upgradient flow shall be diverted around the hotspot area and shall be conveyed to a separate stormwater practice (if treatment is required).
- The hotspot area shall be captured at the source and conveyed to a suitable stormwater practice.
- All tributary area that is conveyed to the stormwater practice treating the hotspot area, shall be subject to the same treatment requirements as the hotspot.

Table 4.3 provides a list of designated stormwater hotspots for the State of New York. The table looks at the illicit discharge potential of each of the activities listed. The potential for an activity to produce an illicit discharge is rated as either high, medium or low. This rating is based on the likelihood that is has a direct connection to a storm drain system (closed system) or that it can produce a transitory discharge (overland flow). These activities are further categorized as:

- Level 1: Hotspots with anticipated moderate pollutant concentration. Application of infiltration practices shall be restricted to provide two treatment practices in series (i.e. non-infiltration standard SMP, followed by an infiltration practice), both of which are sized to treat the entire WQv. Credit for RRv and WQv treated cannot be taken for the first practice in series.
- Level 2: Hotspots with anticipated severe pollutant concentrations. Application of infiltration practices is prohibited, and non-infiltration practices shall be applied to meet the RRv criteria.

It shall be noted that large highways (average daily traffic (ADT) volume greater than 25,000) are not designated as stormwater hotspots. However, based on the potential for contaminants within stormwater runoff as ADT increases, it is important to ensure that highway stormwater management plans adequately protect groundwater.

Not all practices are suitable for treatment of stormwater hotspots. In addition, the design of some practices may need modification to accommodate higher concentrations of pollutants. Refer to **Chapters 5** and **6** for practice suitability and design modifications to treat stormwater hotspots.

Table 4.3 Designated Stormwater Hotspots

Activities		Illicit Discharge Potential		Level 1 (Infiltration Restricted)	Level 2 (Infiltration Prohibited)
		Closed System	Overland Flow		
Industrial activities that are eligible for coverage under the Multi-Sector General Permit for Stormwater Discharges Associated with Industrial Activities (MSGP) [1]	Industrial activities subject to effluent limitation guidelines	Medium	High		✓
	Industrial activities within Sectors C, J, L or U that are located within watersheds requiring enhanced phosphorus removal	Medium	High		✓
	All other industrial activities	Medium	Medium	✓	
Fueling stations		Medium	High		✓
Petroleum storage facilities		High	High		✓
Uncovered vehicle, aircraft, boat, and heavy equipment maintenance facilities		Low	Medium	✓	
Uncovered vehicle, aircraft, boat, and heavy equipment cleaning facilities		Low	Low	✓	
Uncovered vehicle, aircraft, boat, and heavy equipment storage areas		Low	Medium	✓	
Uncovered loading/unloading facilities and recessed loading areas		Low	Medium	✓	
Public works yard with salt storage		Medium	High		✓
Public works yard without salt storage		Medium	Medium	✓	
Facilities that generate or store hazardous materials		Low	High		✓
Wastewater treatment/disposal, solid waste, and composting facilities		Low	High		✓
Nurseries/garden centers		Low	Medium	✓	

[1]At a minimum, infiltration shall be restricted for all industrial activities within the MSGP. However, certain activities with greater pollutant thresholds may prohibit the use of infiltration

Chapter 6: Standard Stormwater Management Practices

This Chapter outlines performance criteria for five groups of standard stormwater management practices (SMPs) to meet water quality treatment goals. These include ponds, wetlands, infiltration practices, filtering practices and open channel systems. Each group of SMPs have six performance criteria:

1. *Feasibility:* Identify site considerations that may restrict use of a practice.
2. *Conveyance:* Convey runoff to and from the practice in a manner that is safe, minimizes erosion, maximizes pretreatment, mimics existing hydrology to the greatest extent practical, and prevents disruption to natural channels. Convey runoff through the practice in a manner that promotes maximum treatment, and detention/infiltration.
3. *Pretreatment:* Trap coarse sediments and debris before they enter the practice, to reduce the maintenance burden and ensure long-term performance of the practice.
4. *Treatment:* Provide water quality treatment through design elements that maximize pollutant removal.
5. *Landscaping:* Reduce secondary environmental impacts through landscaping design that minimizes disturbance of natural stream systems, complies with environmental regulations, and enhances the pollutant removal and aesthetic value of the practice. For planting guidance for stormwater management facilities, refer to **Chapter 11**.
6. *Maintenance:* Preserve the long-term performance of a practice through regular inspection and maintenance activities, as well as design elements that ease the maintenance burden. Refer to **Chapter 12** for guidance on inspection and maintenance activities.

IMPORTANT NOTES:

1. THIS CHAPTER PRESENTS REQUIRED PERFORMANCE CRITERIA BY USE OF DEFINITIVE LANGUAGE LIKE “SHALL” OR “MUST,” WHICH MEANS THAT THOSE CRITERIA SHALL BE USED IN ALL APPLICATIONS.
2. FACT SHEETS FOR EACH DESIGN VARIANT WITHIN THE FIVE SMP GROUPS ARE PRESENTED AT THE END OF EACH SECTION AND SUMMARIZE THE KEY PERFORMANCE CRITERIA FOR EACH PRACTICE. THESE FACT SHEETS ARE FOR REFERENCE AND MAY NOT BE INCLUSIVE OF ALL REQUIREMENTS.
3. ANY PRACTICE THAT CREATES A DAM IS REQUIRED TO FOLLOW THE GUIDANCE PRESENTED IN THE *GUIDELINES FOR DESIGN OF DAMS* (**APPENDIX A**) AND MAY REQUIRE A PERMIT FROM THE NYSDEC. FOR THE MOST RECENT COPY OF THIS DOCUMENT, CONTACT THE NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION, DAM SAFETY SECTION. AN EVALUATION OF HAZARD CLASSIFICATION MUST BE INCLUDED IN THE DESIGN REPORT FOR STORMWATER PONDS OR WETLANDS CREATED BY A DAM.

The following table allows designers to evaluate each standard SMP and determine which practice(s) are feasible for application to a specific site. Feasibility is based on thresholds that shall be met for four key site conditions:

1. *Soil Permeability*: This column outlines the permeability requirements for underlying soils at the location of a proposed SMP. The designer should perform an initial investigation of the NRCS hydrologic soil groups at the site to determine soil characteristics. Please note that more detailed geotechnical tests are usually required, in accordance with **Appendix D**.
2. *Depth to Seasonal High Water Table*: This column indicates the minimum depth to the seasonally high water table from the bottom elevation of the SMP section.
3. *Contributing Area*: This column indicates the minimum or maximum contributing area that is considered optimal for a practice. The minimum contributing area shall not be reduced, and the maximum shall not be increased, except where specific design criteria are met or additional engineering analysis is performed to support an adjusted area.
4. *Max Site Slope*: This column indicates the preferred maximum slope of the area proposed for installation of a practice. Existing slopes may exceed these values with proper engineering to ensure slope stability and non-erosive runoff velocities from the contributing area.

Table 6.1 Standard SMP Feasibility Matrix

SMP Group	SMP Design	Soil Permeability	Separation to Water Table (ft)	Contributing Area (acres)	Max Site Slope
Ponds	Micropool ED	fc ≤0.014 inch/hr, unless impermeable liner provided (see **Section 6.1.4.1**)	0[1,2]	10 (min)[4]	15%
	Wet Pond			25 (min) [4]	
	Wet ED Pond				
	Multiple Pond				
Wetlands	Shallow Wetland	fc ≤0.014 inch/hr, unless impermeable liner provided (see **Section 6.2.4.1**)	0[1,2]	25 (min)	15%
	ED Shallow Wetland				
	Pond/Wetland System				
	Pocket Wetland		0[2]	5 (min)	
	Gravel Wetland		0[1,2]	5 (max)	
Infiltration	Infiltration Trench	f_c > 0.5 inch/hr	2[3]	5 (max)	15%
	Infiltration Basin			Varies (10/25/50 max)	
	Dry Well			1 (max)	
	Underground Infiltration			10 (max)	
Filters	Surface Sand Filter	No Restriction	2	10 (max)	10%
	Underground Sand Filter			2 (max)	
	Perimeter Sand Filter				
	Infiltration Bioretention	f_c > 0.5 inch/hr		5 (max)	
	Filtration Bioretention	No Restriction			
	Bioslope			150 ft (max)	3:1 (h:v)
Open Channels	Dry Swale	No Restriction	2	5 (max)	4% longitudinal
	Wet Swale		below water table		

[1] When treating stormwater hotspots, increase separation to 2 ft.

[2] When located in a sole source aquifer, increase separation to 2 ft.

[3] When located in a sole source aquifer, increase separation to 4 ft.

[4] Minimum contributing area for ponds can be reduced if a water balance analysis is performed in accordance with **Section 6.1.4.2**.

.

Section 6.3 Stormwater Infiltration Practices

Stormwater infiltration practices capture and temporarily store the WQ_v allowing it to infiltrate into the soil over a maximum two-day period. Design variants include the following:

I-1 Infiltration Trench (**Figure 6.11**)

I-2 Infiltration Basin (**Figure 6.12**)

I-3 Dry Well (**Figure 6.13**)

I-4 Underground Infiltration (**Figure 6.14**)

Refer to the **Fact Sheets** at the end of this section for key considerations of each infiltration practice design variant, including performance criteria, practice suitability, implementation considerations, pollutant removal capability, and runoff reduction credit.

IMPORTANT NOTES:

1. PROVIDING ADEQUATE PRETREATMENT IS CRITICAL TO LONG-TERM PERFORMANCE OF INFILTRATION PRACTICES.
2. TO ASSUE THAT INFILTRATION RATES ARE PRESERVED LONG-TERM, POST-CONSTRUCTION INSPECTION AND MAINTENANCE ACTIVITIES MUST BE CLEARLY DEFINED IN ACCORDANCE WITH **CHAPTER 12**.

.

Infiltration Basin (I-2)

Infiltration basins are vegetated excavations designed to capture and temporarily store stormwater runoff to promote infiltration into the surrounding native soils.

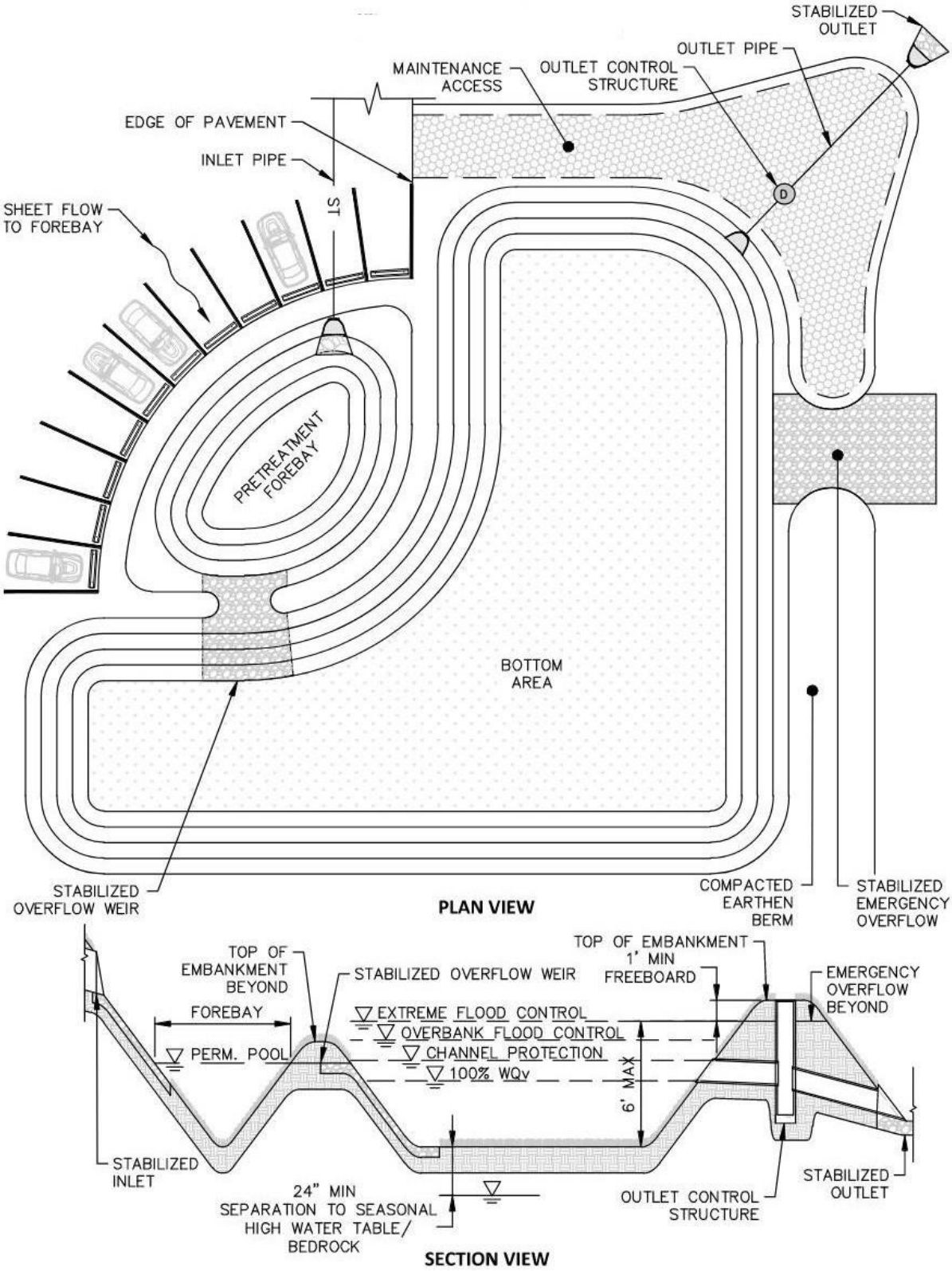


Figure 6.12 Infiltration Basin (I-2)

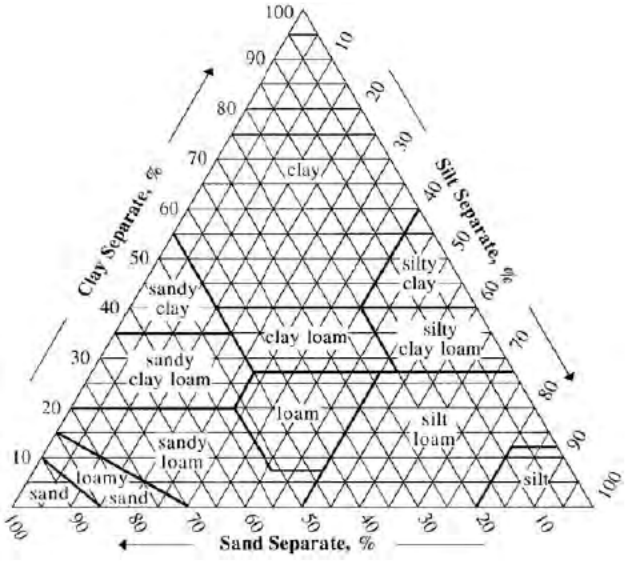
6.3.1 Feasibility

- To be suitable for infiltration, underlying soils shall have an infiltration rate (f_c) of at least 0.5 in/hr, as confirmed by field geotechnical tests. The minimum geotechnical testing shall be consistent with **Appendix D.**
- Underground infiltration systems likely qualify as a Class V injection well based upon the definition of a subsurface fluid distribution system (i.e. "an assemblage of perforated pipes, drain tiles, or other similar mechanisms intended to distribute fluids below the surface of the ground"). Refer to the EPA UIC Program for system registration requirements.
- Designers must be selective with the design of infiltration on sites with karst geology, shallow bedrock and soils, and hotspot land uses. Projects located over karst geology must provide runoff reduction by techniques that do not involve large infiltration basins and deep, concentrated recharge to the ground. A geotechnical assessment is recommended for infiltration and recharge at small scales.
- Infiltration practices shall not be located on areas with natural slopes greater than 15%, unless a slope stability analysis is performed by a qualified geotechnical engineer.
- Underground infiltration systems may be applied as a practice for urban stormwater management (**Chapter 8**).
- Urban fill soils shall not be used for infiltration practices. Urban fill in considered soil that includes unsuitable materials such as brick, cement, asphalt, demolition debris, etc.
- If infiltration practices are constructed in engineered fill soils, then the following criteria shall be met:
  - In-situ/natural soil layer below the infiltration system shall have an infiltration rate greater or equal to the engineered fill soils, as determined by geotechnical testing (**Appendix D**);
  - Soils proposed for engineered fill shall be classified as suitable using **Table 6.9** and **Figure 6.15**;
  - Soils proposed for engineered fill shall have a minimum infiltration rate of 0.50 inch/hr and a material gradation similar to the in-situ/natural soils, as determined by geotechnical testing;
  - After placement of engineered fill, permeability testing (**Appendix D**) shall be performed to confirm the infiltration rate. If engineered fill material requirements are not met, the material shall be removed;
  - The required vertical separation shall be measured from the existing grade of in-situ/natural soil. Engineered fill soils shall not be used to meet separation requirements; and
  - Construction of infiltration practices on slopes, through cut and fill operations, shall utilize the existing cut material to the greatest extent possible. The downhill berm shall be designed to prevent seeps, breakouts and slippage through the berm and at the interface of the in-situ/natural and fill material. A slope stability analysis shall be performed by a qualified geotechnical engineer.

Table 6.9 Hydrologic Soil Properties Classified by Soil Texture

Soil Texture Class	Hydrologic Soil Group	Minimum Infiltration Rate (inch/hr)	Suitability
Sand	A	8.27	Suitable for engineered fill for infiltration practice design
Loamy sand	A	2.41	
Sandy loam	B	1.02	
Loam	B	0.52	
Silt loam	C	0.27	Not suitable for engineered fill for infiltration practice design
Sandy clay loam	C	0.17	
Clay loam	D	0.09	
Silt clay loam	D	0.06	
Sandy clay	D	0.05	
Silty clay	D	0.04	
Clay	D	0.02	

Figure 6.15 USDA Soil Textural Classification



- Runoff from designated stormwater hotspots shall not be directed to an infiltration practice, unless two treatment practices are provided in series (i.e. non-infiltration standard SMP followed by an infiltration practice), both of which shall be sized to treat the entire WQ_v.
- In areas of known contamination, or if contamination is discovered during excavation, contamination levels must be evaluated by a qualified professional and the state remediation program to determine if infiltration is permitted.
- Infiltration practices shall meet the minimum separation requirements listed in **Table 6.10.** Vertical separation shall be taken from the bottom of practice, or stone reservoir where applicable. Horizontal separations shall be taken from the maximum water surface elevation (Extreme Flood peak water surface elevation) of the practice.

Table 6.10 Infiltration Practice Minimum Separation Requirements

	Vertical Separation		Horizontal Separation				
Design Variant	**Seasonal High Water Table[1,2]**	**Sound Bedrock[1]**	**Structures Without Foundation Waterproofing[4]**	**Structures With Foundation Waterproofing[4]**	**Water Supply Well/ Reservoir**	**Septic System[3,4]**	**Sanitary Sewer Main**
Infiltration Trench (I-1)	2 ft	2 ft	25 ft	0 ft	100 ft	50 ft	25 ft
Infiltration Basin (I-2)			25 ft				
Dry Well (I-3)			10 ft (single dry well) 25 ft (multiple dry wells in series)				
Underground Infiltration System (I-4)			25 ft				
Infiltration Bioretention (F-4)			25 ft	10 ft			

[1] Sound bedrock, fractured bedrock or karst geology as documented by on-site geotechnical testing
[2] Separation shall be increased to 4 ft in sole source aquifer
[3] Septic systems are inclusive of septic tanks, distribution boxes, absorption fields
[4] Infiltration practices shall be located downgradient of structures and septic systems

- The maximum contributing area shall meet the requirements listed in **Table 6.11.**

Table 6.11 Infiltration Practice Maximum Contributing Area Requirements

Design Variant	Maximum Contributing Area
Infiltration Trench (I-1)	5 ac
Infiltration Basin (I-2)	10 ac (where f_c of underlying soils 0.50 to 5.0 in/hr OR Contributing Impervious Area ≤ 10 acres) 25 ac (where f_c of underlying soils > 5.0 to 10.0 in/hr AND Contributing Impervious Area ≤ 15 acres) 50 ac (where f_c of underlying soils > 10 in/hr AND Contributing Impervious Area ≤ 20 acres)
Dry Well (I-3)	0.50 ac (for larger contributing areas, use multiple dry wells in series)
Underground Infiltration (I-4)	10 ac

Infiltration Basin Example 1:

Contributing Area = 13 acres
Contributing Impervious Area = 13 acres
Infiltration Rate = 6 in/hr

Under these design criteria, the maximum contributing area is 25 acres, and the designer can convey the entire contributing area to one infiltration basin.

Infiltration Basin Example 2:

Contributing Area = 23 acres
Contributing Impervious Area = 17 acres
Infiltration Rate = 4 in/hr

Under these design criteria, the maximum contributing area is 10 acres to one basin, since the infiltration rate and contributing impervious area do not meet the criteria for a maximum contributing area of 25 acres. Therefore, designer must convey the contributing area to at least three separate infiltration basins.

Construction Requirements

- Practice areas shall be clearly marked before any site work begins and heavy equipment traffic shall be restricted to avoid soil disturbance and compaction. The Erosion and Sediment Control plan shall clearly indicate how sediment will be prevented from entering the practice areas.
- For Design I-1, large tree roots shall be trimmed flush with the trench sides to prevent puncturing or tearing of the filter fabric. The side walls shall be roughened where sheared and sealed by heavy equipment.
- Permanent vegetative cover with 80% uniform density shall be established over the entire contributing pervious drainage area before runoff is directed into the facility.
- Infiltration practices shall never serve as a sediment control device during site construction phase and shall be installed at the end of the construction sequence, to the greatest extent practical.

6.3.2 Conveyance

- Infiltration practices shall be sized to store and infiltrate the required WQ_v. If inflow exceeds the storage capacity under larger storm events, then an adequate outlet pipe or overflow shall be designed to provide safe conveyance. If computed flow velocities exceed erosive velocities, the overflow shall be properly stabilized.
- Runoff conveyed to an infiltration practice by pipe or concentrated flow, under all storm events, shall utilize a pretreatment device or flow dissipator to reduce flow velocity prior to entering the practice. If flow velocity cannot be reduced to non-erosive conditions, then the practice shall be designed off-line (refer to **Appendix C**) by use of a flow regulator or flow splitter diversion structure to divert the WQ_v to the practice and allow larger flows to bypass the practice.
- An emergency spillway shall be provided to safely convey stormwater exceeding the Extreme Flood at non-erosive velocities.

6.3.3 Pretreatment

- Prior to entering an infiltration practice, the following pretreatment volume shall be provided:
  - 25% of the WQv for $f_c \leq 10.00$ in/hr.
  - 50% of the WQv for $f_c > 10.00$ in/hr.
- Adequate pretreatment for Designs I-1, I-2, I-3, and I-4 shall include one of the following:
  - Sedimentation chamber, plunge pool, or forebay, sized in accordance with **Section 6.4.3**; or
  - Vegetated swale with check dams (Maximum velocity of 1 fps for water quality flow).
  - Approved proprietary pretreatment device (Refer to **Chapter 9**).
- For Design I-1: when runoff is conveyed to the practice via sheet flow, adequate pretreatment also includes a grass filter strip sized in accordance with **Table 6.13.**
- For Design I-4: a manufacturer approved pretreatment system.
- Exit velocities from pretreatment devices shall be designed to ensure non-erosive outlet conditions.

6.3.4 Treatment

6.3.4.1 Design Criteria

Table 6.12 Infiltration Practice Design Specifications

		I-1	I-2	I-3	I-4
Freeboard	**Applicability**	N/A	Required	N/A	N/A
	Depth	1 ft. min. measured from top of Extreme Flood elevation to top of embankment			
Pea Gravel	**Applicability**	Required	N/A	N/A	N/A
	Depth	4 inch			
	Material	ASTM D448 No. 6 stone, Porosity = 32%			
Stone Reservoir	**Applicability**	Required	N/A	Required	As Required
	Depth	4 ft. max.	N/A	1 ft. min. on all sides & bottom	Per proprietary requirements
	Material	No. 2 stone, washed, no fines; Porosity=40%			
Storage[1]	**Depth**	Within reservoir	6 ft. max.	As Required[2]	As Required
	Side Slope	N/A	3:1 (h:v) max.	N/A	N/A
Observation Well	**Applicability**	Required	N/A	Required	N/A
	Material	6 inch min. perforated PVC or HDPE pipe with lockable cap			
Drainage Filter Fabric	**Applicability**	Required	N/A	Required	Required
	Material[3]	Non-woven, polypropylene geotextile with flow rate greater than 125 gpm/sf (ASTM D4491) and Apparent Opening Size US #70 sieve (ASTM D4751)			
Maintenance Access[1]	**Applicability**	As Required	Required	As Required	As Required
	Slope	15% max.			
	Width	12 ft. min.			
	Material	Able to withstand loading of maintenance equipment and vehicles			

Footnotes:

[1]Required for all Design Variants

[2] An Underground Injection Control Permit may be required when certain conditions are met. Designer must Consult EPA's Underground Injection Control Program Fact Sheet for further information.

[3]Or acceptable alternatives, such as a 3 inch minimum layer of pea gravel

.

General

- All infiltration practices shall be designed to fully drain within 48-hrs of the maximum storm event for which it was designed.
- Designs I-1 and I-2 shall account for reduced infiltration rates under frozen conditions.
- All infiltration practices shall be designed such that the length, width, or diameter is greater than the depth in order to satisfy the UIC criteria. Refer to **Section 6.3.1**.

Maintenance Access

- A maintenance access easement shall extend to the practices from a public or private road.
- Adequate maintenance access must extend to the pretreatment device, outlet structure/overflow, emergency spillway, and must have sufficient area to allow vehicles to turn around.
- Where applicable, access to the outlet structure shall be provided by lockable manhole cover or grate.

6.3.4.2 Sizing Criteria

- Infiltration practices shall be designed to exfiltrate the entire WQ_v through the bottom surface area of the practice (vertical sides are not considered in sizing).
- Design I-1: calculate the minimum surface area of an infiltration trench using the following equation:

$$A_T = \frac{WQ_V}{\Phi \cdot d_t}$$

Where:

A_T = Surface area of the infiltration trench (sf)

WQ_V = Water Quality Volume (cf)

Φ = Porosity (assume 0.4)

d_t = Depth of trench (ft)

- Design I-2: calculate the minimum bottom area of an infiltration basin using the following equation:

$$A_b = \frac{WQ_V}{d_b}$$

Where:

A_b = Bottom area of the infiltration basin (sf)

WQ_V = Water Quality Volume (cf)

d_b = Depth of basin (ft) (measured from bottom to first outlet)

- Design I-3: calculate the Water Quality Volume provided by dry wells using the following equation:

$$WQ_V = N \cdot V_W$$
$$V_W = V_i + V_s$$
$$V_i = \pi \cdot r^2 \cdot H$$
$$V_s = (\pi \cdot [(r + t + t_s)^2 - (r + t)^2]) \cdot H \cdot 0.40$$

Where:

WQ_V = Water Quality Volume (cf)

N = Number of dry wells

V_w = Volume provided per dry well (cf)

V_i = Inside volume of dry well (cf)

V_s = Volume of stone reservoir (cf)

r = Inside radius of dry well (ft)

H = Inside height of dry well (ft)

t = Thickness of dry well wall (ft)

t_s = Thickness of stone reservoir (ft)

- Design I-4: calculate the minimum stone area of underground infiltration systems using the following equation:

$$A_b = \frac{WQ_V}{d_p}$$

Where:

A_b = Bottom area of the infiltration basin (sf)

WQ_V = Water Quality Volume (cf)

d_p = Depth of bottom stone (ft) (measured from bottom of stone to bottom of chambers)

- Design I-4: calculate the Water Quality Volume provided by underground infiltration systems using the following equation:

$$WQ_V = V_{st} + V_{sys}$$

Where:

WQ_V =Water Quality Volume (cf)

V_{st} = Volume of stone reservoir (cf) (assume 40% voids)

V_{sys} = Volume of system (cf) (excluding volume of stone)

- For Design I-4, the system shall be sized using hydrologic modeling, hydrologic calculations or calculations provided by the manufacturer, to demonstrate that the water quality and quantity control objectives have been met.
- For Designs I-1, I-3, and I-4, the bottom of the stone reservoir shall be laid level, so that runoff will infiltrate through the entire bottom surface area.

6.3.5 Landscaping

- For planting guidance for stormwater management facilities, refer to **Chapter 11**.
- Permanent vegetative cover shall achieve 80% uniform density established over the entire contributing pervious area, before runoff is directed into the facility.
- For Design I-2 stabilizing vegetation shall be provided throughout the practice.

Fact Sheet: Infiltration Basin (I-2)



Description: Vegetated excavations designed to capture and temporarily store stormwater runoff to promote infiltration into the surrounding native soils.

(Photo Source: Clark County, Washington)

Key Considerations

PERFORMANCE CRITERIA

FEASIBILITY

- Underlying soils shall have an min. infiltration rate of 0.50 inch/hr
- Practices shall not be located on areas with natural slopes > 15%
- Urban fill soils shall not be used for infiltration practices
- Max contributing area is 10 acres, 25 acres or 50 acres depending on underlying soil infiltration rates and contributing impervious area
- Min 2 ft separation to seasonal high-water table or bedrock
- Two treatment practices in series both sized to treat the entire WQv (non-infiltration standard SMP followed by an infiltration practice) shall be provided for hotspot treatment

CONVEYANCE

- Practice shall be size to store and infiltrate the WQv
- An outlet pipe or overflow for safe conveyance shall be provided in the event inflow exceeds the storage capacity under larger storm events
- An emergency spillway shall be provided
- Runoff conveyed by pipe or concentrated flow shall utilize a pretreatment device or flow dissipator to reduce velocity prior to entering the practice

PRETREATMENT

- Pretreatment volume shall be 25% WQv for fc ≤ 10.00 inch/hr or 50% WQv for fc > 10.00 inch/hr

TREATMENT

- 1 ft min. freeboard shall be provided
- 6 ft max. basin depth
- Provide a min. 12 ft wide maintenance access at a max. 15% slope
- Design to fully drain within 48 hrs of max. storm event for which it was designed
- Design shall account for reduced infiltration rates under frozen conditions
- Length or width of the practice shall be greater than the depth

TREATMENT

- Stabilizing vegetation shall be provided throughout practice

STORMWATER MANAGEMENT SUITABILITY

✓	Water Quality
✓	Channel Protection
✓	Overbank Flood Protection
✓	Extreme Flood Protection
✓	Runoff Reduction
*	Treatment of Hotspots
✓	Linear Applications

✓ suitable for this practice
* suitable with exceptions

IMPLEMENTATION CONSIDERATIONS

M	Capital Cost
M	Maintenance Burden
M	Safety Risk
M	Landscaping

L = Low **M** = Moderate **H** = High
NA = Not Applicable

POLLUTANT REMOVAL (*See Table 10.3*)

G	Phosphorus
G	Nitrogen
G	Metals
G	Pathogens
G	Total Suspended Solids

G = Good **F** = Fair **P** = Poor

RUNOFF REDUCTION CREDIT

- 100% RRv provided

LEGEND	EXISTING	PROPOSED
5' CONTOUR	155	155
1' CONTOUR	154	154
PROPERTY LINE	PL PL	PL PL
RIGHT OF WAY		
SETBACK		
BUILDING		
ASPHALT PAVEMENT		
CURB		
SIDEWALK		
EDGE OF GRAVEL		
FENCE	- o - o - o -	
WATERLINE	W_x W_x	W W
SANITARY SEWER	SS_x SS_x	SS SS
STORM SEWER	SD_x SD_x	SD SD
OVERHEAD UTILITIES	OU_x OU_x	OU OU
UNDERGROUND ELECTRIC	E_x E_x	E E
GAS	G_x G_x	G G
FIRE HYDRANT		
WATER VALVE	W	
SANITARY MANHOLE	S	
STORM MANHOLE	D	D
CATCH BASIN		S
UTILITY POLE AND GUY		
LIGHT POLE		

PROGRESS PRINT
NOT FOR CONSTRUCTION

GRAPHIC SCALE

40 0 20 40 80 160

(IN FEET)
1 inch = 40 ft.

AUBERTINE CURRIER
ARCHITECTS, ENGINEERS & LAND SURVEYORS, PLLC

522 Bradley Street
Watertown, New York 13601

aubertinecurrier.com

Phone: (315)782-2005
Fax: (315)782-1472

The above Architect, Engineer or Land Surveyor states that to the best of his or her knowledge, information and belief, the plans and specifications are in accordance with applicable regulations of New York State. It is a violation of New York State Law for any person, unless acting under the direct supervision of a Registered Architect, Licensed Professional Engineer or Licensed Land Surveyor to alter this document in any way. If altered, such licensee shall affix to his or her seal and the notation "altered by" followed by his or her signature, date and a specific description of the alteration.

© COPYRIGHT 2018
AUBERTINE and CURRIER ARCHITECTS, ENGINEERS & LAND SURVEYORS, PLLC

ADDITION FOR ROTH INDUSTRIES AND ROTH GLOBAL PLASTICS

268 BELLEW AVE SOUTH
WATERTOWN, NEW YORK 13601
JEFFERSON COUNTY

PROJECT NO:	2018-035
SCALE:	1"=40'
DRAWN BY:	CWT
CHECKED BY:	MPM
ISSUE DATES:	

INF TESTING LOCATION MAP

V-100

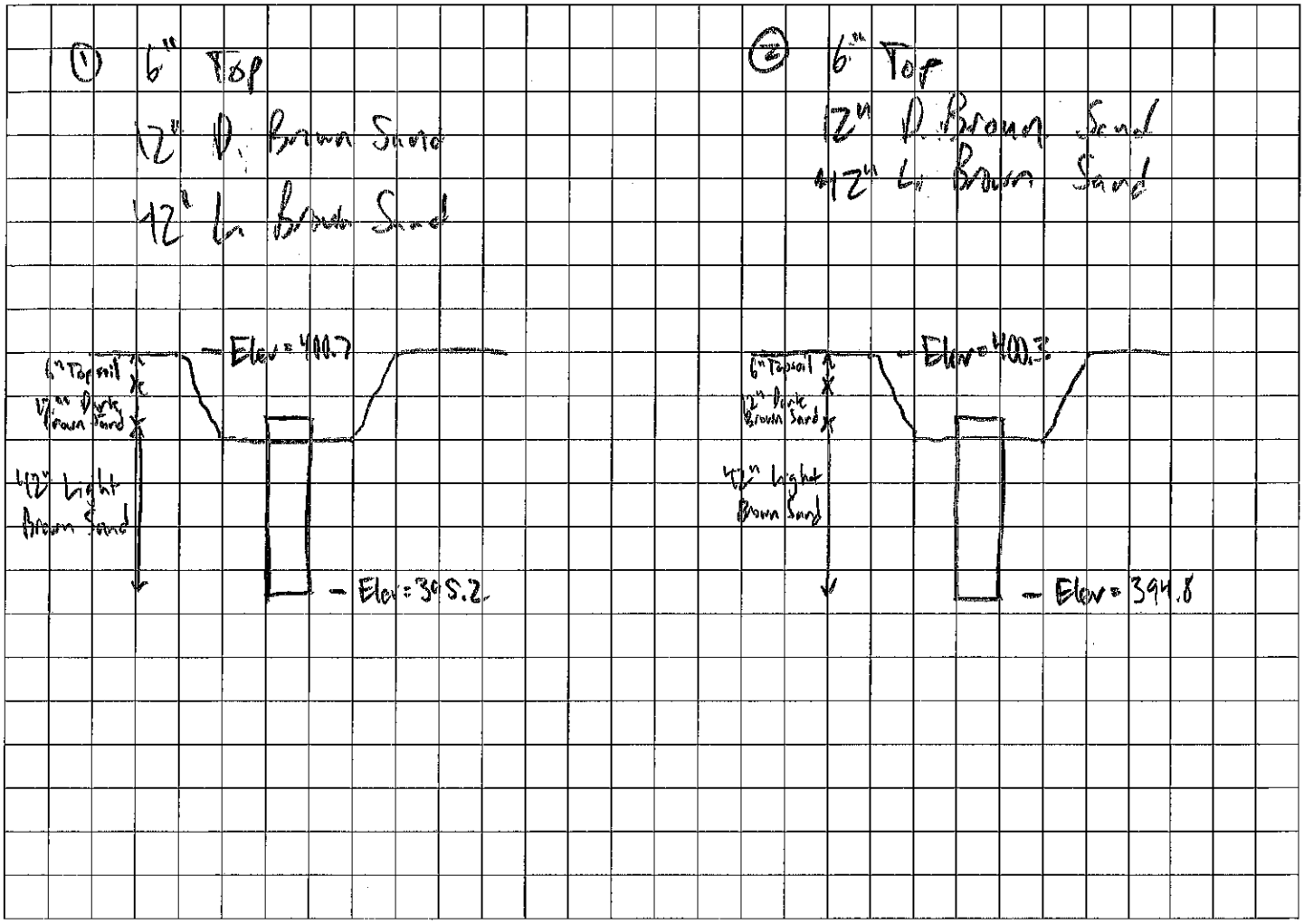
522 BRADLEY STREET
WATERTOWN, NY 13601
TEL: (315) 782-2005
FAX: (315) 782-1472
www.AubertineCurrier.com

Project Number: 2016-033 Date: 6/8/16

Project Name: Cath Industries Bldg Addition

Location: Watertown, NY Observed By: CWT

INFILTRATION TEST SUMMARY



South Basin

Location	Ground Elevation (ft)	Bottom of Pipe Depth (ft)	Bottom of Pipe Elev (ft)	Trial			
				Initial Water Level (ft)	Final Water Level (ft)	Infiltration Rate (in/hr)	
1	400.7'	5.5'	395.2'	9:43 - 2'	9:59 - 0'	90	83
1	-	-	-	10:02 - 2'	10:19 - 0'	85	
1	-	-	-	10:20 - 2'	10:39 - 0'	77	
1	-	-	-	10:40 - 2'	10:58 - 0'	80	
2	400.3'	5.5'	394.8'	9:43 - 2'	10:03 - 0'	72	67
2	-	-	-	10:05 - 2'	10:27 - 0'	65	
2	-	-	-	10:30 - 2'	10:52 - 0'	65	
2	-	-	-	10:55 - 2'	11:17 - 0'	65	

AUBERTINE CURRIER
ARCHITECTS, ENGINEERS & LAND SURVEYORS, P.C.

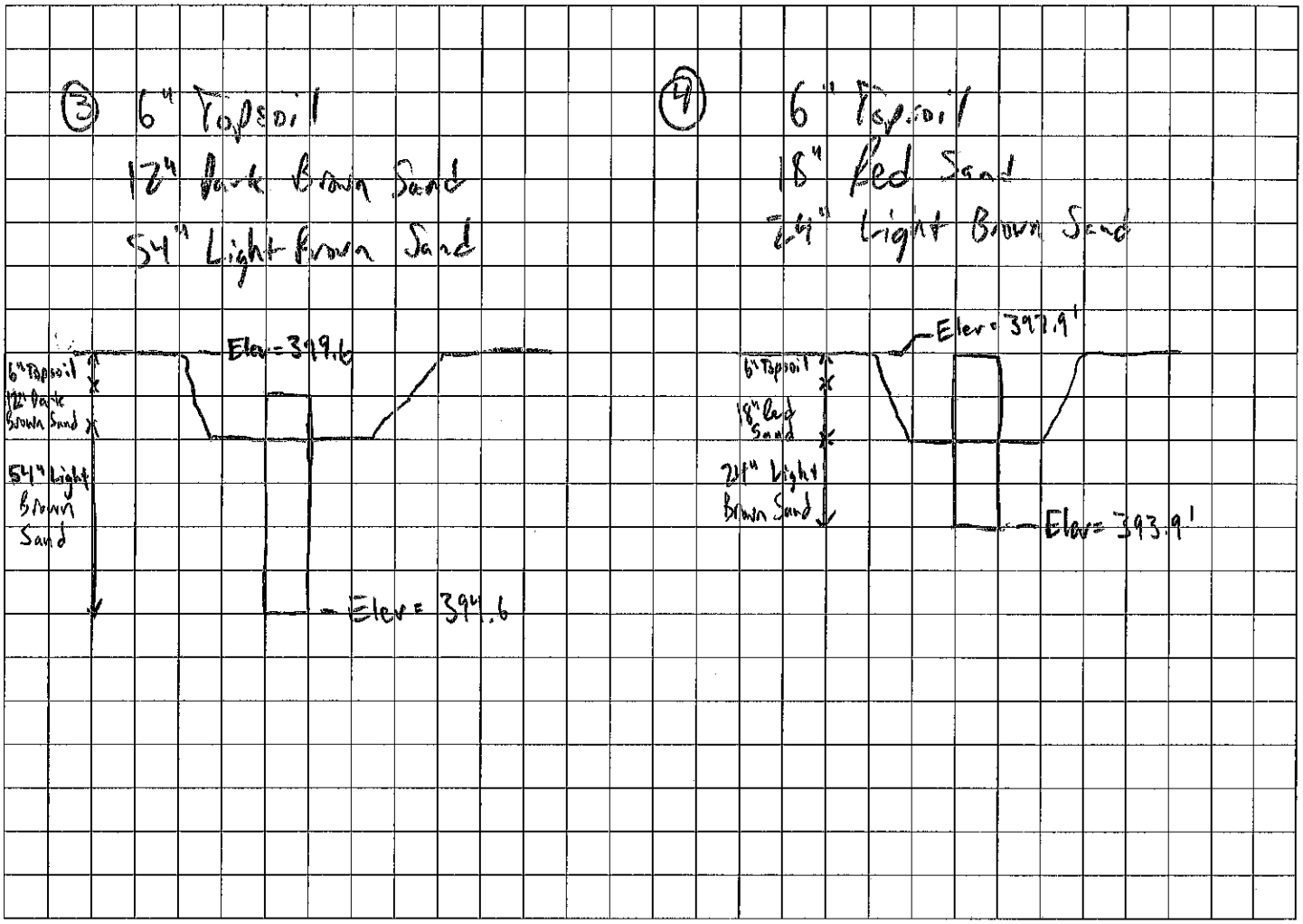
522 BRADLEY STREET
WATERTOWN, NY 13601
TEL: (315) 782-2005
FAX: (315) 782-1472
www.AubertineCurrier.com

Project Number: 2016-033 Date: 6/8/16

Project Name: Roth Industries Bldg Addition

Location: Watertown, NY Observed By: CWT

INFILTRATION TEST SUMMARY



North Basin

Location	Ground Elevation (ft)	Bottom of Pipe Depth (ft)	Bottom of Pipe Elev (ft)	Trial			
				Initial Water Level (ft)	Final Water Level (ft)	Infiltration Rate (in/hr)	
3	399.6'	5'	394.6'	11:13 - 2'	11:31 - 0'	69	64
3				11:35 - 2'	11:57 - 0'	65	
3				11:59 - 2'	12:23 - 0'	60	
3				12:25 - 2'	12:49 - 0'	63	
4	397.9'	4'	393.9'	11:15 - 2'	11:43 - 0'	51	51
4				11:45 - 2'	12:12 - 0'	53	
4				12:14 - 2'	12:43 - 0	50	
4				12:44 - 2'	1:14 - 0	50	

AUBERTINE CURRIER ENGINEERING ARCHITECTURE SURVEYING
522 BRADLEY STREET
WATERTOWN, NY 13601
TEL: (315) 782-2005
FAX: (315) 782-1472
www.AubertineCurrier.com

Project Number: 2016-033 Date: 6/18/16

Project Name: Roth Industries Bldg Addition

Location: Watertown, NY Observed By: CWT

INFILTRATION TEST PIT LOGS

Client Roth Date 6/18/16

Weather Cloudy, Rainy Datum –

Observer CWT

Test Pit No. 1 Elevation 400.3 Water –

Depth	Moisture	W	Description
5"	Wet	–	Topsoil
5-18"	Wet	–	Dark Brown Sandy Soil
18"-84"	Wet	–	Light Brown Sandy Soil
			* No water table encountered
Bottom	Elev = 393.3		

7' Deep

Test Pit No. 2 Elevation 397.9' Water 391.2'

Depth	Moisture	W	Description
6"	Wet	–	Topsoil
6"-24"	Wet	–	Red Sandy Soil
24"-80"	Wet	–	Light Brown Sandy Soil
>80"	Saturated	Water Table = 391.2'	

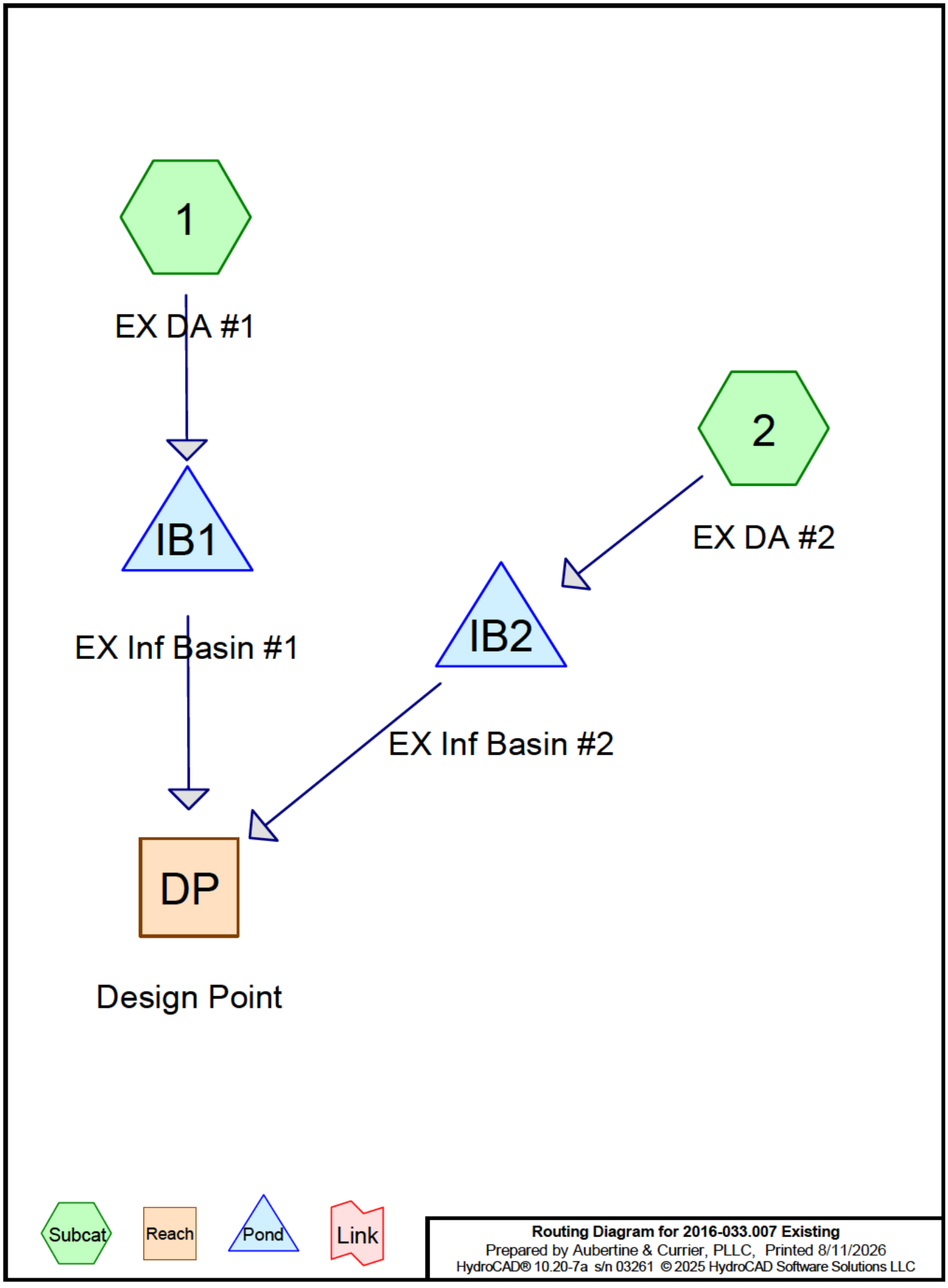
6.7' Deep

Appendix E

Pre Development Drainage Conditions (Hydrocad)

Aubertine and Currier Architects, Engineers and Land Surveyors, PLLC
522 Bradley Street, Watertown, New York 13601 TELE: (315) 782-2005 FAX: (315) 782-1472

Page left intentionally blank for duplex printing



Routing Diagram for 2016-033.007 Existing
Prepared by Aubertine & Currier, PLLC, Printed 8/11/2026
HydroCAD® 10.20-7a s/n 03261 © 2025 HydroCAD Software Solutions LLC

Rainfall Events Listing (selected events)

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	1-Year A	NRCC 24-hr	A	Default	24.00	1	2.00	2
2	10-Year A	NRCC 24-hr	A	Default	24.00	1	3.33	2
3	100-Year A	NRCC 24-hr	A	Default	24.00	1	5.54	2

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
5.960	30	Meadow, non-grazed, HSG A (1, 2)
0.270	71	Meadow, non-grazed, HSG C (2)
2.630	98	Paved parking, HSG A (1, 2)
8.860	**51**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
8.590	HSG A	1, 2
0.000	HSG B	
0.270	HSG C	2
0.000	HSG D	
0.000	Other	
8.860		**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
5.960	0.000	0.270	0.000	0.000	6.230	Meadow, non-grazed	1, 2
2.630	0.000	0.000	0.000	0.000	2.630	Paved parking	1, 2
8.590	**0.000**	**0.270**	**0.000**	**0.000**	**8.860**	**TOTAL AREA**	

Pipe Listing (all nodes)

Line#	Node Number	In-Invert (feet)	Out-Invert (feet)	Length (feet)	Slope (ft/ft)	n	Width (inches)	Diam/Height (inches)	Inside-Fill (inches)	Node Name
1	IB1	397.79	397.43	18.5	0.0195	0.013	0.0	18.0	0.0	
2	IB1	398.11	398.05	6.0	0.0100	0.013	0.0	8.0	0.0	
3	IB2	401.35	401.30	25.0	0.0020	0.013	0.0	15.0	0.0	
4	IB2	401.35	401.30	25.0	0.0020	0.013	0.0	15.0	0.0	
5	IB2	401.35	401.30	25.0	0.0020	0.013	0.0	15.0	0.0	

Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 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 1: EX DA #1 Runoff Area=6.690 ac 35.43% Impervious Runoff Depth>0.00"
Flow Length=450' Tc=36.3 min CN=54 Runoff=0.01 cfs 0.003 af

Subcatchment 2: EX DA #2 Runoff Area=2.170 ac 11.98% Impervious Runoff Depth=0.00"
Flow Length=238' Tc=42.7 min CN=43 Runoff=0.00 cfs 0.000 af

Reach DP: Design Point Inflow=0.00 cfs 0.000 af
Outflow=0.00 cfs 0.000 af

Pond IB1: EX Inf Basin #1 Peak Elev=397.01' Storage=24 cf Inflow=0.01 cfs 0.003 af
Discarded=0.01 cfs 0.002 af Primary=0.00 cfs 0.000 af Outflow=0.01 cfs 0.002 af

Pond IB2: EX Inf Basin #2 Peak Elev=399.00' Storage=0 cf Inflow=0.00 cfs 0.000 af
Discarded=0.00 cfs 0.000 af Primary=0.00 cfs 0.000 af Outflow=0.00 cfs 0.000 af

Total Runoff Area = 8.860 ac Runoff Volume = 0.003 af Average Runoff Depth = 0.00"
70.32% Pervious = 6.230 ac 29.68% Impervious = 2.630 ac

Summary for Subcatchment 1: EX DA #1

[73] Warning: Peak may fall outside time span

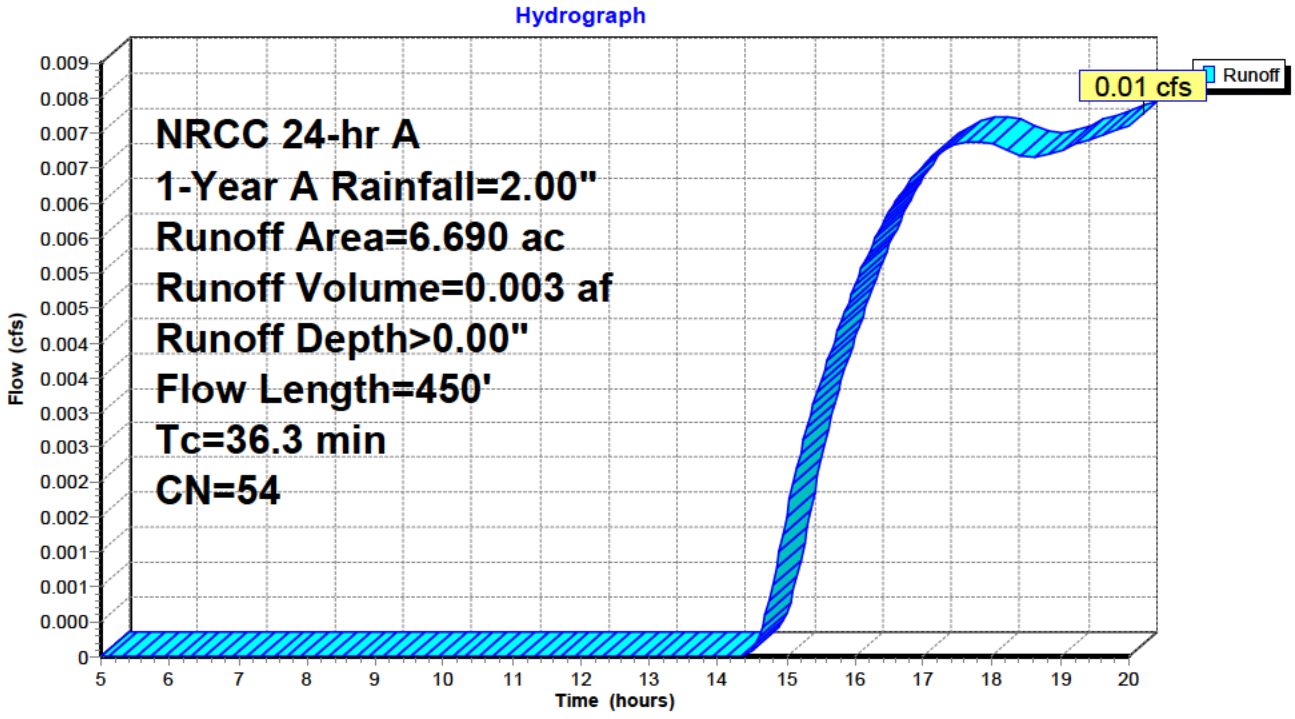
Runoff = 0.01 cfs @ 20.00 hrs, Volume= 0.003 af, Depth> 0.00"
Routed to Pond IB1 : EX Inf Basin #1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NRCC 24-hr A 1-Year A Rainfall=2.00"

Area (ac)	CN	Description
4.320	30	Meadow, non-grazed, HSG A
2.370	98	Paved parking, HSG A
6.690	54	Weighted Average
4.320		64.57% Pervious Area
2.370		35.43% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
28.8	100	0.0150	0.06		**Sheet Flow, Lawn** Grass: Bermuda n= 0.410 P2= 2.33"
7.5	350	0.0125	0.78		**Shallow Concentrated Flow, Lawn** Short Grass Pasture Kv= 7.0 fps
36.3	450	Total			

Subcatchment 1: EX DA #1



Summary for Subcatchment 2: EX DA #2

[45] Hint: Runoff=Zero

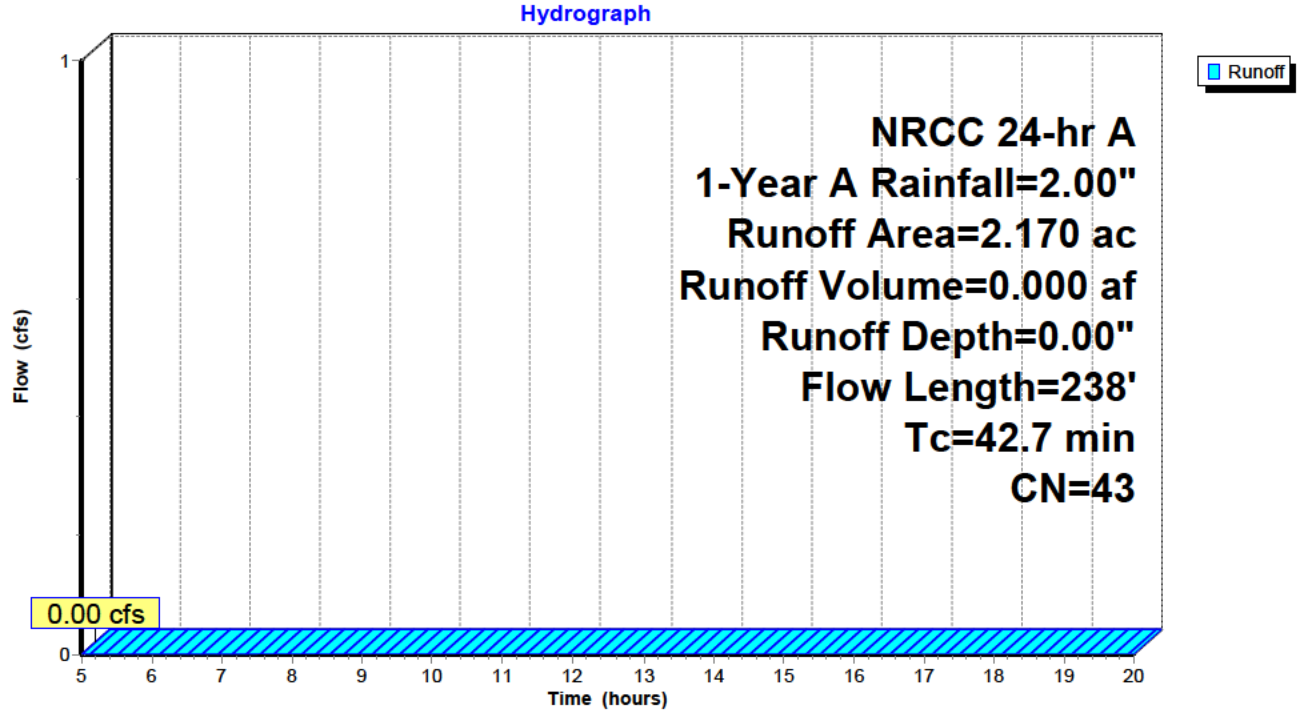
Runoff = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Depth= 0.00"
Routed to Pond IB2 : EX Inf Basin #2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NRCC 24-hr A 1-Year A Rainfall=2.00"

Area (ac)	CN	Description
1.640	30	Meadow, non-grazed, HSG A
0.260	98	Paved parking, HSG A
0.270	71	Meadow, non-grazed, HSG C
2.170	43	Weighted Average
1.910		88.02% Pervious Area
0.260		11.98% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
40.2	100	0.0065	0.04		**Sheet Flow, Lawn** Grass: Bermuda n= 0.410 P2= 2.33"
2.5	138	0.0170	0.91		**Shallow Concentrated Flow, Lawn** Short Grass Pasture Kv= 7.0 fps
42.7	238	Total			

Subcatchment 2: EX DA #2



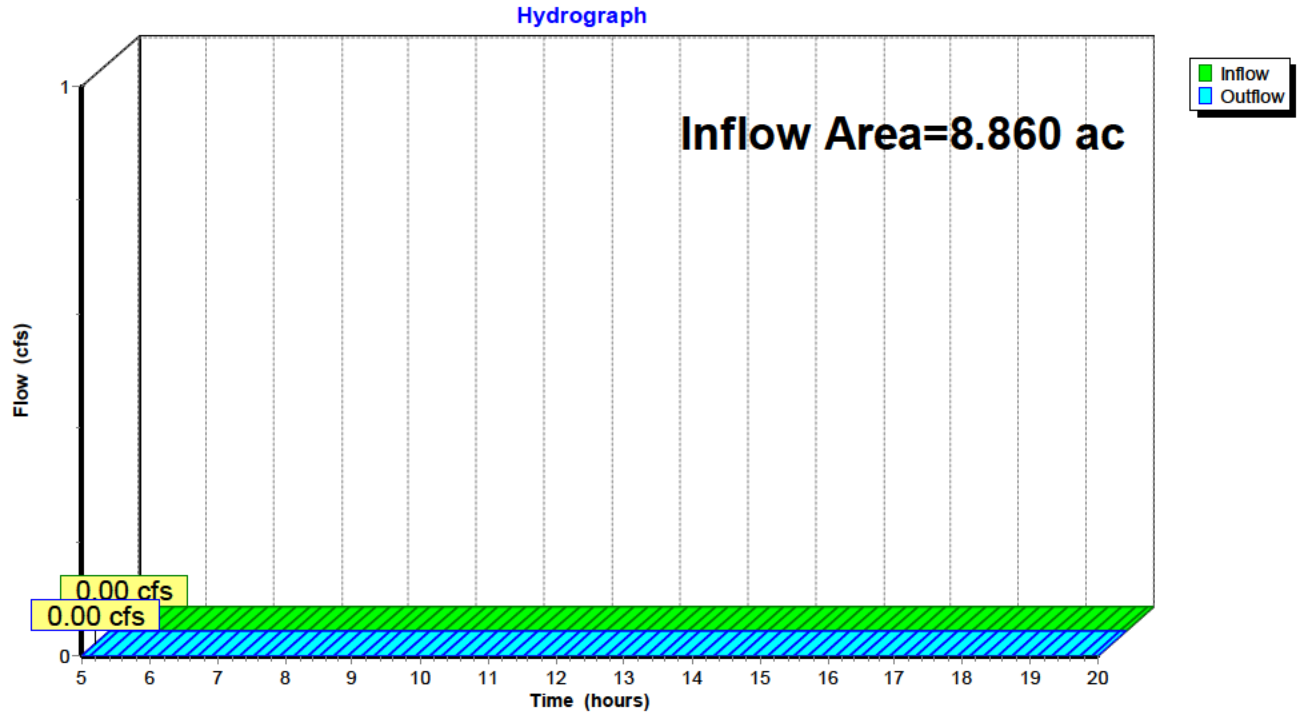
Summary for Reach DP: Design Point

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 8.860 ac, 29.68% Impervious, Inflow Depth = 0.00" for 1-Year A event
Inflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
Outflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach DP: Design Point



Summary for Pond IB1: EX Inf Basin #1

Inflow Area = 6.690 ac, 35.43% Impervious, Inflow Depth > 0.00" for 1-Year A event
Inflow = 0.01 cfs @ 20.00 hrs, Volume= 0.003 af
Outflow = 0.01 cfs @ 20.00 hrs, Volume= 0.002 af, Atten= 4%, Lag= 0.0 min
Discarded = 0.01 cfs @ 20.00 hrs, Volume= 0.002 af
Primary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
Routed to Reach DP : Design Point

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 397.01' @ 20.00 hrs Surf.Area= 1,848 sf Storage= 24 cf

Plug-Flow detention time= 47.6 min calculated for 0.002 af (79% of inflow)
Center-of-Mass det. time= 19.5 min (1,083.8 - 1,064.3)

Volume	Invert	Avail.Storage	Storage Description
#1	397.00'	20,048 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

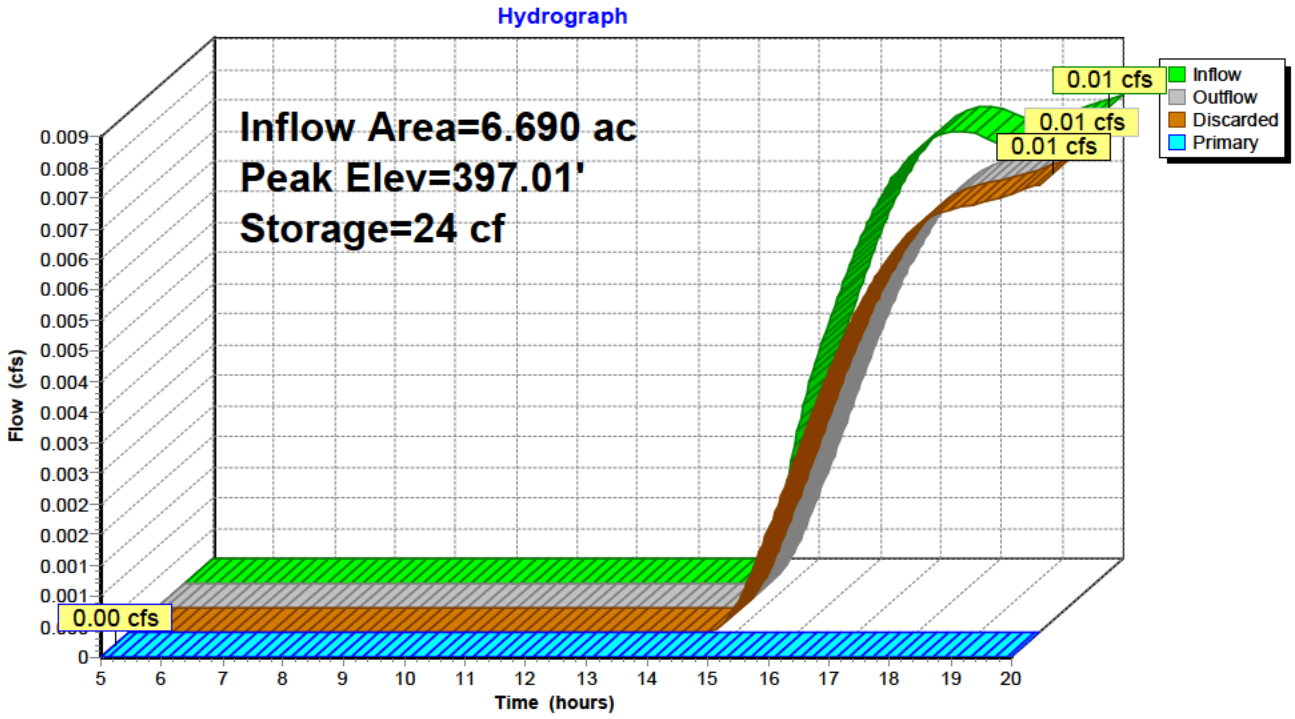
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
397.00	1,835	0	0
398.00	2,820	2,328	2,328
399.00	3,745	3,283	5,610
400.00	5,065	4,405	10,015
401.00	15,000	10,033	20,048

Device	Routing	Invert	Outlet Devices
#1	Discarded	397.00'	**25.000 in/hr Exfiltration over Surface area above 397.00'** Conductivity to Groundwater Elevation = 391.21' Excluded Surface area = 1,835 sf
#2	Primary	397.79'	**18.0" Round Culvert** L= 18.5' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 397.79' / 397.43' S= 0.0195 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf
#3	Device 2	398.11'	**8.0" Round Culvert** L= 6.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 398.11' / 398.05' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.35 sf
#4	Device 2	399.41'	**18.0" W x 12.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#5	Device 2	400.64'	**24.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.01 cfs @ 20.00 hrs HW=397.01' (Free Discharge)
└**1=Exfiltration** (Controls 0.01 cfs)

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=397.00' (Free Discharge)
└**2=Culvert** (Controls 0.00 cfs)
  └**3=Culvert** (Controls 0.00 cfs)
  └**4=Orifice/Grate** (Controls 0.00 cfs)
  └**5=Orifice/Grate** (Controls 0.00 cfs)

Pond IB1: EX Inf Basin #1



Summary for Pond IB2: EX Inf Basin #2

Inflow Area = 2.170 ac, 11.98% Impervious, Inflow Depth = 0.00" for 1-Year A event
Inflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
Outflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min
Discarded = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
Primary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
Routed to Reach DP : Design Point

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 399.00' @ 5.00 hrs Surf.Area= 42 sf Storage= 0 cf

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= (not calculated: no inflow)

Volume	Invert	Avail.Storage	Storage Description
#1	399.00'	4,839 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

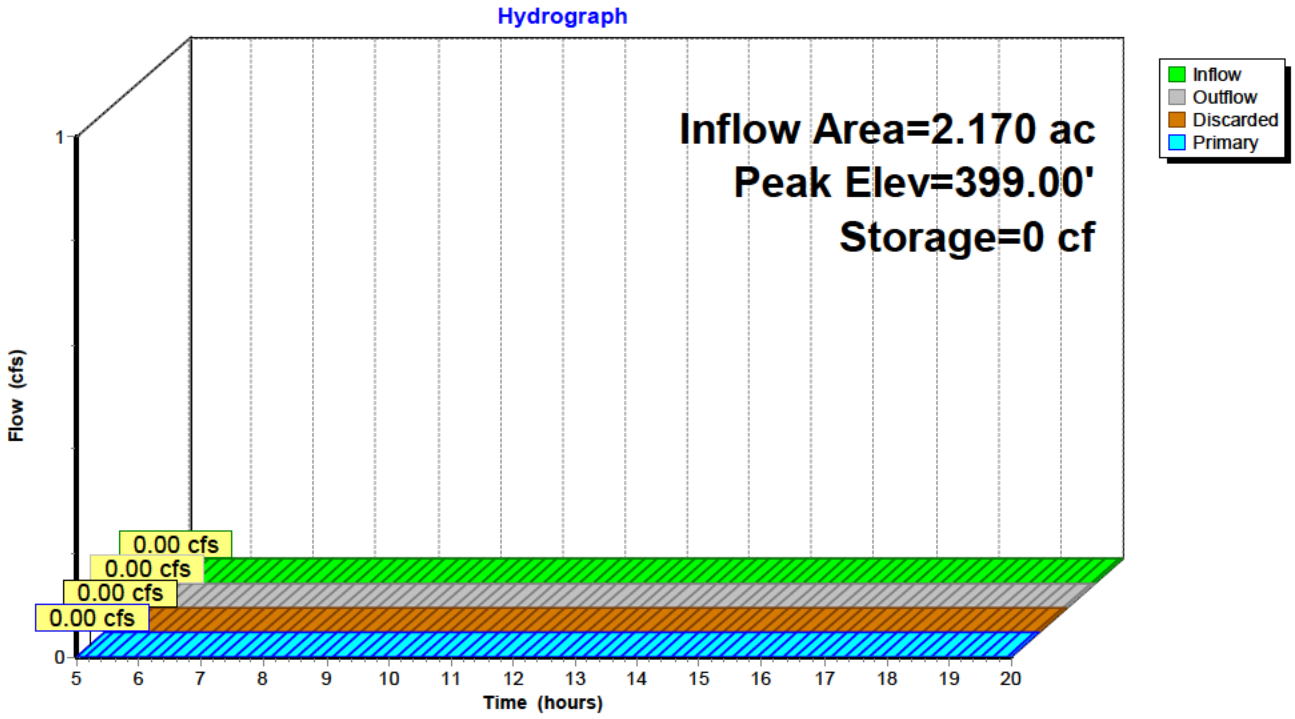
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
399.00	42	0	0
400.00	850	446	446
401.00	1,730	1,290	1,736
402.00	4,475	3,103	4,839

Device	Routing	Invert	Outlet Devices
#1	Discarded	399.00'	**25.000 in/hr Exfiltration over Surface area above 399.00'** Conductivity to Groundwater Elevation = 391.21' Excluded Surface area = 42 sf
#2	Primary	401.35'	**15.0" Round Culvert** L= 25.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 401.35' / 401.30' S= 0.0020 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf
#3	Primary	401.35'	**15.0" Round Culvert** L= 25.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 401.35' / 401.30' S= 0.0020 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf
#4	Primary	401.35'	**15.0" Round Culvert** L= 25.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 401.35' / 401.30' S= 0.0020 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf

Discarded OutFlow Max=0.00 cfs @ 5.00 hrs HW=399.00' (Free Discharge)
└**1=Exfiltration** (Controls 0.00 cfs)

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=399.00' (Free Discharge)
├**2=Culvert** (Controls 0.00 cfs)
├**3=Culvert** (Controls 0.00 cfs)
└**4=Culvert** (Controls 0.00 cfs)

Pond IB2: EX Inf Basin #2



Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 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 1: EX DA #1 Runoff Area=6.690 ac 35.43% Impervious Runoff Depth>0.22"
Flow Length=450' Tc=36.3 min CN=54 Runoff=0.61 cfs 0.121 af

Subcatchment 2: EX DA #2 Runoff Area=2.170 ac 11.98% Impervious Runoff Depth>0.02"
Flow Length=238' Tc=42.7 min CN=43 Runoff=0.01 cfs 0.004 af

Reach DP: Design Point Inflow=0.00 cfs 0.000 af
Outflow=0.00 cfs 0.000 af

Pond IB1: EX Inf Basin #1 Peak Elev=397.57' Storage=1,208 cf Inflow=0.61 cfs 0.121 af
Discarded=0.34 cfs 0.115 af Primary=0.00 cfs 0.000 af Outflow=0.34 cfs 0.115 af

Pond IB2: EX Inf Basin #2 Peak Elev=399.02' Storage=1 cf Inflow=0.01 cfs 0.004 af
Discarded=0.01 cfs 0.004 af Primary=0.00 cfs 0.000 af Outflow=0.01 cfs 0.004 af

Total Runoff Area = 8.860 ac Runoff Volume = 0.125 af Average Runoff Depth = 0.17"
70.32% Pervious = 6.230 ac 29.68% Impervious = 2.630 ac

Summary for Subcatchment 1: EX DA #1

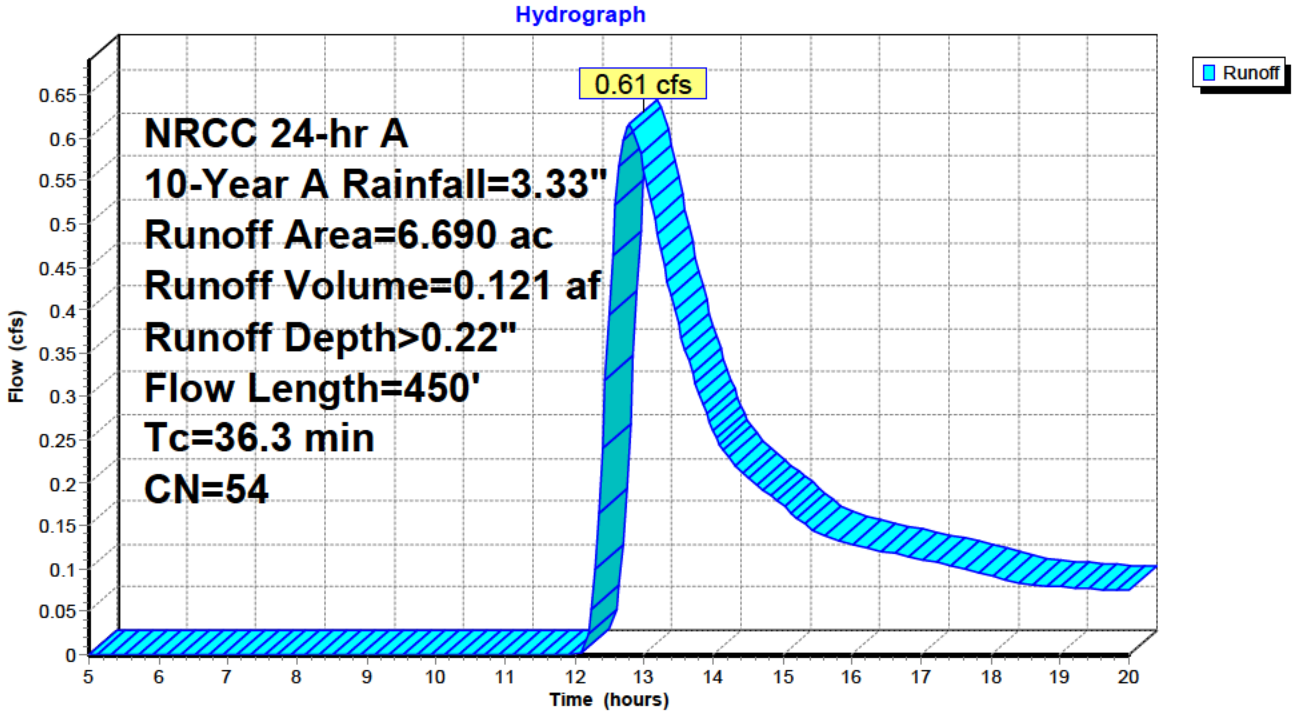
Runoff = 0.61 cfs @ 12.79 hrs, Volume= 0.121 af, Depth> 0.22"
Routed to Pond IB1 : EX Inf Basin #1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NRCC 24-hr A 10-Year A Rainfall=3.33"

Area (ac)	CN	Description
4.320	30	Meadow, non-grazed, HSG A
2.370	98	Paved parking, HSG A
6.690	54	Weighted Average
4.320		64.57% Pervious Area
2.370		35.43% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
28.8	100	0.0150	0.06		**Sheet Flow, Lawn** Grass: Bermuda n= 0.410 P2= 2.33"
7.5	350	0.0125	0.78		**Shallow Concentrated Flow, Lawn** Short Grass Pasture Kv= 7.0 fps
36.3	450	Total			

Subcatchment 1: EX DA #1



Summary for Subcatchment 2: EX DA #2

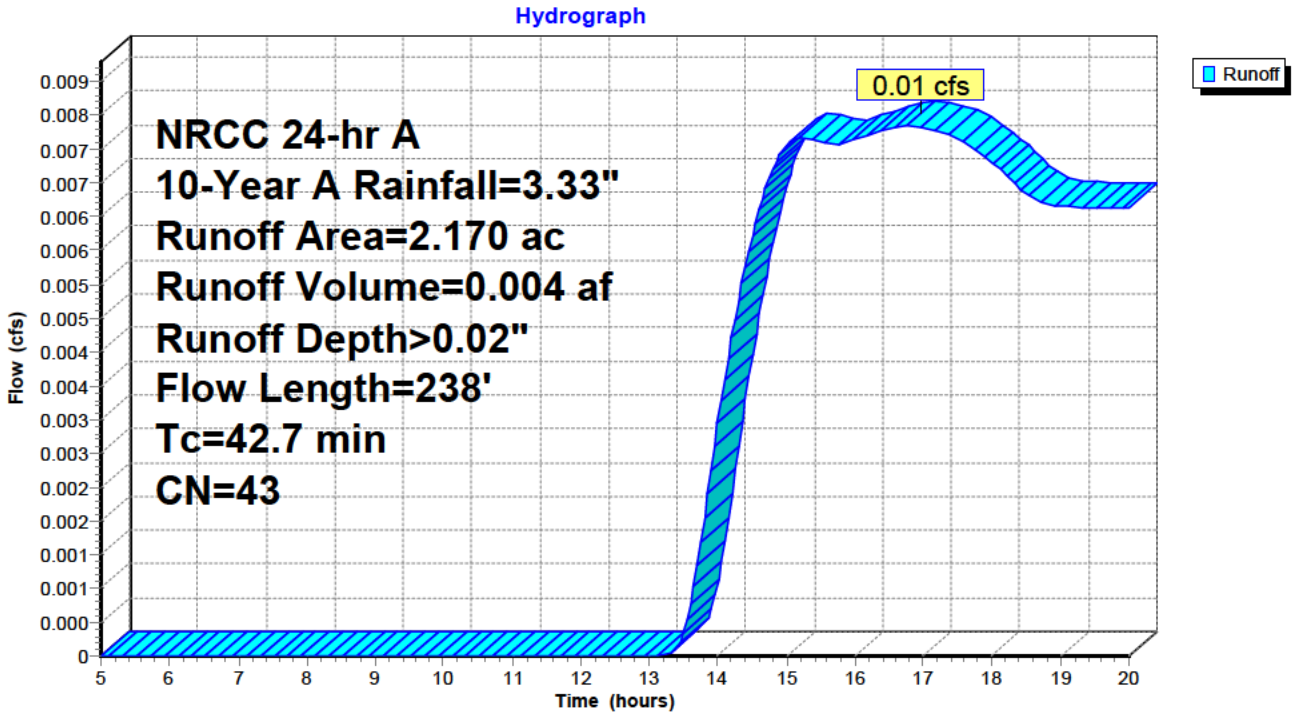
Runoff = 0.01 cfs @ 16.76 hrs, Volume= 0.004 af, Depth> 0.02"
Routed to Pond IB2 : EX Inf Basin #2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NRCC 24-hr A 10-Year A Rainfall=3.33"

Area (ac)	CN	Description
1.640	30	Meadow, non-grazed, HSG A
0.260	98	Paved parking, HSG A
0.270	71	Meadow, non-grazed, HSG C
2.170	43	Weighted Average
1.910		88.02% Pervious Area
0.260		11.98% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
40.2	100	0.0065	0.04		**Sheet Flow, Lawn** Grass: Bermuda n= 0.410 P2= 2.33"
2.5	138	0.0170	0.91		**Shallow Concentrated Flow, Lawn** Short Grass Pasture Kv= 7.0 fps
42.7	238	Total			

Subcatchment 2: EX DA #2



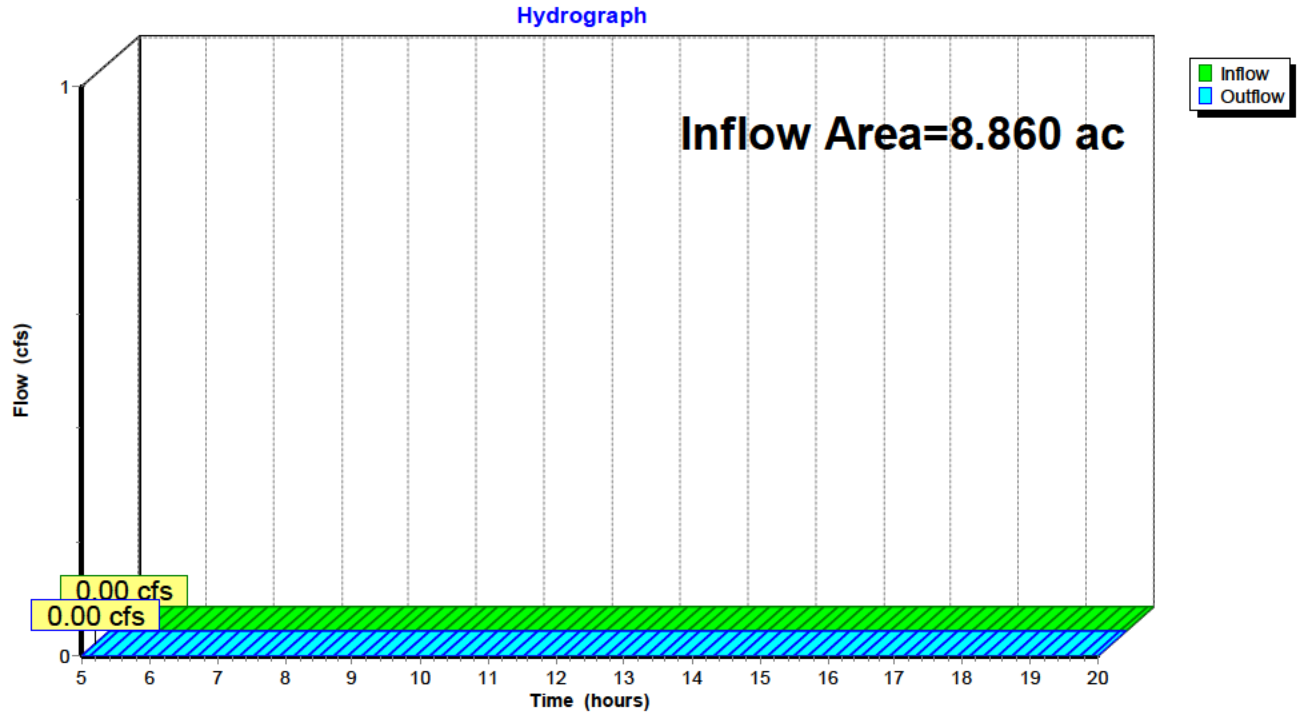
Summary for Reach DP: Design Point

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 8.860 ac, 29.68% Impervious, Inflow Depth = 0.00" for 10-Year A event
Inflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
Outflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach DP: Design Point



Summary for Pond IB1: EX Inf Basin #1

Inflow Area = 6.690 ac, 35.43% Impervious, Inflow Depth > 0.22" for 10-Year A event
Inflow = 0.61 cfs @ 12.79 hrs, Volume= 0.121 af
Outflow = 0.34 cfs @ 13.65 hrs, Volume= 0.115 af, Atten= 45%, Lag= 51.6 min
Discarded = 0.34 cfs @ 13.65 hrs, Volume= 0.115 af
Primary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
Routed to Reach DP : Design Point

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 397.57' @ 13.65 hrs Surf.Area= 2,397 sf Storage= 1,208 cf

Plug-Flow detention time= 55.8 min calculated for 0.115 af (95% of inflow)
Center-of-Mass det. time= 40.3 min (925.7 - 885.4)

Volume	Invert	Avail.Storage	Storage Description
#1	397.00'	20,048 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

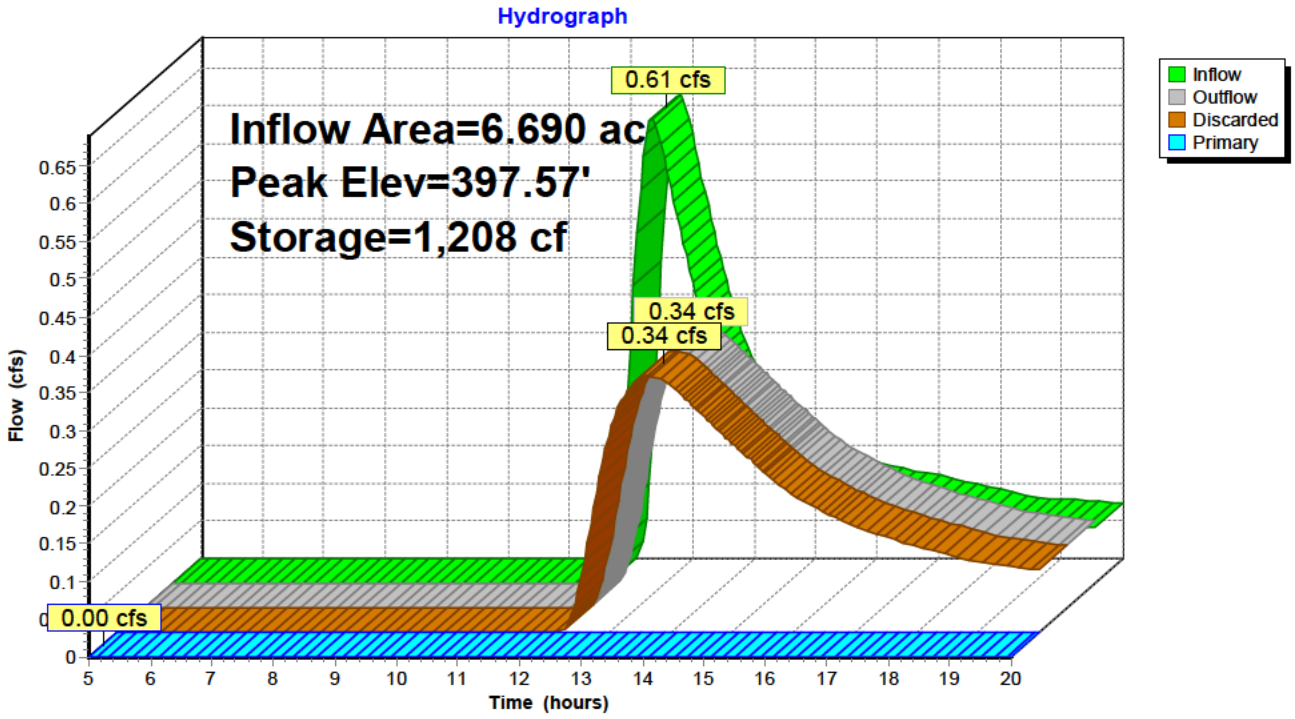
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
397.00	1,835	0	0
398.00	2,820	2,328	2,328
399.00	3,745	3,283	5,610
400.00	5,065	4,405	10,015
401.00	15,000	10,033	20,048

Device	Routing	Invert	Outlet Devices
#1	Discarded	397.00'	**25.000 in/hr Exfiltration over Surface area above 397.00'** Conductivity to Groundwater Elevation = 391.21' Excluded Surface area = 1,835 sf
#2	Primary	397.79'	**18.0" Round Culvert** L= 18.5' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 397.79' / 397.43' S= 0.0195 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf
#3	Device 2	398.11'	**8.0" Round Culvert** L= 6.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 398.11' / 398.05' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.35 sf
#4	Device 2	399.41'	**18.0" W x 12.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#5	Device 2	400.64'	**24.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.34 cfs @ 13.65 hrs HW=397.57' (Free Discharge)
└**1=Exfiltration** (Controls 0.34 cfs)

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=397.00' (Free Discharge)
└**2=Culvert** (Controls 0.00 cfs)
  └**3=Culvert** (Controls 0.00 cfs)
  └**4=Orifice/Grate** (Controls 0.00 cfs)
  └**5=Orifice/Grate** (Controls 0.00 cfs)

Pond IB1: EX Inf Basin #1



Summary for Pond IB2: EX Inf Basin #2

Inflow Area = 2.170 ac, 11.98% Impervious, Inflow Depth > 0.02" for 10-Year A event
Inflow = 0.01 cfs @ 16.76 hrs, Volume= 0.004 af
Outflow = 0.01 cfs @ 16.83 hrs, Volume= 0.004 af, Atten= 0%, Lag= 4.2 min
Discarded = 0.01 cfs @ 16.83 hrs, Volume= 0.004 af
Primary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
Routed to Reach DP : Design Point

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 399.02' @ 16.83 hrs Surf.Area= 56 sf Storage= 1 cf

Plug-Flow detention time= 2.0 min calculated for 0.004 af (99% of inflow)
Center-of-Mass det. time= 1.1 min (1,018.8 - 1,017.7)

Volume	Invert	Avail.Storage	Storage Description
#1	399.00'	4,839 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

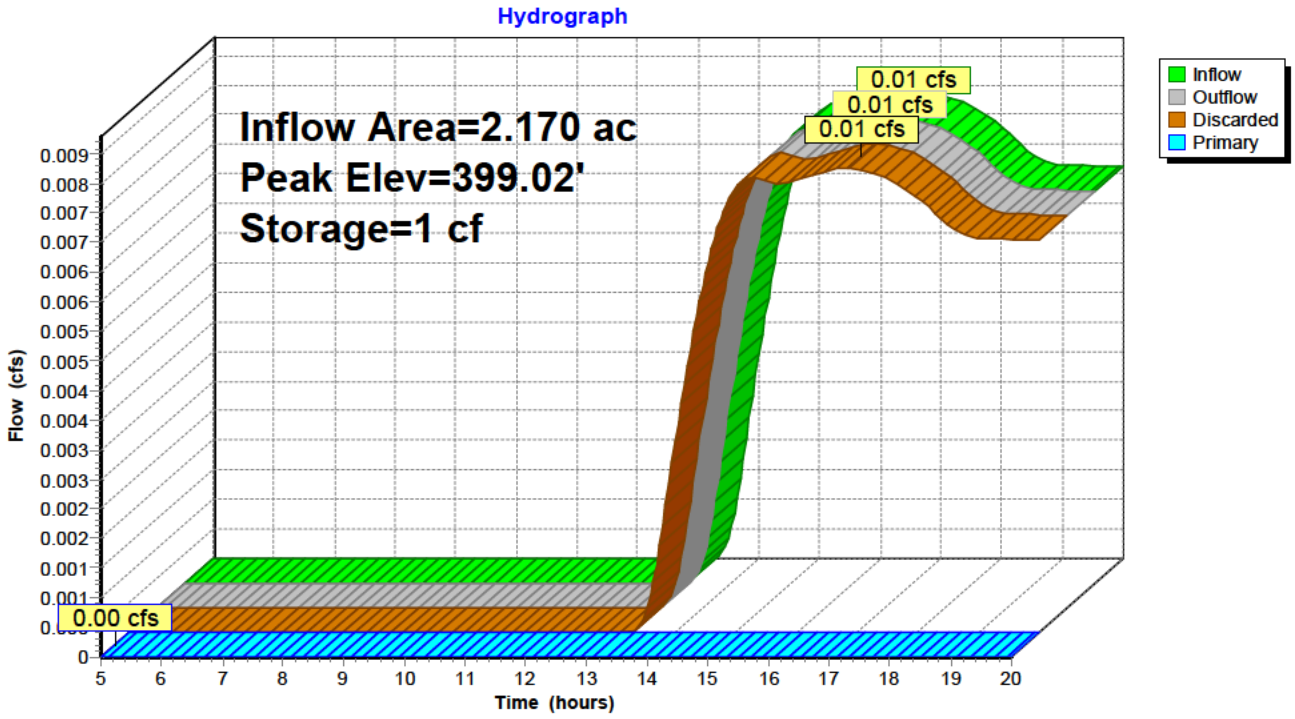
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
399.00	42	0	0
400.00	850	446	446
401.00	1,730	1,290	1,736
402.00	4,475	3,103	4,839

Device	Routing	Invert	Outlet Devices
#1	Discarded	399.00'	**25.000 in/hr Exfiltration over Surface area above 399.00'** Conductivity to Groundwater Elevation = 391.21' Excluded Surface area = 42 sf
#2	Primary	401.35'	**15.0" Round Culvert** L= 25.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 401.35' / 401.30' S= 0.0020 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf
#3	Primary	401.35'	**15.0" Round Culvert** L= 25.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 401.35' / 401.30' S= 0.0020 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf
#4	Primary	401.35'	**15.0" Round Culvert** L= 25.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 401.35' / 401.30' S= 0.0020 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf

Discarded OutFlow Max=0.01 cfs @ 16.83 hrs HW=399.02' (Free Discharge)
└**1=Exfiltration** (Controls 0.01 cfs)

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=399.00' (Free Discharge)
├**2=Culvert** (Controls 0.00 cfs)
├**3=Culvert** (Controls 0.00 cfs)
└**4=Culvert** (Controls 0.00 cfs)

Pond IB2: EX Inf Basin #2



Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 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 1: EX DA #1 Runoff Area=6.690 ac 35.43% Impervious Runoff Depth>1.06"
Flow Length=450' Tc=36.3 min CN=54 Runoff=4.79 cfs 0.592 af

Subcatchment 2: EX DA #2 Runoff Area=2.170 ac 11.98% Impervious Runoff Depth>0.44"
Flow Length=238' Tc=42.7 min CN=43 Runoff=0.42 cfs 0.079 af

Reach DP: Design Point Inflow=1.45 cfs 0.147 af
Outflow=1.45 cfs 0.147 af

Pond IB1: EX Inf Basin #1 Peak Elev=399.21' Storage=6,416 cf Inflow=4.79 cfs 0.592 af
Discarded=1.47 cfs 0.424 af Primary=1.45 cfs 0.147 af Outflow=2.92 cfs 0.571 af

Pond IB2: EX Inf Basin #2 Peak Elev=399.73' Storage=247 cf Inflow=0.42 cfs 0.079 af
Discarded=0.36 cfs 0.079 af Primary=0.00 cfs 0.000 af Outflow=0.36 cfs 0.079 af

Total Runoff Area = 8.860 ac Runoff Volume = 0.671 af Average Runoff Depth = 0.91"
70.32% Pervious = 6.230 ac 29.68% Impervious = 2.630 ac

Summary for Subcatchment 1: EX DA #1

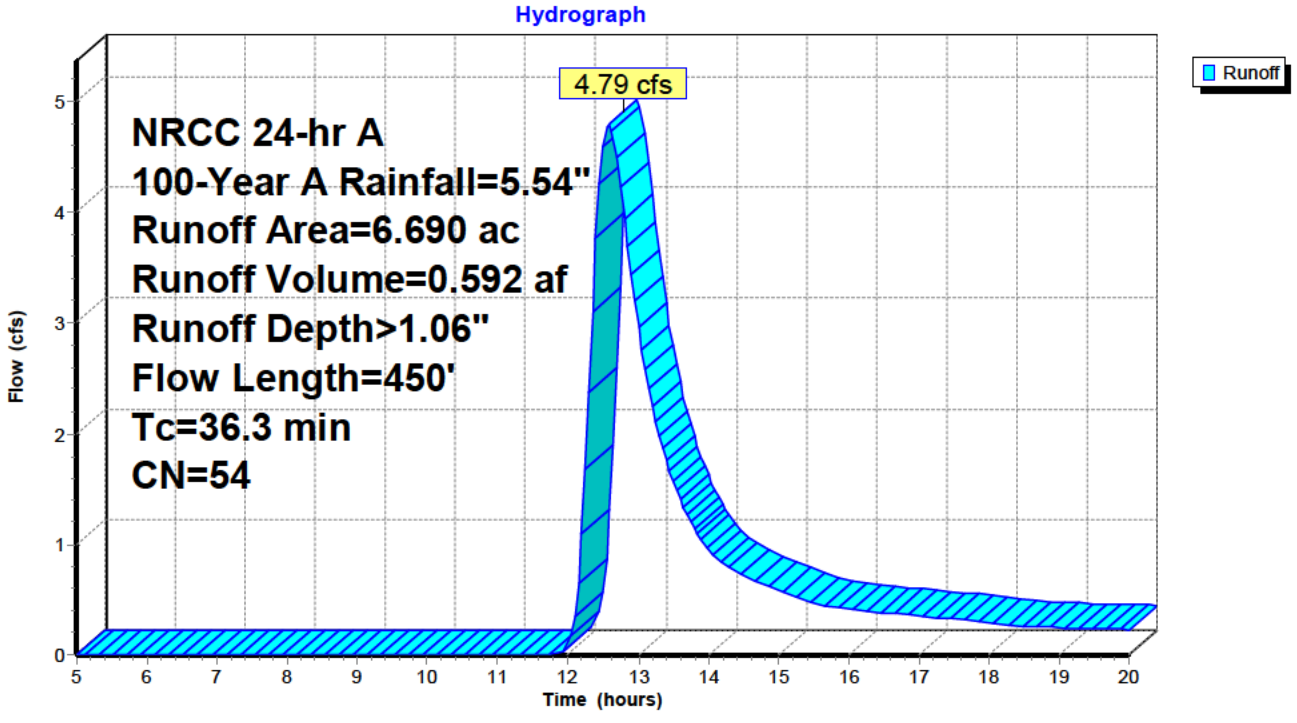
Runoff = 4.79 cfs @ 12.58 hrs, Volume= 0.592 af, Depth> 1.06"
Routed to Pond IB1 : EX Inf Basin #1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NRCC 24-hr A 100-Year A Rainfall=5.54"

Area (ac)	CN	Description
4.320	30	Meadow, non-grazed, HSG A
2.370	98	Paved parking, HSG A
6.690	54	Weighted Average
4.320		64.57% Pervious Area
2.370		35.43% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
28.8	100	0.0150	0.06		**Sheet Flow, Lawn** Grass: Bermuda n= 0.410 P2= 2.33"
7.5	350	0.0125	0.78		**Shallow Concentrated Flow, Lawn** Short Grass Pasture Kv= 7.0 fps
36.3	450	Total			

Subcatchment 1: EX DA #1



Summary for Subcatchment 2: EX DA #2

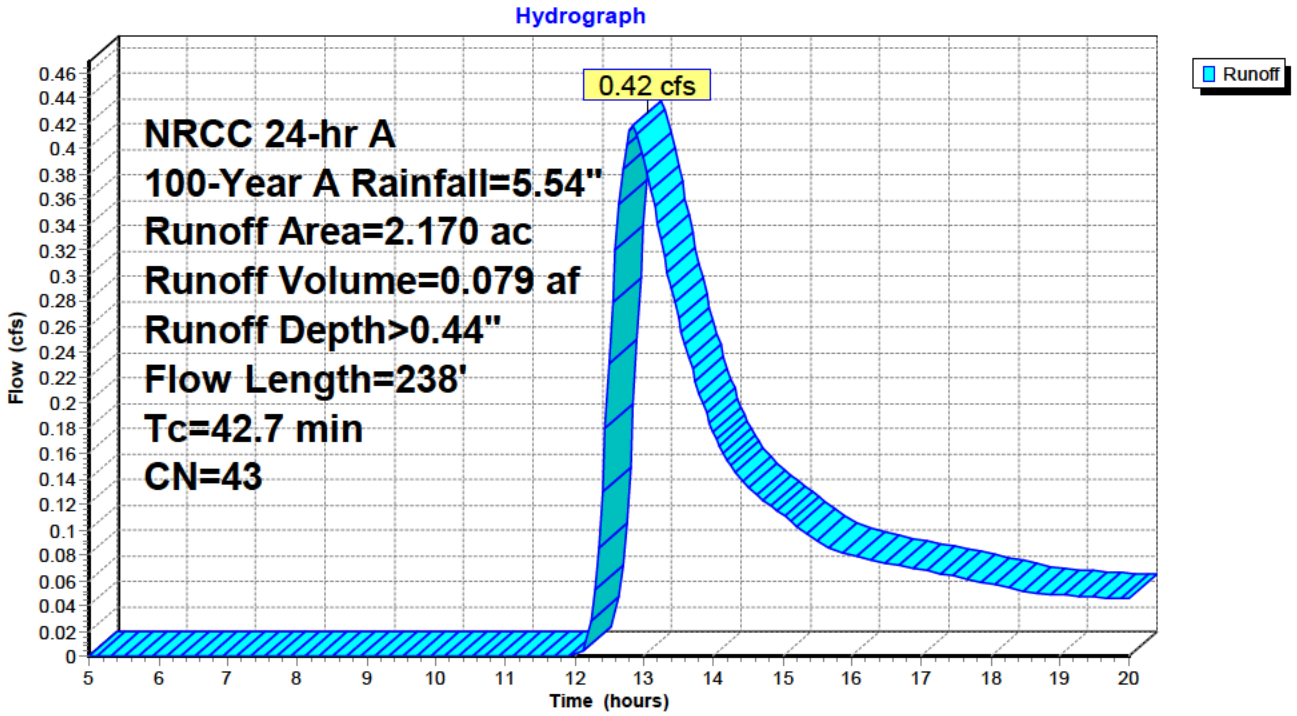
Runoff = 0.42 cfs @ 12.84 hrs, Volume= 0.079 af, Depth> 0.44"
Routed to Pond IB2 : EX Inf Basin #2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NRCC 24-hr A 100-Year A Rainfall=5.54"

Area (ac)	CN	Description
1.640	30	Meadow, non-grazed, HSG A
0.260	98	Paved parking, HSG A
0.270	71	Meadow, non-grazed, HSG C
2.170	43	Weighted Average
1.910		88.02% Pervious Area
0.260		11.98% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
40.2	100	0.0065	0.04		**Sheet Flow, Lawn** Grass: Bermuda n= 0.410 P2= 2.33"
2.5	138	0.0170	0.91		**Shallow Concentrated Flow, Lawn** Short Grass Pasture Kv= 7.0 fps
42.7	238	Total			

Subcatchment 2: EX DA #2



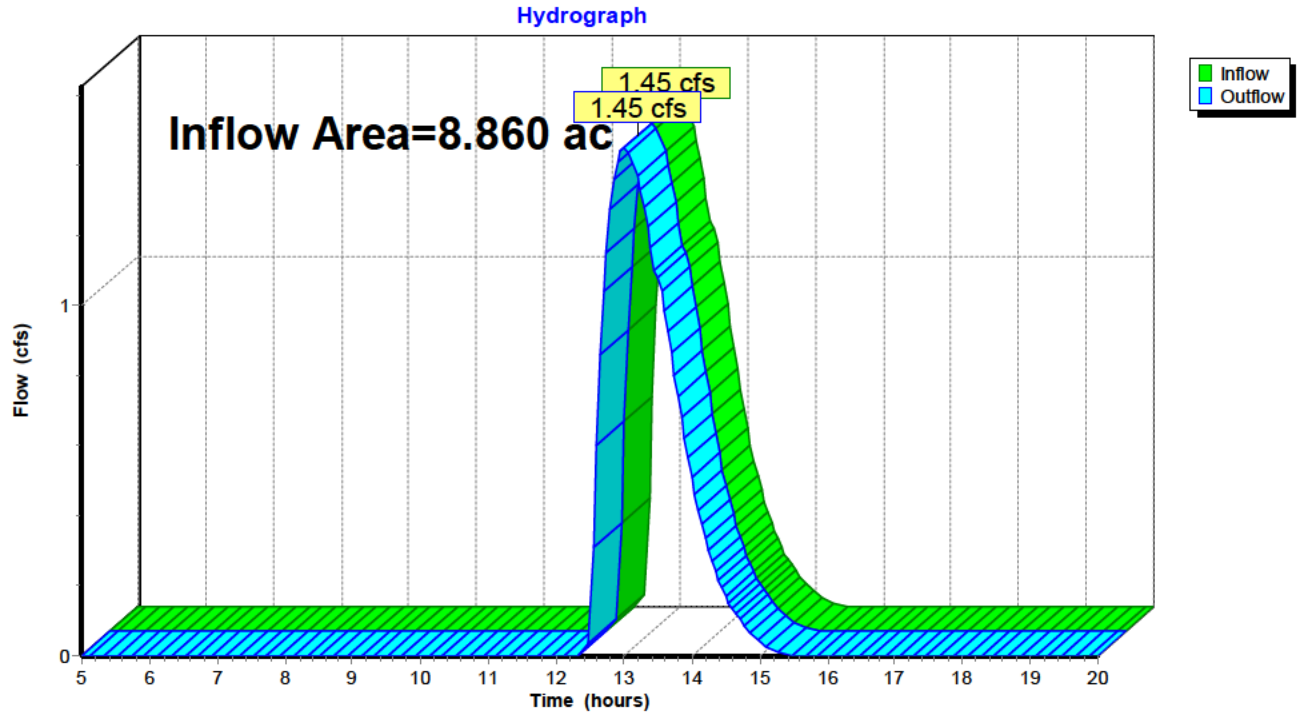
Summary for Reach DP: Design Point

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 8.860 ac, 29.68% Impervious, Inflow Depth = 0.20" for 100-Year A event
Inflow = 1.45 cfs @ 13.01 hrs, Volume= 0.147 af
Outflow = 1.45 cfs @ 13.01 hrs, Volume= 0.147 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach DP: Design Point



Summary for Pond IB1: EX Inf Basin #1

Inflow Area = 6.690 ac, 35.43% Impervious, Inflow Depth > 1.06" for 100-Year A event
Inflow = 4.79 cfs @ 12.58 hrs, Volume= 0.592 af
Outflow = 2.92 cfs @ 13.01 hrs, Volume= 0.571 af, Atten= 39%, Lag= 25.8 min
Discarded = 1.47 cfs @ 13.01 hrs, Volume= 0.424 af
Primary = 1.45 cfs @ 13.01 hrs, Volume= 0.147 af
Routed to Reach DP : Design Point

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 399.21' @ 13.01 hrs Surf.Area= 4,019 sf Storage= 6,416 cf

Plug-Flow detention time= 48.1 min calculated for 0.569 af (96% of inflow)
Center-of-Mass det. time= 36.2 min (879.6 - 843.5)

Volume	Invert	Avail.Storage	Storage Description
#1	397.00'	20,048 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

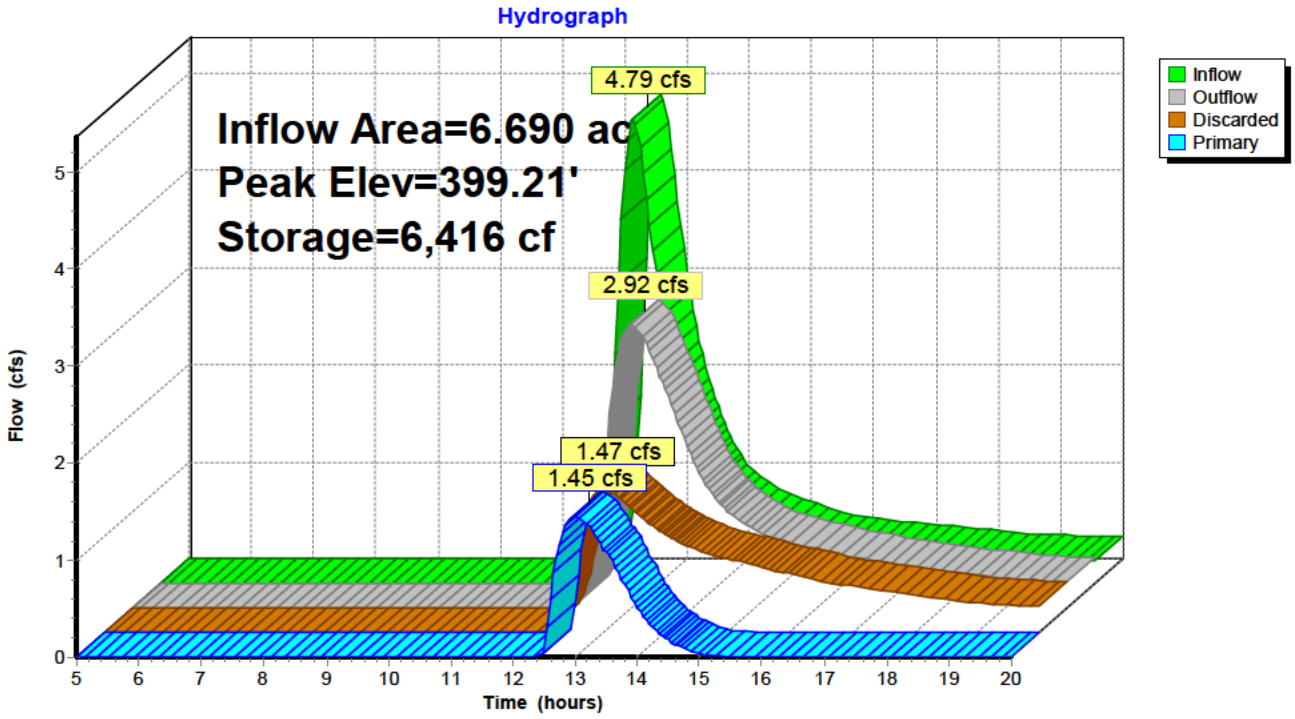
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
397.00	1,835	0	0
398.00	2,820	2,328	2,328
399.00	3,745	3,283	5,610
400.00	5,065	4,405	10,015
401.00	15,000	10,033	20,048

Device	Routing	Invert	Outlet Devices
#1	Discarded	397.00'	**25.000 in/hr Exfiltration over Surface area above 397.00'** Conductivity to Groundwater Elevation = 391.21' Excluded Surface area = 1,835 sf
#2	Primary	397.79'	**18.0" Round Culvert** L= 18.5' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 397.79' / 397.43' S= 0.0195 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf
#3	Device 2	398.11'	**8.0" Round Culvert** L= 6.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 398.11' / 398.05' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.35 sf
#4	Device 2	399.41'	**18.0" W x 12.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#5	Device 2	400.64'	**24.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=1.47 cfs @ 13.01 hrs HW=399.21' (Free Discharge)
└**1=Exfiltration** (Controls 1.47 cfs)

Primary OutFlow Max=1.45 cfs @ 13.01 hrs HW=399.21' (Free Discharge)
└**2=Culvert** (Passes 1.45 cfs of 6.83 cfs potential flow)
  └**3=Culvert** (Barrel Controls 1.45 cfs @ 4.16 fps)
  └**4=Orifice/Grate** (Controls 0.00 cfs)
  └**5=Orifice/Grate** (Controls 0.00 cfs)

Pond IB1: EX Inf Basin #1



Summary for Pond IB2: EX Inf Basin #2

Inflow Area = 2.170 ac, 11.98% Impervious, Inflow Depth > 0.44" for 100-Year A event
Inflow = 0.42 cfs @ 12.84 hrs, Volume= 0.079 af
Outflow = 0.36 cfs @ 13.14 hrs, Volume= 0.079 af, Atten= 14%, Lag= 17.8 min
Discarded = 0.36 cfs @ 13.14 hrs, Volume= 0.079 af
Primary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
Routed to Reach DP : Design Point

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 399.73' @ 13.14 hrs Surf.Area= 633 sf Storage= 247 cf

Plug-Flow detention time= 7.1 min calculated for 0.078 af (99% of inflow)
Center-of-Mass det. time= 6.4 min (888.0 - 881.7)

Volume	Invert	Avail.Storage	Storage Description
#1	399.00'	4,839 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
399.00	42	0	0
400.00	850	446	446
401.00	1,730	1,290	1,736
402.00	4,475	3,103	4,839

Device	Routing	Invert	Outlet Devices
#1	Discarded	399.00'	**25.000 in/hr Exfiltration over Surface area above 399.00'** Conductivity to Groundwater Elevation = 391.21' Excluded Surface area = 42 sf
#2	Primary	401.35'	**15.0" Round Culvert** L= 25.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 401.35' / 401.30' S= 0.0020 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf
#3	Primary	401.35'	**15.0" Round Culvert** L= 25.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 401.35' / 401.30' S= 0.0020 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf
#4	Primary	401.35'	**15.0" Round Culvert** L= 25.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 401.35' / 401.30' S= 0.0020 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf

Discarded OutFlow Max=0.36 cfs @ 13.14 hrs HW=399.73' (Free Discharge)
└**1=Exfiltration** (Controls 0.36 cfs)

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=399.00' (Free Discharge)
├**2=Culvert** (Controls 0.00 cfs)
├**3=Culvert** (Controls 0.00 cfs)
└**4=Culvert** (Controls 0.00 cfs)

Pond IB2: EX Inf Basin #2

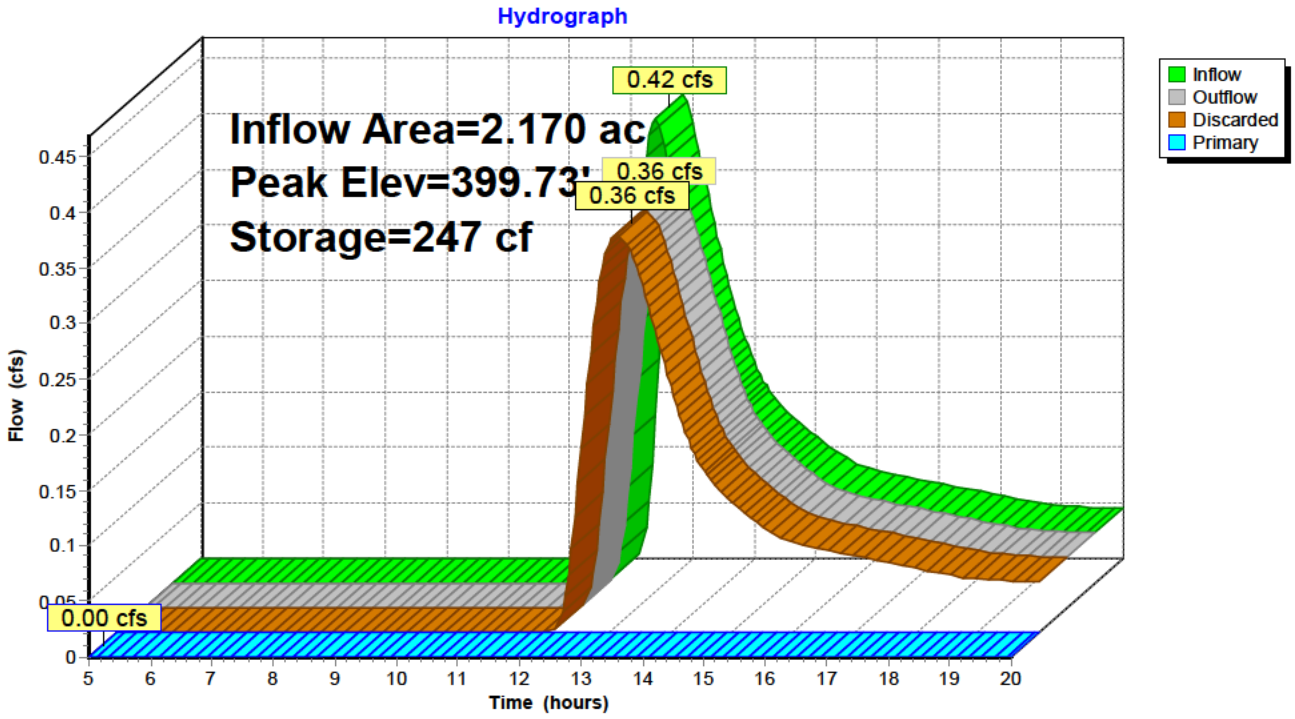


TABLE OF CONTENTS

Project Reports
1 Routing Diagram
2 Rainfall Events Listing (selected events)
3 Area Listing (all nodes)
4 Soil Listing (all nodes)
5 Ground Covers (all nodes)
6 Pipe Listing (all nodes)

1-Year A Event
7 Node Listing
8 Subcat 1: EX DA #1
9 Subcat 2: EX DA #2
10 Reach DP: Design Point
11 Pond IB1: EX Inf Basin #1
13 Pond IB2: EX Inf Basin #2

10-Year A Event
15 Node Listing
16 Subcat 1: EX DA #1
17 Subcat 2: EX DA #2
18 Reach DP: Design Point
19 Pond IB1: EX Inf Basin #1
21 Pond IB2: EX Inf Basin #2

100-Year A Event
23 Node Listing
24 Subcat 1: EX DA #1
25 Subcat 2: EX DA #2
26 Reach DP: Design Point
27 Pond IB1: EX Inf Basin #1
29 Pond IB2: EX Inf Basin #2

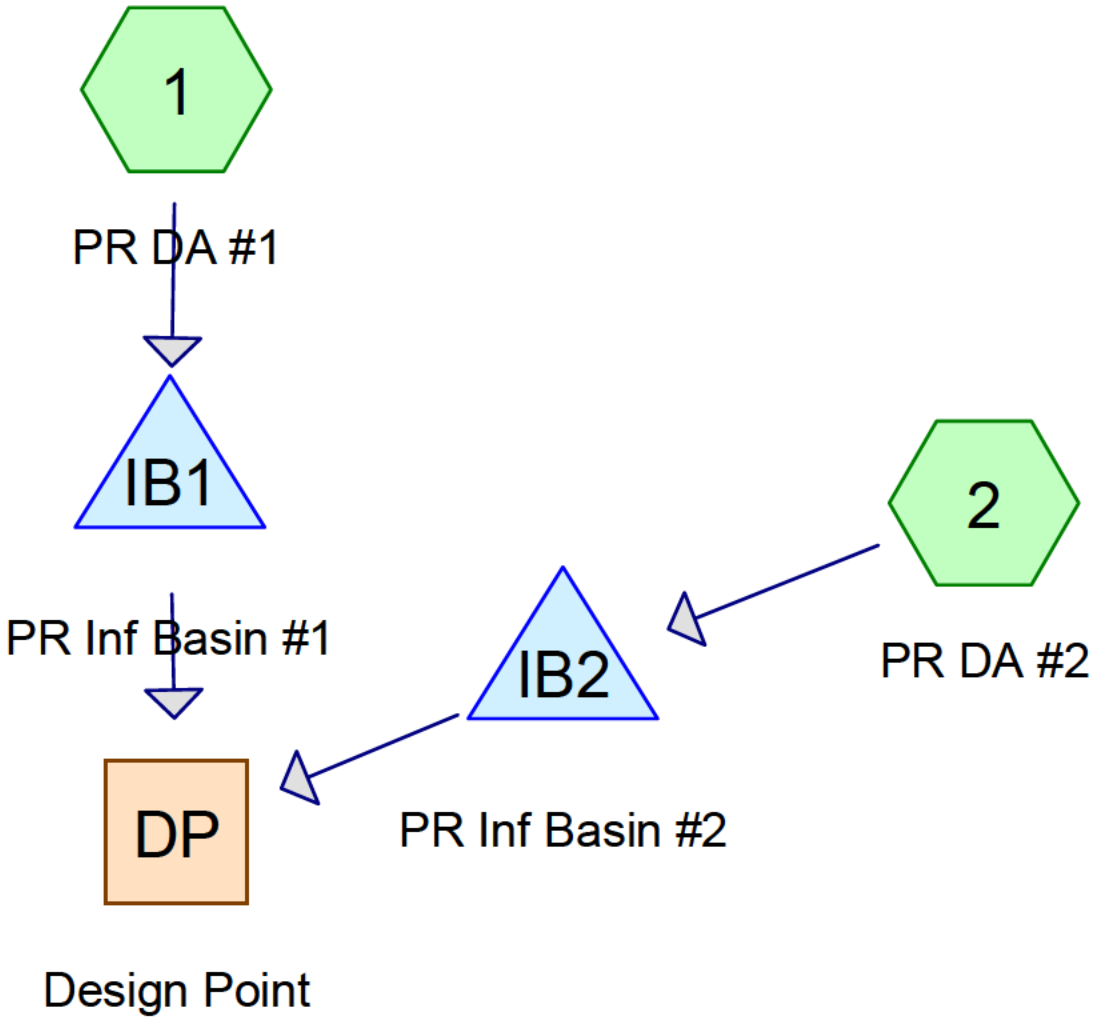
Page left intentionally blank for duplex printing

Appendix F

Post Development Drainage Conditions (Hydrocad)

Aubertine and Currier Architects, Engineers and Land Surveyors, PLLC
522 Bradley Street, Watertown, New York 13601 TELE: (315) 782-2005 FAX: (315) 782-1472

Page left intentionally blank for duplex printing



Subcat Reach Pond Link

Routing Diagram for 2016-033.007 Proposed
Prepared by Aubertine & Currier, PLLC, Printed 8/11/2026
HydroCAD® 10.20-7a s/n 03261 © 2025 HydroCAD Software Solutions LLC

Rainfall Events Listing (selected events)

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	1-Year A	NRCC 24-hr	A	Default	24.00	1	2.00	2
2	10-Year A	NRCC 24-hr	A	Default	24.00	1	3.33	2
3	100-Year A	NRCC 24-hr	A	Default	24.00	1	5.54	2

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
2.500	30	Meadow, non-grazed, HSG A (1, 2)
0.430	71	Meadow, non-grazed, HSG C (2)
3.590	98	Paved parking, HSG A (1, 2)
0.020	98	Paved parking, HSG C (2)
2.240	98	Roofs, HSG A (1)
0.083	98	Unconnected pavement, HSG A (1, 2)
8.863	**78**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
8.413	HSG A	1, 2
0.000	HSG B	
0.450	HSG C	2
0.000	HSG D	
0.000	Other	
8.863		**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
2.500	0.000	0.430	0.000	0.000	2.930	Meadow, non-grazed	1, 2
3.590	0.000	0.020	0.000	0.000	3.610	Paved parking	1, 2
2.240	0.000	0.000	0.000	0.000	2.240	Roofs	1
0.083	0.000	0.000	0.000	0.000	0.083	Unconnected pavement	1, 2
8.413	**0.000**	**0.450**	**0.000**	**0.000**	**8.863**	**TOTAL AREA**	

Pipe Listing (all nodes)

Line#	Node Number	In-Invert (feet)	Out-Invert (feet)	Length (feet)	Slope (ft/ft)	n	Width (inches)	Diam/Height (inches)	Inside-Fill (inches)	Node Name
1	IB1	397.79	397.43	18.5	0.0195	0.013	0.0	18.0	0.0	
2	IB1	398.11	398.05	6.0	0.0100	0.013	0.0	8.0	0.0	
3	IB2	401.23	400.87	25.0	0.0144	0.013	0.0	15.0	0.0	
4	IB2	401.06	400.85	25.0	0.0084	0.013	0.0	15.0	0.0	
5	IB2	401.17	400.96	25.0	0.0084	0.013	0.0	15.0	0.0	

Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 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 1: PR DA #1 Runoff Area=6.333 ac 75.37% Impervious Runoff Depth>0.55"
Flow Length=499' Tc=14.2 min CN=81 Runoff=4.13 cfs 0.292 af

Subcatchment 2: PR DA #2 Runoff Area=2.530 ac 45.85% Impervious Runoff Depth>0.17"
Flow Length=168' Tc=18.2 min CN=68 Runoff=0.26 cfs 0.035 af

Reach DP: Design Point Inflow=0.00 cfs 0.000 af
Outflow=0.00 cfs 0.000 af

Pond IB1: PR Inf Basin #1 Peak Elev=397.05' Storage=386 cf Inflow=4.13 cfs 0.292 af
Discarded=4.06 cfs 0.292 af Primary=0.00 cfs 0.000 af Outflow=4.06 cfs 0.292 af

Pond IB2: PR Inf Basin #2 Peak Elev=397.18' Storage=43 cf Inflow=0.26 cfs 0.035 af
Discarded=0.24 cfs 0.035 af Primary=0.00 cfs 0.000 af Outflow=0.24 cfs 0.035 af

Total Runoff Area = 8.863 ac Runoff Volume = 0.327 af Average Runoff Depth = 0.44"
33.06% Pervious = 2.930 ac 66.94% Impervious = 5.933 ac

Summary for Subcatchment 1: PR DA #1

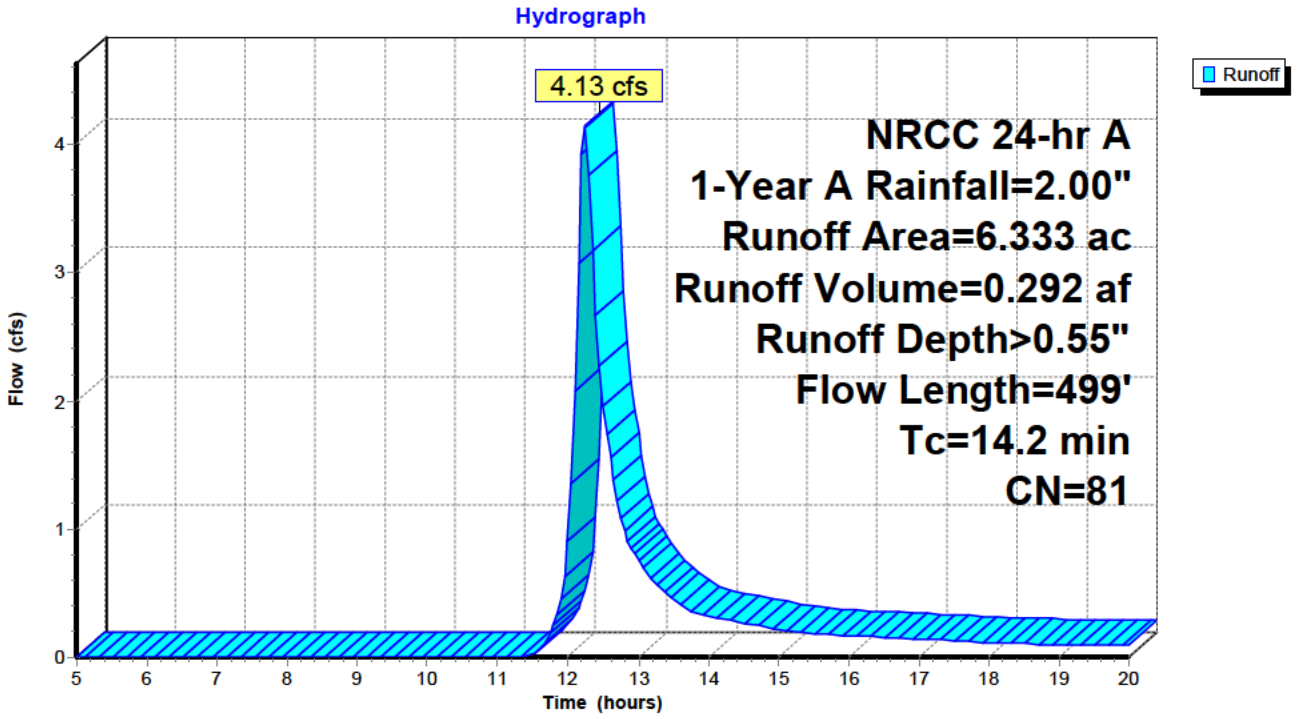
Runoff = 4.13 cfs @ 12.24 hrs, Volume= 0.292 af, Depth> 0.55"
Routed to Pond IB1 : PR Inf Basin #1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NRCC 24-hr A 1-Year A Rainfall=2.00"

Area (ac)	CN	Description
1.560	30	Meadow, non-grazed, HSG A
2.480	98	Paved parking, HSG A
2.240	98	Roofs, HSG A
0.053	98	Unconnected pavement, HSG A
6.333	81	Weighted Average
1.560		24.63% Pervious Area
4.773		75.37% Impervious Area
0.053		1.11% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.5	31	0.0210	0.05		**Sheet Flow, Lawn**
					Grass: Bermuda n= 0.410 P2= 2.50"
1.1	69	0.0181	1.08		**Sheet Flow, Concrete Walk to Asphalt Parking**
					Smooth surfaces n= 0.011 P2= 2.50"
1.7	157	0.0058	1.55		**Shallow Concentrated Flow, Asphalt Parking**
					Paved Kv= 20.3 fps
1.9	242	0.0195	2.09		**Shallow Concentrated Flow, Lawn Area to Infiltration Basin**
					Grassed Waterway Kv= 15.0 fps
14.2	499	Total			

Subcatchment 1: PR DA #1



Summary for Subcatchment 2: PR DA #2

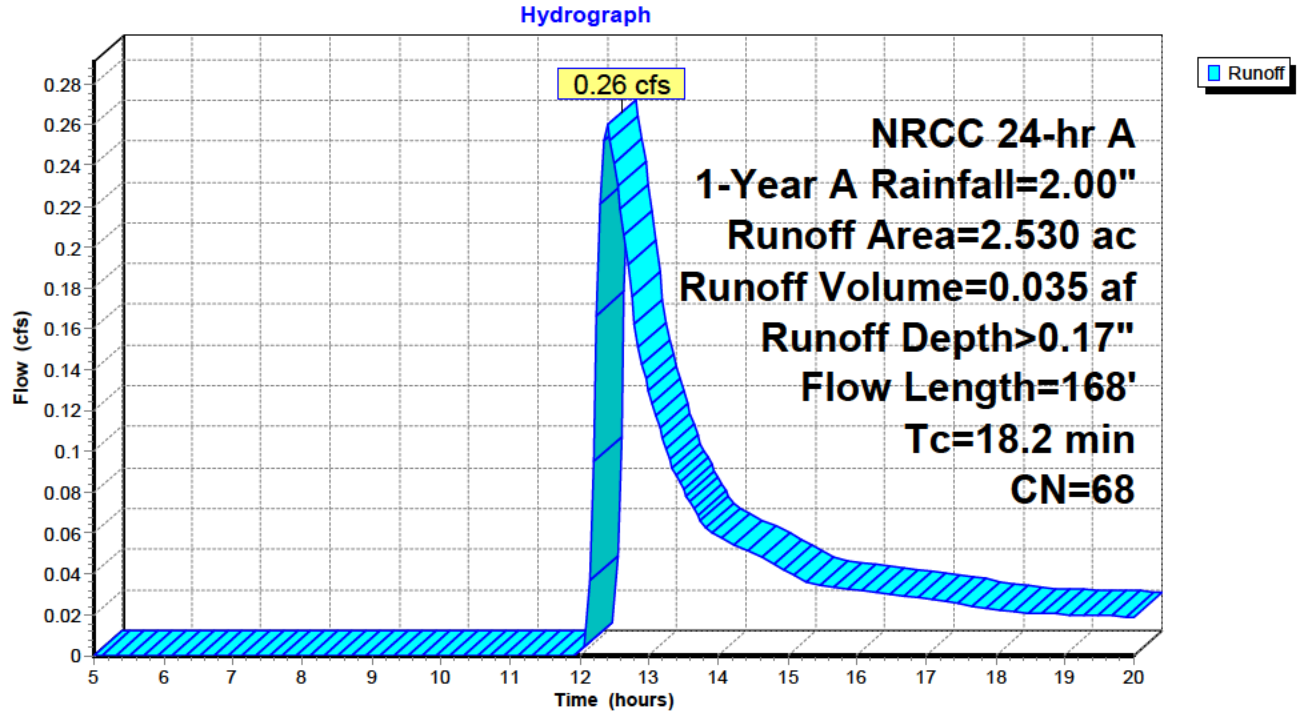
Runoff = 0.26 cfs @ 12.40 hrs, Volume= 0.035 af, Depth> 0.17"
Routed to Pond IB2 : PR Inf Basin #2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NRCC 24-hr A 1-Year A Rainfall=2.00"

Area (ac)	CN	Description
0.940	30	Meadow, non-grazed, HSG A
1.110	98	Paved parking, HSG A
0.430	71	Meadow, non-grazed, HSG C
0.020	98	Paved parking, HSG C
0.030	98	Unconnected pavement, HSG A
2.530	68	Weighted Average
1.370		54.15% Pervious Area
1.160		45.85% Impervious Area
0.030		2.59% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
17.5	100	0.0163	0.10		**Sheet Flow, Lawn** Grass: Dense n= 0.240 P2= 2.50"
0.7	68	0.0572	1.67		**Shallow Concentrated Flow, Lawn to Infiltration Basin** Short Grass Pasture Kv= 7.0 fps
18.2	168	Total			

Subcatchment 2: PR DA #2



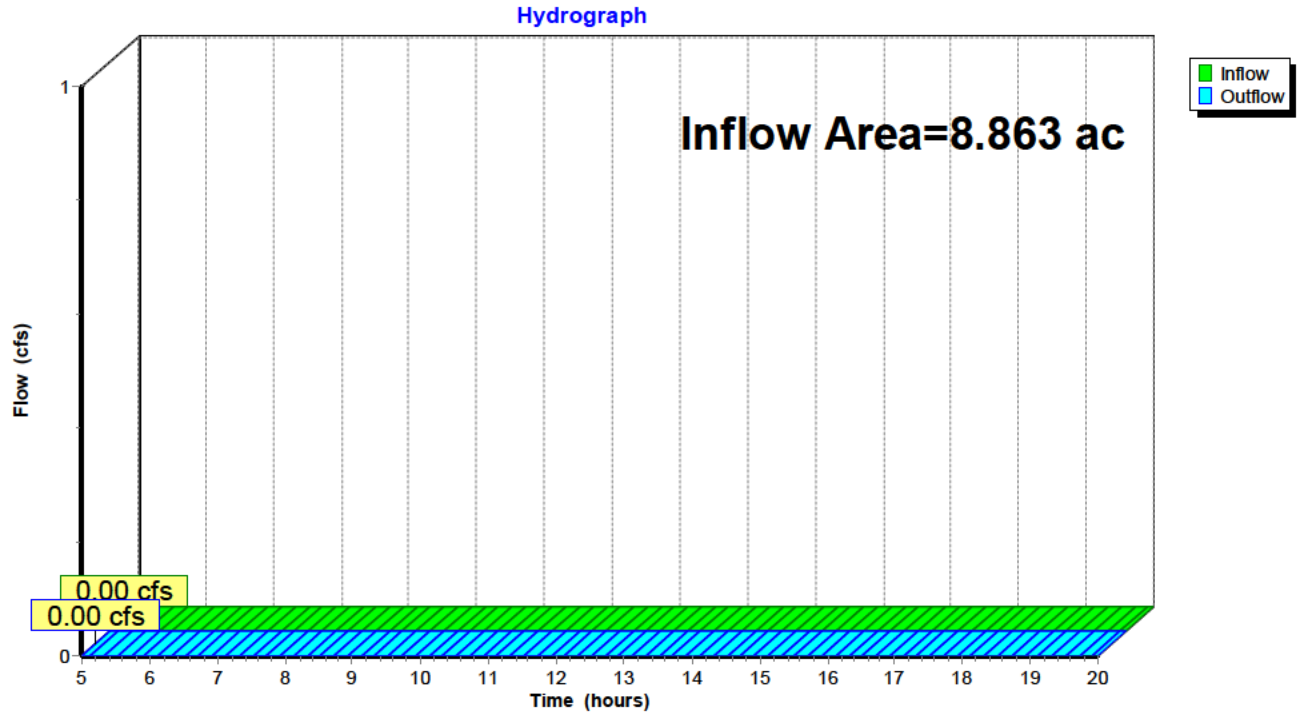
Summary for Reach DP: Design Point

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 8.863 ac, 66.94% Impervious, Inflow Depth = 0.00" for 1-Year A event
Inflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
Outflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach DP: Design Point



Summary for Pond IB1: PR Inf Basin #1

[92] Warning: Device #4 is above defined storage
[92] Warning: Device #5 is above defined storage

Inflow Area = 6.333 ac, 75.37% Impervious, Inflow Depth > 0.55" for 1-Year A event
Inflow = 4.13 cfs @ 12.24 hrs, Volume= 0.292 af
Outflow = 4.06 cfs @ 12.27 hrs, Volume= 0.292 af, Atten= 2%, Lag= 1.6 min
Discarded = 4.06 cfs @ 12.27 hrs, Volume= 0.292 af
Primary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
Routed to Reach DP : Design Point

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 397.05' @ 12.27 hrs Surf.Area= 7,433 sf Storage= 386 cf

Plug-Flow detention time= 1.6 min calculated for 0.292 af (100% of inflow)
Center-of-Mass det. time= 1.3 min (815.6 - 814.3)

Volume	Invert	Avail.Storage	Storage Description
#1	397.00'	21,878 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

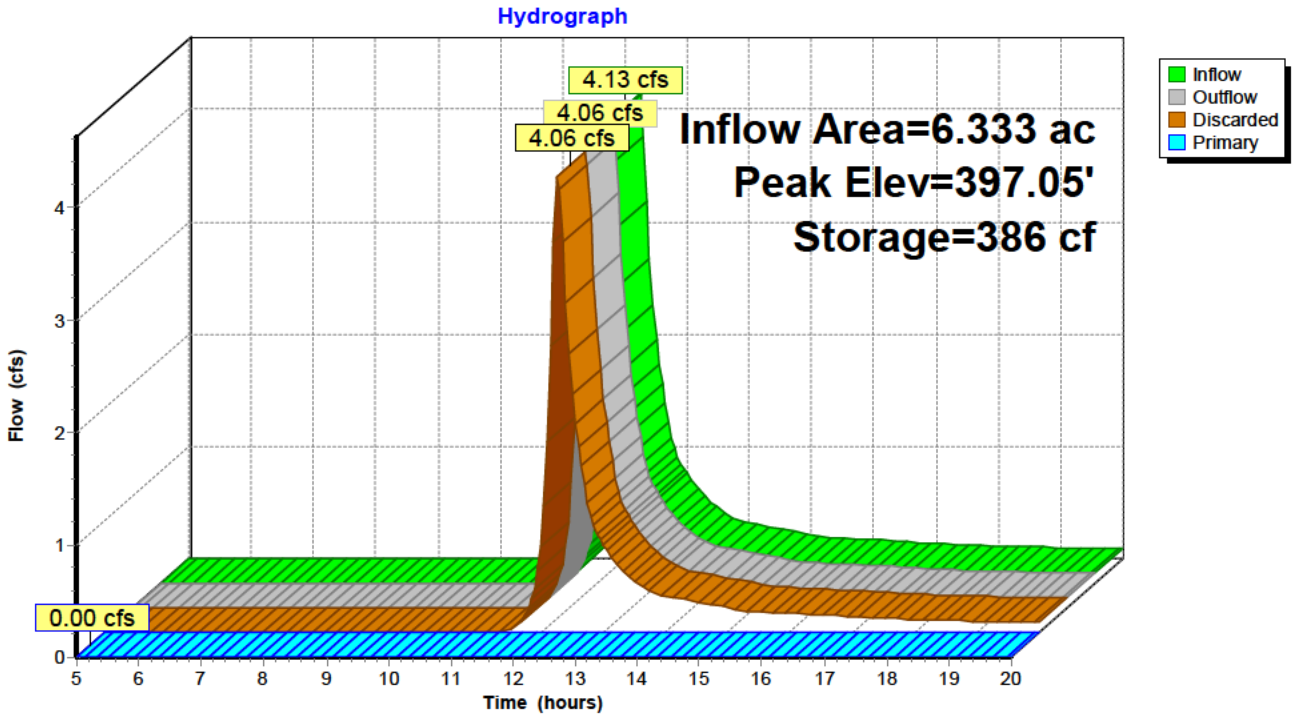
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
397.00	7,241	0	0
398.00	10,888	9,065	9,065
399.00	14,738	12,813	21,878

Device	Routing	Invert	Outlet Devices
#1	Discarded	397.00'	**25.000 in/hr Exfiltration over Surface area above 396.66'** Conductivity to Groundwater Elevation = 391.21' Excluded Surface area = 0 sf
#2	Primary	397.79'	**18.0" Round Culvert** L= 18.5' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 397.79' / 397.43' S= 0.0195 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf
#3	Device 2	398.11'	**8.0" Round Culvert** L= 6.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 398.11' / 398.05' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.35 sf
#4	Device 2	399.41'	**18.0" W x 12.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#5	Device 2	400.64'	**24.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=4.34 cfs @ 12.27 hrs HW=397.05' (Free Discharge)
└**1=Exfiltration** (Controls 4.34 cfs)

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=397.00' (Free Discharge)
└**2=Culvert** (Controls 0.00 cfs)
  ├**3=Culvert** (Controls 0.00 cfs)
  ├**4=Orifice/Grate** (Controls 0.00 cfs)
  └**5=Orifice/Grate** (Controls 0.00 cfs)

Pond IB1: PR Inf Basin #1



Summary for Pond IB2: PR Inf Basin #2

Inflow Area = 2.530 ac, 45.85% Impervious, Inflow Depth > 0.17" for 1-Year A event
Inflow = 0.26 cfs @ 12.40 hrs, Volume= 0.035 af
Outflow = 0.24 cfs @ 12.51 hrs, Volume= 0.035 af, Atten= 7%, Lag= 6.4 min
Discarded = 0.24 cfs @ 12.51 hrs, Volume= 0.035 af
Primary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
Routed to Reach DP : Design Point

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 397.18' @ 12.51 hrs Surf.Area= 410 sf Storage= 43 cf

Plug-Flow detention time= 1.6 min calculated for 0.035 af (100% of inflow)
Center-of-Mass det. time= 1.4 min (864.2 - 862.9)

Volume	Invert	Avail.Storage	Storage Description
#1	397.00'	18,212 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

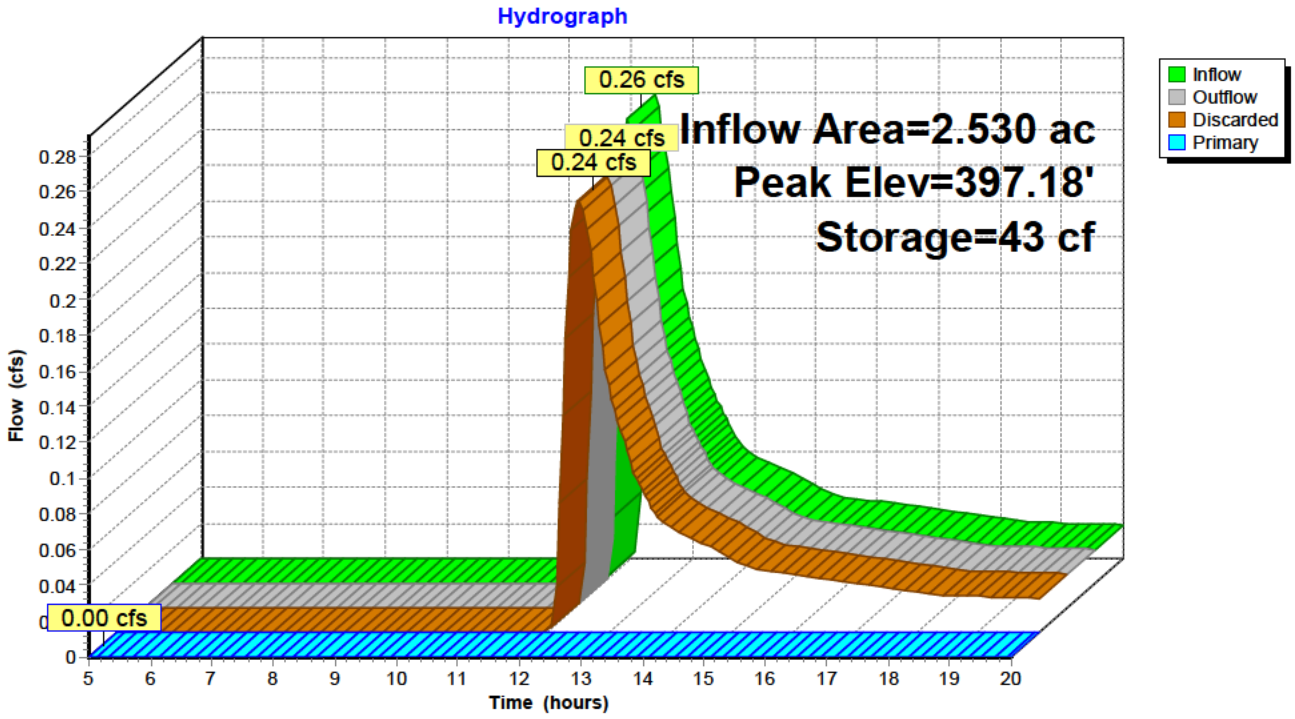
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
397.00	66	0	0
398.00	1,969	1,018	1,018
399.00	3,057	2,513	3,531
400.00	4,183	3,620	7,151
401.00	5,379	4,781	11,932
402.00	7,181	6,280	18,212

Device	Routing	Invert	Outlet Devices
#1	Discarded	397.00'	**25.000 in/hr Exfiltration over Surface area above 396.00'** Conductivity to Groundwater Elevation = 391.21' Excluded Surface area = 0 sf
#2	Primary	401.23'	**15.0" Round Culvert** L= 25.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 401.23' / 400.87' S= 0.0144 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf
#3	Primary	401.06'	**15.0" Round Culvert** L= 25.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 401.06' / 400.85' S= 0.0084 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf
#4	Primary	401.17'	**15.0" Round Culvert** L= 25.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 401.17' / 400.96' S= 0.0084 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf

Discarded OutFlow Max=0.24 cfs @ 12.51 hrs HW=397.18' (Free Discharge)
└**1=Exfiltration** (Controls 0.24 cfs)

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=397.00' (Free Discharge)
├**2=Culvert** (Controls 0.00 cfs)
├**3=Culvert** (Controls 0.00 cfs)
└**4=Culvert** (Controls 0.00 cfs)

Pond IB2: PR Inf Basin #2



Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 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 1: PR DA #1 Runoff Area=6.333 ac 75.37% Impervious Runoff Depth>1.46"
Flow Length=499' Tc=14.2 min CN=81 Runoff=11.30 cfs 0.772 af

Subcatchment 2: PR DA #2 Runoff Area=2.530 ac 45.85% Impervious Runoff Depth>0.73"
Flow Length=168' Tc=18.2 min CN=68 Runoff=1.85 cfs 0.153 af

Reach DP: Design Point Inflow=0.00 cfs 0.000 af
Outflow=0.00 cfs 0.000 af

Pond IB1: PR Inf Basin #1 Peak Elev=397.61' Storage=5,068 cf Inflow=11.30 cfs 0.772 af
Discarded=5.97 cfs 0.772 af Primary=0.00 cfs 0.000 af Outflow=5.97 cfs 0.772 af

Pond IB2: PR Inf Basin #2 Peak Elev=397.96' Storage=946 cf Inflow=1.85 cfs 0.153 af
Discarded=1.18 cfs 0.153 af Primary=0.00 cfs 0.000 af Outflow=1.18 cfs 0.153 af

Total Runoff Area = 8.863 ac Runoff Volume = 0.926 af Average Runoff Depth = 1.25"
33.06% Pervious = 2.930 ac 66.94% Impervious = 5.933 ac

Summary for Subcatchment 1: PR DA #1

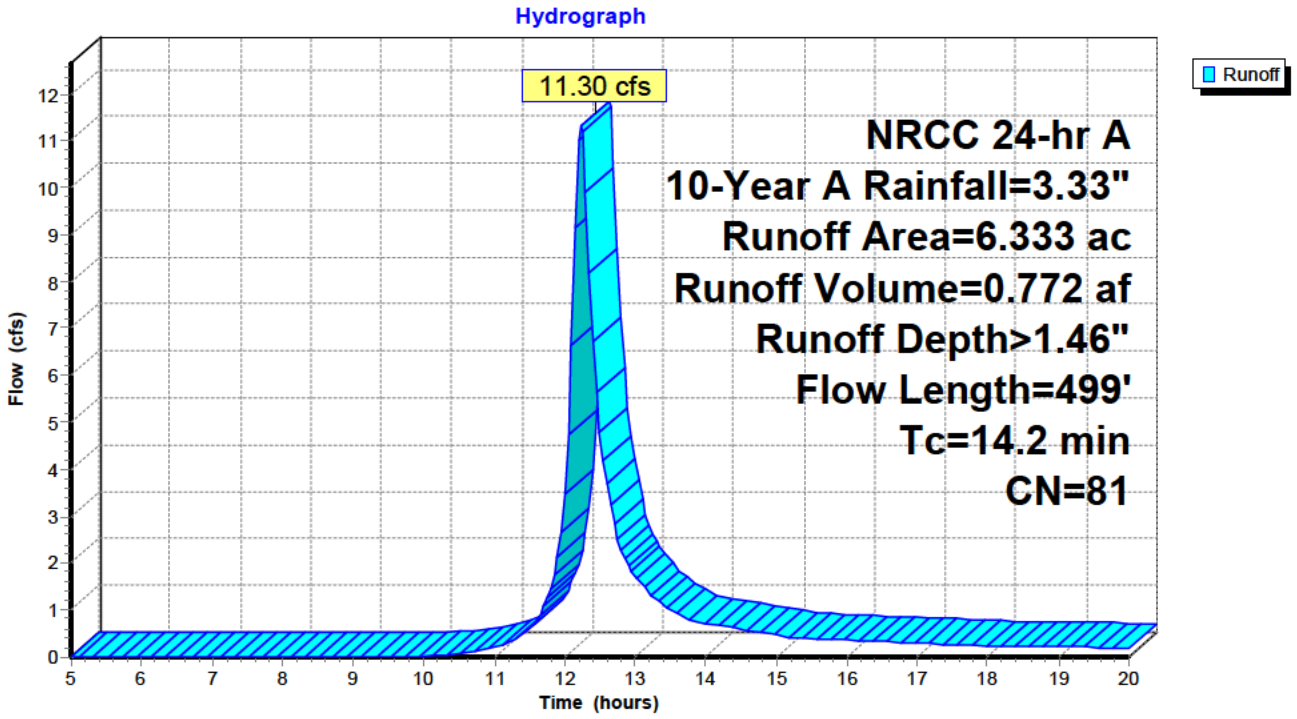
Runoff = 11.30 cfs @ 12.23 hrs, Volume= 0.772 af, Depth> 1.46"
Routed to Pond IB1 : PR Inf Basin #1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NRCC 24-hr A 10-Year A Rainfall=3.33"

Area (ac)	CN	Description
1.560	30	Meadow, non-grazed, HSG A
2.480	98	Paved parking, HSG A
2.240	98	Roofs, HSG A
0.053	98	Unconnected pavement, HSG A
6.333	81	Weighted Average
1.560		24.63% Pervious Area
4.773		75.37% Impervious Area
0.053		1.11% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.5	31	0.0210	0.05		**Sheet Flow, Lawn**
					Grass: Bermuda n= 0.410 P2= 2.50"
1.1	69	0.0181	1.08		**Sheet Flow, Concrete Walk to Asphalt Parking**
					Smooth surfaces n= 0.011 P2= 2.50"
1.7	157	0.0058	1.55		**Shallow Concentrated Flow, Asphalt Parking**
					Paved Kv= 20.3 fps
1.9	242	0.0195	2.09		**Shallow Concentrated Flow, Lawn Area to Infiltration Basin**
					Grassed Waterway Kv= 15.0 fps
14.2	499	Total			

Subcatchment 1: PR DA #1



Summary for Subcatchment 2: PR DA #2

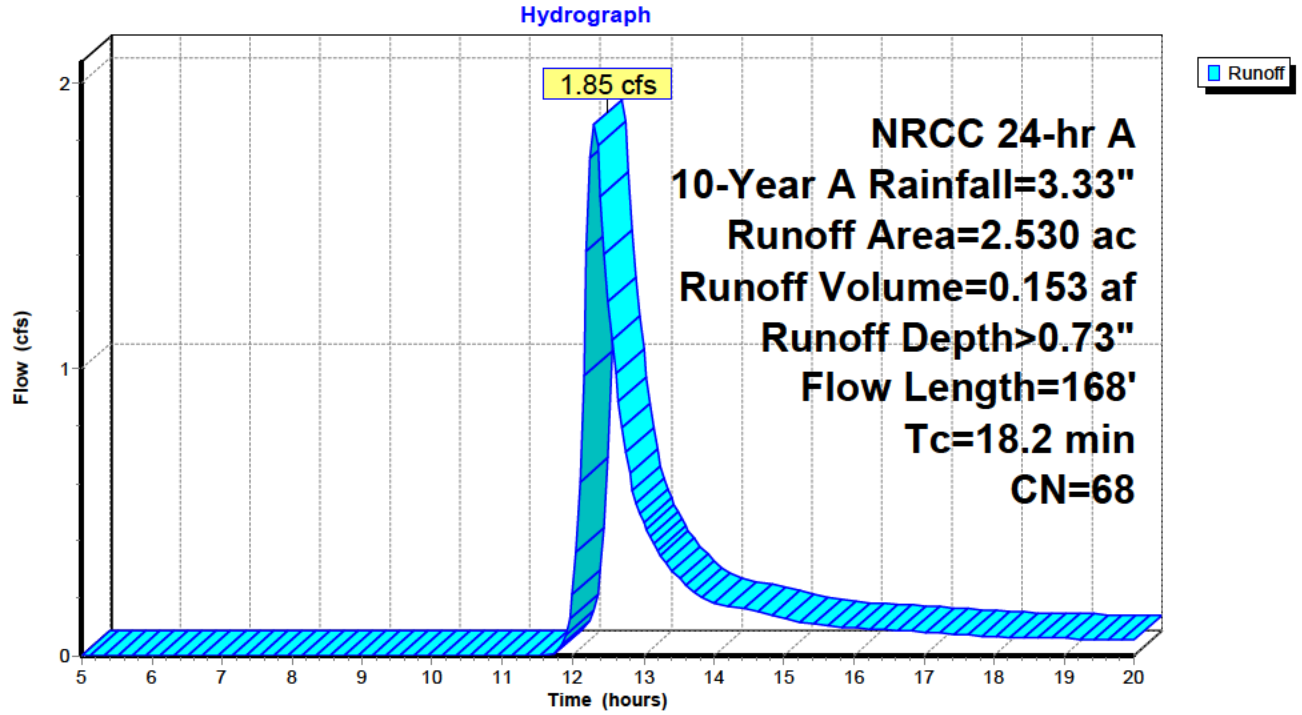
Runoff = 1.85 cfs @ 12.31 hrs, Volume= 0.153 af, Depth> 0.73"
Routed to Pond IB2 : PR Inf Basin #2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NRCC 24-hr A 10-Year A Rainfall=3.33"

Area (ac)	CN	Description
0.940	30	Meadow, non-grazed, HSG A
1.110	98	Paved parking, HSG A
0.430	71	Meadow, non-grazed, HSG C
0.020	98	Paved parking, HSG C
0.030	98	Unconnected pavement, HSG A
2.530	68	Weighted Average
1.370		54.15% Pervious Area
1.160		45.85% Impervious Area
0.030		2.59% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
17.5	100	0.0163	0.10		**Sheet Flow, Lawn** Grass: Dense n= 0.240 P2= 2.50"
0.7	68	0.0572	1.67		**Shallow Concentrated Flow, Lawn to Infiltration Basin** Short Grass Pasture Kv= 7.0 fps
18.2	168	Total			

Subcatchment 2: PR DA #2



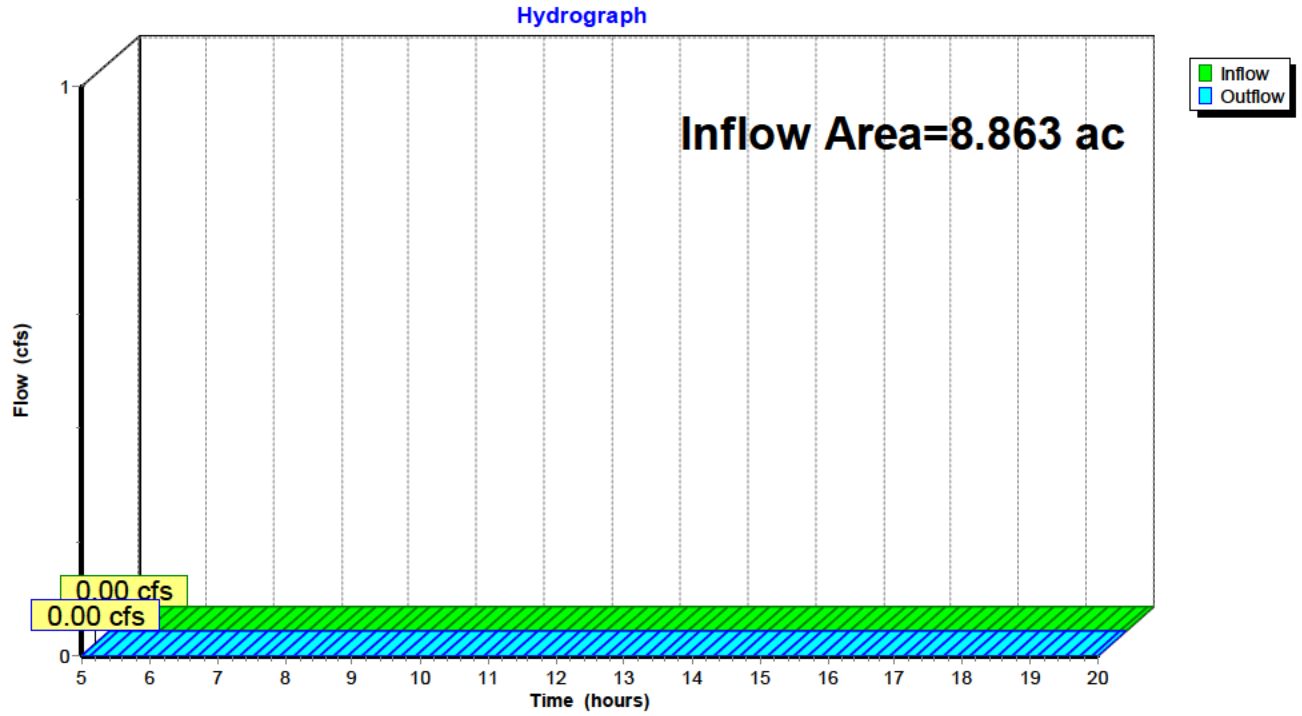
Summary for Reach DP: Design Point

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 8.863 ac, 66.94% Impervious, Inflow Depth = 0.00" for 10-Year A event
Inflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
Outflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach DP: Design Point



Summary for Pond IB1: PR Inf Basin #1

[92] Warning: Device #4 is above defined storage
[92] Warning: Device #5 is above defined storage

Inflow Area = 6.333 ac, 75.37% Impervious, Inflow Depth > 1.46" for 10-Year A event
Inflow = 11.30 cfs @ 12.23 hrs, Volume= 0.772 af
Outflow = 5.97 cfs @ 12.44 hrs, Volume= 0.772 af, Atten= 47%, Lag= 12.3 min
Discarded = 5.97 cfs @ 12.44 hrs, Volume= 0.772 af
Primary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
Routed to Reach DP : Design Point

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 397.61' @ 12.44 hrs Surf.Area= 9,455 sf Storage= 5,068 cf

Plug-Flow detention time= 5.9 min calculated for 0.772 af (100% of inflow)
Center-of-Mass det. time= 5.7 min (802.3 - 796.6)

Volume	Invert	Avail.Storage	Storage Description
#1	397.00'	21,878 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

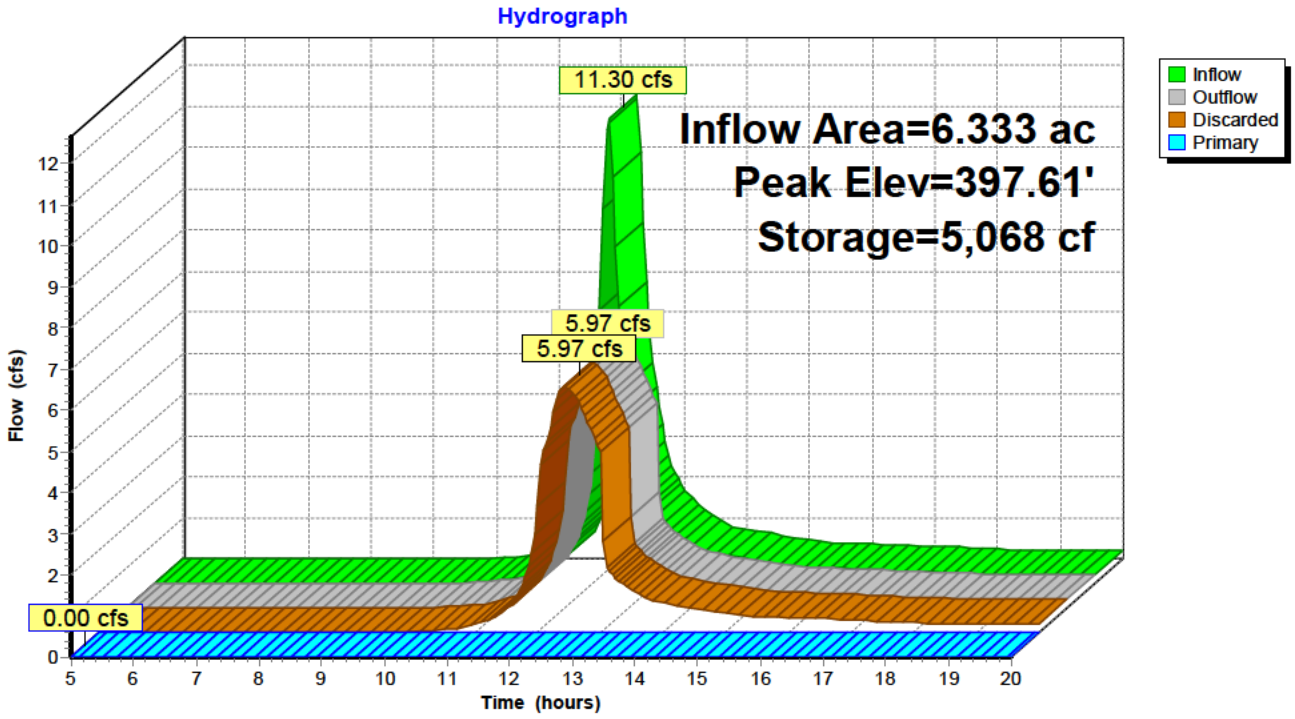
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
397.00	7,241	0	0
398.00	10,888	9,065	9,065
399.00	14,738	12,813	21,878

Device	Routing	Invert	Outlet Devices
#1	Discarded	397.00'	**25.000 in/hr Exfiltration over Surface area above 396.66'** Conductivity to Groundwater Elevation = 391.21' Excluded Surface area = 0 sf
#2	Primary	397.79'	**18.0" Round Culvert** L= 18.5' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 397.79' / 397.43' S= 0.0195 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf
#3	Device 2	398.11'	**8.0" Round Culvert** L= 6.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 398.11' / 398.05' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.35 sf
#4	Device 2	399.41'	**18.0" W x 12.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#5	Device 2	400.64'	**24.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=5.97 cfs @ 12.44 hrs HW=397.61' (Free Discharge)
└**1=Exfiltration** (Controls 5.97 cfs)

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=397.00' (Free Discharge)
└**2=Culvert** (Controls 0.00 cfs)
  ├**3=Culvert** (Controls 0.00 cfs)
  ├**4=Orifice/Grate** (Controls 0.00 cfs)
  └**5=Orifice/Grate** (Controls 0.00 cfs)

Pond IB1: PR Inf Basin #1



Summary for Pond IB2: PR Inf Basin #2

Inflow Area = 2.530 ac, 45.85% Impervious, Inflow Depth > 0.73" for 10-Year A event
Inflow = 1.85 cfs @ 12.31 hrs, Volume= 0.153 af
Outflow = 1.18 cfs @ 12.52 hrs, Volume= 0.153 af, Atten= 36%, Lag= 12.9 min
Discarded = 1.18 cfs @ 12.52 hrs, Volume= 0.153 af
Primary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
Routed to Reach DP : Design Point

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 397.96' @ 12.52 hrs Surf.Area= 1,898 sf Storage= 946 cf

Plug-Flow detention time= 7.1 min calculated for 0.153 af (100% of inflow)
Center-of-Mass det. time= 6.9 min (832.5 - 825.7)

Volume	Invert	Avail.Storage	Storage Description
#1	397.00'	18,212 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

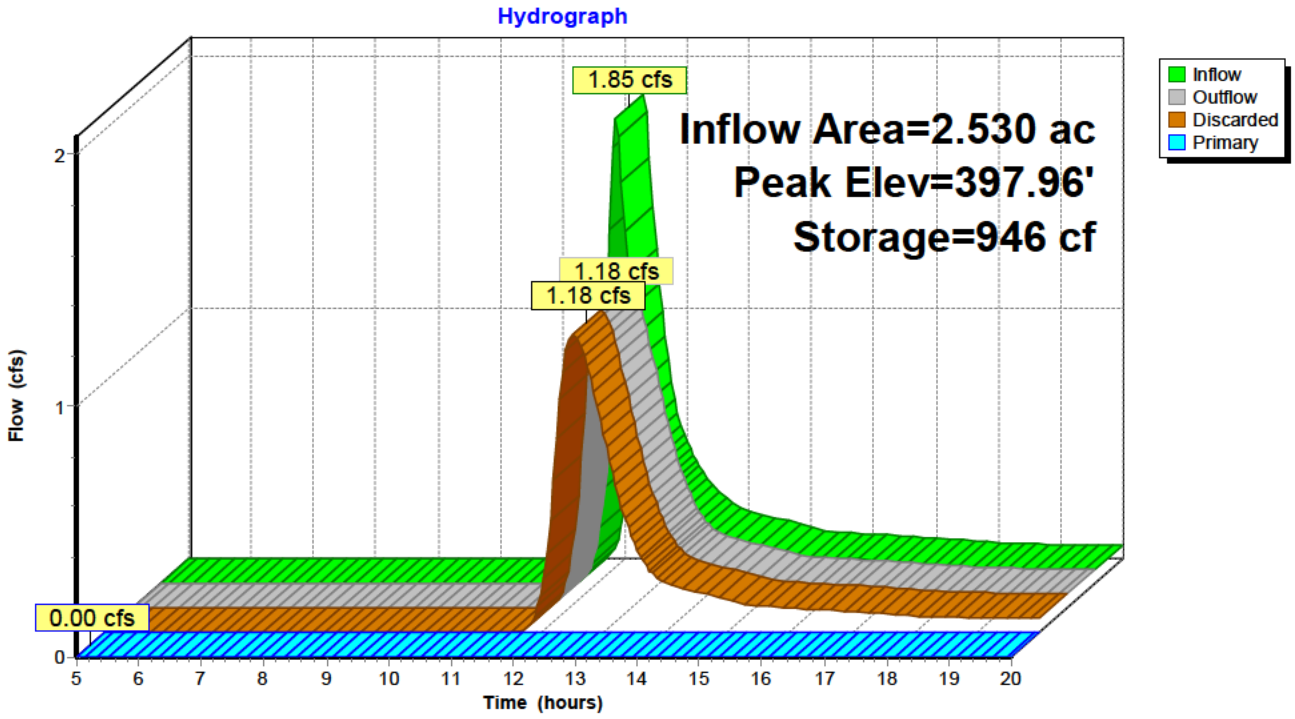
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
397.00	66	0	0
398.00	1,969	1,018	1,018
399.00	3,057	2,513	3,531
400.00	4,183	3,620	7,151
401.00	5,379	4,781	11,932
402.00	7,181	6,280	18,212

Device	Routing	Invert	Outlet Devices
#1	Discarded	397.00'	**25.000 in/hr Exfiltration over Surface area above 396.00'** Conductivity to Groundwater Elevation = 391.21' Excluded Surface area = 0 sf
#2	Primary	401.23'	**15.0" Round Culvert** L= 25.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 401.23' / 400.87' S= 0.0144 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf
#3	Primary	401.06'	**15.0" Round Culvert** L= 25.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 401.06' / 400.85' S= 0.0084 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf
#4	Primary	401.17'	**15.0" Round Culvert** L= 25.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 401.17' / 400.96' S= 0.0084 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf

Discarded OutFlow Max=1.18 cfs @ 12.52 hrs HW=397.96' (Free Discharge)
└**1=Exfiltration** (Controls 1.18 cfs)

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=397.00' (Free Discharge)
├**2=Culvert** (Controls 0.00 cfs)
├**3=Culvert** (Controls 0.00 cfs)
└**4=Culvert** (Controls 0.00 cfs)

Pond IB2: PR Inf Basin #2



Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 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 1: PR DA #1 Runoff Area=6.333 ac 75.37% Impervious Runoff Depth>3.26"
Flow Length=499' Tc=14.2 min CN=81 Runoff=24.90 cfs 1.722 af

Subcatchment 2: PR DA #2 Runoff Area=2.530 ac 45.85% Impervious Runoff Depth>2.10"
Flow Length=168' Tc=18.2 min CN=68 Runoff=5.78 cfs 0.443 af

Reach DP: Design Point Inflow=0.72 cfs 0.027 af
Outflow=0.72 cfs 0.027 af

Pond IB1: PR Inf Basin #1 Peak Elev=398.72' Storage=17,959 cf Inflow=24.90 cfs 1.722 af
Discarded=9.66 cfs 1.694 af Primary=0.72 cfs 0.027 af Outflow=10.37 cfs 1.721 af

Pond IB2: PR Inf Basin #2 Peak Elev=399.44' Storage=4,977 cf Inflow=5.78 cfs 0.443 af
Discarded=2.49 cfs 0.443 af Primary=0.00 cfs 0.000 af Outflow=2.49 cfs 0.443 af

Total Runoff Area = 8.863 ac Runoff Volume = 2.165 af Average Runoff Depth = 2.93"
33.06% Pervious = 2.930 ac 66.94% Impervious = 5.933 ac

Summary for Subcatchment 1: PR DA #1

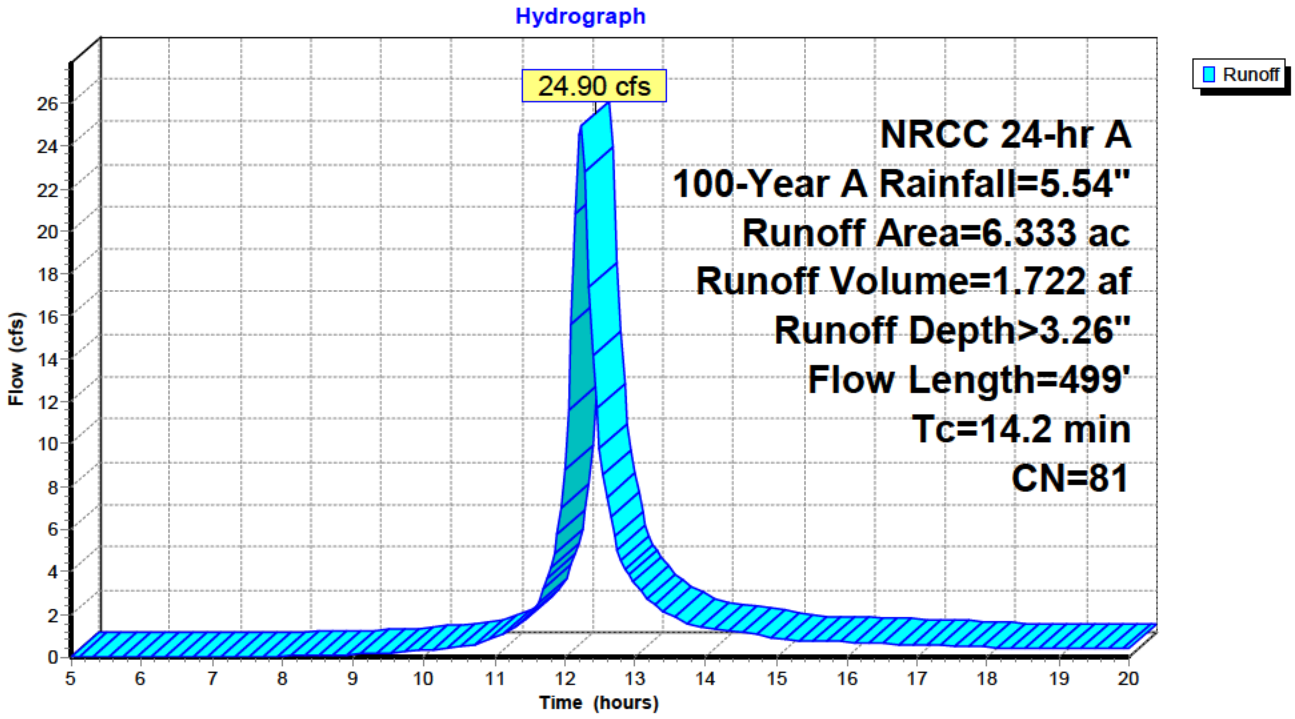
Runoff = 24.90 cfs @ 12.22 hrs, Volume= 1.722 af, Depth> 3.26"
Routed to Pond IB1 : PR Inf Basin #1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NRCC 24-hr A 100-Year A Rainfall=5.54"

Area (ac)	CN	Description
1.560	30	Meadow, non-grazed, HSG A
2.480	98	Paved parking, HSG A
2.240	98	Roofs, HSG A
0.053	98	Unconnected pavement, HSG A
6.333	81	Weighted Average
1.560		24.63% Pervious Area
4.773		75.37% Impervious Area
0.053		1.11% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.5	31	0.0210	0.05		**Sheet Flow, Lawn**
					Grass: Bermuda n= 0.410 P2= 2.50"
1.1	69	0.0181	1.08		**Sheet Flow, Concrete Walk to Asphalt Parking**
					Smooth surfaces n= 0.011 P2= 2.50"
1.7	157	0.0058	1.55		**Shallow Concentrated Flow, Asphalt Parking**
					Paved Kv= 20.3 fps
1.9	242	0.0195	2.09		**Shallow Concentrated Flow, Lawn Area to Infiltration Basin**
					Grassed Waterway Kv= 15.0 fps
14.2	499	Total			

Subcatchment 1: PR DA #1



Summary for Subcatchment 2: PR DA #2

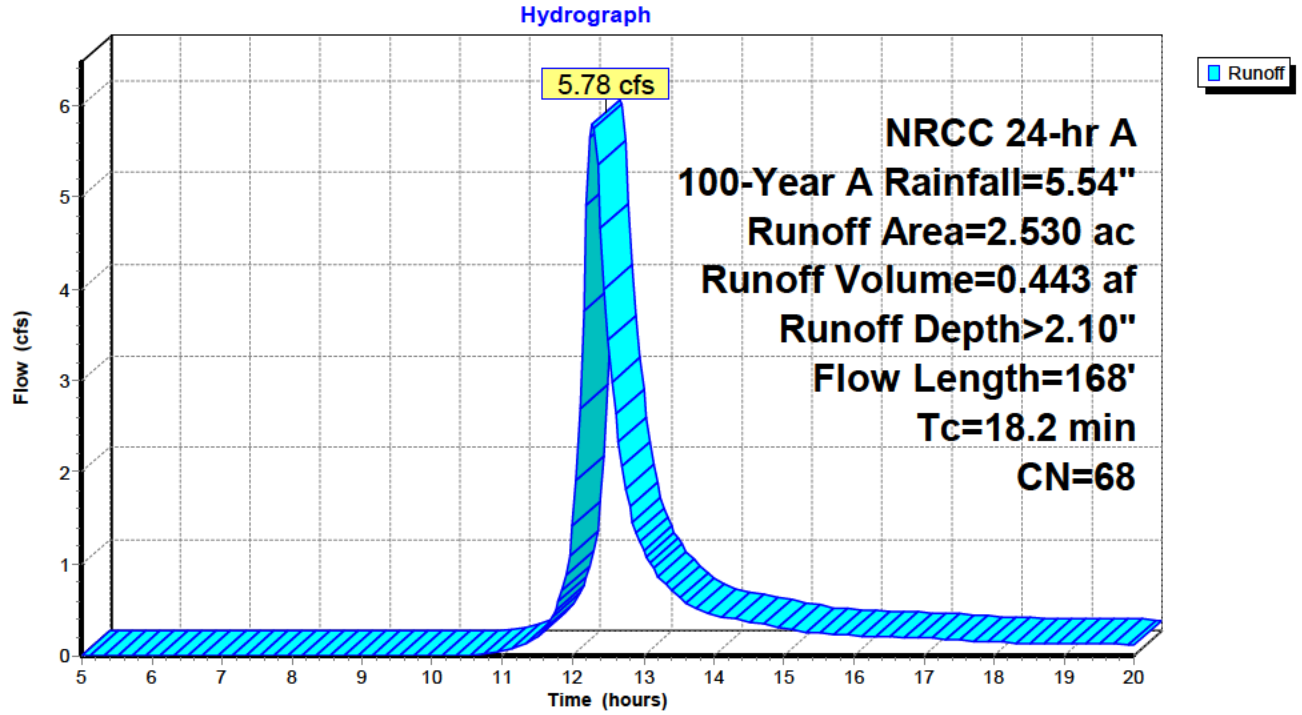
Runoff = 5.78 cfs @ 12.28 hrs, Volume= 0.443 af, Depth> 2.10"
Routed to Pond IB2 : PR Inf Basin #2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NRCC 24-hr A 100-Year A Rainfall=5.54"

Area (ac)	CN	Description
0.940	30	Meadow, non-grazed, HSG A
1.110	98	Paved parking, HSG A
0.430	71	Meadow, non-grazed, HSG C
0.020	98	Paved parking, HSG C
0.030	98	Unconnected pavement, HSG A
2.530	68	Weighted Average
1.370		54.15% Pervious Area
1.160		45.85% Impervious Area
0.030		2.59% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
17.5	100	0.0163	0.10		**Sheet Flow, Lawn** Grass: Dense n= 0.240 P2= 2.50"
0.7	68	0.0572	1.67		**Shallow Concentrated Flow, Lawn to Infiltration Basin** Short Grass Pasture Kv= 7.0 fps
18.2	168	Total			

Subcatchment 2: PR DA #2



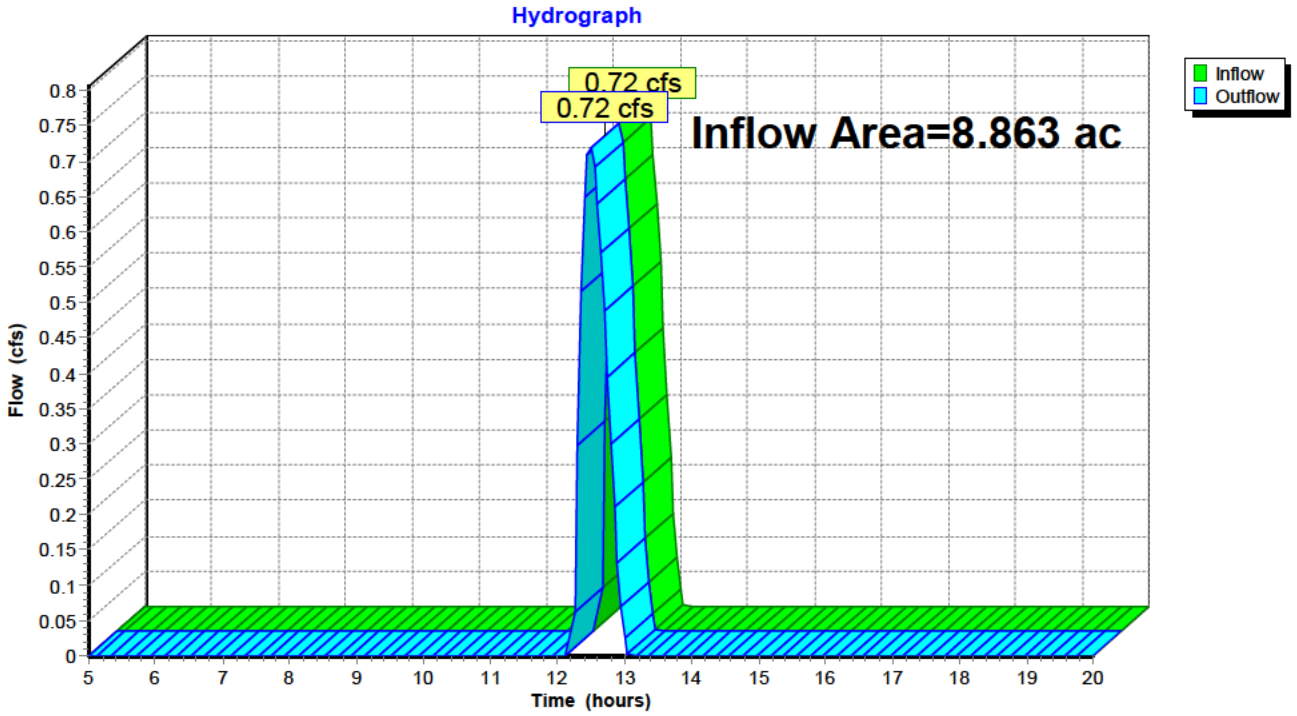
Summary for Reach DP: Design Point

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 8.863 ac, 66.94% Impervious, Inflow Depth = 0.04" for 100-Year A event
Inflow = 0.72 cfs @ 12.49 hrs, Volume= 0.027 af
Outflow = 0.72 cfs @ 12.49 hrs, Volume= 0.027 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach DP: Design Point



Summary for Pond IB1: PR Inf Basin #1

[92] Warning: Device #4 is above defined storage
[92] Warning: Device #5 is above defined storage

Inflow Area = 6.333 ac, 75.37% Impervious, Inflow Depth > 3.26" for 100-Year A event
Inflow = 24.90 cfs @ 12.22 hrs, Volume= 1.722 af
Outflow = 10.37 cfs @ 12.49 hrs, Volume= 1.721 af, Atten= 58%, Lag= 15.8 min
Discarded = 9.66 cfs @ 12.49 hrs, Volume= 1.694 af
Primary = 0.72 cfs @ 12.49 hrs, Volume= 0.027 af
Routed to Reach DP : Design Point

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 398.72' @ 12.49 hrs Surf.Area= 13,676 sf Storage= 17,959 cf

Plug-Flow detention time= 14.6 min calculated for 1.715 af (100% of inflow)
Center-of-Mass det. time= 14.3 min (796.2 - 781.9)

Volume	Invert	Avail.Storage	Storage Description
#1	397.00'	21,878 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

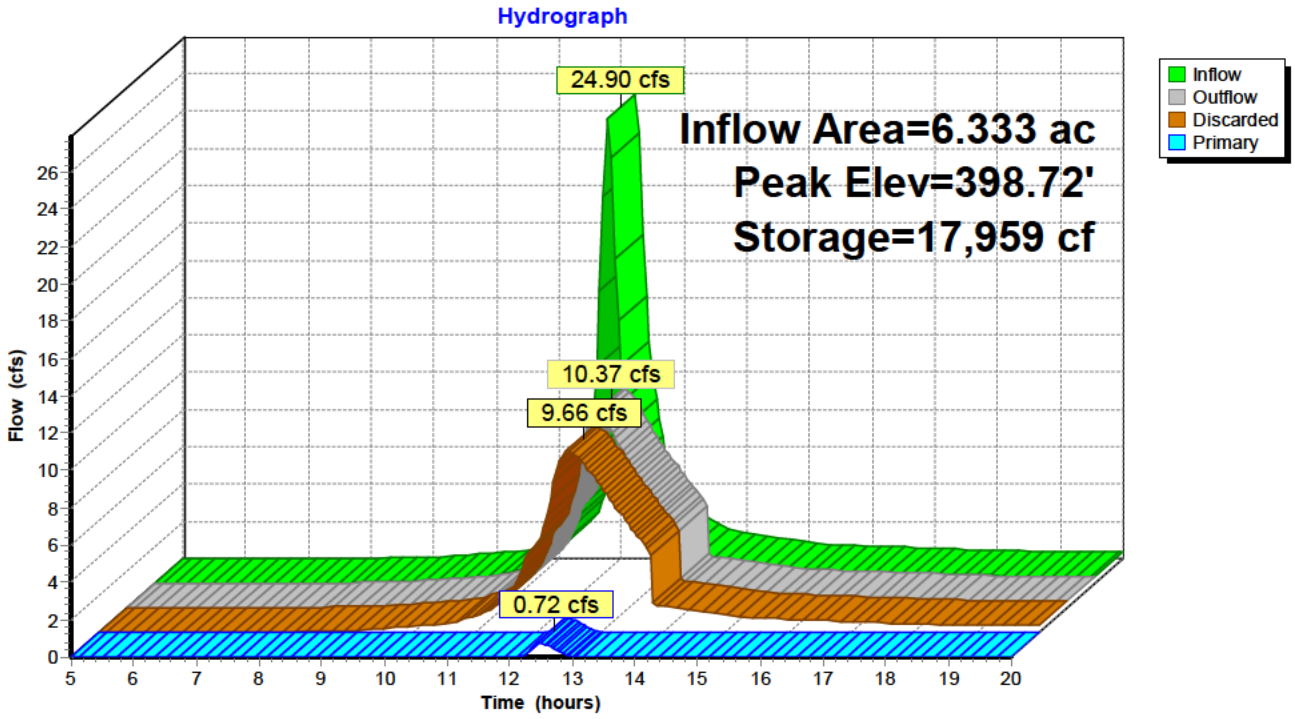
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
397.00	7,241	0	0
398.00	10,888	9,065	9,065
399.00	14,738	12,813	21,878

Device	Routing	Invert	Outlet Devices
#1	Discarded	397.00'	**25.000 in/hr Exfiltration over Surface area above 396.66'** Conductivity to Groundwater Elevation = 391.21' Excluded Surface area = 0 sf
#2	Primary	397.79'	**18.0" Round Culvert** L= 18.5' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 397.79' / 397.43' S= 0.0195 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf
#3	Device 2	398.11'	**8.0" Round Culvert** L= 6.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 398.11' / 398.05' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.35 sf
#4	Device 2	399.41'	**18.0" W x 12.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#5	Device 2	400.64'	**24.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=9.65 cfs @ 12.49 hrs HW=398.72' (Free Discharge)
└**1=Exfiltration** (Controls 9.65 cfs)

Primary OutFlow Max=0.72 cfs @ 12.49 hrs HW=398.72' (Free Discharge)
└**2=Culvert** (Passes 0.72 cfs of 3.66 cfs potential flow)
  └**3=Culvert** (Barrel Controls 0.72 cfs @ 2.79 fps)
  └**4=Orifice/Grate** (Controls 0.00 cfs)
  └**5=Orifice/Grate** (Controls 0.00 cfs)

Pond IB1: PR Inf Basin #1



Summary for Pond IB2: PR Inf Basin #2

Inflow Area = 2.530 ac, 45.85% Impervious, Inflow Depth > 2.10" for 100-Year A event
Inflow = 5.78 cfs @ 12.28 hrs, Volume= 0.443 af
Outflow = 2.49 cfs @ 12.62 hrs, Volume= 0.443 af, Atten= 57%, Lag= 20.4 min
Discarded = 2.49 cfs @ 12.62 hrs, Volume= 0.443 af
Primary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
Routed to Reach DP : Design Point

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 399.44' @ 12.62 hrs Surf.Area= 3,550 sf Storage= 4,977 cf

Plug-Flow detention time= 19.2 min calculated for 0.441 af (100% of inflow)
Center-of-Mass det. time= 18.9 min (824.6 - 805.7)

Volume	Invert	Avail.Storage	Storage Description
#1	397.00'	18,212 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
397.00	66	0	0
398.00	1,969	1,018	1,018
399.00	3,057	2,513	3,531
400.00	4,183	3,620	7,151
401.00	5,379	4,781	11,932
402.00	7,181	6,280	18,212

Device	Routing	Invert	Outlet Devices
#1	Discarded	397.00'	**25.000 in/hr Exfiltration over Surface area above 396.00'** Conductivity to Groundwater Elevation = 391.21' Excluded Surface area = 0 sf
#2	Primary	401.23'	**15.0" Round Culvert** L= 25.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 401.23' / 400.87' S= 0.0144 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf
#3	Primary	401.06'	**15.0" Round Culvert** L= 25.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 401.06' / 400.85' S= 0.0084 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf
#4	Primary	401.17'	**15.0" Round Culvert** L= 25.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 401.17' / 400.96' S= 0.0084 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf

Discarded OutFlow Max=2.49 cfs @ 12.62 hrs HW=399.44' (Free Discharge)
└**1=Exfiltration** (Controls 2.49 cfs)

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=397.00' (Free Discharge)
├**2=Culvert** (Controls 0.00 cfs)
├**3=Culvert** (Controls 0.00 cfs)
└**4=Culvert** (Controls 0.00 cfs)

Pond IB2: PR Inf Basin #2

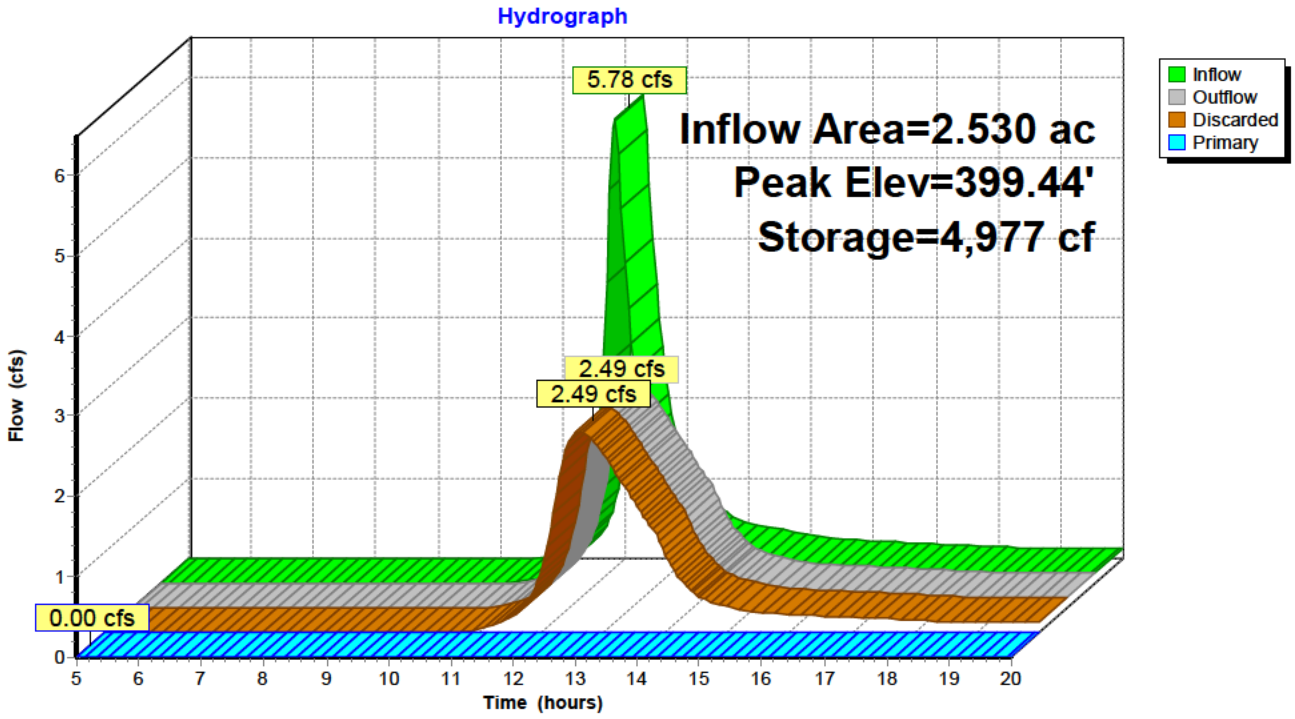


TABLE OF CONTENTS

Project Reports
1 Routing Diagram
2 Rainfall Events Listing (selected events)
3 Area Listing (all nodes)
4 Soil Listing (all nodes)
5 Ground Covers (all nodes)
6 Pipe Listing (all nodes)

1-Year A Event
7 Node Listing
8 Subcat 1: PR DA #1
10 Subcat 2: PR DA #2
11 Reach DP: Design Point
12 Pond IB1: PR Inf Basin #1
14 Pond IB2: PR Inf Basin #2

10-Year A Event
16 Node Listing
17 Subcat 1: PR DA #1
19 Subcat 2: PR DA #2
20 Reach DP: Design Point
21 Pond IB1: PR Inf Basin #1
23 Pond IB2: PR Inf Basin #2

100-Year A Event
25 Node Listing
26 Subcat 1: PR DA #1
28 Subcat 2: PR DA #2
29 Reach DP: Design Point
30 Pond IB1: PR Inf Basin #1
32 Pond IB2: PR Inf Basin #2

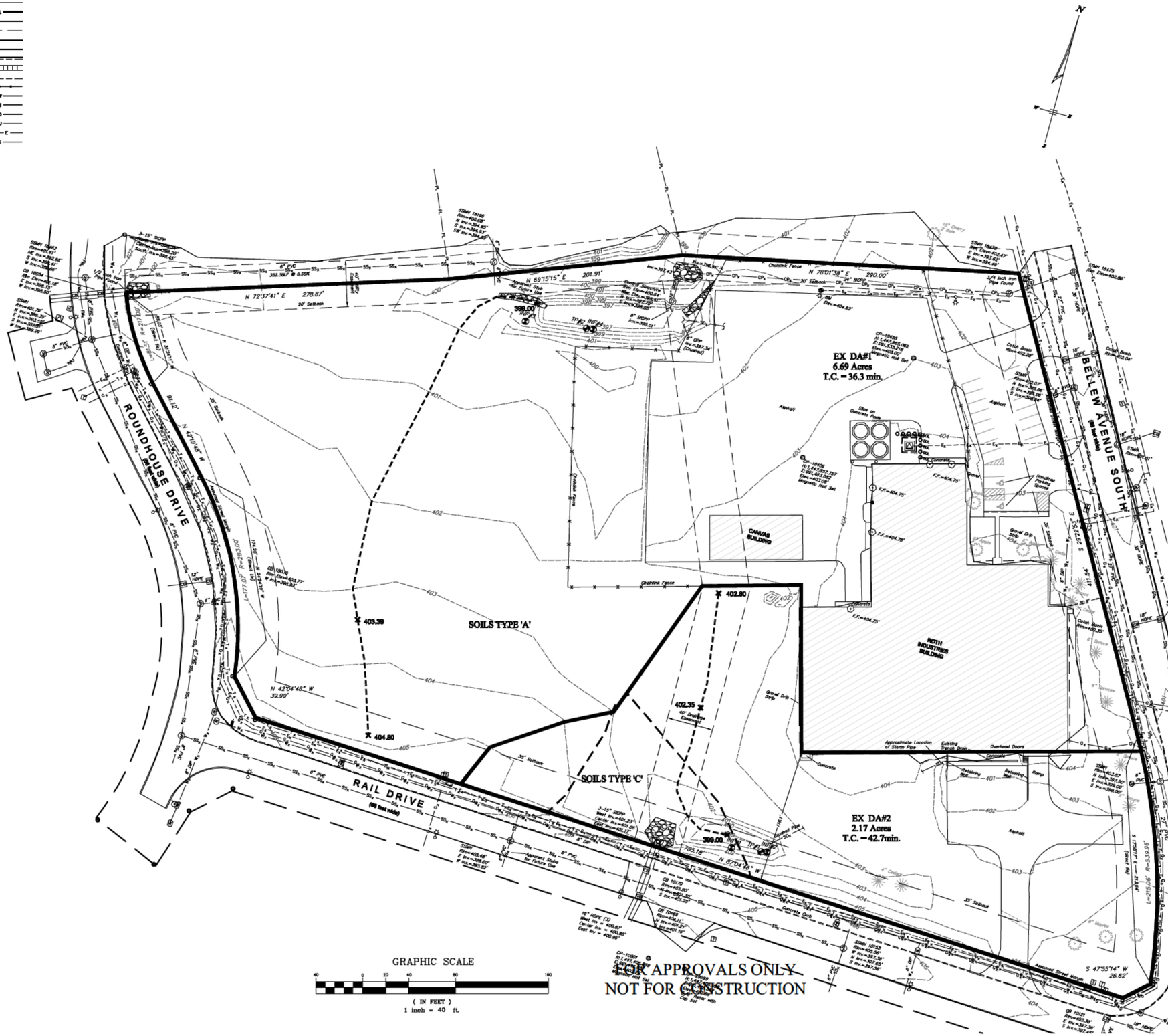
Appendix G

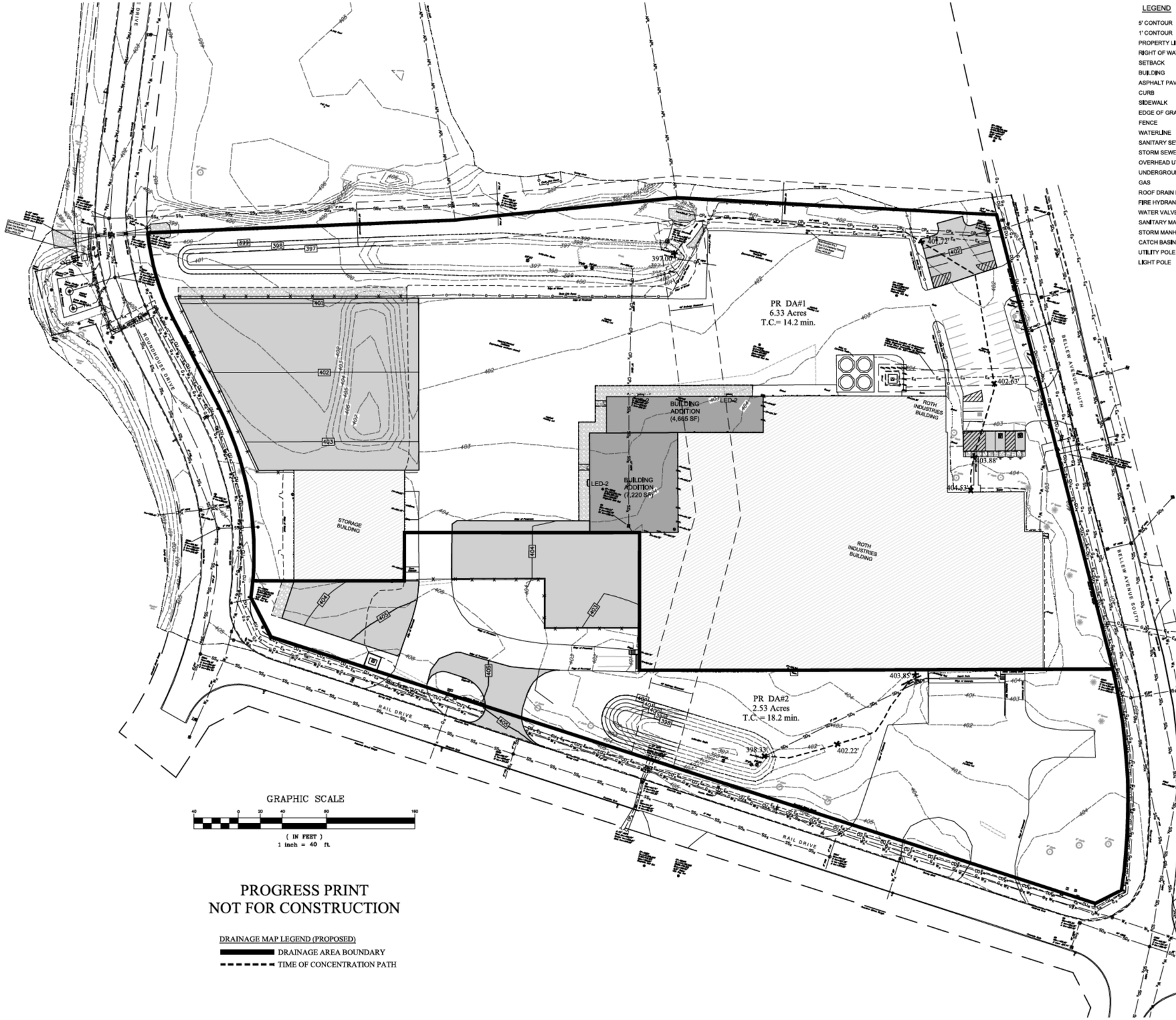
Drainage Area Maps

Aubertine and Currier Architects, Engineers and Land Surveyors, PLLC
522 Bradley Street, Watertown, New York 13601 TELE: (315) 782-2005 FAX: (315) 782-1472

Page left intentionally blank for duplex printing

LEGEND	EXISTING	PROPOSED
5' CONTOUR	155	155
1' CONTOUR	154	154
PROPERTY LINE	PL PL	PL PL
RIGHT OF WAY		
SETBACK		
BUILDING		
ASPHALT PAVEMENT		
CURB		
SIDEWALK		
EDGE OF GRAVEL		
FENCE	- o - o - o -	
WATERLINE	W_x W_x	W W
SANITARY SEWER	SS_x SS_x	SS SS
STORM SEWER	SD_x SD_x	SD SD
OVERHEAD UTILITIES	OU_x OU_x	OU OU
UNDERGROUND ELECTRIC	E_x E_x	E E
GAS	G_x G_x	G G
FIRE HYDRANT		
WATER VALVE	W	
SANITARY MANHOLE	S	
STORM MANHOLE	D	D
CATCH BASIN		S
UTILITY POLE AND GUY		
LIGHT POLE		


N
ROUNDHOUSE DRIVE
(66 feet wide)
RAIL DRIVE
(66 feet wide)
BELLEW AVENUE SOUTH
(66 feet wide)
EX DA#1
6.69 Acres
T.C. = 36.3 min.
EX DA#2
2.17 Acres
T.C. = 42.7min.
SOILS TYPE 'A'
SOILS TYPE 'C'
ROTH INDUSTRIES BUILDING
CANVAS BUILDING
N 69°15'15" E 201.91'
N 72°37'41" E 278.87'
N 78°01'38" E 290.00'
N 42°04'46" W 39.99'
N 87°04'20" W 785.18'
S 47°55'14" W 26.62'
S 39°39'52" E 215.96'
L=177.70'
R=283.00'
Delta=35°58'47"
Chord=N 24°34'14" W
403.39
404.80
402.80
402.35
399.00
398.00
30' Setback
35' Setback
Chainlink Fence
Concrete
Asphalt
Gravel Drip Strip
Overhead Doors
Approximate Location of Storm Pipe
Existing Trench Drain
Retaining Wall
Ramp
Handicap Parking Spaces
Site Pre Cast Concrete Pads
Cobble Swale
Grass Swale
Approximate Street Marking
Approximate Location of Future Line
Existing Drainage Flow Direction
Set Magnetic Nail Set
Found Pipe
Found Iron Pipe
3/4 Inch Iron Pipe Found
Set Iron Pipe
Set Chiseled X
Set Chiseled X with Concrete Nail
Set Drill Hole
Found Drill Hole
Found Concrete Monument
Found Chiseled X
Found Chiseled X with Concrete Nail
Found Drill Hole
Found Magnetic Nail
Found Magnetic Nail Set
Found Iron Rod
Found Iron Rod with Cap
Found Iron Rod with Concrete Nail
Found Iron Rod with Plastic Cap
Found Iron Rod with Yellow Plastic



GRAPHIC SCALE

40 0 20 40 80 160

(IN FEET)

1 inch = 40 ft.

PROGRESS PRINT
NOT FOR CONSTRUCTION

DRAINAGE MAP LEGEND (PROPOSED)

- DRAINAGE AREA BOUNDARY
- TIME OF CONCENTRATION PATH

LEGEND	EXISTING	PROPOSED
5' CONTOUR	155	155
1' CONTOUR	154	154
PROPERTY LINE	PL PL PL	
RIGHT OF WAY		
SETBACK		
BUILDING		
ASPHALT PAVEMENT		
CURB		
SIDEWALK		
EDGE OF GRAVEL		
FENCE		
WATERLINE	W_X	
SANITARY SEWER	SS_X	
STORM SEWER	SD_X	
OVERHEAD UTILITIES	OH_X	
UNDERGROUND ELECTRIC	E_X	E E E
GAS	G_X	G G G
ROOF DRAIN PIPE	RD_X	RD RD RD
FIRE HYDRANT		
WATER VALVE	W	
SANITARY MANHOLE	S	
STORM MANHOLE	D	
CATCH BASIN	CB DI	
UTILITY POLE AND GUY		
LIGHT POLE		

AUBERTINE CURRIER
ARCHITECTS, ENGINEERS & LAND SURVEYORS, PLLC

522 Bradley Street
Watertown, New York 13601

aubertinecurrier.com

Phone: (315)782-2005
Fax: (315)782-1472

The above Architect, Engineer or Land Surveyor states that to the best of his or her knowledge, information and belief, the plans and specifications are in accordance with applicable requirements of New York State. It is a violation of New York State Law for any person, unless acting under the direct supervision of a Registered Architect, Licensed Professional Engineer or Licensed Land Surveyor to alter this document in any way. If altered, such licensee shall affix to his or her seal and the notation "altered by" followed by his or signature, date and a specific description of the alteration.

© COPYRIGHT 2025
AUBERTINE and CURRIER, ARCHITECTS, ENGINEERS & LAND SURVEYORS, PLLC

ROTH INDUSTRIES AND ROTH GLOBAL PLASTICS
2026 EXPANSION PROJECT

268 BELLEW AVENUE SOUTH
CITY OF WATERTOWN
JEFFERSON COUNTY, STATE OF NEW YORK

PROJECT NO:	7019-009.007
SCALE:	1"=40'
DRAWN BY:	CWT
CHECKED BY:	MPM
ISSUE DATE:	09/15/2025

PROPOSED DRAINAGE AREA MAP

PR-1

Appendix H

SPDES General Permit (GP-0-25-001)

Aubertine and Currier Architects, Engineers and Land Surveyors, PLLC
522 Bradley Street, Watertown, New York 13601 TELE: (315) 782-2005 FAX: (315) 782-1472

Page left intentionally blank for duplex printing

NEW YORK STATE
DEPARTMENT OF ENVIRONMENTAL
CONSERVATION (NYSDEC)

SPDES GENERAL PERMIT
FOR STORMWATER DISCHARGES

From

CONSTRUCTION ACTIVITY

Permit No. GP-0-25-001

Construction General Permit (CGP)

Issued Pursuant to Article 17, Titles 7, 8 and Article 70

of the Environmental Conservation Law

Effective Date: January 29, 2025 Expiration Date: January 28, 2030

Scott E. Sheeley

Chief Permit Administrator

Scott E. Sheeley JAN. 29, 2025

Authorized Signature Date

Address: NYSDEC
Division of Environmental Permits
625 Broadway, 4th Floor
Albany, N.Y. 12233-1750

PREFACE

Pursuant to Section 402 of the Clean Water Act (CWA), and 40 CFR 122.26(b)(14)(x), (15)(i), and (15)(ii), *stormwater discharges* from certain *construction activities* are unlawful unless they are authorized by a National Pollutant Discharge Elimination System (NPDES) permit or by a state permit program. New York State administers the approved State Pollutant Discharge Elimination System (SPDES) program with permits issued in accordance with the New York State Environmental Conservation Law (ECL) Article 17, Titles 7 and 8, and Article 70, as well as 6 NYCRR Parts 621 and 750.

C*onstruction activities* constitute construction of a *point source* and, therefore, pursuant to ECL sections 17-0505, 17-0701, and 17-0803, the *owner or operator* must have coverage under a SPDES permit prior to *commencement of construction activities*. The *owner or operator* cannot wait until there is an actual *discharge* from the *construction site* to obtain permit coverage.

***Note: The italicized words/phrases within this permit are defined in Appendix A.**

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
SPDES CONSTRUCTION GENERAL PERMIT (CGP) GP-0-25-001
FOR STORMWATER DISCHARGES FROM CONSTRUCTION ACTIVITIES

Table of Contents

Part I. How to Obtain Coverage and General Requirements 5
A. Eligibility Requirements 5
B. Types of *Discharges* Authorized 9
C. Prohibited *Discharges* 10
D. Electronic Notice of Intent (eNOI) Submittal 10
E. General Requirements for *Owners or Operators* with Permit Coverage 14
F. Permit Coverage for *Discharges* Authorized Under GP-0-20-001 18
G. Change of *Owner or Operator* 19
Part II. Water Quality-Based Effluent Limitations 20
A. Maintaining Water Quality 20
B. Effluent Limitations Applicable to *Discharges* from *Construction Activities* 20
C. Post-Construction Stormwater Management Practice (SMP) Requirements 23
Part III. Stormwater Pollution Prevention Plan (SWPPP) 28
A. General *SWPPP* Requirements 28
B. Required *SWPPP* Contents 32
C. Required *SWPPP* Components by Project Type 37
Part IV. Inspection and Maintenance Requirements 37
A. General Construction Site Inspection and Maintenance Requirements 37
B. Contractor Maintenance Inspection Requirements 37
C. *Qualified Inspector* Inspection Requirements 38
Part V. How to Terminate CGP Coverage 43
A. Electronic Notice of Termination (eNOT) Submittal 43
Part VI. Record Retention and Reporting 45
A. Record Retention 46
B. Reporting 46
Part VII. Standard Permit Requirements 46
A. Duty to Comply 46
B. Need to Halt or Reduce Activity Not a Defense 46
C. Penalties 46
D. False Statements 47
E. Re-Opener Clause 47
F. Duty to Mitigate 47
G. Requiring Another General Permit or Individual SPDES Permit 47
H. Duty to Provide Information 49
I. Extension 49
J. Signatories and Certification 50
K. Inspection and Entry 52
L. Confidentiality of Information 53
M. Other Permits May Be Required 53

N. NYSDEC Orders or Civil Decrees/Judgments 53
O. Property Rights 53
P. Compliance with Interstate Standards 53
Q. Oil and Hazardous Substance Liability 54
R. Severability 54
S. NYSDEC Approved Forms 54
APPENDIX A – Abbreviations and Definitions 55
Abbreviations 55
Definitions 56
APPENDIX B – Required SWPPP Components by Project Type 64
Table 1 64
Table 2 66
APPENDIX C – Watersheds Requiring Enhanced Phosphorus Removal 68
APPENDIX D – Impaired Waterbodies (by Construction Related Pollutants) 74
APPENDIX E – List of NYSDEC Regional Offices 80
APPENDIX F – SWPPP Preparer Certification Form 81
APPENDIX G – MS4 SWPPP Acceptance Form 83
APPENDIX H – NYCDEP SWPPP Acceptance/Approval Form 86
APPENDIX I – MS4 No Jurisdiction Form 89
APPENDIX J – Owner/Operator Certification Form 91

Part I. How to Obtain Coverage and General Requirements

To be covered under this permit, the *owner or operator* must meet all eligibility requirements in Part I.A. and follow the requirements for obtaining permit coverage in Part I.D., F., or G.

A. Eligibility Requirements

For a *common plan of development or sale*, the *phase(s)* that meet the eligibility requirements in Part I.A. may obtain coverage under this permit even if other *phase(s)* of the same *common plan of development or sale* do not meet the eligibility requirements and require an individual SPDES permit.

1. The *owner's or operator's construction activities* involve soil disturbances of:

    a. one or more acres; or

    b. less than one acre which are part of a *common plan of development or sale* that will ultimately disturb one or more acres; or

    c. less than one acre where NYSDEC has determined that a SPDES permit is required for *stormwater discharges* based on the potential for contribution to a violation of a *water quality standard* or for significant contribution of pollutants to *surface waters of the State*.

        i. 5,000 square feet or more, but less than one acre, and are in the New York City Watershed located east of the Hudson River, Appendix C Figure 1; or

        ii. 20,000 square feet or more, but less than one acre, within the municipal boundaries of the City of New York (NYC); or

        iii. less than 20,000 square feet which are part of a *common plan of development or sale* that will ultimately disturb 20,000 square feet or more, but less than one acre, within the municipal boundaries of NYC; or

        iv. that creates 5,000 square feet or more of *impervious area* within the municipal boundaries of NYC.

2. *Discharges* from the *owner's or operator's construction activities* are/were not:

    a. already covered by a different SPDES permit; or

    b. covered under a different SPDES permit that was denied, terminated, or revoked; or

    c. identified in an expired individual SPDES permit that was not renewed; or

    d. required to obtain an individual SPDES permit or another general SPDES permit in accordance with Part VII.K.

3. If *construction activities* may adversely affect a species that is endangered or threatened, the *owner or operator* must obtain a:

    a. permit issued pursuant to 6 NYCRR Part 182 for the project; or

    b. letter issued by NYSDEC of non-jurisdiction pursuant to 6 NYCRR Part 182 for the project.

4. If *construction activities* have the potential to affect an *historic property*, the *owner or operator* must obtain one of the following:

    a. documentation that the *construction activity* is not within an archeological buffer area indicated on the sensitivity map, and that the *construction activity* is not located on or immediately adjacent to a property listed or determined to be eligible for listing on the National or State Registers of Historic Places, and that there is no new permanent building on the *construction site* within the following distances from a building, structure, or object that is more than 50 years old, or if there is such a new permanent building on the *construction site* within those parameters that NYS Office of Parks, Recreation and Historic Preservation (OPRHP), a Historic Preservation Commission of a Certified Local Government, or a qualified preservation professional has determined that the building, structure, or object more than 50 years old is not historically/archeologically significant:

        i. 1-5 acres of disturbance - 20 feet; or

        ii. 5-20 acres of disturbance - 50 feet; or

iii. 20+ acres of disturbance - 100 feet.

b. NYSDEC consultation form sent to OPRHP,[1] and copied to NYSDEC's Agency Historic Preservation Officer (APO), and

i. the State Environmental Quality Review Act (SEQR) Environmental Assessment Form (EAF) with a negative declaration or the Findings Statement, with documentation of OPRHP's agreement with the resolution; or

ii. documentation from OPRHP that the *construction activity* will result in No Impact; or

iii. documentation from OPRHP providing a determination of No Adverse Impact; or

iv. a Letter of Resolution signed by the *owner or operator*, OPRHP and the DEC APO which allows for this *construction activity* to be eligible for coverage under the general permit in terms of the State Historic Preservation Act (SHPA).

c. documentation of satisfactory compliance with Section 106 of the National Historic Preservation Act for a coterminous project area:

i. No Affect; or

ii. No Adverse Affect; or

iii. Executed Memorandum of Agreement.

d. documentation that SHPA Section 14.09 has been completed by NYSDEC or another state agency.

5. If *construction activities* are subject to SEQR, the *owner or operator* must obtain documentation that SEQR has been satisfied.

6. If *construction activities* are not subject to SEQR, but subject to the equivalent environmental review from another New York State or federal agency, the

[1] The consultation form can be submitted, along with other project information, through OPRHP's Cultural Resource Information System (CRIS) portal. If submitted through CRIS, paper copies of the consultation form need not be mailed.

owner or operator must obtain documentation that project review, pursuant to a process equivalent to SEQR from another New York State or federal agency, has been satisfied.

7. If *construction activities* require Uniform Procedures Act (UPA) Permits (see 6 NYCRR Part 621) from NYSDEC, or the equivalent from another New York State or federal agency, the *owner or operator* must:

    a. obtain all such necessary permits; or

    b. receive notification from NYSDEC pursuant to 6 NYCRR 621.3(a)(4) excepting Part I.A.7.a.

8. *Construction activities* are not eligible if they meet the following criteria in Part I.A.8.a. or b.:

    a. For linear transportation and linear utility project types, the *construction activities*:

        i. are within the watershed of *surface waters of the State* classified as AA or AA-S identified utilizing the Stormwater Interactive Map on NYSDEC's website; and

        ii. are undertaken on land with no existing *impervious cover*; and

        iii. disturb two or more acres of *steep slope*.

    b. For all other project types, the *construction activities*:

        i. are within the watershed of *surface waters of the State* classified as AA or AA-S identified utilizing the Stormwater Interactive Map on NYSDEC's website; and

        ii. are undertaken on land with no existing *impervious cover*; and

        iii. disturb one or more acres of *steep slope*.

B. Types of *Discharges* Authorized

1. The following *stormwater discharges* are authorized under this permit:

   a. *Stormwater discharges*, including *stormwater* runoff, snowmelt runoff, and surface runoff and drainage, associated with *construction activity*, are authorized under this permit provided that appropriate *stormwater* controls are designed, installed, and maintained in accordance with Part II. and Part III.

   b. *Stormwater discharges* from construction support activities at the *construction site* (including concrete or asphalt batch plants, equipment staging yards, material storage areas, excavated material disposal areas, and borrow areas) if the following requirements are met:

      i. The support activity is directly related to the *construction site* required to have permit coverage for *stormwater discharges*; and

      ii. The support activity is not a commercial operation, nor does it serve multiple unrelated *construction sites*; and

      iii. The support activity does not continue to operate beyond the completion of the *construction activity* at the site it supports; and

      iv. *Stormwater* controls are implemented in accordance with Part II. and Part III. for *discharges* from the support activity areas.

2. The following non-*stormwater discharges* associated with *construction activity* are authorized under this permit:

   a. Non-*stormwater discharges* listed in 6 NYCRR 750-1.2(a)(29)(vi), with the following exception: "*Discharges* from firefighting activities are authorized only when the firefighting activities are emergencies/unplanned"; and

   b. Non-*stormwater discharges* of waters to which other components have not been added that are used in accordance with the *SWPPP* to control dust or irrigate vegetation in stabilized areas; and

   c. Uncontaminated *discharges* from *dewatering* operations

3. Authorized *discharges* of *stormwater* or authorized *discharges* of non-*stormwater*, commingled with a *discharge* authorized by a different SPDES permit and/or a *discharge* that does not require SPDES permit authorization, are also authorized under this permit.

C. Prohibited *Discharges*

1. Non-*stormwater discharges* prohibited under this permit include but are not limited to:

    a. Wastewater from washout of concrete; and

    b. Wastewater from washout and cleanout of stucco, paint, form release oils, curing compounds, and other construction materials; and

    c. Fuels, oils, or other *pollutants* used in vehicle and equipment operation and maintenance; and

    d. Soaps, solvents, or detergents used in vehicle and equipment washing or external building washdown; and

    e. Toxic or hazardous substances from a spill or other release.

D. Electronic Notice of Intent (eNOI) Submittal

To receive authorization in accordance with Part I.D.3.b., the *owner or operator* must submit a complete eNOI in accordance with the requirements in Part I.D. The eNOI contains questions to: ensure eligibility requirements in Part I.A. have been met; obtain *owner or operator* contact information; obtain the total area to be disturbed and the existing/future *impervious areas* (rounded to the nearest tenth of an acre); confirm *Traditional Land Use Control MS4 Operator* jurisdiction over construction projects; satisfy the EPA eRule requirements; confirm that the Water Quality-Based Effluent Limitations in Part II. have been met; demonstrate consideration of the future risks due to climate change in accordance with Part III.A.2.; and confirm that the other *Stormwater Pollution Prevention Plan (SWPPP)* requirements in Part III. have been met.

1. An eNOI may be submitted for:

    a. *construction activities* that are not part of a *common plan of development or sale*; or

b. an entire *common plan of development or sale*; or

c. separate *phase(s)* of a *common plan of development or sale* if the following requirements are met:

    i. the *common plan of development or sale* meets the eligibility requirements of Part I.A.5. or 6.; and

    ii. the *phase(s)* meet(s) all other eligibility requirements of Part I.A.; and

    iii. Part III.C. Required *SWPPP* Components by Project Type is based on the *common plan of development or sale*, not the *phase(s)*; or

d. *tree clearing* that is associated with, or will support, a *renewable energy* generation, transmission, or storage project that meets Part I.A.5. and 6., if the *tree clearing*:

    i. meets all other eligibility requirements of Part I.A.; and

    ii. will occur in NYSDEC's Regions 3-9; and

    iii. is not within ¼ mile of a bat hibernaculum protected pursuant to 6 NYCRR Part 182; and

    iv. will occur between November 1st and March 31st.

2. As prerequisites for submitting an eNOI, the *owner or operator* must:

    a. prepare a *SWPPP* for Part I.D.1.a., b., c., or d. in accordance with Part III.; and

    b. based on the following criteria, upload the following signature forms signed in accordance with Part VII.J. to the eNOI prior to submission:

        i. for all eNOIs:

            1. the SWPPP Preparer Certification Form, Appendix F, signed by the *SWPPP* preparer; and

2. the Owner/Operator Certification Form, Appendix J, signed by the *owner or operator*; and

ii. if an eNOI includes *construction activities* within the municipal boundary(ies) of *Traditional Land Use Control MS4 Operator(s)* that will *discharge* to the *MS4(s)*:

1. determine if the *Traditional Land Use Control MS4 Operator(s)* have review authority. A *Traditional Land Use Control MS4 Operator* does not have review authority where:

a. the *owner or operator* of the *construction activities* in Part I.D.2.b.ii. is the same entity as the *Traditional Land Use Control MS4 Operator* identified in Part I.D.2.b.ii.; or

b. there is a statute exempting the *owner or operator* from zoning review by the *Traditional Land Use Control MS4 Operator*; or

c. there is no such statute per Part I.D.2.b.ii.1.b., the *Traditional Land Use Control MS4 Operator* concludes, after public hearing, that it does not have zoning review authority in accordance with Legal Memorandum LU14 Updated January 2020 “Governmental Immunity from Zoning and Other Legislation”; and

2. if the *Traditional Land Use Control MS4 Operator(s)* have review authority, submit the *SWPPP* to the *Traditional Land Use Control MS4 Operator(s)* for review and have:

a. if outside the municipal boundaries of NYC: the MS4 SWPPP Acceptance Form, Appendix G, signed by the principal executive officer or ranking elected official from the *Traditional Land Use Control MS4 Operator,* or by a duly authorized representative of that person in accordance with Part VII.J.2.; or

b. if within the municipal boundaries of NYC: The City of New York Department of Environmental Protection (NYCDEP) SWPPP Acceptance/Approval Form, Appendix H, signed by the principal executive officer or ranking elected official from the Traditional Land Use Control MS4 Operator, or by a duly authorized representative of that person in accordance with Part VII.J.2.; and

3. if the *Traditional Land Use Control MS4 Operator* does not have review authority, have the MS4 No Jurisdiction Form, Appendix I, signed by the principal executive officer or ranking elected official from the *Traditional Land Use Control MS4 Operator,* or by a duly authorized representative of that person in accordance with Part VII.J.2.

3. Submitting an eNOI:

a. The *owner or operator* must submit a complete Notice of Intent electronically using a NYSDEC approved form.[2]

b. The *owner or operator* is authorized to *commence construction activity* as of the authorization date indicated in the Letter of Authorization (LOA), which is sent by NYSDEC after a complete eNOI is submitted.

i. If an eNOI is received for a *SWPPP* that deviates from one of the technical standards but demonstrates *equivalence* in accordance with Part III.B.1.a.ii. or Part III.B.2.b.ii., if the *SWPPP* includes *construction activities* that are not within the municipal boundary(ies) of *Traditional Land Use Control MS4 Operator(s)*, and/or if the *SWPPP* includes *construction activities* within the municipal boundary(ies) of *Traditional Land Use Control MS4 Operator(s)* that do not have review authority in accordance with Part I.D.2.b.ii.1., the authorization date indicated in the LOA will be 60 business days after the eNOI submission date.

[2] Unless NYSDEC grants a waiver in accordance with 40 CFR 127.15(c) or (d). All waiver requests must be submitted to Stormwater_info@dec.ny.gov or NYSDEC, Bureau of Water Permits, 625 Broadway, 4th Floor, Albany, New York 12233-3505.

c. If *Traditional Land Use Control MS4 Operator(s)* have review authority in accordance with Part I.D.2.b.ii.2., the *owner or operator* must, within five business days of receipt of the LOA, send an electronic copy of the LOA to the *Traditional Land Use Control MS4 Operator(s)* with review authority.

E. General Requirements for *Owners or Operators* with Permit Coverage

1. As of the date the LOA is received, the *owner or operator* must make the eNOI, *SWPPP*, and LOA available for review and copying in accordance with the requirements in Part VII.H. When applicable, as of the date an updated LOA is received, the *owner or operator* must make the updated LOA available for review and copying in accordance with the requirements in Part VII.H.

2. The *owner or operator* must ensure compliance with all requirements of this permit and that the provisions of the *SWPPP*, including any changes made to the *SWPPP* in accordance with Part III.A.5., are properly implemented and maintained from the *commencement of construction activity* until:

   a. all areas of disturbance have achieved *final stabilization;* and

   b. the owner's or operator's coverage under this permit is terminated in accordance with Part V.A.5.a.

3. As of the date of the *commencement of construction activities* until Part I.E.2.a. and b. have been met, the *owner or operator* must maintain at the *construction site*, a copy of:

   a. all documentation necessary to demonstrate eligibility with this permit; and

   b. this permit; and

   c. the *SWPPP*; and

   d. the signed SWPPP Preparer Certification Form; and

   e. the signed MS4 SWPPP Acceptance Form or signed NYCDEP SWPPP Acceptance/Approval Form or signed MS4 No Jurisdiction Form (when applicable); and

   f. the signed Owner/Operator Certification Form; and

g. the eNOI; and

h. the LOA; and

i. the LOA transmittal to the Traditional Land Use Control MS4 Operator in accordance with Part I.D.3.c. (when applicable).

4. The *owner or operator* must maintain at the *construction site*, until Part I.E.2.a. and b. have been met, as of the date the documents become final or are received, a copy of the:

   a. responsible contractor's or subcontractor's certification statement(s) in accordance with Part III.A.7.; and

   b. inspection reports in accordance with Part IV.C.4. and 6.; and

   c. Request to Disturb Greater Than Five Acres and the Authorization Letter to Disturb Greater Than Five Acres in accordance with Part I.E.6. (when applicable); and

   d. Request to Continue Coverage and the Letter of Continued Coverage (LOCC) in accordance with Part I.F.2. and 4. (when applicable); and

   e. The updated LOA(s) in accordance with Part I.E.9. (when applicable).

5. The *owner or operator* must maintain the documents in Part I.E.3. and 4. in a secure location, such as a job trailer, on-site construction office, or mailbox with lock. The secure location must be accessible during normal business hours to an individual performing a compliance inspection. The documents must be paper documents unless electronic documents are accessible to the inspector during an inspection to the same extent as a paper copy stored at the site would be. If electronic documents are kept on site, the *owner or operator* must maintain functional equipment on site available to an inspector during normal hours of operation such that an inspector may view the electronic documents in a format that can be read in a similar manner as a paper record and in a legally dependable format with no less evidentiary value than their paper equivalent.

6. The *owner or operator* must meet the following requirements prior to disturbing greater than five acres of soil at any one time:

   a. The *owner or operator* must submit a written Request to Disturb Greater Than Five Acres to:

i. NYSDEC's Regional Office Division of Water staff based on the project location, Appendix E, if a *Traditional Land Use Control MS4 Operator* does not have review authority in accordance with Part I.D.2.b.ii.1.; or

ii. the *Traditional Land Use Control MS4 Operator*, if a *Traditional Land Use Control MS4 Operator* has review authority in accordance with Part I.D.2.b.ii.1.; or

iii. NYSDEC's Regional Office Division of Water staff based on the project location, Appendix E, and each involved *Traditional Land Use Control MS4 Operator*, if the project spans multiple municipalities with more than one *Traditional Land Use Control MS4 Operator* involved with review authority in accordance with Part I.D.2.b.ii.1.

b. The written Request to Disturb Greater Than Five Acres must include:

i. The SPDES permit identification number (Permit ID); and

ii. Full technical justification demonstrating why alternative methods of construction that would result in five acres of soil disturbance or less at any one time are not feasible; and

iii. The phasing plan for the project and sequencing plans for all *phases* from the *SWPPP* in accordance with Part III.B.1.d.; and

iv. Plans with locations and details of erosion and sediment control practices such that the heightened concern for erosion when disturbing greater than five acres at one time has been addressed; and

v. Acknowledgment that "the *owner or operator* will comply with the requirements in Part IV.C.2.b."; and

vi. Acknowledgment that "the *owner or operator* will comply with the requirements in Part II.B.1.b."

c. The *owner or operator* must be in receipt of an Authorization Letter to Disturb Greater Than Five Acres, which will include when the

authorization begins and ends and indicate a maximum area (acres) of soil disturbance allowed at any one time, from:

i. NYSDEC, if Part I.E.6.a.i. or iii. apply; or

ii. the *Traditional Land Use Control MS4 Operator*, if Part I.E.6.a.ii. applies.

7. Upon a finding of significant non-compliance with the practices described in the *SWPPP* or violation of this permit, NYSDEC may order an immediate stop to all *construction activity* at the site until the non-compliance is remedied. The stop work order must be in writing, describe the non-compliance in detail, and be sent to the *owner or operator*.

8. If any human remains or archaeological remains are encountered during excavation, the *owner or operator* must immediately cease, or cause to cease, all *construction activity* in the area of the remains and notify the appropriate Regional Water Engineer (RWE).[3] *Construction activity* shall not resume until written permission to do so has been received from the RWE.

9. To be authorized to implement modifications to the information previously submitted in the eNOI, the *owner or operator* must:

   a. notify NYSDEC via email at Stormwater_info@dec.ny.gov requesting access to update the eNOI; and

   b. update the eNOI to reflect the modifications and resubmit the eNOI in accordance with Part I.D.; and

   c. receive an updated LOA.

10. The eNOI, *SWPPP*, LOA, updated LOAs (when applicable), and inspection reports required by this permit are public documents that the *owner or operator* must make available for review and copying by any person within five business days of the *owner or operator* receiving a written request by any such person to review these documents. Copying of documents will be done at the requester's expense.

[3] The Regional Water Manager where a DEC Region does not have a RWE.

F. Permit Coverage for *Discharges* Authorized Under GP-0-20-001

When applicable:

1. Upon the effective date of this permit, an *owner or operator* of *a construction activity*, with coverage under GP-0-20-001, will have interim coverage under GP-0-25-001 for 45 calendar days starting on the effective date of GP-0-25-001 so long as the *owner or operator* maintains compliance with all applicable requirements of this permit.

2. Within 30 calendar days of the effective date of this permit, the *owner or operator*, with coverage under GP-0-20-001, must submit a complete Request to Continue Coverage electronically using a NYSDEC approved form,[4] which contains the information identified in Part I.F.3. below, if:

   a. the *owner or operator* continues to implement the SMP component in conformance with the technical standards in place at the time of initial project authorization; and

   b. the *owner or operator* will comply with all non-design requirements of GP-0-25-001.

3. The Request to Continue Coverage form contains questions to: ensure eligibility requirements in Part I.A. have been met; verify *owner or operator* contact information; verify the permit identification number; verify the original eNOI submission ID, if applicable; verify Part I.F.2.a. and b.; verify the version of the Design Manual that the technical/design components conform to; and receive an updated Owner/Operator Certification Form, Appendix I.

4. The *owner or operator* has obtained continued coverage under GP-0-25-001 as of the date indicated in the LOCC, which is sent by NYSDEC after a complete Request to Continue Coverage form is submitted.

5. If the owner or operator does not submit the Request to Continue Coverage form in accordance with Part I.F.2. and 3., coverage under this permit is automatically terminated after interim coverage expires.

[4] Unless NYSDEC grants a waiver in accordance with 40 CFR 127.15(c) or (d). All waiver requests must be submitted to Stormwater_info@dec.ny.gov or NYSDEC, Bureau of Water Permits, 625 Broadway, 4th Floor, Albany, New York 12233-3505.

G. Change of *Owner or Operator*

When applicable:

1. When property ownership changes, or when there is a change in operational control over the construction plans and specifications, the following process applies:

    a. The new *owner or operator* must meet the applicable prerequisites for submitting an eNOI in accordance with Part I.D.2.; and

    b. The new *owner or operator* must submit an eNOI in accordance with Part I.D.3.; and

    c. Permit coverage for the new *owner or operator* will be effective upon receipt of the LOA in accordance with Part I.D.3.b.; and

    d. The new *owner or operator*, upon receipt of their LOA, must provide their Permit ID to the original *owner or operator*; and

    e. If the original *owner or operator* will no longer be the *owner or operator* of the *construction activity* identified in the original *owner's or operator's* eNOI, the original *owner or operator*, upon receipt of the new *owner's or operator's* Permit ID in accordance with Part I.G.1.d., must submit to NYSDEC a completed eNOT in accordance with Part V. that includes the name and Permit ID of the new *owner or operator*; or

    f. If the original *owner or operator* maintains ownership of a portion of the *construction activity*, the original *owner or operator* must maintain their coverage under the permit by modifying their eNOI; modifications to the eNOI must include:

        i. the revised area of disturbance and/or *impervious area(s)*; and

        ii. the revised SMP information, if applicable; and

        iii. a narrative description of what has changed; and

        iv. the new *owner's or operator's* Permit ID for the portion of the project removed from the eNOI.

    Owners or operators must follow Part I.E.9. to modify the eNOI.

Part II. Water Quality-Based Effluent Limitations

A. Maintaining Water Quality

NYSDEC expects that compliance with the requirements of this permit will control *discharge*s necessary to meet applicable *water quality standards*. It shall be a violation of the *ECL* for any *discharge* to either cause or contribute to a violation of the following *water quality standards* as contained in Parts 700 through 705 of Title 6 of the Official Compilation of Codes, Rules and Regulations of the State of New York:

1. There must be no increase in turbidity that will cause a substantial visible contrast to natural conditions; and

2. There must be no increase in suspended, colloidal or settleable solids that will cause deposition or impair the waters for their best usages; and

3. There must be no residue from oil and floating substances, nor visible oil film, nor globules of grease.

If there is evidence indicating that the *stormwater discharge*s authorized by this permit are causing, have the reasonable potential to cause, or are contributing to a violation of the *water quality standard,* the *owner or operator* must take appropriate corrective action in accordance with Part IV.C.5. of this permit and document in accordance with Part IV.C.4. of this permit. To address the *water quality standard* violation the *owner or operator* must include and implement appropriate controls in the *SWPPP* to correct the problem or obtain an individual SPDES permit.

If, despite compliance with the requirements of this permit, it is demonstrated that the *stormwater discharge*s authorized by this permit are causing or contributing to a violation of *water quality standards*, or if NYSDEC determines that a modification of this permit is necessary to prevent a violation of *water quality standards*, the authorized *discharge*s will no longer be eligible for coverage under this permit, and the *owner or operator* must obtain an individual SPDES permit prior to further *discharges* from the *construction site*.

B. Effluent Limitations Applicable to *Discharges* from *Construction Activities*

*Discharge*s authorized by this permit must achieve, at a minimum, the effluent limitations in Part II.B.1.a., b., c., d., and e. These limitations represent the

degree of effluent reduction attainable by the application of best practicable technology currently available.

1. Erosion and Sediment Control Requirements - The *owner or operator* must select, design, install, implement, and maintain control measures to *minimize* the *discharge* of *pollutants* and prevent a violation of the *water quality standards*. The selection, design, installation, implementation, and maintenance of these control measures must meet the non-numeric effluent limitations in Part II.B.1.a., b., c., d., and e. and be in accordance with the New York State Standards and Specifications for Erosion and Sediment Control (BB), dated November 2016, using sound engineering judgment. Where control measures are not designed in conformance with the design criteria included in the technical standard, the *owner or operator* must include in *SWPPP* the reason(s) for the deviation, or alternative design, and provide information in the *SWPPP* demonstrating that the deviation or alternative design is *equivalent* to the technical standard.

    a. **Erosion and Sediment Controls.** At a minimum, erosion and sediment controls must be selected, designed, installed, implemented, and maintained to:

        i. *Minimize* soil erosion through application of runoff control and soil stabilization control measure to *minimize pollutant discharge*s; and

        ii. Control *stormwater discharge*s, including both peak flow rates and total *stormwater* volume, to *minimize* channel and *streambank* erosion and scour in the immediate vicinity of the *discharge* points; and

        iii. *Minimize* the amount of soil exposed during *construction activity*; and

        iv. *Minimize* the disturbance of *steep slope*; and

        v. *Minimize* sediment *discharge*s from the site; and

        vi. Provide and maintain *natural buffers* around surface waters, direct *stormwater* to vegetated areas and maximize *stormwater* infiltration to reduce *pollutant discharge*s, unless *infeasible*; and

        vii. *Minimize* soil compaction. *Minimizing* soil compaction is not required

where the intended function of a specific area of the site dictates that it be compacted; and

viii. Unless *infeasible*, preserve a sufficient amount of topsoil to complete soil restoration and establish a uniform, dense vegetative cover; and

ix. *Minimize* dust. On areas of exposed soil, *minimize* dust through the appropriate application of water or other dust suppression techniques to control the generation of *pollutants* that could be discharged from the site.

b. **Soil Stabilization**. In areas where soil disturbance activity has ceased, whether permanently or *temporarily ceased*, the application of soil stabilization measures must be initiated by the end of the next business day and completed within 14 calendar days from the date the current soil disturbance activity ceased. For *construction sites* that *directly discharge* to one of the 303(d) segments listed in Appendix D, or are located in one of the watersheds listed in Appendix C, or are authorized to disturb greater than five acres in accordance with Part I.E.5.a.viii., the application of soil stabilization measures must be initiated by the end of the next business day and completed within seven calendar days from the date the soil disturbance activity ceased.

c. **Dewatering**. *Discharge*s from *dewatering* activities, including *discharge*s from *dewatering* of trenches and excavations, must be managed by appropriate control measures.

d. **Pollution Prevention Measures**. Select, design, install, implement, and maintain effective pollution prevention measures to *minimize* the *discharge* of *pollutants* and prevent a violation of the *water quality standards*. At a minimum, such measures must be selected, designed, installed, implemented, and maintained to:

i. *Minimize* the *discharge* of *pollutants* from equipment and vehicle washing, wheel wash water, and other wash waters. Soaps, detergents and solvents cannot be used; and

ii. *Minimize* the exposure of building materials, building products, construction wastes, trash, landscape materials, fertilizers, pesticides, herbicides, detergents, sanitary waste, hazardous and toxic waste, and other materials present on the site to precipitation

and to *stormwater*. *Minimization* of exposure is not required in cases where the exposure to precipitation and to *stormwater* will not result in a *discharge* of *pollutants*, or where exposure of a specific material or product poses little risk of *stormwater* contamination (such as final products and materials intended for outdoor use); and

iii. Prevent the *discharge* of *pollutants* from spills and leaks and implement chemical spill and leak prevention and response procedures.

e. **Surface Outlets.** When discharging from basins and impoundments, the surface outlets must be designed, constructed, and maintained in such a manner that sediment does not leave the basin or impoundment and that erosion at or below the outlet does not occur.

C. Post-Construction Stormwater Management Practice (SMP) Requirements

1. The *owner or operator* of a *construction activity* that requires post-construction SMPs, in accordance with Part III.C., must select, design, install, implement, and maintain the SMPs to meet the *performance criteria* in the New York State Stormwater Management Design Manual, dated July 31, 2024 (DM), using sound engineering judgment. Where SMPs are not designed in conformance with the *performance criteria* in the DM, the *owner or operator* must include in the *SWPPP* the reason(s) for the deviation or alternative design and provide information which demonstrates that the deviation or alternative design is *equivalent* to the technical standard.

2. The *owner or operator* of a *construction activity*, that requires SMPs in accordance with Part III.C., must design the practices to meet the applicable *sizing criteria* in Part II.C.2.a., b., c., or d.

a. Sizing Criteria for *New Development*

i. Runoff Reduction Volume (RRv) and Water Quality Volume (WQv):

1. Reduce the total WQv by application of RR techniques and standard SMPs with RRv capacity. The total WQv must be calculated in accordance with the criteria in Section 4.2 of the DM; or

2. Minimum RRv and Treatment of Remaining Total WQv: *Construction activities* that cannot meet the requirements in Part II.C.2.a.i.1. due to *site limitations* must direct runoff from all newly constructed *impervious areas* to a RR technique or standard SMP with RRv capacity unless *infeasible*. The specific *site limitations* that prevent the reduction of 100% of the WQv must be documented in the *SWPPP*. For each *impervious area* that is not directed to a RR technique or standard SMP with RRv capacity, the *SWPPP* must include documentation which demonstrates that all options were considered and for each option explains why it is considered *infeasible*.

   In no case shall the runoff reduction achieved from the newly constructed *impervious areas* be less than the Minimum RRv as calculated using the criteria in Section 4.4 of the DM. The remaining portion of the total WQv that cannot be reduced must be treated by application of standard SMPs.

ii. Channel Protection Volume (CPv): Provide 24 hour extended detention of the post-developed 1-year, 24-hour storm event, remaining after runoff reduction. Where a CPv control orifice is provided, the minimum orifice size must be 3 inches, with acceptable external trash rack or orifice protection. The CPv requirement does not apply when:

   1. Reduction of the entire CPv is achieved by application of runoff reduction techniques or infiltration systems; or

   2. The 1-year post-development peak *discharge* is less than or equal to 2.0 cfs without detention or velocity controls; or

   3. The site *directly discharges* into a fifth order or larger water body (stream, river, or lake), or tidal waters, where the increase in smaller flows will not impact the stream bank or channel integrity. However, the point of *discharge* must be adequately protected against scour and erosion by the increased peak *discharge*.

iii. *Overbank* Flood Control Criteria (Qp): Requires storage to attenuate the post-development 10-year, 24-hour peak *discharge* rate (Qp) to predevelopment rates. The Qp requirement does not apply when:

1. the site *directly discharges* to tidal waters or fifth order or larger streams, or

2. A downstream analysis reveals that *overbank* control is not required.

iv. Extreme Flood Control Criteria (Qf): Requires storage to attenuate the post-development 100-year, 24-hour peak *discharge* rate (Qf) to predevelopment rates. The Qf requirement does not apply when:

1. the site *directly discharges* to tidal waters or fifth order or larger streams, or

2. A downstream analysis reveals that *overbank* control is not required.

b. *Sizing Criteria* for *New Development* in Enhanced Phosphorus Removal Watersheds

i. Runoff Reduction Volume (RRv) and Water Quality Volume (WQv):

1. Reduce the WQv by application of RR techniques and standard SMPs with RRv capacity. The total WQv is the runoff volume from the 1-year, 24-hour design storm over the post-developed watershed and must be calculated in accordance with the criteria in Section 4.3 of the DM; or

2. Minimum RRv and Treatment of Remaining Total WQv: *Construction activities* that cannot meet the criteria in Part II.C.2.b.i.1. due to *site limitations* must direct runoff from all newly constructed *impervious areas* to a RR technique or standard SMP with RRv capacity unless *infeasible*. The specific *site limitations* that prevent the reduction of 100% of the WQv must be documented in the *SWPPP*. For each *impervious area* that is not directed to a RR technique or standard SMP with RRv capacity, the *SWPPP* must include

documentation which demonstrates that all options were considered and for each option explains why it is considered *infeasible.*

In no case shall the runoff reduction achieved from the newly constructed *impervious areas* be less than the Minimum RRv as calculated using the criteria in Section 4.5 of the DM. The remaining portion of the total WQv that cannot be reduced must be treated by application of standard SMPs.

ii. Channel Protection Volume (CPv): Provide 24 hour extended detention of the post-developed 1-year, 24-hour storm event, remaining after runoff reduction. Where a CPv control orifice is provided, the minimum orifice size must be 3 inches, with acceptable external trash rack or orifice protection. The CPv requirement does not apply when:

1. Reduction of the entire CPv is achieved by application of runoff reduction techniques or infiltration systems; or

2. The 1-year post-development peak *discharge* is less than or equal to 2.0 cfs; or

3. The site *directly discharges* to tidal waters, or a fifth order or larger water body (stream, river, or lake) where the increase in smaller flows will not impact the stream bank or channel integrity. However, the point of *discharge* must be adequately protected against scour and erosion by the increased peak *discharge*.

iii. *Overbank* Flood Control Criteria (Qp): Requires storage to attenuate the post-development 10-year, 24-hour peak *discharge* rate (Qp) to predevelopment rates. The Qp requirement does not apply when:

1. the site *directly discharges* to tidal waters or fifth order or larger streams; or

2. A downstream analysis reveals that *overbank* control is not required.

iv. Extreme Flood Control Criteria (Qf): Requires storage to attenuate the post-development 100-year, 24-hour peak *discharge* rate (Qf) to predevelopment rates. The Qf requirement does not apply when:

1. the site *directly discharges* to tidal waters or fifth order or larger streams; or

2. A downstream analysis reveals that *overbank* control is not required.

c. *Sizing Criteria* for *Redevelopment Activity*

i. Water Quality Volume (WQv): The WQv treatment objective for *redevelopment activity* must be addressed by one of the following options, as outlined in Section 9.2.1. *Redevelopment activities* located in an Enhanced Phosphorus Removal Watershed (see Part III.B.3. and Appendix C) must calculate the WQv in accordance with Section 4.3 of the DM. All other *redevelopment activities* must calculate the WQv in accordance with Section 4.2 of the DM.

1. Reduce the existing *impervious cover* by a minimum of 25% of the total disturbed, *impervious area*. The Soil Restoration criteria in Section 5.1.6 of the DM must be applied to all newly created pervious areas; or

2. Capture and treat 100% of the required WQv, for a minimum of 25% of the disturbed redevelopment *impervious area*, by implementation of standard SMPs or reduced by application of runoff reduction techniques; or

3. Capture and treat 100% of the required WQv, for a minimum of 75% of the disturbed redevelopment *impervious area*, by implementation of a volume-based alternative SMP, as defined in Section 9.4 of the DM; or

4. Capture and treat 100% of the required WQv, for a minimum of 75% of the disturbed redevelopment *impervious area*, by implementation of a flow-through alternative SMP sized to treat the peak rate of runoff from the WQv design storm; or

5. Application of a combination of 1 through 4 above that provide a weighted average of at least two of the above methods. Application of this method must be in accordance with the criteria in Section 9.2.1(A)(V) of the DM; or

6. If there is an existing SMP located on the site that captures and treats runoff from the *impervious area* that is being disturbed, the WQv treatment option selected must, at a minimum, provide treatment equal to the treatment that was being provided by the existing practice(s) if that treatment is greater than the treatment required by options 1 through 5 above.

ii. Channel Protection Volume (CPv) is not required if there is 0% change to hydrology that increases the *discharge* rate and volume from the project site.

iii. *Overbank* Flood Control (Qp) is not required if there is 0% change to hydrology that increases the *discharge* rate from the project site.

iv. Extreme Flood Control (Qf) is not required if there is 0% change to hydrology that increases the *discharge* rate from the project site.

d. *Sizing Criteria* for Combination of *Redevelopment Activity* and *New Development*

Construction projects, that include both *new development* and *redevelopment activity*, must use SMPs that meet the *sizing criteria* calculated as an aggregate of the *sizing criteria* in Part II.C.2.a. or b. for the *new development* portion of the project and Part II.C.2.c. for the *redevelopment activity* portion of the project.

Part III. Stormwater Pollution Prevention Plan (SWPPP)

A. General *SWPPP* Requirements

1. A *SWPPP* must be prepared and implemented by the *owner or operator* of all *construction activity* covered by this permit. All authorized *discharges* must be identified in the *SWPPP*. The *SWPPP* must document the selection, design, installation, implementation and maintenance of the control measures and

practices that will be used to meet the effluent limitations in Part II.B. and, where applicable, the SMP requirements in Part II.C.

2. The *SWPPP* must demonstrate consideration in narrative format of the future physical risks due to climate change pursuant to the Community Risk and Resiliency Act (CRRA), 6 NYCRR Part 490, and associated guidance.

    a. The owner or operator must consider:

        i. the following physical risks due to climate change:

            (i) increasing temperature; and

            (ii) increasing precipitation; and

            (iii) increasing variability in precipitation, including chance of drought; and

            (iv) increasing frequency and severity of flooding; and

            (v) rising sea level; and

            (vi) increasing storm surge; and

            (vii) shifting ecology.

        ii. for each of the following:

            (i) overall site planning; and

            (ii) location, elevation, and sizing of:

                a. control measures and practices; and

                b. conveyance system(s); and

                c. detention system(s).

3. The *SWPPP* must describe the erosion and sediment control practices and where required, SMPs that will be used and/or constructed to reduce the *pollutants* in *stormwater discharges* and to assure compliance with the

requirements of this permit. In addition, the *SWPPP* must identify potential sources of pollution which may reasonably be expected to affect the quality of *stormwater discharges*.

4. All *SWPPPs*, that require the SMP component in accordance with Part III.B.2., must be prepared by a *qualified professional*.

5. The *owner or operator* must keep the *SWPPP* current so that, at all times, it accurately documents the erosion and sediment control practices that are being used or will be used during construction, and all SMPs that will be constructed on the site. At a minimum, the *owner or operator* must modify the *SWPPP*, including construction drawings:

   a. whenever the current provisions prove to be ineffective in *minimizing pollutants* in *stormwater discharges* from the site; and

   b. whenever there is a change in design, construction, or operation at the *construction site* that has or could have an effect on the *discharge* of *pollutants*; and

   c. to address issues or deficiencies identified during an inspection by the *qualified inspector,* NYSDEC, or other regulatory authority; and

   d. to document the final construction conditions in an as-built drawing.

6. NYSDEC may notify the *owner or operator* at any time that the *SWPPP* does not meet one or more of the minimum requirements of this permit. The notification must be in writing and identify the provisions of the *SWPPP* that require modification. Within fourteen (14) calendar days of such notification, or as otherwise indicated by NYSDEC, the *owner or operator* must make the required changes to the *SWPPP* and submit written notification to NYSDEC that the changes have been made. If the *owner or operator* does not respond to NYSDEC's comments in the specified time frame, NYSDEC may suspend the *owner's or operator's* coverage under this permit or require the *owner or operator* to obtain coverage under an individual SPDES permit in accordance with Part II.D.4.

7. Prior to the *commencement of construction activity*, the *owner or operator* must identify the contractor(s) and subcontractor(s) that will be responsible for installing, constructing, repairing, replacing, inspecting, and maintaining the erosion and sediment control practices included in the *SWPPP* and the

contractor(s) and subcontractor(s) that will be responsible for constructing the SMPs included in the *SWPPP*. The *owner or operator* must have each of the contractors and subcontractors identify at least one person from their company to be *trained contractor* that will be responsible for implementation of the *SWPPP*. The *owner or operator* must ensure that at least one *trained contractor* is on site daily when soil disturbance activities are being performed.

The *owner or operator* must have each of the contractors and subcontractors identified above sign a copy of the following certification statement below before the *commencement of construction activities*:

> "I hereby certify under penalty of law that I understand and agree to comply with the requirements of the *SWPPP* and agree to implement any corrective actions identified by the *qualified inspector* during a site inspection. I also understand that the *owner or operator* must comply with the requirements of the most current version of the New York State Pollutant Discharge Elimination System (SPDES) Construction General Permit (CGP) for Stormwater Discharges from Construction Activities and that it is unlawful for any person to cause or contribute to a violation of *water quality standards*. Furthermore, I am aware that there are significant penalties for submitting false information, that I do not believe to be true, including the possibility of fine and imprisonment for knowing violations"

In addition to providing the certification statement above, the certification page must also identify the specific elements of the *SWPPP* that each contractor and subcontractor will be responsible for and include the name and title of the person providing the signature; the name and title of the *trained contractor* responsible for *SWPPP* implementation; the name, address and telephone number of the contracting firm; the address (or other identifying description) of the site; and the date the certification statement is signed. The *owner or operator* must attach the certification statement(s) to the copy of the *SWPPP* that is maintained at the *construction site*. If new or additional contractors are hired to implement measures identified in the *SWPPP* after the *commencement of construction activities*, they must also sign the certification statement and provide the information listed above prior to performing *construction activities*.

B. Required *SWPPP* Contents

1. Erosion and sediment control component - The *owner or operator* must prepare a *SWPPP* that includes erosion and sediment control practices.

    a. Erosion and sediment control practices must be designed:

        i. in conformance with the BB; or

        ii. *equivalent* to the BB if deviating from Part III.B.1.a.i.

    b. If the erosion and sediment control practices are designed in conformance with Part III.B.1.a.ii., the *SWPPP* must include a demonstration of *equivalence* to the BB.

    c. At a minimum, the erosion and sediment control component of the *SWPPP* must include the following:

        i. Background information about the scope of the project, including the location, type and size of project; and

        ii. A site map/construction drawing(s) with north arrows for the project, including a general location map. At a minimum, the site map must show the total site area; all improvements; areas of disturbance; areas that will not be disturbed; existing vegetation; on-site and adjacent off-site surface water(s); floodplain/floodway boundaries; wetlands and drainage patterns that could be affected by the *construction activity*; existing and final contours; locations of different soil types with boundaries; material, waste, borrow or equipment storage areas located on adjacent properties; and location(s) of the *stormwater discharge*(s) and receiving surface water(s); and

        iii. A description of the soil(s) present at the site, including an identification of the Hydrologic Soil Group (HSG); and

        iv. A phasing plan for the project and sequencing plans for all *phases*, both of which must address clearing and grubbing, excavation and grading, utility and infrastructure installation, *final stabilization*,

and any other *construction activity* at the site that will result in soil disturbance.

1. The phasing plan must include:

    a. a map delineating and labeling the limits of soil disturbance for all *phases* of a project; and

    b. a table identifying the order and intended schedule of when each *phase* will begin and end its sequencing plan. The table must identify the total disturbed area for each *phase* at any one time and the total disturbed area for the overall project at any one time all on one timeline showing all overlapping quantities of disturbed area at any one time; and

2. A sequencing plan for a specific *phase* must include:

    a. a table indicating the order and intended schedule of *construction activities* within a *phase*, and corresponding construction drawings with a description of the work to be performed; and

    b. all permanent and *temporary stabilization* measures; and

v. A description of the minimum erosion and sediment control practices to be installed or implemented for each *construction activity* that will result in soil disturbance. Include a schedule that identifies the timing of initial placement or implementation of each erosion and sediment control practice and the minimum time frames that each practice should remain in place or be implemented; and

vi. A site map/construction drawing(s) showing the specific location(s), size(s), and length(s) of each erosion and sediment control practice; and

vii. The dimensions, material specifications, installation details, and operation and maintenance requirements for all erosion and sediment control practices. Include the location and sizing of any

temporary sediment basins and structural practices that will be used to divert flows from exposed soils; and

viii. A maintenance inspection schedule for the contractor(s) and subcontractor(s) identified in Part III.A.7. to ensure continuous and effective operation of the erosion and sediment control practices. The maintenance inspection schedule must be in accordance with the requirements in the BB technical standard; and

ix. A description of the pollution prevention measures that will be used to control litter, construction chemicals and construction debris from becoming a *pollutant* source in the *stormwater discharges*; and

x. A description and location of any *stormwater discharges* associated with industrial activity other than construction at the site, including, but not limited to, *stormwater discharges* from asphalt plants and concrete plants located on the *construction site*; and

xi. Identification of any elements of the design that are not in conformance with the design criteria in the BB technical standard. Include the reason for the deviation or alternative design and provide information which demonstrates that the deviation or alternative design is *equivalent* to the technical standard.

2. SMP component – The *owner or operator* of *construction activity* identified in Table 2 of Appendix B must prepare a *SWPPP* that includes SMPs.

   a. SMPs must be designed in conformance with the applicable *sizing criteria* in Part II.C.2.a., c., or d.; and

   b. SMPs must be designed in conformance with the *performance criteria*:

      i. in the DM; or

      ii. *equivalent* to the DM if deviating from Part III.B.2.b.i.; or

      iii. in the New York State Stormwater Management Design Manual, dated January 2015 (2015 Design Manual), or *equivalent* to it, if the following criteria are met:

1. The eNOI is submitted in accordance with Part I.D. before January 29, 2027 for *construction activities* that are either:

    a. subject to governmental review and approval:

        i. where the *owner or operator* made any application to that governmental entity prior to the effective date of this permit; and

        ii. such application included a *SWPPP* developed using the 2015 Design Manual or *equivalent* to it; or

    b. not subject to governmental review and approval:

        i. where a fiscal allocation for the *construction activities* has been developed and approved by a governmental entity; and

        ii. the *SWPPP* was developed using the 2015 Design Manual or *equivalent* to it; and

c. If SMPs are designed in conformance with Part III.B.2.b.ii., the *SWPPP* must include the reason(s) for the deviation or alternative design and a demonstration of *equivalence* to the DM; and

d. If SMPs are designed in conformance with Part III.B.2.b.iii., the *SWPPP* must include supporting information or documentation demonstrating that Part III.B.2.b.iii.1.a. or b. apply; and

e. The SMP component of the *SWPPP* must include the following:

    i. Identification of all SMPs to be constructed as part of the project, including which option the SMP designs conform to, either Part III.B.2.b.i., ii., or iii. Include the dimensions, material specifications and installation details for each SMP; and

    ii. A site map/construction drawing(s) showing the specific location and size of each SMP; and

iii. A Stormwater Modeling and Analysis Report that includes:

(i) Map(s) showing pre-development conditions, including watershed/subcatchments boundaries, flow paths/routing, and design points; and

(ii) Map(s) showing post-development conditions, including watershed/subcatchments boundaries, flow paths/routing, design points and SMPs; and

(iii) Results of *stormwater* modeling (i.e. hydrology and hydraulic analysis) for the required storm events. Include supporting calculations (model runs), methodology, and a summary table that compares pre- and post-development runoff rates and volumes for the different storm events; and

(iv) Summary table, with supporting calculations, which demonstrates that each SMP has been designed in conformance with the *sizing criteria* included in the DM; and

(v) Identification of any *sizing criteria* that is not required based on the requirements included in Part II.C.; and

(vi) Identification of any elements of the design that are not in conformance with the *performance criteria* in the DM. Include the reason(s) for the deviation or alternative design and provide information which demonstrates that the deviation or alternative design is *equivalent* to the DM.

iv. Soil testing results and locations (test pits, borings); and

v. Infiltration test results, when required in accordance with Part III.B.2.a.; and

vi. An operations and maintenance plan that includes inspection and maintenance schedules and actions to ensure continuous and effective operation of each SMP. The plan must identify the entity

that will be responsible for the long-term operation and maintenance of each practice; and

3. Enhanced Phosphorus Removal Standards - The *owner or operator* of *construction activity* identified in Table 2 of Appendix B that is located in a watershed identified in Appendix C must prepare a *SWPPP* that includes SMPs designed in conformance with the applicable *sizing criteria* in Part II.C.2.b., c., or d. and the *performance criteria* Enhanced Phosphorus Removal Standards included in the DM. At a minimum, the SMP component of the *SWPPP* must meet the requirements of Part III.B.2.

C. Required *SWPPP* Components by Project Type

Owners or operators of *construction activities*, identified in Table 1 of Appendix B, are required to prepare a *SWPPP* that only includes erosion and sediment control practices designed in accordance with Part III.B.1. *Owners or operators* of the *construction activities*, identified in Table 2 of Appendix B, must prepare a *SWPPP* that also includes SMPs designed in accordance with Part III.B.2 or 3.

For the entire area of disturbance, including the entire *common plan of development or sale* if applicable, the owner or operator must evaluate every bullet from Appendix B Table 1 and Table 2 separately. If bullets from both Table 1 and Table 2 apply, the *SWPPP* must include erosion and sediment control practices for all *construction activities* but SMPs for only those portions of the *construction activities* that fall under Table 2 bullet(s).

Part IV. Inspection and Maintenance Requirements

A. General Construction Site Inspection and Maintenance Requirements

1. The *owner or operator* must ensure that all erosion and sediment control practices (including pollution prevention measures), and all SMPs identified in the *SWPPP*, are inspected and maintained in accordance with Part IV.B. and C.

B. Contractor Maintenance Inspection Requirements

1. The *owner or operator* of each *construction activity*, identified in Tables 1 and 2 of Appendix B, must have a *trained contractor* inspect the erosion and sediment control practices and pollution prevention measures being

implemented within the active work area daily to ensure that they are being maintained in effective operating condition at all times. If deficiencies are identified, the contractor must:

a. if the corrective action does not require engineering design:

    i. begin implementing corrective actions within one business day; and

    ii. complete the corrective actions within five business days; or

b. if the corrective action requires engineering design:

    i. begin the engineering design process within five business days; and

    ii. complete the corrective action in a reasonable time frame but no later than within 60 calendar days.

2. For *construction sites* where soil disturbance activities have been temporarily suspended (e.g. winter shutdown) and *temporary stabilization* measures have been applied to all disturbed areas, the *trained contractor* can stop conducting the maintenance inspections in accordance with Part IV.B.1. The *trained contractor* must begin conducting the maintenance inspections in accordance with Part IV.B.1. as soon as soil disturbance activities resume.

3. For *construction sites* where soil disturbance activities have been shut down with partial project completion, the *trained contractor* can stop conducting the maintenance inspections in accordance with Part IV.B.1. if all areas disturbed as of the project shutdown date have achieved *final stabilization* and all SMPs required for the completed portion of the project have been constructed in conformance with the *SWPPP* and are operational.

C. *Qualified Inspector* Inspection Requirements

1. With the exception of the following *construction activities* identified in Tables 1 and 2 of Appendix B, a *qualified inspector* must conduct site inspections for all other *construction activities* identified in Tables 1 and 2 of Appendix B:

    a. the construction of a single-family residential subdivision with 25% or less *impervious cover* at total site build-out that involves a soil disturbance of one (1) or more acres of land but less than or equal to five (5) acres and is

not located in one of the watersheds listed in Appendix C and not *directly discharging* to one of the 303(d) segments listed in Appendix D; and

b. the construction of a single-family home that involves soil disturbances of one (1) or more acres but less than or equal to five (5) acres and is not located in one of the watersheds listed in Appendix C and not *directly discharging* to one of the 303(d) segments listed in Appendix D; and

c. construction on *agricultural property* that involves soil disturbances of one (1) or more acres but less than five (5) acres; and

d. *construction activities* located in the New York City Watershed located east of the Hudson River, see Appendix C Figure 1, that involve soil disturbances of 5,000 square feet or more, but less than one acre.

2. The *qualified inspector* must conduct site inspections in accordance with the following timetable:

a. For *construction sites* where soil disturbance activities are on-going, the *qualified inspector* must conduct a site inspection at least once every seven (7) calendar days; or

b. For *construction sites* where soil disturbance activities are on-going and the *owner or operator* has received authorization in accordance with Part I.E.6. to disturb greater than five (5) acres of soil at any one time, the *qualified inspector* must conduct at least two (2) site inspections every seven (7) calendar days. The two (2) inspections must be separated by a minimum of two (2) full calendar days; or

c. For *construction sites* where soil disturbance activities have been temporarily suspended (e.g. winter shutdown) and *temporary stabilization* measures have been applied to all disturbed areas, the *qualified inspector* must conduct a site inspection at least once every thirty (30) calendar days. The *owner or operator* must notify the DOW Water (SPDES) Program contact at the Regional Office (see contact information in Appendix E) or, in areas under the jurisdiction of a *Traditional Land Use Control MS4 Operator,* the *Traditional Land Use Control MS4 Operator* (provided the *Traditional Land Use Control MS4 Operator* is not the *owner or operator* of the *construction activity*) by hard copy or email prior to reducing the inspections to this frequency and again by hard copy or email prior to re-commencing construction; or

d. For *construction sites* where soil disturbance activities have been shut down with partial project completion, the requirement to have the *qualified inspector* conduct inspections ceases if all areas disturbed as of the project shutdown date have achieved *final stabilization* and all SMPs required for the completed portion of the project have been constructed in conformance with the *SWPPP* and are operational. The *owner or operator* must notify the DOW Water (SPDES) Program contact at the Regional Office (see contact information in Appendix E) or, in areas subject to the review authority of *Traditional Land Use Control MS4 Operator(s)* in accordance with Part I.D.2.b.ii.1., the *Traditional Land Use Control MS4 Operator(s)* (provided the *Traditional Land Use Control MS4 Operator(s)* are not the *owners or operators* of the *construction activity*) in writing prior to the shutdown and again in writing prior to resuming *construction activity*. If soil disturbance activities are not resumed within 2 years from the date of shutdown, the *owner or operator* must terminate coverage by meeting the requirements of Part V; or

e. For *construction sites* involving soil disturbance of one (1) or more acres that *directly discharge* to one of the 303(d) segments listed in Appendix D or is located in one of the watersheds listed in Appendix C, the *qualified inspector* must conduct at least two (2) site inspections every seven (7) calendar days. The two (2) inspections must be separated by a minimum of two (2) full calendar days.

3. At a minimum, the *qualified inspector* must inspect:

   a. all erosion and sediment control practices and pollution prevention measures to ensure integrity and effectiveness; and

   b. all SMPs under construction to ensure that they are constructed in conformance with the *SWPPP*; and

   c. all areas of disturbance that have not achieved *final stabilization*; and

   d. all points of *discharge* to *surface waters of the State* located within, or immediately adjacent to, the property boundaries of the *construction site*; and

   e. all points of *discharge* from the *construction site*.

4. The *qualified inspector* must prepare an inspection report subsequent to each and every inspection. At a minimum, the inspection report must include and/or address all of the following, for all *construction activities* except those listed in Part IV.C.1.:

   a. Permit identification number; and

   b. Date and time of inspection; and

   c. Name and title of person(s) performing inspection; and

   d. A description of the weather and soil conditions (e.g. dry, wet, saturated) at the time of the inspection, including the temperature at the time of the inspection; and

   e. A description of the condition of the runoff at all points of *discharge* from the *construction site*. This must include identification of any *discharges* of sediment from the *construction site*. Include *discharges* from conveyance systems (i.e. pipes, culverts, ditches, etc.) and overland flow; and

   f. A description of the condition of all *surface waters of the State* located within, or immediately adjacent to, the property boundaries of the *construction site* which receive runoff from disturbed areas. This must include identification of any *discharges* of sediment to the *surface waters of the State*; and

   g. Identification of all erosion and sediment control practices and pollution prevention measures that need repair or maintenance; and

   h. Identification of all erosion and sediment control practices and pollution prevention measures that were not installed properly or are not functioning as designed and need to be reinstalled or replaced; and

   i. Description and sketch (map) of areas with active soil disturbance activity, areas that have been disturbed but are inactive at the time of the inspection, and areas that have been stabilized (temporary and/or final) since the last inspection; and

   j. Estimates, in square feet or acres, of the following areas:

i. Total area with active soil disturbance (not requiring either *temporary stabilization* or *final stabilization*); and

ii. Total area with inactive soil disturbance (requiring either *temporary stabilization* or *final stabilization*); and

iii. Total area that has achieved *temporary stabilization*; and

iv. Total area that has achieved *final stabilization*; and

k. Current stage of construction of all SMPs and identification of all *construction activity* on site that is not in conformance with the *SWPPP* and technical standards; and

l. Corrective action(s) that must be taken to install, repair, replace or maintain erosion and sediment control practices and pollution prevention measures; and to correct deficiencies identified with the construction of the SMP(s); and

m. Identification and status of all corrective actions that were required by previous inspection; and

n. Digital photographs, with date stamp, that clearly show the condition of all practices that have been identified as needing corrective actions. The *qualified inspector* must attach color copies of the digital photographs to the inspection report being maintained onsite within seven (7) calendar days of the date of the inspection. The *qualified inspector* must also take digital photographs, with date stamp, that clearly show the condition of the practice(s) after the corrective action has been completed. The *qualified inspector* must attach paper color copies of the digital photographs to the inspection report that documents the completion of the corrective action work within seven (7) calendar days of that inspection.

5. Within one business day of the completion of an inspection, the *qualified inspector* must notify the *owner or operator*, and appropriate contractor or subcontractor identified in Part III.A.7., of any corrective actions that need to be taken. The contractor or subcontractor must:

a. if the corrective action does not require engineering design:

i. begin implementing corrective actions within one business day; and

ii. complete the corrective actions within five business days; or

b. if the corrective action requires engineering design:

i. begin the engineering design process within five business days; and

ii. complete the corrective action in a reasonable time frame but no later than within 60 calendar days.

6. All inspection reports must be signed by the *qualified inspector.* In accordance with Part I.E.3., the inspection reports must be maintained on site with the *SWPPP*.

Part V. How to Terminate CGP Coverage

A. Electronic Notice of Termination (eNOT) Submittal

The eNOT contains questions to ensure requirements in Part V.A. have been met.

1. An *owner or operator* must terminate coverage when one or more of the following requirements have been met:

a. Total project completion:

i. all *construction activity* identified in the *SWPPP* has been completed; and

ii. all areas of disturbance have achieved *final stabilization*; and

iii. all temporary, structural erosion and sediment control measures have been removed; and

iv. all SMPs have been constructed in conformance with the *SWPPP* and are operational; and

v. an as-built drawing has been prepared; or

b. Planned shutdown with partial project completion:

   i. all soil disturbance activities have ceased; and

   ii. all areas disturbed as of the project shutdown date have achieved *final stabilization*; and

   iii. all temporary, structural erosion and sediment control measures have been removed; and

   iv. all SMPs required for the completed portion of the project have been constructed in conformance with the *SWPPP* and are operational; and

   v. an as-built drawing has been prepared; or

c. In accordance with Part I.G. Change of Owner or Operator; or

d. The *owner or operator* has obtained coverage under an alternative general SPDES permit or an individual SPDES permit.

2. For *construction activities* that require *qualified inspector* inspections in accordance with Part IV.C.1. and have met Part V.A.1.a. or b., the *owner or operator* must have the *qualified inspector* perform a final site inspection prior to submitting the eNOT. The *qualified inspector* must, by signing the "Final Stabilization" and "Post-Construction Stormwater Management Practice(s)" certification statements on the eNOT, certify that all the requirements in Part V.A.1.a. or b. have been achieved.

3. For *construction activities* that are subject to the review authority of *Traditional Land Use Control MS4 Operator(s)* in accordance with Part I.D.2.b.ii.1. and meet Part V.A.1.a. or b., the *owner or operator* must have the *Traditional Land Use Control MS4 Operator(s)* sign the "MS4 Acceptance" statement on the eNOT in accordance with the requirements in Part VII.J. A *Traditional Land Use Control MS4 Operator* official, by signing this statement, determined that it is acceptable for the *owner or operator* to submit the eNOT in accordance with the requirements of this Part. A *Traditional Land Use Control MS4 Operator* can make this determination by performing a final site inspection themselves or by accepting the *qualified inspector*'s final site inspection certification(s) when required in Part V.A.2.

4. For *construction activities* that require SMPs and meet Part V.A.1.a. or b., the *owner or operator* must, prior to submitting the eNOT, ensure one of the following:

    a. for SMP(s) that were constructed by a private entity, but will be owned, operated, and maintained by a public entity, the SMP(s) and any right-of-way(s) needed to operate and maintain such practice(s) have been deeded to the municipality in which the practice(s) is located; or

    b. for SMP(s) that are privately owned, but will be operated and maintained by a public entity, an executed operation and maintenance agreement is in place with the municipality that will operate and maintain the SMP(s); or

    c. for SMP(s) that are privately owned, the *owner or operator* has a mechanism in place that requires operation and maintenance of the practice(s) in accordance with the operation and maintenance plan, such as a deed covenant in the *owner or operator's* deed of record; or

    d. for SMP(s) that are owned by a public or private institution (e.g. school, university, hospital), government agency or authority, or public utility, the *owner or operator* has policies and procedures in place that ensure operation and maintenance of the practices in accordance with the operation and maintenance plan.

5. An *owner or operator* that has met the requirements of Part V.A.1., 2., 3., and 4. must request termination of coverage under this permit by submitting a complete Notice of Termination form electronically using a NYSDEC approved form.[5]

    a. The owner's or operator's coverage is terminated as of the termination date indicated in the Letter of Termination (LOT), which is sent by NYSDEC after a complete eNOT is submitted.

[5] Unless NYSDEC grants a waiver in accordance with 40 CFR 127.15(c) or (d). All waiver requests must be submitted to Stormwater_info@dec.ny.gov or NYSDEC, Bureau of Water Permits, 625 Broadway, 4th Floor, Albany, New York 12233-3505.

Part VI. Record Retention and Reporting

A. Record Retention

The *owner or operator* must retain a copy of the documents listed in Part I.E.3. and a copy of the LOT for a period of at least five years from the date that NYSDEC accepts a complete NOT submitted in accordance with Part V.

B. Reporting

Except for the eNOI, the signature forms associated with the eNOI, and the eNOT, all other written correspondence requested by NYSDEC, including individual permit applications, must be sent to the address of the appropriate DOW (SPDES) Program contact at the Regional Office listed in Appendix E.

Part VII. Standard Permit Requirements

For the purposes of this permit, examples of contractors and subcontractors include: third-party maintenance and construction contractors.

A. Duty to Comply

The *owner or operator*, and all contractors or subcontractors, must comply with all requirements of this permit. Any non-compliance with the requirements of this permit constitutes a violation of the New York State Environmental Conservation Law (ECL), and its implementing regulations, and is grounds for enforcement action. Filing of a request for termination of coverage under this permit, or a notification of planned changes or anticipated non-compliance, does not limit, diminish or stay compliance with any requirements of this permit.

B. Need to Halt or Reduce Activity Not a Defense

The necessity to halt or reduce the *construction activity* regulated by this permit, in order to maintain compliance with the requirements of this permit, must not be a defense in an enforcement action.

C. Penalties

There are substantial criminal, civil, and administrative penalties associated with violating the requirements of this permit. Fines of up to $37,500 per day for each

violation and imprisonment for up to 15 years may be assessed depending upon the nature and degree of the offense.

D. False Statements

Any person who knowingly makes any false material statement, representation, or certification in any application, record, report, or other document filed or required to be maintained under this permit, including monitoring reports or reports of compliance or noncompliance must, upon conviction, be punished in accordance with ECL §71-1933 and or New York State Penal Law Articles 175 and 210.

E. Re-Opener Clause

Upon issuance of this permit, a determination has been made on the basis of a submitted Notice of Intent, plans, or other available information, that compliance with the specified permit requirements will reasonably protect classified water use and assure compliance with applicable *water quality standards*. Satisfaction of the requirements of this permit notwithstanding, if operation pursuant to this permit causes or contributes to a condition in contravention of State *water quality standards* or guidance values, or if NYSDEC determines that a modification is necessary to prevent impairment of the best use of the waters or to assure maintenance of *water quality standards* or compliance with other provisions of ECL Article 17 or the Clean Water Act (CWA), or any regulations adopted pursuant thereto, NYSDEC may require such modification and the Commissioner may require abatement action to be taken by the *owner or operator* and may also prohibit such operation until the modification has been implemented.

F. Duty to Mitigate

The *owner or operator*, and its contractors and subcontractors, must take all reasonable steps to *minimize* or prevent any *discharge* in violation of this permit which has a reasonable likelihood of adversely affecting human health or the environment.

G. Requiring Another General Permit or Individual SPDES Permit

NYSDEC may require any *owner or operator* authorized to *discharge* in accordance with this permit to apply for and obtain an individual SPDES permit or apply for authorization to *discharge* in accordance with another general SPDES permit.

1. Cases where an individual SPDES permit or authorization to discharge in accordance with another general SPDES permit may be required include, but is not limited to the following:

a. the *owner or operator* is not in compliance with the conditions of this permit or does not meet the requirements for coverage under this permit; and

b. a change has occurred in the availability of demonstrated technology or practices for the control or abatement of *pollutants* applicable to the *point source*; and

c. new effluent limitation guidelines or new source performance standards are promulgated that are applicable to *point sources* authorized to *discharge* in accordance with this permit; and

d. existing effluent limitation guidelines or new source performance standards that are applicable to *point sources* authorized to *discharge* in accordance with this permit are modified; and

e. a water quality management plan containing requirements applicable to such *point sources* is approved by NYSDEC; and

f. circumstances have changed since the time of the request to be covered so that the *owner or operator* is no longer appropriately controlled under this permit, or either a temporary or permanent reduction or elimination of the authorized *discharge* is necessary; and

g. the *discharge* is in violation of section 17-0501 of the ECL; and

h. the *discharge(s)* is a significant contributor of *pollutants*. In making this determination, NYSDEC may consider the following factors:

   i. the location of the *discharge(s)* with respect to *surface waters of the State*; and

   ii. the size of the *discharge(s)*; and

   iii. the quantity and nature of the *pollutants discharged* to *surface waters of the State*; and

   iv. other relevant factors including compliance with other provisions of ECL Article 17, or the CWA.

2. When NYSDEC requires any *owner or operator* authorized by this permit to apply for an individual SPDES permit as provided for in this subdivision, it must notify the *owner or operator* in writing that a permit application is required. This notice must include a brief statement of the reasons for this decision, an application

form, a statement setting a time for the *owner or operator* to file the application for an individual SPDES permit, and a deadline, not sooner than 180 days from the *owner's or operator's* receipt of the notification letter, whereby the authorization to *discharge* under this permit must be terminated. NYSDEC may grant additional time upon demonstration, to the satisfaction of the RWE,[6] that additional time to apply for an alternative authorization is necessary or where NYSDEC has not provided a permit determination in accordance with 6 NYCRR Part 621.

3. When an individual SPDES permit is issued to an *owner or operator* authorized to *discharge* under this permit for the same *discharge(s)*, this permit authorization for *construction activities* authorized under the individual SPDES permit is automatically terminated on the effective date of the individual SPDES permit unless termination is earlier in accordance with 6 NYCRR Part 750.

H. Duty to Provide Information

The *owner or operator* must furnish to NYSDEC, within five business days, unless otherwise set forth by NYSDEC, any information that NYSDEC may request to determine whether cause exists to determine compliance with this permit or to determine whether cause exists for requiring an individual SPDES permit in accordance with 6 NYCRR 750-1.21(e) (see Part VII.G. Requiring Another General Permit or Individual Permit).

The *owner or operator* must make available to NYSDEC, for inspection and copying, or furnish to NYSDEC within 25 business days of receipt of a NYSDEC request for such information, any information retained in accordance with this permit.

Except for Part I.D.4. and 5. and Part I.G., the following applies: where the *owner or operator* becomes aware that it failed to submit any relevant facts on the Notice of Intent, or submitted incorrect information in a Notice of Intent or in any report to NYSDEC, the *owner or operator* must submit such facts or corrected information to NYSDEC within five business days.

I. Extension

In the event a new permit is not issued and effective prior to the expiration of this permit, and this permit is extended pursuant to the State Administrative Procedure Act and 6 NYCRR Part 621, then the *owner or operator* with coverage under this permit may continue to operate and *discharge* in accordance with the requirements of this permit until a new permit is issued and effective.

[6] The Regional Water Manager where a DEC Region does not have a RWE.

J. Signatories and Certification

The Notice of Intent, Notice of Termination, and reports required by this permit must be signed as provided in 40 CFR §122.22.

1. All Notices of Intent and Notices of Termination must be signed as follows:

    a. For a corporation. By a responsible corporate officer. For the purpose of this section, a responsible corporate officer means:

        (i) a president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy- or decision-making functions for the corporation; or

        (ii) the manager of one or more manufacturing, production or operating facilities, provided, the manager is authorized to make management decisions which govern the operation of the regulated facility including having the explicit or implicit duty of making major capital investment recommendations, and initiating and directing other comprehensive measures to assure long term environmental compliance with environmental laws and regulations; the manager can ensure that the necessary systems are established or actions taken to gather complete and accurate information for Notice of Intent or Notice of Termination requirements; and where authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures.

        Note: NYSDEC does not require specific assignments or delegations of authority to responsible corporate officers identified in 40 CFR §122.22(a)(1)(i). NYSDEC will presume that these responsible corporate officers have the requisite authority to sign the Notice of Intent or Notice of Termination unless the corporation has notified NYSDEC to the contrary. Corporate procedures governing authority to sign a Notice of Intent or Notice of Termination may provide for assignment or delegation to applicable corporate positions under 40 CFR §122.22(a)(1)(ii) rather than to specific individuals.

    b. For a partnership or sole proprietorship. By a general partner or the proprietor, respectively.

c. For a municipality, State, Federal, or other public agency. By either a principal executive officer or ranking elected official. For purposes of this section, a principal executive officer of a Federal agency includes:

    1. the chief executive officer of the agency; or

    2. a senior executive officer having responsibility for the overall operations of a principal geographic unit of the agency (e.g., Regional Administrators of EPA).

2. All reports required by this permit, and other information requested by NYSDEC, must be signed by a person described in Part VII.J.1., or by a duly authorized representative of that person. A person is a duly authorized representative only if:

    a. The authorization is made in writing by a person described in Part VII.J.1. or using the Duly Authorized Form, found on the DEC website; and

    b. The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity, position of equivalent responsibility, or an individual or position having overall responsibility for environmental matters for the company. (A duly authorized representative may thus be either a named individual or any individual occupying a named position); and

    c. The written authorization is submitted to NYSDEC.

3. Changes to authorization. If an authorization under Part VII.J.2. is no longer accurate because a different individual or position has responsibility for the overall operation of the *construction activity*, a new authorization satisfying the requirements of Part VII.J.2. must be submitted to NYSDEC prior to or together with any reports, information, or applications to be signed by an authorized representative.

4. Certification. Any person signing a document under Part VII.J.1. or 2. must make the following certification:

    I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who

manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

5. Electronic reporting. If documents described in Part VII.J.1. or 2. are submitted electronically by or on behalf of the *construction activity* with coverage under this permit, any person providing the electronic signature for such documents must meet all relevant requirements of this section, and must ensure that all of the relevant requirements of 40 CFR Part 3 (including, in all cases, subpart D to Part 3) (Cross-Media Electronic Reporting) and 40 CFR Part 127 (NPDES Electronic Reporting Requirements) are met for that submission.

K. Inspection and Entry

The *owner or operator* must allow NYSDEC, the USEPA Regional Administrator, the applicable county health department, or any authorized representatives of those entities, or, in the case of a *construction site* which *discharges* through an *MS4*, an authorized representative of the *MS4* receiving the *discharge*, upon the presentation of credentials and other documents as may be required by law, to:

1. enter upon the *owner's or operator's* premises where a regulated facility or activity is located or conducted or where records must be kept under the requirements of this permit; and

2. have access to and copy at reasonable times, any records that must be kept under the requirements of this permit, including records required to be maintained for purposes of operation and maintenance; and

3. inspect at reasonable times any facilities, equipment (including monitoring and control equipment), practices or operations regulated or required under this permit; and

4. sample or monitor at reasonable times, for the purposes of assuring general SPDES permit compliance or as otherwise authorized by the CWA or ECL, any substances or parameters at any location; and

5. enter upon the property of any contributor to the regulated facility or activity under authority of the *owner or operator*.

L. Confidentiality of Information

The following must not be held confidential: this permit, the fact sheet for this permit, the name and address of any *owner or operator*, effluent data, the Notice of Intent, and information regarding the need to obtain an individual permit or an alternative general SPDES permit. This includes information submitted on forms themselves and any attachments used to supply information required by the forms (except information submitted on usage of substances). Upon the request of the *owner or operator*, NYSDEC must make determinations of confidentiality in accordance with 6 NYCRR Part 616, except as set forth in the previous sentence. Any information accorded confidential status must be disclosed to the Regional Administrator upon his or her written request. Prior to disclosing such information to the Regional Administrator, NYSDEC will notify the Regional Administrator of the confidential status of such information.

M. Other Permits May Be Required

Nothing in this permit relieves the *owner or operator* from a requirement to obtain any other permits required by law.

N. NYSDEC Orders or Civil Decrees/Judgments

The issuance of this permit by the NYSDEC, and the coverage under this permit by the *owner or operator*, does not supersede, revoke, or rescind any existing order on consent or civil Decree/Judgment, or modification to any such documents or to any order issued by the Commissioner, or any of the terms, conditions, or requirements contained in such order or modification therefore, unless expressly noted.

O. Property Rights

Coverage under this permit does not convey any property rights in either real or personal property, or any exclusive privileges, nor does it authorize any injury to private property or any invasion of personal rights, nor any infringement of Federal, State, or local laws or regulations, nor does it obviate the necessity of obtaining the assent of any other jurisdiction as required by law for the *discharge* authorized.

P. Compliance with Interstate Standards

If the *construction activity* covered by this permit originates within the jurisdiction of an interstate water pollution control agency, then the *construction activity* must also comply with any applicable effluent standards or *water quality standards* promulgated by that interstate agency and as set forth in this permit for such *construction activities*.

Q. Oil and Hazardous Substance Liability

Coverage under this permit does not affect the imposition of responsibilities upon, or the institution of any legal action against, the *owner or operator* under section 311 of the CWA, which must be in conformance with regulations promulgated pursuant to section 311 governing the applicability of section 311 of the CWA to *discharges* from facilities with *NPDES* permits, nor must such issuance preclude the institution of any legal action or relieve the *owner or operator* from any responsibilities, liabilities, or penalties to which the *owner or operator* is or may be subject pursuant to the Comprehensive Environmental Response, Compensation and Liability Act of 1980, 42 U.S.C. section 9601 et seq. (CERCLA).

R. Severability

The provisions of this permit are severable, and if any provision of this permit, or the application of any provision of this permit to any circumstance, is held invalid, the application of such provision to other circumstances, and the remainder of this permit, must not be affected thereby.

S. NYSDEC Approved Forms

The *owner or operator* must provide all relevant information that is requested by NYSDEC, and required by this permit, on all NYSDEC approved forms.

APPENDIX A – Abbreviations and Definitions

Abbreviations

APO – Agency Preservation Officer
BB – New York State Standards and Specifications for Erosion and Sediment Control (Blue Book), dated November 2016
BMP – Best Management Practice
CPESC – Certified Professional in Erosion and Sediment Control
CPv – Channel Protection Volume
CWA – Clean Water Act (or the Federal Water Pollution Control Act, 33 U.S.C. §1251 et seq)
DM – New York State Stormwater Management Design Manual (Design Manual), dated July 31, 2024
DOW – Division of Water
EAF – Environmental Assessment Form
ECL – chapter 43-B of the Consolidated Laws of the State of New York, entitled the Environmental Conservation Law
EPA – U.S. Environmental Protection Agency
HSG – Hydrologic Soil Group
MS4 – Municipal Separate Storm Sewer System
NOI – Notice of Intent
NOT – Notice of Termination
NPDES – National Pollutant Discharge Elimination System
NYC – The City of New York
NYCDEP – The City of New York Department of Environmental Protection
NYSDEC – The New York State Department of Environmental Conservation
OPRHP – Office of Parks, Recreation and Historic Places
Qf – Extreme Flood
Qp – Overbank Flood
RR – Runoff Reduction
RRv – Runoff Reduction Volume
RWE – Regional Water Engineer
SEQR – State Environmental Quality Review Act
SHPA – State Historic Preservation Act
SMP – Post-Construction Stormwater Management Practice
SPDES – State Pollutant Discharge Elimination System
SWPPP – Stormwater Pollution Prevention Plan
TMDL – Total Maximum Daily Load
UPA – Uniform Procedures Act
USDA – United States Department of Agriculture
WQv – Water Quality Volume

Definitions

All definitions in this section are solely for the purposes of this permit. If a word is not italicized in the permit, use its common definition.

Agricultural Building – a structure designed and constructed to house farm implements, hay, grain, poultry, livestock or other horticultural products; excluding any structure designed, constructed or used, in whole or in part, for human habitation, as a place of employment where agricultural products are processed, treated or packaged, or as a place used by the public.

Agricultural Property – the land for construction of a barn, *agricultural building*, silo, stockyard, pen or other structural practices identified in Table II in the "Agricultural Best Management Practice Systems Catalogue" (dated June 2023).

Alter Hydrology from Pre- to Post-Development Conditions – the post-development peak flow rate(s) has increased by more than 5% of the pre-developed condition for the design storm of interest (e.g. 10 yr and 100 yr).

Combined Sewer System – a sewer system which conveys sewage and *stormwater* through a single pipe system to a publicly owned treatment works.

Commence (Commencement of) Construction Activities – the initial disturbance of soils associated with clearing, grading or excavation activities; or other construction related activities that disturb or expose soils such as demolition, stockpiling of fill material, and the initial installation of erosion and sediment control practices required in the *SWPPP*. See definition for "*Construction Activity(ies)*" also.

Common Plan of Development or Sale – a contiguous area where multiple separate and distinct *construction activities* are occurring, or may occur, under one plan. The "common plan" of development or sale is broadly defined as any announcement or piece of documentation (including a sign, public notice or hearing, marketing plan, advertisement, drawing, permit application, State Environmental Quality Review Act (SEQR) environmental assessment form or other documents, zoning request, computer design, etc.) or physical demarcation (including boundary signs, lot stakes, surveyor markings, etc.) indicating *construction activities* may occur on a specific plot. A *common plan of development or sale* is comprised of two or more *phases*.

Common plan of development or sale does not include separate and distinct *construction activities* that are occurring, or may occur, under one plan that are at least 1/4 mile apart provided any interconnecting road, pipeline or utility project that is part of the same "common plan" is not concurrently being disturbed.

Construction Activity(ies) – identified within 40 CFR 122.26(b)(14)(x), 122.26(b)(15)(i), and 122.26(b)(15)(ii), any clearing, grading, excavation, filling, demolition or stockpiling activities that result in soil disturbance. Clearing activities can include, but are not limited to, mechanized logging equipment operation, the cutting and skidding of trees, stump removal and/or brush root removal.

Construction activity does not include routine maintenance that is performed to maintain the original line and grade, hydraulic capacity, or original purpose of a facility, which is excluded from the calculation of the soil disturbance for a project. Routine maintenance includes, but is not limited to:

- Re-grading of gravel roads or parking lots; and
- Cleaning and shaping of existing roadside ditches and culverts that maintains the approximate original line and grade, and maintains or improves the hydraulic capacity of the ditch; and
- Replacement of existing culverts that maintains the approximate original line and grade, and maintains or improves the hydraulic capacity of a ditch; and
- Replacement of existing bridges that maintains the approximate original line and grade, and maintains or improves the hydraulic capacity beneath the bridges; and
- Cleaning and shaping of existing roadside ditches that does not maintain the approximate original grade, hydraulic capacity and purpose of the ditch if the changes to the line and grade, hydraulic capacity or purpose of the ditch are installed to improve water quality and quantity controls (e.g. installing grass lined ditch); and
- Placement of aggregate shoulder backing that stabilizes the transition between the road shoulder and the ditch or *embankment*; and
- Full depth milling and filling of existing asphalt pavements, replacement of concrete pavement slabs, and similar work that does not expose soil or disturb the bottom six (6) inches of subbase material; and
- Long-term use of equipment storage areas at or near highway maintenance facilities; and
- Removal of sediment from the edge of the highway to restore a previously existing sheet-flow drainage connection from the highway surface to the highway ditch or *embankment*; and
- Existing use of Canal Corp owned upland disposal sites for the canal, and
- Replacement of curbs, gutters, sidewalks and guide rail posts; and
- Maintenance of ski trails including brush hog use and mowing; and
- Above ground snowmaking pipe replacement; and
- Replacement of existing utility poles; etc.

Construction Site – the land area where *construction activity(ies)* will occur. See also the definitions for "*Commence (Commencement of) Construction Activities"* and "*Common Plan of Development or Sale."*

Dewatering – the act of draining rainwater and/or groundwater from building foundations, vaults or excavations/trenches.

Directly Discharge(s)(ing) (to a specific surface waterbody) – runoff flows from a *construction site* by overland flow and the first point of *discharge* is the specific surface waterbody, or runoff flows from a *construction site* to a separate storm sewer system and the first point of *discharge* from the separate storm sewer system is the specific surface waterbody.

Discharge(s)(d) – any addition of any *pollutant* to waters of the State through an outlet or *point source*.

Embankment – an earthen or rock slope that supports a road/highway.

Equivalent (Equivalence) – the practice or measure meets all the performance, longevity, maintenance, and safety objectives of the technical standard and will provide an equal or greater degree of water quality protection.

Final Stabilization – all soil disturbance activities have ceased and a uniform, perennial vegetative cover with a density of eighty (80) percent over the entire pervious surface has been established; or other *equivalent* stabilization measures, such as permanent landscape mulches, rock rip-rap or washed/crushed stone have been applied on all disturbed areas that are not covered by permanent structures, concrete or pavement.

Historic Property – any building, structure, site, object or district that is listed on the State or National Registers of Historic Places or is determined to be eligible for listing on the State or National Registers of Historic Places.

Impervious Area (Cover) – all impermeable surfaces that cannot effectively infiltrate rainfall. This includes paved, concrete and compacted gravel surfaces (i.e. parking lots, driveways, roads, runways and sidewalks); building rooftops and miscellaneous impermeable structures such as patios, pools, and sheds.

Infeasible – not technologically possible, or not economically practicable and achievable considering best industry practices.

Minimize(ing)(ation) – reduce and/or eliminate to the extent achievable using control measures (including best management practices) that are technologically available and economically practicable and achievable in light of best industry practices.

Municipal Separate Storm Sewer System (MS4) - a conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels, or storm drains):

1. owned or operated by a State, city, town, village, borough, county, parish, district, association, or other public body (created by or pursuant to State law) having jurisdiction over disposal of sewage, industrial wastes, *stormwater*, or other wastes, including special districts under State law such as a sewer district, flood control district or drainage district, or similar entity, or an Indian tribe or an authorized Indian tribal organization, or a designated and approved management agency under section 208 of the CWA, that *discharges* to *surface waters of the State*; and

2. designed or used for collecting or conveying *stormwater*; and

3. which is not a *combined sewer system*; and

4. which is not part of a Publicly Owned Treatment Works (POTW) as defined at 40 CFR 122.2.

Natural Buffer(s) – an undisturbed area with natural cover running along a surface water (e.g. wetland, stream, river, lake, etc.).

New Development – any land disturbance that does not meet the definition of *Redevelopment Activity* included in this appendix.

New York State Erosion and Sediment Control Certificate Program – a certificate program that establishes and maintains a process to identify and recognize individuals who are capable of developing, designing, inspecting and maintaining erosion and sediment control plans on projects that disturb soils in New York State. The certificate program is administered by the New York State Conservation District Employees Association.

Nonpoint Source(s) – any source of water pollution or *pollutants* which is not a discrete conveyance or *point source* permitted pursuant to Title 7 or 8 of Article 17 of the Environmental Conservation Law (see ECL Section 17-1403).

Overbank – flow events that exceed the capacity of the stream channel and spill out into the adjacent floodplain.

Owner or Operator – the person, persons, or legal entity which owns or leases the property on which the *construction activity* is occurring; an entity that has operational control over the construction plans and specifications, including the ability to make modifications to the plans and specifications; and/or an entity that has day-to-day operational control of those activities at a project that are necessary to ensure compliance with the permit requirements.

Performance Criteria – the six performance criteria for each group of SMPs in Chapters 5 and 6 of the technical standard, New York State Stormwater Management Design Manual (DM), dated July 31, 2024. These include feasibility, conveyance, pretreatment, treatment, landscaping, and maintenance. It does not include the *Sizing Criteria* (i.e. WQv, RRv, CPv, Qp and Qf) in Part I.C.2. of the permit.

Phase – a defined area in which *construction activities* are occurring or will occur separate from other defined area(s).

Point Source – any discernible, confined, and discrete conveyance, including but not limited to any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operation, vessel or other floating craft, or landfill leachate collection system from which *pollutants* are or may be *discharged*.

Pollutant(s) – dredged spoil, filter backwash, solid waste, incinerator residue, sewage, garbage, sewage sludge, munitions, chemical wastes, biological materials, radioactive materials, heat, wrecked or discarded equipment, rock, sand and industrial, municipal, agricultural waste and ballast *discharged* into water; which may cause or might reasonably be expected to cause pollution of the waters of the state in contravention of the standards or guidance values adopted as provided in 6 NYCRR Parts 700 et seq.

Qualified Inspector – a person that is knowledgeable in the principles and practices of erosion and sediment control, such as a licensed Professional Engineer, Certified Professional in Erosion and Sediment Control (CPESC), Registered Landscape Architect, *New York State Erosion and Sediment Control Certificate Program* holder or other NYSDEC endorsed individual(s).

It can also mean someone working under the direct supervision of, and at the same company as, the licensed Professional Engineer or Registered Landscape Architect, provided that person has training in the principles and practices of erosion and sediment control. Training in the principles and practices of erosion and sediment control means that the individual working under the direct supervision of the licensed Professional Engineer or Registered Landscape Architect has received four (4) hours of NYSDEC endorsed training in proper erosion and sediment control principles from a Soil and Water Conservation District, or other NYSDEC endorsed entity. After receiving the initial training, the individual working under the direct supervision of the licensed Professional Engineer or Registered Landscape Architect shall receive four (4) hours of training every three (3) years.

It can also mean a person that meets the *Qualified Professional* qualifications in addition to the *Qualified Inspector* qualifications.

Note: Inspections of any SMPs that include structural components, such as a dam for an impoundment, shall be performed by a licensed Professional Engineer.

Qualified Professional – a person that is knowledgeable in the principles and practices of *stormwater* management and treatment, such as a licensed Professional Engineer, Registered Landscape Architect or other NYSDEC endorsed individual(s). Individuals preparing *SWPPPs* that require the SMP component must have an understanding of the principles of hydrology, water quality management practice design, water quantity control design, and, in many cases, the principles of hydraulics. All components of the *SWPPP* that involve the practice of engineering, as defined by the NYS Education Law (see Article 145), shall be prepared by, or under the direct supervision of, a professional engineer licensed to practice in the State of New York.

Redevelopment Activity(ies) – the disturbance and reconstruction of existing *impervious area*, including *impervious areas* that were removed from a project site within five (5) years of preliminary project plan submission to the local government (i.e. site plan, subdivision, etc.).

Renewable Energy – electricity or thermal energy generated by renewable energy systems through use of the following technologies: solar thermal, photovoltaics, on land and offshore wind, hydroelectric, geothermal electric, geothermal ground source heat, tidal energy, wave energy, ocean thermal, and fuel cells which do not utilize a fossil fuel resource in the process of generating electricity.

Site Limitations – site conditions that prevent the use of an infiltration technique and or infiltration of the total WQv. Typical *site limitations* include: seasonal high groundwater, shallow depth to bedrock, and soils with an infiltration rate less than 0.5 inches/hour. The existence of *site limitations* shall be confirmed and documented using actual field testing (i.e. test pits, soil borings, and infiltration test) or using information from the most current United States Department of Agriculture (USDA) Soil Survey for the County where the project is located.

Sizing Criteria – the criteria included in Part I.C.2 of the permit that are used to size SMPs. The criteria include; Water Quality Volume (WQv), Runoff Reduction Volume (RRv), Channel Protection Volume (Cpv), *Overbank* Flood (Qp), and Extreme Flood (Qf).

Steep Slope – land area designated on the current United States Department of Agriculture (USDA) Soil Survey as Soil Slope Phase D, (provided the map unit name or description is inclusive of slopes greater than 25%), or Soil Slope Phase E or F, (regardless of the map unit name), or a combination of the three designations.

Stormwater – that portion of precipitation that, once having fallen to the ground, is in excess of the evaporative or infiltrative capacity of soils, or the retentive capacity of surface features, which flows or will flow off the land by surface runoff to waters of the State.

Streambank – the terrain alongside the bed of a creek or stream. The bank consists of the sides of the channel, between which the flow is confined.

Stormwater Pollution Prevention Plan (SWPPP) – a project specific report, including construction drawings, that among other things: describes the *construction activity(ies)*, identifies the potential sources of pollution at the *construction site*; describes and shows the *stormwater* controls that will be used to control the *pollutants* (i.e. erosion and sediment controls; for many projects, includes SMPs); and identifies procedures the *owner or operator* will implement to comply with the requirements of the permit. See Part III of the permit for a complete description of the information that must be included in the *SWPPP*.

Surface Waters of the State – shall be construed to include lakes, bays, sounds, ponds, impounding reservoirs, springs, rivers, streams, creeks, estuaries, marshes, inlets, canals, the Atlantic ocean within the territorial seas of the state of New York and all other bodies of surface water, natural or artificial, inland or coastal, fresh or salt, public or private (except those private waters that do not combine or effect a junction with natural surface waters), which are wholly or partially within or bordering the state or within its jurisdiction. Waters of the state are further defined in 6 NYCRR Parts 800 to 941.

Temporarily Ceased – an existing disturbed area will not be disturbed again within 14 calendar days of the previous soil disturbance.

Temporary Stabilization – exposed soil has been covered with material(s) as set forth in the technical standard, New York Standards and Specifications for Erosion and Sediment Control, to prevent the exposed soil from eroding. The materials can include, but are not limited to, mulch, seed and mulch, and erosion control mats (e.g. jute twisted yarn, excelsior wood fiber mats).

Total Maximum Daily Load (TMDL) – the sum of the allowable loads of a single *pollutant* from all contributing point and *nonpoint source*s. It is a calculation of the maximum amount of a *pollutant* that a waterbody can receive and still meet *water quality standards*, and an allocation of that amount to the *pollutant's* sources. A TMDL stipulates Waste Load Allocations (WLA) for *point source discharges*, Load Allocations (LA) for *nonpoint source*s, and a margin of safety (MOS).

Traditional Land Use Control MS4 Operator – a city, town, or village with land use control authority that is authorized to *discharge* under New York State DEC's SPDES General Permit For Stormwater Discharges from Municipal Separate Stormwater Sewer Systems (MS4s) or the City of New York's Individual SPDES Permit for their Municipal Separate Storm Sewer Systems (NY-0287890).

Trained Contractor – an employee from the contracting (construction) company, identified in Part III.A.7., that has received four (4) hours of NYSDEC endorsed training

in proper erosion and sediment control principles from a Soil and Water Conservation District, or other NYSDEC endorsed entity. After receiving the initial training, the *trained contractor* shall receive four (4) hours of training every three (3) years.

It can also mean an employee from the contracting (construction) company, identified in Part III.A.7., that meets the *qualified inspector* qualifications (e.g. licensed Professional Engineer, Certified Professional in Erosion and Sediment Control (CPESC), Registered Landscape Architect, *New York State Erosion and Sediment Control Certificate Program* holder, or someone working under the direct supervision of, and at the same company as, the licensed Professional Engineer or Registered Landscape Architect, provided they have received four (4) hours of NYSDEC endorsed training in proper erosion and sediment control principles from a Soil and Water Conservation District, or other NYSDEC endorsed entity).

The *trained contractor* is responsible for the day-to-day implementation of the *SWPPP*.

Tree Clearing – *construction activities* limited to felling and removal of trees.

Tree clearing does not include hand felling and leaving the trees in place with no support from mechanized equipment, which is not considered *construction activity* requiring coverage under this permit.

Water Quality Standard – such measures of purity or quality for any waters in relation to their reasonable and necessary use as promulgated in 6 NYCRR Part 700 et seq.

APPENDIX B – Required SWPPP Components by Project Type

Table 1
CONSTRUCTION ACTIVITIES THAT REQUIRE THE PREPARATION OF A *SWPPP* THAT ONLY INCLUDES EROSION AND SEDIMENT CONTROLS

The following *construction activities* that involve soil disturbances of one (1) or more acres of land, but less than five (5) acres:

- Single-family home not located in one of the watersheds listed in Appendix C and not *directly discharging* to one of the 303(d) segments listed in Appendix D
- Single-family residential subdivisions with 25% or less *impervious cover* at total site build-out and not located in one of the watersheds listed in Appendix C and not *directly discharging* to one of the 303(d) segments listed in Appendix D
- Construction of a barn or other *agricultural building*, silo, stock yard or pen.
- Structural agricultural conservation practices as identified in Table II in the "Agricultural Best Management Practice Systems Catalogue" (dated June 2023) that include construction or reconstruction of *impervious area* or *alter hydrology from pre- to post-development* conditions.

The following *construction activities* that involve soil disturbances between five thousand (5000) square feet and one (1) acre of land:

- All construction activities located in the New York City Watershed located east of the Hudson River, see Appendix C Figure 1, that involve soil disturbances between five thousand (5,000) square feet and one (1) acre of land.

Within the municipal boundaries of NYC:

- Stand-alone road reconstruction, where the total soil disturbance from only that road construction, is less than one (1) acre of land.

The following *construction activities*:

- Installation of underground linear utilities; such as gas lines, fiber-optic cable, cable TV, electric, telephone, sewer mains, and water mains
- Environmental enhancement projects, such as wetland mitigation, *stormwater* retrofits, stream restoration, and resiliency projects that reconstruct shoreline areas to address sea level rise
- Pond construction
- Linear bike paths running through areas with vegetative cover, including bike paths surfaced with an *impervious cover*
- Cross-country ski trails, walking/hiking trails, and mountain biking trails, including a de minimis parking lot (maximum 10 spaces total, sized for passenger cars) with 35 feet minimum preservation of undisturbed area downgradient from the parking lot
- Dam rehabilitation (the structure of the dam itself)
- Sidewalks, bike paths, or walking paths, surfaced with an *impervious cover*, that are not part of residential, commercial, or institutional development;
- Sidewalks, bike paths, or walking paths, surfaced with an *impervious cover*, that include incidental shoulder or curb work along an existing highway to support construction of the sidewalk, bike path, or walking path.

Table 1 (Continued)
CONSTRUCTION ACTIVITIES THAT REQUIRE THE PREPARATION OF A *SWPPP* THAT ONLY INCLUDES EROSION AND SEDIMENT CONTROLS

The following *construction activities*:

- Slope stabilization
- Slope flattening that changes the grade of the site, but does not significantly change the runoff characteristics
- Spoil areas that will be covered with vegetation
- Vegetated open space (i.e. recreational parks, lawns, meadows, fields, downhill ski trails) that do not *alter hydrology from pre- to post-development* conditions
- Athletic fields (natural grass) that do not include the construction or reconstruction of *impervious area* and do not *alter hydrology from pre- to post-development* conditions
- Demolition where vegetation will be established, and no *redevelopment activity* is planned[1]
- Installation or replacement of either an overhead electric transmission line or a ski lift tower that does not include the construction of permanent access roads or parking areas surfaced with *impervious cover*.
- Solar array field areas that have tables elevated off the ground, spaced one table width apart, do not *alter hydrology from pre- to post-development conditions*, and address water quality volume and runoff reduction volume by maintaining sheet flow on slopes less than 8%.
- Structural agricultural conservation practices as identified in Table II in the "Agricultural Best Management Practice Systems Catalogue" (dated June 2023) that do not include construction or reconstruction of *impervious area* and do not *alter hydrology from pre- to post-development* conditions.
- Temporary access roads, median crossovers, detour roads, lanes, or other temporary *impervious areas* that will be restored to pre-construction conditions once the *construction activity* is complete (in this context, "temporary" means the *impervious area* will be in place for two years or less)
- Other *construction activities* that do not include the construction or reconstruction of *impervious area*, and do not *alter hydrology from pre- to post-development* conditions, and are not listed in Table 2.

1. If the site is redeveloped in the future, a new eNOI must be submitted.

Table 2
CONSTRUCTION ACTIVITIES THAT REQUIRE THE PREPARATION OF A *SWPPP* THAT INCLUDES POST-CONSTRUCTION STORMWATER MANAGEMENT PRACTICES (SMPS)

The following *construction activities*:

- Single-family home located in one of the watersheds listed in Appendix C or *directly discharging* to one of the 303(d) segments listed in Appendix D
- Single-family home that disturbs five (5) or more acres of land
- Single-family residential subdivisions located in one of the watersheds listed in Appendix C or *directly discharging* to one of the 303(d) segments listed in Appendix D
- Single-family residential subdivisions that involve soil disturbances of between one (1) and five (5) acres of land with greater than 25% *impervious cover* at total site build-out
- Single-family residential subdivisions that involve soil disturbances of between 20,000 square feet and one (1) acre of land within the municipal boundaries of NYC with greater than 25% *impervious cover* at total site build-out
- Single-family residential subdivisions that involve soil disturbances of five (5) or more acres of land, and single-family residential subdivisions that involve soil disturbances of less than five (5) acres that are part of a *common plan of development or sale* that will ultimately disturb five (5) or more acres of land
- Multi-family residential developments; includes duplexes, townhomes, condominiums, senior housing complexes, apartment complexes, and mobile home parks
- Creation of 5,000 square feet or more of *impervious area* in the municipal boundaries of NYC
- Airports
- Amusement parks
- Breweries, cideries, and wineries, including establishments constructed on agricultural land
- Campgrounds
- Cemeteries that include the construction or reconstruction of *impervious area* (>5% of disturbed area) or *alter the hydrology from pre- to post-development* conditions
- Commercial developments
- Churches and other places of worship
- Construction of a barn or other *agricultural building* (e.g. silo) that involves soil disturbance greater than five acres.
- Structural agricultural conservation practices as identified in Table II in the “Agricultural Best Management Practice Systems Catalogue” (dated June 2023) that involves soil disturbance greater than five acres and include the construction or reconstruction of *impervious area* or *alter hydrology from pre- to post-development* conditions.
- Facility buildings, including ski lodges, restroom buildings, pumphouses, ski lift terminals, and maintenance and groomer garages
- Institutional development; includes hospitals, prisons, schools and colleges
- Industrial facilities; includes industrial parks
- Landfills; including creation of landfills or capping landfills.
- Municipal facilities; includes highway garages, transfer stations, office buildings, POTWs, water treatment plants, and water storage tanks
- Golf courses
- Office complexes

Table 2 (Continued)

CONSTRUCTION ACTIVITIES THAT REQUIRE THE PREPARATION OF A *SWPPP* THAT INCLUDES POST-CONSTRUCTION STORMWATER MANAGEMENT PRACTICES (SMPS)

The following *construction activities*:

- Permanent laydown yards and equipment storage lots
- Playgrounds that include the construction or reconstruction of *impervious area*
- Sports complexes
- Racetracks; includes racetracks with earthen (dirt) surfaces
- Road construction or reconstruction, outside the municipal boundaries of NYC
- Road construction within the municipal boundaries of NYC
- Stand-alone road reconstruction, within the municipal boundaries of NYC where the total soil disturbance from that road reconstruction involves soil disturbance of one (1) acre or more of land
- Parking lot construction or reconstruction (as with all Table 2 bullets, this includes parking lots constructed as part of the *construction activities* listed in Table 1, unless a Table 1 bullet specifies otherwise)
- Athletic fields (natural grass) that include the construction or reconstruction of *impervious area* (>5% of disturbed area) or *alter the hydrology from pre- to post-development* conditions
- Athletic fields with artificial turf
- Permanent access roads, parking areas, substations, compressor stations, and well drilling pads, surfaced with *impervious cover,* and constructed as part of an overhead electric transmission line, wind-power, cell tower, oil or gas well drilling, sewer or water main, ski lift, or other linear utility project
- Sidewalks, bike paths, or walking paths, surfaced with an *impervious cover*, that are part of a residential, commercial or institutional development
- Sidewalks, bike paths, or walking paths, surfaced with an *impervious cover*, that are part of highway construction or reconstruction
- Solar array field areas on slopes greater than 8% that cannot maintain sheet flow using management practices identified in the BB or the DM
- Solar array field areas on slopes less than 8% that will *alter the hydrology from pre- to post-development* conditions
- Solar array field areas with tables that are not elevated high enough to achieve *final stabilization* beneath the tables
- Traditional *impervious areas* associated with solar development (e.g. roads, buildings, transformers)
- Utility pads surfaced with *impervious cover*, including electric vehicle charging stations
- All other *construction activities* that include the construction or reconstruction of *impervious area* or *alter the hydrology from pre- to post-development* conditions, and are not listed in Table 1

APPENDIX C – Watersheds Requiring Enhanced Phosphorus Removal

Watersheds where *owners or operators* of *construction activities* identified in Table 2 of Appendix B must prepare a *SWPPP* that includes SMPs designed in conformance with the Enhanced Phosphorus Removal Standards included in the DM technical standard.

- Entire New York City Watershed located east of the Hudson River – Figure 1
- Onondaga Lake Watershed – Figure 2
- Greenwood Lake Watershed – Figure 3
- Oscawana Lake Watershed – Figure 4
- Kinderhook Lake Watershed – Figure 5

Figure 1 - New York City Watershed East of the Hudson

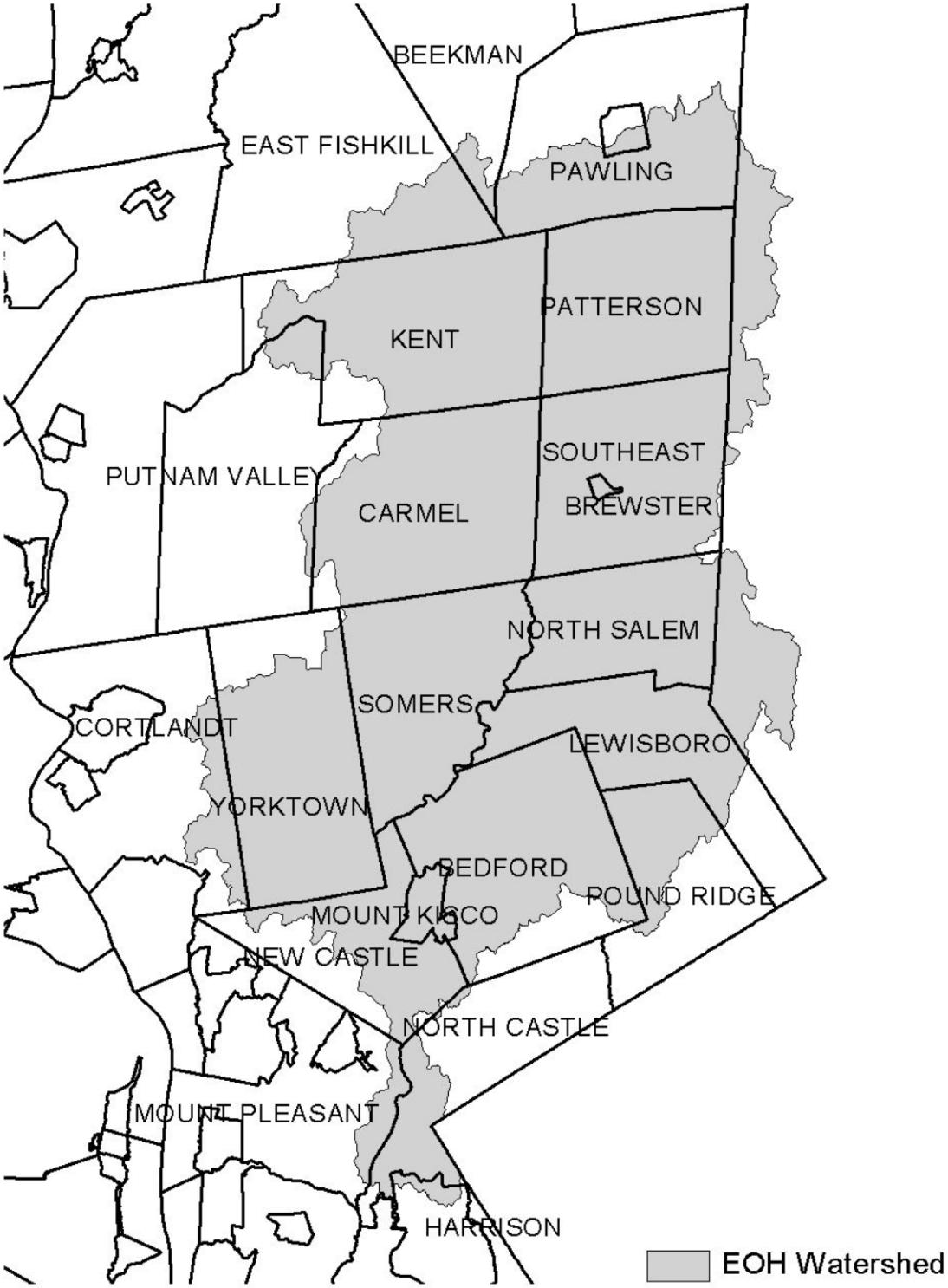


Figure 2 - Onondaga Lake Watershed



Figure 3 - Greenwood Lake Watershed

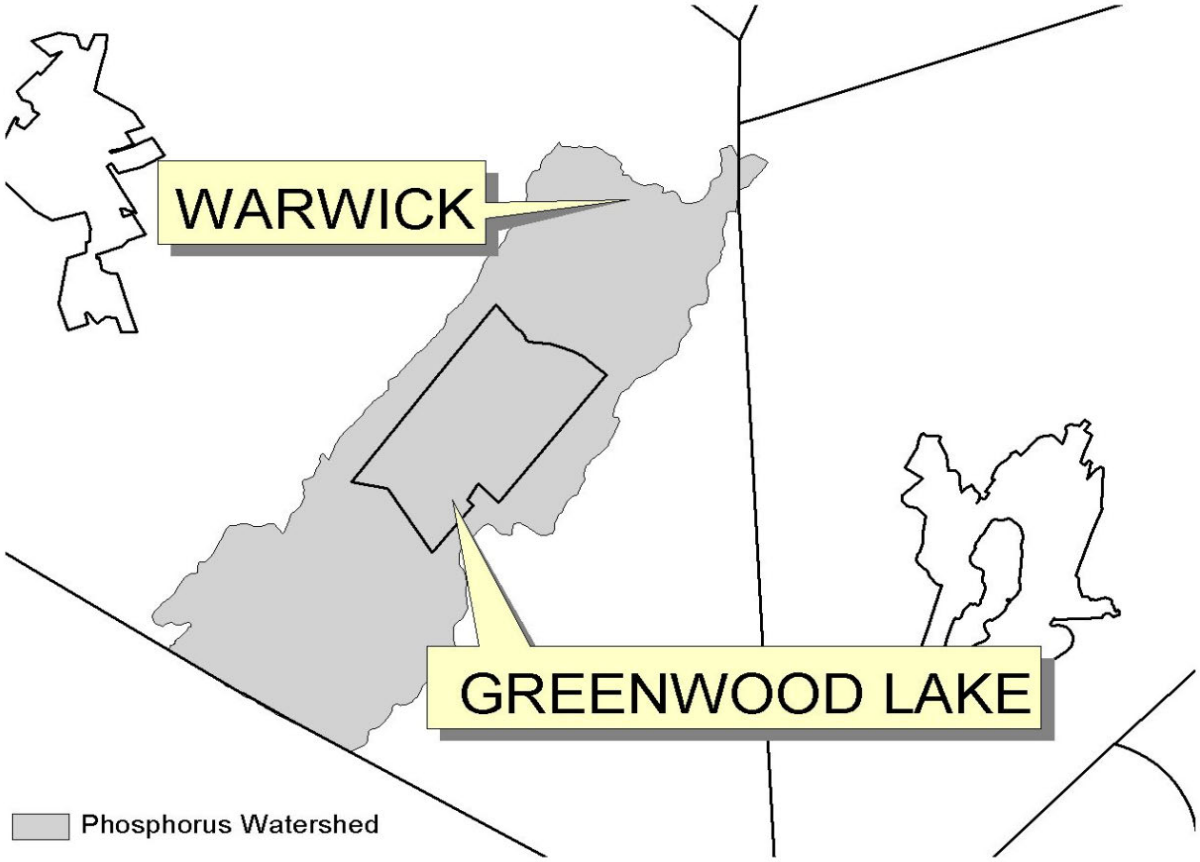


Figure 4 - Oscawana Lake Watershed

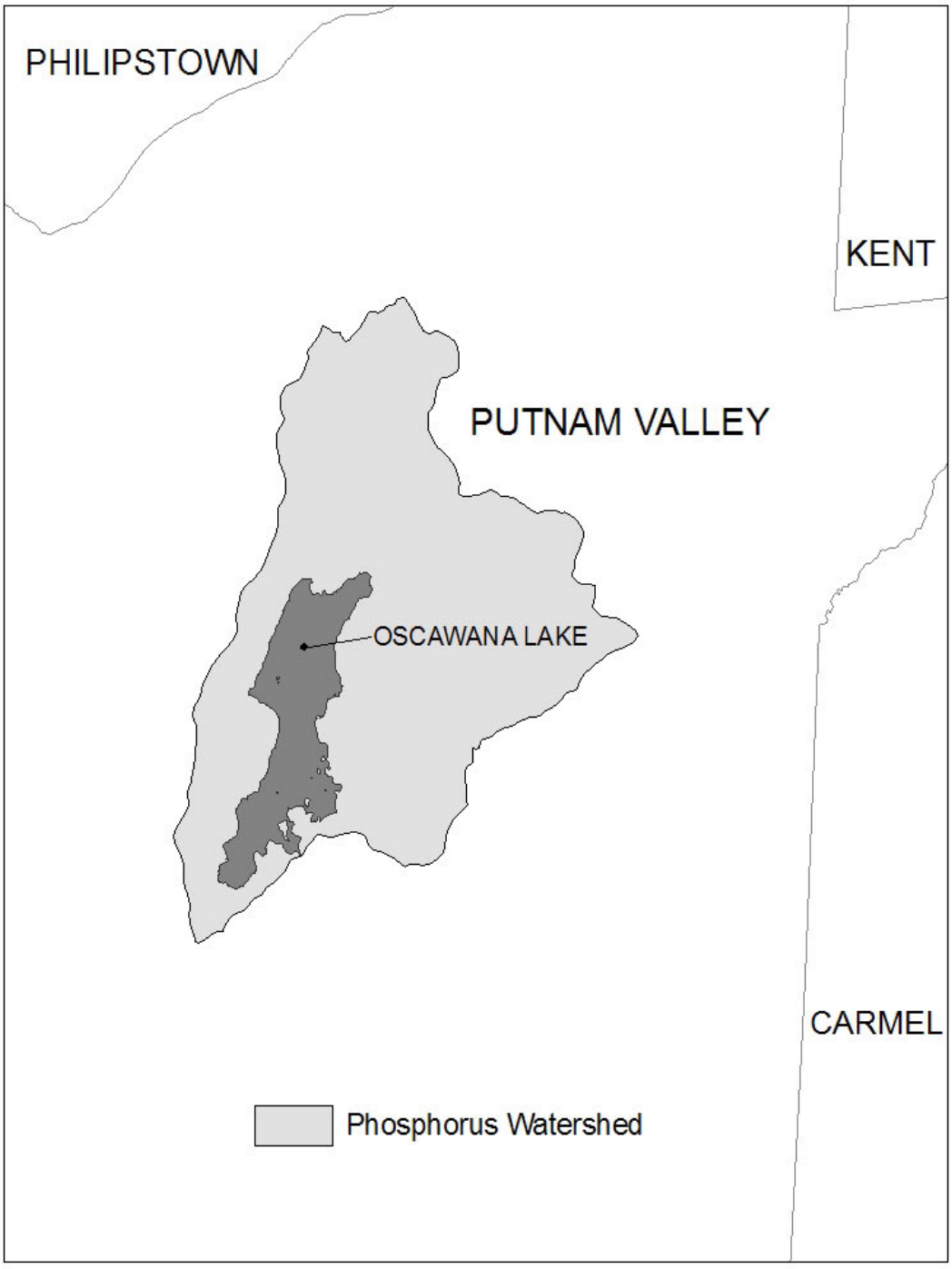
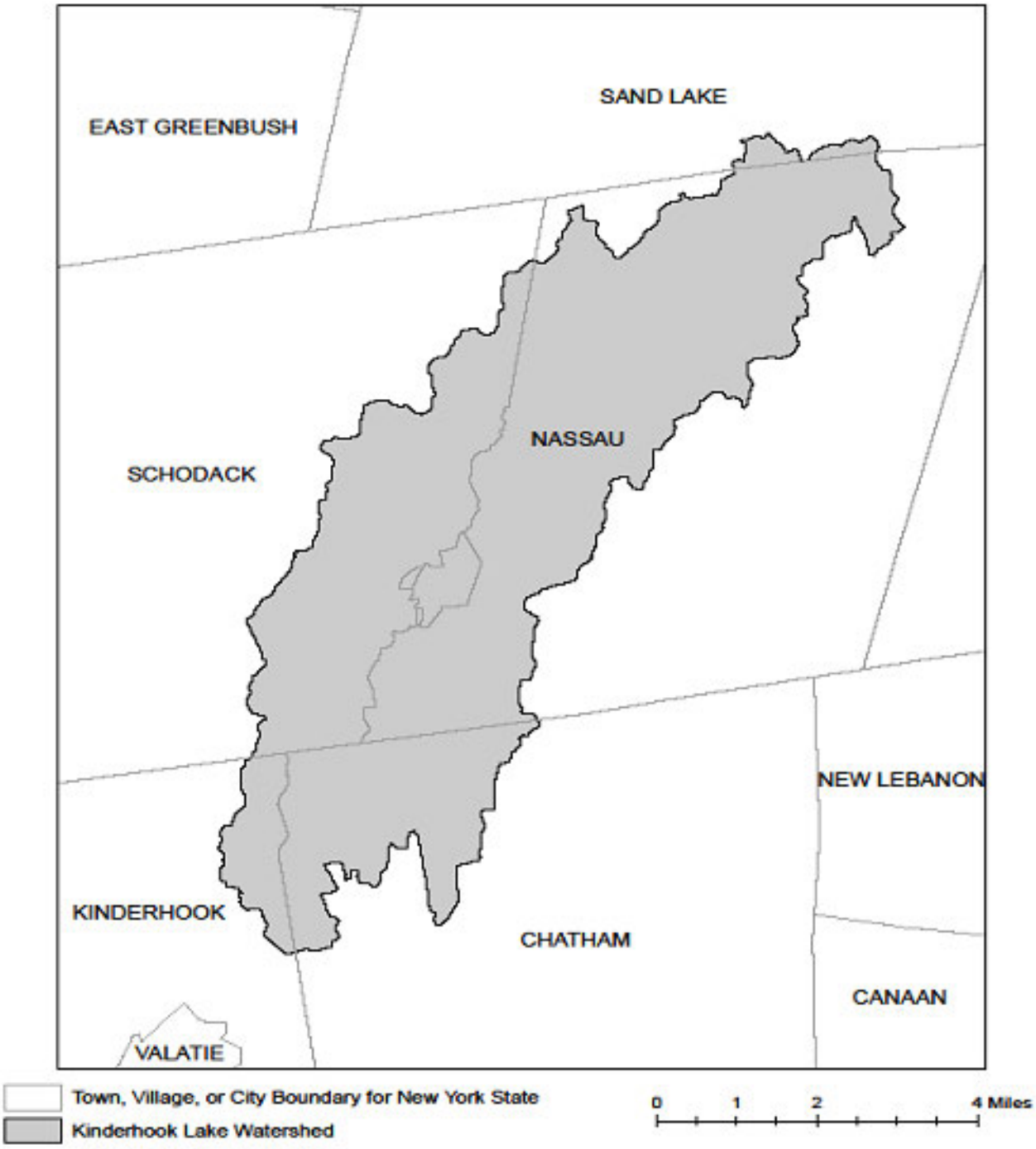


Figure 5 - Kinderhook Lake Watershed



APPENDIX D – Impaired Waterbodies (by Construction Related Pollutants)

List of waterbodies impaired by *pollutants* related to *construction activity*, including turbidity, silt/sediment, and nutrients (e.g. nitrogen, phosphorus). This list is a subset of "The Final New York State 2018 Section 303(d) List of Impaired Waters Requiring a TMDL" dated June 2020.

County	Waterbody	Pollutant
Albany	Ann Lee (Shakers) Pond, Stump Pond (1201-0096)	Phosphorus
Albany	Lawsons Lake (1301-0235)	Phosphorus
Allegany	Amity Lake, Saunders Pond (0403-0054)	Phosphorus
Allegany	Andover Pond (0403-0056)	Phosphorus
Bronx	Reservoir No.1/Lake Isle (1702-0075)	Phosphorus
Bronx	Van Cortlandt Lake (1702-0008)	Phosphorus
Broome	Blueberry, Laurel Lakes (1404-0033)	Phosphorus
Broome	Fly Pond, Deer Lake (1404-0038)	Phosphorus
Broome	Minor Tribs to Lower Susquehanna (0603-0044)	Phosphorus
Broome	Whitney Point Lake/Reservoir (0602-0004)	Phosphorus
Cattaraugus	Allegheny River/Reservoir (0201-0023)	Phosphorus
Cattaraugus	Beaver Lake/Alma Pond (0201-0073)	Phosphorus
Cattaraugus	Case Lake (0201-0020)	Phosphorus
Cattaraugus	Linlyco/Club Pond (0201-0035)	Phosphorus
Cayuga	Duck Lake (0704-0025)	Phosphorus
Cayuga	Owasco Inlet, Upper, and tribs (0706-0014)	Nutrients
Chautauqua	Chadakoin River and tribs (0202-0018)	Phosphorus
Chautauqua	Hulburt/Clymer Pond (0202-0079)	Phosphorus
Chautauqua	Middle Cassadaga Lake (0202-0002)	Phosphorus
Clinton	Great Chazy River, Lower, Main Stem (1002-0001)	Silt/Sediment
Columbia	Robinson Pond (1308-0003)	Phosphorus
Cortland	Dean Pond (0602-0077)	Phosphorus
Dutchess	Fallkill Creek (1301-0087)	Phosphorus
Dutchess	Hillside Lake (1304-0001)	Phosphorus
Dutchess	Wappingers Lake (1305-0001)	Phosphorus
Dutchess	Wappingers Lake (1305-0001)	Silt/Sediment
Erie	Beeman Creek and tribs (0102-0030)	Phosphorus
Erie	Delaware Park Pond (0101-0026)	Phosphorus
Erie	Ellicott Creek, Lower, and tribs (0102-0018)	Phosphorus
Erie	Ellicott Creek, Lower, and tribs (0102-0018)	Silt/Sediment
Erie	Green Lake (0101-0038)	Phosphorus
Erie	Little Sister Creek, Lower, and tribs (0104-0045)	Phosphorus
Erie	Murder Creek, Lower, and tribs (0102-0031)	Phosphorus

Erie	Rush Creek and tribs (0104-0018)	Phosphorus
Erie	Scajaquada Creek, Lower, and tribs (0101-0023)	Phosphorus
Erie	Scajaquada Creek, Middle, and tribs (0101-0033)	Phosphorus
Erie	Scajaquada Creek, Upper, and tribs (0101-0034)	Phosphorus
Erie	South Branch Smoke Cr, Lower, and tribs (0101-0036)	Phosphorus
Erie	South Branch Smoke Cr, Lower, and tribs (0101-0036)	Silt/Sediment
Genesee	Bigelow Creek and tribs (0402-0016)	Phosphorus
Genesee	Black Creek, Middle, and minor tribs (0402 0028)	Phosphorus
Genesee	Black Creek, Upper, and minor tribs (0402-0048)	Phosphorus
Genesee	Bowen Brook and tribs (0102-0036)	Phosphorus
Genesee	LeRoy Reservoir (0402-0003)	Phosphorus
Genesee	Mill Pond (0402-0050)	Phosphorus
Genesee	Oak Orchard Cr, Upper, and tribs (0301-0014)	Phosphorus
Genesee	Oatka Creek, Middle, and minor tribs (0402-0031)	Phosphorus
Genessee	Tonawanda Cr, Middle, Main Stem (0102-0002)	Phosphorus
Greene	Schoharie Reservoir (1202-0012)	Silt/Sediment
Greene	Sleepy Hollow Lake (1301-0059)	Silt/Sediment
Herkimer	Steele Creek tribs (1201-0197)	Phosphorus
Herkimer	Steele Creek tribs (1201-0197)	Silt/Sediment
Kings	Hendrix Creek (1701-0006) 18	Nitrogen
Kings	Prospect Park Lake (1701-0196)	Phosphorus
Lewis	Mill Creek/South Branch, and tribs (0801-0200)	Nutrients
Livingston	Christie Creek and tribs (0402-0060)	Phosphorus
Livingston	Conesus Lake (0402-0004)	Phosphorus
Livingston	Mill Creek and minor tribs (0404-0011)	Silt/Sediment
Monroe	Black Creek, Lower, and minor tribs (0402-0033)	Phosphorus
Monroe	Buck Pond (0301-0017)	Phosphorus
Monroe	Cranberry Pond (0301-0016)	Phosphorus
Monroe	Durand, Eastman Lakes (0302-0037)	Phosphorus
Monroe	Lake Ontario Shoreline, Western (0301-0069) 9	Phosphorus
Monroe	Long Pond (0301-0015)	Phosphorus
Monroe	Mill Creek and tribs (0302-0025)	Phosphorus 2
Monroe	Mill Creek/Blue Pond Outlet and tribs (0402-0049)	Phosphorus
Monroe	Minor Tribs to Irondequoit Bay (0302-0038)	Phosphorus
Monroe	Rochester Embayment - East (0302-0002) [9]	Phosphorus
Monroe	Rochester Embayment - West (0301-0068) 9	Phosphorus
Monroe	Shipbuilders Creek and tribs (0302-0026)	Phosphorus 2
Monroe	Thomas Creek/White Brook and tribs (0302-0023)	Phosphorus

Nassau	Bannister Creek/Bay (1701-0380)	Nitrogen
Nassau	Beaver Lake (1702-0152)	Phosphorus
Nassau	Browswere Bay (1701-0383)	Nitrogen
Nassau	Camaans Pond (1701-0052)	Phosphorus
Nassau	East Meadow Brook, Upper, and tribs (1701-0211)	Silt/Sediment
Nassau	East Rockaway Channel (1701-0381)	Nitrogen
Nassau	Glen Cove Creek, Lower, and tribs (1702-0146)	Silt/Sediment
Nassau	Grant Park Pond (1701-0054)	Phosphorus
Nassau	Hempstead Bay, Broad Channel (1701-0032)	Nitrogen
Nassau	Hempstead Lake (1701-0015)	Phosphorus
Nassau	Hewlett Bay (1701-0382)	Nitrogen
Nassau	Hog Island Channel (1701-0220)	Nitrogen
Nassau	Massapequa Creek, Upper, and tribs (1701-0174)	Phosphorus
Nassau	Milburn/Parsonage Creeks, Upp, and tribs (1701-0212)	Phosphorus
Nassau	Reynolds Channel, East (1701-0215) [12]	Nitrogen
Nassau	Reynolds Channel, West (1701-0216) 12	Nitrogen
Nassau	Tidal Tribs to Hempstead Bay (1701-0218)	Nitrogen
Nassau	Tribs (fresh) to East Bay (1701-0204)	Silt/Sediment
Nassau	Tribs (fresh) to East Bay (1701-0204)	Phosphorus
Nassau	Tribs to Smith Pond/Halls Pond (1701-0221)	Phosphorus
Nassau	Woodmere Channel (1701-0219)	Nitrogen
New York	Harlem Meer (1702-0103)	Phosphorus
New York	The Lake in Central Park (1702-0105)	Phosphorus
Niagara	Bergholtz Creek and tribs (0101-0004)	Phosphorus
Niagara	Hyde Park Lake (0101-0030)	Phosphorus
Niagara	Lake Ontario Shoreline, Western (0301-0053) 9	Phosphorus
Niagara	Lake Ontario Shoreline, Western (0301-0072) 9	Phosphorus
Oneida	Ballou, Nail Creeks (1201-0203)	Phosphorus
Onondaga	Ley Creek and tribs (0702-0001) 10	Nutrients (phosphorus)
Onondaga	Minor Tribs to Onondaga Lake (0702-0022) 10	Nutrients (phosphorus)
Onondaga	Minor Tribs to Onondaga Lake (0702-0022) 10	Nitrogen (NH3, NO2)
Onondaga	Onondaga Creek, Lower (0702-0023) 10	Nutrients (phosphorus)
Onondaga	Onondaga Creek, Lower, and tribs (0702-0023)	Turbidity
Onondaga	Onondaga Creek, Middle, and tribs (0702-0004)	Turbidity
Onondaga	Onondaga Creek, Upper, and tribs (0702-0024)	Turbidity
Ontario	Great Brook and minor tribs (0704-0034)	Phosphorus 2
Ontario	Great Brook and minor tribs (0704-0034)	Silt/Sediment

Ontario	Hemlock Lake Outlet and minor tribs (0402-0013)	Phosphorus
Ontario	Honeoye Lake (0402-0032)	Phosphorus
Orange	Brown Pond Reservoir (1303-0013)	Phosphorus
Orange	Lake Washington (1303-0012)	Phosphorus
Orange	Minor Tribs to Middle Wallkill (1306-0061)	Phosphorus
Orange	Monhagen Brook and tribs (1306-0074)	Phosphorus
Orange	Orange Lake (1301-0008) [16]	Phosphorus
Orange	Quaker Creek and tribs (1306-0025)	Phosphorus
Orange	Wallkill River, Middle, Main Stem (1306-0038)	Phosphorus
Orange	Wallkill River, Upper, and Minor tribs (1306-0017)	Phosphorus
Orleans	Glenvwood Lake (0301-0041)	Phosphorus
Orleans	Lake Ontario Shoreline, Western (0301-0070) 9	Phosphorus
Orleans	Lake Ontario Shoreline, Western (0301-0071) 9	Phosphorus
Oswego	Lake Neatahwanta (0701-0018)	Nutrients (phosphorus)
Oswego	Pleasant Lake (0703-0047)	Phosphorus
Putnam	Lost Lake, Putnam Lake (1302-0053)	Phosphorus
Putnam	Minor Tribs to Croton Falls Reservoir (1302-0001)	Phosphorus
Queens	Bergen Basin (1701-0009) 18	Nitrogen
Queens	Jamaica Bay, Eastern, and tribs, Queens (1701-0005) 18	Nitrogen
Queens	Kissena Lake (1702-0258)	Phosphorus
Queens	Meadow Lake (1702-0030)	Phosphorus
Queens	Shellbank Basin (1701-0001) 18	Nitrogen
Queens	Willow Lake (1702-0031)	Phosphorus
Rensselaer	Nassau Lake (1310-0001)	Phosphorus
Rensselaer	Snyders Lake (1301-0043)	Phosphorus
Richmond	Grassmere Lake/Bradys Pond (1701-0357)	Phosphorus
Rockland	Congers Lake, Swartout Lake (1501-0019)	Phosphorus
Rockland	Rockland Lake (1501-0021)	Phosphorus
Saratoga	Ballston Lake (1101-0036)	Phosphorus
Saratoga	Dwaas Kill and tribs (1101-0007)	Phosphorus
Saratoga	Dwaas Kill and tribs (1101-0007)	Silt/Sediment
Saratoga	Lake Lonely (1101-0034)	Phosphorus
Saratoga	Round Lake (1101-0060)	Phosphorus
Saratoga	Tribs to Lake Lonely (1101-0001)	Phosphorus
Schenectady	Collins Lake (1201-0077)	Phosphorus
Schenectady	Duane Lake (1311-0006)	Phosphorus
Schenectady Lake	Mariaville Lake (1201-0113)	Phosphorus
Schuyler	Cayuta Lake (0603-0005)	Phosphorus

Seneca	Reeder Creek and tribs (0705-0074)	Phosphorus
St.Lawrence	Black Lake Outlet, Black Lake (0906-0001)	Phosphorus
St.Lawrence	Fish Creek and minor tribs (0906-0026)	Phosphorus
Steuben	Smith Pond (0502-0012)	Phosphorus
Suffolk	Agawam Lake (1701-0117)	Phosphorus
Suffolk	Big/Little Fresh Ponds (1701-0125)	Phosphorus
Suffolk	Canaan Lake (1701-0018)	Phosphorus
Suffolk	Canaan Lake (1701-0018)	Silt/Sediment
Suffolk	Fresh Pond (1701-0241)	Phosphorus
Suffolk	Great South Bay, East (1701-0039)	Nitrogen
Suffolk	Great South Bay, Middle (1701-0040)	Nitrogen
Suffolk	Great South Bay, West (1701-0173)	Nitrogen
Suffolk	Lake Ronkonkoma (1701-0020)	Phosphorus
Suffolk	Mattituck/Marratooka Pond (1701-0129)	Phosphorus
Suffolk	Mill and Seven Ponds (1701-0113)	Phosphorus
Suffolk	Millers Pond (1702-0013)	Phosphorus
Suffolk	Moriches Bay, East (1701-0305)	Nitrogen
Suffolk	Moriches Bay, West (1701-0038)	Nitrogen
Suffolk	Quantuck Bay (1701-0042)	Nitrogen
Suffolk	Shinnecock Bay and Inlet (1701-0033)	Nitrogen
Suffolk	Tidal Tribs to West Moriches Bay (1701-0312)	Nitrogen
Sullivan	Bodine, Mongomery Lakes (1401-0091)	Phosphorus
Sullivan	Davies Lake (1402-0047)	Phosphorus
Sullivan	Evens Lake (1402-0004)	Phosphorus
Sullivan	Pleasure Lake (1402-0055)	Phosphorus
Sullivan	Swan Lake (1401-0063)	Phosphorus
Tompkins	Cayuga Lake, Southern End (0705-0040)	Phosphorus
Tompkins	Cayuga Lake, Southern End (0705-0040)	Silt/Sediment
Ulster	Ashokan Reservoir (1307-0004)	Silt/Sediment
Ulster	Esopus Creek, Lower, Main Stem (1307-0010) [17]	Turbidity
Ulster	Esopus Creek, Middle, Main Stem (1307-0003) 17	Turbidity
Ulster	Esopus Creek, Upper, and minor tribs (1307-0007)[3]	Silt/Sediment
Ulster	Wallkill River, Lower, Main Stem (1306-0027)	Phosphorus
Warren	Hague Brook and tribs (1006-0006)	Silt/Sediment
Warren	Huddle/Finkle Brooks and tribs (1006-0003)	Silt/Sediment
Warren	Indian Brook and tribs (1006-0002)	Silt/Sediment
Warren	Lake George (1006-0016) and tribs	Silt/Sediment
Warren	Tribs to Lake George, East Shore (1006-0020)	Silt/Sediment
Warren	Tribs to Lake George, Lk.George Village (1006-0008)	Silt/Sediment

Washington	Wood Cr/Champlain Canal and tribs (1005-0036)	Phosphorus
Westchester	Lake Katonah (1302-0136)	Phosphorus
Westchester	Lake Lincolndale (1302-0089)	Phosphorus
Westchester	Lake Meahagh (1301-0053)	Phosphorus
Westchester	Lake Mohegan (1301-0149)	Phosphorus
Westchester	Lake Shenorock (1302-0083)	Phosphorus
Westchester	Mamaroneck River, Lower (1702-0071)	Silt/Sediment
Westchester	Mamaroneck River, Upp, & minor tribs (1702-0123)	Silt/Sediment
Westchester	Saw Mill River (1301-0007)	Phosphorus
Westchester	Saw Mill River, Middle, and tribs (1301-0100)	Phosphorus
Westchester	Sheldrake River (1702-0069)	Phosphorus
Westchester	Sheldrake River (1702-0069)	Silt/Sedimnt
Westchester	Silver Lake (1702-0040)	Phosphorus
Westchester	Teatown Lake (1302-0150)	Phosphorus
Westchester	Truesdale Lake (1302-0054)	Phosphorus
Westchester	Wallace Pond (1301-0140)	Phosphorus

APPENDIX E – List of NYSDEC Regional Offices

Region	Covering the following counties:	DIVISION OF ENVIRONMENTAL PERMITS (DEP) Permit Administrators	DIVISION OF WATER (DOW) Water (SPDES) Program
1	Nassau and Suffolk	50 Circle Road Stony Brook, NY 11790 Tel. (631) 444-0365	50 Circle Road Stony Brook, NY 11790-3409 Tel. (631) 444-0405
2	Bronx, Kings, New York, Queens and Richmond	1 Hunters Point Plaza, 47-40 21st St. Long Island City, NY 11101-5407 Tel. (718) 482-4997	1 Hunters Point Plaza, 47-40 21st St. Long Island City, NY 11101-5407 Tel. (718) 482-4933
3	Dutchess, Orange, Putnam, Rockland, Sullivan, Ulster and Westchester	21 South Putt Corners Road New Paltz, NY 12561-1696 Tel. (845) 256-3059	220 White Plains Road, Suite 110 Tel. (914) 428 - 2505
4	Albany, Columbia, Delaware, Greene, Montgomery, Otsego, Rensselaer, Schenectady and Schoharie	1130 North Westcott Road Schenectady, NY 12306-2014 Tel. (518) 357-2069	1130 North Westcott Road Schenectady, NY 12306-2014 Tel. (518) 357-2045
5	Clinton, Essex, Franklin, Fulton, Hamilton, Saratoga, Warren and Washington	1115 State Route 86, Po Box 296 Ray Brook, NY 12977-0296 Tel. (518) 897-1234	232 Golf Course Road Warrensburg, NY 12885-1172 Tel. (518) 623-1200
6	HERKIMER, JEFFERSON, LEWIS, ONEIDA AND ST. LAWRENCE	STATE OFFICE BUILDING 317 WASHINGTON STREET WATERTOWN, NY 13601-3787 TEL. (315) 785-2245	STATE OFFICE BUILDING 207 GENESEE STREET UTICA, NY 13501-2885 TEL. (315) 793-2554
7	BROOME, CAYUGA, CHENANGO, CORTLAND, MADISON, ONONDAGA, OSWEGO, TIOGA AND TOMPKINS	5786 WIDEWATERS PARKWAY SYRACUSE, NY 13214-1867 TEL. (315) 426-7438	5786 WIDEWATERS PARKWAY SYRACUSE, NY 13214-1867 TEL. (315) 426-7500
8	CHEMUNG, GENESEE, LIVINGSTON, MONROE, ONTARIO, ORLEANS, SCHUYLER, SENECA, STEUBEN, WAYNE AND YATES	6274 EAST AVON-LIMA ROADAVON, NY 14414-9519 TEL. (585) 226-2466	6274 EAST AVON-LIMA RD. AVON, NY 14414-9519 TEL. (585) 226-2466
9	ALLEGANY, CATTARAUGUS, CHAUTAUQUA, ERIE, NIAGARA AND WYOMING	700 DELAWARE AVENUE BUFFALO, NY 14209-2999 TEL. (716) 851-7165	700 DELAWARE AVENUE BUFFALO, NY 14209-2999 TEL. (716) 851-7070

APPENDIX F – SWPPP Preparer Certification Form

The SWPPP Preparer Certification Form required by this permit begins on the following page.

SWPPP Preparer Certification Form

SPDES General Permit for Stormwater Discharges from Construction Activity, GP-0-25-001 (CGP)

(In accordance with CGP Part I.D.2.b., the completed form must be attached to the eNOI and submitted to NYSDEC electronically.)

Project/Site Name:

eNOI Submission ID:

Owner/Operator Name:

Certification Statement – SWPPP Preparer

I hereby certify that the Stormwater Pollution Prevention Plan (SWPPP) has been prepared in accordance with the requirements of GP-0-25-001. I certify under penalty of law that the SWPPP and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

SWPPP Preparer First Name | MI | SWPPP Preparer Last Name

Signature

Date

Revised: January 2025

APPENDIX G – MS4 SWPPP Acceptance Form

The MS4 SWPPP Acceptance Form required by this permit begins on the following page.

MS4 SWPPP Acceptance Form

for construction activities seeking authorization under the

SPDES General Permit for Stormwater Discharges from Construction Activity, GP-0-25-001 (CGP)

(In accordance with CGP Part I.D.2.b., the completed form must be attached to the eNOI and submitted to NYSDEC electronically.)

I. Project Owner/Operator Information
1. Owner/Operator Name:
2. Contact Person:
3. Street Address:
4. City/State/Zip:
II. Project Site Information
5. Project/Site Name:
6. Street Address:
7. City/State/Zip:
III. Stormwater Pollution Prevention Plan (SWPPP) Review and Acceptance Information
8. SWPPP Reviewed by:
9. Title/Position:
10. Date Final SWPPP Reviewed and Accepted:
IV. Regulated MS4 Information
11. Name of MS4 Operator:
12. MS4 SPDES Permit Identification Number: NYR20A
13. Street Address:
14. City/State/Zip:
15. Telephone Number:

MS4 SWPPP Acceptance Form - continued

V. Certification Statement - MS4 Official (principal executive officer or ranking elected official) or Duly Authorized Representative

I hereby certify that the final Stormwater Pollution Prevention Plan (SWPPP) for the construction project identified in section II. of this form has been reviewed and meets the substantive requirements in the SPDES General Permit for Stormwater Discharges from Construction Activity, GP-0-25-001 (CGP). Note: The MS4 Operator, through the acceptance of the SWPPP, assumes no responsibility for the accuracy and adequacy of the design included in the SWPPP. In addition, review and acceptance of the SWPPP by the MS4 Operator does not relieve the owner/operator or their SWPPP preparer of responsibility or liability for errors or omissions in the plan.

Printed Name[1]:

Title/Position:

Signature:

Date:

VI. Additional Information

[1] Printed name of the principal executive officer or ranking elected official for the MS4 Operator or their duly authorized representative in accordance with CGP Part VII.J.2.

APPENDIX H – NYCDEP SWPPP Acceptance/Approval Form

The City of New York Department of Environmental Protection (NYCDEP) SWPPP Acceptance/Approval form required by this permit begins on the following page.

THE CITY OF NEW YORK
DEPARTMENT OF ENVIRONMENTAL PROTECTION
Bureau of Environmental Planning and Analysis
59-17 Junction Blvd., 9th Floor; Flushing, NY 11373

SWPPP Acceptance/Approval

Application Number:

I. Project Owner/Operator Information
1. Owner/Operator Name:
2. Contact Person:
3. Street Address:
4. City/State/Zip:
II. Project Site Information
5. Project/Site Name:
6. Street Address:
7. City/State/Zip:
III. Stormwater Pollution Prevention Plan (SWPPP) Review and Acceptance/Approval
8. SWPPP Reviewed by:
9. Title/Position: /
10. Date Final SWPPP Reviewed and Accepted:
11. Acceptance/Approval Expiration Date:
IV. Regulated MS4 Information for projects that require coverage under the NY State Pollution Discharge Elimination System General Permit for Stormwater Discharges from Construction Activity
12. Name of MS4: *CITY OF NEW YORK*
13. MS4 SPDES Permit Identification Number: *NY-0287890*
14. Contact Person:
15. Street Address: *59-17 Junction Blvd. 9th Floor*
16. City/State/Zip: *Flushing, NY 11373*
17. Telephone Number:

Projects in the MS4 area must submit a copy of this SWPPP Acceptance with a Notice of Intent for coverage under the NY SPDES General Permit for Stormwater Discharges from Construction Activity to: NYS Department of Environmental Conservation, Division of Water; 625 Broadway, 4th Floor; Albany, New York 12233-3505.

THE CITY OF NEW YORK
DEPARTMENT OF ENVIRONMENTAL PROTECTION
Bureau of Environmental Planning and Analysis
59-17 Junction Blvd., 9th Floor; Flushing, NY 11373

V. Certification Statement - MS4 Official (principal executive officer or ranking elected official) or Duly Authorized Representative

I hereby certify that the final Stormwater Pollution Prevention Plan (SWPPP) for the construction project identified in question 5 has been reviewed and meets the substantive requirements in the SPDES General Permit For Stormwater Discharges from Municipal Separate Storm Sewer Systems (MS4s).

Note: The MS4, through the acceptance of the SWPPP, assumes no responsibility for the accuracy and adequacy of the design included in the SWPPP. In addition, review and acceptance of the SWPPP by the MS4 does not relieve the owner/operator or their SWPPP preparer of responsibility or liability for errors or omissions in the plan.

Printed Name:

Title/Position:

Signature:

Date:

VI. Conditions of Acceptance/Approval and Additional Information

Projects in the MS4 area must submit a copy of this SWPPP Acceptance with a Notice of Intent for coverage under the NY SPDES General Permit for Stormwater Discharges from Construction Activity to: NYS Department of Environmental Conservation, Division of Water; 625 Broadway, 4th Floor; Albany, New York 12233-3505.

APPENDIX I – MS4 No Jurisdiction Form

The MS4 No Jurisdiction Form required by this permit begins on the following page.

MS4 No Jurisdiction Form

for construction activities seeking authorization under the

SPDES General Permit for Stormwater Discharges from Construction Activity, GP-0-25-001 (CGP)

(In accordance with CGP Part I.D.2.b., the completed form must be attached to the eNOI and submitted to NYSDEC electronically.)

I. Project Owner/Operator Information

a. Owner/Operator Name:

b. Contact Person:

c. Street Address:

d. City/State/Zip:

II. Project Site Information

a. Project/Site Name:

b. Street Address:

c. City/State/Zip:

d. eNOI Submission ID:

III. Traditional Land Use Control MS4 Operator Information

a. Name of MS4 Operator:

b. MS4 SPDES Permit ID Number: NYR20A

c. Street Address:

d. City/State/Zip:

e. Telephone Number:

IV. Certification Statement

In accordance with CGP Part I.D.2.b.ii.3., I hereby certify that the Traditional Land Use Control MS4 Operator identified in section III. of this form does not have review authority over the construction project identified in section II. of this form, which is owned/operated by the entity identified in section I. of this form. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

a. Printed name of the principal executive officer or ranking elected official for the MS4 Operator or their duly authorized representative in accordance with CGP Part VII.J.2.:

b. Title/Position:

c. Signature:

d. Date:

APPENDIX J – Owner/Operator Certification Form

The Owner/Operator Certification Form required by this permit begins on the following page.

Owner/Operator Certification Form

SPDES General Permit for Stormwater Discharges from Construction Activity, GP-0-25-001 (CGP)

(In accordance with CGP Part I.D.2.b. or Part I.F.2. and 3., the completed form must be attached to the eNOI or the Request to Continue Coverage, and submitted to NYSDEC electronically.

Project/Site Name: _____

eNOI Submission ID: _____

eNOI Submitted by: ☐ **Owner/Operator** ☐ **SWPPP Preparer** ☐ **Other**

Certification Statement - Owner/Operator

I hereby certify that I read, and will comply with, the GP-0-25-001 permit requirements. I understand that authorization to discharge under the permit for the project/site named above is dependent on receipt of a Letter of Authorization (LOA) or a Letter of Continued Coverage (LOCC) from the New York State Department of Environmental Conservation (NYSDEC) in accordance with CGP Part I.D.3.b. or Part I.F.4. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Owner/Operator First Name MI Owner/Operator Last Name

_____

Signature

_____

Date

Revised: January 2025

Appendix I

Notice of Intent

Aubertine and Currier Architects, Engineers and Land Surveyors, PLLC
522 Bradley Street, Watertown, New York 13601 TELE: (315) 782-2005 FAX: (315) 782-1472

Page left intentionally blank for duplex printing

Construction General Permit (CGP) Electronic Notice of Intent (eNOI) GP-0-25-001

version 1.18

(Submission #: HQQ-QP3Z-VQN49, version 1)

Details

Originally Started By	Peter Partlow
Alternate Identifier	Roth Industries 2026 Expansion Project—Region 6
Submission ID	HQQ-QP3Z-VQN49
Status	Draft

Form Input

Eligibility

Disturbance Threshold

1. Will the construction activity involve soil disturbances listed in Part I.A.1 of GP-0-25-001?
Yes

1.a. Will any runoff from the site enter a sewer system classified as a combined sewer?
No

1.b. Is this a remediation project being done under a Department approved work plan (i.e. CERCLA, RCRA, Voluntary Cleanup Agreement, etc.) with a SWPPP which meets the substantive requirements of GP-0-25-001?
No

1.c. Is the construction activity related to a stormwater discharge that does not require a permit as described in 40 CFR 122.3(e), e.g. non-point source agriculture or silviculture activities?
No

Other SPDES Permits

2. Will the discharge from the construction activity meet all conditions listed in Part I.A.2 of GP-0-25-001?
Yes

Threatened and Endangered Species

3. Will the construction activity potentially adversely affect a species that is endangered or threatened per Part I.A.3.?
No

State Historic Preservation Act (SHPA)

4. Is the construction activity designated by the Commissioner of the Office of Parks, Recreation and Historic Preservation (OPRHP), pursuant to 9 NYCRR §§428.12 or 428.13 as exempt from the SHPA review (see Attachment 2 of the Letter of Resolution between NYSDEC and OPRHP, dated January 9, 2015)?
No

4.a. Will the construction activity:

a) occur within an archeologically sensitive area indicated on the sensitivity map, or

b) have the potential to affect a property that is listed or determined to be eligible for listing on the National or State Registers of Historic Places, or

c) include a new permanent building on the construction site within the following distances from a building, structure, or object that is more than 50 years old and OPRHP, a Historic Preservation Commission of a Certified Local Government, or a qualified preservation professional has determined is a historically/archeologically significant building, structure, or object:

- 1-5 acres of disturbance—20 feet
- 5-20 acres of disturbance—50 feet
- 20+ acres of disturbance—100 feet?

Yes

4.a.i. Have the impacts to historic properties been resolved?
NONE PROVIDED

State Environmental Quality Review (SEQR)

5. Is the construction activity subject to SEQR (Part I.A.5.), or the equivalent environmental review from another NYS or federal agency (Part I.A.6.)?
Yes

5.a. Has the owner/operator obtained documentation that the project review pursuant to SEQR, or the equivalent, has been satisfied per Part I.A.5. or I.A.6. of GP-0-25-001?
NONE PROVIDED

Uniform Procedures Act (UPA) Permits

6. Has the owner/operator obtained all necessary UPA permits from NYSDEC, or the equivalent from another NYS or federal agency per Part I.A.7.a. of GP-0-25-001? Select "Yes" if no UPA permits, or the equivalent, are required for this construction activity.
NONE PROVIDED

Steep Slope

7. Is the construction activity within the watershed of surface waters of the State classified as AA or AA-S identified utilizing the Stormwater Interactive Map on NYSDEC's website?
No

Owner/Operator Information

8. Owner/Operator Name
Roth Industries, Inc.

9. Owner/Operator Contact Person Information

First and Last Name	Phone	E-mail
Dave Gerber	(315) 475-0100	daveg@roth-usa.com

10. Owner/Operator Mailing Address

268 BELLEW AVE S
WATERTOWN, NY 13601-2377
USA

11. Is the billing contact different from the Owner/Operator Contact?
No

12. What type of organization is the owner/operator?
Privately Owned Facility

12.b. Is the owner/operator registered with the Department of State to do business in New York State?
NONE PROVIDED

Site Information

13. Project/Site Name
Roth Industries 2026 Expansion Project

14. Site Address
268 BELLEW AVE S
WATERTOWN, NY 13601-2377
Jefferson

DEC Region
6

15. Site Latitude & Longitude
43.97106471952917,-75.93315505194265

Project Details

16. This eNOI submission is for:
A construction activity not part of a common plan of development or sale in accordance with Part I.D.1.a.

17. Does the project type fall under Table 1 or Table 2 of Appendix B of GP-0-25-001? If any portion of the construction activity falls under Table 2, regardless of the size of the disturbance, select "Table 2".
Table 2

18. Consistent with Part III.B.1.c.i. of GP-0-25-001, provide a concise overview of the project. Describe existing and proposed conditions, and include any other relevant information.
The project includes two (2) building additions, expanded asphalt parking lot, reconfigured ADA parking spaces, asphalt entrance drive, expanded asphalt storage areas, chain link fence, relocated site light poles, and expanded infiltration basins.

Enter the total project site acreage, the acreage to be disturbed, and the future impervious area (acreage) within the disturbed area, rounded to the nearest tenth of an acre.

19. Total Site Area (acres)
8.8

20. Total Area to be Disturbed (acres)
2.3

21. Existing Impervious Area to be Disturbed (acres)
2.6

22. Future Impervious Area Within Disturbed Area (acres)
5.9

> The existing impervious area or future impervious area is greater than the total area to be disturbed. Please review the responses to Questions 20, 21, and 22 to ensure the correct values are provided.

Nature of the project:
Redevelopment with increase in impervious area

23. Do you plan to disturb more than 5 acres of soil at any one time?
No

---

24. Indicate the percentage (%) of each Hydrologic Soil Group(HSG) at the site.

A (%)
97

B (%)
0

C (%)
3

D (%)
0

25. Enter the planned start and end dates of the disturbance activities.

Start Date
NONE PROVIDED

End Date
NONE PROVIDED

26. Identify the nearest surface waterbody(ies) to which construction site runoff will discharge.
NONE PROVIDED

27. Type of waterbody identified in question 26?
NONE PROVIDED

28. Has the surface waterbody in question 26 been identified as a 303(d) segment in Appendix D of GP-0-25-001?
No

29. Is this project located in one of the Watersheds identified in Appendix C of GP-0-25-001?
No

30. Will the project disturb soils within a State regulated wetland or the protected 100 foot adjacent area?
Yes

31. Does the site runoff enter a separate storm sewer system (including roadside drains, swales, ditches, culverts, etc)?
Yes

31.a. What is the name of the municipality/entity that owns the separate storm sewer system? If the separate sewer system is owned by an MS4 Operator, enter the MS4 Operator name.
Watertown

32. Will future use of this site be an agricultural property as defined by the NYS Agriculture and Markets Law?
No

33. Is this property owned by a state authority, state agency, federal government or local government?
No

Required SWPPP Components

General SWPPP Requirements

34. Has a SWPPP been developed in conformance with the requirements in Part III. of GP-0-25-001?
Yes

35. Does the SWPPP demonstrate consideration of the future physical risks due to climate change pursuant to the CRRA, 6 NYCRR Part 490, and associated guidance per Part III.A.2. of GP-0-25-001?
Yes

36. Has the required Erosion and Sediment Control component of the SWPPP been developed in conformance with the current NYS Standards and Specifications for Erosion and Sediment Control (aka Blue Book)?
Yes

37. Has the post-construction stormwater management practice component of the SWPPP been developed in conformance with the NYS Stormwater Management Design Manual?
Yes

37.a. Which version of the NYS Stormwater Management Design Manual was used to develop the SWPPP?
2015

SWPPP Preparer

---

39. The Stormwater Pollution Prevention Plan (SWPPP) was prepared by:
Professional Engineer (P.E.)

40. Name of the person who prepared the SWPPP
Matthew Morgia

41. SWPPP Preparer Organization Name
Aubertine and Currier, Architects, Engineers, and Land Surveyors, PLLC

42. SWPPP Preparer Contact Information

First and Last Name	Phone	E-mail
Matthew Morgia	(315) 782-2005	mrm@aubertinecurrier.com

43. SWPPP Preparer Address

522 BRADLEY ST
WATERTOWN, NY 13601-1204

Download SWPPP Preparer Certification Form

Please take the following steps to prepare and upload your preparer certification form:

1) Click on the link below to download a blank certification form
2) The certified SWPPP preparer should sign this form
3) Upload the completed form
Download SWPPP Preparer Certification Form

44. Please upload the SWPPP Preparer Certification

NONE PROVIDED

Comment

NONE PROVIDED

44.a. Has the SWPPP Preparer Certification Form been signed by the SWPPP preparer in accordance with Part VII.J of GP-0-25-001?
NONE PROVIDED

Erosion & Sediment Control Criteria

45. Has a construction sequence schedule for the planned management practices been prepared?
Yes

Post-Construction Criteria

Site Planning and Soil Restoration

46. Identify all site planning practices that were used to prepare the final site plan/layout for the project.
Preservation of Undisturbed Area
Parking Reduction

47. Indicate which of the following soil restoration criteria was used to address the requirements in Section 5.1.6 ("Soil Restoration") of the Design Manual.
All disturbed areas will be restored in accordance with the Soil Restoration requirements in Table 5.3 of the Design Manual (see page 5-22).

Water Quality Criteria

49. Water Quality Sizing Criteria

Total WQv required (acre-feet)	Total RRv provided (acre-feet)	Minimum RRv (acre-feet)	Total WQv provided (acre-feet)	Sum of RRv and WQv provided
NONE PROVIDED	*NONE PROVIDED*			*NONE PROVIDED*

Water Quantity Criteria

50. Per Section 9.2.1.C.VI and VII of the 2024 Design Manual, is there 0% change to hydrology that increases the discharge rate and volume from the project site?
Yes

Operation and Maintenance

53. Has a long-term Operation and Maintenance Plan for the post-construction stormwater management practice(s) been developed?
Yes

53.a. Identify the entity responsible for the long-term Operation and Maintenance.
Roth Industries, Inc.

Post-Construction SMP Identification

54. Post-Construction RR Techniques and Standard SMPs

RR Techniques and SMPs	Contributing Impervious Area (acres)	Total Contributing Area (acres)
Infiltration Basin (I-2)	5.93	

55. Alternative SMPs

Type of Alternative SMP	Manufacturer of the Alternative SMP	Name of the Alternative SMP	Contributing Impervious Area (acres)
NONE PROVIDED	*NONE PROVIDED*	*NONE PROVIDED*	*NONE PROVIDED*

Other Permits

56. Identify other permits, existing and new, that are required for this project/facility.
NONE PROVIDED

57. Is this NOI for a change in owner/operator per Part I.G.?
No

MS4 SWPPP Acceptance

59. Will the construction activities be within the municipal boundary(ies) of Traditional Land Use Control MS4 Operator(s) and discharge to the MS4(s)?
Yes

59.a. Which form is required per Part I.D.2.b.ii.?
NONE PROVIDED

Owner/Operator Certification

Owner/Operator Certification Form Download

Download the Owner/Operator Certification Form by clicking the link below.
Owner/Operator Certification Form

61. Upload Owner/Operator Certification Form

NONE PROVIDED

Comment

NONE PROVIDED

61.a. Has the Owner/Operator Certification Form from Appendix J been signed by the owner/operator, or a representative of the owner/operator in accordance with Part VII.J of GP-0-25-001 and uploaded to the eNOI?

NONE PROVIDED

Additional Project Information

62. Enter any additional pertinent project information in the text box below.

NONE PROVIDED

SWPPP Preparer Certification Form

SPDES General Permit for Stormwater Discharges from Construction Activity, GP-0-25-001 (CGP)

(In accordance with CGP Part I.D.2.b., the completed form must be attached to the eNOI and submitted to NYSDEC electronically.)

Project/Site Name:

eNOI Submission ID:

Owner/Operator Name:

Certification Statement – SWPPP Preparer

I hereby certify that the Stormwater Pollution Prevention Plan (SWPPP) has been prepared in accordance with the requirements of GP-0-25-001. I certify under penalty of law that the SWPPP and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

SWPPP Preparer First Name | MI | SWPPP Preparer Last Name

Signature | Date

Revised: January 2025

Owner/Operator Certification Form

SPDES General Permit for Stormwater Discharges from Construction Activity, GP-0-25-001 (CGP)

(In accordance with CGP Part I.D.2.b. or Part I.F.2. and 3., the completed form must be attached to the eNOI or the Request to Continue Coverage, and submitted to NYSDEC electronically.

Project/Site Name: _____

eNOI Submission ID: _____

eNOI Submitted by: ☐ **Owner/Operator** ☑ **SWPPP Preparer** ☐ **Other**

Certification Statement - Owner/Operator

I hereby certify that I read, and will comply with, the GP-0-25-001 permit requirements. I understand that authorization to discharge under the permit for the project/site named above is dependent on receipt of a Letter of Authorization (LOA) or a Letter of Continued Coverage (LOCC) from the New York State Department of Environmental Conservation (NYSDEC) in accordance with CGP Part I.D.3.b. or Part I.F.4. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Owner/Operator First Name MI Owner/Operator Last Name

_____

Signature

_____

Date

Revised: January 2025

Appendix J

MS4 SWPPP ACCEPTANCE FORM

Aubertine and Currier Architects, Engineers and Land Surveyors, PLLC
522 Bradley Street, Watertown, New York 13601 TELE: (315) 782-2005 FAX: (315) 782-1472

Page left intentionally blank for duplex printing

NEW YORK STATE | Department of Environmental Conservation

MS4 SWPPP Acceptance Form

for construction activities seeking authorization under the

SPDES General Permit for Stormwater Discharges from Construction Activity, GP-0-25-001 (CGP)

(In accordance with CGP Part I.D.2.b., the completed form must be attached to the eNOI and submitted to NYSDEC electronically.)

I. Project Owner/Operator Information
1. Owner/Operator Name:
2. Contact Person:
3. Street Address:
4. City/State/Zip:
II. Project Site Information
5. Project/Site Name:
6. Street Address:
7. City/State/Zip:
III. Stormwater Pollution Prevention Plan (SWPPP) Review and Acceptance Information
8. SWPPP Reviewed by:
9. Title/Position:
10. Date Final SWPPP Reviewed and Accepted:
IV. Regulated MS4 Information
11. Name of MS4 Operator:
12. MS4 SPDES Permit Identification Number: NYR20A
13. Street Address:
14. City/State/Zip:
15. Telephone Number:

MS4 SWPPP Acceptance Form - continued

V. Certification Statement - MS4 Official (principal executive officer or ranking elected official) or Duly Authorized Representative

I hereby certify that the final Stormwater Pollution Prevention Plan (SWPPP) for the construction project identified in section II. of this form has been reviewed and meets the substantive requirements in the SPDES General Permit for Stormwater Discharges from Construction Activity, GP-0-25-001 (CGP). Note: The MS4 Operator, through the acceptance of the SWPPP, assumes no responsibility for the accuracy and adequacy of the design included in the SWPPP. In addition, review and acceptance of the SWPPP by the MS4 Operator does not relieve the owner/operator or their SWPPP preparer of responsibility or liability for errors or omissions in the plan.

Printed Name[1]:

Title/Position:

Signature:

Date:

VI. Additional Information

[1] Printed name of the principal executive officer or ranking elected official for the MS4 Operator or their duly authorized representative in accordance with CGP Part VII.J.2.

Appendix K

Notice of Termination

Aubertine and Currier Architects, Engineers and Land Surveyors, PLLC
522 Bradley Street, Watertown, New York 13601 TELE: (315) 782-2005 FAX: (315) 782-1472

Page left intentionally blank for duplex printing

eNOT Owner or Operator Certification

for construction activities seeking termination from the

SPDES General Permit for Stormwater Discharges from Construction Activity, GP-0-25-001 (CGP)

(The completed form must be attached to the eNOT, which must be submitted to NYSDEC electronically in accordance with CGP Part V.A.5.)

I. Project Owner/Operator Information

a. Owner/Operator Name:

b. Contact Person:

c. Street Address:

d. City/State/Zip:

II. Project Site Information

a. Project/Site Name:

b. Street Address:

c. City/State/Zip:

d. CGP SPDES Permit ID:

III. Certification Statement

I certify that I have met the requirements of CGP Part V.A.1., 2., 3., and 4. I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

a. Printed name of the Owner or Operator:

b. Title/Position:

c. Signature:

d. Date:

eNOT Qualified Inspector Certification – SMPs

for construction activities seeking termination from the

SPDES General Permit for Stormwater Discharges from Construction Activity, GP-0-25-001 (CGP)

(The completed form must be attached to the eNOT, which must be submitted to NYSDEC electronically in accordance with CGP Part V.A.5.)

I. Project Owner/Operator Information

a. Owner/Operator Name:

b. Contact Person:

c. Street Address:

d. City/State/Zip:

II. Project Site Information

a. Project/Site Name:

b. Street Address:

c. City/State/Zip:

d. CGP SPDES Permit ID:

III. Certification Statement

I hereby certify that all the requirements in CGP Part V.A.1.a.iv. or CGP Part V.A.1.b.iv. have been achieved. I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

a. Printed name of the Qualified Inspector:

b. Title/Position:

c. Signature:

d. Date:

eNOT Qualified Inspector Certification – Final Stabilization

for construction activities seeking termination from the

SPDES General Permit for Stormwater Discharges from Construction Activity, GP-0-25-001 (CGP)

(The completed form must be attached to the eNOT, which must be submitted to NYSDEC electronically in accordance with CGP Part V.A.5.)

I. Project Owner/Operator Information

a. Owner/Operator Name:

b. Contact Person:

c. Street Address:

d. City/State/Zip:

II. Project Site Information

a. Project/Site Name:

b. Street Address:

c. City/State/Zip:

d. CGP SPDES Permit ID:

III. Certification Statement

I hereby certify that all the requirements in CGP Part V.A.1.a.i., ii., and iii. or CGP Part V.A.1.b.i., ii., and iii. have been achieved. I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

a. Printed name of the Qualified Inspector:

b. Title/Position:

c. Signature:

d. Date:

Page left intentionally blank for duplex printing

2026 EXPANSION PROJECT
ROTH INDUSTRIES, INC.
268 BELLEW AVENUE SOUTH, CITY OF WATERTOWN
JEFFERSON COUNTY, STATE OF NEW YORK
SITE PLANS: 08/26/2026



OWNER

ROTH INDUSTRIES, INC.
ATTN: DAVE GERBER
268 BELLEW AVENUE SOUTH
WATERTOWN, NEW YORK
TELE: (315) 475-0100

ARCHITECT AND CIVIL/SITE ENGINEER

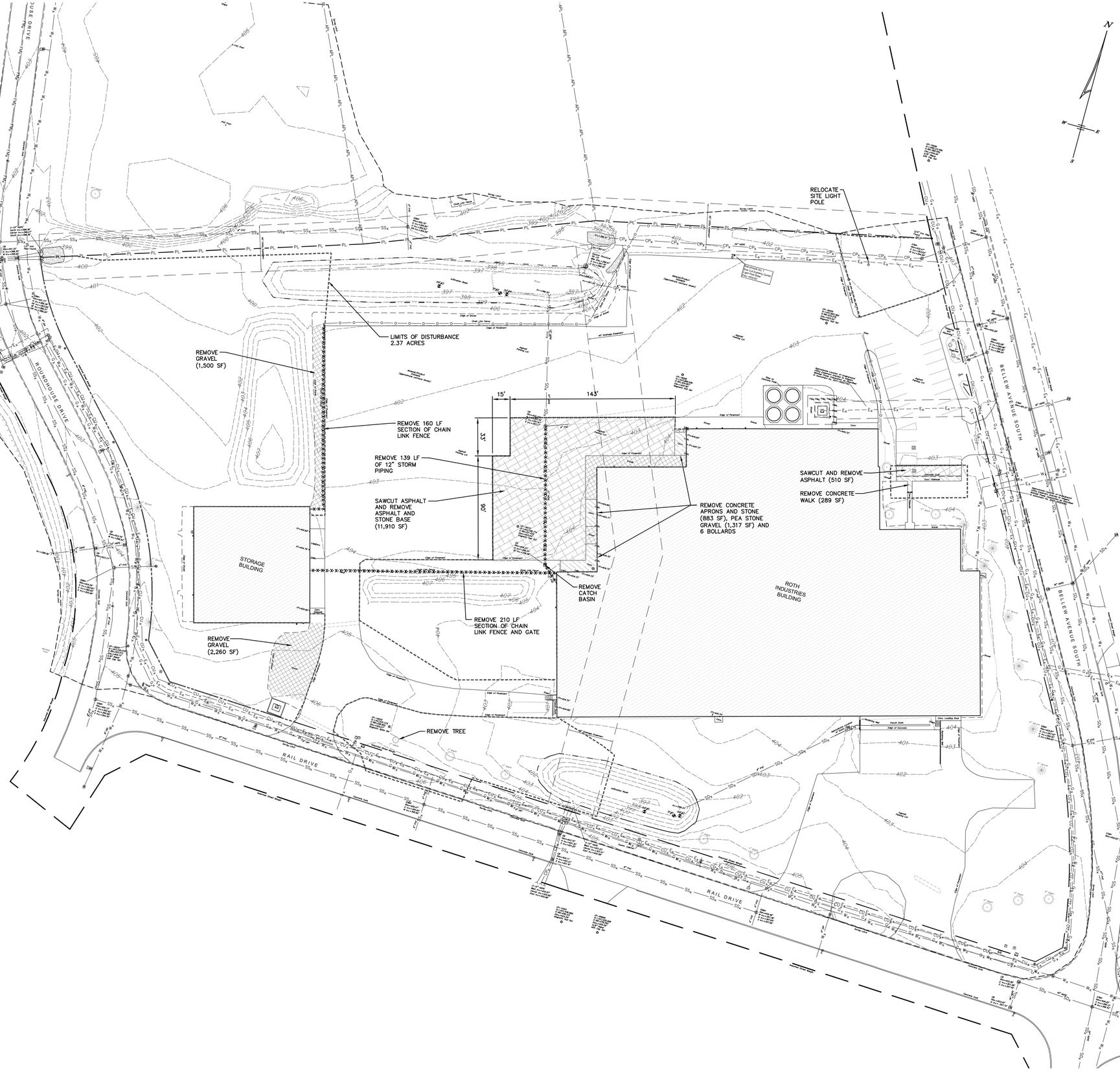
AUBERTINE and CURRIER, PLLC
522 BRADLEY STREET
WATERTOWN, NY 13601
TELE: (315) 782-2005
FAX: (315) 782-1472
www.aubertinecurrier.com

INDEX OF DRAWINGS

CD-100	EXISTING CONDITIONS AND DEMOLITION PLAN
CS-100	SITE PLAN
CG-100	GRADING, DRAINAGE, AND ESC PLAN
CT-100	TRAFFIC CIRCULATION PLAN
CS-500	SITE DETAILS
CS-501	SITE DETAILS
CG-500	ESC AND DRAINAGE DETAILS
CG-501	STORM SEWER DETAILS

FOR APPROVALS ONLY
NOT FOR CONSTRUCTION

AUBERTINE and CURRIER
ARCHITECTS, ENGINEERS & LAND SURVEYORS, PLLC



LEGEND

	EXISTING	PROPOSED
5' CONTOUR	155	155
1' CONTOUR	154	154
PROPERTY LINE	PL PL PL	
RIGHT OF WAY		
SETBACK		
BUILDING		
ASPHALT PAVEMENT		
CURB		
SIDEWALK		
EDGE OF GRAVEL		
FENCE	o o o	
WATERLINE	W_X W_X W_X	
SANITARY SEWER	SS_X SS_X SS_X	
STORM SEWER	SD_X SD_X SD_X	
OVERHEAD UTILITIES	OU_X OU_X OU_X	
UNDERGROUND ELECTRIC	E_X E_X E_X	E E E
GAS	G_X G_X G_X	G G G
ROOF DRAIN PIPE	RD_X RD_X	RD RD RD
FIRE HYDRANT		
WATER VALVE	W	
SANITARY MANHOLE	S	
STORM MANHOLE	D	
CATCH BASIN	CB CB	
UTILITY POLE AND GUY		
LIGHT POLE		

GENERAL NOTES:

1. UNDERGROUND FACILITIES, STRUCTURES AND UTILITIES HAVE BEEN PLOTTED FROM AVAILABLE SURVEYS AND RECORDS, AND THEREFORE THEIR LOCATIONS MUST BE CONSIDERED APPROXIMATE ONLY. THERE MAY BE OTHERS. THE EXISTENCE OF WHICH IS PRESENTLY NOT KNOWN. PRIOR TO CONSTRUCTION CONTACT UNDERGROUND UTILITIES CALL CENTER OF NEW YORK FOR EXACT LOCATION OF ALL UNDERGROUND UTILITIES, (1-800-962-7962). CONTRACTOR IS RESPONSIBLE FOR LOCATING AND WORKING WITH THE APPROPRIATE UTILITY COMPANIES PRIOR TO CONSTRUCTION.
2. THE ONSITE TOPOGRAPHIC, UTILITY, AND PLANIMETRIC SURVEY FOR THE PROJECT AREA WAS CONDUCTED BY AUBERTINE AND CURRIER, PLLC ON 03/11/2016, 03/14/2016, 03/16/2016, 04/13/2016, AND 08/31/2017. ONSITE FIELD VERIFICATION SURVEY FOR THE PROJECT AREA WAS CONDUCTED BY AUBERTINE AND CURRIER, PLLC ON 01/03/2020, AND 01/13/2020. UTILITY LOCATIONS WERE PLOTTED FROM VISIBLE EVIDENCE, OWNERS RECORD DRAWINGS, AND RECORD DRAWINGS PROVIDED BY THE CITY OF WATERTOWN ENGINEERING DEPARTMENT. VERTICAL DATUM IS BASED ON NAVD88 DATUM AND THE HORIZONTAL DATUM IS BASED ON NAD83(96).
3. ALL OUT-OF-SCOPE AREAS DISTURBED BY THE CONTRACTOR'S OPERATIONS WILL BE RESTORED TO CONDITIONS EQUAL TO OR BETTER THAN THAT PRIOR TO CONSTRUCTION. OUTSIDE OF PROPERTY BOUNDARIES AND EASEMENT AREAS THE CONTRACTOR IS REMINDED THAT HE MUST OBTAIN WRITTEN AUTHORIZATION TO USE PRIVATE PROPERTY AND ASSUMES ALL LIABILITY HIMSELF.
4. THE CONTRACTOR IS RESPONSIBLE FOR VERIFYING THE CHARACTERISTICS AND EXTENT OF SUBSURFACE SOILS, ROCK, WATER TABLE LEVELS, ETC., PRIOR TO BIDDING.
5. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND BONDS NECESSARY TO OBTAIN SAID PERMITS WHERE APPLICABLE.
6. SITE CONTRACTOR TO PROVIDE EROSION AND DUST CONTROL AS REQUIRED.
7. A LICENSED LAND SURVEYOR SHALL BE RETAINED FOR ALL UTILITY AND FIELD STAKEOUT AT THE CONTRACTORS EXPENSE.
8. PAVED AREAS WILL BE SAWCUT PRIOR TO EXCAVATION AND PAVING OPERATIONS. SAW CUT AREAS WILL BE TACK COATED PRIOR TO PAVING. TACK COAT SHALL MEET THE REQUIREMENTS OF ASPHALT OF ASPHALT EMULSION FOR TACK COAT, NYSDOT TABLE 702-9.
9. CONTRACTOR SHALL MAINTAIN ALL EROSION CONTROL MEASURES THROUGHOUT CONSTRUCTION UNTIL ESTABLISHMENT OF VEGETATIVE COVER. RUN-OFF CONTAINING SEDIMENTS FROM DISTURBED AREAS OF THE SITE SHALL NOT BE ALLOWED DIRECTLY INTO NATURAL STREAM CHANNELS.
10. ALL TREES AND WETLANDS TO REMAIN SHALL BE PROTECTED BY THE CONTRACTOR. CONSTRUCTION ACTIVITIES ADJACENT TO TREES SHALL BE CONDUCTED TO REDUCE THE IMPACT TO TREES TO THE MAXIMUM EXTENT PRACTICAL. ANY DAMAGE TO EXISTING TREES SHALL BE REPAIRED OR THE TREE REPLACED, AS DIRECTED BY THE OWNER AT THE CONTRACTORS EXPENSE.
11. CONTRACTOR SHALL PERFORM ALL ROADWAY CONNECTION WORK IN ACCORDANCE WITH NYSDOT SPECIFICATIONS. ALL ROADWAY WORK SHALL BE IN ACCORDANCE WITH NYSDOT MAINTENANCE AND PROTECTION OF TRAFFIC REGULATIONS, INCLUDING FLAGMEN, BARRICADES, WARNING SIGNS/LIGHTS, ETC., WHERE WARRANTED.
12. CONTRACTOR SHALL BE RESPONSIBLE FOR REMOVAL AND PROPER DISPOSAL, AT A NYSDEC ACCEPTABLE LOCATION, OF ALL MATERIALS NOT REUSED AS TRENCH BACKFILL.
13. EXCAVATIONS SHALL BE TO DEPTHS SHOWN ON DRAWINGS. ALL UNSTABLE OR UNSUITABLE MATERIAL SHALL BE EXCAVATED AND REMOVED TO SUCH DEPTH AS REQUIRED TO PROVIDE SUFFICIENT BEARING CAPACITY. OVEREXCAVATED AREAS SHALL BE BACKFILLED WITH SUITABLE MATERIAL.
14. COMPACTION OF PIPE BEDDING AND BACKFILL MATERIAL SHALL BE BY MEANS OF HAND-GUIDED POWER DRIVEN OR DRUM-TYPE OR PLATE TAMPERS. BACKFILLING SHOULD PROCEED IN ACCORDANCE WITH LIFT THICKNESSES AND COMPACTION REQUIREMENTS AS SHOWN ON THE DRAWINGS. UNLESS OTHERWISE NOTED ON THE DRAWINGS, COMPACTION REQUIREMENTS REFER TO PERCENT OF MAXIMUM DRY DENSITY AS DETERMINED IN ACCORDANCE WITH ASTM STANDARD D1557 METHOD "C". CARE SHOULD BE TAKEN TO SHAPE PIPE BEDDING TO FIT THE LOWER PART OF THE PIPE. BACKFILLING AND COMPACTION SHOULD PROGRESS EVENLY ALONG THE PIPE SIDEWALLS AND TO THE TOP OF PIPE BEDDING.
15. THE CONTRACTOR SHALL NOTIFY THE ENGINEER OF ANY DISCREPANCIES OF DIMENSIONS, ELEVATIONS AND LOCATIONS DURING PRECONSTRUCTION FIELD VERIFICATION. SUCH INFORMATION SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER FOR VERIFICATION OR MODIFICATION OF THE PLANS.
16. THE CONTRACTOR SHALL PROVIDE AS-BUILT RECORD DRAWINGS INCLUDING, AS A MINIMUM, THE FOLLOWING INFORMATION AS WELL AS ALL REQUIREMENTS OF THE SPECIFICATION:
    - RECORD OF ALL UTILITIES ENCOUNTERED IN TRENCH EXCAVATION. INFORMATION SHALL INCLUDE DIAMETER OF UTILITY, DEPTH OF BURIAL AND LOCATION WITH REFERENCE TO NEAREST STRUCTURE SHOWN ON DRAWINGS. THIS INFORMATION SHALL BE KEPT CURRENT ON A WEEKLY BASIS. FAILURE TO DO SO MAY RESULT IN WITHHOLDING OF PAYMENTS.
    - DISTANCE TIES TO ALL MANHOLES, CLEANOUTS, BENDS AND CORPORATION STOPS.
    - UTILITY REPAIRS, SIDEWALK, AND DRIVEWAY REPLACEMENTS CENTERLINE.
    - STATIONS OF BENDS, CLEANOUTS, VALVES AND CORPORATION STOPS.
    - DENOTE BENCH MARK REFERENCE USED.
    - PERIODIC OFFSETS.
    - RECORD DETAILS NOT SHOWN ON THE ORIGINAL CONTRACT DOCUMENTS. ANY FIELD CHANGES OF DIMENSIONS AND DETAILS AND ANY CHANGES MADE BY CHANGE ORDER OR FIELD ORDER.
    - CERTIFICATE OF SUBSTANTIAL COMPLETION SHALL NOT BE ISSUED UNTIL AS-BUILT INFORMATION IS ACCEPTABLE.
    - PROVIDE TWO (2) SETS OF FINAL COMPLETE RECORD DRAWINGS. CONTRACTOR SHALL FURNISH AS-BUILT DATA ON PLAN SHEETS.
17. ALL WORK TO BE PERFORMED WITHIN THE CITY OF WATERTOWN MARGIN WILL REQUIRE SIGN-OFF FROM AN ENGINEER LICENSED IN THE STATE OF NEW YORK THAT THE WORK WAS BUILT ACCORDING TO THE APPROVED SITE PLAN AND APPLICABLE CITY OF WATERTOWN STANDARDS. COMPACTION TESTING WILL BE REQUIRED FOR ALL WORK TO BE PERFORMED WITHIN THE CITY OF WATERTOWN MARGIN AND MUST BE SUBMITTED TO THE CITY OF WATERTOWN CODES DEPARTMENT.
18. ALL WATER MAIN AND SERVICE WORK MUST BE COORDINATED WITH THE CITY OF WATERTOWN WATER DEPARTMENT. THE WATER DEPARTMENT REQUIREMENTS SUPERCEDE ALL OTHER PLANS AND SPECIFICATIONS PROVIDED.
19. UPON COMPLETION OF STORM SEWER FACILITIES AND ESTABLISHMENT OF VEGETATION, THE NEW AND EXISTING STORM SYSTEMS RECEIVING RUNOFF FROM THIS SITE SHALL BE CLEANED OF DEBRIS. ONLY AT THIS TIME SHALL THE EROSION AND SEDIMENTATION CONTROL MEASURES BE REMOVED.

GRAPHIC SCALE

40 0 20 40 80 160

(IN FEET)
1 inch = 40 ft.

PROGRESS PRINT
NOT FOR CONSTRUCTION

AUBERTINE and CURRIER
ARCHITECTS, ENGINEERS & LAND SURVEYORS, PLLC

522 Bradley Street
Watertown, New York 13601

aubertinecurrier.com

Phone: (315)782-2005
Fax: (315)782-1472

The above Architect, Engineer or Land Surveyor states that to the best of his or her knowledge, information and belief, the plans and specifications are in accordance with applicable requirements of New York State. It is a violation of New York State Law for any person, unless acting under the direct supervision of a Registered Architect, Licensed Professional Engineer or Licensed Land Surveyor to alter this document in any way. If altered, such licensee shall affix his or her seal and the notification "altered by" followed by his or signature, date and a specific description of the alteration.
© COPYRIGHT 2026
AUBERTINE and CURRIER ARCHITECTS, ENGINEERS & LAND SURVEYORS, PLLC

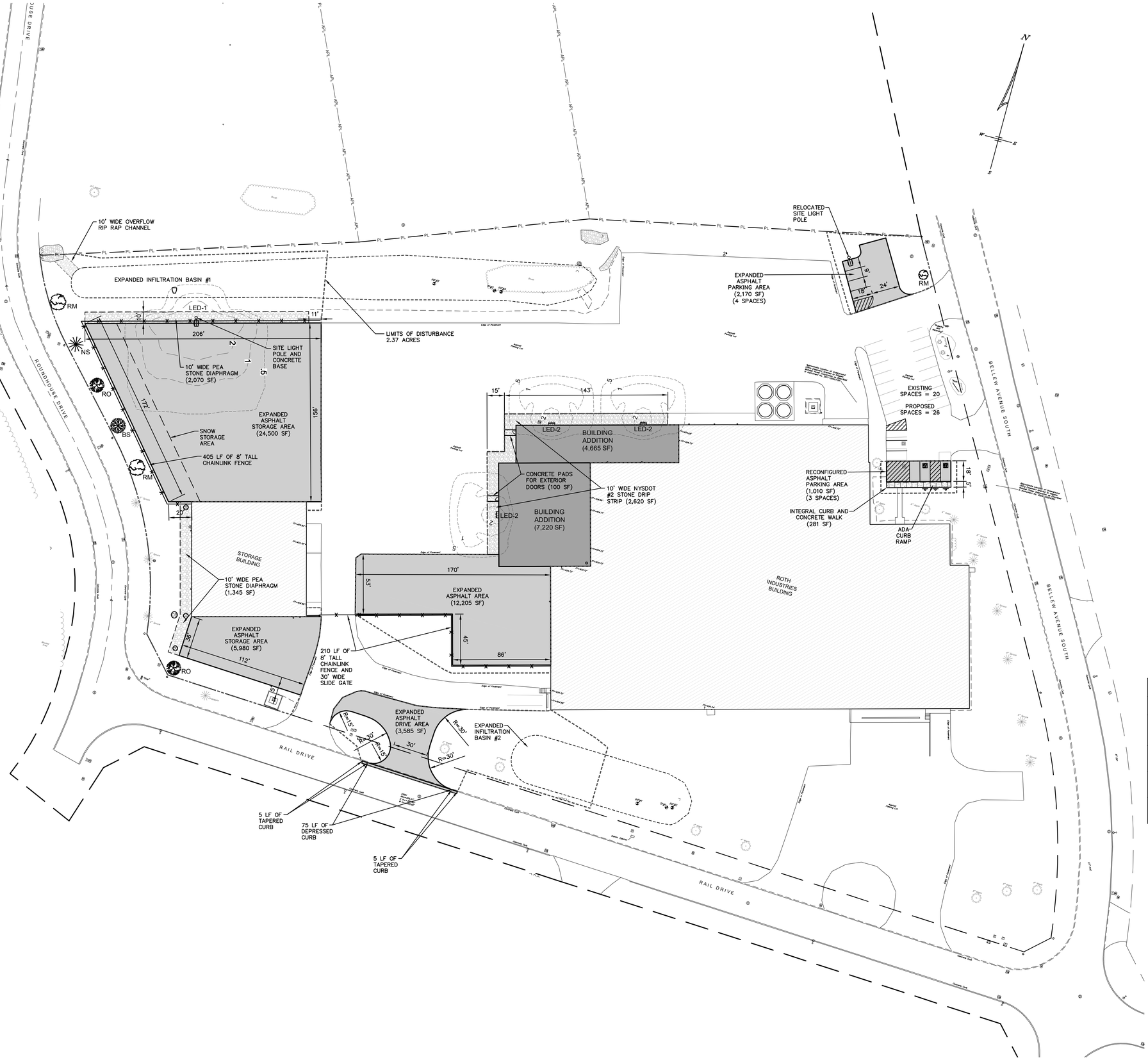
ROTH INDUSTRIES AND ROTH GLOBAL PLASTICS
2026 EXPANSION PROJECT

268 BELLEW AVENUE SOUTH
CITY OF WATERTOWN
JEFFERSON COUNTY, STATE OF NEW YORK

PROJECT NO:	2016-033.007
SCALE:	1"=40'
DRAWN BY:	CWT
CHECKED BY:	MRM
ISSUE DATES:	08/11/2026 08/25/2026

EXISTING CONDITIONS AND DEMOLITION PLAN

CD-100



LEGEND	EXISTING	PROPOSED
5' CONTOUR	155	155
1' CONTOUR	154	154
PROPERTY LINE	PL	
RIGHT OF WAY		
SETBACK		
BUILDING		
ASPHALT PAVEMENT		
CURB		
SIDEWALK		
EDGE OF GRAVEL		
FENCE		
WATERLINE	W_X	
SANITARY SEWER	SS_X	
STORM SEWER	SD_X	
OVERHEAD UTILITIES	OU_X	
UNDERGROUND ELECTRIC	E_X	E
GAS	G_X	G
ROOF DRAIN PIPE	RD_X	RD
FIRE HYDRANT		
WATER VALVE	W	
SANITARY MANHOLE	S	
STORM MANHOLE	D	
CATCH BASIN	CB	
UTILITY POLE AND GUY		
LIGHT POLE		

PLANNING DATA

ZONING: IND - INDUSTRIAL
USE: INDUSTRIAL FACILITY

ITEM	REQUIRED	AS PROVIDED
MIN. LOT AREA	10,000 SQ. FT. 0.23 ACRES)	386,092 SQ. FT. (8.86 ACRES)
MIN. LOT FRONTAGE	50'	648'
MIN. FRONT SETBACK	25'	EXISTING BUILDING = 31' PROPOSED BUILDING = 35'
MIN. REAR YARD SETBACK	10'	173'
MIN. SIDE YARD SETBACK	10'	N/A
MAX. BUILDING HEIGHT	4 STORIES	EXISTING - 46'
MAX. LOT COVERAGE	60%	68%
PARKING REQUIREMENTS - RETAIL AND SERVICES - 1 SPACE PER 250 SF - 4,800 SF / 250 SF = 20 SPACES	20 SPACES	36 SPACES
HANDICAPPED SPACES (PER ADA)	1	2
LIMIT OF DISTURBANCE	2.37 ACRES	

TRAFFIC INFORMATION
(ITE TRAFFIC GENERATION, 7TH EDITION)

WEEKDAY, AM	ENTERING EXITING	30 8
WEEKDAY, PM	ENTERING EXITING	19 20
SATURDAY	ENTERING EXITING	8 8

SITE LIGHTING SCHEDULE

SYMBOL	FIXTURE	MOUNTING HEIGHT	QUANTITY
LED-1	GLEON-SA2C-740-U-T4FT-BZ BY COOPER LIGHTING	28' MOUNTING HEIGHT (25' POLE W 3' CONC BASE)	1
LED-2	IST-E01-LED-E1-BL4-BZ BY COOPER LIGHTING	16' MOUNTING HEIGHT (MOUNTED ON BUILDING)	3

PLANTING SCHEDULE

SYM	COMMON NAME	ABBREV.	BOTANICAL NAME	SIZE	QUANTITY
	RED MAPLE	RM	ACER PALMATUM	2" CALIPER	3
	NORTHERN RED OAK	RO	QUERCUS RUBRA	2" CALIPER	2
	COLORADO BLUE SPRUCE	BS	PICEA PUNGENS GLAUCA	2'-3' B.B.	1
	NORWAY SPRUCE	NS	PICEA GLAUCA	2'-3' B.B.	1

LANDSCAPING NOTE:

1. PLANT SPECIES WERE SELECTED BASED ON ABILITY TO GROW IN EXISTING SOIL CONDITIONS. PLANT SPECIFIED WERE ALSO CHOSEN BASED ON SIZE, SHAPE, COLOR AND GROWTH HABIT. ANY SUBSTITUTIONS SHALL BE APPROVED BY THE ARCHITECT.
2. ALL PLANTINGS SHALL ARRIVE ON-SITE BEARING THE ORIGINAL IDENTIFICATION TAGS SHOWING THEIR BOTANICAL NAME, COMMON NAME AND SIZE.
3. ALL TREES SHALL HAVE A 4' DIA. SHREDDED HARDWOOD MULCH RING AROUND THE BASE OF THE TREE.
4. ALL LANDSCAPED AREAS SHALL HAVE A WEED BARRIER FABRIC AND A MIN. OF 3" DEEP SHREDDED HARDWOOD MULCH.
5. ALL PLANTINGS SHALL BE THOROUGHLY WATERED AT THE TIME OF PLANTING.

GRAPHIC SCALE

40 0 20 40 80 160

(IN FEET)
1 inch = 40 ft.

PROGRESS PRINT
NOT FOR CONSTRUCTION

AUBERTINE and CURRIER
ARCHITECTS, ENGINEERS & LAND SURVEYORS, PLLC

522 Bradley Street
Watertown, New York 13601

aubertinecurrier.com

Phone: (315)782-2005
Fax: (315)782-1472

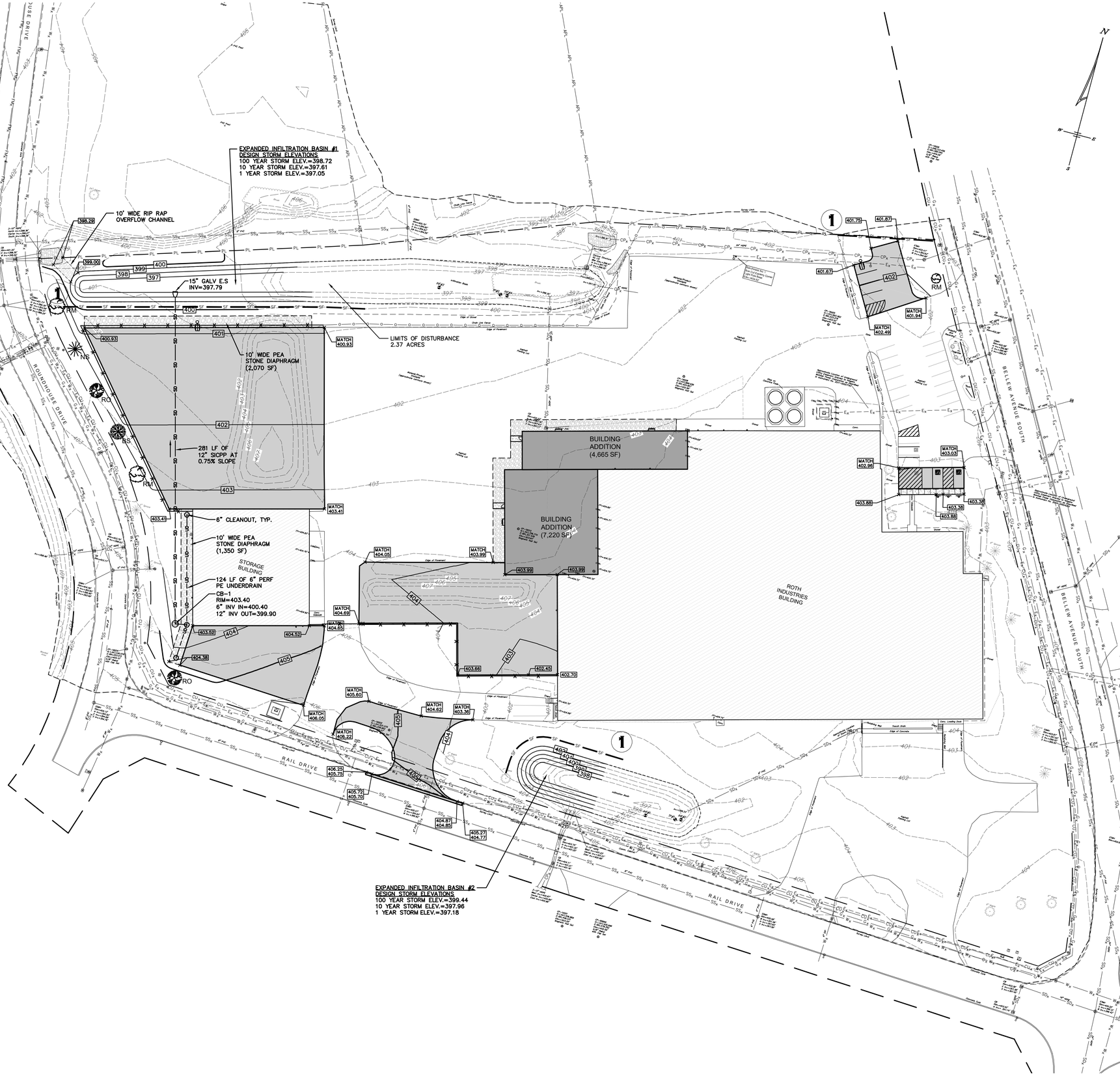
The above Architect, Engineer or Land Surveyor states that to the best of his or her knowledge, information and belief, the plans and specifications are in accordance with applicable requirements of New York State. It is a violation of New York State Law for any person, unless acting under the direct supervision of a Registered Architect, Licensed Professional Engineer or Licensed Land Surveyor to alter this document in any way. If altered, such licensee shall affix his or her seal and the notification "altered by" followed by his or signature, date and a specific description of the alteration.
© COPYRIGHT 2026
AUBERTINE and CURRIER ARCHITECTS, ENGINEERS & LAND SURVEYORS, PLLC

ROTH INDUSTRIES AND ROTH GLOBAL PLASTICS
2026 EXPANSION PROJECT
268 BELLEW AVENUE SOUTH
CITY OF WATERTOWN
JEFFERSON COUNTY, STATE OF NEW YORK

PROJECT NO: 2016-033.007
SCALE: 1"=40'
DRAWN BY: CWT
CHECKED BY: MRM
ISSUE DATES:
08/11/2026
08/25/2026

SITE PLAN

CS-100



LEGEND	EXISTING	PROPOSED
5' CONTOUR	155	155
1' CONTOUR	154	154
PROPERTY LINE	PL	
RIGHT OF WAY		
SETBACK		
BUILDING		
ASPHALT PAVEMENT		
CURB		
SIDEWALK		
EDGE OF GRAVEL		
FENCE		
WATERLINE	W_X	
SANITARY SEWER	SS_X	
STORM SEWER	SD_X	
OVERHEAD UTILITIES	OU_X	
UNDERGROUND ELECTRIC	E_X	E
GAS	G_X	G
ROOF DRAIN PIPE	RD_X	RD
FIRE HYDRANT		
WATER VALVE	W	
SANITARY MANHOLE	S	
STORM MANHOLE	D	
CATCH BASIN	CB	
UTILITY POLE AND GUY		
LIGHT POLE		

TEMPORARY MEASURES:

1. INSTALL SILT FENCE IN LOCATIONS INDICATED AND WHERE THERE IS THE POTENTIAL FOR OFFSITE RUNOFF TO OCCUR PRIOR TO ANY CONSTRUCTION WITHIN THOSE AREAS. FENCE MUST BE MAINTAINED AND MUST REMAIN IN PLACE UNTIL PROJECT HAS BEEN FINAL GRADED AND VEGETATION HAS BEEN ESTABLISHED.
2. CONSTRUCTION ENTRANCES SHALL BE MAINTAINED IN A CONDITION WHICH WILL PREVENT TRACKING OF SEDIMENT ONTO PUBLIC RIGHT OF WAY OR STREETS. ALL SEDIMENT SPILLED, DROPPED OR WASHED ONTO PUBLIC RIGHTS OF WAY MUST BE REMOVED IMMEDIATELY.
3. INLET PROTECTION SHALL BE INSTALLED AROUND CULVERTS AND CATCH BASINS FOLLOWING THEIR INSTALLATION.

SILT FENCE

STABILIZED CONSTRUCTION ENTRANCE

INLET PROTECTION

INFILTRATION TEST DATA

INF TEST #	1	2	3	4
GROUND ELEV	400.7'	400.3'	399.6'	397.9'
TEST ELEV	395.2'	394.8'	394.6'	393.9'
INF RATE 1	90 IN/HR	72 IN/HR	69 IN/HR	51 IN/HR
INF RATE 2	85 IN/HR	65 IN/HR	65 IN/HR	53 IN/HR
INF RATE 3	77 IN/HR	65 IN/HR	60 IN/HR	50 IN/HR
INF RATE 4	80 IN/HR	65 IN/HR	63 IN/HR	50 IN/HR

INFILTRATION TESTING CONDUCTED BY AUBERTINE AND CURRIER ON 06/08/2016

GRAPHIC SCALE

40 0 20 40 80 160

(IN FEET)
1 inch = 40 ft.

PROGRESS PRINT
NOT FOR CONSTRUCTION

AUBERTINE and CURRIER
ARCHITECTS, ENGINEERS & LAND SURVEYORS, PLLC

522 Bradley Street
Watertown, New York 13601

aubertinecurrier.com

Phone: (315)782-2005
Fax: (315)782-1472

The above Architect, Engineer or Land Surveyor states that to the best of his or her knowledge, information and belief, the plans and specifications are in accordance with applicable requirements of New York State. It is a violation of New York State Law for any person, unless acting under the direct supervision of a Registered Architect, Licensed Professional Engineer or Licensed Land Surveyor to alter this document in any way. If altered, such licensee shall affix his or her seal and the notification "altered by" followed by his or signature, date and a specific description of the alteration.
© COPYRIGHT 2026
AUBERTINE and CURRIER ARCHITECTS, ENGINEERS & LAND SURVEYORS, PLLC

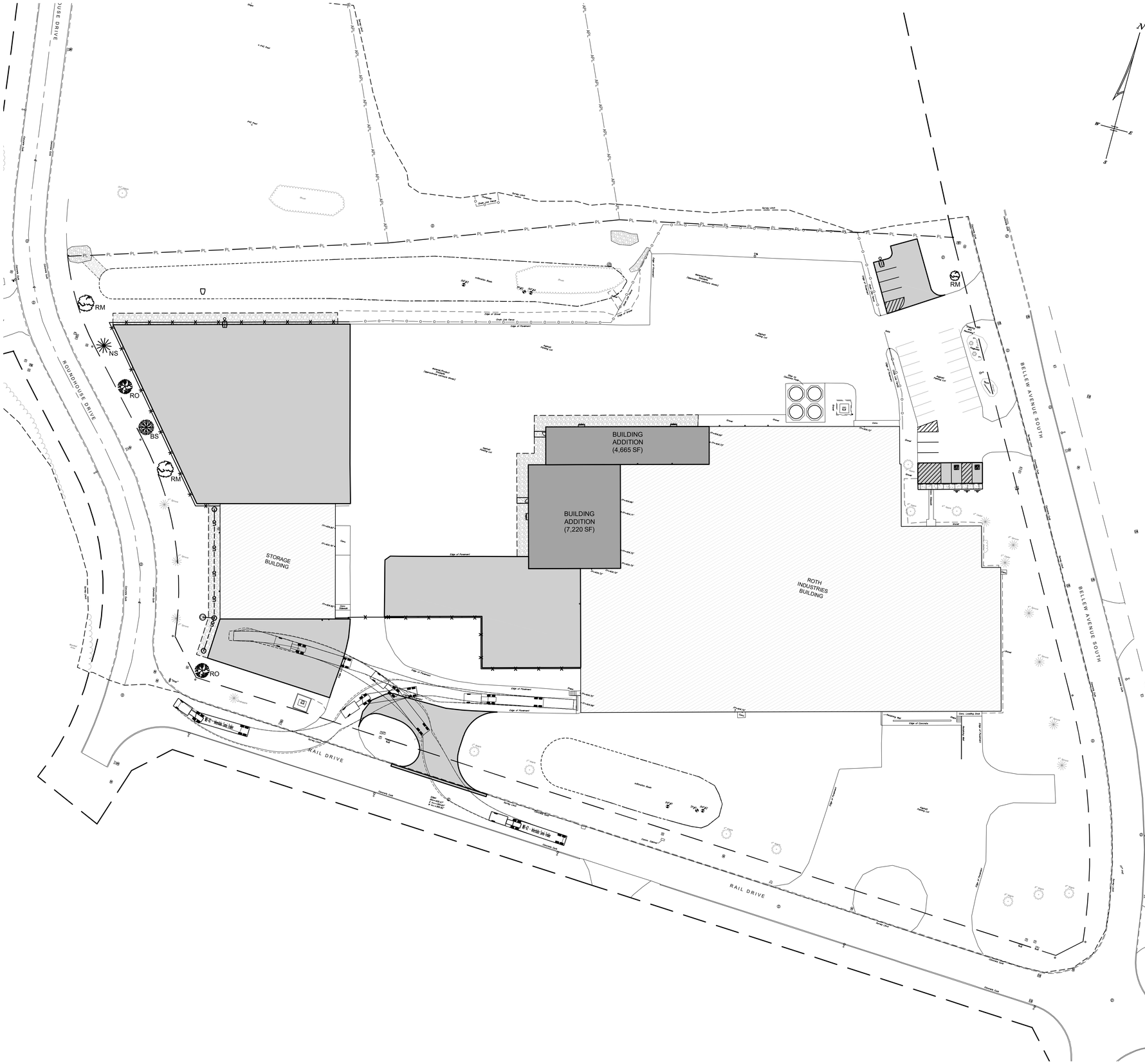
ROTH INDUSTRIES AND ROTH GLOBAL PLASTICS
2026 EXPANSION PROJECT

268 BELLEW AVENUE SOUTH
CITY OF WATERTOWN
JEFFERSON COUNTY, STATE OF NEW YORK

PROJECT NO:	2016-033.007
SCALE:	1"=40'
DRAWN BY:	CWT
CHECKED BY:	MRM
ISSUE DATES:	08/11/2026 08/25/2026

GRADING, DRAINAGE, AND ESC PLAN

CG-100

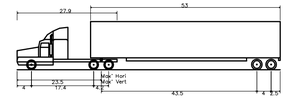


N

W E

S

LEGEND	EXISTING	PROPOSED
5' CONTOUR	155	155
1' CONTOUR	154	154
PROPERTY LINE	PL PL PL	
RIGHT OF WAY		
SETBACK		
BUILDING		
ASPHALT PAVEMENT		
CURB		
SIDEWALK		
EDGE OF GRAVEL		
FENCE	O O O	
WATERLINE	W_X W_X W_X	
SANITARY SEWER	SS_X SS_X SS_X	
STORM SEWER	SD_X SD_X SD_X	
OVERHEAD UTILITIES	OU_X OU_X OU_X	
UNDERGROUND ELECTRIC	E_X E_X E_X	E E E
GAS	G_X G_X G_X	G G G
ROOF DRAIN PIPE	RD_X RD_X	RD RD RD
FIRE HYDRANT		
WATER VALVE	W	
SANITARY MANHOLE	S	
STORM MANHOLE	D	
CATCH BASIN	CB CB	
UTILITY POLE AND GUY		
LIGHT POLE		



WB-67 - Interstate Semi-Trailer

Overall Length	73.501ft
Overall Width	8.500ft
Overall Body Height	13.500ft
Min Body Ground Clearance	1.334ft
Max Track Width	8.500ft
Lock-to-lock time	6.00s
Max Steering Angle (Virtual)	28.40°

GRAPHIC SCALE

40 0 20 40 80 160

(IN FEET)
1 inch = 40 ft.

PROGRESS PRINT
NOT FOR CONSTRUCTION

AUBERTINE and CURRIER
ARCHITECTS, ENGINEERS & LAND SURVEYORS, PLLC

522 Bradley Street
Watertown, New York 13601

aubertinecurrier.com

Phone: (315)782-2005
Fax: (315)782-1472

The above Architect, Engineer or Land Surveyor states that to the best of his or her knowledge, information and belief, the plans and specifications are in accordance with applicable requirements of New York State. It is a violation of New York State Law for any person, unless acting under the direct supervision of a Registered Architect, Licensed Professional Engineer or Licensed Land Surveyor to alter this document in any way. If altered, such licensee shall affix his or her seal and the notification "altered by" followed by his or signature, date and a specific description of the alteration.
© COPYRIGHT 2026
AUBERTINE and CURRIER ARCHITECTS, ENGINEERS & LAND SURVEYORS, PLLC

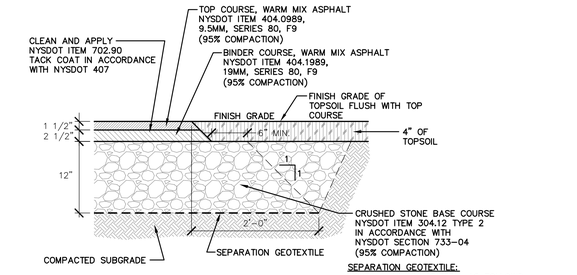
ROTH INDUSTRIES AND ROTH GLOBAL PLASTICS
2026 EXPANSION PROJECT

268 BELLEW AVENUE SOUTH
CITY OF WATERTOWN
JEFFERSON COUNTY, STATE OF NEW YORK

PROJECT NO:	2016-033.007
SCALE:	1"=40'
DRAWN BY:	CWT
CHECKED BY:	MRM
ISSUE DATES:	08/11/2026

TRAFFIC CIRCULATION PLANS

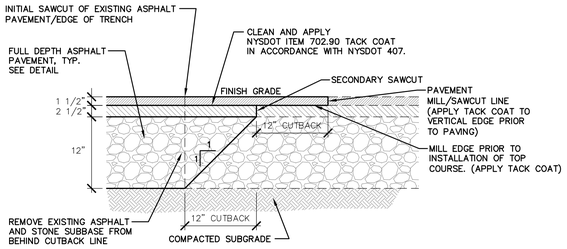
CT-100



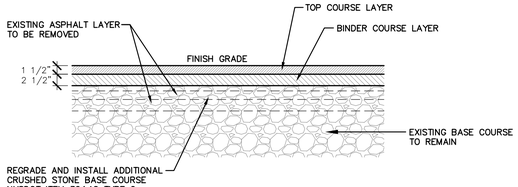
NOTES:
1. ALL HMA COMPACTION WILL BE TO 95% MADMTD (MIXTURE'S AVERAGE DAILY MAXIMUM THEORETICAL DENSITY) PER NYS DOT SPECIFICATIONS FOR HMA COMPACTION 402-3.07
2. BASE COURSE SHALL BE COMPACTED TO 95% MODIFIED PROCTOR MAXIMUM DENSITY.
3. FIELD VERIFICATION OF COMPACTION SHALL BE BY NUCLEAR DENSITY TESTING METHODS

SEPARATION GEOTEXTILE:
WOVEN, MINIMUM CRITERIA AS FOLLOWS:
1. NYSDOT 737.01, STRENGTH CLASS 2
2. MIN. 247 LB GRAB STRENGTH AT <50% ELONGATION, ASTM D-4632
3. MIN. 495 LB PUNCTURE, ASTM D-6241
4. MAX. NO.30 SIEVE, APPARENT OPENING (AOS), ASTM D-4751
5. MIN. 0.02 sec^{-1} PERMITIVITY, ASTM D-4491

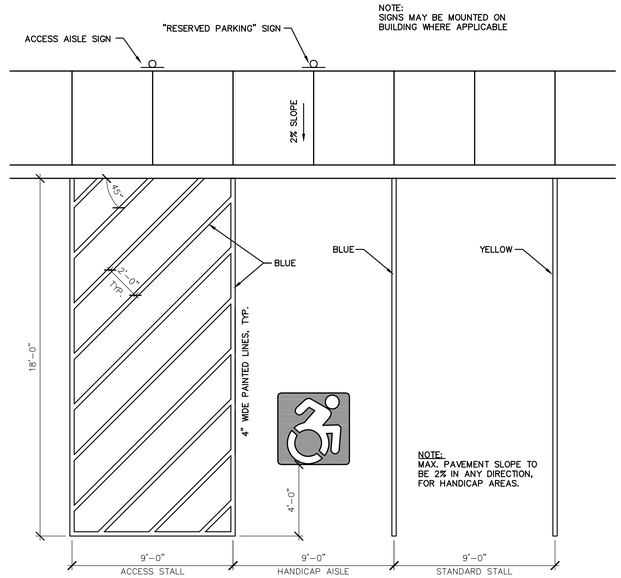
1 TYPICAL ASPHALT PAVEMENT DETAIL
NOT TO SCALE



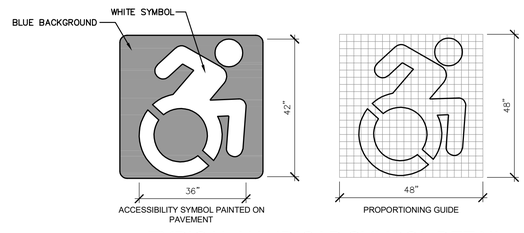
2 TYPICAL ASPHALT PAVEMENT JOINT DETAIL
NOT TO SCALE



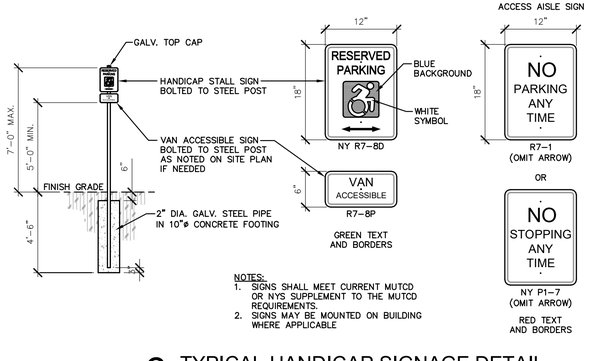
3 TYPICAL EXISTING ASPHALT PAVEMENT REMOVAL AND REGRADE AND ASPHALT PAVEMENT RECONSTRUCTION DETAIL
NOT TO SCALE



4 TYPICAL PARKING STALL MARKINGS DETAIL
NOT TO SCALE

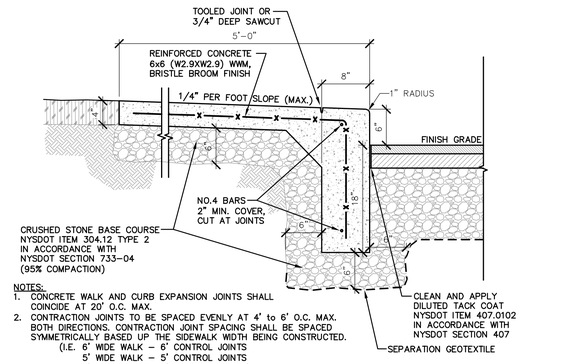


5 TYPICAL HANDICAP SYMBOL DETAIL
NOT TO SCALE



NOTES:
1. SIGNS SHALL MEET CURRENT MUTCD OR NYS SUPPLEMENT TO THE MUTCD REQUIREMENTS.
2. SIGNS MAY BE MOUNTED ON BUILDING WHERE APPLICABLE

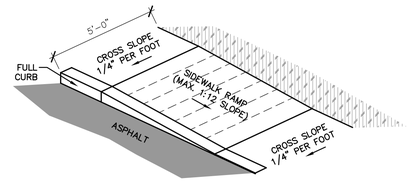
6 TYPICAL HANDICAP SIGNAGE DETAIL
NOT TO SCALE



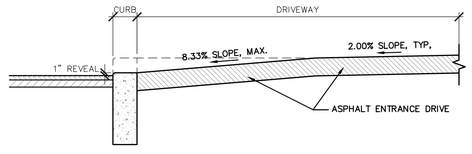
NOTES:
1. CONCRETE WALK AND CURB EXPANSION JOINTS SHALL COINCIDE AT 20' O.C. MAX.
2. CONTRACTION JOINTS TO BE SPACED EVENLY AT 4' to 6' O.C. MAX. BOTH DIRECTIONS. CONTRACTION JOINT SPACING SHALL BE SPACED SYMMETRICALLY BASED UP THE SIDEWALK WIDTH BEING CONSTRUCTED.
   (I.E. 6' WIDE WALK – 6' CONTROL JOINTS
   5' WIDE WALK – 5' CONTROL JOINTS
   8' WIDE WALK – 4' CONTROL JOINTS)
3. EXPANSION JOINTS TO BE 1/2" WIDE PREMOLDED CLOSED-CELL POLYPROPYLENE FOAM EXPANSION JOINT MATERIAL CONFORMING TO ASTM D8139 OR D7174.
4. EXPANSION JOINT SEALANT SHALL BE ELASTIC POLYURETHANE SEALANT CONFORMING TO ASTM C920.
5. CONTROL/CONTRACTION JOINTS SHALL BE TOOLED OR SAW CUT JOINT WITH A DEPTH OF 1/4 THE CONCRETE THICKNESS.
6. CONCRETE SHALL BE MIN. 4,500 PSI, MAX W/C RATIO 0.45, 3"-5" SLUMP, AIR CONTENT 4-7%

SEPARATION GEOTEXTILE:
WOVEN, MINIMUM CRITERIA AS FOLLOWS:
1. NYSDOT 737.01, STRENGTH CLASS 2
2. MIN. 247 LB GRAB STRENGTH AT <50% ELONGATION, ASTM D-4632
3. MIN. 495 LB PUNCTURE, ASTM D-6241
4. MAX. NO.30 SIEVE, APPARENT OPENING (AOS), ASTM D-4751
5. MIN. 0.02 sec^{-1} PERMITIVITY, ASTM D-4491

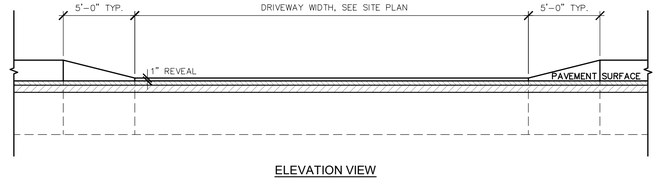
7 TYPICAL INTEGRAL CURB AND WALK DETAIL
NOT TO SCALE



8 SIDEWALK RAMP DETAIL
NOT TO SCALE

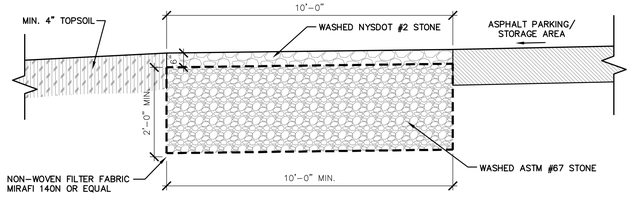


SECTION VIEW



ELEVATION VIEW

9 TYPICAL DRIVEWAY CURB CUT AND TAPER DETAIL
NOT TO SCALE



10 PEA STONE DIAPHRAGM FILTER STRIP DETAIL
NOT TO SCALE

AUBERTINE and CURRIER
ARCHITECTS, ENGINEERS & LAND SURVEYORS, PLLC

NYS WBE/DBE Certified
SBA Woman Owned
Small Business (WOSB)

aubertinecurrier.com

522 Bradley Street
Watertown, New York 13601
Phone: (315)782-2005

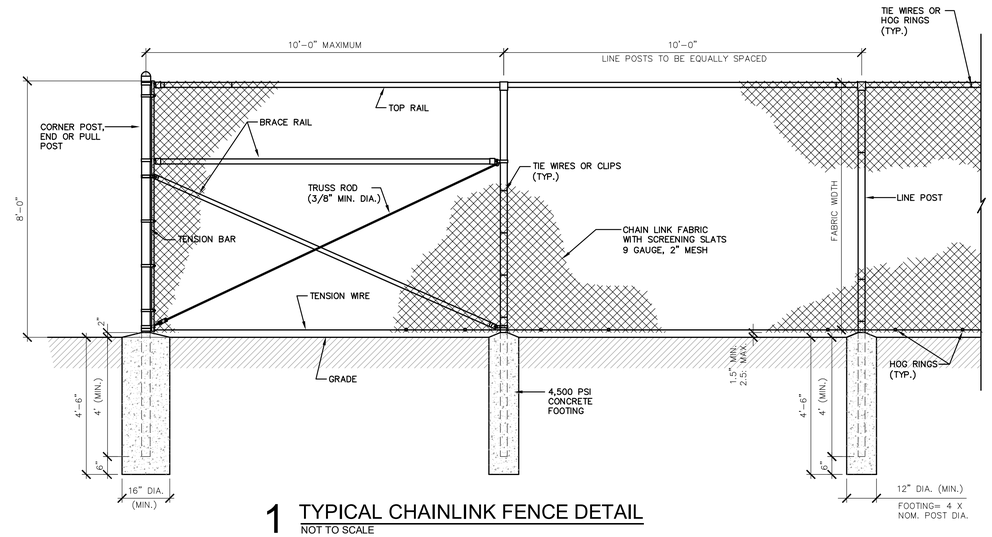
The above Architect, Engineer or Land Surveyor states that to the best of his or her knowledge, information and belief, the plans and specifications are in accordance with applicable requirements of New York State. It is a violation of New York State Law for any person, unless acting under the direct supervision of a Registered Architect, Licensed Professional Engineer or Licensed Land Surveyor to alter this document in any way. If altered, such licensee shall affix his or her seal and the notification "altered by" followed by his or signature, date and a specific description of the alteration.
© COPYRIGHT 2026
AUBERTINE and CURRIER ARCHITECTS, ENGINEERS & LAND SURVEYORS, PLLC

ROTH INDUSTRIES AND GLOBAL PLASTICS
2026 EXPANSION PROJECT
268 BELLEW AVENUE SOUTH
CITY OF WATERTOWN
JEFFERSON COUNTY, STATE OF NEW YORK

PROJECT NO: 2016-033.007
SCALE: 1"=1'
DRAWN BY: SRJ
CHECKED BY: MRM
ISSUE DATES:
08/11/2026

SITE DETAILS

CS-500



1 TYPICAL CHAINLINK FENCE DETAIL
NOT TO SCALE

MATERIAL TYPE	SIZE
GATE POSTS	4" O.D.
CORNER, END AND PULL POST (TUBULAR)	2.875" O.D.
LINE POST (TUBULAR)	2.375" O.D.
TOP, BOTTOM OR BRACE RAILS (TUBULAR)	1.66" O.D.
TENSION WIRE	7 GAUGE

TYPICAL CHAIN LINK FENCING NOTES

1. DETAILS SHOWN ILLUSTRATE THE GENERAL FENCE REQUIREMENTS AND ARE NOT INTENDED TO LIMIT VARIATIONS IN ASSEMBLY TYPES UTILIZED BY DIFFERENT MANUFACTURERS OF FENCE COMPONENTS. CONTRACTOR SHALL PROVIDE SHOP DRAWINGS DETAILING THE NECESSARY COMPONENTS AND ASSEMBLIES.

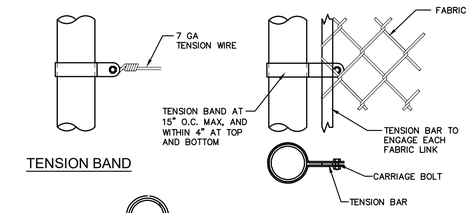
2. ALL GATE POSTS AND FRAMES, TOP AND BRACE RAILS, LINE, CORNER, TERMINAL OR PULL POST SHALL CONFORM TO ASTM-F1083, SS40 PIPE.

3. FABRIC: 9 GA. CORE WIRE SIZE 2" MESH, CONFORMING TO ASTM-A392.

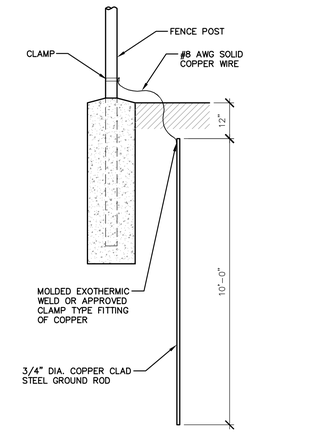
4. TIE WIRE: MINIMUM 11 GA. GALVANIZED STEEL FOR ATTACHMENT OF FABRIC TO LINE POSTS, RAIL AND BRACES. HOG RINGS OF 11 GA. FOR ATTACHMENT OF FABRIC TO TENSION WIRE SPACED MAX 24" INTERVALS.

5. TENSION WIRE: 7 GA. GALVINIZED STEEL.

6. GROUNDING: GROUND WIRE, CONNECTING TO EACH FENCE TERMINAL, CORNER, AND GATE POSTS. INSTALL GROUND RODS ON EACH SIDE OF GATES AND EVERY 160 FT. ALL UNDERGROUND CONNECTIONS BY EXOTHERMIC WELD PROCESS (CAD WELD).



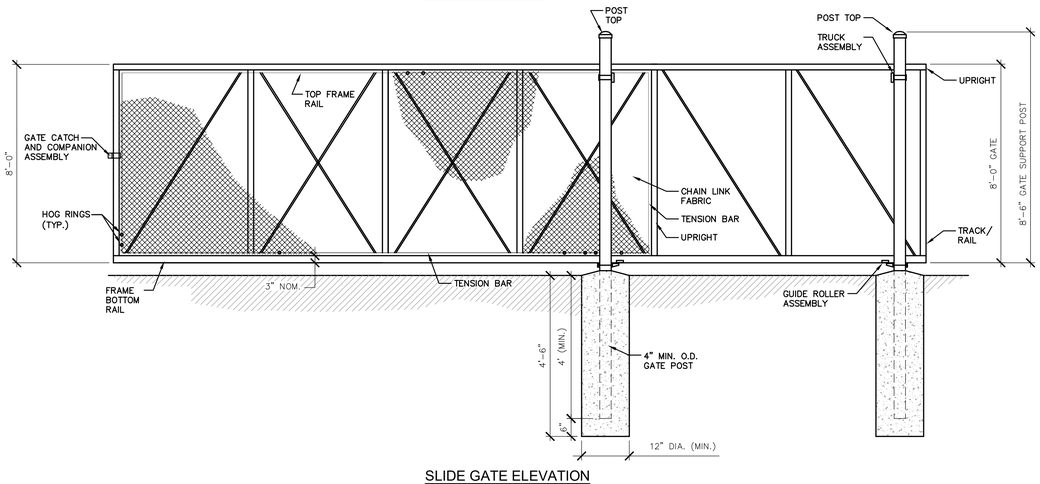
3 TYPICAL FABRIC TIE DETAILS
NOT TO SCALE



4 TYPICAL CHAIN LINK FENCE GROUNDING DETAIL
NOT TO SCALE

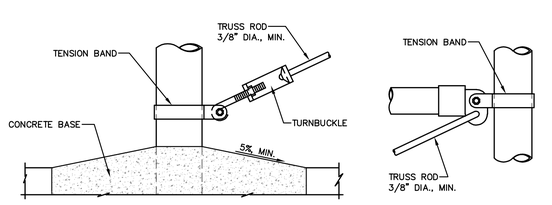


SLIDE GATE PLAN

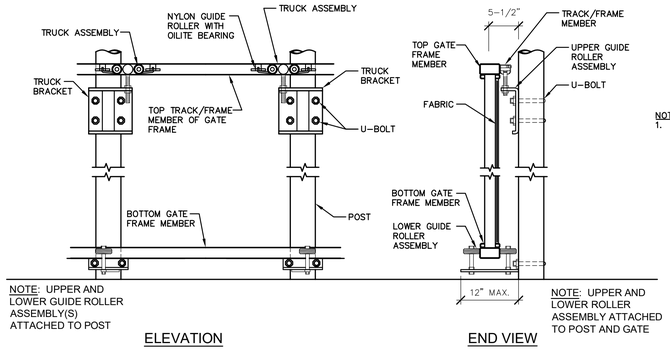


SLIDE GATE ELEVATION

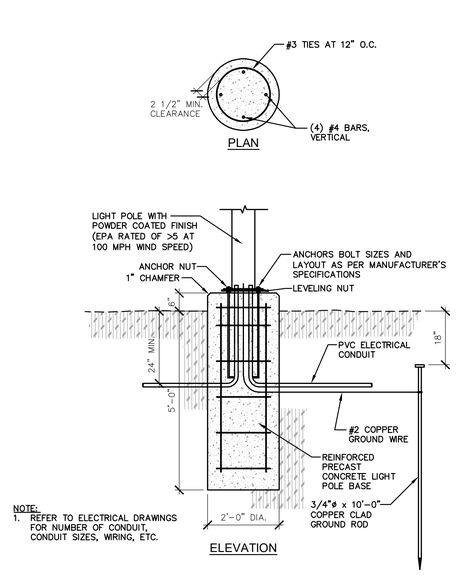
2 TYPICAL SLIDING GATE DETAIL
NOT TO SCALE



5 TYPICAL TRUSS ROD AND TURNBUCKLE DETAIL
NOT TO SCALE



6 TYPICAL SLIDING GATE TRACK/RAIL DETAIL
NOT TO SCALE



7 TYPICAL LIGHT POLE BASE DETAIL
NOT TO SCALE

AUBERTINE and CURRIER
ARCHITECTS, ENGINEERS & LAND SURVEYORS, PLLC

NYS WBE/DBE Certified
SBA Woman Owned
Small Business (WOSB)

aubertinecurrier.com

522 Bradley Street
Watertown, New York 13601
Phone: (315)782-2005

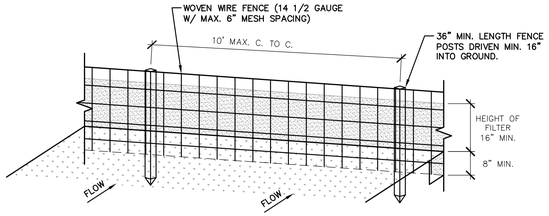
The above Architect, Engineer or Land Surveyor states that to the best of his or her knowledge, information and belief, the plans and specifications are in accordance with applicable requirements of New York State. It is a violation of New York State Law for any person, unless acting under the direct supervision of a Registered Architect, Licensed Professional Engineer or Licensed Land Surveyor to alter this document in any way. If altered, such licensee shall affix his or her seal and the notification "altered by" followed by his or signature, date and a specific description of the alteration.
© COPYRIGHT 2026
AUBERTINE and CURRIER ARCHITECTS, ENGINEERS & LAND SURVEYORS, PLLC

ROTH INDUSTRIES AND GLOBAL PLASTICS
2026 EXPANSION PROJECT
268 BELLEW AVENUE SOUTH
CITY OF WATERTOWN
JEFFERSON COUNTY, STATE OF NEW YORK

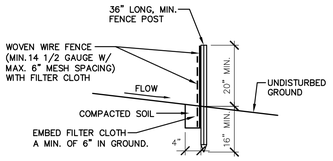
PROJECT NO: 2016-033.007
SCALE: 1"=1"
DRAWN BY: SRJ
CHECKED BY: MRM
ISSUE DATES: 08/11/2026

SITE DETAILS

CS-501



PERSPECTIVE VIEW

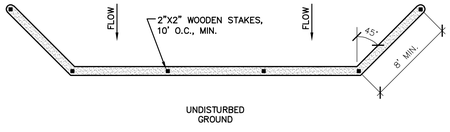


SECTION VIEW

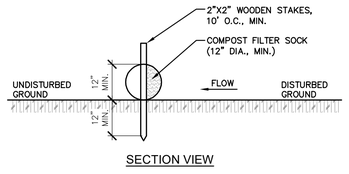
CONSTRUCTION SPECIFICATIONS

1. WOVEN WIRE FENCE TO BE FASTENED SECURELY TO FENCE POSTS WITH WIRE TIES OR STAPLES. POSTS SHALL BE STEEL EITHER "T" OR "U" TYPE OR HARDWOOD.
2. FILTER CLOTH TO BE TO BE FASTENED SECURELY TO WOVEN WIRE FENCE WITH TIES SPACED EVERY 24" AT TOP AND MID SECTION. FENCE SHALL BE WOVEN WIRE, 12 1/2 GAUGE, 6" MAXIMUM MESH OPENING.
3. WHEN TWO SECTIONS OF FILTER CLOTH ADJOIN EACH OTHER THEY SHALL BE OVER–LAPPED BY SIX INCHES AND FOLDED. FILTER CLOTH SHALL MEET THE MINIMUM FOLLOWING REQUIREMENTS:
   a. 110 LBS, GRAB TENSILE STRENGTH (ASTM D4632)
   b. 25 GAL/MIN/SF, FLOW THRU RATE (ASTM D4491)
   c. 40–80 SEIVE, APPARENT OPENING SIZE (ASTM D4751)
   d. 70% MINIMUM UV RESIDUAL (ASTM D4355)
4. PREFABRICATED SILT FENCE IS ACCEPTABLE AS LONG AS ALL MATERIAL SPECIFICATIONS ARE MET.
5. MAINTENANCE SHALL BE PERFORMED AS NEEDED AND MATERIAL REMOVED WHEN "BULGES" DEVELOP IN THE SILT FENCE.

1 TYPICAL SILT FENCE DETAIL
NOT TO SCALE



PLAN VIEW

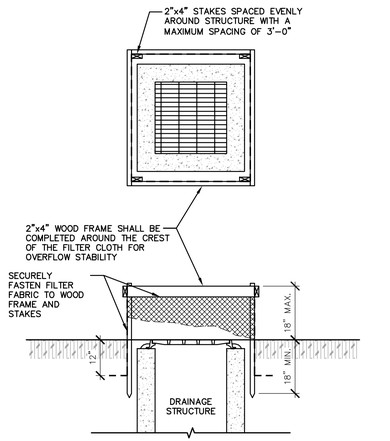


SECTION VIEW

CONSTRUCTION SPECIFICATIONS:

1. ON UNEVEN GROUND, FILTER FABRIC MAY BE PLACED ON THE SIDE OF THE DISTURBED GROUND AND OVER THE FILTER SOCK FOR EFFECTIVE GROUND CONTACT.
2. FILTER SOCKS SHALL BE PLACED PARALLEL TO THE CONTOURS.
3. STANDARD FILTER SOCKS SHALL BE PHOTODEGRADABLE. FILTER SOCKS SHALL MEET THE MINIMUM FOLLOWING REQUIREMENTS:
   a. ORGANIC MATTER, 255–100% (DRY WEIGHT), FIBEROUS AND ELONGATED.
   b. PH= 6.0–8.0,
   c. MOISTURE CONTENT= 30%–60%
   d. 100% PASSING A 1" SCREEN AND 10%–50% PASSING A 3/8" SCREEN
4. SOCKS SHALL BE INSPECTED AND SEDIMENT SHALL BE REMOVED WHEN IT REACHES HALF OF THE HEIGHT OF THE SOCK HEIGHT. DAMAGED OR DEGRADED FILTER SOCKS SHALL BE REPLACED.

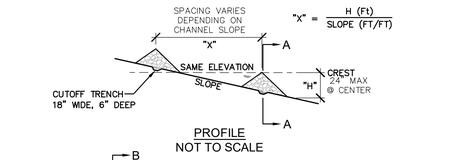
2 TYPICAL COMPOST FILTER SOCK DETAIL
NOT TO SCALE



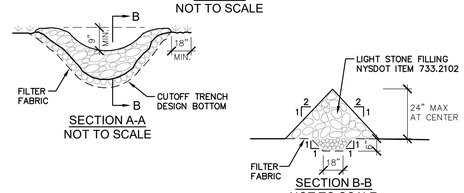
INSTALLATION NOTES:

1. FILTER CLOTH TO BE CUT FROM A ROLL TO ELIMINATED JOINTS. IF JOINTS ARE NEEDED THEY WILL BE OVERLAPPED TO THE NEXT STAKE.
2. STAKE SHALL BE 2"x4" AND A MINIMUM OF 36" LONG.
3. MAINTENANCE SHALL BE PERFORMED AS NEEDED AND MATERIAL REMOVED AT REGULAR INTERVALS.
4. FILTER FABRIC SHALL BE NON–WOVEN, MINIMUM CRITERIA OF NYSDOT 737.01C, STRENGTH CLASS 2, DRAINAGE CLASS C OR APPROVED EQUAL.

3 TYPICAL INLET PROTECTION DETAIL
NOT TO SCALE



PROFILE
NOT TO SCALE



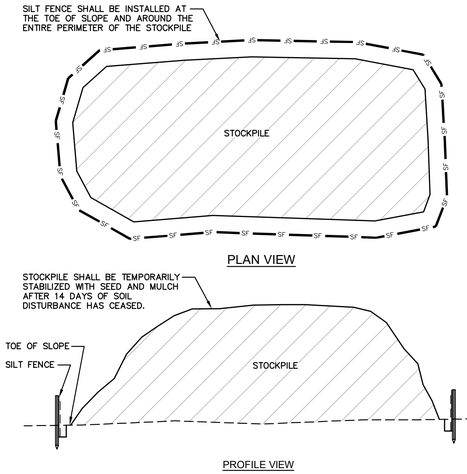
SECTION A-A
NOT TO SCALE

SECTION B-B
NOT TO SCALE

CONSTRUCTION SPECIFICATIONS:

1. STONE WILL BE PLACED ON A FILTER FABRIC FOUNDATION TO THE LINES, GRADES AND LOCATIONS SHOWN IN THE PLAN.
2. SET SPACING OF CHECK DAMS TO ASSUME THAT THE ELEVATIONS OF THE CREST OF THE DOWNSTREAM DAM IS AT THE SAME ELEVATION OF THE TOE OF THE UPSTREAM DAM.
3. EXTEND THE STONE A MINIMUM OF 1.5 FEET BEYOND THE DITCH BANKS TO PREVENT CUTTING AROUND THE DAM.
4. PROTECT THE CHANNEL DOWNSTREAM OF THE LOWEST CHECK DAM FROM SCOUR AND EROSION WITH STONE OR LINER AS APPROPRIATE.
5. ENSURE THAT CHANNEL APPURTENANCES SUCH AS CULVERT ENTRANCES BELOW CHECK DAMS ARE NOT SUBJECT TO DAMAGE OR BLOCKAGE FROM DISPLACED STONE. MAXIMUM DRAINAGE AREA 2 ACRES.

4 TYPICAL STONE CHECK DAM DETAIL
NOT TO SCALE



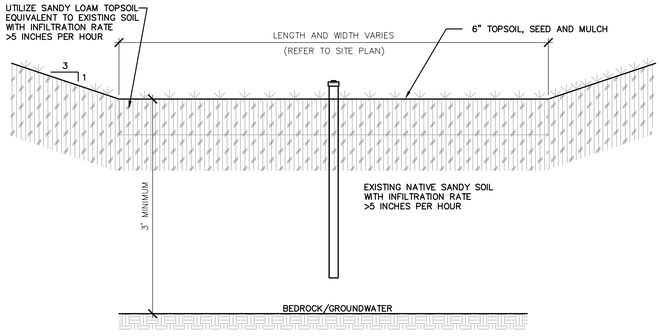
PLAN VIEW

PROFILE VIEW

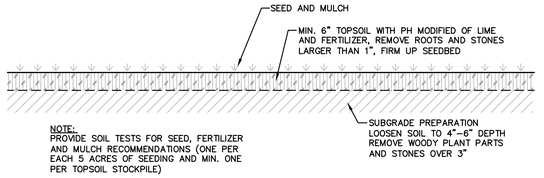
5 TYPICAL STOCKPILE DETAIL
NOT TO SCALE

EROSION AND SEDIMENT CONTROL NOTES:

1. PRIOR TO COMMENCING ANY CLEARING GRUBBING, EARTHWORK ACTIVITIES, ETC. AT THE SITE, THE CONTRACTOR SHALL FLAG THE WORK LIMITS AND SHALL INSTALL ALL TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES (I.E. SILT FENCES, TREE PROTECTION/BARRIER FENCES, STABILIZED CONSTRUCTION ENTRANCES, STORM DRAIN SEDIMENT FILTERS, DRAINAGE DITCH SEDIMENT FILTERS, ETC.) INDICATED ON THE PROJECT DRAWINGS. TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES MUST BE CONSTRUCTED, STABILIZED, AND FUNCTIONAL BEFORE SITE DISTURBANCE BEGINS WITHIN THEIR TRIBUTARY AREAS. ONCE CONSTRUCTED, ALL MEASURES SHALL BE PROPERLY MAINTAINED AND/OR REPLACED AS NECESSARY AND THEN REMOVED FROM THE SITE ONCE VEGETATION AND PAVEMENT ARE IN PLACE.
2. EARTH DISTURBANCE SHALL BE LIMITED TO AREAS WHERE TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES ARE TO BE INSTALLED. ONCE ALL MEASURES ARE INSTALLED TO THE SATISFACTION OF THE ENGINEER, THE REMAINDER OF THE CLEARING AND GRADING ACTIVITIES SHALL COMMENCE.
3. ALL EROSION AND SEDIMENT CONTROL MEASURES SHALL BE IN STRICT COMPLIANCE WITH THE "NEW YORK STATE STANDARDS AND SPECIFICATIONS FOR EROSION AND SEDIMENT CONTROL" CURRENT EDITION.
4. THE CONTRACTOR SHALL COMPLY WITH THE PROVISIONS OF ALL ENVIRONMENTAL PERMITS ISSUED FOR THIS PROJECT. THESE PLANS REFLECT THE PROVISIONS AND REQUIREMENTS OF SAID PERMIT(S). PERMIT(S) WILL BE AVAILABLE FROM THE ENGINEER–IN–CHARGE PRIOR TO THE START OF CONSTRUCTION.
5. CONSTRUCTION IS TO PROCEED IN ACCORDANCE WITH THE CONSTRUCTION PHASING SCHEDULED SUPPLIED BY THE CONTRACTOR OR SHOWN ON THE PLANS. ALL ELEMENTS OF THE SCHEDULE SHALL BE COMPLETED PRIOR TO BEGINNING THE NEXT CONSTRUCTION PHASE. THESE ELEMENTS INCLUDE ALL UTILITY CONSTRUCTION, THE BASE COURSE OF ASPHALT PAVING, AND ESTABLISHING GRASSES ON ALL DISTURBED AREAS. FOR TIME FRAMES OUTSIDE THE GROWING SEASON, OTHER METHODS OF SOIL STABILIZATION (SUCH AS THE USE OF JUTE MESH) SHALL BE USED UNTIL SUCH TIME AS GRASSES CAN BE ESTABLISHED.
6. THE CONTRACTOR SHALL INSPECT AND MAINTAIN THE INTEGRITY AND FUNCTION OF ALL TEMPORARY EROSION CONTROL MEASURES THROUGHOUT THE DURATION OF THE DEVELOPMENT PROCESS. TO ASSURE PROPER FUNCTION, SILTATION BARRIERS SHALL BE MAINTAINED IN GOOD CONDITION AND REINFORCED, EXTENDED, REPAIRED OR REPLACED AS NECESSARY. WASHOUTS SHALL BE IMMEDIATELY REPAIRED, RE–SEEDED AND PROTECTED FROM FURTHER EROSION. ALL ACCUMULATED SEDIMENT SHALL BE REMOVED AND CONTAINED IN APPROPRIATE SPOIL AREAS. WATER SHALL BE APPLIED TO NEWLY SEEDED AREAS AS NEEDED UNTIL GRASS COVER IS WELL ESTABLISHED TO EFFECTIVELY CONTROL WIND EROSION. WATER SHALL BE APPLIED TO ALL EXPOSED SOILS AS NECESSARY UNTIL GROUND COVER IS PERMANENTLY ESTABLISHED.
7. THE STABILIZED CONSTRUCTION ENTRANCE, UTILIZED DURING CONSTRUCTION, SHALL BE MAINTAINED IN A CONDITION THAT SHALL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHTS–OF–WAY. THIS MAY REQUIRE PERIODIC TOP DRESSING WITH ADDITIONAL STONE AS CONDITIONS DEMAND AND REPAIR AND/OR CLEANOUT OF ANY MEASURES USED TO TRAP SEDIMENT. ALL SEDIMENT SPILLED, DROPPED, WASHED, OR TRACKED ONTO PUBLIC RIGHTS–OF–WAY MUST BE REMOVED IMMEDIATELY. WHEELS SHALL BE CLEANED TO REMOVE SEDIMENT PRIOR TO ENTRANCE ONTO PUBLIC RIGHTS–OF–WAY. WHEN WASHING IS REQUIRED, IT SHALL BE DONE ON AN AREA STABILIZED WITH STONE AND WHICH DRAINS INTO AN APPROVED SEDIMENT TRAPPING DEVISE. PERIODIC INSPECTIONS AND NEEDED MAINTENANCE SHALL BE PROVIDED AFTER EACH RAIN EVENT.
8. IMMEDIATELY FOLLOWING COMPLETION OF ANY AND ALL STORM DRAIN INLETS, STORM DRAIN INLET PROTECTION SHALL BE CONSTRUCTED. THE INLET PROTECTION SHALL FUNCTION TO PREVENT SEDIMENT FROM ENTERING THE STORM DRAINS. THEY SHALL BE MAINTAINED IN GOOD CONDITION UNTIL FINAL VEGETATIVE COVER IS WELL ESTABLISHED.
9. AS MUCH AS IS PRACTICAL, EXISTING VEGETATION SHALL BE PRESERVED. FOLLOWING THE COMPLETION OF CONSTRUCTION ACTIVITIES IN ANY PORTION OF THE SITE, PERMANENT VEGETATION SHALL BE ESTABLISHED ON ALL EXPOSED SOILS.
10. IN SOME INSTANCES, ESTABLISHING VEGETATION WILL BE NECESSARILY DELAYED WHILE CONSTRUCTION IS IN PROGRESS. DURING THESE TIMES, SEDIMENT CONTROL MEASURES WILL BE EMPLOYED TO PREVENT SEDIMENT FROM LEAVING THE SITE. VEGETATION SHALL BE ESTABLISHED IN THESE AREAS AS SOON AS IT IS PRACTICAL.
11. SITE PREPARATION ACTIVITIES SHALL BE PLANNED TO MINIMIZE THE SCOPE AND DURATION OF SOIL DISRUPTION.
12. PERMANENT TRAFFIC CORRIDORS SHALL BE ESTABLISHED AND "ROUTES OF CONVENIENCE" SHALL BE AVOIDED. STABILIZED CONSTRUCTION ENTRANCES SHALL BE INSTALLED AT ALL POINTS OF ENTRY ONTO THE PROJECT SITE.
13. AREAS UNDERGOING CLEARING OR GRADING AND WHERE WORK IS DELAYED OR COMPLETED AND WILL NOT BE REDISTURBED FOR 21 DAYS OR MORE SHALL BE STABILIZED WITH TEMPORARY OR PERMANENT VEGETATIVE COVER WITHIN 14 DAYS.
14. TOPSOIL AND FILL THAT IS TO REMAIN STOCKPILED ON–SITE FOR PERIODS GREATER THAN 30 DAYS SHALL BE STABILIZED BY SEEDING. PRIOR TO THE SEEDING OPERATION, THE STOCKPILED MATERIAL SHALL BE GRADED AS NEEDED AND FEASIBLE TO PERMIT THE USE OF CONVENTIONAL EQUIPMENT FOR SEEDBED PREPARATION, FERTILIZATION, SEEDING, MULCH APPLICATIONS AND SULCH ANCHORING.
15. SILT FENCES SHALL BE CONSTRUCTED AROUND ALL STOCKPILES OF FILL, TOPSOIL, AND EXCAVATED OVERBURDEN. SILT FENCES SHALL BE ANCHORED AND MAINTAINED IN GOOD CONDITION UNTIL SUCH TIME AS SAID STOCKPILES ARE REMOVED AND STOCKPILING AREAS ARE BROUGHT TO FINAL GRADE AND PERMANENTLY STABILIZED.
16. IN NO CASE SHALL ERODIBLE MATERIALS BE STOCKPILED WITHIN 25 FEET OF ANY DITCH STREAM OR OTHER SURFACE WATER BODY.
17. DAMAGE TO SURFACE WATERS RESULTING FROM EROSION AND SEDIMENTATION SHALL BE MINIMIZED BY STABILIZING DISTURBED AREAS AND BY REMOVING SEDIMENT FROM CONSTRUCTION SITE DISCHARGES.
18. CONSTRUCTION TRAFFIC SHALL NOT CROSS STREAMS OR DITCHES EXCEPT AT SUITABLE CROSSING FACILITIES, AND SHALL NOT OPERATE UNNECESSARILY WITHIN WATERWAYS OR DRAINAGE DITCHES.
19. NO SYNTHETIC EROSION CONTROL MATERIAL, FENCING OR MATTING SHALL BE PART OF THE PERMANENT INSTALLATION.
20. WHERE CONCENTRATED FLOWS ARE CREATED AS A RESULT OF CONSTRUCTION OPERATIONS, CHECK DAMS SHALL BE INSTALLED DEEMED NECESSARY.



6 TYPICAL INFILTRATION BASIN DETAIL
NOT TO SCALE



NOTE:
PROVIDE SOIL TESTS FOR SEED, FERTILIZER AND MULCH RECOMMENDATIONS (ONE PER EACH 5 ACRES OF SEEDING AND MIN. ONE PER TOPSOIL STOCKPILE)

7 TYPICAL TOPSOIL REPLACEMENT DETAIL
NOT TO SCALE

AUBERTINE and CURRIER
ARCHITECTS, ENGINEERS & LAND SURVEYORS, PLLC

NYS WBE/DBE Certified
SBA Woman Owned
Small Business (WOSB)

aubertinecurrier.com

522 Bradley Street
Watertown, New York 13601
Phone: (315)782-2005

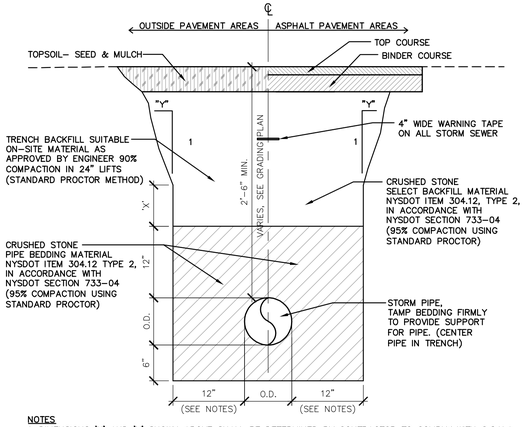
The above Architect, Engineer or Land Surveyor states that to the best of his or her knowledge, information and belief, the plans and specifications are in accordance with applicable requirements of New York State. It is a violation of New York State Law for any person, unless acting under the direct supervision of a Registered Architect, Licensed Professional Engineer or Licensed Land Surveyor to alter this document in any way. If altered, such licensee shall affix his or her seal and the notification "altered by" followed by his or signature, date and a specific description of the alteration.
© COPYRIGHT 2026
AUBERTINE and CURRIER ARCHITECTS, ENGINEERS & LAND SURVEYORS, PLLC

ROTH INDUSTRIES AND GLOBAL PLASTICS
2026 EXPANSION PROJECT
268 BELLEW AVENUE SOUTH
CITY OF WATERTOWN
JEFFERSON COUNTY, STATE OF NEW YORK

PROJECT NO:	2016-033.007
SCALE:	1"=1"
DRAWN BY:	SRJ
CHECKED BY:	MRM
ISSUE DATES:	08/11/2026

ESC AND DRAINAGE DETAILS

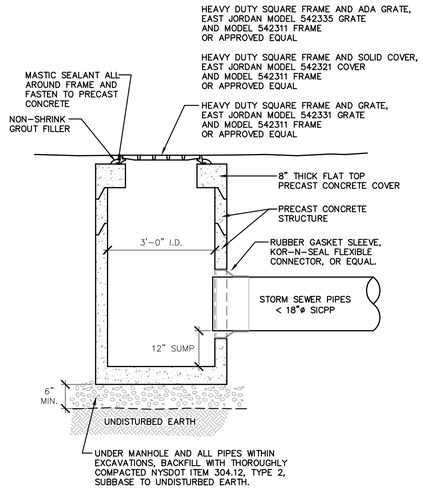
CG-500



NOTES

1. DIMENSIONS 'X' AND 'Y' SHOWN ABOVE SHALL BE DETERMINED BY CONTRACTOR TO COMPLY WITH O.S.H.A., NEW YORK STATE DEPARTMENT OF LABOR, NEW YORK STATE INDUSTRIAL CODE AND ALL OTHER APPLICABLE SAFETY STANDARDS.
2. SAFETY SHEETING OR TRENCH BOX MAY BE USED IN PLACE OF SLOPED TRENCH WALLS.
3. SHEETING, WHEN REQUIRED, TO BE CUT OFF AT LEAST 5 FEET BELOW STREET AND A MINIMUM OF 1 FOOT ABOVE TOP OF PIPE. WOOD SHEETING DRIVEN BELOW MID–DIAMETER OF THE PIPE SHALL BE LEFT IN PLACE. STEEL SHEETING DRIVEN BELOW MID–DIAMETER MAY BE WITHDRAWN IF APPROVED IN WRITING BY THE ENGINEER. FOR PVC PIPE ALL SHEETING DRIVEN BELOW MID–DIAMETER SHALL BE LEFT IN PLACE.
4. TRENCHES LOCATED WITHIN 5' OF ROAD SHOULDERS SHALL BE TREATED THE SAME AS UNDER PAVEMENT.
5. PIPE TO TRENCH WALL DISTANCE MAY BE REDUCED WHEN INSTALLED IN SAWCUT ROCK TRENCH.

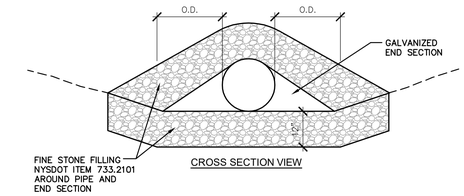
1 TYPICAL STORM SEWER TRENCH DETAIL
NOT TO SCALE



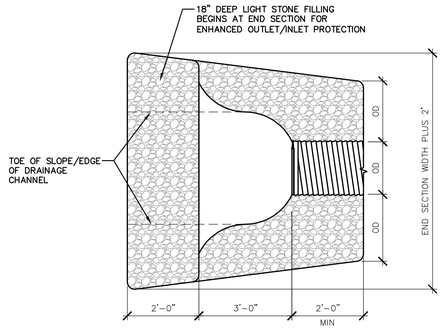
TYPICAL PRECAST MANHOLE NOTES:

1. CONCRETE SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 5,000 PSI AT 28 DAYS.
2. CONCRETE SHALL BE AIR ENTRAINED 5%–8%.
3. WALLS, FLOOR, TOP SLAB AND ACCESS COVERS SHALL BE DESIGNED IN ACCORDANCE WITH ASTM C890 (HS–20 LOAD).
4. REINFORCEMENT – ASTM A497/A615 GRADE 60.
5. ALL JOINTS SHALL BE SEALED SUCH THAT THE TANK IS WATERTIGHT WITH BUTYL SEALANT CS–102 ASTM C–990.

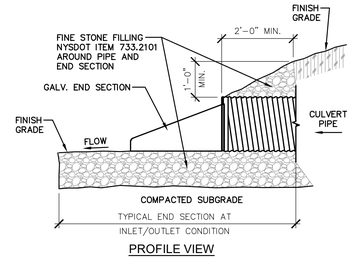
2 TYPICAL 3'-0" I.D. STORM MANHOLE DETAIL
NOT TO SCALE



CROSS SECTION VIEW

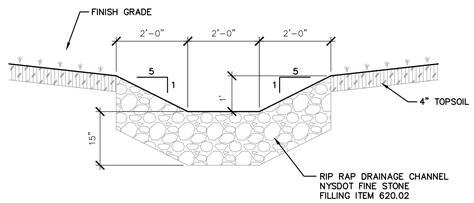


PLAN VIEW



PROFILE VIEW

3 TYPICAL CULVERT END SECTION DETAIL
NOT TO SCALE



4 TYPICAL RIP RAP DRAINAGE CHANNEL DETAIL
NOT TO SCALE

AUBERTINE and CURRIER
ARCHITECTS, ENGINEERS & LAND SURVEYORS, PLLC

NYS WBE/DBE Certified
SBA Woman Owned
Small Business (WOSB)

aubertinecurrier.com

522 Bradley Street
Watertown, New York 13601
Phone: (315)782-2005

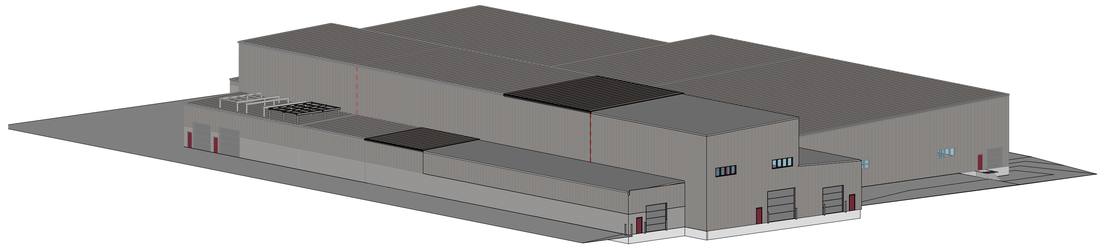
The above Architect, Engineer or Land Surveyor states that to the best of his or her knowledge, information and belief, the plans and specifications are in accordance with applicable requirements of New York State. It is a violation of New York State Law for any person, unless acting under the direct supervision of a Registered Architect, Licensed Professional Engineer or Licensed Land Surveyor to alter this document in any way. If altered, such licensee shall affix his or her seal and the notification "altered by" followed by his or signature, date and a specific description of the alteration.
© COPYRIGHT 2026
AUBERTINE and CURRIER ARCHITECTS, ENGINEERS & LAND SURVEYORS, PLLC

ROTH INDUSTRIES AND GLOBAL PLASTICS
2026 EXPANSION PROJECT
268 BELLEW AVENUE SOUTH
CITY OF WATERTOWN
JEFFERSON COUNTY, STATE OF NEW YORK

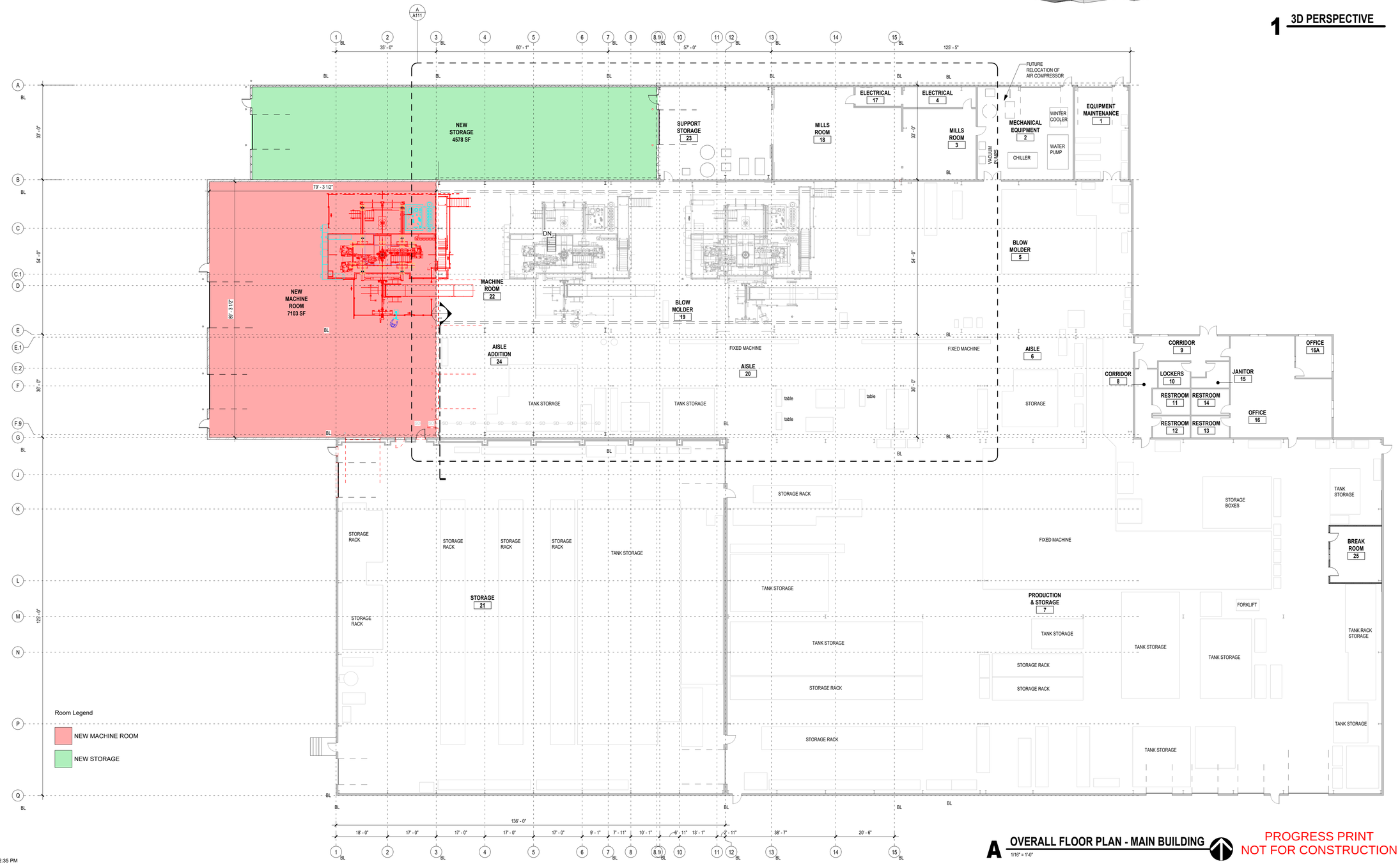
PROJECT NO:	2016-033.007
SCALE:	1"=1'
DRAWN BY:	SRJ
CHECKED BY:	MRM
ISSUE DATES:	05/26/2026

STORM SEWER DETAILS

CG-501



1 3D PERSPECTIVE



A OVERALL FLOOR PLAN - MAIN BUILDING
1/16" = 1'-0"

PROGRESS PRINT
NOT FOR CONSTRUCTION

8/11/2026 4:02:35 PM

AUBERTINE and CURRIER
ARCHITECTS, ENGINEERS & LAND SURVEYORS, PLLC

522 Bradley Street
Watertown, New York 13601

aubertinecurrier.com

Phone: (315)782-2005
Fax: (315)782-1472

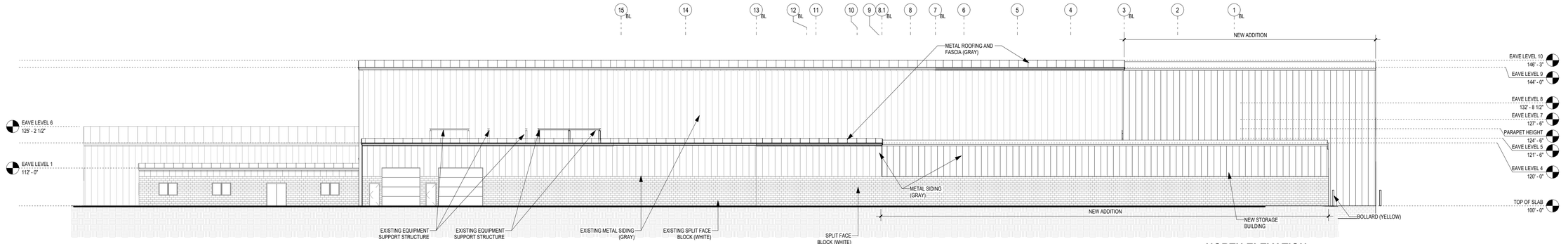
The above Architect, Engineer or Land Surveyor states that to the best of his or her knowledge, information and belief, the plans and specifications are in accordance with applicable requirements of New York State. It is a violation of New York State Law for any person, unless acting under the direct supervision of a Registered Architect, Licensed Professional Engineer or Licensed Land Surveyor to alter this document in any way. If altered, such licensee shall affix his or her seal and the notification "altered by" followed by his or signature, date and a specific description of the alteration.
© COPYRIGHT 2020
AUBERTINE and CURRIER ARCHITECTS, ENGINEERS & LAND SURVEYORS, PLLC

ROTH INDUSTRIES AND ROTH GLOBAL PLASTICS
EXPANSION PROJECT
268 BELLEW AVE SOUTH
CITY OF WATERTOWN
JEFFERSON COUNTY, STATE OF NEW YORK

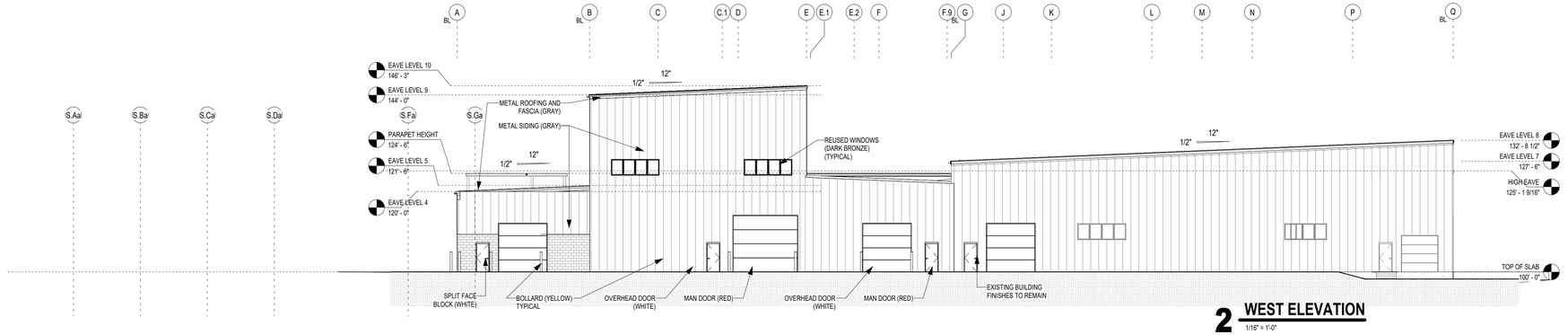
PROJECT NO: 2016-033.004
SCALE: 1/16" = 1'-0"
DRAWN BY: BMK
CHECKED BY: AMM
ISSUE DATES:
2026-08-11 PRELIMINARY SET

OVERALL FLOOR PLAN - MAIN BUILDING

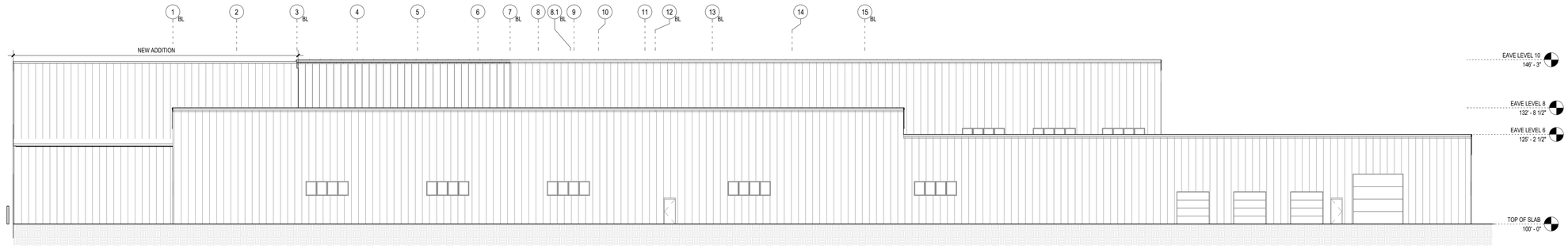
A010



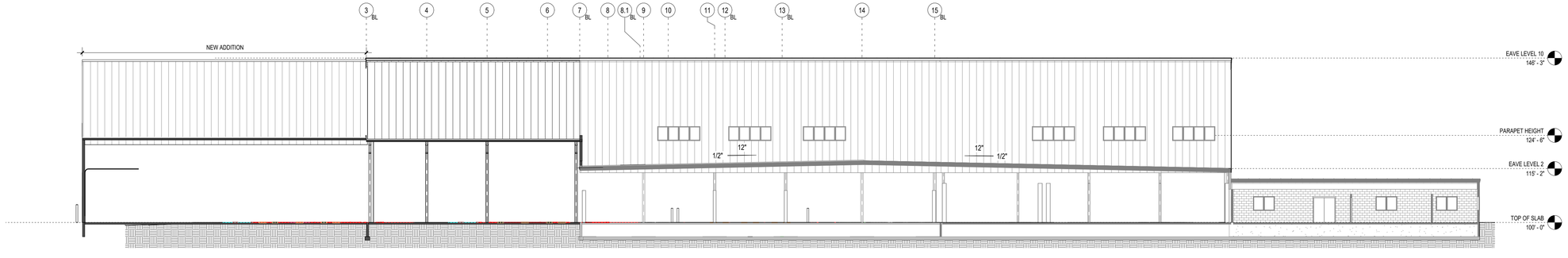
1 NORTH ELEVATION
1/16" = 1'-0"



2 WEST ELEVATION
1/16" = 1'-0"



3 SOUTH ELEVATION
1/16" = 1'-0"



4 SOUTH ELEVATION
1/16" = 1'-0"

PROGRESS PRINT
NOT FOR CONSTRUCTION

8/11/2026 4:02:38 PM

AUBERTINE and CURRIER
ARCHITECTS, ENGINEERS & LAND SURVEYORS, PLLC

522 Bradley Street
Watertown, New York 13601

aubertinecurrier.com

Phone: (315)782-2005
Fax: (315)782-1472

The above Architect, Engineer or Land Surveyor states that to the best of his or her knowledge, information and belief, the plans and specifications are in accordance with applicable requirements of New York State. It is a violation of New York State Law for any person, unless acting under the direct supervision of a Registered Architect, Licensed Professional Engineer or Licensed Land Surveyor to alter this document in any way. If altered, such licensee shall affix his or her seal and the notification "altered by" followed by his or signature, date and a specific description of the alteration.
© COPYRIGHT 2020
AUBERTINE and CURRIER ARCHITECTS, ENGINEERS & LAND SURVEYORS, PLLC

ROTH INDUSTRIES AND ROTH GLOBAL PLASTICS
EXPANSION PROJECT
268 BELLEW AVE SOUTH
CITY OF WATERTOWN
JEFFERSON COUNTY, STATE OF NEW YORK

PROJECT NO: 2016-033.004
SCALE: 1/16" = 1'-0"
DRAWN BY: BMK
CHECKED BY: AMM
ISSUE DATES:
2026-08-11 PRELIMINARY SET

EXTERIOR ELEVATIONS - MAIN FACILITY

A211

Short Environmental Assessment Form
Part 1 - Project Information

Instructions for Completing

Part 1 – Project Information. The applicant or project sponsor is responsible for the completion of Part 1. Responses become part of the application for approval or funding, are subject to public review, and may be subject to further verification. Complete Part 1 based on information currently available. If additional research or investigation would be needed to fully respond to any item, please answer as thoroughly as possible based on current information.

Complete all items in Part 1. You may also provide any additional information you believe will be needed by or useful to the lead agency; attach additional pages as necessary to supplement any item.

Part 1 – Project and Sponsor Information

Name of Action or Project:
2026 Expansion Project

Project Location (describe, and attach a location map):
268 Bellew Ave South, Watertown, NY - Jefferson County

Brief Description of Proposed Action:
The project includes two (2) building additions, expanded asphalt parking lot, reconfigured ADA parking spaces, asphalt entrance drive, expanded asphalt storage areas, chain link fence, site lighting, landscaping, and expanded infiltration basins.

Name of Applicant or Sponsor:	Telephone: [redacted]
Roth Industries Inc. - Attn: [redacted]	E-Mail: [redacted]

Address:
268 Bellew Avenue South

City/PO:	State:	Zip Code:
Watertown	NY	13601

	NO	YES
1. Does the proposed action only involve the legislative adoption of a plan, local law, ordinance, administrative rule, or regulation? If Yes, attach a narrative description of the intent of the proposed action and the environmental resources that may be affected in the municipality and proceed to Part 2. If No, continue to question 2.	☑	☐
2. Does the proposed action require a permit, approval or funding from any other government Agency? If Yes, list agency(s) name and permit or approval:	☑	☐

3. a. Total acreage of the site of the proposed action? 8.86 acres
   b. Total acreage to be physically disturbed? 2.27 acres
   c. Total acreage (project site and any contiguous properties) owned or controlled by the applicant or project sponsor? 8.86 acres

4. Check all land uses that occur on, are adjoining or near the proposed action:
   ☑ Urban ☐ Rural (non-agriculture) ☑ Industrial ☑ Commercial ☐ Residential (suburban)
   ☐ Forest ☐ Agriculture ☐ Aquatic ☐ Other(Specify):
   ☐ Parkland

	NO	YES	N/A
5. Is the proposed action,			
a. A permitted use under the zoning regulations?	☐	☑	☐
b. Consistent with the adopted comprehensive plan?	☐	☑	☐

	NO	YES
6. Is the proposed action consistent with the predominant character of the existing built or natural landscape?	☐	☑

	NO	YES
7. Is the site of the proposed action located in, or does it adjoin, a state listed Critical Environmental Area?		
If Yes, identify:	☑	☐

	NO	YES
8. a. Will the proposed action result in a substantial increase in traffic above present levels?	☑	☐
b. Are public transportation services available at or near the site of the proposed action?	☐	☑
c. Are any pedestrian accommodations or bicycle routes available on or near the site of the proposed action?	☑	☐

	NO	YES
9. Does the proposed action meet or exceed the state energy code requirements?		
If the proposed action will exceed requirements, describe design features and technologies:	☐	☑

	NO	YES
10. Will the proposed action connect to an existing public/private water supply?		
If No, describe method for providing potable water: _____	☐	☑

	NO	YES
11. Will the proposed action connect to existing wastewater utilities?		
If No, describe method for providing wastewater treatment: _____	☐	☑

	NO	YES
12. a. Does the project site contain, or is it substantially contiguous to, a building, archaeological site, or district which is listed on the National or State Register of Historic Places, or that has been determined by the Commissioner of the NYS Office of Parks, Recreation and Historic Preservation to be eligible for listing on the State Register of Historic Places?	☑	☐
b. Is the project site, or any portion of it, located in or adjacent to an area designated as sensitive for archaeological sites on the NY State Historic Preservation Office (SHPO) archaeological site inventory?	☐	☑

	NO	YES
13. a. Does any portion of the site of the proposed action, or lands adjoining the proposed action, contain wetlands or other waterbodies regulated by a federal, state or local agency?	☐	☑
b. Would the proposed action physically alter, or encroach into, any existing wetland or waterbody?	☑	☐
If Yes, identify the wetland or waterbody and extent of alterations in square feet or acres: _____		

14. Identify the typical habitat types that occur on, or are likely to be found on the project site. Check all that apply:

☐ Shoreline ☐ Forest ☐ Agricultural/grasslands ☐ Early mid-successional

☐ Wetland ■ Urban ☐ Suburban

	NO	YES
15. Does the site of the proposed action contain any species of animal, or associated habitats, listed by the State or Federal government as threatened or endangered? Indiana Bat, Northern Long-...	☐	☑
16. Is the project site located in the 100-year or 500-year flood plain?	☑	☐
17. Will the proposed action create storm water discharge, either from point or non-point sources? If Yes,	☐	☑
a. Will storm water discharges flow to adjacent properties?	☑	☐
b. Will storm water discharges be directed to established conveyance systems (runoff and storm drains)?	☐	☑
If Yes, briefly describe:		
18. Does the proposed action include construction or other activities that would result in the impoundment of water or other liquids (e.g., retention pond, waste lagoon, dam)? If Yes, explain the purpose and size of the impoundment:	☑	☐
19. Has the site of the proposed action or an adjoining property been the location of an active or closed solid waste management facility? If Yes, describe:	☑	☐
20. Has the site of the proposed action or an adjoining property been the subject of remediation (ongoing or completed) for hazardous waste? If Yes, describe:	☑	☐
21. Is the project located within, or within ½ mile of, a disadvantaged community?	☐	☑
If No, could impacts from the project affect a disadvantaged community?	☐	☐
If Yes to either question in 21, answer the following question.		
a. Identify the potential pollution impacts of the project, either direct or indirect, that may occur within the disadvantaged community (e.g., wastewater discharges, air emissions, noise, odors, solid or hazardous waste generation or management): Possible slight noise increase from expanded operations. Building is located in industrial park		

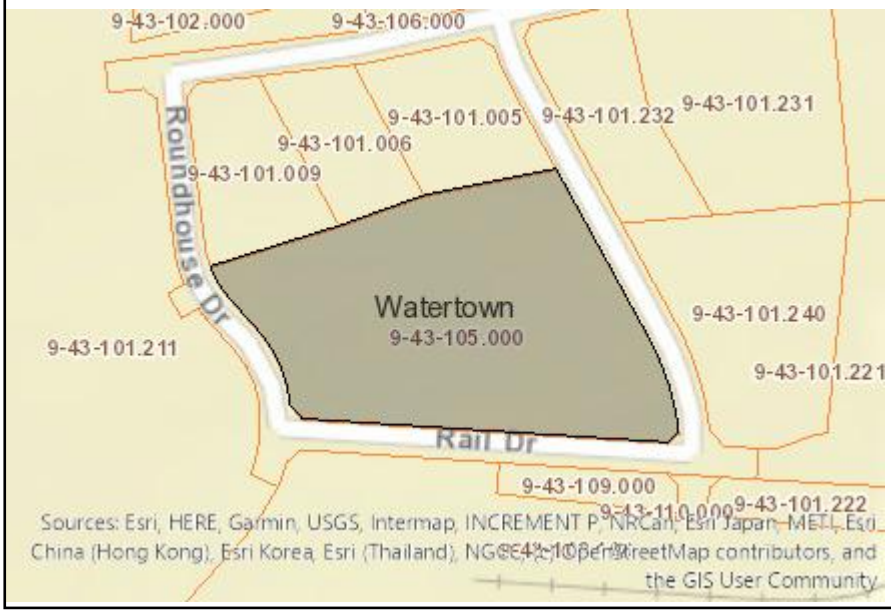
I CERTIFY THAT THE INFORMATION PROVIDED ABOVE IS TRUE AND ACCURATE TO THE BEST OF MY KNOWLEDGE

Applicant/sponsor/name: [redacted] Date: _____

Signature: _____ Title: [redacted]

EAF Mapper Summary Report

Thursday, August 27, 2026 8:55 AM



Disclaimer: The EAF Mapper is a screening tool intended to assist project sponsors and reviewing agencies in preparing an environmental assessment form (EAF). Not all questions asked in the EAF are answered by the EAF Mapper. Additional information on any EAF question can be obtained by consulting the EAF Workbooks. Although the EAF Mapper provides the most up-to-date digital data available to DEC, you may also need to contact local or other data sources to confirm data provided by the Mapper or to obtain data not provided by the Mapper.



Part 1 / Question 7 [Critical Environmental Area]	No
Part 1 / Question 12a [National or State Register of Historic Places or State Eligible Sites]	No
Part 1 / Question 12b [Archeological Sites]	Yes
Part 1 / Question 13a [Wetlands or Other Regulated Waterbodies]	Yes - Digital mapping information on local, New York State, and federal wetlands and waterbodies is known to be incomplete. Refer to the EAF Workbook.
Part 1 / Question 15 [Threatened or Endangered Animal]	Yes
Part 1 / Question 15 [Threatened or Endangered Animal - Name]	Indiana Bat, Northern Long-eared Bat
Part 1 / Question 16 [100 or 500 Year Floodplain]	Digital mapping data are not available or are incomplete. Refer to EAF Workbook.
Part 1 / Question 20 [Remediation Site]	No
Part 1 / Question 21 [Disadvantaged Community]	Yes

FULL EAF SUMMARY REPORT:

Questions 12b, 13a, and 15 are answered automatically by the EAF mapper based upon limited digital mapping information that is available.

- Questions 12b, Archeological Sites, is answered yes due to the location of the historic railroad car maintenance turn-table located on the adjacent tax parcel number 9-43-101.231, northeast of the site. See Subdivision Final Plat, City Center Industrial Park, 11/21/2008, Jeff. Co. File #4655.

- Question 13a, Wetlands, is answered yes due to the location of wetlands located on the adjacent lots directly west of the City Center Industrial Park site. See Subdivision Final Plat, City Center Industrial Park, 11/21/2008, Jeff. Co. File #4655.

- Question 15, Threatened or Endangered Species, is answered yes due to the lot being part of the City Center Industrial Park, which was previously developed adjacent to undeveloped wetlands and forest area to the west. The industrial park was developed in 2001 and currently the site contains only buildings, parking lot, grass lawn and landscaping.

AUBERTINE and CURRIER
ARCHITECTS, ENGINEERS & LAND SURVEYORS, PLLC
NYS WBE/DBE Certified
SBA Woman Owned
Small Business (WOSB)
aubertinecurrier.com
522 Bradley Street
Watertown, New York 13601
Phone: 315.782.2005
Fax: 315.782.1472
Managing Partner
Annette M. Mason, P.E.
Structural Engineer
Partners
Brian A. Jones, AIA.,
LEED AP BD+C
Architect
Matthew R. Morgia, P.E.
Civil Engineer
Jayson J. Jones, P.L.S.
Land Surveyor
Brian M. Krueger, AIA.,
Architect