Town of Manlius

Planning Board Agenda

December 13, 2021

6:30PM

1. Zoom Meeting Instructions

   Documents:

   ZOOM PLANNING BOARD MEETING INSTRUCTIONS DECEMBER 13, 2021.PDF

2. Pledge Of Allegiance

3. Approval Of Minutes - November 26, 2021

4. William T. Adams - 7145 Ferstler Road, Kirkville, NY 13082 - Set Date For Public Hearing - 2-Lot Subdivision - 7063 Ferstler Road, Kirkville, NY 13082 Tax Map # 042.-01-21.1

   Documents:

   7063 FERSTLER ROAD - 2-LOT SUBDIVISON APPLICATION.PDF
   7063 FERSTLER ROAD - SUBDIVISON MAP.PDF
   7063 FERSTLER ROAD - UPDATED MAP.PDF

5. Harrington Homes - 3848 Henneberry Road, Jamesville, NY 13078 - Set Date For Public Hearing -34 Lot Subdivision & Site Plan – Harrington Homes At Brandywine - Brandywine Off Of Henneberry Road Tax Map # 109.-02-07.1

   Documents:

   BRANDYWINE LETTER FROM GERRY GOULD.PDF
   BRANDYWINE - 34 - LOT SUBDIVISION - WELL REPORT MANLIUS PB RESPONSE LETTER.PDF
   BRANDYWINE - 34 - LOT SUBDIVISION - PEER REVIEW COMMENTS.PDF
   BRANDYWINE - 34 - LOT SUBDIVISION - WELL REPORT.PDF
   BRANDYWINE - 34 - LOT SUBDIVISION - PRELIMINARY LAYOUT PLAN.PDF
   OCPB REFERAL -HARRINGTON HOMES - BRANDYWINE - 34 LOT SUBDIVISION.PDF
   OCPB RESPONSE - HARRINGTON HOMES - BRANDYWINE - 34 - LOT SUBDIVISION.PDF
   BRANDYWINE - 34 - LOT SUBDIVISION - SWPPP 2020-09-17.PDF
   BRANDYWINE - 34 - LOT SUBDIVISION - PLAT PHASE 3_PP.PDF
   BRANDYWINE - 34 - LOT SUBDIVISION - SHORT FORM EAF - SIGNED.PDF
   BRANDYWINE - 34 - LOT SUBDIVISON - PB APPLICATION-SIGNED.PDF
   BRANDYWINE - 34 - LOT SUBDIVISION - SITE PLANS 2020-09-17.PDF
   UPDATED - BRANDYWINE - 34 - LOT - SUBDIVISION - LETTER REPORT HARRINGTON REPONSE TO GOULD NOV 2021.PDF
   UPDATED - BRANDYWINE - 34 - LOT - SUBDIVISION - 2021-12-01 SITE PLAN SET.PDF
   UPDATED - BRANDYWINE - 34 - LOT SUBDIVISON - SWPPP 2021-12-01.PDF

6. Kimley-Horn - 401 B Street, Suite 6000, NY NY 92101 - Public Hearing - Target Drive-Up Expansion - 340 Towne Drive, Fayetteville, NY 13066 - Tax Map # 087.-01-20.0

   Documents:

   340 TOWNE DRIVE - PLANNING_BOARD_-FULL_APPLICATION_NOTARIZED.PDF
   340 TOWNE DRIVE - T1476 DRIVEUP EXPANSION CD_TJL SS.PDF
   340 TOWNE DRIVE - PLANNING_BOARD_-FULL_APPLICATION_NOTARIZED.PDF

7. Robert Caron Homes - 7990 Blarney Stone Way, Manlius, NY 13104 - Public Hearing - Subdivision Final Approval - Hunters Ridge At Pauli Drive - Tax Map #'s 111.-08-17.1 And 111.-02-09.5

   Documents:

   HUNTERS RIDGE - MAP.PDF
   HUNTERS RIDGE - PLANNING BOARD APPLICATION.PDF

8. Special Permit Renewals

   Documents:

   SPECIAL PERMIT RENEWAL - MEMO.PDF
   5428 NORTH BURDICK ST. - SPECIAL PERMIT RENEWAL.PDF
   6953 COLLAMER ROAD - SPECIAL PERMIT RENEWAL.PDF

9. Other Business

10. Adjournment

Town of
MANLIUS
New York

December 13, 2021

Virtual Planning Board Meeting

Instructions to attend the December 13, 2021 virtual Planning Board meeting:

The easiest way to join is to go to our website www.TownOfManlius.org and click on the link that is located on the homepage. You can also watch on our Facebook page by searching for "Town of Manlius"

Enter the meeting url web address as listed below:

https://us02web.zoom.us/j/85253978149?

Password to join when prompted:

Password: 138177

Enter your email address and name and join the meeting!

Join by telephone by dialing the number below:

1 929 436 2866

When prompted to enter the Webinar ID, use the number below followed by #

Webinar ID: 852 5397 8149

Press # again to sk404702ip the personal id and enter the password below followed by #

Password: 138177

Expected Fee: $300

TOWN OF MANLIUS
PLANNING DEPARTMENT
INITIAL APPEARANCE APPLICATION

adamscharli64@gmail.com

RECEIVED
SEP 27 2021
By

DATE:

Name of Project: W.T. ADAMS SR SUBDIVISION

Applicant must submit 12 copies of all site plans, surveys, and supporting data with the final application before a planning board meeting can be scheduled.

Location of Project: 7063 FERSTLER RD. KIRKVILLE NY 13082

Type of Project:

○ Division of Land ☒ Subdivision ○ Accessory Use ○ Zone Change ○ Site Review ○ Other

Developer: WILLIAM T. ADAMS SR. Phone:

Address: 7145 FERSTLER RD. KIRKVILLE Zip: 13082

Tax Map Number(#)/s: 042.-01-21.1

Present Zoning: RA Desired Zoning:

Total Acreage: Total Number of Lots: 2

Property Owner/s: WILLIAM T. ADAMS SR. Phone: (315) 558-8556

Address: 7145 FERSTLER RD KIRKVILLE Zip: 13082

Tax Map#(s): Owner's Signature: William T Adams

Printed Name: WILLIAM T. ADAMS SR

Property Owner/s: Phone:

Address: Zip:

Tax Map#(s): Owner's Signature:

Printed Name:

Use next page for additional known property owners' information

Planning Board Meeting Date Assignment:

Fee: Paid: Per: ○ Credit/Debit Card ○ Check ○ Cash

Planning Board - Initial

TOWN OF MANLIUS

DISCLOSURE AFFIDAVIT

This affidavit is a part of and must be completed and attached to every application, petition, request submitted for a *site plan, variance, amendment, change of zoning, approval of a plat, exemption from a plat or official map, license* or *permit.*

STATE OF NEW YORK)
) SS:
COUNTY OF ONONDAGA)

I. WILLIAM TADAHS, being duly sworn, deposes and says that (s) he is:

PROPERTY OWNER

(applicant, petitioner, corporation officer, property owner, *etc.)*

II. That deponent has read and is familiar with the provisions of the General Municipal Law, Section 809 which states:

A. Every application, petition or request submitted for a site plan, variance, amendment, change of zoning, approval of a plat, exemption from a plat or official map, license or permit, pursuant to the provisions or any ordinance, local law, rule or regulation constituting the zoning and planning regulations of a municipality shall state the name, residence and the nature and extent of the interest of any state officer or any officer or employee of such municipality is a part, in the person, partnership or association making such application, petition or request (hereinafter called the applicant) to the extent known to such applicant.

B. For the purpose of this action an officer or employee shall be deemed to have an interest in the applicant when (s)he, his/her spouse, or their brothers, sisters, parents, children, grandchildren, or the spouse of any of them:

1) is the applicant, or
2) is an officer, director, partner or employee of the applicant, or
3) legally or beneficially owns or controls stock of a corporate applicant or is a member of a partnership or association applicant, or
4) is a party to an agreement with such an applicant, express or implied, whereby (s) he may receive any payment or other benefit, whether or not for services rendered, or contingent upon the favorable approval of such application, petition or request.

C. Ownership of less than five percent (5%) of the stock of a corporation whose stock is listed on the New York or American Stock Exchanges shall not constitute an interest for the purposes of this section.

D. A person who knowingly and intentionally violates this section shall be guilty of a misdemeanor.

617.20
Appendix B
Short Environmental Assessment Form

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 which 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:
W.T. ADAMS SR. SUBDIVISION

Project Location (describe, and attach a location map):
7063 FERSTLER RD. KIRKVILLE NY 13082

Brief Description of Proposed Action:
SUBDIVISION BACK TO TWO LOTS.

Name of Applicant or Sponsor:	Telephone: 315-558-8556
WILLIAM T. ADAMS SR.	E-Mail:

Address:
7145 FERSTLER RD.

City/PO:	State:	Zip Code:
KIRKVILLE	NY	13082

	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 governmental Agency? If Yes, list agency(s) name and permit or approval:	☒	☐

3.a. Total acreage of the site of the proposed action? 4.4 acres
b. Total acreage to be physically disturbed? _____ acres
c. Total acreage (project site and any contiguous properties) owned or controlled by the applicant or project sponsor? _____ acres

4. Check all land uses that occur on, adjoining and 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?	☐	☒
7. Is the site of the proposed action located in, or does it adjoin, a state listed Critical Environmental Area? If Yes, identify: _____	☒	☐
8. a. Will the proposed action result in a substantial increase in traffic above present levels?	☒	☐
b. Are public transportation service(s) available at or near the site of the proposed action?	☒	☐
c. Are any pedestrian accommodations or bicycle routes available on or near site of the proposed action?	☒	☐
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: _____	☒	☐
10. Will the proposed action connect to an existing public/private water supply? If No, describe method for providing potable water: _____	☐	☒
11. Will the proposed action connect to existing wastewater utilities? If No, describe method for providing wastewater treatment: SEPTIC	☒	☐
12. a. Does the site contain a structure that is listed on either the State or National Register of Historic Places?	☒	☐
b. Is the proposed action located in an archeological sensitive area?	☒	☐
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?	☒	☐
16. Is the project site located in the 100 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? ☒ NO ☐ YES	☒	☐
b. Will storm water discharges be directed to established conveyance systems (runoff and storm drains)? If Yes, briefly describe: ☒ NO ☐ YES		

	NO	YES
18. Does the proposed action include construction or other activities that result in the impoundment of water or other liquids (e.g. retention pond, waste lagoon, dam)? If Yes, explain purpose and size:	☒	☐
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:	☒	☐

I AFFIRM THAT THE INFORMATION PROVIDED ABOVE IS TRUE AND ACCURATE TO THE BEST OF MY KNOWLEDGE

Applicant/sponsor name: [illegible] Date:

Signature:

STOP

Part 2 - Impact Assessment. The Lead Agency is responsible for the completion of Part 2. Answer all of the following questions in Part 2 using the information contained in Part 1 and other materials submitted by the project sponsor or otherwise available to the reviewer. When answering the questions the reviewer should be guided by the concept "Have my responses been reasonable considering the scale and context of the proposed action?"

	No, or small impact may occur	Moderate to large impact may occur
1. Will the proposed action create a material conflict with an adopted land use plan or zoning regulations?	☐	☐
2. Will the proposed action result in a change in the use or intensity of use of land?	☐	☐
3. Will the proposed action impair the character or quality of the existing community?	☐	☐
4. Will the proposed action have an impact on the environmental characteristics that caused the establishment of a Critical Environmental Area (CEA)?	☐	☐
5. Will the proposed action result in an adverse change in the existing level of traffic or affect existing infrastructure for mass transit, biking or walkway?	☐	☐
6. Will the proposed action cause an increase in the use of energy and it fails to incorporate reasonably available energy conservation or renewable energy opportunities?	☐	☐
7. Will the proposed action impact existing: a. public / private water supplies?	☐	☐
b. public / private wastewater treatment utilities?	☐	☐
8. Will the proposed action impair the character or quality of important historic, archaeological, architectural or aesthetic resources?	☐	☐
9. Will the proposed action result in an adverse change to natural resources (e.g., wetlands, waterbodies, groundwater, air quality, flora and fauna)?	☐	☐

	No, or small impact may occur	Moderate to large impact may occur
10. Will the proposed action result in an increase in the potential for erosion, flooding or drainage problems?	☐	☐
11. Will the proposed action create a hazard to environmental resources or human health?	☐	☐

Part 3 - Determination of significance. The Lead Agency is responsible for the completion of Part 3. For every question in Part 2 that was answered "moderate to large impact may occur", or if there is a need to explain why a particular element of the proposed action may or will not result in a significant adverse environmental impact, please complete Part 3. Part 3 should, in sufficient detail, identify the impact, including any measures or design elements that have been included by the project sponsor to avoid or reduce impacts. Part 3 should also explain how the lead agency determined that the impact may or will not be significant. Each potential impact should be assessed considering its setting, probability of occurring, duration, irreversibility, geographic scope and magnitude. Also consider the potential for short-term, long-term and cumulative impacts.

☐ Check this box if you have determined, based on the information and analysis above, and any supporting documentation, that the proposed action may result in one or more potentially large or significant adverse impacts and an environmental impact statement is required.

☐ Check this box if you have determined, based on the information and analysis above, and any supporting documentation, that the proposed action will not result in any significant adverse environmental impacts.

Name of Lead Agency	Date
Print or Type Name of Responsible Officer in Lead Agency	Title of Responsible Officer
Signature of Responsible Officer in Lead Agency	Signature of Preparer (if different from Responsible Officer)

PRINT

III. That no Town of Manlius officer, employee or a relative of either, as defined in Section 809 General Municipal Law has any interest in this application.

-OR-

If a Town of Manlius officer, employee or relative of either as defined in Section 809 General Municipal law has any interest in this application, the full particulars are provided on an attached sheet.

Date: September 27, 20 21.

WILLIAM T. ADAMS SR.
(Print Name)

(Signature)

(Entity Name)

By (Officer) (Title)

7145 FERSTLER RD KIRKVILLE
(Mailing Address of Applicant)

315-558-8556
(Telephone Number)

Date: _____, 20____.

(Print Name)

(Signature)

(Entity Name)

By (Officer) (Title)

(Mailing Address of Applicant)

(Telephone Number)

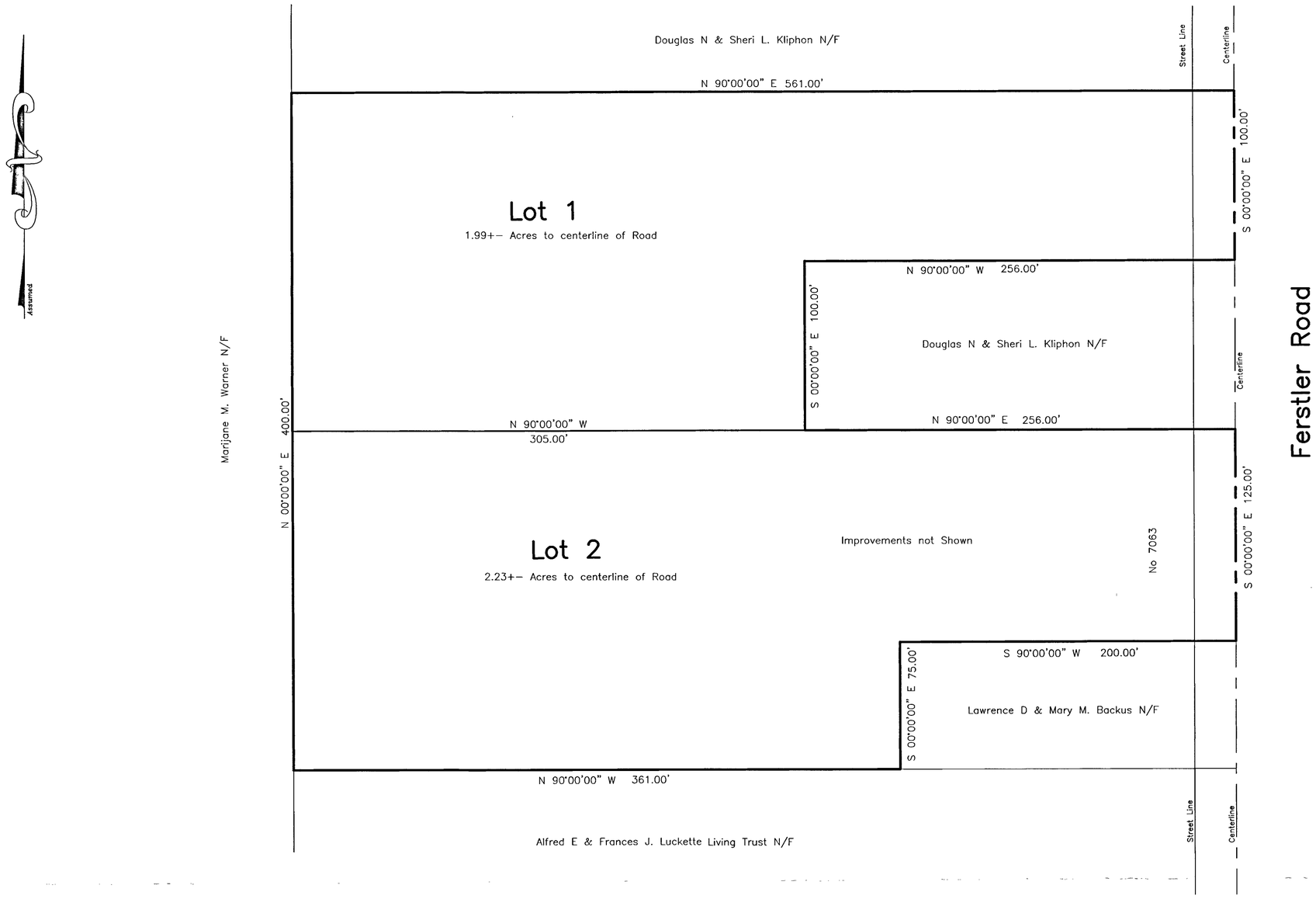
ACKNOWLEDGEMENTS

STATE OF NEW YORK)
) SS:
COUNTY OF ONONDAGA)

On this 27th day of September in the year 2021, before me, the undersigned, a notary public in and for said state, personally appeared WILLIAM T. ADAMS, SR _____, and _____ personally known to me or proved to me on the basis of satisfactory evidence to be the individual whose name is subscribed to the within Petition and acknowledged to me the he/she/they executed the same in his/her/their capacity, and that by his/her/their signature(s) on the Petition, the individual or the persons upon behalf of which the individual acted executed the instrument.

Notary Public

FRANKLIN A. JOSEF
NOTARY PUBLIC, State of New York
Qualified in Onon. Co.
My Commission Expires July 31, 2021



Approved By Town

I hereby certify that this subdivision plat was prepared by me, and was made from an actual survey completed by me on 10/14/2019.

David W. Hannig L.S. N.Y.S. Lic. No. 047411

STATE OF NEW YORK · DAVID WILLIAM HANNIG · OFFICIAL SEAL · NO. 047411 · LICENSED LAND SURVEYOR

Approved By Owner

I hereby approve this tract map.

William T. Adams
7143 Ferstler Road
Kirkville, New York 13082

The underground utilities shown have been located from field survey information and existing drawings. The surveyor makes no guarantee that the underground utilities shown comprise all such utilities in the area either in service or abandoned. The surveyor further does not warrant that the underground utilities shown are in the exact location indicated although he does certify that they are located as accurately as possible from information available. The surveyor has not physically located the underground utilities – Underground Facilities Protective Organization (315) 437–7333.

Adams Subdivision Preliminary Plan
Pt of Lot 15, Town of Manlius
Onondaga Co., N.Y.

50 0 50 100 150
GRAPHIC SCALE – FEET

Scale 1' = 50'

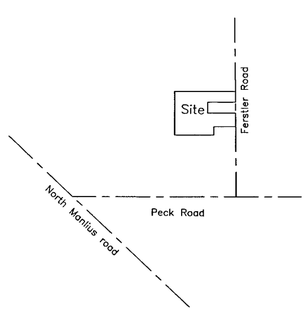
September 24, 2021

RECEIVED
SEP 27 2021
By

D. W. HANNIG L.S., P.C.
SURVEYORS - PLANNERS - CONSULTANTS
THE MARKET PLACE, BUILDING #1
MANLIUS, NEW YORK 13104
PHONE: (315) 682-5225 - FAX: (315) 682-7774

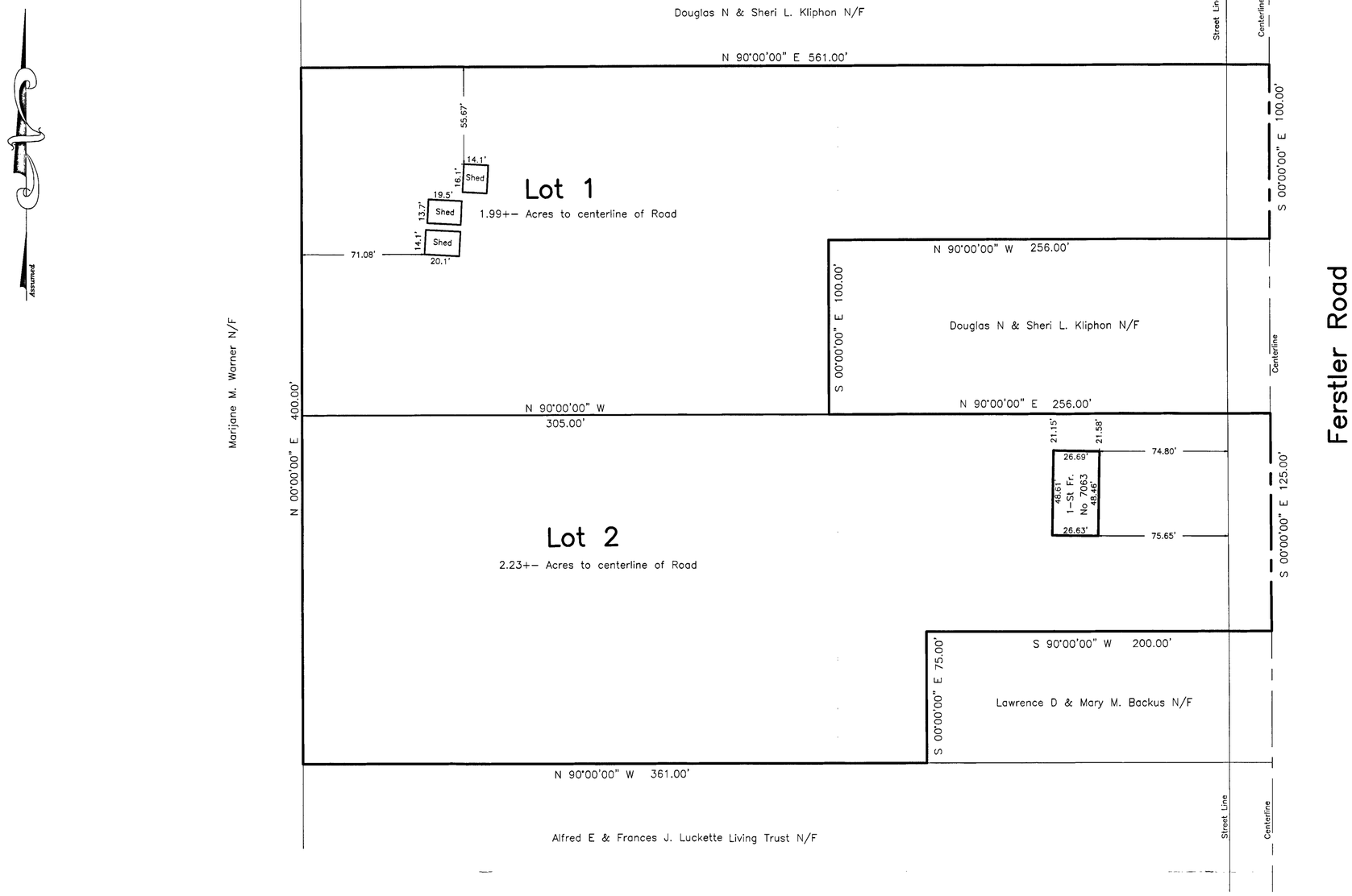
Projects/J182797/base plan/dwg/Final Map 7063 Ferstler

Revisions



Site Location

Approved By Onondaga County Health Dept.



Approved By Town

I hereby certify that this subdivision plat was prepared by me, and was made from an actual survey completed by me on 10/14/2019.

David W. Hannig L.S. N.Y.S. Lic. No. 047411

STATE OF NEW YORK · DAVID WILLIAM HANNIG · OFFICIAL SEAL · NO. 047411 · LICENSED LAND SURVEYOR

Approved By Owner

I hereby approve this tract map.

William T. Adams
7143 Ferstler Road
Kirkville, New York 13082

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Adams Subdivision Preliminary Plan
Pt of Lot 15, Town of Manlius
Onondaga Co., N.Y.

50 0 50 100 150
GRAPHIC SCALE – FEET

Scale 1' = 50'

September 24, 2021

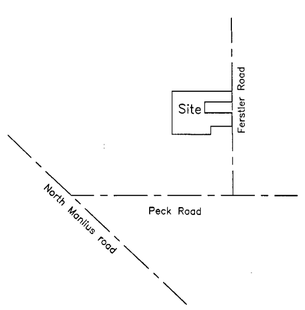
DEC 01 2021

D. W. HANNIG L.S., P.C.
SURVEYORS - PLANNERS - CONSULTANTS
THE MARKET PLACE, BUILDING #1
MANLIUS, NEW YORK 13104
PHONE: (315) 682-5225 - FAX: (315) 682-7774

Projects/J182797/base plan/dwg/Final Map 7063 Ferstler

1/30/2021	House & Sheds

Revisions



Site Location

Approved By Onondaga County Health Dept.

Doug Miller

From: Gerald Gould - GGG <ggould@gouldgw.com>
Sent: Friday, September 24, 2021 9:26 AM
To: Doug Miller
Subject: Brandywine Estates drinking water supply evaluation

Doug,
I have reviewed David Stoner's report. I agree with his conclusion that the results appear promising, however the evidence provided is not what was promised in the proposal and lacks information I consider important to understanding the aquifer and better evaluating the effects of 34 simultaneously pumping wells. It should be noted that the test described meets NYSDOH standards for a single domestic well flow, this result cannot necessarily be extrapolated to account for the additive effect of running many wells at the same time.

Here are my concerns, in no particular order:

1. Ground surface, well logs and drawdown elevations are not provided. A report like this typically presents the data in terms of surveyed elevations related to sea level or an assumed datum. This allows more accurate comparison of wells, geology and groundwater relationships.
2. The characterization of upgradient and cross gradient wells is speculative without the elevation data.
3. Typically a study like this would be most informative with two observation wells at 90 degree angles to the pumping well. It would also be most useful if the wells were oriented in relationship to the local fracture patterns and the strike and dip of the geologic units of interest. The well locations for this study are not easily determined from the figure and these relationships not established.
4. The distance between wells was not reported. This is important to calculating drawdown influences.
5. No geologic cross sections were included. Cross sections depicting the geology interpreted from the drilling logs and indicating the depths and casing in the wells would provide more complete information.
6. The time-draw down data is not presented in graphic form. It is very difficult to determine if the drawdown during pumping is uniform or if there are sudden drops in water level that may indicate fracture flow and possible interfering connections between wells.
7. No information is provided about weather conditions preceding or during the pumping test. If not accounted for, precipitation and barometric pressure changes can influence drawdown and effect the results interpretation.
8. It is concerning that Well #5 and Well #6 experienced identical drawdown during the pumping test. Typically a non-pumping well shows a smaller drawdown than the pumping well. This may indicate that the wells are connected by a fracture. Fractures can quickly transmit contaminants over large distances. Fractures could also de-water very quickly, especially if tapped by several pumping wells, and cause wells to go dry.
9. The report mentions image well theory, however no data or analysis is provided.
10. The report does not state how pumping test discharge water was handled. Pumped water should be discharged far enough away from the wells so as not to percolate back down to the well causing recirculation and invalidating the drawdown result.
11. Well # 6 was cased to 120 ft below ground surface. Wells #5 and #29 were cased to 30 ft. No explanation is given for the rational of casing depths.
12. There is no water chemistry data provided. This is important in considering the potability of the water and possible changes in chemistry over the duration of the pumping test.
13. The calculation of drawdown of multiple wells of 4.8 feet is not supported with any calculations or assumptions.

Call me if you have questions.

Gerry

NAPIERALA CONSULTING
PROFESSIONAL ENGINEER, P.C.
SITE • DESIGN • ENGINEERING

110 FAYETTE STREET
MANLIUS, NEW YORK 13104

October 4th, 2021

Mr. Joseph Lupia and Manlius Planning Board Members
Town of Manlius
Planning Board Chairman
301 Brooklea Drive
Fayetteville, New York 13066

Re: Brandywine Estates Drinking Water Supply Evaluation

Dear Joe and Planning Board Members,

Following the review of comments made by Mr. Gerald Gould, C.P.G., P.G., & Mr. Doug Miller, P.E., regarding the drinking water supply evaluation for the Brandywine Estates project, we've prepared the following responses addressing the concerns that have recently been raised. Below is the question in italics with our team's response below.

With these responses, we would like to be on the next planning board agenda for the October 25, 2021 meeting.

1. ***Ground surface, well logs and drawdown elevations are not provided. A report like this typically presents the data in terms of surveyed elevations related to sea level or an assumed datum. This allows more accurate comparison of wells, geology, and groundwater relationships.***

   Response courtesy of David Stoner
   Ground surface elevations, well logs and drawdown data are included in the attachments to the August 11, 2021 report. A brief summary is as follows: Well #5- elevation 894, the lithology of all three wells is similar with about 20 feet of glacial till underlain by about 50 feet of shale, in turn underlain by about 190 feet of hard limestone, in turn underlain by a loose and soft limestone Depth to water pre-test 287 ft., groundwater elevation 607 ft.

   -Well #6- elevation 898, depth to water pre-test 289 ft., groundwater elevation 609 ft.
   -Well #29- elevation 920, depth to water pre-test 271 ft., groundwater elevation 649 ft.

   The data show that the groundwater elevations in Wells #5 and #6 are similar (607 and 609 ft.) and that Well #29 is higher in surface elevation and had a pretest water level that is about 40 feet higher than water levels in Wells 5 and 6.

PH 315-682-5580 • FAX 315-682-5544 • EMAIL:MNAP@NAPCON.COM

2. ***The characterization of upgradient and cross gradient wells is speculative without the elevation data.***

   Response courtesy of David Stoner
   Based on the data from the three wells the question of what is cross gradient and what is upgradient indicates that groundwater flows, generally, from south to north. Cross gradient is east and west.

   Summary Response By Matt Napierala
   As stated in Mr. Stoner's response to question 1, elevation information for each well and water surface elevations have been provided, therefore, the characterization for the upgradient and cross gradient wells is not speculative.

3. ***Typically, a study like this would be most informative with two observation wells at 90-degree angles to the pumping well. It would also be useful if the wells were oriented in relationship to the local fracture patterns and the strike and dip of the geologic units of interest. The well locations for the study are not easily determined from the figure and these relationships not established.***

   Response courtesy of David Stoner
   The study design was intended to provide an observation well cross gradient (approximately 90 degrees) and upgradient (approximately 90 degrees) from the pumping well. Due to site access difficulties, the locations of the three wells were changed from lots 1, 2 and 23 to locations on lots 5, 6 and 29. The geometry of the well locations was maintained i.e. we have two observation wells at right angles to the pumping well. The well locations and elevations are shown on the site layout figure and the well logs.

4. ***The distance between wells was not reported. This is important to calculating drawdown influence.***

   Response courtesy of David Stoner
   The distance from well 5 to well 6 is approximately 200 feet and the distance to well 29 is approximately 100 feet. These distances can be tape measured and provided to the town as necessary.

5. ***No geologic cross section were included. Cross sections depicting the geology interpreted from the drilling logs and indicating the depths and casings in the wells would provide more complete information.***

   Response courtesy of David Stoner
   Cross sections were not provided because the limited number of wells did not warrant it. Nevertheless the well logs show that the lithology is fairly uniform as described in section one above.

6. ***The time-drawdown data is not presented in graphic form. It is very difficult to determine if the drawdown during pumping is uniform or if there are sudden drops in water level that may indicate fracture flow and possible interfering connections between wells.***

Response courtesy of David Stoner

Time drawdown data was not presented in graphical form because there were 1380 data points during the pumping test. The drawdown data was included in the attachment to the report. Examination of the data from the pumping well indicates that water levels were: 0.74 ft. at 30 minutes, 1.05 ft. at 2 hours, and the maximum drawdown was at about 21.5 hours. It is hard to interpret the subtleties that might exist in the pattern of water levels with such a small amount of drawdown.

There is no doubt that the water in the Onondaga formation (the aquifer that is being used) is being carried in fractures. Based on the well logs it appears that the zone between 260 feet below ground surface and the bottom of each well is highly fractured. There is no evidence in the well logs or the pumping test results that indicate that singular fractures are conducting or storing water. The bottom 60 feet or so is described as soft and loose.

7. ***No information is provided about weather conditions preceding or during the pumping test. If not accounted for, precipitation and barometric pressure changes can influence drawdown and effect the results interpretation.***

Response courtesy of David Stoner

It is true that barometric pressure change, recharge and other factors can affect water levels in wells. The pumping test was run over a three-day period and any effect of barometric pressure change would be uniform between the three wells. It is very difficult to say what role recharge might have over a three-day period but it seems likely that a water bearing zone lying beneath glacial till and shale would not react quickly to short term recharge events.

8. ***It is concerning that Well #5 and Well #6 experienced identical drawdown during the pumping test. Typically, a non-pumping well shows smaller drawdown than the pumping well. This may indicate the wells are connected by a fracture. Fracturs can quickly transmit contaminants over large distances. Fractures could also de-water very quickly, especially if tapped by several pumping wells, and cause wells to go dry.***

Response courtesy of David Stoner

It is surprising that the drawdown in well #6 is almost as much as seen in the pumping well. It reflects the relatively high hydraulic conductivity of the formation. Concern about fractures being dewatered and wells going dry is, generally, a valid concern. There are many wells further to the south that cannot provide enough water for individual homes. In this situation the pumping well and the observation wells did not dewater during almost 24 hours of continuous pumping at a rate that exceeds what might be expected for the peak, instantaneous pumping rate. The drawdown in both well 5 and 6 stabilized before the end of the test. Well #5 discharged enough water, in less than one day, to provide an individual home with water for more than a month.

-

9. ***The report mentions image well theory, however no data or analysis is provided.***

Response courtesy of David Stoner
Drawdown of multiple wells can be estimated by superposition. Superposition is based on the concept that the aggregate drawdown is the sum of individual drawdowns. For example, if Well A is pumping at 10 gallons per minute with a drawdown of 10 feet, and Well B that is 200 feet away has a drawdown of 5 feet during the pumping of Well A then by superposition it can be estimated that with both wells pumping at 10 gallons per minute the drawdown in each well will be 15 feet. Based on the pumping test completed at Well #5. At a pumping rate and duration that far exceeds what can be expected the drawdown in wells pumping at lot 5 and 6 would be the addition of drawdowns in each well or a total of 4.48 feet. It is harder to extrapolate this further because we have no data further away. Normally the drawdown diminishes with distance so it should be expected that the drawdown on lots 7 and 8 from pumping Well #5 would be less than what is observed in the well on lot #6. Nevertheless, even if we assume that the drawdown in other cross gradient wells is additive, we would add the cumulative drawdown of four wells and the total drawdown would be 9 feet, compared to a safe yield drawdown of 23 feet.

10. ***The report does not state how pumping test discharge water was handled. Pumped water should be discharged far enough away from the wells so as not to percolate back down to the well causing recirculation and invalidating the drawdown result.***

Response courtesy of Mark Shute

The pumping test discharge water was piped approximately 80-100 feet north of Well #5. The area around Well #5 was dry throughout the test.

11. ***Well #6 was cased to 120 ft below ground surface. Wells #5 and #29 were cased to 30 ft. No explanation is given for the rational of casing depths.***

Response courtesy of Mark Shute

Between 85 – 110 ft, we encountered a fractured zone of loose limestone. We determined it may create a problem in the future with a pump installed below it and needed to be cased into the competent bedrock.

12. ***There is no water chemistry data provided. This is important in considering the potability of the water and possible changes in chemistry over the duration of the pumping test.***

Response courtesy of Mark Shute

A water analysis was conducted on the pumping well. These results were given to Dave in the same summary letter dated 7-27-21. We did not do a coliform or e. coli test. I still have the pump installed in lot #5 and can re chlorinate and get a sample if needed.

-

13. ***The calculation of drawdown of multiple wells of 4.8 feet is not supported with any calculations or assumptions.***

    Please refer to the above response for comment #9 from David Stoner regarding the calculations and assumptions made in finding of the 4.8-foot drawdown of multiple wells.

    Drawdown of multiple wells can be estimated by superposition. Superposition is based on the concept that the aggregate drawdown is the sum of individual drawdowns. For example, if Well A is pumping at 10 gallons per minute with a drawdown of 10 feet, and Well B that is 200 feet away has a drawdown of 5 feet during the pumping of Well A then by superposition it can be estimated that with both wells pumping at 10 gallons per minute the drawdown in each well will be 15 feet. Based on the pumping test completed at Well #5. At a pumping rate and duration that far exceeds what can be expected the drawdown in wells pumping at lot 5 and 6 would be the addition of drawdowns in each well or a total of 4.48 feet. It is harder to extrapolate this further because we have no data further away. Normally the drawdown diminishes with distance so it should be expected that the drawdown on lots 7 and 8 from pumping Well #5 would be less than what is observed in the well on lot #6. Nevertheless, even if we assume that the drawdown in other cross gradient wells is additive, we would add the cumulative drawdown of four wells and the total drawdown would be 9 feet, compared to a safe yield drawdown of 23 feet.

If you have any questions or if you need any other additional information, please contact us.

Respectfully submitted,

NAPIERALA CONSULTING
Professional Engineer, P.C.

Matthew R. Napierala

Matthew R. Napierala, P.E.
Managing Engineer/ President

cc: Doug Miller, P.E., Town of Manlius

From: Gerald Gould - GGG <ggould@gouldgw.com>
Sent: Friday, September 24, 2021 9:26 AM
To: Doug Miller <dougmiller@millerengineers.com>
Subject: Brandywine Estates drinking water supply evaluation

Doug,
I have reviewed David Stoner's report. I agree with his conclusion that the results appear promising, however the evidence provided is not what was promised in the proposal and lacks information I consider important to understanding the aquifer and better evaluating the effects of 34 simultaneously pumping wells. It should be noted that the test described meets NYSDOH standards for a single domestic well flow, this result cannot necessarily be extrapolated to account for the additive effect of running many wells at the same time.

Here are my concerns, in no particular order:

1. Ground surface, well logs and drawdown elevations are not provided. A report like this typically presents the data in terms of surveyed elevations related to sea level or an assumed datum. This allows more accurate comparison of wells, geology and groundwater relationships.
2. The characterization of upgradient and cross gradient wells is speculative without the elevation data.
3. Typically a study like this would be most informative with two observation wells at 90 degree angles to the pumping well. It would also be most useful if the wells were oriented in relationship to the local fracture patterns and the strike and dip of the geologic units of interest. The well locations for this study are not easily determined from the figure and these relationships not established.
4. The distance between wells was not reported. This is important to calculating drawdown influences.
5. No geologic cross sections were included. Cross sections depicting the geology interpreted from the drilling logs and indicating the depths and casing in the wells would provide more complete information.
6. The time-draw down data is not presented in graphic form. It is very difficult to determine if the drawdown during pumping is uniform or if there are sudden drops in water level that may indicate fracture flow and possible interfering connections between wells.
7. No information is provided about weather conditions preceding or during the pumping test. If not accounted for, precipitation and barometric pressure changes can influence drawdown and effect the results interpretation.
8. It is concerning that Well #5 and Well #6 experienced identical drawdown during the pumping test. Typically a non-pumping well shows a smaller drawdown than the pumping well. This may indicate that the wells are connected by a fracture. Fractures can quickly transmit contaminants over large distances. Fractures could also de-water very quickly, especially if tapped by several pumping wells, and cause wells to go dry.
9. The report mentions image well theory, however no data or analysis is provided.
10. The report does not state how pumping test discharge water was handled. Pumped water should be discharged far enough away from the wells so as not to percolate back down to the well causing recirculation and invalidating the drawdown result.
11. Well # 6 was cased to 120 ft below ground surface. Wells #5 and #29 were cased to 30 ft. No explanation is given for the rational of casing depths.
12. There is no water chemistry data provided. This is important in considering the potability of the water and possible changes in chemistry over the duration of the pumping test.
13. The calculation of drawdown of multiple wells of 4.8 feet is not supported with any calculations or assumptions.

Call me if you have questions.

Gerry

Gerald Gould, CPG, PG
Gould Groundwater Geosciences, P.C.
300 Brooklea Drive
Fayetteville, NY 13066
(315) 569-2144 cell
www.gouldgw.com

Brandywine Estates
Well Report

8/31/2021

Harrington Homes Inc.

3848 Henneberry Road

Manlius, NY 13078

NAPIERALA CONSULTING
PROFESSIONAL ENGINEER, P.C.
SITE • DESIGN • ENGINEERING

110 Fayette Street
Manlius, New York 13104

August 31st, 2021

Town of Manlius Planning Board
Town of Manlius
301 Brooklea Drive
Fayetteville, NY 13066

Re: Brandywine Estates, Phase II Well Report
3848 Henneberry Road
Jamesville, NY 13078

Dear Chairman Lupia and Board Members,

Following our last Planning Board meeting in December of 2020, Harrington Homes, LLC retained the services of DW Stoner & Associates, LLC to perform a well study and report at the proposed Brandywine Estates Phase II project site. This well study was conducted following concerns raised by the Planning Board regarding water availability and sustainability on-site for the proposed 34 lot single-family home subdivision.

As per the attached report, the results and testing conducted showed that the installation and utilization of individual water wells on this property is appropriate. Based on the attached pumping test performed at a pumping rate of 12gpm, the cumulative drawdown of multiple nearby wells was 4.8ft, or about 14% of the aquifer saturated thickness. In conclusion, all 34 lots on the project site, atop the geologic Onondaga Formation, is capable of yielding adequate volumes of water to each individual home without the risk of excessive drawdown.

If you have any questions or if you need any other additional information, please contact us.

Respectfully submitted,

NAPIERALA CONSULTING
Professional Engineer, P.C.

Matt Napierala
Matthew R. Napierala

cc:
Doug Miller P.E., Town Engineer
Mark Harrington, Harrington Homes

Enclosure

PH 315-682-5580 • FAX 315-682-5544 • EMAIL:MNAP@NAPCON.COM

DW Stoner & Associates, LLC

PO Box 164
Groton, Vermont 05046
Phone: 315-447-8733

August 11, 2021

Mr. Mark Harrington, President
Harrington Homes Inc.
3848 Henneberry Road
Manlius, New York 13078

RE: Well Installation and Testing Results
Brandywine Estates – Phase 2

Dear Mr. Harrington,

The purpose of this report is to describe the installation and testing of three wells on proposed lots 5, 6 and 29 of the Brandywine Estates Phase 2 subdivision located in Manlius NY.

Well Installation and Testing

In a workplan dated January 4, 2021 it was proposed that wells be installed on lots 1, 2 and 23 and that a pumping test be conducted by pumping well 2 at a safe yield pumping rate for 24 hours while measuring the water level in wells 1, 2 and 23. Due to access problems for these three lots it was agreed to install wells on lots 5,6 and 29 and conducting a pumping test by pumping the well on lot 5 and monitoring water levels in wells on lots 5,6 and 29 during the duration of the pumping test and for 24 hours after pumping had ceased. The configuration of wells 5,6 and 29 is similar to that of the original wells i.e. the pumping well and one of the observation wells are on the same elevation and the third well is uphill from the pumping well on the adjacent lot (cross-gradient and upgradient respectively).

Well locations are shown on the attached figure and well logs are also attached. Well installation and the pumping test were conducted by Shute's Lafayette Well Drilling in consultation with David W. Stoner, P.G.

The lithology at the three well locations is similar with about twenty feet of glacial till overlying bedrock. The top 40-50 feet of bedrock is shale of the Marcellus formation. The shale is underlain by a fairly hard and competent limestone to about 260 feet below ground surface (bgs). That limestone is underlain by a much softer, loose and fractured limestone from approximately 260 feet to the bottom of each well (323-327 ftbgs).The measured water level in each well demonstrates that the saturated thickness (water column) in each well ranges from 35 to 56 feet.

Following well installation and development (purging the well of sediment) a preliminary yield estimate indicated that a pumping rate of 12 gallons per minute would easily meet the safe yield metric of no greater than 2/3 of the available drawdown.

Of the three wells the least amount of pre-pumping standing water is 35 feet. Safe yield would be equal to a discharge rate resulting in a stabilized drawdown not exceeding 23 feet.

Pumping Test Results

A pump was set in well (lot) 5 and data loggers placed in all three wells. From July 21st to July 22 the well on lot 5 was pumped at a constant rate of 12 gallons per minute. The well was pumped continuously for 23 hours at which time the generator quit operating. The data loggers collected water levels every minute during the pumping period and every minute for 24 hours after pumping ceased. Those data are attached and the results are summarized as follows:

Well #5 (pumping well)

1. Pre- pumping test water level depth below grade- 286.47 ft
2. Maximum drawdown during the pumping test depth below grade-288.71 ft.
3. Equates to a drawdown of 2.24 ft
4. Well fully recovered 24 hours after pumping ceased

Well #29 (upgradient observation well)

1. Pre- pumping test water level depth below grade-263.18 ft
2. Maximum drawdown during the pumping test depth below grade-263.24 ft
3. Equates to a drawdown of 0.06 ft (3/4 inch)
3. Well fully recovered 24 hours after pumping test.

Well #6 (cross-gradient observation well)

1. Pre- pumping test water level depth below grade-279.19 ft
2. Maximum drawdown during the pumping test depth below grade-281.43 ft
3. Equates to a drawdown of 2.24 ft
4. Well fully recovered 24 hours after pumping test

Results and Discussion

The results of the pumping test indicate that wells installed at these depths and in this location perform far above what is needed for domestic supply wells. Pumping well #5 produced a total of 16650 gallons of water with less than 2.5 feet of drawdown, where a safe yield drawdown would be 23 feet. Based on the data collected via the pumping test the hydraulic conductivity of the aquifer was calculated, using the Thiem equation, as 1.7 meters per day, a relatively high rate of flow. The drawdown in the observation wells was less than 2.5 feet on well #6 and negligible in well # 29. It is very unlikely that even the maximum instantaneous demand from a home built in this neighborhood would reach 12 gallons per minute and unlikely that these homes would consume more than 500 gallons per day. Applying image well theory to the test results can provide a worst case projection of the influence of one pumping well on another. In simple

but conservative terms we can project that at a sustained pumping rate of 12 gallons per minute the combined drawdown of well #5 with well #6 pumping at the same would produce a drawdown of about 4.8 feet in well #6. This amount of drawdown is about 12 percent of the water column in well #6. The projected drawdown produced by pumping well #5 on well 29 is negligible.

The well logs and testing information indicate that this aquifer is unconfined; that is the static water level in each well is below the top of the more permeable limestone unit. The natural hydraulic gradient is from south to north. For an unconfined aquifer the amount of water stored in the aquifer is equivalent to the effective porosity which Bouwer (Groundwater Hydrology, 1978) estimates for this type of aquifer as being between 10 and 20 percent. For frame of reference an aquifer with this amount of storage (say 10 percent) has about 32000 gallons of water in each acre foot of aquifer.

It should be noted that this productive aquifer is part of the Onondaga formation which dips gently to the south and is overlain by the relatively impermeable Marcellus shale. The presence of the Marcellus shale offers some protection for the Onondaga from surface activities. However this highly productive aquifer is accessible in a zone that runs east-west about 250 miles but is only 2-5 miles from north to south (USGS).

The Harrington Homes development appears to be located to take advantage of this productive zone. The results of this testing indicate that the installation and use of individual water wells on this property will be appropriate. Based on the pumping test performed at a pumping rate of 12gpm it is calculated that the cumulative drawdown of multiple wells will be 4.8 feet or about 14% of the aquifer saturated thickness throughout the proposed subdivision. While an instantaneous demand of 12 gpm for a single home is possible the average daily demand will probably less than 500 gallons. The pumping test indicates that wells installed on all 34 lots, completed in the Onondaga Formation will be capable of yielding adequate water to individual homes without excessive drawdown. I would be happy to answer any questions that you or the Manlius Planning Board might have about this report.

Very Truly Yours,

David W. Stoner, P.G.

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Appendix A

Site Plan

PROJECT TITLE:
BRANDYWINE ESTATES PHASE 2
HENNEBERRY ROAD
TOWN OF MANLIUS — ONONDAGA COUNTY, NY

PREPARED FOR:
HARRINGTON HOMES
3848 HENNEBERRY ROAD
JAMESVILLE, NY 13078

SHEET TITLE:
WELL WATER STUDY PLAN

NO.	REVISION/ISSUE	DATE

PREPARED BY:
NAPIERALA CONSULTING
PROFESSIONAL ENGINEER, P.C.
SITE • DESIGN • ENGINEERING
110 FAYETTE STREET
MANLIUS, NEW YORK 13104
email: MNAP@NAPCON.COM
PH: (315) 682-5580 FAX: (315) 682-5544

PRELIMINARY
NOT FOR CONSTRUCTION

PLAN SEAL BY:
NEAL H. ZINSMEYER, JR., P.E.
NYS REGISTRATION # 087211

PROJECT NO. 20-1906
DATE 26 AUG 2021
SCALE 1" = 80'

SHEET
SK-8

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NAPIERALA CONSULTING
PROFESSIONAL ENGINEER, PC
IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS THEY ARE ACTING UNDER THE DIRECTION OF A LICENSED ARCHITECT, ENGINEER, LANDSCAPE ARCHITECT OR LAND SURVEYOR TO ALTER IN ANY WAY AN ITEM BEARING THE SEAL OF THE LICENSED PERSON.
ITEMS MARKED WITH A "STEP" TYPE DOCUMENT IS RECORDED BY LAW TO APPLY TO ALL ITEMS ON THIS DOCUMENT. ADDITIONS, ALTERES BY PLOTTERS BY ANY OR HER OTHER THAN THE ORIGINAL PRODUCER OF THE ALTERATIONS.

Appendix B

Well Reports

(1) COUNTY Onondaga

(2) TOWN Manlius town

DEPARTMENT OF ENVIRONMENTAL CONSERVATION

WATER WELL COMPLETION REPORT

(3) DEC Well Number: OD3152

(4) OWNER: Harrington Homes
Same as owner address

(5) ADDRESS: 3848 Henneberry Rd
Manlius, NY

(6) LOCATION OF WELL (See Instructions on Reverse): Brandywine Estates Lot 5 Manlius, NY

(7) LATITUDE LONGITUDE AND METHOD USED (8) TAX MAP NO
☑ GPS ☐ Map Lat: 42.9884 Long -76.007267

(9) DEPTH OF WELL BELOW LAND SURFACE (feet)	(10) DEPTH TO GROUNDWATER LAND SURFACE (feet)	DATE MEASURED	(12) FLOWING?
323	300	6/9/2021	NO

CASINGS

(13) DIAMETER	6 in	in	in	in
(14) LENGTH	30 ft	ft	ft	ft

(15) GROUT TYPE / SEALING: Bentonite/slurry

(16) GROUT / SEALING INTERVAL (feet): 0 30

SCREENS

(17) MAKE & MATERIAL

(18) SLOT SIZE

(19) DIAMETER	in	in	in	in
(20) LENGTH	ft	ft	ft	ft

(21) DEPTH TO TOP OF SCREEN FROM TOP OF CASIN (Feet)

YIELD TEST

(22) DATE: 6/10/2021

(23) DURATION OF TEST: 2Hr 0 Min

(24) LIFT METHOD: Pump X Air Lift Bail

(25) STABILIZED DISCHARGE (GPM): 20

(26) STATIC LEVEL PRIOR TO TEST: 287

(27) MAXIMUM DRAWDOWN (Stabilized)

(28) RECOVERY (Time in Hours/minutes): Hr Min

(29) Was the water produced during the test discharged away from the immediate area? YES ☐ NO ☑

DRILLER INFORMATION

(30) METHOD OF DRILLING: X Rotary Cable Tool Other

(31) USE OF WATER: Domestic

(32) DATE DRILLING WORK STARTED: 6/9/2021

(33) DATE DRILLING WORK COMPLETED: 6/10/2021

(34) DATE REPORT FILED: 7/23/2021

(35) REGISTERED COMPANY: Shute's LaFayette Well Drilling LLC

(35) DEC REGISTRATION NO: NYRD 10613

(37) REGISTERED COMPANY ADDRESS: 5954 US Route 20 LaFayette NY 13084

(38) CERTIFIED DRILLER (Print name): Jeff Shute

(44) CERTIFIED DRILLER SIGNATURE: Jeff M. Shute

PUMP INSTALLATION

(40) PUMP INSTALLED: Yes ☐ No ☑

(41) DATE

(42) TYPE

(43) MAKE

(44) MODEL

(45) MAXIMUM CAPACITY (GPM)

(46) PUMP INSTALLATION LEVEL FROM TOP OF CASING (Feet)

(47) DATE REPORT FILED

(48) REGISTERED COMPANY

(49) DEC REGISTRATION NO: NYRD

(37) REGISTERED COMPANY ADDRESS

WELL LOG

DEPTH TO BEDROCK (ft below land surface): 22

GROUND ELEVATION (ft above sea level): 894

TOP OF CASING (ft above (+) or below (-) ground surface): +2

TOP OF WELL

0	5	Brown Hardpan Hard
5	22	Brown Clay Gravel Stones Medium
22	28	Black Shale Soft
28	60	Black Shale Medium
60	260	Gray Limestone Hard
260	300	Brown Limestone Soft
300	323	Brown Limestone Loose

(1) COUNTY Onondaga

(2) TOWN Manlius town

DEPARTMENT OF ENVIRONMENTAL CONSERVATION

WATER WELL COMPLETION REPORT

(3) DEC Well Number OD3153

(4) OWNER Harrington Homes
Same as owner address

(5) ADDRESS 3848 Henneberry Rd
Manlius, NY

(6) LOCATION OF WELL (See Instructions on Reverse
Brandywine Estates Lot 6 Manlius, NY

(7) LATITUDE LONGITUDE AND METHOD USED (8) TAX MAP NO
☑ GPS ☐ Map Lat: 42.9885 Long: -76.007833

(9) DEPTH OF WELL BELOW LAND SURFACE (feet)	(10) DEPTH TO GROUNDWATER LAND SURFACE (feet)	DATE MEASURED	(12) FLOWING?
327	303	6/11/2021	NO

CASINGS

(13) DIAMETER	6 in	in	in	in
(14) LENGTH	120 ft	ft	ft	ft

(15) GROUT TYPE / SEALING: Bentonite/slurry

(16) GROUT / SEALING INTERVAL (feet) 5 115

SCREENS

(17) MAKE & MATERIAL

(18) SLOT SIZE

(19) DIAMETER	in	in	in	in
(20) LENGTH	ft	ft	ft	ft

(21) DEPTH TO TOP OF SCREEN FROM TOP OF CASIN (Feet)

YIELD TEST

(22) DATE 6/11/2021

(23) DURATION OF TEST 2Hr 0 Min

(24) LIFT METHOD Pump X Air Lift Bail

(25) STABILIZED DISCHARGE (GPM) 20

(26) STATIC LEVEL PRIOR TO TEST 289

(27) MAXIMUM DRAWDOWN (Stabilized)

(28) RECOVERY (Time in Hours/minutes) Hr Min

(29) Was the water produced during the test discharged away from the immediate area? YES ☐ NO ☑

DRILLER INFORMATION

(30) METHOD OF DRILLING X Rotary Cable Tool Other

(31) USE OF WATER Domestic

(32) DATE DRILLING WORK STARTED 6/11/2021

(33) DATE DRILLING WORK COMPLETED 6/11/2021

(34) DATE REPORT FILED 7/23/2021

(35) REGISTERED COMPANY Shute's LaFayette Well Drilling LLC

(35) DEC REGISTRATION NO NYRD 10613

(37) REGISTERED COMPANY ADDRESS
5954 US Route 20 LaFayette NY 13084

(38) CERTIFIED DRILLER (Print name) Jeff Shute

(44) CERTIFIED DRILLER SIGNATURE Jeff Shute

PUMP INSTALLATION

(40) PUMP INSTALLED Yes ☐ No ☑

(41) DATE

(42) TYPE

(43) MAKE

(44) MODEL

(45) MAXIMUM CAPACITY (GPM)

(46) PUMP INSTALLATION LEVEL FROM TOP OF CASING (Feet)

(47) DATE REPORT FILED

(48) REGISTERED COMPANY

(49) DEC REGISTRATION NO NYRD

(37) REGISTERED COMPANY ADDRESS

WELL LOG

DEPTH TO BEDROCK 21 ft below land surface

GROUND ELEVATION 898 ft above sea level

TOP OF CASING +2 ft above (+) or below (-) ground surface

TOP OF WELL

0	6	Brown Hardpan Hard
6	21	Brown Clay & Stones Medium
21	65	Black Shale Soft
65	85	Gray Limestone Hard
85	110	Gray Limestone Loose
110	262	Gray Limestone Hard
262	303	Brown Limestone Soft
303	327	Brown Limestone Loose

(1) COUNTY Onondaga

(2) TOWN Manlius town

DEPARTMENT OF ENVIRONMENTAL CONSERVATION

WATER WELL COMPLETION REPORT

(3) DEC Well Number: OD3154

(4) OWNER: Harrington Homes
Same as owner address

(5) ADDRESS: 3848 Henneberry Rd
Manlius, NY

(6) LOCATION OF WELL (See Instructions on Reverse): Brandywine Estates Lot 29 Manlius, NY

(7) LATITUDE LONGITUDE AND METHOD USED: ☑ GPS ☐ Map Lat: 42.9881 Long: -76.007167

(8) TAX MAP NO

(9) DEPTH OF WELL BELOW LAND SURFACE (feet)	(10) DEPTH TO GROUNDWATER LAND SURFACE (feet)	DATE MEASURED	(12) FLOWING?
327	299	6/12/2021	NO

CASINGS

(13) DIAMETER	6 in	in	in	in
(14) LENGTH	30 ft	ft	ft	ft

(15) GROUT TYPE / SEALING: Bentonite/slurry

(16) GROUT / SEALING INTERVAL (feet): 0 30

SCREENS

(17) MAKE & MATERIAL

(18) SLOT SIZE

(19) DIAMETER	in	in	in	in
(20) LENGTH	ft	ft	ft	ft

(21) DEPTH TO TOP OF SCREEN FROM TOP OF CASIN (Feet)

YIELD TEST

(22) DATE: 6/12/2021

(23) DURATION OF TEST: 2Hr 0 Min

(24) LIFT METHOD: Pump X Air Lift Bail

(25) STABILIZED DISCHARGE (GPM): 20

(26) STATIC LEVEL PRIOR TO TEST: 271

(27) MAXIMUM DRAWDOWN (Stabilized)

(28) RECOVERY (Time in Hours/minutes): Hr Min

(29) Was the water produced during the test discharged away from the immediate area? YES ☐ NO ☑

DRILLER INFORMATION

(30) METHOD OF DRILLING: X Rotary Cable Tool Other

(31) USE OF WATER: Domestic

(32) DATE DRILLING WORK STARTED: 6/12/2021

(33) DATE DRILLING WORK COMPLETED: 6/12/2021

(34) DATE REPORT FILED: 7/23/2021

(35) REGISTERED COMPANY: Shute's LaFayette Well Drilling LLC

(36) DEC REGISTRATION NO: NYRD 10613

(37) REGISTERED COMPANY ADDRESS: 5954 US Route 20 LaFayette NY 13084

(38) CERTIFIED DRILLER (Print name): Jeff Shute

(44) CERTIFIED DRILLER SIGNATURE*: Jeff Shute

PUMP INSTALLATION

(40) PUMP INSTALLED: Yes ☐ No ☑

(41) DATE

(42) TYPE

(43) MAKE

(44) MODEL

(45) MAXIMUM CAPACITY (GPM)

(46) PUMP INSTALLATION LEVEL FROM TOP OF CASING (Feet)

(47) DATE REPORT FILED

(48) REGISTERED COMPANY

(49) DEC REGISTRATION NO: NYRD

(37) REGISTERED COMPANY ADDRESS

WELL LOG

DEPTH TO BEDROCK (ft below land surface): 21

GROUND ELEVATION (ft above sea level): 920

TOP OF CASING (ft above (+) or below (-) ground surface): +2

TOP OF WELL

0	8	Brown Hardpan Medium
8	21	Brown Clay & Stones Hard
21	70	Black Shale Soft
70	268	Gray Limestone Hard
268	299	Brown Limestone Soft
299	327	Brown Limestone Loose

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Appendix C

Raw Well Drawdown Data

Data file for DataLogger.
==========
COMPANY : <Company name>
COMP.STATUS: Done (Barometer: Baro | Serial number: U0191 | Sample Interval: 01 Minute)
DATE : 28/07/2021
TIME : 08:38:19
FILENAME : C:\Users\shute\Desktop\CSV\Well Lot5 Brandywine_210728083819_R1358.CSV
CREATED BY : Diver-Office 11.2.0.0
========== BEGINNING OF DATA ==========
[Logger settings]
Instrument type =Micro-Diver=15
Status =Started =0
Serial number =..00-R1358 215.
Instrument number = UTC-4
=0
Location =Well Lot5 Brandywine
Sample period =S60
Sample method =T
Number of channels =2
[Channel 1]
Identification =WATER HEAD (TOC-CL)
Reference level =13.1234 ft
Range =352.6903 ft
Master level =0 m
Altitude =0 ft
[Channel 2]
Identification =TEMPERATURE
Reference level =-4.000 °F
Range =180.000 °F

[Series settings]
Serial number =..00-R1358 215.
Instrument number = UTC-4
Location =Well Lot5 Brandywine
Sample period =00 00:00:60 0
Sample method =T
Start date / time =00:00:17 21/07/21
End date / time =00:48:16 23/07/21
[Channel 1 from data header]
Identification =WATER HEAD (TOC-CL)
Reference level =13.1234 ft
Range =352.6903 ft
Master level =0 m
Altitude =0 ft
[Channel 2 from data header]
Identification =TEMPERATURE

Reference level =-4.000 °F
Range =180.000 °F

Date/time	Water hea	Temperature[°F]
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########	286.7181	48.536
########	286.7347	48.548
########	286.77	48.566
########	286.8288	48.59
########	286.8405	48.602
########	286.8405	48.602
########	286.8993	48.614
########	286.9111	48.626
########	286.9521	48.626
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########	287.147	48.728
########	287.152	48.728
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END OF DATA FILE OF DATALOGGER FOR WINDOWS

Data file for DataLogger.
==========
COMPANY : <Company name>
COMP.STATUS: Done (Barometer: Baro | Serial number: U0191 | Sample Interval: 01 Minute)
DATE : 28/07/2021
TIME : 08:38:20
FILENAME : C:\Users\shute\Desktop\CSV\Well Lot6 Brandywine_210728083819_L8333.CSV
CREATED BY : Diver-Office 11.2.0.0
========== BEGINNING OF DATA ==========
[Logger settings]
Instrument type =Micro-Diver=15
Status =Started =0
Serial number =..00-L8333 215.
Instrument number = UTC-4
=0
Location =Well Lot6 Brandywine
Sample period =S60
Sample method =T
Number of channels =2
[Channel 1]
Identification =WATER HEAD (TOC-CL)
Reference level =13.1234 ft
Range =352.6903 ft
Master level =0 m
Altitude =0 ft
[Channel 2]
Identification =TEMPERATURE
Reference level =-4.000 °F
Range =180.000 °F

[Series settings]
Serial number =..00-L8333 215.
Instrument number = UTC-4
Location =Well Lot6 Brandywine
Sample period =00 00:00:60 0
Sample method =T
Start date / time =00:00:17 21/07/21
End date / time =00:52:16 23/07/21
[Channel 1 from data header]
Identification =WATER HEAD (TOC-CL)
Reference level =13.1234 ft
Range =352.6903 ft
Master level =0 m
Altitude =0 ft
[Channel 2 from data header]
Identification =TEMPERATURE

Reference level =-4.000 °F
Range =180.000 °F

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END OF DATA FILE OF DATALOGGER FOR WINDOWS

Data file for DataLogger.
==========
COMPANY : <Company name>
COMP.STATUS: Done (Barometer: Baro | Serial number: U0191 | Sample Interval: 01 Minute)
DATE : 28/07/2021
TIME : 08:25:53
FILENAME : C:\Users\shute\Desktop\CSV\Well Lot29 Brandywin_210728082553_R3296.CSV
CREATED BY : Diver-Office 11.2.0.0
========== BEGINNING OF DATA ==========
[Logger settings]
Instrument type =Micro-Diver=15
Status =Started =0
Serial number =..00-R3296 215.
Instrument number = UTC-4
=0
Location =Well Lot29 Brandywin
Sample period =S60
Sample method =T
Number of channels =2
[Channel 1]
Identification =WATER HEAD (TOC-CL)
Reference level =13.1234 ft
Range =352.6903 ft
Master level =0 m
Altitude =0 ft
[Channel 2]
Identification =TEMPERATURE
Reference level =-4.000 °F
Range =180.000 °F

[Series settings]
Serial number =..00-R3296 215.
Instrument number = UTC-4
Location =Well Lot29 Brandywin
Sample period =00 00:00:60 0
Sample method =T
Start date / time =00:00:17 21/07/21
End date / time =00:55:16 23/07/21
[Channel 1 from data header]
Identification =WATER HEAD (TOC-CL)
Reference level =13.1234 ft
Range =352.6903 ft
Master level =0 m
Altitude =0 ft
[Channel 2 from data header]
Identification =TEMPERATURE

Reference level =-4.000 °F
Range =180.000 °F

Date/time	Water hea	Temperature[°F]
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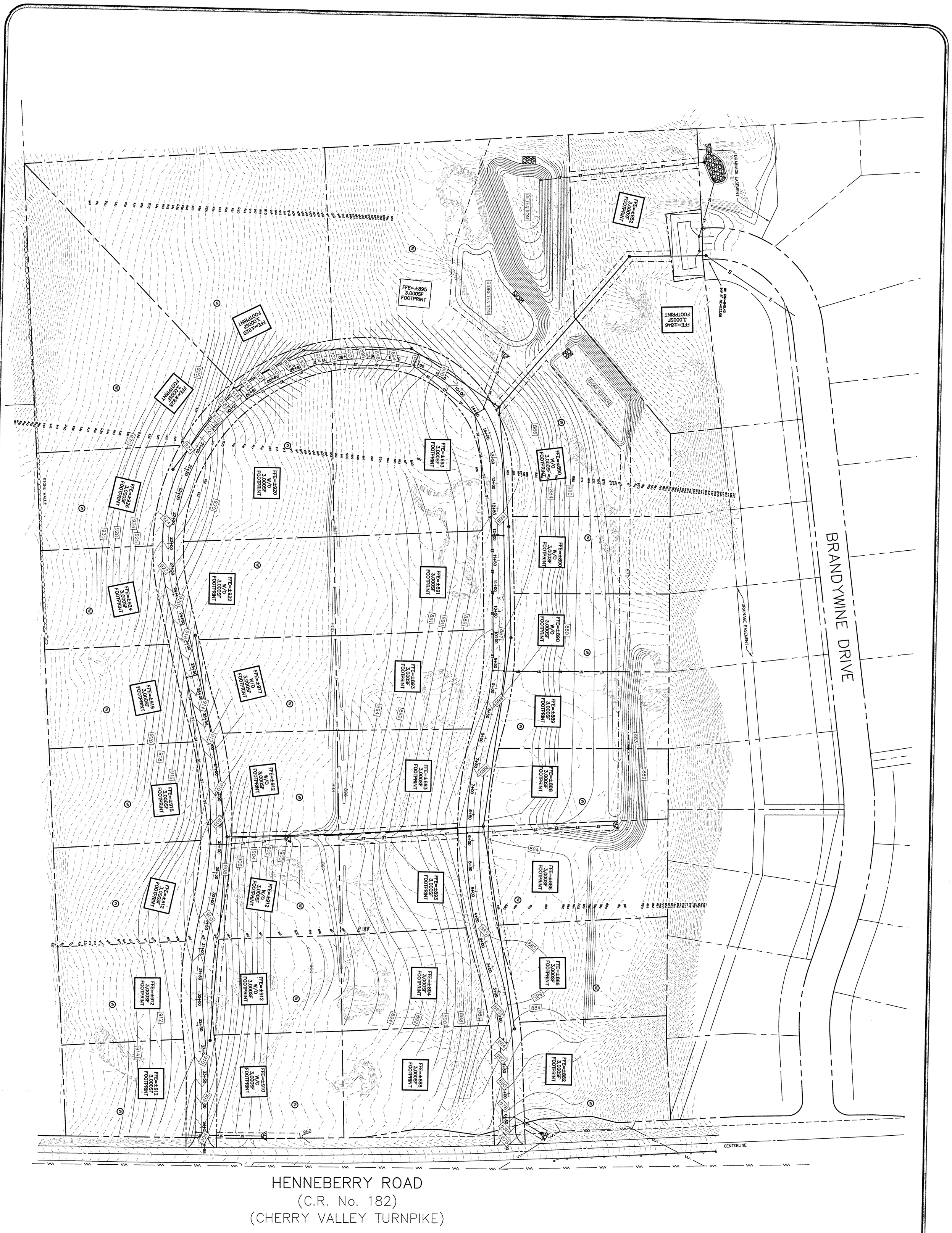

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PROFESSIONAL ENGINEER, PC

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ANY LICENSEE WHO ALTERS THIS DOCUMENT IS REQUIRED BY LAW TO AFFIX HIS OR HER SEAL AND THE NOTATION "ALTERED BY" FOLLOWED BY HIS OR HER SIGNATURE AND SPECIFIC DESCRIPTION OF THE ALTERATIONS

PRELIMINARY
NOT FOR CONSTRUCTION

PLAN SEAL BY:
NEAL H. ZINSMEYER, JR., P.E.
NYS REGISTRATION # 087211

GRAPHIC SCALE
(IN FEET)
1 inch = 80 ft
0 80' 160'

RECEIVED
DEC 03 2020
By

SHEET
SK-8

PROJECT NO.
20-1906

DATE
03 DEC 2020

SCALE
1" = 80'

PREPARED BY:
NAPIERALA CONSULTING
PROFESSIONAL ENGINEER, P.C.
SITE • DESIGN • ENGINEERING
110 FAYETTE STREET
MANLIUS, NEW YORK 13104
email: MNAP@NAPCON.COM
PH: (315) 682-5580 FAX: (315) 682-5544

NO.	REVISION/ISSUE	DATE

SHEET TITLE:
PRELIMINARY LAYOUT PLAN

PROJECT TITLE:
BRANDYWINE ESTATES PHASE 2
HENNEBERRY ROAD
TOWN OF MANLIUS ONONDAGA COUNTY, NY

PREPARED FOR:
HARRINGTON HOMES
3848 HENNEBERRY ROAD
JAMESVILLE, NY 13078

Onondaga County Planning Board

GML 239 Referral Notice

Referring Municipality/Board: Town of Manlius Planning Board

Referral Contact: Lisa Beeman

Contact Email/Phone: lbeeman@townofmanlius.org 315-637-8619

Type of Referral: ☒ General Municipal Law §239 Review ☐ Informal Review ☐ 3-Mile Limit Review

1. Project Applicant: Harrington Homes **2. Site Address:** Brandywine off of Henneberry Road

3. Tax ID Number(s): 109.-02-07.1 **4. Total Acres:** 54

5. Current Zoning: R-1 **6. Current Land Use:** Vacant

7. Project Description: Create a 34 - Lot Subdivision of single family homes

Please indicate the existing AND proposed water and wastewater service. The notes field is available to provide further details which may better describe the proposed conditions, particularly for projects with multiple lots/structures.

Water Service *Provider:* _____

8a. Existing:
- ☐ Municipal
- ☐ Individual Well
- ☒ None

8b. Proposed:
- ☐ New or Additional Municipal Connection
- ☒ New or Additional Individual Well
- ☐ No Change

Wastewater Service *Provider:* _____

9a. Existing:
- ☐ Municipal Sanitary Sewer
- ☐ Individual Septic System
- ☒ None

9b. Proposed:
- ☒ New or Additional Municipal Connection
- ☐ New or Additional Individual Septic System
- ☐ No Change

Notes: _____

10. ☒ **OCPB Jurisdiction (c**heck ALL that apply and specify)

☐ **Text Adoption/Amendment** -or- ☒ **Site is located within 500 feet of:**

- ☒ a municipal boundary: Town of Pompey
- ☒ a state or county thruway/highway/roadway: State Route 173
- ☐ an existing or proposed state or county park/recreation area: _____
- ☐ an existing or proposed county-owned stream or drainage channel: _____
- ☐ a parcel containing a state or county-owned building/institution: _____
- ☐ a farm operation located in a New York State Agricultural District (include Ag Data Statement pursuant to AML §305-a)

Referred Action(s)

If referring multiple actions related to the same project, identify the referring municipal board if different from above.

11. ☐ **Text Adoption** -or- ☐ **Text Amendment** **Referring Board:** _____

(Includes: adoption of and amendments to comprehensive plans, local laws, zoning ordinances, subdivision regulations)

Please enclose a document with changes tracked OR the existing and proposed text with a summary of the proposed change(s).

Summary of the proposed additions/changes: _____

12. ☐ **Zone Change** (Includes map amendments) **Referring Board:**

Proposed Zoning District: _____ Number of Acres Affected: _____

Purpose and Proposed Use: _____

13. ☐ **Site Plan** -or- ☐ **Project Site Review** **Referring Board:**

Proposed Use/Improvements: _____

14. ☐ **Special Permit** **Referring Board:**

Section of local zoning code that requires a special permit for this use: _____

Purpose: _____

15. ☒ **Preliminary Subdivision** -or- ☐ **Final Subdivision** **Referring Board:** Town of Manlius Planning Board

Name of Subdivision: Harrington Homes at Brandywine

Number of Proposed Lots and Use Type (residential and/or commercial): 34 Lots

Is this a cluster subdivision pursuant to Section 278 of the New York State Town Law? ☐ Yes ☒ No

16. ☐ **Use Variance** **Referring Board:**

Section(s) of local zoning code to which the variance is being sought: _____

Describe how the proposed project varies from the above code section: _____

17. ☐ **Area Variance** **Referring Board:**

Section(s) of local zoning code to which the variance is being sought: _____

Describe how the proposed project varies from the above code section: _____

18. ☐ **Other Authorization** **Referring Board:**

Indicate the referable action and provide any other applicable details: _____

SEQR Information

Action (check one):

☐ Type I
☐ Type II
☐ Unlisted Action

Determination of Significance (if known):

☐ Positive Declaration – Draft EIS Required
☐ Conditional Negative Declaration (for Unlisted Actions only)
☐ Negative Declaration
☐ No Finding (Type II Actions only)

Lead Agency (if known): _____ **Date Lead Agency Assigned:** _____

In order for a referral to be considered complete, *the Type of Action must be classified, and the appropriate EAF (Short or Long EAF) must be filled out as required under SEQR*, except in the case of Type II Actions which do not require an EAF. If the municipality possesses or will be requiring additional materials in order to make a determination under SEQR, or if a determination has been made, those materials are also required for the referral to be considered complete.

Attachments

☒ Survey ☒ Subdivision Plat ☒ EAF/Related Materials ☐ Laws/Texts
☒ Site Plan ☒ Local Application Form ☐ Ag Data Statement ☐ Other _____

This referral, as required by NYS GML §239 l, m & n, includes all materials required by and submitted to the referring body as an application on the proposed action, including all materials required by the referring body in order to make its determination of significance pursuant to SEQRA.

Lisa Beeman/ Clerk	315-637-8619 lbeeman@townofmanlius.org	09-23-2020
Name/Title of Person Completing This Form	*Phone/Email*	*Transmittal Date*

J.Ryan McMahon II
County Executive

Onondaga County Planning Board

RESOLUTION OF THE
ONONDAGA COUNTY PLANNING BOARD

Meeting Date: October 14, 2020

OCPB Case # S-20-51

WHEREAS, the Onondaga County Planning Board, pursuant to General Municipal Law, Section 239 l, m and n, has considered and reviewed the referral for a PRELIMINARY SUBDIVISION from the Town of Manlius Planning Board at the request of Harrington Homes for the property located at Brandywine Drive off Henneberry Road; and

WHEREAS, General Municipal Law Section 239-n allows the County Planning Board to review the approval of subdivisions and the site is located within 500 feet of Route 173, a state highway, Henneberry Road (Route 182), a county highway, and the municipal boundary between the Town of Manlius and the Town of Pompey; and

WHEREAS, the applicant is proposing to subdivide a 54-acre parcel into 34 single-family residential lots in a Residential (R-1) zoning district; and

WHEREAS, the site is located along the boundary between the Towns of Manlius and Pompey and just southwest of the Village boundary; surrounding land uses include low-density residential and large wooded lots to the west and south transitioning to higher density residential subdivisions occurring at the outskirts of the Village; the site abuts single-family dwellings on roughly 1-acre lots to the north; these lots have frontage on Brandywine Drive, a local road that dead ends at a hammerhead on the site; and

WHEREAS, aerial imagery dated May 2020 shows the vacant site has additional frontage on Henneberry Road, a county road, and appears to contain open fields and some wooded areas; there is an existing farm access road onto Henneberry Road; ADVISORY NOTE: per the Onondaga County Department of Transportation, all existing or proposed driveways on Henneberry Road must meet Department requirements; and

WHEREAS, the Preliminary Plan dated April 28, 2020 shows the proposed 34-lot subdivision for Harrington Homes at Brandywine will include (12) proposed lots ranging in size from 1.04 to 1.55 acres as part of Phase 1, (10) proposed lots ranging in size from 1.10 to 3.30 acres as part of Phase 2, and (12) proposed lots ranging in size from 0.98 to 1.29 acres as part of Phase 3; and

WHEREAS, the submitted Preliminary Overall Grading Plan dated September 17, 2020 shows 3,000 sf building footprints on all lots except (1) 5,000 sf building footprint on Lot 10 (2.3 acres); the hammerhead at the end of Brandywine Drive will be converted to a circle; proposed Lots 8 and 9 are shown to have frontage on the circle; all other lots will front on a proposed u-shaped road with two access points onto Henneberry Road; no connections between Brandywine Drive and Henneberry Road are shown; and

WHEREAS, per the submitted Environmental Assessment Form (EAF) dated September 11, 2020, 20 acres of the site will be physically disturbed by the proposed project; stormwater management systems will be designed to current standards; a

1100 Civic Center, 421 Montgomery Street, Syracuse, NY 13202 (315) 435-2611, Fax (315) 435-2439

E-mail Address: countyplanning@ongov.net

Stormwater Pollution Prevention Plan (SWPPP) was included with the referral materials; the plans show a proposed storm sewer network with outlet to three proposed detention basins, one near the northern lot line and two at the interior of the new road; two of the detention basins will have an adjacent bioretention area; the storm sewer lines appear to occur within a utility easement or the road right-of-way; detention basins and bioretention areas are shown to occur within access and maintenance easements on the proposed lots;
ADVISORY NOTES: per the Onondaga County Department of Transportation, additional stormwater runoff into the county's drainage system is prohibited; any project that cumulatively disturbs one acre or more of land must be covered under the NYS SPDES Permit, and the municipality is advised to ensure that the applicant has obtained the appropriate permits from the NYS Department of Environmental Conservation prior to municipal approval; and

WHEREAS, per the plans, drinking water services for each proposed lot will be provided by an individual well, except for Lots 8 and 9, which have access to public drinking water provided by OCWA; per OCWA and the Onondaga County Health Department, public drinking water service to the remaining lots is restricted by the elevation of the site, which would require an increase in water pressure via a pumping station or a new water tank;
ADVISORY NOTE: the applicant is advised to contact OCWA's Engineering Department to determine the activities and structures permitted within OCWA easements/right-of-ways, water availability and service options, obtain hydrant flow test information, evaluate backflow prevention requirements, and/or request that the Authority conduct hydrant flow testing to assess fire flow availability; and

WHEREAS, the plans show a Town sewer line along Brandywine Drive that will be extended to serve the new parcels; new sewer lines are shown to occur in a sanitary sewer easement or the road right-of-way; the site is located in the Meadowbrook-Limestone Wastewater Treatment Plant service area; per the Onondaga County Department of Water Environment Protection, the submitted project is located in an area designated as flow constrained or impacted by excessive wet weather flow or is tributary to a Combined Sewer Overflow (CSO);
ADVISORY NOTES: the Onondaga County Department of Water Environment Protection asks that the applicant contact the Department's Flow Control office to determine sewer availability and capacity; the applicant is also advised to develop a 2 gallon to 1 gallon sanitary flow offset plan/project in coordination with the municipal engineer; and

WHEREAS, the site may contain the Indiana bat or Northern long-eared bat, or their associated habitats, which have been listed by the state or federal government as threatened or endangered animal species (per EAF Mapper); impacts to bat species are often associated with tree clearing and from aerial imagery it appears that there are some wooded areas on the site;
ADVISORY NOTE: per the NYS Department of Environmental Conservation (DEC), if the site contains a threatened or endangered species and/or associated habitat, and the project requires review under the State Environmental Quality Review Act (SEQRA), a request for a project screening should be submitted to the New York Natural Heritage Program or to the regional DEC Division of Environmental Permits office; and

WHEREAS, the site or a portion of it is located in or adjacent to an area designated as sensitive for archaeological sites on the NYS Historic Preservation Office archaeological site inventory (per EAF Mapper);
ADVISORY NOTE: the applicant and/or municipality is advised to contact the NYS Historic Preservation Office to determine if the project should be submitted to the Office for review as part of the State Environmental Quality Review (SEQR) process; and

WHEREAS, ADVISORY NOTE: per GML § 239-nn, the legislative body or other authorized body having jurisdiction in a municipality shall give notice to an adjacent municipality when a hearing is held by such body relating to a subdivision, site plan, special use permit, or a use variance on property that is within five hundred feet of an adjacent municipality; such notice shall be given by mail or electronic transmission to the clerk of the adjacent municipality at least ten days prior to any such hearing; and

NOW THEREFORE BE IT RESOLVED, that the Onondaga County Planning Board recommends the following MODIFICATION(S) to the proposed action prior to local board approval of the proposed action:

Per the Onondaga County Department of Transportation, all access to the proposed lots must come from Brandywine Drive or the proposed access road. No driveways on Henneberry Road will be permitted for individual lots. The applicant must coordinate plans for the new access road with the Department, and submit a copy of the Stormwater Pollution Prevention Plan (SWPPP) for review. The municipality must ensure any mitigation as may be determined by the Department is reflected on the project plans prior to, or as a condition of, municipal approval.

The Board also offers the following comments:

1. The Town and applicant are encouraged to cluster the proposed lots to help minimize infrastructure costs and allow for the retention of existing wooded areas for shared green space, which may help to preserve open space, protect habitats, screen the development from Henneberry Road, and ensure buffering for neighboring residential lots.

2. For better access management and to better meet the needs of local emergency service providers, the Town is encouraged to require an interconnected road network to allow for vehicle and pedestrian movement between the new development and Brandywine Drive to the north. The Town may also wish to consider opportunities for future connections to parcels to the south and west given any potential for development.

3. The Town and applicant are advised that compliance with Section 10 of the Onondaga County Right of Way Designation Law (Local Law # 5-1972) is required for any new streets/street names, and the subdivision map must be modified to reflect approved street names prior to subdivision filing. The applicant should contact Rachel Woods at the Syracuse-Onondaga County Planning Agency at

rachelwoods@ongov.net for approval of street names and addresses prior to filing the subdivision.

4. The Board recommends that the Town ensure appropriate and sustained maintenance and funding mechanisms are in place for future ownership and care of stormwater management facilities to serve the subdivision. Potential strategies may include separating such areas onto non-residential parcels, to be owned and maintained by a Homeowner's Association (HOA), land trust, or the Town.

5. Per the Onondaga County Health Department, establishment of individual wells will require a series of well tests to be drilled and tested prior to the Department endorsing the proposed subdivision plan.

Daniel Cupoli, Chairman
Onondaga County Planning Board
Transmittal Date: 10-14-2020

GML 239 Report of Final Action

NYS GML § 239-m.6. and n.6. require the referring body to file a report of the final action it has taken on a referred matter with the county planning agency within 30 days after the final action (separate from the minutes taken at the meeting). A referring body which acts contrary to a County Planning Board recommendation of MODIFICATION or DISAPPROVAL of a referred matter shall also set forth the reasons for the contrary action in such report.

This section to be completed by the Syracuse-Onondaga County Planning Agency

To: Onondaga County Planning Board **From:** Town of Manlius Planning Board

Fax: 435-2439 **Phone:** 435-2611

Re:

Applicant: Harrington Homes
Address: at Brandywine Drive off Henneberry Road
Referral Type: PRELIMINARY SUBDIVISION
OCPB Date: October 14, 2020
OCPB Action: Modification
OCPB Case #: S-20-51

The local board took the following action regarding the above referenced referral (Check one box. If checking Other, please specify the final action taken. Use the space at the bottom of the report to identify reasons if acting contrary to the OCPB recommendation.):

☐ Approved the proposed action with regard to the OCPB's No Position or No Position with Comment.
☐ Approved the proposed action as modified by the OCPB.
☐ Approved the proposed action contrary to some of the modifications recommended by the OCPB.*
☐ Approved the proposed action contrary to all of the modifications recommended by the OCPB.*
☐ Approved the proposed action contrary to the disapproval recommended by the OCPB.*

☐ Disapproved the proposed action with regard to the OCPB's no position or no position with comment.
☐ Disapproved the proposed action with regard to the recommended modification(s) by the OCPB.
☐ Disapproved the proposed action as recommended and for reasons set forth by the OCPB.
☐ Disapproved the proposed action as recommended but for reasons other than those set forth by the OCPB. (Please list reasons below for local disapproval.)

☐ Other _____

Local Board Date: _____

*List reasons for acting contrary to the OCPB recommendation and include a copy of the local board resolution. Attach additional reasons on a separate sheet of paper as necessary.

_____
_____
_____
_____

PRELIMINARY STORMWATER POLLUTION PREVENTION PLAN

For the:

Proposed Brandywine Estates – Phase 2
Henneberry Road
Town of Manlius

Prepared for:

HARRINGTON HOMES

Your Builder for Life

Harrington Homes, Inc
3848 Henneberry Road
Jamesville, NY 13078

Prepared by:

NAPIERALA CONSULTING
PROFESSIONAL ENGINEER, P.C.
SITE • DESIGN • ENGINEERING
110 FAYETTE STREET
MANLIUS, NEW YORK 13104
Telephone: (315) 682-5580
Fax: (315) 682-5544

Project No. 20-1906

September 2020

DRAFT

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EXECUTIVE SUMMARY

A. Purpose

The following Stormwater Pollution Prevention Plan (SWPPP) has been developed to control stormwater runoff and pollutants from a site during and after construction activities. The objective of this SWPPP is to comply with the NYSDEC SPDES Stormwater Permit from Construction Activities by planning and implementing standard design practices.

B. Project Description

The ±54 acre property is located on the west side of Henneberry Road in the Town of Manlius, Onondaga County, NY. This project consists of the subdivision and development of 34 single family homes. The development will also include necessary amenities such as public street(s), public/private utility extensions/connections, and applicable stormwater management facilities.

C. Stormwater Practices

Stormwater practices are categorized as either temporary construction measures or permanent operation measures. The temporary measures that will be used on this site for erosion and sediment control include (but are not limited to): stabilized construction entrance, silt fencing, and temporary sediment basins. The permanent stormwater practices to be installed are a series of vegetated swales, two bioretention areas, and four above ground grass-line detention basins which will provide water quality, runoff reduction, and storage for quantity control. All practices, both the temporary construction measures and the permanent operation measures, have been designed in accordance with the established standards.

D. Water Quality Treatment

The water quality volume treatment characteristics are summarized below. The entire water quality descriptions and calculations are further detailed in Section III.E and F.

Water Quality Volume	
Required WQv (ac-ft)	**Total Provided WQv (ac-ft)**
0.431	0.427

E. Runoff Reduction Volume (RRv)

The NYSDEC regulation requires all construction projects that disturb greater than one acre of land to provide runoff reduction through the implementation of green infrastructure practices. Runoff reduction volume for this project is achieved using vegetated swales and bioretention areas. This volume is summarized below and further detailed in Section III.D, E, and F.

Runoff Reduction Volume	
Required RRv (ac-ft)	**Total Provided RRv (ac-ft)**
0.051	0.143

F. Stormwater Quantity

The impacts to stormwater runoff quantity (i.e. peak flows) will be mitigated in the aboveground grass-lined detention basins throughout the site. The detention basins will be constructed with sufficient volume to store additional runoff from the site and discharge it in a controlled manner. The chart below summarizes the stormwater discharges from the site and is further detailed in Section III.G and H.

	Existing Peak Runoff Rate (cfs)			**Proposed Peak Runoff Rate (cfs)**		
Point of Study	Pt. 1B	Pt. 2	Pt. 3	Pt. 1B	Pt. 2	Pt. 3
10-Year Storm	69.99	7.68	9.35	28.86	1.33	5.84
100-Year Storm	163.03	18.46	22.06	101.76	3.01	12.42

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Section I. SCOPE

A. PURPOSE

Napierala Consulting, Professional Engineer, P.C., has prepared this Stormwater Pollution Prevention Plan (SWPPP) in compliance with the New York State Department of Environmental Conservation (NYSDEC) State Pollutant Discharge Elimination System (SPDES) Construction General Permit governing stormwater discharges during construction. The contractor's participation and adherence to this plan is mandatory. Non-compliance with the plan is subject to various remedies including, without limitation, monetary set-offs, withholding payments, reimbursement for costs, expenses (including reasonable attorney's fees), fines and civil penalties incurred and/or liquidated damages. This section provides a descriptive explanation of the Stormwater Pollution Prevention Plan and required contractor participation.

B. SPDES GENERAL PERMIT GP-0-20-001

Regulations enacted by the New York State Department of Environmental Conservation require permitting for the discharge of stormwater from construction activities on sites where an area of one acre or more of soil disturbance is proposed. To comply with these regulations, the developer of the site must request coverage under the NYSDEC SPDES General Permit for Stormwater Discharges from Construction Activity (GP-0-20-001). In order to obtain coverage under the General Permit a Stormwater Pollution Prevention Plan (SWPPP) for the site must be prepared following the requirements of the New York State Stormwater Management Design Manual and the New York State Standards and Specifications for Erosion and Sediment Control.

The NOI, the SWPPP, and any amendments to the SWPPP, as well as any reports required by the SPDES General Permit for Stormwater Discharges from Construction Activity, must also be submitted concurrently to the local governing body and any other authorized agency having jurisdiction or regulatory control over the construction project.

C. RESPONSIBILITIES OF THE OWNER

The owner/operator shall 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. The owner/operator shall identify the contractor(s) and subcontractor(s) that will be responsible for constructing the post-construction stormwater management practices included in the SWPPP. The owner/operator shall have each of the contractors and subcontractors identify at least one person from their company that will be responsible for implementation of the SWPPP. The owner/operator shall ensure that at least one trained contractor is on site on a daily basis when soil disturbance activities are being performed. The owner/operator shall have a qualified inspector conduct site inspections.

D. RESPONSIBILITIES OF THE CONTRACTOR

The contractor shall manage the discharge of stormwater from the site in accordance with the NYSDEC SPDES General Permit for Stormwater Discharges from Construction Activity. The owner shall be responsible for conducting the stormwater management practices in accordance with the permit. The contractor shall be responsible for providing qualified inspectors to conduct the inspections required by the SWPPP. The contractor shall be responsible for any enforcement action taken or imposed by federal, state, or local agencies, including the cost of fines, construction delays, and remedial actions resulting from the contractor's failure to comply with the permit provisions. It shall be the responsibility of the contractor to make any changes to the SWPPP necessary when the contractor or any of his subcontractors elects to use borrow or fill or material storage sites, either contiguous to or remote from the construction

site, when such sites are used solely for this construction site. Such sites are considered to be part of the construction site covered by the permit and this SWPPP. Off-site borrow, fill, or material storage sites which are used for multiple construction projects are not subject to this requirement, unless specifically required by state or local jurisdictional entity regulations. The contractor should consider this requirement in negotiating with earthwork subcontractors, since the choice of an off-site borrow, fill, or material storage site may impact their duty to implement, make changes to, and perform inspections required by the SWPPP for the site.

The SWPPP shall provide forms for both the general contractor and subcontractor(s) identifying the company name, business address and telephone number along with the responsible person for the contractor and all subcontractors' who will implement the measures identified in the SWPPP. **The general contractor shall sign the "General Contractor's Certification" and all subcontractors shall sign the "Subcontractor's Certification",** verifying they have been instructed on how to comply with and fully understand the requirements of the NYSDEC and SWPPP. **This certification must be signed, by a fully qualified individual on behalf of each entity, prior to the beginning of any construction activities and shall be filed in the projects SWPPP.**

The SWPPP is meant to be a working document that shall be maintained at the site of the construction activities at all times throughout the project, shall be readily available upon request by the operator's personnel or NYSDEC or any other agency with regulatory authority over storm water issues, and shall be kept on-site until the site complies with the Final Stabilization section of this document. **A sign or other notice must be posted near the main entrance of the construction site which contains a completed NOI, the location of the SWPPP and the name and phone number of a contact person responsible for scheduling SWPPP viewing times, and any other state specific requirements.**

E. NOTICE OF INTENT

The operator has petitioned the NYSDEC for the stormwater discharges during construction at this site to be covered by the NYSDEC SPDES General Permit for Stormwater Discharges from Construction Activity. A **Notice of Intent** (NOI) to be covered under this permit has been filed by the operator. The signatory on the NOI must sign all documents (i.e., inspection reports) associated with the SWPPP. If the signatory chooses not to sign all documents, he/she must designate a duly authorized representative to sign all relevant documents. This designation must be made in writing and be included in the SWPPP. The duly authorized representative may be either a named individual or any individual occupying a named position. Additionally, the written designation must be submitted to the NYSDEC.

F. STORMWATER INSPECTIONS

1. Inspection Procedures

Inspections of the erosion control practices are required every seven days by a qualified professional. All inspections will continue until the site complies with the final stabilization section of this document. **Weekly Inspections must be conducted by a "Qualified Professional". "Qualified Professional" means a person knowledgeable in the principles and practice of erosion and sediment controls, such as a licensed Professional Engineer (PE), Certified Professional in Erosion and Sediment Control (CPESC), or soil scientist.** Each inspection must be followed up by a report documenting the inspector's findings and request the required maintenance and/or repair for the erosion and sedimentation control measures. It is imperative that the contractor documents the inspection and maintenance of all erosion and sedimentation control measures as soon as possible after the inspection and/or maintenance have been completed. These records are used to prove that the required inspection and maintenance were performed. The records shall be placed in the SWPPP. In addition to inspection and maintenance reports, records should be kept of the construction activities that occur on the site. The operator shall post at the site, in a publicly-accessible location, a summary of the site inspection activities on a monthly basis.

2. Record Keeping

The operator shall also prepare a written summary of its status with respect to compliance with this

general permit at a minimum frequency of every three months during which coverage under the NYSDEC SPDES General Permit for Stormwater Discharges from Construction Activity exists. The summary should address the status of achieving each component of the SWPPP. The reports shall be signed by the signatory of the NOI or a duly-authorized person and be retained at the construction site.

The contractor shall retain copies of the SWPPP, all reports and data for a minimum of five (5) years after the project. The following list identifies the required inspection and maintenance documentation that must be maintained by the contractor under this SWPPP.

- Inspection Report
- Stabilization Schedule
- Implementation Schedule
- Status Report

G. SWPPP MODIFICATIONS

The inspection report should also identify if any revisions to the SWPPP are warranted due to unexpected conditions. The SWPPP is meant to be a dynamic working guide that is to be kept current and amended whenever:

- The NYSDEC provides notification that the SWPPP does not comply with the minimum permit requirements.
- The design, construction, operation, or maintenance of the site changes in a way which significantly affects the potential for the discharge of pollutants or when the plan proves to be ineffective in eliminating or significantly minimizing pollutant discharges
- Within seven (7) calendar days of knowledge of a reportable release.

Any such changes to the SWPPP must be made in writing within seven (7) days of the date such modification or amendment is made. The contractor's failure to monitor or report deficiencies to the operator will result in the contractor being liable for fines and construction delays resulting from any federal, state, or local agency enforcement action.

H. FINAL STABILIZATION AND TERMINATION OF PERMIT COVERAGE

A site can be considered stabilized when all soil disturbing activities have been completed and a uniform perennial vegetative cover with a density of 80% over the unpaved areas and areas not covered by permanent structures has been established or equivalent permanent stabilization measures have been established and the facility no longer discharges stormwater associated with construction activities, and a **Notice of Termination** (NOT) form has been filed by the operator(s) with the NYSDEC. Prior to filing of the Notice of Termination, the operator shall have the qualified professional perform a final site inspection. The qualified professional shall certify that the site has undergone final stabilization using either vegetative or structural stabilization methods and that all temporary erosion and sediment controls (such as silt fence) not needed for long-term erosion control have been removed. The filing of the NOT terminates coverage under the General Permit and terminates the contractor's responsibility to implement the SWPPP, but the requirements of the SWPPP, including periodic inspections, must be continued until the NOT is filed. Upon achieving this milestone, the contractor shall also submit "Final Stabilization Certification/Termination Checklist". Final payment and/or the release of any retainer will be withheld until all provisions of the SWPPP have been submitted, completed and accepted by the operator.

Section II. SITE DESCRIPTION

A. PROJECT NAME AND LOCATION

Harrington Home, Inc
Brandywine Estates, Phase 2
Henneberry Road
Town of Manlius
Onondaga County, New York

UTM Coordinates from NYSDEC Interactive Map: E: 417962; N: 4759972
NYSDEC Region 7

The ±54 acre property is located on the west side of Henneberry Road in the Town of Manlius, Onondaga County, NY. Figure 1 shows the project location on a street map and Figure 2 shows an aerial image of the proposed site in its existing condition.

B. OWNER/OPERATOR NAME AND ADDRESS

Harrington Homes, Inc
3848 Henneberry Road
Jamesville, NY 10378

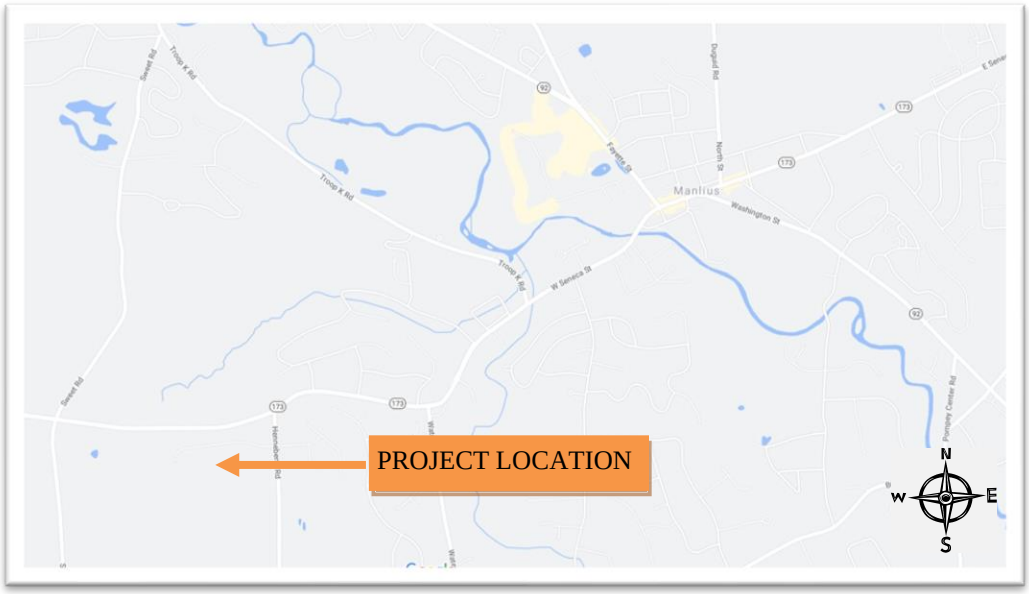


Figure 1: Site Location Map

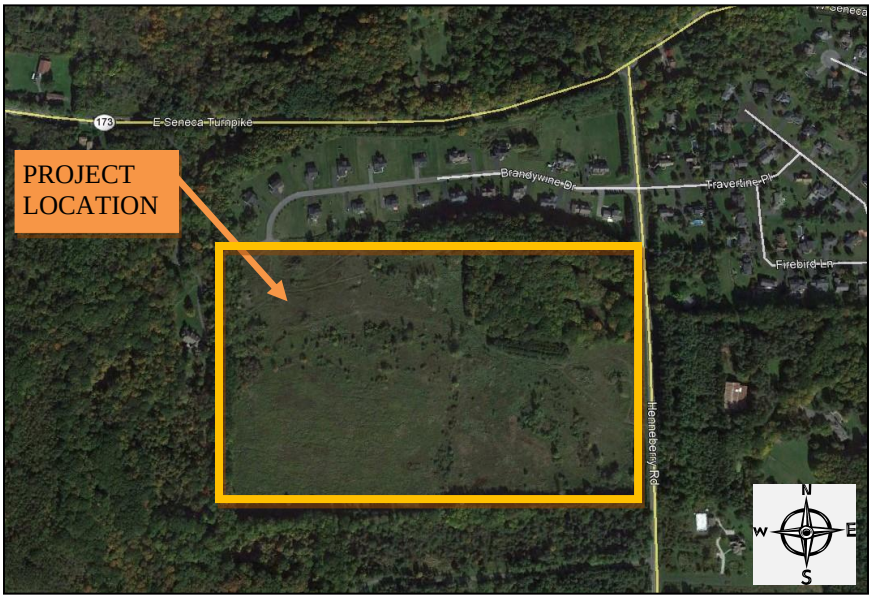


Figure 2: Proposed Site Aerial Image - Google Earth

C. PROJECT DESCRIPTION

The ±54 acre property is located on the west side of Henneberry Road in the Town of Manlius, Onondaga County, NY. This project consists of the subdivision and development of 34 single family homes. The development will also include necessary amenities such as public street(s), public/private utility extensions/connections, and applicable stormwater management facilities.

D. RECEIVING WATERS

Runoff from the site generally flows to the north toward Limestone Creek. This site is within a regulated MS4 (municipal separate storm sewer system). Figure 3 shows the project site location in relation to certain environmental boundaries using the NYSDEC Environmental Resource Mapper. The NYSDEC Environmental Resource Mapper shows that no regulated wetlands are within the vicinity of the project.

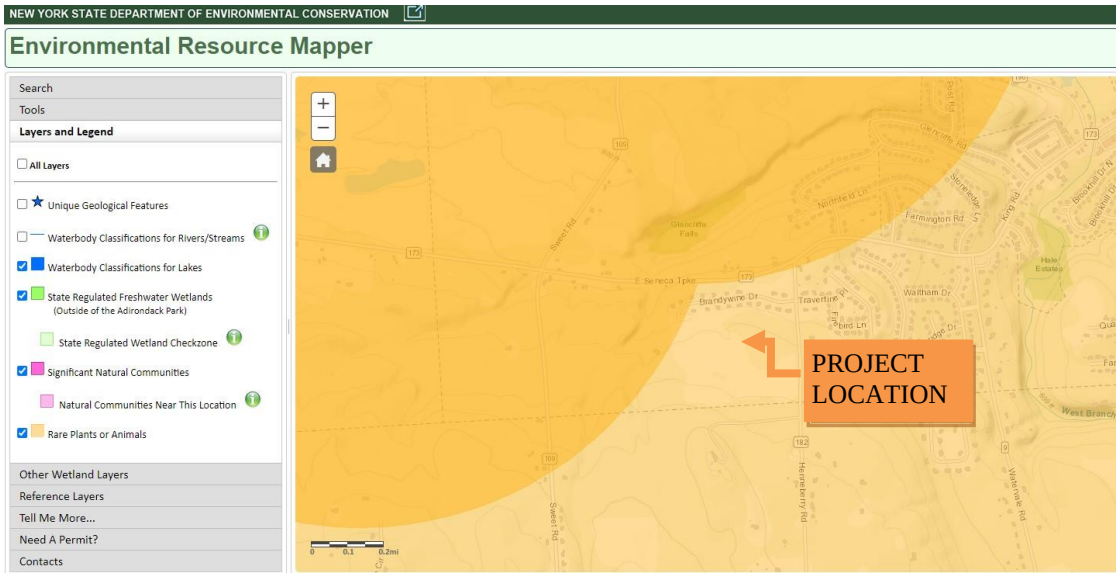


Figure 3: NYS DEC Environmental Resource Mapper

E. ENDANGERED OR THREATENED SPECIES

The NYS DEC Environmental Resource Mapper does not identify the site as containing any rare significant natural communities but is within the check zone for rare plants or animals. The site has been previously disturbed and therefore will not have an impact on plant or animal species but we have reached out to Natural Heritage for confirmation.

F. FEDERAL AND STATE HISTORIC PRESERVATION

The SPDES (State Pollutant Discharge Elimination System) GP-0-20-001 requires that the discharge from construction activities shall not influence properties listed as or eligible for listing on the State or National Register of Historic Places. Figure 4 shows the SHPO (State Historic Preservation) map which indicates the project is not within an archeological check zone.

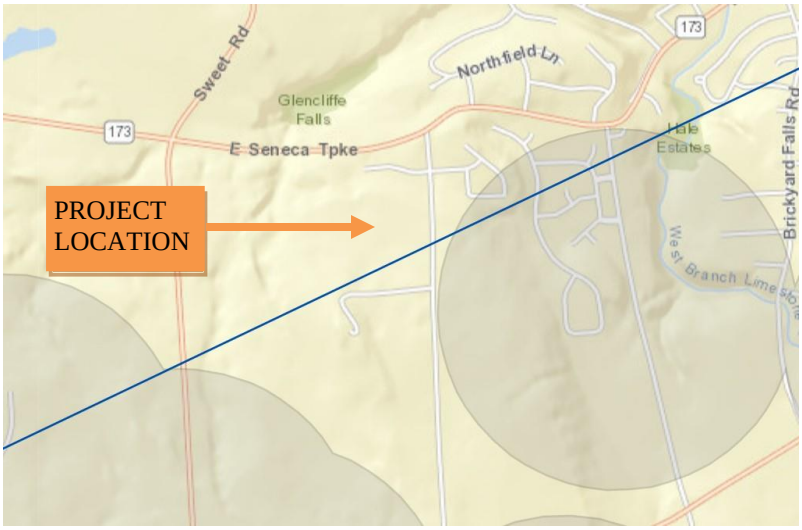


Figure 4: State Historic Preservation Office Map

G. FEMA

Based on local GIS mapping, there are no floodplain/floodway boundaries on this property, as shown on Figure 5 below. This is also confirmed on the site survey by Ianuzi and Romans Land Surveying, P.C., noting the project is in Zone X.

Figure 5: Onondaga County GIS Mapping

Section III. STORMWATER MANAGEMENT

A. METHODOLOGY

1. Hydrologic Conditions

The peak runoff rates for the site were calculated for the existing and proposed hydrologic conditions using HydroCAD software. The HydroCAD program uses the standard SCS TR-55 Curve Number Method for calculation of the time of concentration, composite curve number, and peak runoff rates for the drainage area(s) based on input by the user. The input data was taken from soil maps, detailed topographic and utility survey information, rainfall distribution maps, and aerial images. The required Water Quality Volume (WQ_v) was calculated in accordance with the New York State Stormwater Management Design Manual. The Channel Protection Volume (Cp_v) was calculated based on the release of the 1-year storm runoff volume over a 24-hour period. The hydrologic conditions are used to assess the impacts to the runoff characteristics and to design appropriate measures to mitigate these impacts. The NYS SPDES General Permit for Stormwater Discharges from Construction Activity requires that a stormwater mitigation system meet the following five design criteria.

a. Water Quality Volume: The system must capture and treat 90% of the average annual runoff volume.
b. Runoff Reduction Volume: The system must apply green infrastructure techniques and Stormwater Management Practices to replicate pre-development hydrology.
c. Provide 24-hour extended detention of the runoff from the one-year, 24-hour rainfall event.
d. Attenuation of the post-development 10-year, 24-hour peak discharge rate to predevelopment levels.
e. Attenuation of the post-development 100-year, 24-hour peak discharge rate to predevelopment levels.

2. Rainfall Information

The following table shows the rainfall values used in the design of the stormwater mitigation basin. These values are taken from rainfall distribution maps provided by the Northeast Regional Climate Center and the New York State Stormwater Management Design Manual, which can be seen on the following page. These values are applied to a Type II 24-hour rainfall distribution in the modeling of the watersheds using the HydroCAD program.

Table 1: Rainfall Information

Precipitation Event	Rainfall in inches
90% Rainfall (WQ_v)	1.0
1-Yr, 24-Hr (Cp_v)	2.04
10-Yr, 24-Hr (Q_p)	3.43
50-Yr, 24-Hr	4.94
100-Yr, 24-Hr (Q_f)	5.78

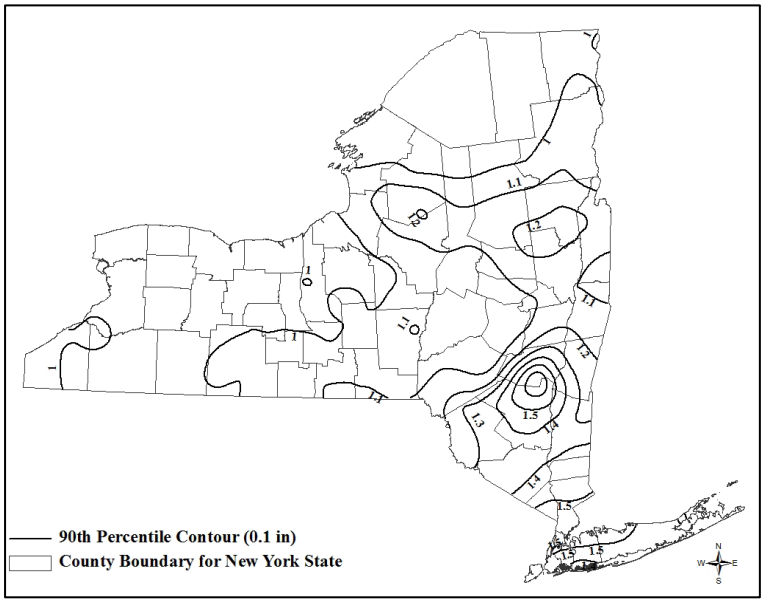


Figure 6: New York State 90% Rainfall Map

Extreme Precipitation Tables

Northeast Regional Climate Center

Data represents point estimates calculated from partial duration series. All precipitation amounts are displayed in inches.

Smoothing	Yes
State	New York
Location	
Longitude	76.007 degrees West
Latitude	42.988 degrees North
Elevation	0 feet
Date/Time	Thu, 20 Aug 2020 10:25:27 -0400

Extreme Precipitation Estimates

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr
1yr	0.28	0.43	0.53	0.69	0.86	1.06	**1yr**	0.75	0.96	1.21	1.45	1.73	2.04	2.29
2yr	0.33	0.50	0.63	0.82	1.04	1.28	**2yr**	0.89	1.16	1.44	1.73	2.04	2.39	2.68
5yr	0.39	0.61	0.76	1.02	1.31	1.61	**5yr**	1.13	1.44	1.83	2.17	2.54	2.93	3.31
10yr	0.44	0.70	0.88	1.20	1.55	1.93	**10yr**	1.34	1.69	2.19	2.59	3.00	3.43	3.88
25yr	0.53	0.84	1.07	1.48	1.96	2.44	**25yr**	1.69	2.10	2.76	3.25	3.73	4.22	4.80
50yr	0.60	0.97	1.24	1.74	2.34	2.93	**50yr**	2.02	2.48	3.32	3.88	4.41	4.94	5.63
100yr	0.70	1.13	1.46	2.06	2.80	3.51	**100yr**	2.42	2.94	3.96	4.60	5.21	5.78	6.62
200yr	0.80	1.31	1.69	2.43	3.35	4.20	**200yr**	2.89	3.47	4.74	5.48	6.15	6.77	7.78
500yr	0.98	1.61	2.09	3.04	4.25	5.33	**500yr**	3.67	4.35	5.99	6.88	7.65	8.35	9.65

Figure 7: Northeast Regional Climate Center Design Storms

3. Soil Information

The majority of the soils within the project site area consist of Aurora silt loam and Angola-Darien silt loams which are classified as Hydrologic Soil Group D. This indicates that the site should have low transmissive soils if undeveloped. The NRCS Soil Survey Map is shown in Figure 8 below and the soil descriptions can be reviewed in Appendix C.

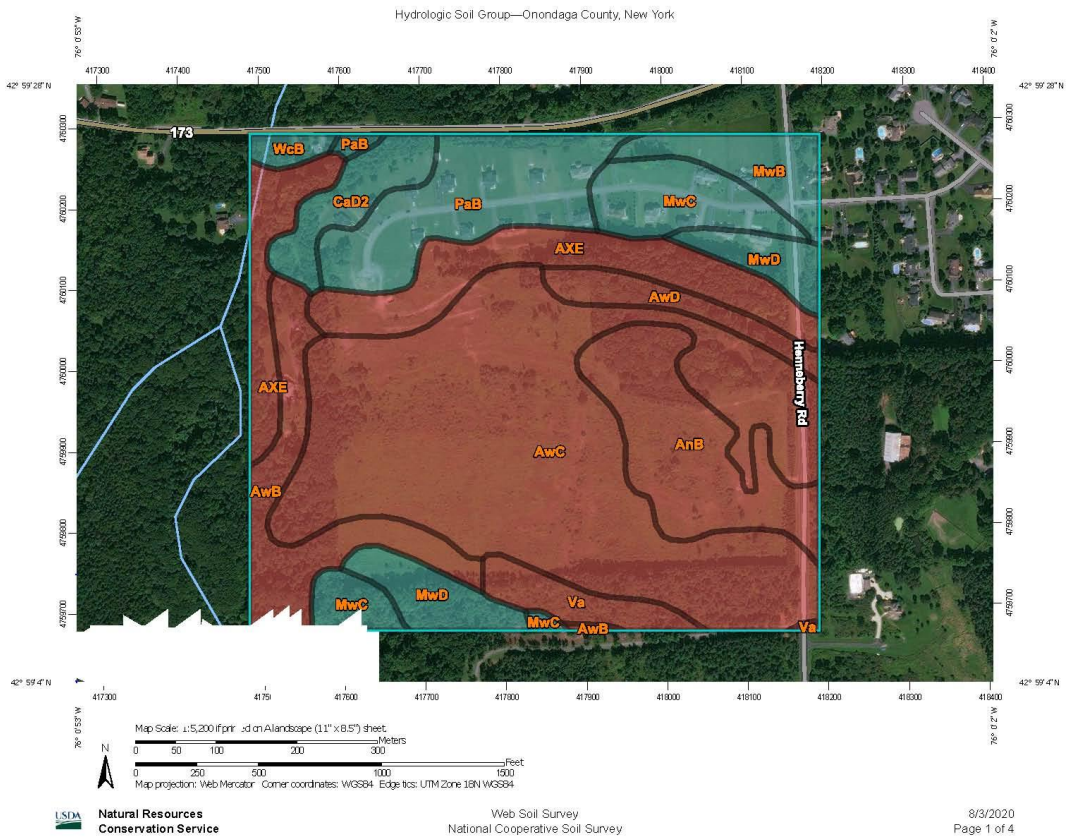


Figure 8: Project Site NRCS Soil Survey Map

B. EXISTING CONDITIONS

The existing project drainage area consists of approximately ±56 acres of mixed woods, brush, and grass area located on the west side of Henneberry Road and to the south of the Brandywine Road subdivision. The only impervious area in the existing drainage area is the hammerhead at the end of Brandywine Drive to the northwest. The entirety of the subject site slopes generally towards the north at grades varying between ±3% and 13%. The overall drainage area has three main points of study at which the peak runoff rates for pre and post-development conditions were analyzed. Point of Study 1 is split into two drainage areas: DA-1, which drains to Point 1A, and DA-2, which drains to Point 1B. These two points combine at a common drainage channel offsite to the west, and are therefore being treated as a common point of study in an effort to be more conservative. DA-3 and DA-4 drain to Point 2 and Point 3, respectively.

DA-1 includes a significant offsite wooded area to the south of the project site. This area sheet flows to the existing grass area on-site before being channelized in a drainage ditch that flows from east to west across the width of the project site. This ditch discharges to an offsite drainage ditch to the west of the subject site at Point 1A before combining with the discharge of Point 1B downstream of the project site.

Table 2: Existing Drainage Area 1 Curve Number Calculation

Area (ac)	CN	Description
12.250	77	Woods, Good, HSG D
28.140	80	>75% Grass cover, Good, HSG D
40.390	79	Weighted Average
40.390		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.0	100	0.0600	0.10		**Sheet Flow, Sheet Flow** Woods: Light underbrush n= 0.400 P2= 2.39"
3.6	885	0.0650	4.10		**Shallow Concentrated Flow, Shallow** Unpaved Kv= 16.1 fps
2.2	1,127	0.0080	8.44	135.03	**Channel Flow, Swale** Area= 16.0 sf Perim= 8.0' r= 2.00' n= 0.025 Earth, clean & straight
21.8	2,112	Total			

DA-2 includes wooded, grass, and brush area that drain to the northeast to Point 1B. There is a series of existing drainage swales that channelize flow towards this point of study. This area is located to the north of the existing drainage ditch that cuts through the site and includes the hammerhead at the end of Brandywine Drive.

Table 3: Existing Drainage Area 2 Curve Number Calculation

Area (ac)	CN	Description
0.650	77	Woods, Good, HSG D
4.040	80	>75% Grass cover, Good, HSG D
0.070	98	Paved parking, HSG D
4.760	80	Weighted Average
4.690		98.53% Pervious Area
0.070		1.47% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.3	100	0.0650	0.16		**Sheet Flow, Sheet Flow** Grass: Dense n= 0.240 P2= 2.39"
0.5	144	0.0833	4.65		**Shallow Concentrated Flow, Shallow** Unpaved Kv= 16.1 fps
0.6	726	0.0440	21.93	307.08	**Channel Flow, Swale** Area= 14.0 sf Perim= 6.0' r= 2.33' n= 0.025 Earth, clean & straight
11.4	970	Total			

DA-3 consists of a significant portion of wooded area and grass area on the north side of the subject site. This portion drains to Point 2 which is a drainage structure locate within a drainage easement on the southern boundary of the existing Brandywine subdivision. Flow from this structure enters a conveyance system which drains towards the XXXX.

Table 4: Existing Drainage Area 3 Curve Number Calculation

Area (ac)	CN	Description
3.330	77	Woods, Good, HSG D
2.740	80	>75% Grass cover, Good, HSG D
6.070	78	Weighted Average
6.070		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.5	100	0.0400	0.13		**Sheet Flow, Sheet Flow** Grass: Dense n= 0.240 P2= 2.39"
14.2	555	0.0170	0.65		**Shallow Concentrated Flow, Shallow** Woodland Kv= 5.0 fps
1.5	281	0.0360	3.05		**Shallow Concentrated Flow, Shallow** Unpaved Kv= 16.1 fps
0.2	280	0.1210	20.51	205.13	**Channel Flow, Swale** Area= 10.0 sf Perim= 5.0' r= 2.00' n= 0.040 Earth, dense weeds
28.4	1,216	Total			

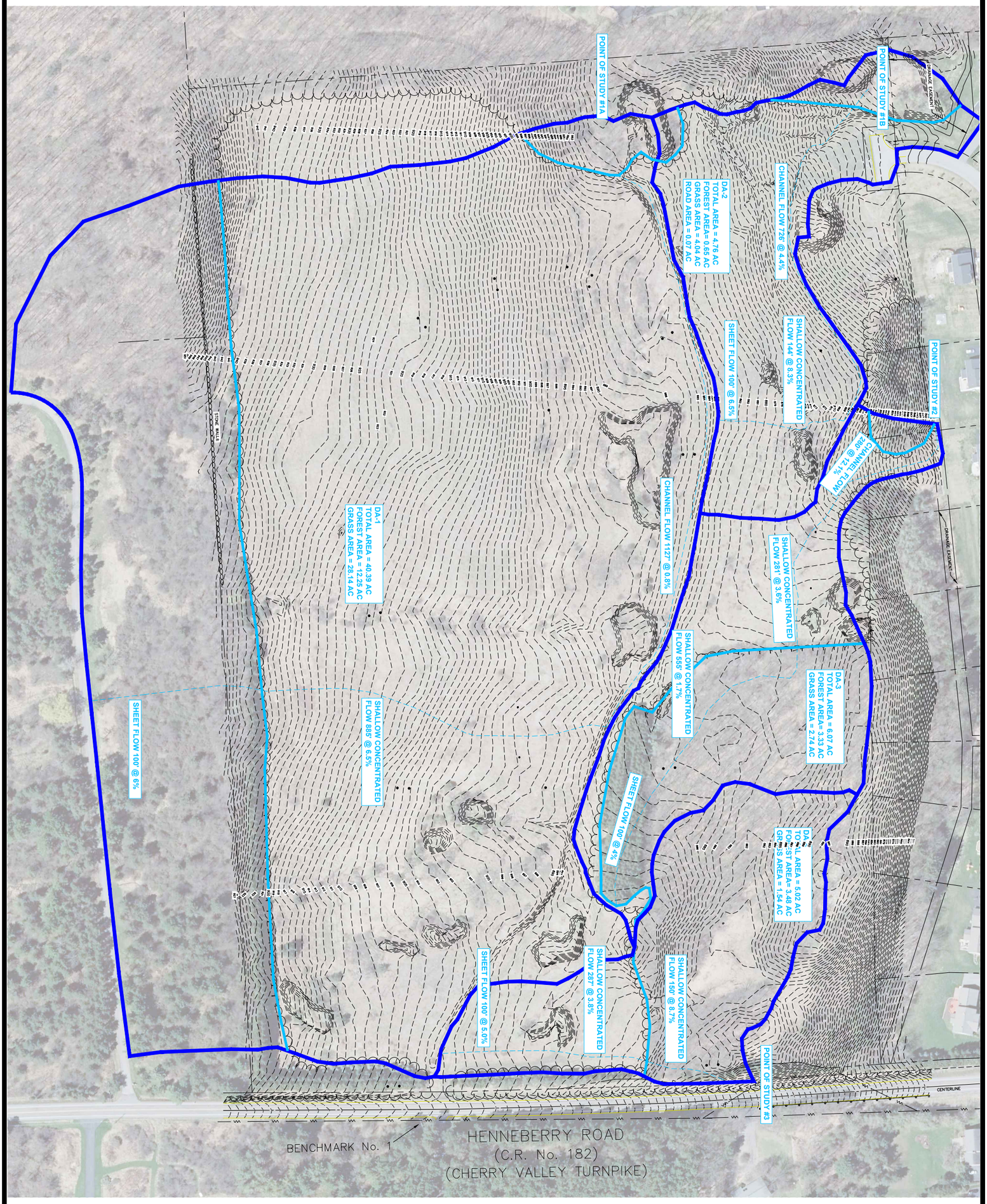
DA-4 includes the wooded and grassed area in the northeast portion of the subject site. This area drains to Point 3 and represents the tributary area to the drainage ditch within the right-of-way on the west side of Henneberry Road.

Table 5: Existing Drainage Area 4 Curve Number Calculation

Area (ac)	CN	Description
3.480	77	Woods, Good, HSG D
1.540	80	>75% Grass cover, Good, HSG D
5.020	78	Weighted Average
5.020		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.4	100	0.0500	0.15		**Sheet Flow, Sheet Flow** Grass: Dense n= 0.240 P2= 2.39"
1.5	287	0.0380	3.14		**Shallow Concentrated Flow, Shallow** Unpaved Kv= 16.1 fps
1.7	150	0.0870	1.47		**Shallow Concentrated Flow, Shallow** Woodland Kv= 5.0 fps
14.6	537	Total			

The map on the following page summarizes the hydrology of the proposed condition watershed.



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PLAN SEAL BY:
NEAL H. ZINSMEYER, JR., P.E.
NYS REGISTRATION # 087211

SHEET	PROJECT NO.	PREPARED BY:	NO.	REVISION/ISSUE	DATE	SHEET TITLE:	PROJECT TITLE:
EX	20-1906	NAPIERALA CONSULTING PROFESSIONAL ENGINEER, P.C. SITE • DESIGN • ENGINEERING				EXISTING DRAINAGE AREA	BRANDYWINE ESTATES PHASE 2 HENNEBERRY ROAD
	DATE 17 SEP 2020	110 FAYETTE STREET MANLIUS, NEW YORK 13104					TOWN OF MANLIUS ONONDAGA COUNTY, NY
	SCALE 1" = 80'	email: MNAP@NAPCON.COM PH: (315) 682-5580 FAX: (315) 682-5544					PREPARED FOR: HARRINGTON HOMES 3848 HENNEBERRY ROAD JAMESVILLE, NY 13078

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C. PROPOSED CONDITIONS

This project consists of the construction of a 34-lot subdivision of single-family homes. The impervious area on each lot will consist of rooftop area, which will be properly disconnected via gutter discharge to grass buffer strips, and asphalt driveway area, which is assumed to be approximately 1,200 square-feet (about 0.03 acres) for each individual lot. The development will also include necessary amenities such as public street(s), public/private utility extensions/connections, and applicable stormwater management facilities. The stormwater mitigation area will collect and treat runoff in order to meet the objectives of the SPDES General Permit for Stormwater Discharges from Construction Activity and local regulations.

The stormwater management system includes several management practices to capture, treat and control the release of runoff from the site. Runoff from the impervious areas, both rooftop and asphalt, will be directed to practices to provide infiltration/runoff reduction, water quality treatment and water quantity storage. The following stormwater management practices will be constructed:

- Bioretention Areas: Bioretention filters are considered a standard stormwater management practice with runoff reduction capacity to decrease stormwater quantity and improve water quality (NYSDEC Stormwater Management Design Manual, p. 5-97)[1]. The filters collect runoff from rainfall events, temporarily store it, and filter it through the root structure of the plants and the planting soil media. Through the plants' uptake of runoff and the filtering through the soil media, the amount of runoff the site generates is reduced and the remaining runoff from these frequent, but less intense, rainfall events is treated to remove pollutants such as suspended solids and phosphorus. The runoff in excess of the water quality event (the 90th-percentile rain event) will discharge to the downstream detention basin.
- Vegetated Swale: Vegetated swales are open drainage channel systems lined with grass and designed to capture and divert stormwater runoff to a downstream point of collection or discharge. Vegetated swales temporarily store, infiltrate, and treat stormwater runoff from lower intensity storms while providing a path of conveyance for higher intensity storm events.
- Detention Basin: The detention basin will collect runoff from the more intense but less frequent rainfall events and temporarily store and released in a controlled manner such that the peak rates of runoff to the downstream design points will not be adversely impacted.

DA-A includes off-site wooded area and portions of the proposed development. This area is treated by a vegetated swale and is directly tributary to Detention Basin #1.

Table 6: Proposed Drainage Area A Curve Number Calculations

Area (ac)	CN	Description
0.270	98	Paved parking, HSG D
2.580	80	>75% Grass cover, Good, HSG D
1.540	77	Woods, Good, HSG D
0.280	98	Roofs, HSG D
4.670	81	Weighted Average
4.120		88.22% Pervious Area
0.550		11.78% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.0	100	0.0600	0.10		**Sheet Flow, SHEET FLOW** Woods: Light underbrush n= 0.400 P2= 2.39"
2.5	188	0.0650	1.27		**Shallow Concentrated Flow, SCF** Woodland Kv= 5.0 fps
0.8	202	0.0650	4.10		**Shallow Concentrated Flow, SCF** Unpaved Kv= 16.1 fps
0.2	230	0.0200	16.17	32.33	**Channel Flow, GUTTER** Area= 2.0 sf Perim= 2.0' r= 1.00' n= 0.013 Asphalt, smooth
19.5	720	Total			

[1] The "biogeochemical process" in terms of stormwater management is the pathway by which water is recycled through plant material where the plant can consume it or return it to the atmosphere through evapotranspiration.

DA-B includes ±8 acres of off-site wooded area, and significant portions of the proposed development. This area is treated by Bioretention Area #1 and is directly tributary to Detention Basin #1.

Table 7: Proposed Drainage Area B Curve Number Calculations

Area (ac)	CN	Description
0.740	98	Paved parking, HSG D
7.140	80	>75% Grass cover, Good, HSG D
7.840	77	Woods, Good, HSG D
0.490	98	Roofs, HSG D
16.210	80	Weighted Average
14.980		92.41% Pervious Area
1.230		7.59% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.0	100	0.0600	0.10		**Sheet Flow, SHEET FLOW** Woods: Light underbrush n= 0.400 P2= 2.39"
4.8	370	0.0650	1.27		**Shallow Concentrated Flow, SCF** Woodland Kv= 5.0 fps
0.8	200	0.0650	4.10		**Shallow Concentrated Flow, SCF** Unpaved Kv= 16.1 fps
0.3	290	0.0200	16.17	32.33	**Channel Flow, GUTTER** Area= 2.0 sf Perim= 2.0' r= 1.00' n= 0.013 Asphalt, smooth
21.9	960	Total			

DA-C includes portions of the proposed development within the middle of the proposed loop road. This area is treated by a vegetated swale and is directly tributary to Detention Basin #3.

Table 8: Proposed Drainage Area C Curve Number Calculations

Area (ac)	CN	Description
0.060	98	Paved parking, HSG D
3.200	80	>75% Grass cover, Good, HSG D
0.180	98	Roofs, HSG D
3.440	81	Weighted Average
3.200		93.02% Pervious Area
0.240		6.98% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.6	100	0.0600	0.16		**Sheet Flow, SHEET FLOW** Grass: Dense n= 0.240 P2= 2.39"
1.5	270	0.0370	3.10		**Shallow Concentrated Flow, SCF** Unpaved Kv= 16.1 fps
12.1	370	Total			

DA-D includes portions of the proposed development on the inside and outside of the proposed loop road. This area is treated by a vegetated swale and is directly tributary to Detention Basin #3.

Table 9: Proposed Drainage Area D Curve Number Calculations

Area (ac)	CN	Description
0.310	98	Paved parking, HSG D
2.560	80	>75% Grass cover, Good, HSG D
0.170	98	Roofs, HSG D
3.040	83	Weighted Average
2.560		84.21% Pervious Area
0.480		15.79% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0	100	0.0700	0.17		**Sheet Flow, SHEET FLOW** Grass: Dense n= 0.240 P2= 2.39"
0.5	140	0.0900	4.83		**Shallow Concentrated Flow, SCF** Unpaved Kv= 16.1 fps
0.3	200	0.0200	9.55	76.42	**Channel Flow, swale flow** Area= 8.0 sf Perim= 8.0' r= 1.00' n= 0.022 Earth, clean & straight
10.8	440	Total			

DA-E includes portions of the proposed development to northwest of the proposed loop road. This area is treated by a vegetated swale before draining to Point 1B.

Table 10: Proposed Drainage Area E Curve Number Calculations

Area (ac)	CN	Description
0.030	98	Paved parking, HSG D
1.800	80	>75% Grass cover, Good, HSG D
0.070	98	Roofs, HSG D
1.900	81	Weighted Average
1.800		94.74% Pervious Area
0.100		5.26% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.4	100	0.0500	0.15		**Sheet Flow, SHEET FLOW** Grass: Dense n= 0.240 P2= 2.39"
0.3	85	0.0950	4.96		**Shallow Concentrated Flow, SCF** Unpaved Kv= 16.1 fps
11.7	185	Total			

DA-F includes portions of the proposed development on the inside and outside of the proposed loop road. This area is treated by a vegetated swale and Bioretention #2 before draining to Detention Basin #2.

Table 11: Proposed Drainage Area F Curve Number Calculations

Area (ac)	CN	Description
0.090	98	Paved parking, HSG D
2.040	80	>75% Grass cover, Good, HSG D
0.140	98	Roofs, HSG D
2.270	82	Weighted Average
2.040		89.87% Pervious Area
0.230		10.13% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.4	100	0.0500	0.15		**Sheet Flow, SHEET FLOW** Grass: Dense n= 0.240 P2= 2.39"
0.7	150	0.0500	3.60		**Shallow Concentrated Flow, SCF** Unpaved Kv= 16.1 fps
12.1	250	Total			

DA-G includes portions of the proposed development on the inside and outside of the proposed loop road. This area is treated by Bioretention #2 and is directly tributary to Detention Basin #2.

Table 12: Proposed Drainage Area G Curve Number Calculations

Area (ac)	CN	Description
1.050	98	Paved parking, HSG D
8.080	80	>75% Grass cover, Good, HSG D
0.490	98	Roofs, HSG D
9.620	83	Weighted Average
8.080		83.99% Pervious Area
1.540		16.01% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.4	100	0.0500	0.15		**Sheet Flow, sheet** Grass: Dense n= 0.240 P2= 2.39"
1.1	250	0.0550	3.78		**Shallow Concentrated Flow, shallow conc flow** Unpaved Kv= 16.1 fps
12.5	350	Total			

DA-H includes on-site wooded area and portions of the proposed development on the inside and outside of the proposed loop road. This area is treated by a vegetated swale before draining to Detention Basin #2.

Table 13: Proposed Drainage Area H Curve Number Calculations

Area (ac)	CN	Description
0.060	98	Paved parking, HSG D
2.100	80	>75% Grass cover, Good, HSG D
1.030	77	Woods, Good, HSG D
0.210	98	Roofs, HSG D
3.400	81	Weighted Average
3.130		92.06% Pervious Area
0.270		7.94% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.0	100	0.0300	0.12		**Sheet Flow, SHEET FLOW** Grass: Dense n= 0.240 P2= 2.39"
0.9	155	0.0300	2.79		**Shallow Concentrated Flow, SCF** Unpaved Kv= 16.1 fps
14.9	255	Total			

DA-1 includes off-site wooded area and on-site grass area that is tributary to Point 1A.

Table 14: Proposed Drainage Area 1 Curve Number Calculations

Area (ac)	CN	Description
3.390	80	>75% Grass cover, Good, HSG D
2.850	77	Woods, Good, HSG D
0.030	98	Paved parking, HSG D
0.070	98	Roofs, HSG D
6.340	79	Weighted Average
6.240		98.42% Pervious Area
0.100		1.58% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.6	100	0.0600	0.16		**Sheet Flow, SHEET FLOW** Grass: Dense n= 0.240 P2= 2.39"
5.4	485	0.0900	1.50		**Shallow Concentrated Flow, SCF** Woodland Kv= 5.0 fps
1.8	517	0.0900	4.83		**Shallow Concentrated Flow, SCF** Unpaved Kv= 16.1 fps
0.2	300	0.0860	27.67	442.73	**Channel Flow, SWALE** Area= 16.0 sf Perim= 8.0' r= 2.00' n= 0.025 Earth, clean & winding
18.0	1,402	Total			

DA-2 includes a portion of the development in the northwest portion of the subject site including the cul-de-sac at the end of Brandywine Drive. DA-2 is tributary to Point 1B.

Table 15: Proposed Drainage Area 2 Curve Number Calculations

Area (ac)	CN	Description
2.070	80	>75% Grass cover, Good, HSG D
0.660	77	Woods, Good, HSG D
0.220	98	Paved parking, HSG D
0.140	98	Roofs, HSG D
3.090	81	Weighted Average
2.730		88.35% Pervious Area
0.360		11.65% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0	100	0.0700	0.17		**Sheet Flow, SHEET FLOW** Grass: Dense n= 0.240 P2= 2.39"
0.2	56	0.1300	5.80		**Shallow Concentrated Flow, SCF** Unpaved Kv= 16.1 fps
0.2	367	0.0820	27.02	432.31	**Channel Flow, SWALE** Area= 16.0 sf Perim= 8.0' r= 2.00' n= 0.025 Earth, clean & winding
10.4	523	Total			

DA-3 includes a minor portion of wooded area and on-site grass area that is tributary to Point 2.

Table 16: Proposed Drainage Area 3 Curve Number Calculations

Area (ac)	CN	Description
0.390	80	>75% Grass cover, Good, HSG D
0.140	77	Woods, Good, HSG D
0.530	79	Weighted Average
0.530		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.4	100	0.1500	0.23		**Sheet Flow, SHEET FLOW** Grass: Dense n= 0.240 P2= 2.39"
0.3	104	0.1300	5.80		**Shallow Concentrated Flow, SCF** Unpaved Kv= 16.1 fps
7.7	204	Total			

DA-4 includes the northeastern-most portion of the development that drains to Point 3.

Table 17: Proposed Drainage Area 4 Curve Number Calculations

Area (ac)	CN	Description
2.020	80	>75% Grass cover, Good, HSG D
0.250	98	Paved parking, HSG D
0.140	98	Roofs, HSG D
2.410	83	Weighted Average
2.020		83.82% Pervious Area
0.390		16.18% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.9	100	0.0450	0.14		**Sheet Flow, SHEET FLOW** Grass: Dense n= 0.240 P2= 2.39"
1.5	307	0.0450	3.42		**Shallow Concentrated Flow, SCF** Unpaved Kv= 16.1 fps
0.2	80	0.0200	6.42	5.04	**Pipe Channel, storm pipe** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013 Corrugated PE, smooth interior
13.6	487	Total			

The map on the following page summarizes the hydrology of the proposed condition watershed.

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POINT OF STUDY #1B

DA-2
TOTAL AREA = 3.09 AC
WOODS AREA = 0.66 AC
GRASS AREA = 2.21 AC
ROAD AREA = 0.16 AC
DRIVE AREA = 0.06 AC

FFE=±852 3,000SF FOOTPRINT

CHANNEL FLOW
367' @ 8.2%

SHALLOW CONCENTRATED
FLOW 56' @ 13%

SHEET FLOW 100' @ 7%

POINT OF STUDY #1A

CHANNEL FLOW

DA-1
TOTAL AREA = 6.34 AC
WOODS AREA = 2.92 AC
GRASS AREA = 3.39 AC
DRIVE AREA=0.03 AC

FFE=±860 3,000SF FOOTPRINT

SHALLOW CONCENTRATED
FLOW 140' @ 9.8%

SHALLOW CONCENTRATED
FLOW 517' @ 9.0%

SHALLOW CONCENTRATED
FLOW 485' @ 9.8%

SHEET FLOW 100' @ 7%

SHEET FLOW 100' @ 6%

POINT OF STUDY #2

SHALLOW CONCENTRATED
FLOW 104' @ 13%

SHEET FLOW 100' @ 15%

DRAINAGE EASEMENT

DA-3
TOTAL AREA = 0.53 AC
WOODS AREA = 0.14 AC
GRASS AREA = 0.39 AC

FFE=±854 3,000SF FOOTPRINT

DA-E
TOTAL AREA = 1.98 AC
DRIVE AREA = 0.03 AC
GRASS AREA = 1.87 AC

FFE=±869 W/O 3,000SF FOOTPRINT

DA-F
TOTAL AREA = 2.27 AC
DRIVE AREA = 0.09 AC
GRASS AREA = 2.18 AC

FFE=±887 W/O 3,000SF FOOTPRINT

FFE=±886 3,000SF FOOTPRINT

DA-H
TOTAL AREA = 3.96 AC
WOODED AREA = 1.22 AC
DRIVE AREA = 0.09 AC
LAWN AREA = 2.65 AC

FFE=±885 3,000SF FOOTPRINT

FFE=±886 3,000SF FOOTPRINT

FFE=±886 3,000SF FOOTPRINT

DA-4
TOTAL AREA = 2.41 AC
DRIVE AREA = 0.12 AC
ROAD AREA = 0.13 AC
GRASS AREA = 2.16 AC

FFE=±882 3,000SF FOOTPRINT

POINT OF STUDY #3

SHALLOW CONCENTRATED
FLOW 307' @ 4.5%

SHEET FLOW 100' @ 4.5%

DA-G
TOTAL AREA = 9.62 AC
ROAD AREA = 0.85 AC
DRIVE AREA = 0.20 AC
GRASS AREA = 8.57 AC

FFE=±897 3,000SF FOOTPRINT

FFE=±891 3,000SF FOOTPRINT

FFE=±893 3,000SF FOOTPRINT

FFE=±893 3,000SF FOOTPRINT

FFE=±893 3,000SF FOOTPRINT

FFE=±894 3,000SF FOOTPRINT

FFE=±888 3,000SF FOOTPRINT

CHANNEL FLOW

DA-D
TOTAL AREA = 3.04 AC
ROAD AREA = 0.21 AC
DRIVE AREA = 0.10 AC
LAWN AREA = 2.73 AC

FFE=±920 W/O 3,000SF FOOTPRINT

SHALLOW CONCENTRATED
FLOW 210' @ 3.7%

DA-C
TOTAL AREA = 3.44 AC
DRIVE AREA = 0.06 AC
LAWN AREA = 3.38 AC

FFE=±917 W/O 3,000SF FOOTPRINT

FFE=±922 W/O 3,000SF FOOTPRINT

SHEET FLOW 100' @ 6%

FFE=±912 W/O 3,000SF FOOTPRINT

FFE=±912 W/O 3,000SF FOOTPRINT

FFE=±912 W/O 3,000SF FOOTPRINT

FFE=±910 3,000SF FOOTPRINT

DA-A
TOTAL AREA = 4.67 AC
ROAD AREA = 0.16 AC
DRIVE AREA = 0.11 AC
LAWN AREA = 2.86 AC
WOODS AREA = 1.54 AC

CHANNEL FLOW

FFE=±925 3,000SF FOOTPRINT

CHANNEL FLOW

FFE=±919 3,000SF FOOTPRINT

FFE=±915 3,000SF FOOTPRINT

FFE=±912 3,000SF FOOTPRINT

FFE=±912 3,000SF FOOTPRINT

FFE=±912 3,000SF FOOTPRINT

FFE=±926 3,000SF FOOTPRINT

FFE=±924 3,000SF FOOTPRINT

DA-B
TOTAL AREA = 16.21 AC
ROAD AREA = 0.55 AC
DRIVE AREA = 0.19 AC
LAWN AREA = 7.63 AC
WOODS AREA = 7.84 AC

SHALLOW CONCENTRATED
FLOW 200' @ 6.5%

SHALLOW CONCENTRATED
FLOW 202' @ 6.5%

SHALLOW CONCENTRATED
FLOW 188' @ 6.5%

SHALLOW CONCENTRATED
FLOW 370' @ 6.5%

SHEET FLOW 100' @ 6%

SHEET FLOW 100' @ 6%

SHEET FLOW 100' @ 6%

HENNEBERRY ROAD
(C.R. No. 182)
(CHERRY VALLEY TURNPIKE)

BENCHMARK No. 1

STONE WALLS

CENTERLINE

PROJECT TITLE:
BRANDYWINE ESTATES PHASE 2
HENNEBERRY ROAD
TOWN OF MANLIUS — ONONDAGA COUNTY, NY

PREPARED FOR:
HARRINGTON HOMES
3848 HENNEBERRY ROAD
JAMESVILLE, NY 13078

SHEET TITLE:
PROPOSED DRAINAGE AREA

NO.	REVISION/ISSUE	DATE

PREPARED BY:
NAPIERALA CONSULTING
PROFESSIONAL ENGINEER, P.C.
SITE • DESIGN • ENGINEERING
110 FAYETTE STREET
MANLIUS, NEW YORK 13104
email MNAPIERALA@NYCON.COM
PH: (315) 682-5280 FAX: (315) 682-5544

PROJECT NO. 20-1906
DATE 17 SEP 2020
SCALE 1" = 80'

SHEET **PR**

PLAN SEAL BY:
NEAL H. ZABSMEYER, JR., P.E.
NYS REGISTRATION # 097251

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NAPIERALA CONSULTING,
PROFESSIONAL ENGINEER, PC

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D. RUNOFF REDUCTION VOLUME (RRV)

The NYSDEC implemented regulations effective March 1, 2011 that requires all construction projects that disturb greater than one acre of land to provide runoff reduction through the implementation of green infrastructure practices. The goal of the runoff reduction volume criteria is to implement stormwater management practices and green infrastructure techniques to replicate pre-development hydrology. The NYS Stormwater Management Design Manual provides the acceptable green planning techniques and green infrastructure techniques to meet the runoff reduction volume criteria. The following narrative and calculations detail the implementation of the planning and infrastructure techniques on the site to achieve the minimum runoff reduction volume. The narrative follows the Design Manual, Chapter 5.

PLANNING

1. Plan to preserve, avoid, and minimize:

	Applicable	Not Applicable
a. Preserve undisturbed, natural buffer, and critical environmental areas.	☐	☒
b. Employ open space, conservation, and clustering site design techniques.	☒	☐
c. Avoid developing in environmentally sensitive areas: floodplain, steep slopes, habitat, ecosystems, bedrock, wetlands, shorelines, shallow groundwater, impervious soils and unstable soils.	☒	☐
d. Minimize impervious surfaces: building footprints, parking, roads, sidewalks, and driveways.	☒	☐
e. Minimize clearing and grading	☒	☐

Discussion:

a. The project does not have any critical environmental areas.

b. Open space is used in projects on tracts of land where the development can be concentrated in a portion of the site while maintaining large portions of undisturbed land. Open space design was taking into consideration when planning the subdivision of the property. Town code requires lot sizes to be a minimum of 40,000 square feet and this plan proposes lots between 43,000 sf and 100,000 sf.

c. The project does not have any critical environmental areas with the exception of steep slopes. Development in steep slopes will be minimized as much as possible and is limited to areas of the individual homes.

d. The NYS Stormwater Design Manual discusses building footprint reduction in terms of building multiple floors to achieve the same, or comparable, square footage as a single-floor footprint. The majority of these house are expected to be two-story homes to reduce the footprint and achieve more square foot area of the house.

e. The proposed grading plan for the project minimizes the amount of grading to the maximum extent practicable. Grade requirements for a functional site, including slopes to meet the buildable lots, were taken into account during the design phase. The off-grading was designed to catch up to the existing grade in the shortest distance possible (i.e., minimize off-grading) while still meeting acceptable standards for slope stabilization and erosion control.

Disconnection of Rooftop Runoff

All direct runoff from residential rooftop areas has been designed to be distributed to surrounding pervious areas to promote overland vegetative filtering and infiltration. As such, all rooftop impervious area is treated as pervious lawn area when calculating the required water quality volume and runoff reduction volume. The rooftop impervious area is not deducted when calculating the water quantity mitigation in the detention basins.

E. WATER QUALITY VOLUME (WQ_v) REQUIRED:

1. Calculate the required water quality volume for new impervious area within DA-1

$$\mathbf{WQ_v = \frac{PR_vA}{12}}$$

90-th Percentile Rainfall (P) = 1.0 inch

Drainage Area (A) = 44.55 acres

Impervious Area (A_I) = 3.22 acres

$$R_v = 0.05 + 0.9\left(\frac{A_I}{A}\right)$$

$$R_v = 0.05 + 0.9(0.0754)$$

$R_v = 0.115$

therefore:

$$WQ_v = \frac{1.0*0.115*44.55}{12}$$

Total WQ_v Required= 0.427 ac·ft (18,600 cf)

2. Minimum RR_v requirements

Calculate minimum required Runoff Reduction Volume (RR_v) for DA-1 using:

$$\mathbf{RR_v = \frac{P \cdot Rv \cdot S \cdot A_I}{12}}$$

A_I = total impervious area

S = 0.55 (A Soils), 0.40 (B Soils), 0.30 (C Soils), 0.20 (D Soils), or weighted HSG average in drainage area

$$RR_v = \frac{1.0(0.95)(0.20)(3.22)}{12}$$

Total Minimum RR_v required = 0.051 ac·ft (2,220 cf)

F. WATER QUALITY VOLUME (WQV) PROVIDED

Water quality treatment for the runoff from proposed impervious surfaces will be provided by a combination of vegetated swales and bioretention areas. Rooftop area is assumed to be properly disconnected from nearby impervious surfaces, and is therefore treated as pervious area in analysis.

Vegetated Swale Design #1 (DA-A)

The *Simplified Peak Flow Estimating Method* outlined in Appendix B.2 of the Stormwater Design Manual was used to calculate the peak rate of runoff during the water quality event.

$$CN = \frac{1000}{10 + 5P + 10Q - 10\sqrt{Q^2 + 1.25QP}}$$

Where,

CN = the computed runoff curve number

P = rainfall, in inches (use the 90% rainfall event for the Water Quality Storm, 1.0")

Q = runoff volume ($P*R_v$), in inches

Drainage Area Tributary to Practice = 4.67 acres

Impervious Areas (A_I) = 0.27 acres

$$R_v = 0.05 + 0.9\left(\frac{0.27\text{ ac}}{4.67\text{ ac}}\right) = 0.102$$

$\therefore$ CN = 81

Time of Concentration, t_c, is **19.5** minutes (minimum TR-55 value)

From Table 4-1 of TR-55, the initial abstraction, I_a, for a watershed is 0.469

$$\frac{I_a}{P} = \frac{0.469}{1.0} = 0.469$$

Using the I_a/P and the t_c, the unit peak discharge, q_u, is **350** csm/in (from Exhibit 4-II, TR-55)

The peak rate of runoff is then calculated using the following formula: $Q_p = q_u \times A \times WQ_v$

Where, Q_p = the peak discharge, in cfs

q_u = the unit peak discharge, in cfs/mi^2/inch

A = drainage area, in square miles (acres/640)

WQ_v = water quality volume, in watershed inches ($P*R_v$)

$$Q_p = 350\frac{\text{csm}}{\text{in}} \times \frac{4.67\text{ acres}}{\frac{640\text{ ac}}{\text{mi}^2}} \times (0.102) \times 1.0"$$

$\mathbf{Q_p = 0.26\ cfs}$

The required swale length must provide an average of <u>10 minutes</u> of retention time where:

base width = 4 ft

side slope = 3H:1V

slope = 0.02 ft/ft

depth = 0.25 ft

V = 0.28 fps (calculated using Hyroflow Express in AutoCAD)

$$\text{Required Length} = 0.28\frac{\text{ft}}{\text{sec}} \cdot 10\text{ min} \cdot \frac{60\text{ sec}}{\text{min}} = 168\text{ ft}$$

Length provided = 255 ft

$\mathbf{WQ_v\ Provided\ in\ Swale} = \frac{1.0*0.102*4.67}{12} = \mathbf{0.040\ ac \cdot ft}$ (1,730 cf)

The RR_v provided is calculated as follows:

Bioretention areas in C and D soils have a RRv factor of 0.2 * WQv.

$RR_v = 0.2 * 0.040\text{ ac} \bullet \text{ft}$

RR_v Provided in Swale = 0.008 ac·ft

Vegetated Swale Design #2 (DA-C)

The *Simplified Peak Flow Estimating Method* outlined in Appendix B.2 of the Stormwater Design Manual was used to calculate the peak rate of runoff during the water quality event.

$$CN = \frac{1000}{10 + 5P + 10Q - 10\sqrt{Q^2 + 1.25QP}}$$

Where,

CN = the computed runoff curve number

P = rainfall, in inches (use the 90% rainfall event for the Water Quality Storm, 1.0")

Q = runoff volume ($P*R_v$), in inches

Drainage Area Tributary to Practice = 3.44 acres

Impervious Areas (A_I) = 0.06 acres

$$R_v = 0.05 + 0.9\left(\frac{0.06\text{ ac}}{3.44\text{ ac}}\right) = 0.066$$

$\therefore CN = 81$

Time of Concentration, t_c, is **12.1** minutes (minimum TR-55 value)

From Table 4-1 of TR-55, the initial abstraction, I_a, for a watershed is 0.469

$$\frac{I_a}{P} = \frac{0.532}{1.0} = 0.532$$

Using the I_a/P and the t_c, the unit peak discharge, q_u, is **325** csm/in (from Exhibit 4-II, TR-55)

The peak rate of runoff is then calculated using the following formula: $Q_p = q_u \times A \times WQ_v$

Where, Q_p = the peak discharge, in cfs

q_u = the unit peak discharge, in cfs/mi²/inch

A = drainage area, in square miles (acres/640)

WQ_v = water quality volume, in watershed inches ($P*R_v$)

$$Q_p = 325\frac{\text{csm}}{\text{in}} \times \frac{3.44\text{ acres}}{\frac{640\text{ ac}}{\text{mi}^2}} \times (0.066) \times 1.0"$$

$$\mathbf{Q_p = 0.11\ cfs}$$

The required swale length must provide an average of 10 minutes of retention time where:

base width = 4 ft

side slope = 3H:1V

slope = 0.02 ft/ft

depth = 0.25 ft

V = 0.21 fps (calculated using Hyroflow Express in AutoCAD)

$$\text{Required Length} = 0.21\frac{\text{ft}}{\text{sec}} \cdot 10\text{ min} \cdot \frac{60\text{ sec}}{\text{min}} = 126\text{ ft}$$

Length provided = 290 ft

$\mathbf{WQ_v\ Provided\ in\ Swale} = \frac{1.0*0.066*3.44}{12} = \mathbf{0.019\ ac \cdot ft}$ (825 cf)

The RR_v provided is calculated as follows:

Bioretention areas in C and D soils have a RRv factor of 0.2 * WQv.

$RR_v = 0.2 * 0.019\ ac \bullet ft$

RR_v Provided in Swale = 0.004 ac·ft

<u>Vegetated Swale Design #3 (DA-D)</u>

The *Simplified Peak Flow Estimating Method* outlined in Appendix B.2 of the <u>Stormwater Design Manual</u> was used to calculate the peak rate of runoff during the water quality event.

$$CN = \frac{1000}{10 + 5P + 10Q - 10\sqrt{Q^2 + 1.25QP}}$$

Where,

CN = the computed runoff curve number

P = rainfall, in inches (use the 90% rainfall event for the Water Quality Storm, 1.0")

Q = runoff volume ($P*R_v$), in inches

Drainage Area Tributary to Practice = 3.04 acres

Impervious Areas (A_I) = 0.31 acres

$$R_v = 0.05 + 0.9\left(\frac{0.31\ ac}{3.04\ ac}\right) = 0.142$$

$\therefore CN = 84$

Time of Concentration, t_c, is **12.2** minutes (minimum TR-55 value)

From Table 4-1 of TR-55, the initial abstraction, I_a, for a watershed is 0.41

$$\frac{I_a}{P} = \frac{0.41}{1.0} = 0.41$$

Using the I_a/P and the t_c, the unit peak discharge, q_u, is **500** csm/in (from Exhibit 4-II, TR-55)

The peak rate of runoff is then calculated using the following formula: $Q_p = q_u \times A \times WQ_v$

Where, Q_p = the peak discharge, in cfs

q_u = the unit peak discharge, in cfs/mi²/inch

A = drainage area, in square miles (acres/640)

WQ_v = water quality volume, in watershed inches ($P*R_v$)

$$Q_p = 500\frac{csm}{in} \times \frac{3.04\ acres}{\frac{640\ ac}{mi^2}} \times (0.142) \times 1.0"$$

$\mathbf{Q_p = 0.34\ cfs}$

The required swale length must provide an average of <u>10 minutes</u> of retention time where:

base width = 4 ft

side slope = 3H:1V

slope = 0.02 ft/ft

depth = 0.25 ft

V = 0.33 fps (calculated using Hyroflow Express in AutoCAD)

$$\text{Required Length} = 0.33\frac{\text{ft}}{\text{sec}} \cdot 10\text{ min} \cdot \frac{60\text{ sec}}{\text{min}} = 198\text{ ft}$$

Length provided = 210 ft

$$\mathbf{WQ_v\ Provided\ in\ Swale} = \frac{1.0*0.142*3.04}{12} = \mathbf{0.036\ ac \cdot ft}\ (1{,}570\text{ cf})$$

The RR_v provided is calculated as follows:

Bioretention areas in C and D soils have a RRv factor of 0.2 * WQv.

$RR_v = 0.2 * 0.036$ ac • ft

RR_v Provided in Swale = 0.007 ac·ft

<u>Vegetated Swale Design #4 (DA-E)</u>

The *Simplified Peak Flow Estimating Method* outlined in Appendix B.2 of the <u>Stormwater Design Manual</u> was used to calculate the peak rate of runoff during the water quality event.

$$CN = \frac{1000}{10 + 5P + 10Q - 10\sqrt{Q^2 + 1.25QP}}$$

Where,

CN = the computed runoff curve number

P = rainfall, in inches (use the 90% rainfall event for the Water Quality Storm, 1.0")

Q = runoff volume ($P*R_v$), in inches

Drainage Area Tributary to Practice = 1.9 acres

Impervious Areas (A_I) = 0.03 acres

$$R_v = 0.05 + 0.9\left(\frac{0.03\text{ ac}}{1.9\text{ ac}}\right) = 0.064$$

$\therefore CN = 79$

Time of Concentration, t_c, is **15.5** minutes (minimum TR-55 value)

From Table 4-1 of TR-55, the initial abstraction, I_a, for a watershed is 0.469

$$\frac{I_a}{P} = \frac{0.532}{1.0} = 0.532$$

Using the I_a/P and the t_c, the unit peak discharge, q_u, is **300** csm/in (from Exhibit 4-II, TR-55)

The peak rate of runoff is then calculated using the following formula: $Q_p = q_u \times A \times WQ_v$

Where, Q_p = the peak discharge, in cfs

q_u = the unit peak discharge, in cfs/mi^2/inch

A = drainage area, in square miles (acres/640)

WQ_v = water quality volume, in watershed inches ($P*R_v$)

$$Q_p = 300\frac{\text{csm}}{\text{in}} \times \frac{1.9\text{ acres}}{\frac{640\text{ ac}}{\text{mi}^2}} \times (0.064) \times 1.0"$$

$\mathbf{Q_p = 0.09\ cfs}$

The required swale length must provide an average of <u>10 minutes</u> of retention time where:

base width = 4 ft

side slope = 3H:1V

slope = 0.02 ft/ft

depth = 0.25 ft

V = 0.20 fps (calculated using Hyroflow Express in AutoCAD)

$$\text{Required Length} = 0.20\frac{\text{ft}}{\text{sec}} \cdot 10\text{ min} \cdot \frac{60\text{ sec}}{\text{min}} = 120\text{ ft}$$

Length provided = 250 ft

$\mathbf{WQ_v\ Provided\ in\ Swale} = \frac{1.0*0.064*1.9}{12} = \mathbf{0.010\ ac \cdot ft}$ (440 cf)

The RR_v provided is calculated as follows:

Bioretention areas in C and D soils have a RRv factor of 0.2 * WQv.

$RR_v = 0.2 * 0.010\text{ ac} \bullet \text{ft}$

RR_v Provided in Swale = 0.002 ac·ft

<u>Vegetated Swale Design #5 (DA-F)</u>

The *Simplified Peak Flow Estimating Method* outlined in Appendix B.2 of the <u>Stormwater Design Manual</u> was used to calculate the peak rate of runoff during the water quality event.

$$CN = \frac{1000}{10 + 5P + 10Q - 10\sqrt{Q^2 + 1.25QP}}$$

Where,

CN = the computed runoff curve number

P = rainfall, in inches (use the 90% rainfall event for the Water Quality Storm, 1.0")

Q = runoff volume ($P*R_v$), in inches

Drainage Area Tributary to Practice = 2.27 acres

Impervious Areas (A_I) = 0.09 acres

$$R_v = 0.05 + 0.9\left(\frac{0.09\text{ ac}}{2.27\text{ ac}}\right) = 0.086$$

$\therefore CN = 80$

Time of Concentration, t_c, is **11** minutes (minimum TR-55 value)

From Table 4-1 of TR-55, the initial abstraction, I_a, for a watershed is 0.469

$$\frac{I_a}{P} = \frac{0.50}{1.0} = 0.50$$

Using the I_a/P and the t_c, the unit peak discharge, q_u, is **375** csm/in (from Exhibit 4-II, TR-55)

The peak rate of runoff is then calculated using the following formula: $Q_p = q_u \times A \times WQ_v$

Where, Q_p = the peak discharge, in cfs

q_u = the unit peak discharge, in cfs/mi²/inch

A = drainage area, in square miles (acres/640)

WQ_v = water quality volume, in watershed inches ($P*R_v$)

$$Q_p = 375\frac{\text{csm}}{\text{in}} \times \frac{2.27\text{ acres}}{\frac{640\text{ ac}}{\text{mi}^2}} \times (0.086) \times 1.0"$$

$$\mathbf{Q_p = 0.11\ cfs}$$

The required swale length must provide an average of <u>10 minutes</u> of retention time where:

base width = 4 ft

side slope = 3H:1V

slope = 0.02 ft/ft

depth = 0.25 ft

V = 0.26 fps (calculated using Hyroflow Express in AutoCAD)

$$\text{Required Length} = 0.26\frac{\text{ft}}{\text{sec}} \cdot 10\text{ min} \cdot \frac{60\text{ sec}}{\text{min}} = 156\text{ ft}$$

Length provided = 156 ft

$$\mathbf{WQ_v\ Provided\ in\ Swale} = \frac{1.0*0.086*2.27}{12} = \mathbf{0.016\ ac \cdot ft}\ (710\text{ cf})$$

The RR_v provided is calculated as follows:

Bioretention areas in C and D soils have a RRv factor of 0.2 * WQv.

$RR_v = 0.2 * 0.016\text{ ac} \bullet \text{ft}$

RR_v Provided in Swale = 0.003 ac·ft

<u>Vegetated Swale Design #6 (DA-H)</u>

The *Simplified Peak Flow Estimating Method* outlined in Appendix B.2 of the <u>Stormwater Design Manual</u> was used to calculate the peak rate of runoff during the water quality event.

$$CN = \frac{1000}{10 + 5P + 10Q - 10\sqrt{Q^2 + 1.25QP}}$$

Where,

CN = the computed runoff curve number

P = rainfall, in inches (use the 90% rainfall event for the Water Quality Storm, 1.0")

Q = runoff volume ($P*R_v$), in inches

Drainage Area Tributary to Practice = 3.96 acres

Impervious Areas (A_I) = 0.09 acres

$$R_v = 0.05 + 0.9\left(\frac{0.09\text{ ac}}{3.96\text{ ac}}\right) = 0.070$$

$\therefore$ CN = 79

Time of Concentration, t_c, is **14.9** minutes (minimum TR-55 value)

From Table 4-1 of TR-55, the initial abstraction, I_a, for a watershed is 0.469

$$\frac{I_a}{P} = \frac{0.532}{1.0} = 0.532$$

Using the I_a/P and the t_c, the unit peak discharge, q_u, is **325** csm/in (from Exhibit 4-II, TR-55)

The peak rate of runoff is then calculated using the following formula: $Q_p = q_u \times A \times WQ_v$

Where, Q_p = the peak discharge, in cfs

q_u = the unit peak discharge, in cfs/mi^2/inch

A = drainage area, in square miles (acres/640)

WQ_v = water quality volume, in watershed inches ($P*R_v$)

$$Q_p = 325\frac{\text{csm}}{\text{in}} \times \frac{3.96\text{ acres}}{\frac{640\text{ ac}}{\text{mi}^2}} \times (0.070) \times 1.0"$$

$$\mathbf{Q_p = 0.14\ cfs}$$

The required swale length must provide an average of <u>10 minutes</u> of retention time where:

base width = 4 ft

side slope = 3H:1V

slope = 0.02 ft/ft

depth = 0.25 ft

V = 0.26 fps (calculated using Hyroflow Express in AutoCAD)

$$\text{Required Length} = 0.26\frac{\text{ft}}{\text{sec}} \cdot 10\text{ min} \cdot \frac{60\text{ sec}}{\text{min}} = 156\text{ ft}$$

Length provided = 500 ft

$$\mathbf{WQ_v\ Provided\ in\ Swale} = \frac{1.0*0.070*3.96}{12} = \mathbf{0.023\ ac \cdot ft}\ (1{,}006\text{ cf})$$

The RR_v provided is calculated as follows:

Bioretention areas in C and D soils have a RRv factor of 0.2 * WQv.

$RR_v = 0.2 * 0.023$ ac • ft

RR_v Provided in Swale = 0.005 ac·ft

Bioretention Basin #1 (DA-B)

$$\mathbf{WQ_v = \frac{PR_vA}{12}}$$

90-th Percentile Rainfall (P) = 1.0 inch

Drainage Area (A) = 16.21 acres

Impervious Area (A_I) = 0.74 acres

Total Af provided = 6,250 sf

$$A_f = \frac{(WQ_v)(d_f)}{(k)(h_f + d_f)(t_f)}$$

Where,

A_f	=	Area of the filter (ft^2)
WQ_v	=	Water Quality Volume (ft^3)
d_f	=	depth of the bioretention soil media (2.5 feet as required in NYS Design Manual)
k	=	coefficient of permeability (0.5 ft/day per NYS Design Manual)
h_f	=	average height of water above the filter bed (0.25 ft)
t_f	=	design filter bed drain time (2 days per NYS Design Manual)

$$6{,}000\ \text{ft}^2 = \frac{(WQ_v)(2.5\ \text{ft})}{\left(0.5\ \frac{\text{ft}}{\text{day}}\right)(0.25\ \text{ft} + 2.5\ \text{ft})(2\ \text{days})}$$

$$WQ_V = 0.151\ ac \cdot ft$$

∴Total WQ_v provided = 0.151 ac-ft

The RR_v provided is calculated as follows:

Bioretention areas in C and D soils have a RRv factor of 0.4 * WQv.

$RR_v = 0.4 * 0.151$ ac • ft

RR_v provided = 0.060 ac·ft

Bioretention Basin #2 (DA-G)

$$\mathbf{WQ_v = \frac{PR_vA}{12}}$$

90-th Percentile Rainfall (P) = 1.0 inch

Drainage Area (A) = 16.21 acres

Impervious Area (A_I) = 0.74 acres

Total Af provided = 5,400 sf

$$A_f = \frac{(WQ_v)(d_f)}{(k)(h_f + d_f)(t_f)}$$

Where,

A_f	=	Area of the filter (ft^2)

WQ_v	=	Water Quality Volume (ft^3)
d_f	=	depth of the bioretention soil media (2.5 feet as required in NYS Design Manual)
k	=	coefficient of permeability (0.5 ft/day per NYS Design Manual)
h_f	=	average height of water above the filter bed (0.25 ft)
t_f	=	design filter bed drain time (2 days per NYS Design Manual)

$$5{,}400\ \text{ft}^2 = \frac{(\text{WQ}_\text{v})(2.5\ \text{ft})}{\left(0.5\ \frac{\text{ft}}{\text{day}}\right)(0.25\ \text{ft} + 2.5\ \text{ft})(2\ \text{days})}$$

$$WQ_V = 0.136\ ac \cdot ft$$

∴ Total WQ_v provided = 0.136 ac-ft

The RR_v provided is calculated as follows:
Bioretention areas in C and D soils have a RRv factor of 0.4 * WQv.

$$\text{RR}_\text{v} = 0.4 * 0.136\ \text{ac} \bullet \text{ft}$$

RR_v provided = 0.054 ac·ft

Total RR_v provided = 0.008 + 0.004 + 0.007 + 0.002 + 0.003 + 0.005 + 0.060 + 0.054
= **0.143 ac·ft** (0.051 ac-ft Required)

Total WQ_v provided = 0.040 + 0.019 + 0.036 + 0.010 + 0.016 + 0.023 + 0.151 + 0.136
= **0.431 ac·ft** (0.427 ac-ft Required)

G. CHANNEL PROTECTION VOLUME (CP_V)

The proposed project must provide sufficient storage of the channel protection volume (CPv), which is accomplished by providing 24-hour extended detention of the one-year, 24-hour storm event, remained from runoff reduction. The NYS Stormwater Design Manual methodology for determining the storage volume was used (Appendix B.1) and is discussed below. Below is a summary of the calculations for DA-1.

Proposed Detention Basins 1, 2, &3

Tributary Area = 43.21 acres, CN = 81, & t_c = 22 minutes

I_a = 0.469, P = 1.0"

$$\frac{I_a}{P} = 0.469$$

Using I_a/P and T_c, q_u = 330 csm/in (TR-55, Exhibit 4-II)

Using q_u and T = 24 hr, q_o/q_i = 0.051 (Design Manual, Figure B.1)

Using formula 2.1.16 (Design Manual, Appendix B.1), calculate V_s/V_r

$$\frac{V_s}{V_r} = 0.61$$

Using formula 2.1.17 (Design Manual, Appendix B.1), calculate V_s

$$V_s = \frac{\left(\frac{V_s}{V_r}\right) Q_d A}{12}$$

$V_s = (0.61)2.303\ \mathrm{ac \cdot ft}$ (total tributary from HydroCAD)

$V_s = 1.40\ \mathrm{ac \cdot ft}$ (60,984 cf)

CPv required = CPv - RR_V Provided

CPv required = 60,984 ft^3 – 6,185 ft^3 = **54,799 ft^3 required**

CPv Provided in Bioretention #1 = 3,438 ft^3

CPv Provided in Bioretention #2 = 2,970 ft^3

CPv Provided in Detention #1 = 20,168 ft^3

CPv Provided in Detention #2 = 22,999 ft^3

CPv Provided in Detention #3 = 6,010 ft^3

Total* CPv =55,585 ft^3 *Provided

H. PEAK FLOW MITIGATION (Q_{p10} and Q_{p100})

The remaining two requirements of the NYSDEC SPDES General Permit for Stormwater Discharges from Construction Activity are that the stormwater system cannot discharge runoff from the site during the 10-year and 100-year, 24-hour rainfall events at rates higher than the existing condition peak rates of runoff during the correlating rainfall events. To meet these requirements, the underground stormwater chamber system will act as a detention basin that capture the runoff, temporarily store it, and release the runoff in a controlled manner to the existing drainage ditch such that the proposed project will not adversely impact the downstream areas. The following tables summarize the HydroCAD results for the 10-year and 100-year rainfall events.

Table 18: Peak Flow Rates for 10-Year & 100-Year Rainfall Events

	Existing Peak Runoff Rate (cfs)			**Proposed Peak Runoff Rate (cfs)**		
Point of Study	Pt. 1B	Pt. 2	Pt. 3	Pt. 1B	Pt. 2	Pt. 3
10-Year Storm	69.99	7.68	9.35	28.86	1.33	5.84
100-Year Storm	163.03	18.46	22.06	101.76	3.01	12.42

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
888.00	373	0	0
889.00	3,768	2,071	2,071
890.00	11,124	7,446	9,517
891.00	12,590	11,857	21,374
892.00	14,113	13,352	34,725
893.00	15,691	14,902	49,627
894.00	17,327	16,509	66,136
895.00	19,019	18,173	84,309
896.00	20,768	19,894	104,203

Device	Routing	Invert	Outlet Devices
#1	Primary	887.90'	**30.0" Round Culvert** L= 20.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 887.90' / 886.90' S= 0.0500 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 4.91 sf
#2	Device 1	888.00'	**5.0" Vert. Orifice1** C= 0.600
#3	Device 1	891.20'	**15.0" Vert. Orifice2** C= 0.600
#4	Device 1	894.90'	**30.0" x 30.0" Horiz. Grate** C= 0.600 Limited to weir flow at low heads
#5	Secondary	896.00'	**25.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Figure 11: Proposed Detention Basin #1 Summary

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
863.00	335	0	0
864.00	3,479	1,907	1,907
865.00	5,953	4,716	6,623
866.00	7,741	6,847	13,470
867.00	9,739	8,740	22,210
868.00	11,941	10,840	33,050
869.00	14,156	13,049	46,099
870.00	16,371	15,264	61,362
871.00	18,599	17,485	78,847
872.00	20,845	19,722	98,569

Device	Routing	Invert	Outlet Devices
#1	Secondary	872.00'	**20.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64
#2	Primary	862.90'	**30.0" Round Culvert** L= 20.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 862.90' / 861.00' S= 0.0950 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 4.91 sf
#3	Device 2	863.00'	**5.0" Vert. Orifice1** C= 0.600
#4	Device 2	866.80'	**15.0" Vert. Orifice2** C= 0.600
#5	Device 2	870.00'	**30.0" x 30.0" Horiz. Grate** C= 0.600 Limited to weir flow at low heads

Figure 12: Proposed Detention Basin #2 Summary

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
900.00	2,381	0	0
901.00	3,197	2,789	2,789
902.00	7,737	5,467	8,256
903.00	9,288	8,513	16,769
904.00	10,896	10,092	26,861
905.00	12,560	11,728	38,589

Device	Routing	Invert	Outlet Devices
#1	Secondary	905.00'	**20.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64
#2	Primary	900.00'	**18.0" Round Culvert** L= 330.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 900.00' / 889.00' S= 0.0333 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf
#3	Device 2	900.00'	**5.0" Vert. Orifice1** C= 0.600
#4	Device 2	901.90'	**10.0" Vert. Orifice2** C= 0.600
#5	Device 2	904.00'	**24.0" x 24.0" Horiz. Grate** C= 0.600 Limited to weir flow at low heads

Figure 13: Proposed Detention Basin #3 Summary

Section IV. CONTROLS

A. EROSION AND SEDIMENT CONTROLS

Prior to the commencement of construction, the operator will identify the contractor(s) and subcontractor(s) that will implement each erosion and sediment control measure identified in this SWPPP. All contractors and subcontractors identified in the SWPPP must sign a copy of the certification statement in Part III.E. of the NYS DEC SPDES General Permit for Stormwater Discharges from Construction Activities in accordance with Part V.H. of the SPDES General Permit.

1. Stabilization Practices (Permanent)
   Permanent stabilization practices for this site include:

   a. Land clearing activities shall be done only in areas where earthwork will be performed and shall progress as earthwork is needed.
   b. Permanent seeding and planting of all unpaved areas.

2. Stabilization Practices (Temporary) Temporary stabilization practices for this site include:
   a. Temporary seeding and planting of all unpaved areas when construction activity has ceased, or will cease, in an area for 14 days. Seeding mixtures and application rates are listed in the erosion and sediment control notes on the plans.
   b. Mulching exposed areas. Mulching rates are listed in the erosion and sediment control notes on the plan sheet C-15.
   c. Frequent watering to minimize wind erosion during construction.

3. Structural Practices (Permanent)Permanent structural practices for this site include:
   a. Bioretention Areas. Bioretention filters are considered a standard stormwater management practice with runoff reduction capacity to decrease stormwater quantity and improve water quality.
   b. Land grading. Land grading is the reshaping of the existing land surface in accordance with a plan as determined by the engineering survey and layout. The purpose of a land grading specification is to provide erosion control and vegetative establishment on areas where the existing land is to be reshaped according to the plan.

4. Structural Practices (Temporary)
   Temporary structural practices for this site include:

   a. Silt fence. Silt fence is a temporary barrier of geotextile fabric installed on the contours across from a slope used to intercept sediment laden runoff from small drainage areas of disturbed soil. The purpose of silt fence is to reduce runoff velocity and effect deposition of transported sediment load.
   b. Stabilized construction entrance/exit. A stabilized construction entrance/exit is a stabilized pad of aggregate underlain with geotextile located at any point where traffic will be entering or leaving a construction site to or from a public right-of-way, street, alley, sidewalk, or parking area. The purpose of the stabilized construction entrance is to reduce or eliminate the tracking of sediment onto public rights-of-way or streets
      1. Aggregate size: Use a matrix of one to four-inch stone, or reclaimed or recycled equivalent
      2. Thickness: Not less than six inches
      3. Width: 24-foot minimum
      4. Length: As required, but not less than 50 feet
      5. Geotextile: To be placed over the entire area to be covered with aggregate. Piping of surface water under entrance shall be provided as necessary.

c. Sediment trap. The detention basins will be used as a sediment trap during construction. The sediment basin will have a riprap outlet sediment trap in place of the emergency spillway. Upon completion of construction, the sediment basin will be cleaned of all sediment buildup and the basin shall be finalized per plans.
d. Concrete washout area. A temporary excavated or above ground lined constructed pit where concrete truck mixers and equipment can be washed after their loads have been discharged to prevent highly alkaline runoff from entering storm drainage systems or leaching into the soil.
    1. The washout facility is sized to contain solids, wash water and rainfall. The maximum size shall be eight feet by eight feet at the bottom and two feet deep. If excavated, then the side slopes shall be 2:1 (horizontal to vertical).
    2. The facility shall be located a minimum of 100 feet from drainage swales, storm drain inlets, wetlands, streams, and other surface waters. Surface waters shall be prevented from entering the structure except got the access road. Appropriate access shall be provided with a gravel access road sloped down to the structure. Signs shall be placed to direct drivers to the facility after their load is discharged.
    3. All washout facilities will be lined to prevent leaching of liquids into the ground. The liner shall be plastic sheeting with a minimum thickness of 10 mils with no holes or tears, and anchored beyond the top of the pit with an earthen berm, sand bags, stone, or other structural appurtenance except at the access point.

5. Sequence of Major Activities

The contractor will be responsible for implementing the above listed erosion and sediment control practices. The contractor may designate these tasks to certain subcontractors as is seen fit, but the ultimate responsibility for implementing these controls and ensuring their proper function remains with the contractor. The order of activities shall be as follows:

a. Conduct a preconstruction meeting with all involved parties
b. Delineate boundaries of disturbance as per the layout and grading plans
c. Construct construction entrance at the location shown on the erosion and sediment control plan
d. Install silt fence in locations shown on the layout and grading plans
e. Establish staging areas on the project site
f. Construct sediment trap(s) and overflow spillways for use during construction
g. Excavate detention basin and install overflow spillway
h. Remove topsoil, stockpile and stabilize
i. Rough grade site including swales and provide temporary stabilization when idle for more than 7 days
j. Building foundation excavation
k. Install underground stormwater management system
l. Compact gravel along driveways and parking areas
m. Utility installations.
n. Install concrete washout, complete concrete site work.
o. Complete final grading of the site
p. Restore all compacted soils in accordance with section 5.1.6 of the NYS Stormwater Design Manual
q. Provide final stabilization and landscaping of new area
r. Site Paving
s. Provide final stabilization of disturbed areas via seeding mulching.
t. Construct bioretention basins and outlet controls upon upstream stabilization
u. Remove all temporary stabilization control practices

Disturbed areas of the site where construction activity has ceased for more than seven (7) days shall be temporarily seeded and mulched. The Erosion & Sediment Control plan is shown in Appendix F.

B. INSPECTION AND MAINTENANCE REQUIREMENTS

Best management practices, both construction and operational, must be inspected and maintained on a routine basis to ensure continued compliance with the NYS SPDES General Permit for Stormwater Discharges from Construction Activity. The contractor is responsible for inspecting the erosion and sediment control practices, the operator/owner is responsible for providing a qualified professional, as defined in the SPDES General Permit, to perform the required weekly inspections of the construction site from the time earth-disturbing activities begin until final stabilization is achieved and the Notice of Termination is filed. The contractor will obtain copies of all local and state regulations that are applicable to stormwater management, erosion control, and pollution minimization at this job site and will comply fully with such regulations. The contractor will submit written evidence of such compliance if requested by the operator or any agent of a regulatory body. The contractor will comply with all conditions of the NYSDEC SPDES General Permit for Stormwater Discharges from Construction Activity, including the conditions related to maintaining the SWPPP and evidence of compliance with the SWPPP at the job site and allowing regulatory personnel access to the job site and to records to determine compliance.

C. CONSTRUCTION MAINTENANCE/INSPECTION PROCEDURES

The operator shall maintain a record of all inspection reports in a site logbook. The logbook shall be maintained on site and be made available to the permitting authority upon request. Prior to the commencement of construction, the operator shall certify in the site logbook that the SWPPP, prepared in accordance with Part III.D. of the NYS DEC SPDES General Permit for Discharges from Construction Activities, meets all Federal, State and local erosion and sediment control requirements. The operator shall post at the site, in a publicly accessible location, a summary of the site inspection activities monthly. The following inspection and maintenance practices will be used to maintain erosion and sediment controls and stabilization measures.

1. Inspection and Maintenance Practices
    a. Inspections shall occur once every seven calendar days.
    b. 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 waterbodies located within or immediately adjacent to the property boundaries of the construction site, and all points of discharge from the construction site.
    c. The qualified inspector shall prepare an inspection report subsequent to each and every inspection. At a minimum, the inspection report shall include and/or address the following:
        i. Date and time of inspection;
        ii. Name and title of person(s) performing inspection;
        iii. A description of the weather and soil conditions (e.g. dry, wet, saturated) at the time of the inspection;
        iv. 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;
        v. 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;
        vi. Identification of all erosion and sediment control practices that need repair or maintenance;
        vii. Identification of all erosion and sediment control practices that were not installed or are not functioning as designed and need to be reinstalled or replaced;
        viii. Description and sketch of areas that are disturbed at the time of the inspection and areas that have been stabilized (temporarily and/or final) since the last inspection;

ix. Current phase of construction of all post-construction stormwater management practices and identification of all construction that is not in conformance with the SWPPP and technical standards;

x. 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); and

xi. 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.

d. Within one business day of the completion of an inspection, the qualified inspector shall notify the owner or operator and appropriate contractor or subcontractor of any corrective actions that need to be taken. The contractor or subcontractor shall begin implementing the corrective actions within one business day of this notification and shall complete the corrective actions in a reasonable time frame.

e. All inspection reports shall be signed by the qualified inspector. The inspection reports shall be maintained on the site.

f. Erosion and Sediment Control Inspection/Maintenance

i. Silt Fence: Silt fence shall be inspected for depth of sediment, tears, etc., to see if the fabric is securely attached to the fence posts, and to see that the fence posts are securely in the ground. Built up sediment will be removed from silt fence when it has reached one-third the height of the fence.

ii. Stabilized Construction Entrance/Exit: The entrance shall be maintained in a condition which will prevent tracking of sediment onto public rights-of-way. This may require periodic top dressing with additional aggregate. All sediment spilled, dropped, or washed onto public rights-of-way must be removed immediately. When necessary, wheels must 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 aggregate, which drains into an approved sediment-trapping device. All sediment shall be prevented from entering storm drains, ditches, or water courses.

iii. Seeding: Temporary and permanent seeding and all other stabilization measures will be inspected for bare spots, washouts, and healthy growth.

2. Inspection and Maintenance Report Forms

- Once installation of any required or optional erosion control device or measure has been implemented, at least twice every seven calendar days a Qualified Professional shall inspect each practice. The inspector shall use the forms found in this SWPPP to inventory and report the condition of each measure to assist in maintaining the erosion and sediment control measures in good working order.
- These report forms shall become an integral part of the SWPPP and shall be made readily accessible to governmental inspection officials, the operator's engineer, and the operator for review upon request during visits to the project site. In addition, copies of the reports shall be provided to any of these persons upon requires, via mail or facsimile transmission. Inspection and maintenance report forms are to be maintained by the permittee for three years following the final stabilization of the site.
- The operator shall also prepare a written summary of its status with respect to compliance with the NYSDEC SPDES General Permit for Stormwater Discharges from Construction Activity at a minimum frequency of every three months during which coverage under the SPDES General Permit exists. The summary should address the status of achieving each

component of the SWPPP. The reports shall be signed by the signatory of the NOI or a duly authorized person and be retained at the construction site.

1. Other Record Keeping Requirements

   The contractor shall keep the following records related to construction activities at the site:

   - Dates when major grading activities occur and the areas which were graded.
   - Dates and details concerning the installation of structural controls.
   - Dates when construction activities cease in an area.
   - Dates when an area is stabilized, either temporarily or permanently.
   - Dates of rainfall and the amount of rainfall.
   - Dates and descriptions of the character and amount of any spills of hazardous materials.
   - Records of reports filed with regulatory agencies if reportable quantities of hazardous materials are spilled.

D. OPERATION MAINTENANCE AND INSPECTION PROCEDURES

Long-term maintenance of the stormwater mitigation basins and swales will be the responsibility of the owner and/or the tenant. Maintenance and inspection check lists have been included in Appendix D.

1. Embankments and emergency spillways will be inspected annually and after major storm events. Items to be inspected include:
   a. Vegetation and ground cover is adequate to prevent erosion.
   b. No embankment erosion has occurred.
   c. No animal burrows into embankments.
   d. No unauthorized planting.
   e. No cracking, bulging or sliding of dam.
   f. Emergency spillway is in good condition, free of silt buildup and debris.
   g. No leaks or seepage is occurring on downstream face.
   h. All slope protection and riprap is intact and no failure has occurred.

2. Bioretention basins will be inspected monthly and after major storm events. Items to be inspected include:
   a. Debris and undesirable vegetative growth shall be removed.
   b. Sediment depth shall be noted. Sediment shall be removed prior to reaching 50% of the design depth.
   c. No visible pollution within basins.

3. Grass lined swales shall be inspected and maintained as follows:
   a. All channels are free of debris on monthly basis.
   b. No visible evidence of erosion.
   c. Mowing shall be performed as needed. Inspect to ensure minimum mowing depth has not been exceeded.
   d. Dewatering of swales between storms. Inspect monthly or as necessary.
   e. Inspect swales for sediment deposition annually and clean as necessary.

Section V. MATERIALS MANAGEMENT PLAN

A. MATERIALS COVERED

The following materials or substances are expected to be present onsite during construction:

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

B. MATERIAL MANAGEMENT PRACTICES

The following are the material management practices that will be 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. Good Housekeeping
   The following good housekeeping practices will be followed onsite during the construction project.
   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 their lids on when not in use. Drip pans shall be provided under all dispensers.
   c. Products will be kept in their original containers with the original manufacturer's label in legible condition.
   d. Substances will not be mixed with one another unless recommended by the manufacturer.
   e. Whenever possible, all of a product will be used up before disposing of the container.
   f. Manufacturer's recommendations for proper use and disposal will be followed.
   g. The job site superintendent will be responsible for daily inspections to ensure proper use and disposal of materials.

2. Hazardous Products
   These practices will be used to reduce the risks associated with hazardous materials. 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. An MSDS will be posted in the immediate area where such product is stored and/or used and another copy of each MSDS will be maintained in the SWPPP file at the job site construction trailer office. Each employee who must handle a substance with hazardous properties will be instructed on the use of MSDS sheets and the specific information in the applicable MSDS for the product he/she is using, particularly regarding spill control techniques.
   a. Products will be kept in original containers with the original labels in legible condition.
   b. Original labels and material safety data sheets (MSDS's) will be procured and used for each material.
   c. If surplus product must be disposed of, manufacturer's or local/state/federal recommended methods for proper disposal will be followed.

3. Hazardous Waste
   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. Site personnel will be instructed in these practices by the job site superintendent, who will also be responsible for seeing that these practices are followed.

4. Product Specific Practices
   The following product specific practices will be followed on the job site.

   a. Petroleum Products
      All onsite vehicles will be monitored for leaks and receive regular preventative maintenance to reduce the chance of leakage. Petroleum products will be stored in tightly sealed containers, which are clearly labeled. Any petroleum storage tanks used onsite will have a dike or berm containment structure constructed around it to contain any spills, which may occur. Drip pans shall be provided for all dispensers. Any asphalt substances used onsite will be applied per the manufacturer's recommendations.

   b. Fertilizers
      Due to the onsite public water supply that will be constructed as part of this project, the use of fertilizers is not allowed without the written authorization of the operator. Authorization will be based on the specific product's possible contaminants and impacts to the groundwater.

   c. Paints, Paint Solvents, and Cleaning Solvents
      All containers will be tightly sealed and stored when not in use. Excess paint and solvents will not be discharged to the storm sewer system but will be properly disposed of per manufacturer's instructions or state and federal regulations.

5. Concrete Wastes
   Concrete trucks will be allowed to wash out or discharge surplus concrete or drum wash water on the site, but only in either (1) specifically designated area which has been prepared to prevent contact between the concrete and/or washout and stormwater which will be discharged from the site or (2) in locations where waste concrete can be poured into forms to make riprap or other useful concrete products.

   The hardened residue from the concrete washout areas will be disposed of in the same manner as other non-hazardous construction waste materials or may be broken up and used on site as deemed appropriate by the contractor. The job site superintendent will be responsible for seeing that these procedures are followed.

   All concrete washout areas will be in an area where the likelihood of the area contributing to storm water discharges is negligible. If required, additional BMPs must be implemented to prevent concrete wastes from contributing to storm water discharges.

6. Solid and Construction Wastes
   All waste materials will be collected and stored in a securely lidded 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 management regulations.

   All trash and construction debris from the site will be deposited in the dumpster. The dumpster will be emptied a minimum of twice 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 personnel will be instructed regarding the correct procedures for waste disposal.

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

7. Sanitary Wastes
   All sanitary waste will be collected from the portable units a minimum of three times per week by a licensed portable facility provider in complete compliance with local and state regulation.

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

Section VI. SPILL PREVENTION AND RESPONSE PROCEDURES

The contractor will train all personnel in the proper handling and cleanup of spilled materials. No spilled hazardous materials or hazardous wastes will be allowed to come in contact with storm water discharges. If such contact occurs, the storm water discharge will be contained on site until appropriate measures in compliance with state and federal regulations are taken to dispose of such contaminated storm water. It shall be the responsibility of the job site superintendent to properly train all personnel in spill prevention and clean up procedures.

In order to minimize the potential for a spill of hazardous materials to come into contact with storm water, the following steps will be implemented:

1. All materials with hazardous properties (such as pesticides, petroleum products, fertilizers, detergents, construction chemicals, acids, paints, paint solvents, cleaning solvents, additives for soil stabilization, concrete curing compounds and additives, etc.) will be stored in a secure location, with their lids on, preferably under cover, when not in use.
2. The minimum practical quantity of all such materials will be kept on the job site.
3. A spill control and containment kit (containing, for example, absorbent materials, acid neutralizing powder, brooms, dust pans, mops, rags, gloves, goggles, plastic and metal trash containers, etc.) will be provided at the storage site.
4. Manufacturer's recommended methods for spill cleanup will be clearly posted and site personnel will be trained regarding these procedures and the location of the information and cleanup supplies.

In the event of a spill, the following procedures should be followed

1. All spills will be cleaned up immediately after discovery.
2. The spill area will be kept well ventilated and personnel will wear appropriate protective clothing to prevent injury from contact with the hazardous substances.
3. The project manager and the Engineer of Record will be notified immediately.

   Spills of toxic or hazardous materials will be reported to the appropriate federal, state, and/or local government agency, regardless of the size of the spill. Spills of amounts that exceed Reportable Quantities of certain substances specifically mentioned in federal regulations (40 CFR 110, 40 CFR 117, and 40 CFR 302) must be immediately reported to the NYSDEC 24-Hour Spill Hotline at **1-800-457-7362.**

4. If the spill exceeds a Reportable Quantity, the SWPPP must be modified within seven (7) calendar days of knowledge of the discharge to provide a description of the release, the circumstances leading to the release, and the date of the release. The plans must identify measures to prevent the recurrence of such releases and to respond to such releases.

The job site superintendent will be the spill prevention and response coordinator. He will designate the individuals who will receive spill prevention and response training. These individuals will each become responsible for a particular phase of prevention and response. The names of these personnel will be posted in the material storage area and in the office trailer onsite.

Section VII. CONTROL OF NON-STORMWATER DISCHARGES

Certain types of discharges are allowable under the NYS-DEC SPDES General Permit for Stormwater Discharges from Construction Activity, and it is the intent of this SWPPP to allow such discharges. These types of discharges will be allowed under the conditions that no pollutants will be allowed to come in contact with the water prior to or after its discharge. The control measures, which have been outlined previously in this SWPPP, will be strictly followed to ensure that no contamination of these non-stormwater discharges takes place. The following non-storm water discharges are allowed by the NYS-DEC and may occur at the job site:

1. Discharges from firefighting activities
2. Fire hydrant flushing
3. Waters to which cleansers or other components have not been added that are used to wash vehicles or control dust
4. Routine external building wash down which does not use detergents
5. Pavement wash waters where spills or leaks of toxic or hazardous materials have not occurred (unless all spilled material has been removed) and where detergents are not used
6. Air conditioning condensate
7. Springs
8. Foundation or footing drains where flows are not contaminated with process materials such as solvents.

Section VIII. CERTIFICATION AND NOTIFICATION

The New York State Department of Environmental Conservation requires that the operator and the contractor make certifications of knowledge of the contents of this SWPPP and agreement to follow the SWPPP. The terms of the General Permit also require that each contractor sign the SWPPP plan, thereby making them co-permittees and acknowledging their responsibility for certain operational aspects of the plan. These certifications should be signed before the contractor begins activities and should be filed with the site's SWPPP at the jobsite.

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APPENDIX A: HYDRO CAD – EXISTING CONDITIONS

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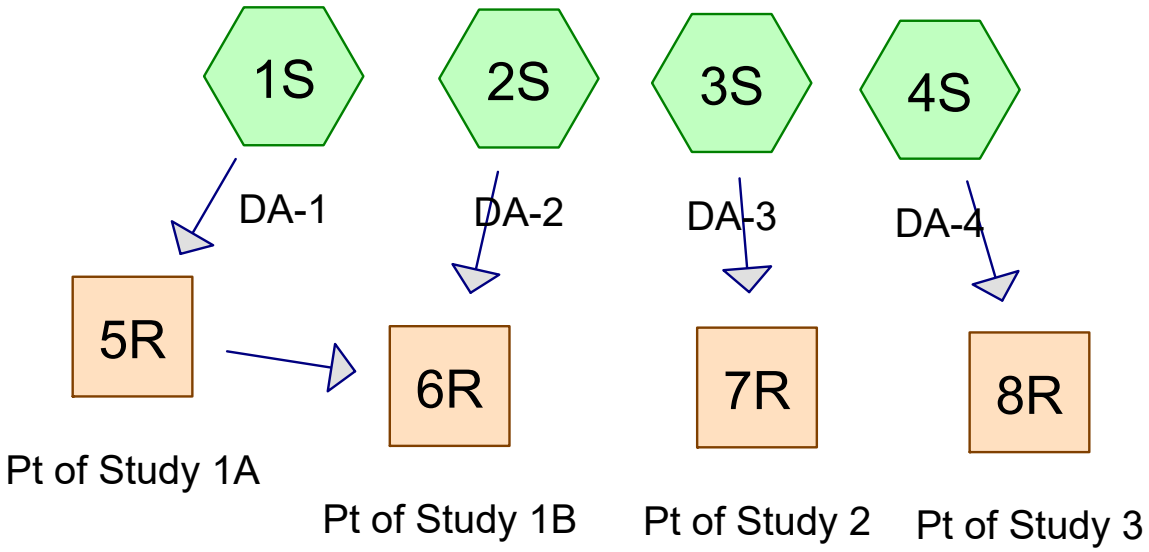
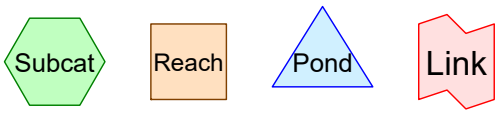




Routing Diagram for Existing Drainage Areas
Prepared by Napierala Consulting, P.C., Printed 9/3/2020
HydroCAD® 10.00-18 s/n 01332 © 2016 HydroCAD Software Solutions LLC

Summary for Subcatchment 1S: DA-1

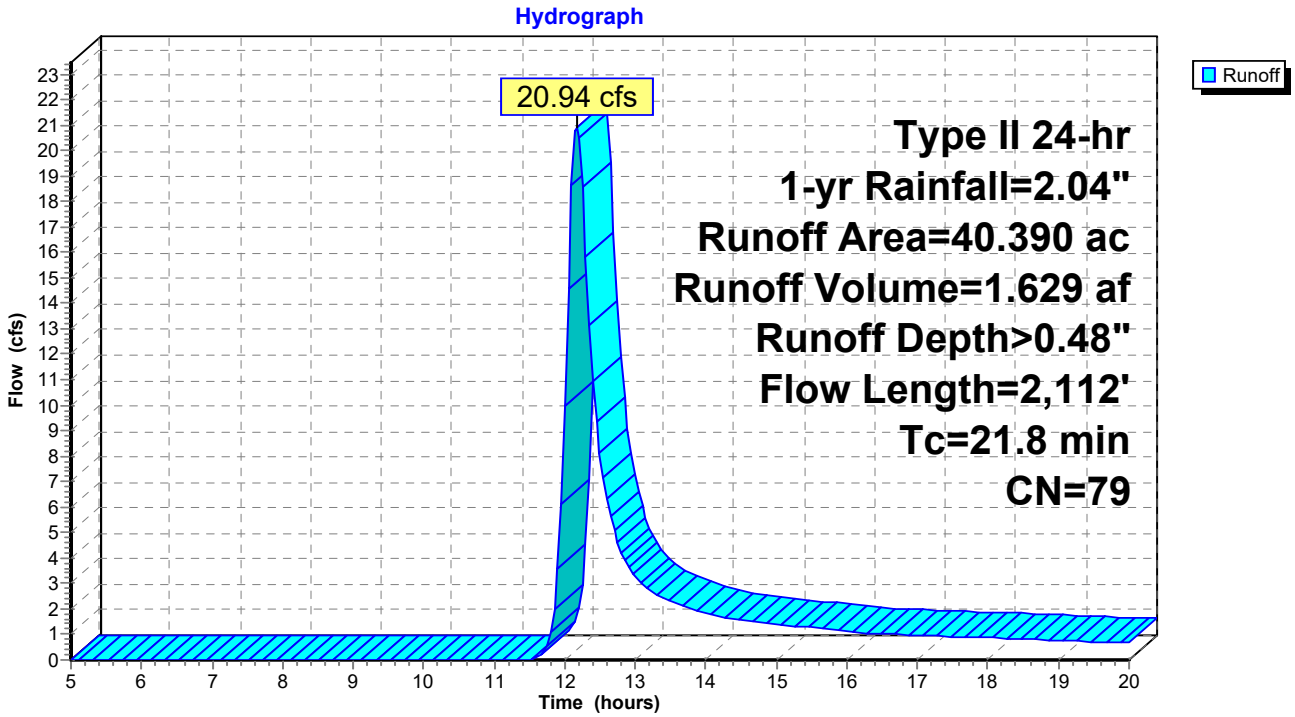
Runoff = 20.94 cfs @ 12.17 hrs, Volume= 1.629 af, Depth> 0.48"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 1-yr Rainfall=2.04"

Area (ac)	CN	Description
12.250	77	Woods, Good, HSG D
28.140	80	>75% Grass cover, Good, HSG D
40.390	79	Weighted Average
40.390		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.0	100	0.0600	0.10		**Sheet Flow, Sheet Flow** Woods: Light underbrush n= 0.400 P2= 2.39"
3.6	885	0.0650	4.10		**Shallow Concentrated Flow, Shallow** Unpaved Kv= 16.1 fps
2.2	1,127	0.0080	8.44	135.03	**Channel Flow, Swale** Area= 16.0 sf Perim= 8.0' r= 2.00' n= 0.025 Earth, clean & straight
21.8	2,112	Total			

Subcatchment 1S: DA-1



Summary for Subcatchment 2S: DA-2

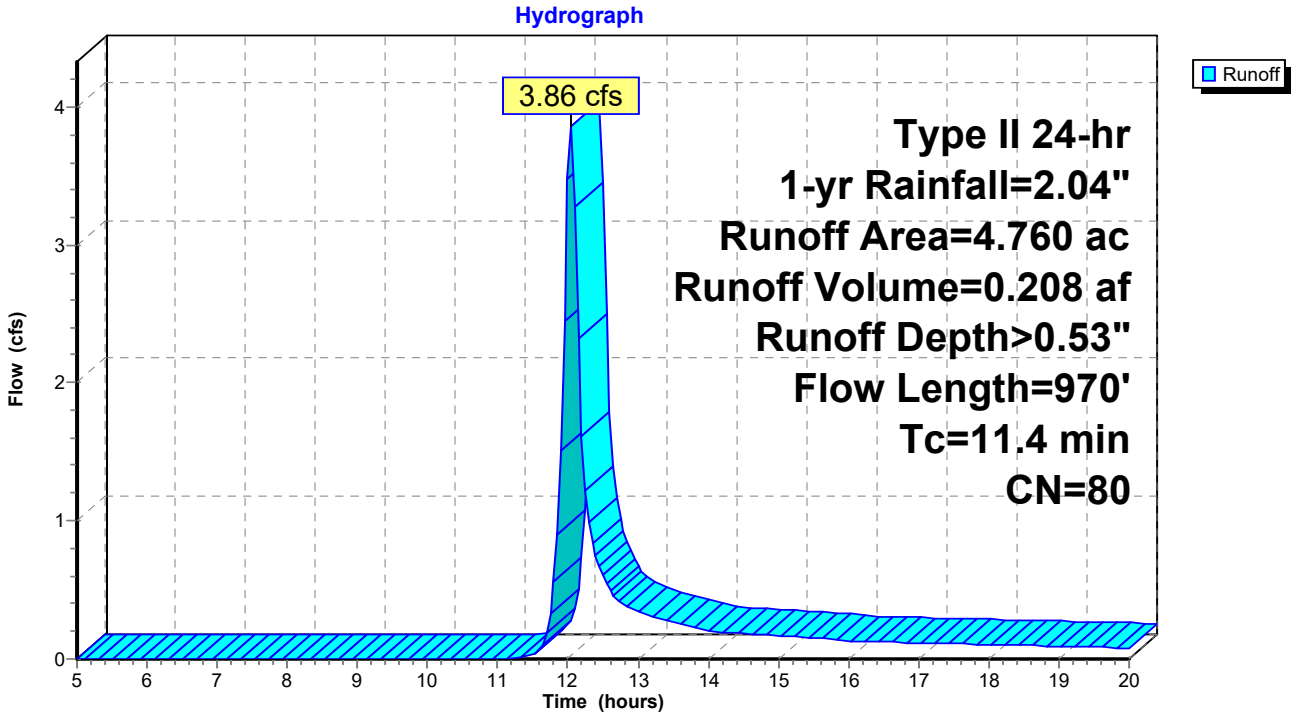
Runoff = 3.86 cfs @ 12.04 hrs, Volume= 0.208 af, Depth> 0.53"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 1-yr Rainfall=2.04"

Area (ac)	CN	Description
0.650	77	Woods, Good, HSG D
4.040	80	>75% Grass cover, Good, HSG D
0.070	98	Paved parking, HSG D
4.760	80	Weighted Average
4.690		98.53% Pervious Area
0.070		1.47% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.3	100	0.0650	0.16		**Sheet Flow, Sheet Flow** Grass: Dense n= 0.240 P2= 2.39"
0.5	144	0.0833	4.65		**Shallow Concentrated Flow, Shallow** Unpaved Kv= 16.1 fps
0.6	726	0.0440	21.93	307.08	**Channel Flow, Swale** Area= 14.0 sf Perim= 6.0' r= 2.33' n= 0.025 Earth, clean & straight
11.4	970	Total			

Subcatchment 2S: DA-2



Summary for Subcatchment 3S: DA-3

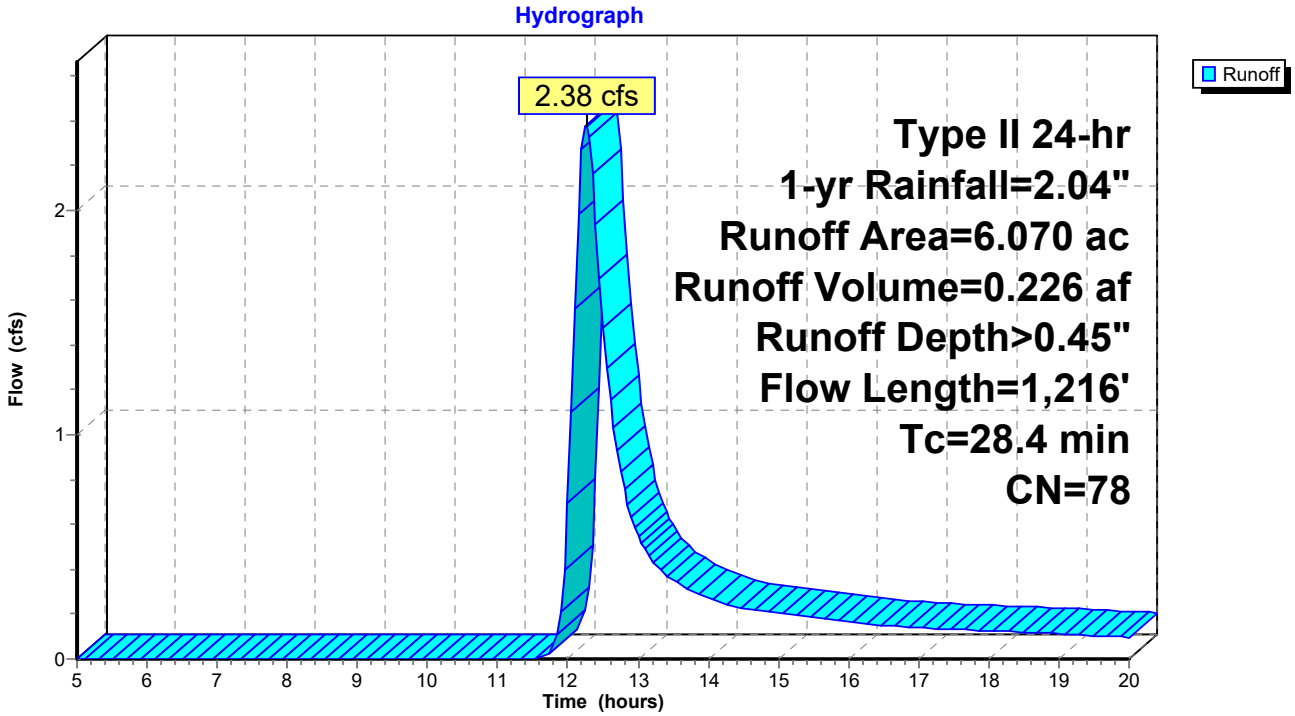
Runoff = 2.38 cfs @ 12.26 hrs, Volume= 0.226 af, Depth> 0.45"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 1-yr Rainfall=2.04"

Area (ac)	CN	Description
3.330	77	Woods, Good, HSG D
2.740	80	>75% Grass cover, Good, HSG D
6.070	78	Weighted Average
6.070		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.5	100	0.0400	0.13		**Sheet Flow, Sheet Flow** Grass: Dense n= 0.240 P2= 2.39"
14.2	555	0.0170	0.65		**Shallow Concentrated Flow, Shallow** Woodland Kv= 5.0 fps
1.5	281	0.0360	3.05		**Shallow Concentrated Flow, Shallow** Unpaved Kv= 16.1 fps
0.2	280	0.1210	20.51	205.13	**Channel Flow, Swale** Area= 10.0 sf Perim= 5.0' r= 2.00' n= 0.040 Earth, dense weeds
28.4	1,216	Total			

Subcatchment 3S: DA-3



Summary for Subcatchment 4S: DA-4

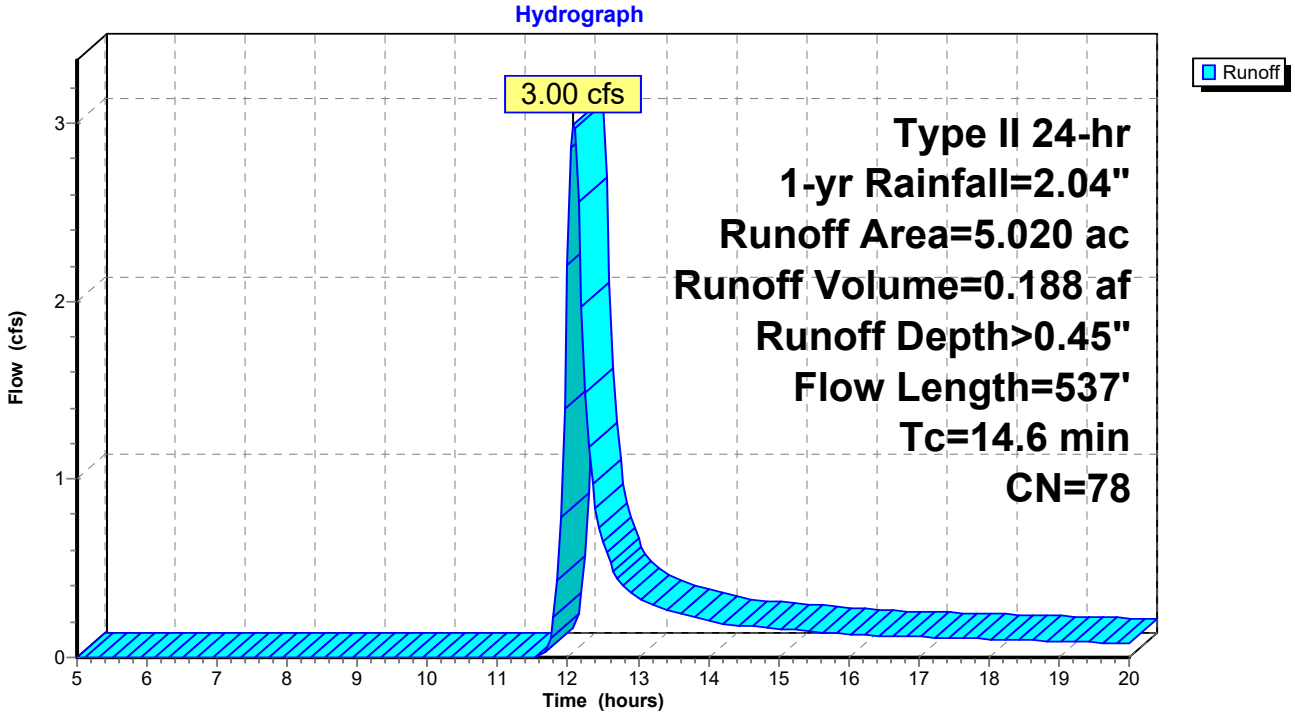
Runoff = 3.00 cfs @ 12.09 hrs, Volume= 0.188 af, Depth> 0.45"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 1-yr Rainfall=2.04"

Area (ac)	CN	Description
3.480	77	Woods, Good, HSG D
1.540	80	>75% Grass cover, Good, HSG D
5.020	78	Weighted Average
5.020		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.4	100	0.0500	0.15		**Sheet Flow, Sheet Flow** Grass: Dense n= 0.240 P2= 2.39"
1.5	287	0.0380	3.14		**Shallow Concentrated Flow, Shallow** Unpaved Kv= 16.1 fps
1.7	150	0.0870	1.47		**Shallow Concentrated Flow, Shallow** Woodland Kv= 5.0 fps
14.6	537	Total			

Subcatchment 4S: DA-4

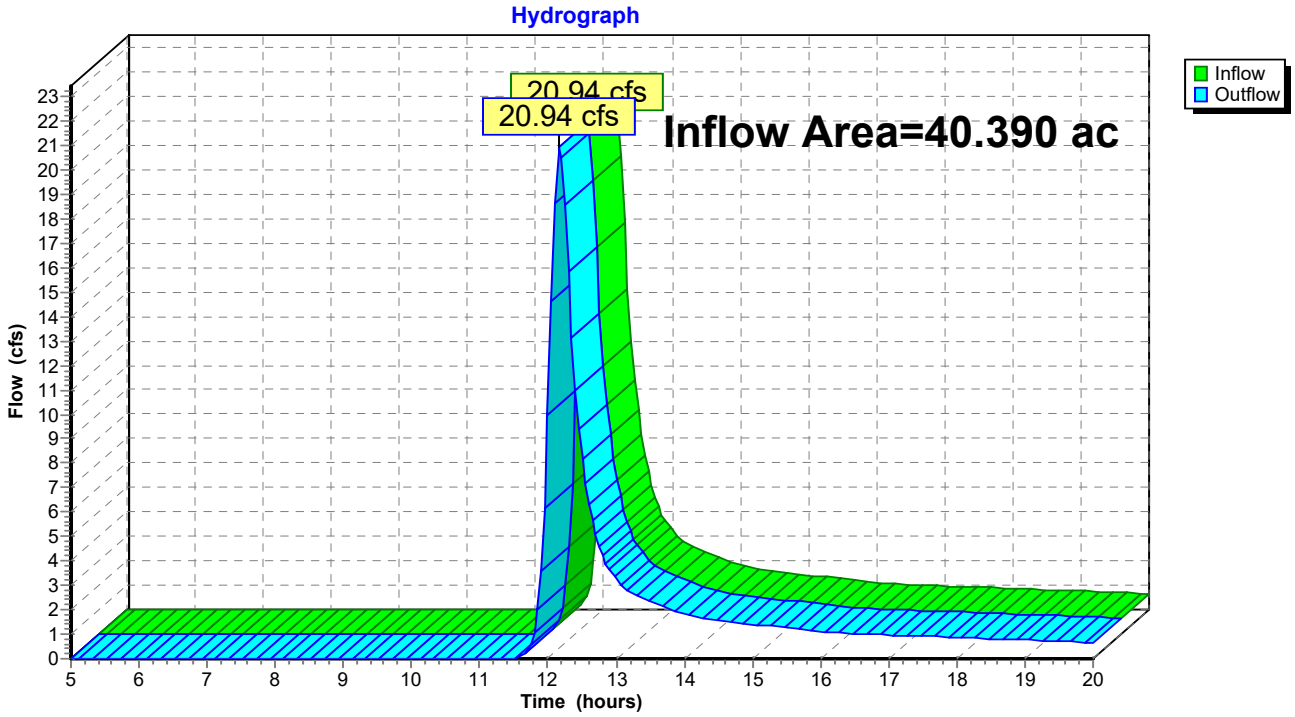


Summary for Reach 5R: Pt of Study 1A

Inflow Area = 40.390 ac, 0.00% Impervious, Inflow Depth > 0.48" for 1-yr event
Inflow = 20.94 cfs @ 12.17 hrs, Volume= 1.629 af
Outflow = 20.94 cfs @ 12.17 hrs, Volume= 1.629 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 5R: Pt of Study 1A

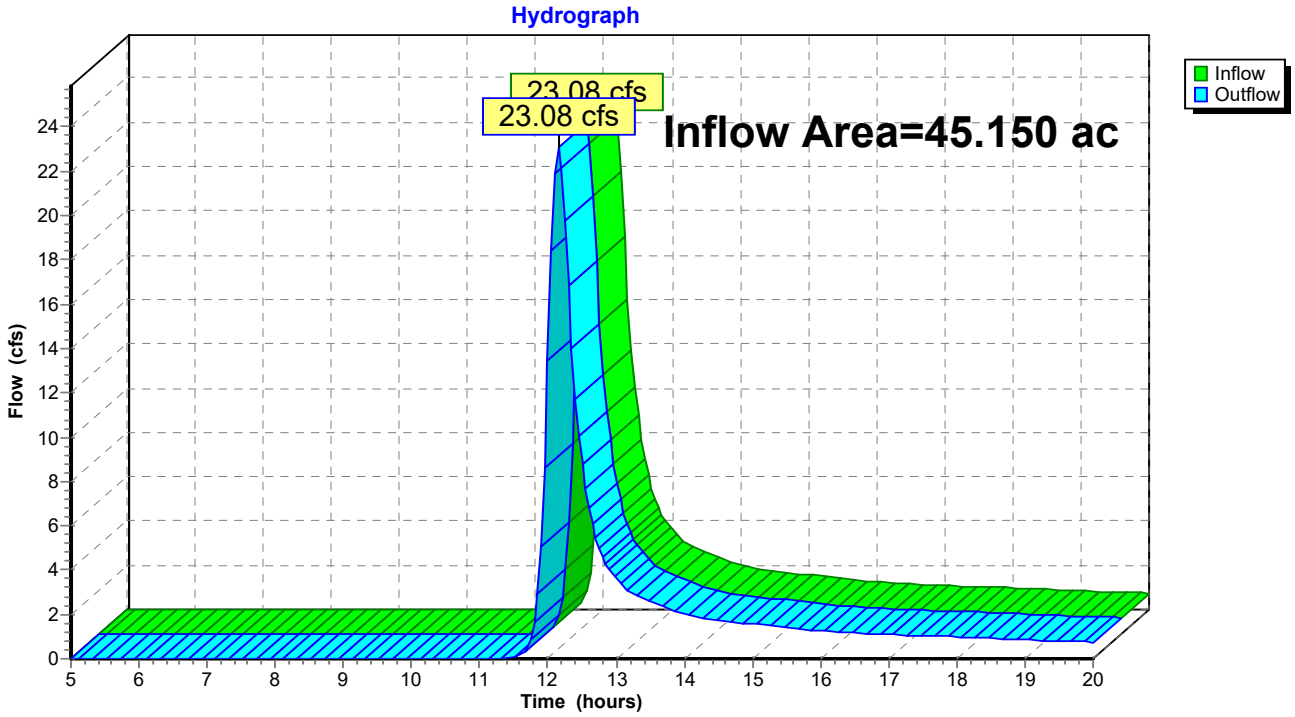


Summary for Reach 6R: Pt of Study 1B

Inflow Area = 45.150 ac, 0.16% Impervious, Inflow Depth > 0.49" for 1-yr event
Inflow = 23.08 cfs @ 12.15 hrs, Volume= 1.837 af
Outflow = 23.08 cfs @ 12.15 hrs, Volume= 1.837 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 6R: Pt of Study 1B

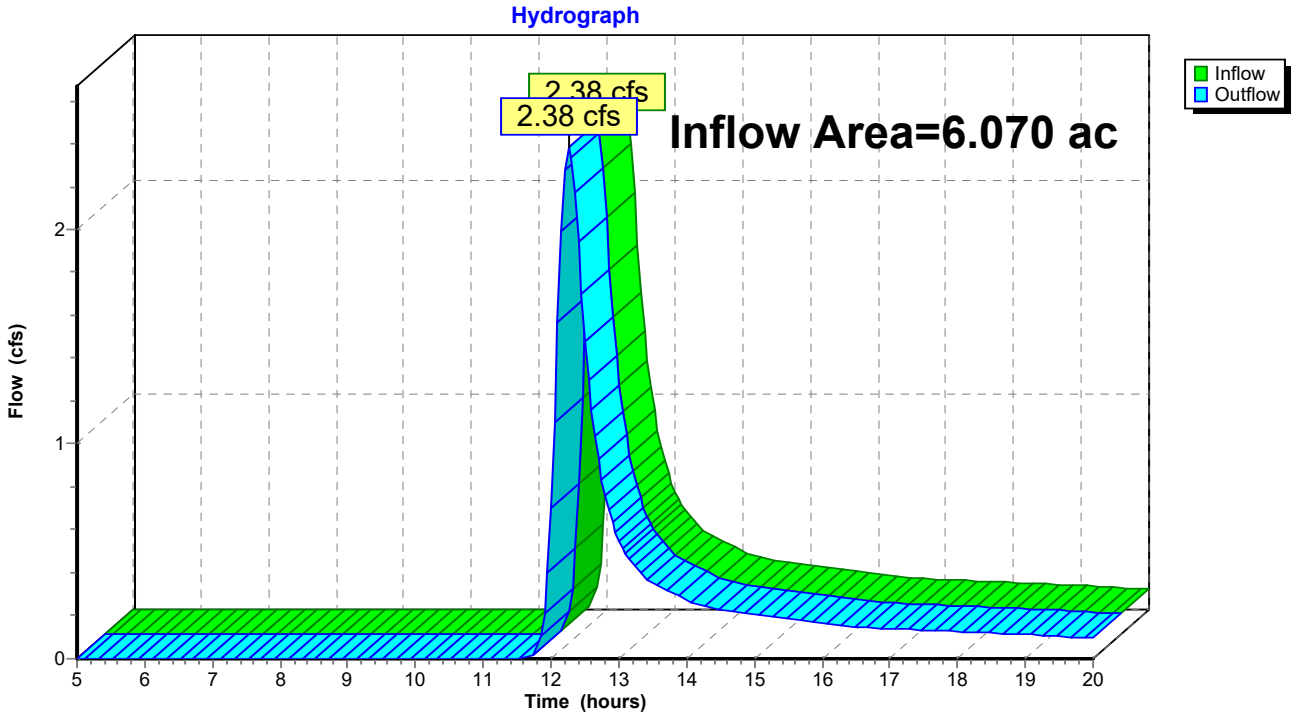


Summary for Reach 7R: Pt of Study 2

Inflow Area = 6.070 ac, 0.00% Impervious, Inflow Depth > 0.45" for 1-yr event
Inflow = 2.38 cfs @ 12.26 hrs, Volume= 0.226 af
Outflow = 2.38 cfs @ 12.26 hrs, Volume= 0.226 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 7R: Pt of Study 2

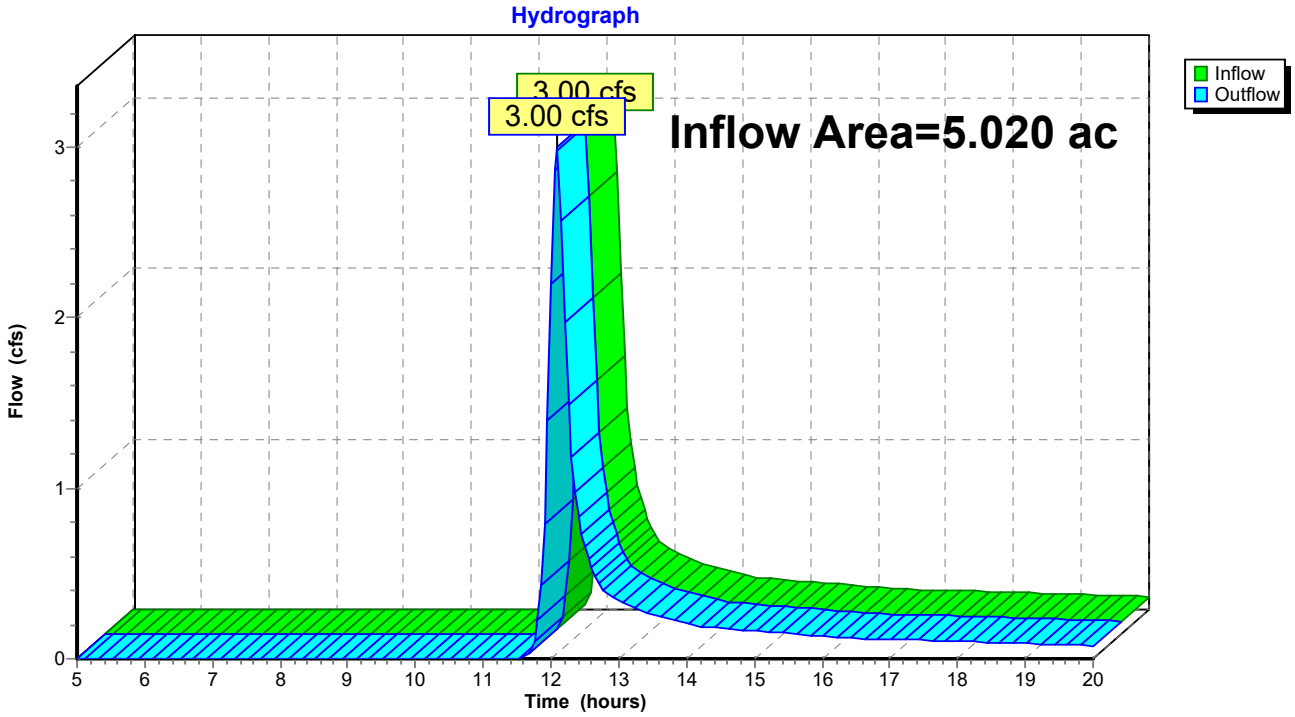


Summary for Reach 8R: Pt of Study 3

Inflow Area = 5.020 ac, 0.00% Impervious, Inflow Depth > 0.45" for 1-yr event
Inflow = 3.00 cfs @ 12.09 hrs, Volume= 0.188 af
Outflow = 3.00 cfs @ 12.09 hrs, Volume= 0.188 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 8R: Pt of Study 3



Summary for Subcatchment 1S: DA-1

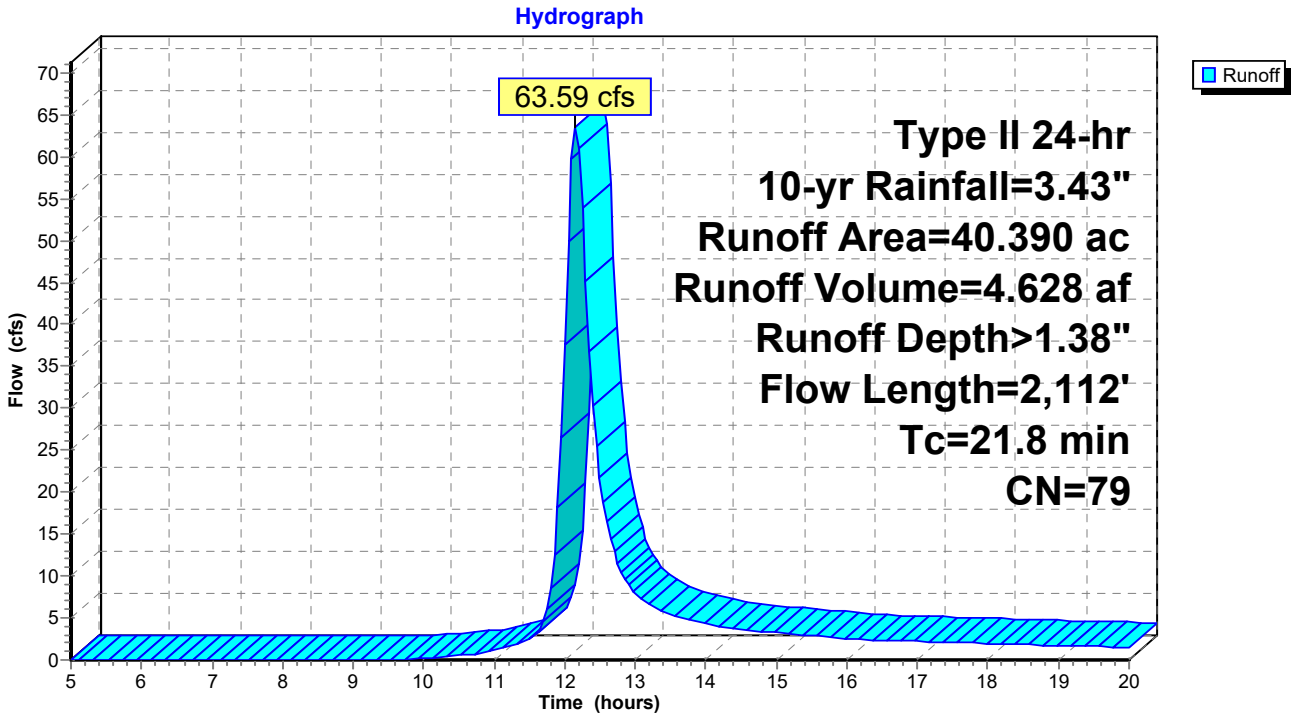
Runoff = 63.59 cfs @ 12.15 hrs, Volume= 4.628 af, Depth> 1.38"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-yr Rainfall=3.43"

Area (ac)	CN	Description
12.250	77	Woods, Good, HSG D
28.140	80	>75% Grass cover, Good, HSG D
40.390	79	Weighted Average
40.390		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.0	100	0.0600	0.10		**Sheet Flow, Sheet Flow** Woods: Light underbrush n= 0.400 P2= 2.39"
3.6	885	0.0650	4.10		**Shallow Concentrated Flow, Shallow** Unpaved Kv= 16.1 fps
2.2	1,127	0.0080	8.44	135.03	**Channel Flow, Swale** Area= 16.0 sf Perim= 8.0' r= 2.00' n= 0.025 Earth, clean & straight
21.8	2,112	Total			

Subcatchment 1S: DA-1



Summary for Subcatchment 2S: DA-2

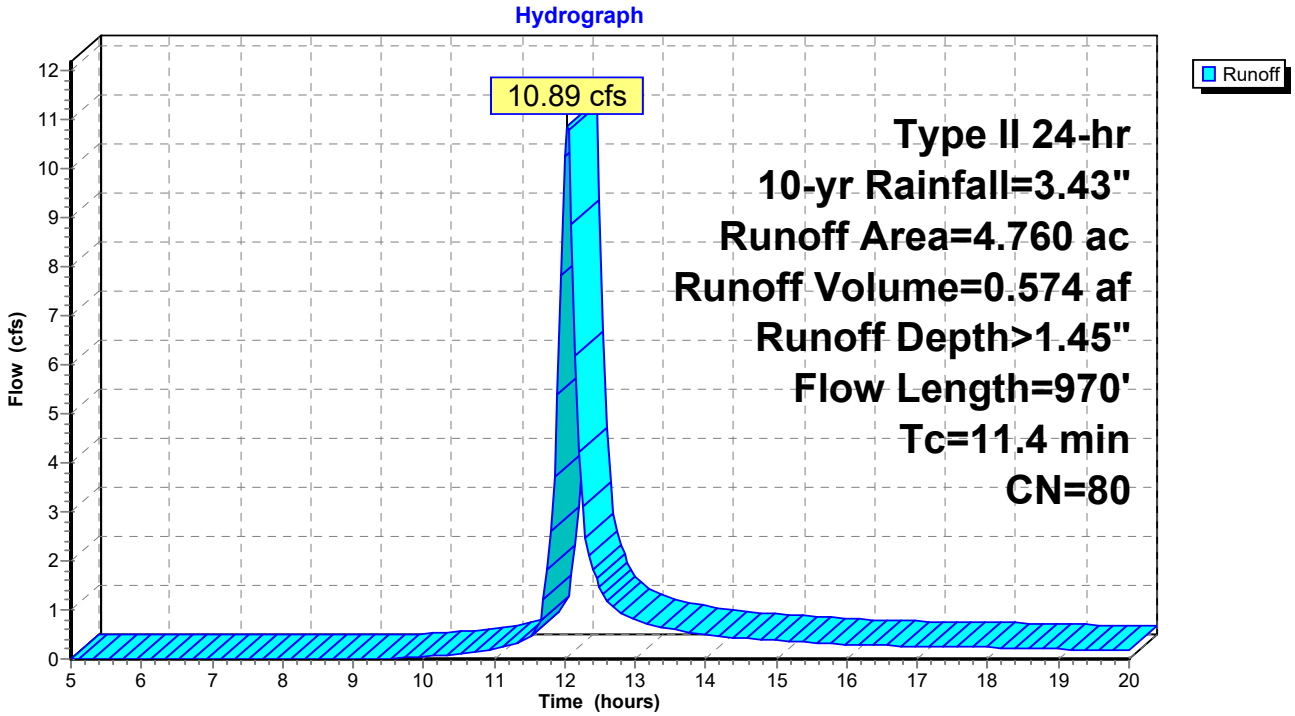
Runoff = 10.89 cfs @ 12.04 hrs, Volume= 0.574 af, Depth> 1.45"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-yr Rainfall=3.43"

Area (ac)	CN	Description
0.650	77	Woods, Good, HSG D
4.040	80	>75% Grass cover, Good, HSG D
0.070	98	Paved parking, HSG D
4.760	80	Weighted Average
4.690		98.53% Pervious Area
0.070		1.47% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.3	100	0.0650	0.16		**Sheet Flow, Sheet Flow** Grass: Dense n= 0.240 P2= 2.39"
0.5	144	0.0833	4.65		**Shallow Concentrated Flow, Shallow** Unpaved Kv= 16.1 fps
0.6	726	0.0440	21.93	307.08	**Channel Flow, Swale** Area= 14.0 sf Perim= 6.0' r= 2.33' n= 0.025 Earth, clean & straight
11.4	970	Total			

Subcatchment 2S: DA-2



Summary for Subcatchment 3S: DA-3

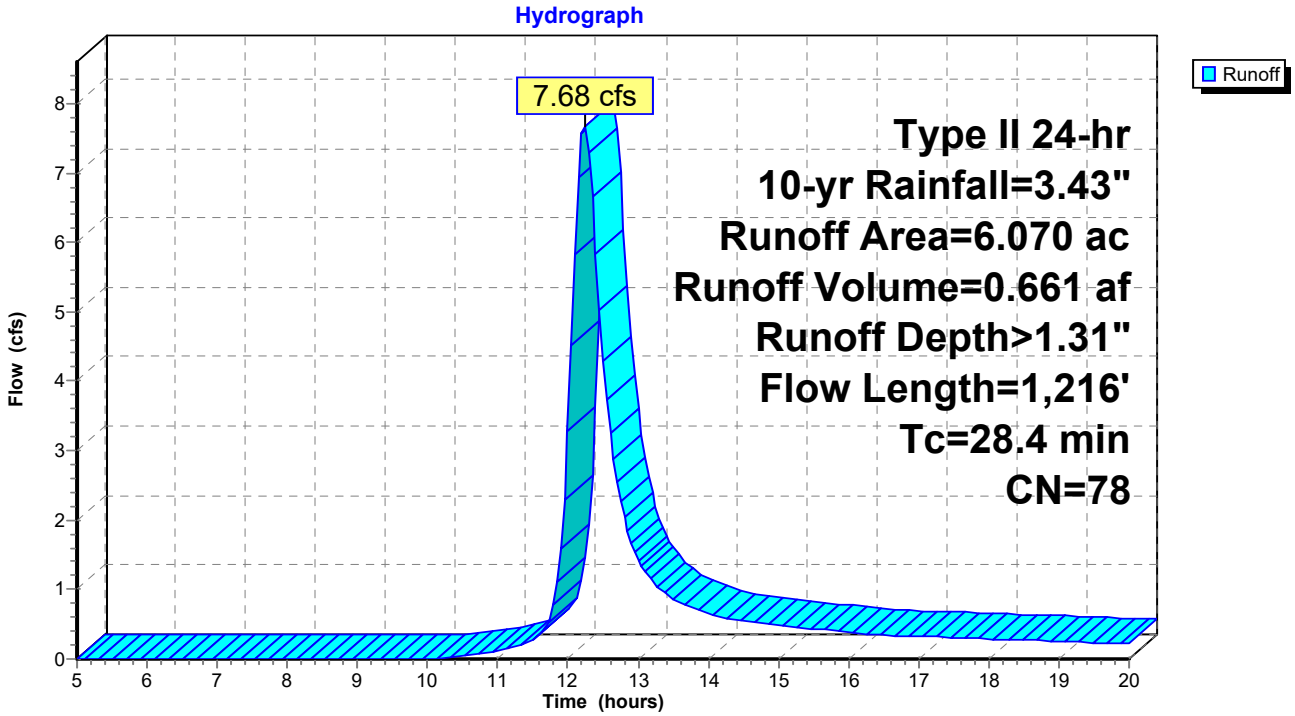
Runoff = 7.68 cfs @ 12.23 hrs, Volume= 0.661 af, Depth> 1.31"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-yr Rainfall=3.43"

Area (ac)	CN	Description
3.330	77	Woods, Good, HSG D
2.740	80	>75% Grass cover, Good, HSG D
6.070	78	Weighted Average
6.070		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.5	100	0.0400	0.13		**Sheet Flow, Sheet Flow** Grass: Dense n= 0.240 P2= 2.39"
14.2	555	0.0170	0.65		**Shallow Concentrated Flow, Shallow** Woodland Kv= 5.0 fps
1.5	281	0.0360	3.05		**Shallow Concentrated Flow, Shallow** Unpaved Kv= 16.1 fps
0.2	280	0.1210	20.51	205.13	**Channel Flow, Swale** Area= 10.0 sf Perim= 5.0' r= 2.00' n= 0.040 Earth, dense weeds
28.4	1,216	Total			

Subcatchment 3S: DA-3



Summary for Subcatchment 4S: DA-4

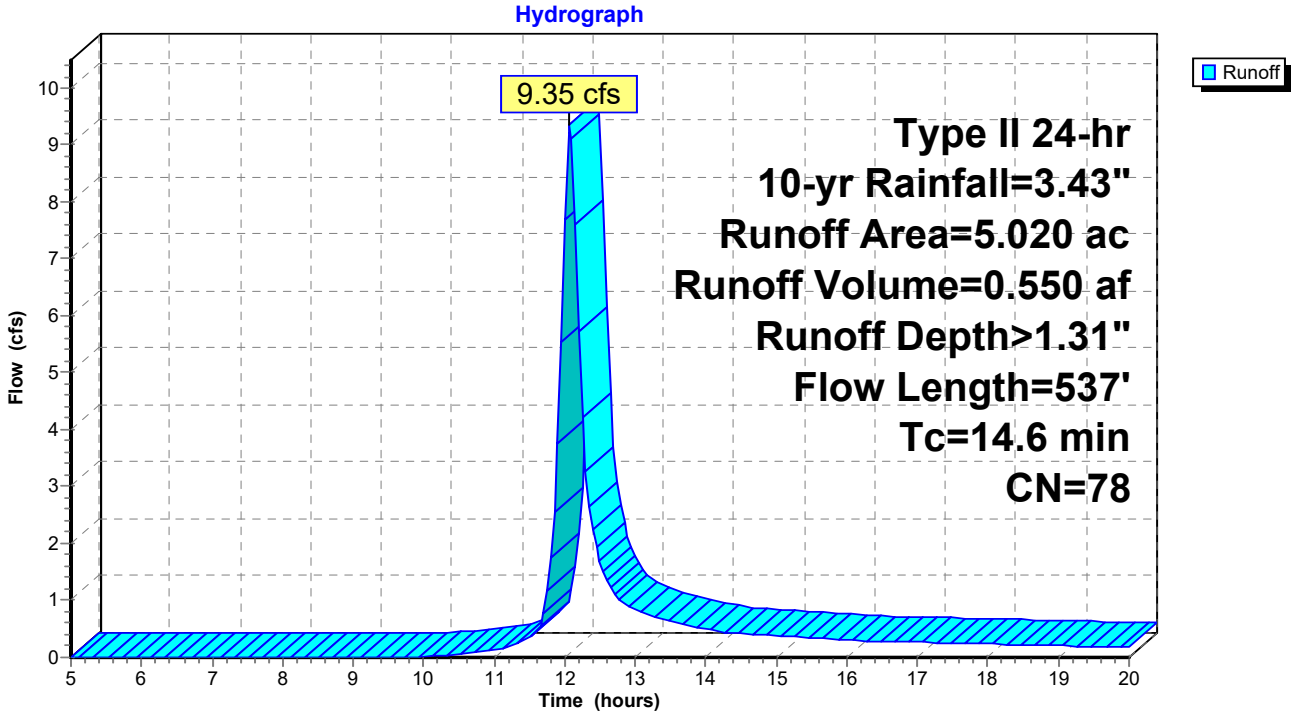
Runoff = 9.35 cfs @ 12.07 hrs, Volume= 0.550 af, Depth> 1.31"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-yr Rainfall=3.43"

Area (ac)	CN	Description
3.480	77	Woods, Good, HSG D
1.540	80	>75% Grass cover, Good, HSG D
5.020	78	Weighted Average
5.020		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.4	100	0.0500	0.15		**Sheet Flow, Sheet Flow** Grass: Dense n= 0.240 P2= 2.39"
1.5	287	0.0380	3.14		**Shallow Concentrated Flow, Shallow** Unpaved Kv= 16.1 fps
1.7	150	0.0870	1.47		**Shallow Concentrated Flow, Shallow** Woodland Kv= 5.0 fps
14.6	537	Total			

Subcatchment 4S: DA-4

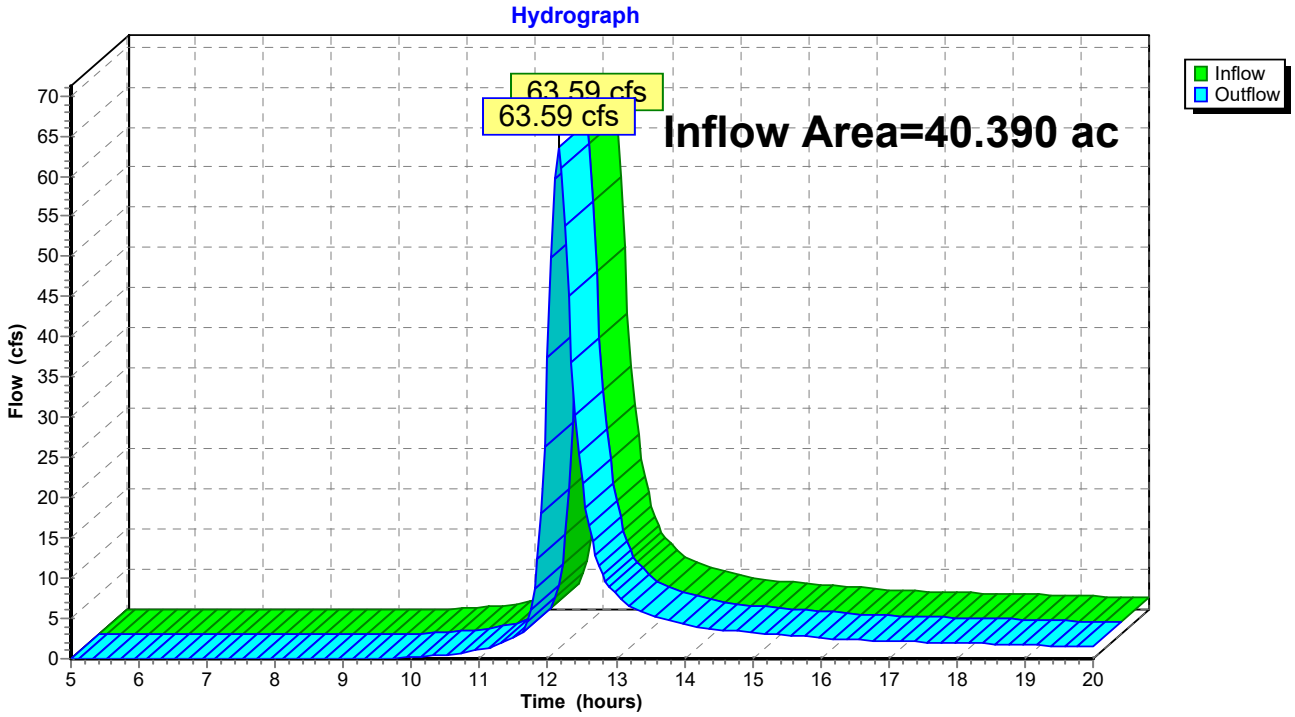


Summary for Reach 5R: Pt of Study 1A

Inflow Area = 40.390 ac, 0.00% Impervious, Inflow Depth > 1.38" for 10-yr event
Inflow = 63.59 cfs @ 12.15 hrs, Volume= 4.628 af
Outflow = 63.59 cfs @ 12.15 hrs, Volume= 4.628 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 5R: Pt of Study 1A

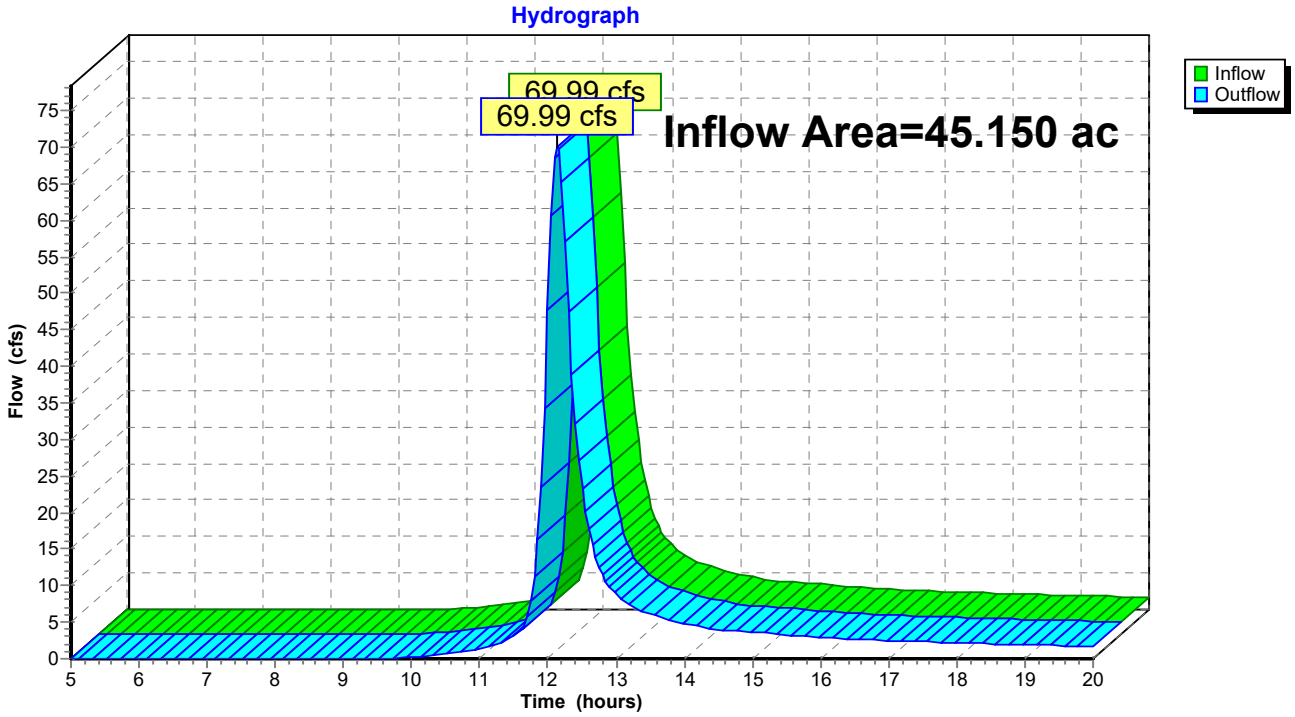


Summary for Reach 6R: Pt of Study 1B

Inflow Area = 45.150 ac, 0.16% Impervious, Inflow Depth > 1.38" for 10-yr event
Inflow = 69.99 cfs @ 12.14 hrs, Volume= 5.202 af
Outflow = 69.99 cfs @ 12.14 hrs, Volume= 5.202 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 6R: Pt of Study 1B

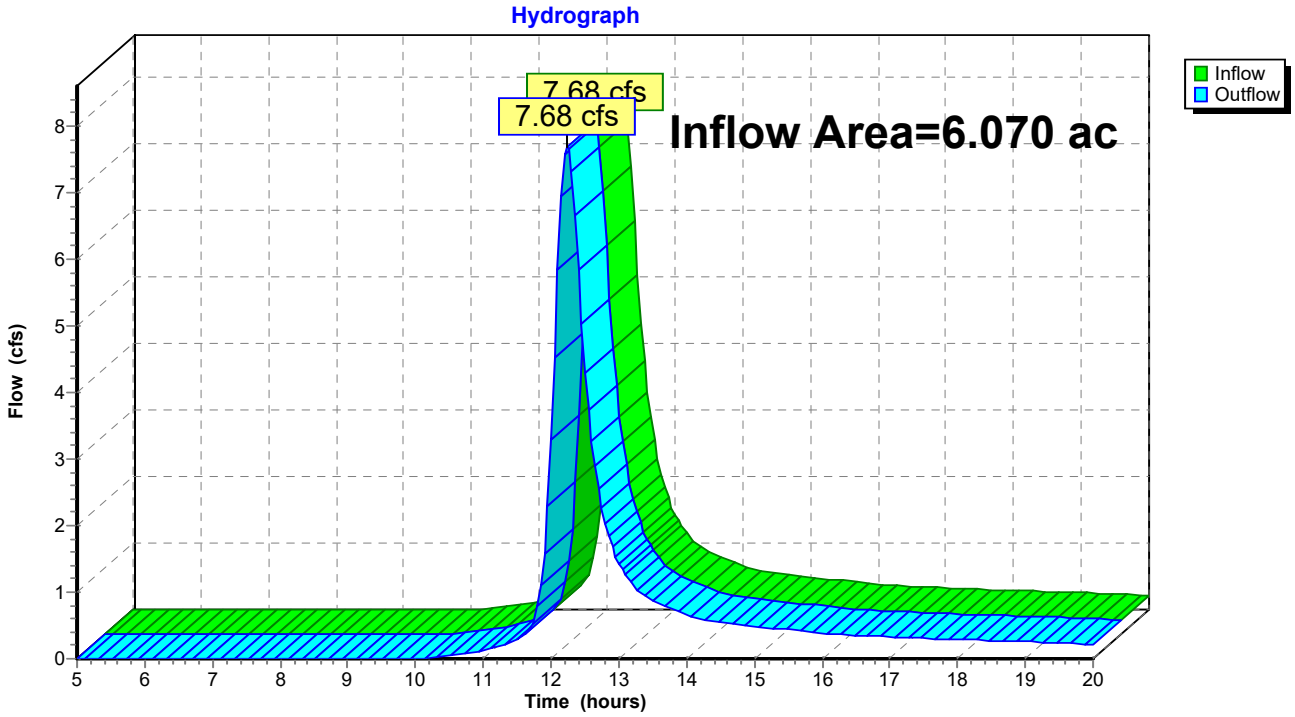


Summary for Reach 7R: Pt of Study 2

Inflow Area = 6.070 ac, 0.00% Impervious, Inflow Depth > 1.31" for 10-yr event
Inflow = 7.68 cfs @ 12.23 hrs, Volume= 0.661 af
Outflow = 7.68 cfs @ 12.23 hrs, Volume= 0.661 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 7R: Pt of Study 2

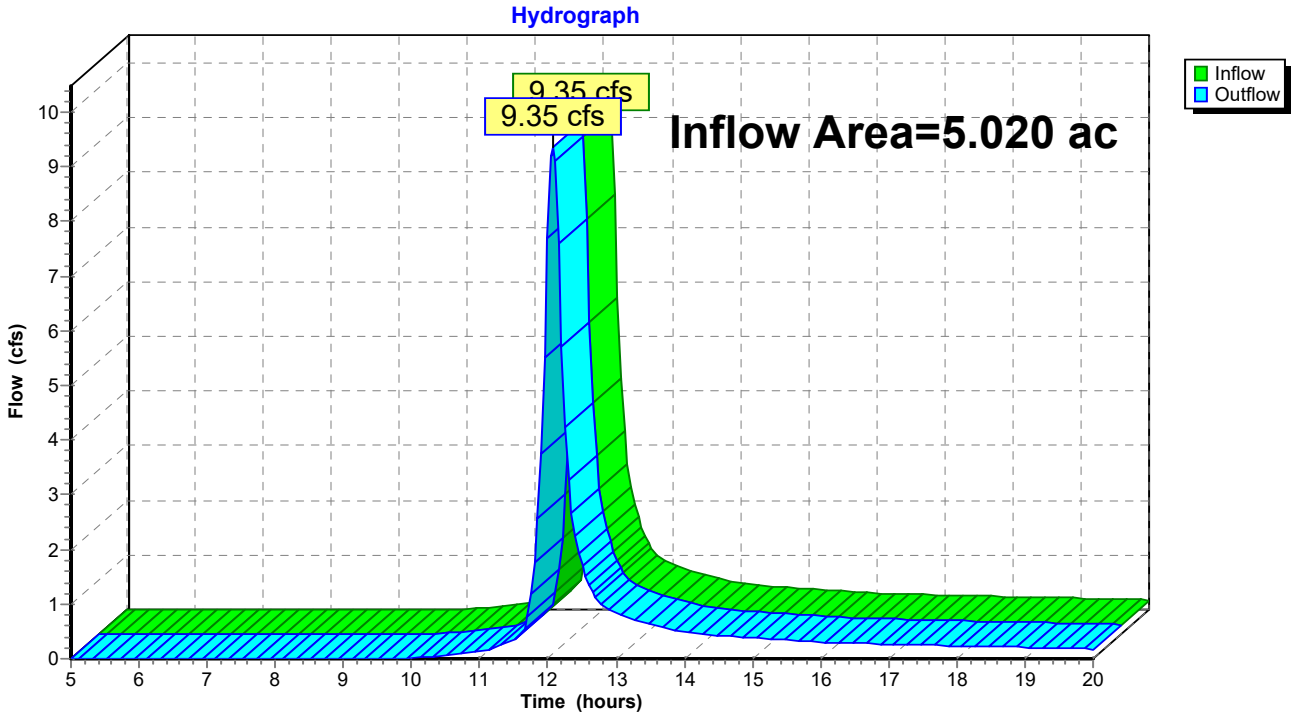


Summary for Reach 8R: Pt of Study 3

Inflow Area = 5.020 ac, 0.00% Impervious, Inflow Depth > 1.31" for 10-yr event
Inflow = 9.35 cfs @ 12.07 hrs, Volume= 0.550 af
Outflow = 9.35 cfs @ 12.07 hrs, Volume= 0.550 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 8R: Pt of Study 3



Summary for Subcatchment 1S: DA-1

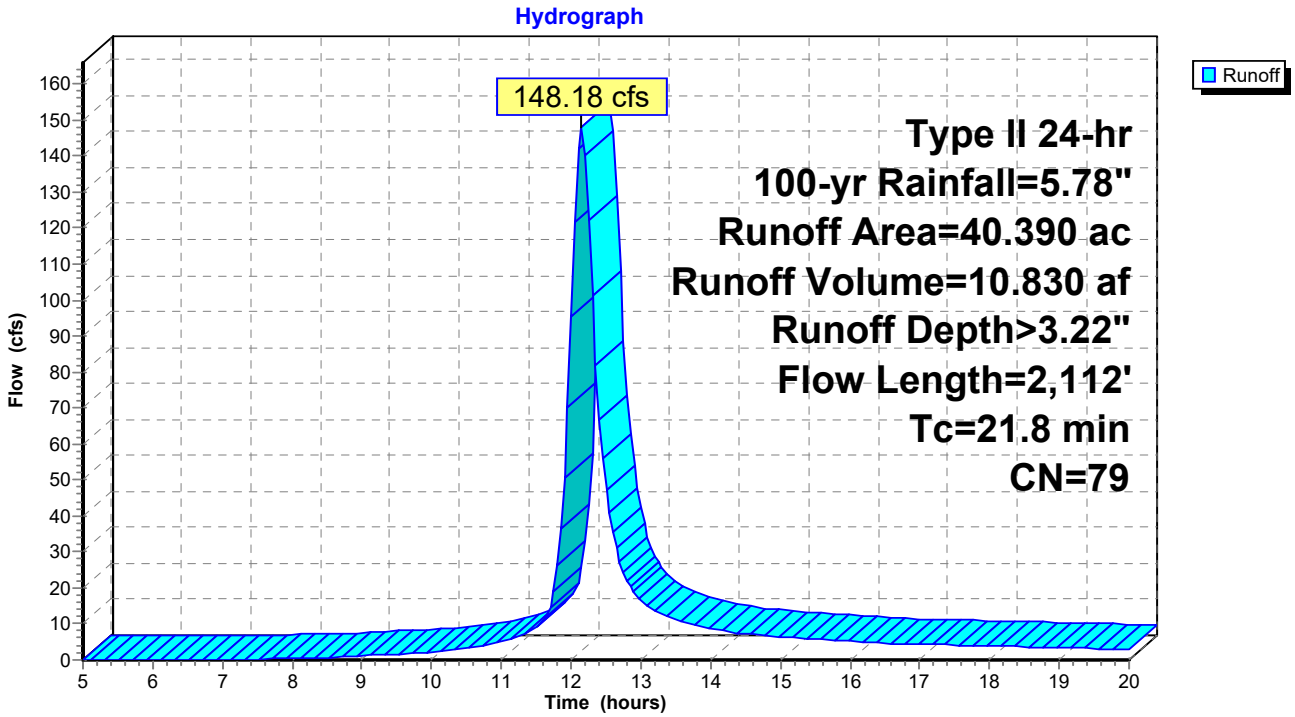
Runoff = 148.18 cfs @ 12.15 hrs, Volume= 10.830 af, Depth> 3.22"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 100-yr Rainfall=5.78"

Area (ac)	CN	Description
12.250	77	Woods, Good, HSG D
28.140	80	>75% Grass cover, Good, HSG D
40.390	79	Weighted Average
40.390		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.0	100	0.0600	0.10		**Sheet Flow, Sheet Flow** Woods: Light underbrush n= 0.400 P2= 2.39"
3.6	885	0.0650	4.10		**Shallow Concentrated Flow, Shallow** Unpaved Kv= 16.1 fps
2.2	1,127	0.0080	8.44	135.03	**Channel Flow, Swale** Area= 16.0 sf Perim= 8.0' r= 2.00' n= 0.025 Earth, clean & straight
21.8	2,112	Total			

Subcatchment 1S: DA-1



Summary for Subcatchment 2S: DA-2

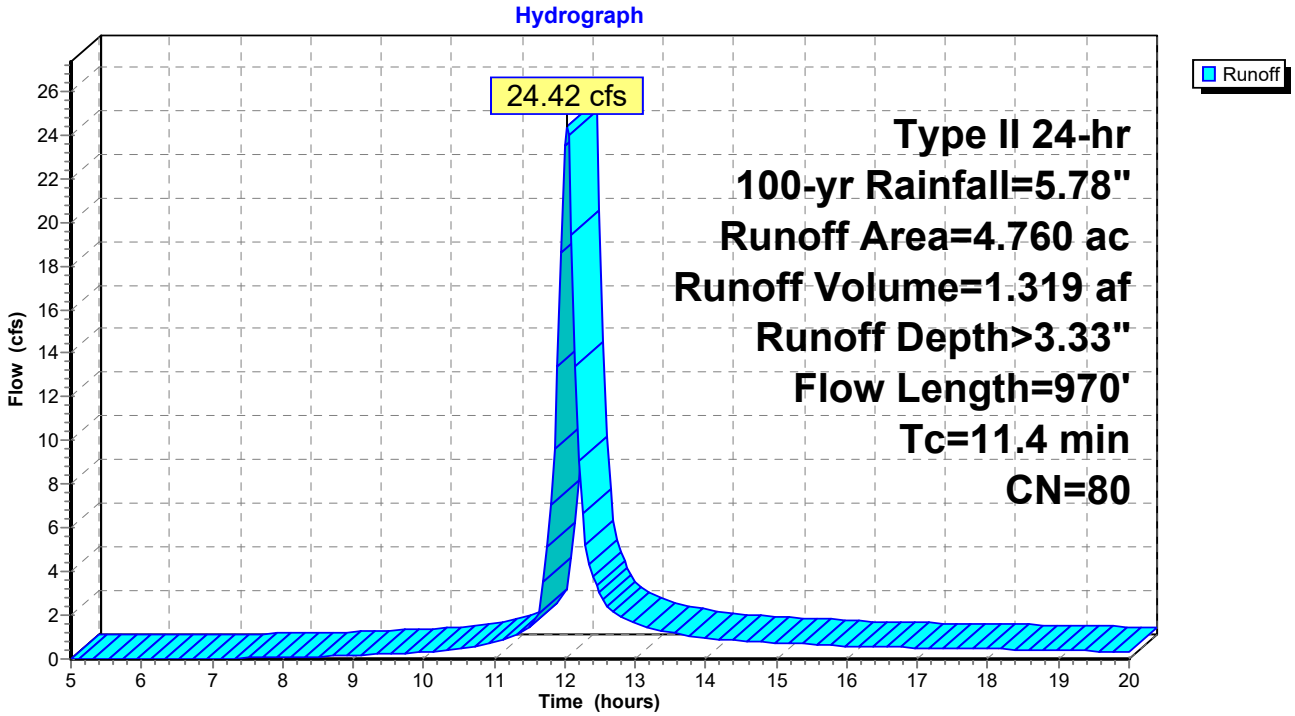
Runoff = 24.42 cfs @ 12.03 hrs, Volume= 1.319 af, Depth> 3.33"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 100-yr Rainfall=5.78"

Area (ac)	CN	Description
0.650	77	Woods, Good, HSG D
4.040	80	>75% Grass cover, Good, HSG D
0.070	98	Paved parking, HSG D
4.760	80	Weighted Average
4.690		98.53% Pervious Area
0.070		1.47% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.3	100	0.0650	0.16		**Sheet Flow, Sheet Flow** Grass: Dense n= 0.240 P2= 2.39"
0.5	144	0.0833	4.65		**Shallow Concentrated Flow, Shallow** Unpaved Kv= 16.1 fps
0.6	726	0.0440	21.93	307.08	**Channel Flow, Swale** Area= 14.0 sf Perim= 6.0' r= 2.33' n= 0.025 Earth, clean & straight
11.4	970	Total			

Subcatchment 2S: DA-2



Summary for Subcatchment 3S: DA-3

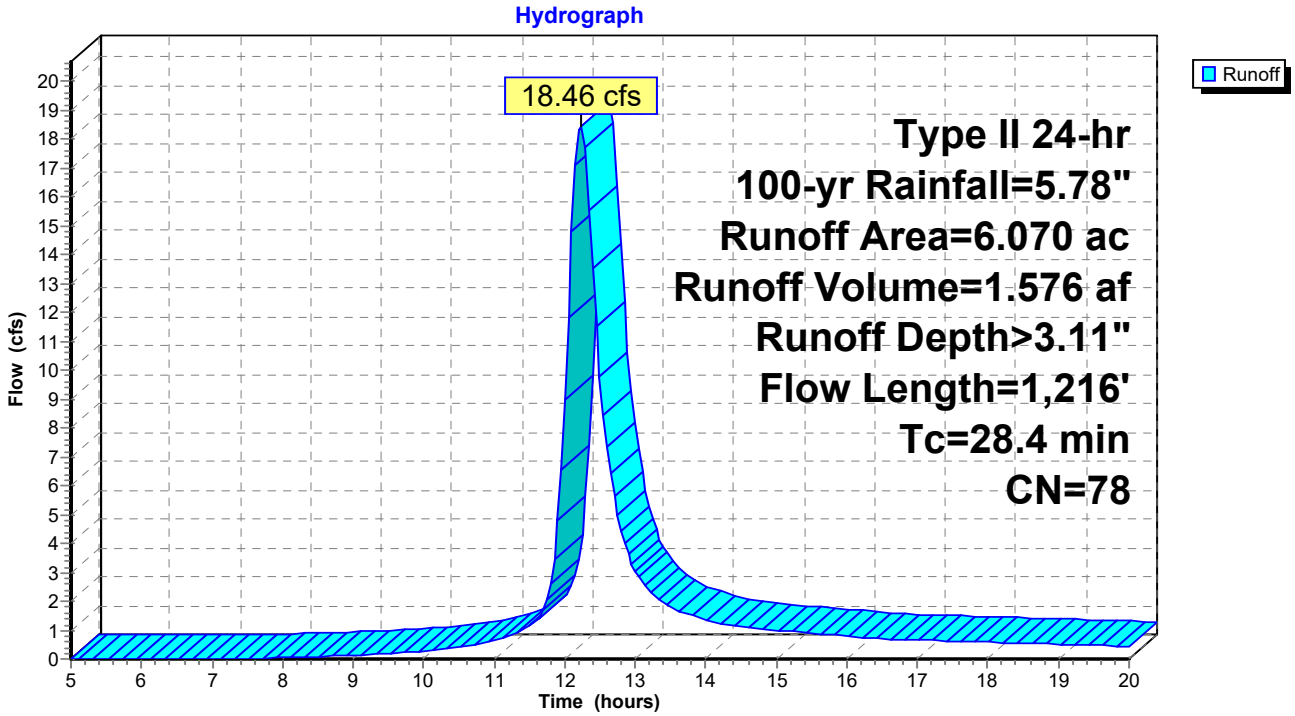
Runoff = 18.46 cfs @ 12.22 hrs, Volume= 1.576 af, Depth> 3.11"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 100-yr Rainfall=5.78"

Area (ac)	CN	Description
3.330	77	Woods, Good, HSG D
2.740	80	>75% Grass cover, Good, HSG D
6.070	78	Weighted Average
6.070		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.5	100	0.0400	0.13		**Sheet Flow, Sheet Flow** Grass: Dense n= 0.240 P2= 2.39"
14.2	555	0.0170	0.65		**Shallow Concentrated Flow, Shallow** Woodland Kv= 5.0 fps
1.5	281	0.0360	3.05		**Shallow Concentrated Flow, Shallow** Unpaved Kv= 16.1 fps
0.2	280	0.1210	20.51	205.13	**Channel Flow, Swale** Area= 10.0 sf Perim= 5.0' r= 2.00' n= 0.040 Earth, dense weeds
28.4	1,216	Total			

Subcatchment 3S: DA-3



Summary for Subcatchment 4S: DA-4

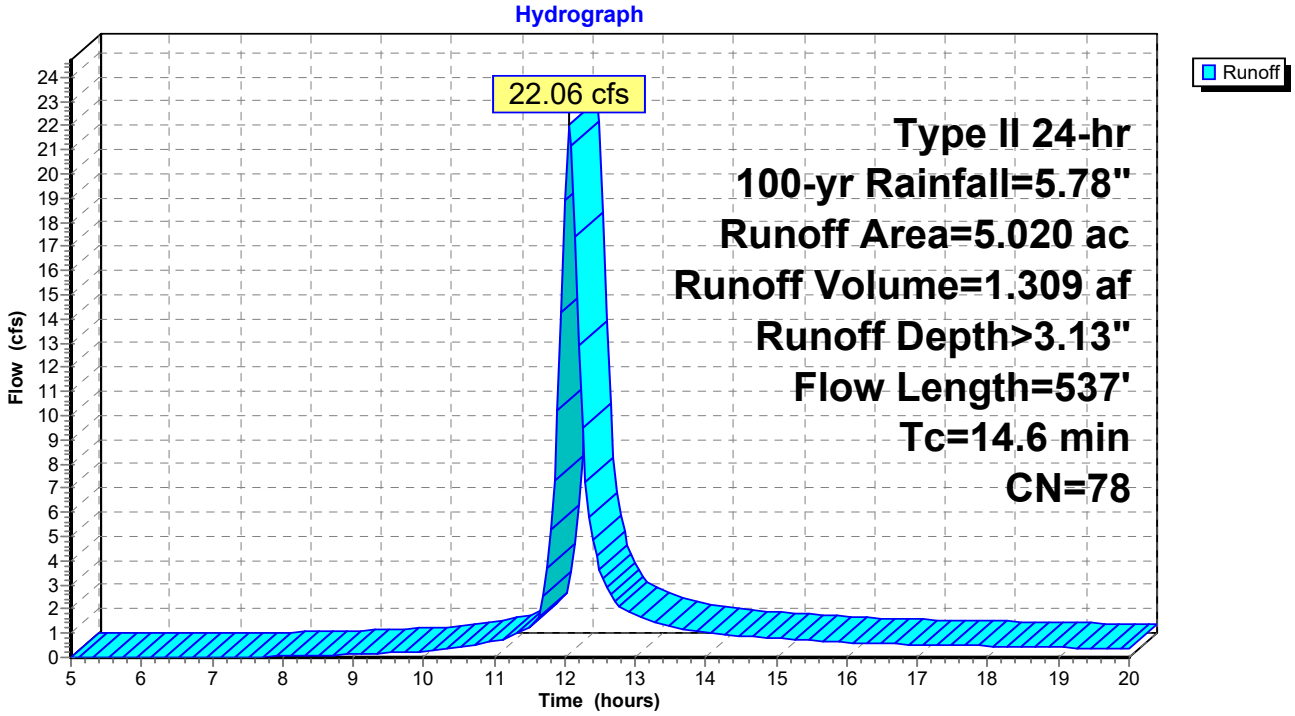
Runoff = 22.06 cfs @ 12.07 hrs, Volume= 1.309 af, Depth> 3.13"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 100-yr Rainfall=5.78"

Area (ac)	CN	Description
3.480	77	Woods, Good, HSG D
1.540	80	>75% Grass cover, Good, HSG D
5.020	78	Weighted Average
5.020		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.4	100	0.0500	0.15		**Sheet Flow, Sheet Flow** Grass: Dense n= 0.240 P2= 2.39"
1.5	287	0.0380	3.14		**Shallow Concentrated Flow, Shallow** Unpaved Kv= 16.1 fps
1.7	150	0.0870	1.47		**Shallow Concentrated Flow, Shallow** Woodland Kv= 5.0 fps
14.6	537	Total			

Subcatchment 4S: DA-4

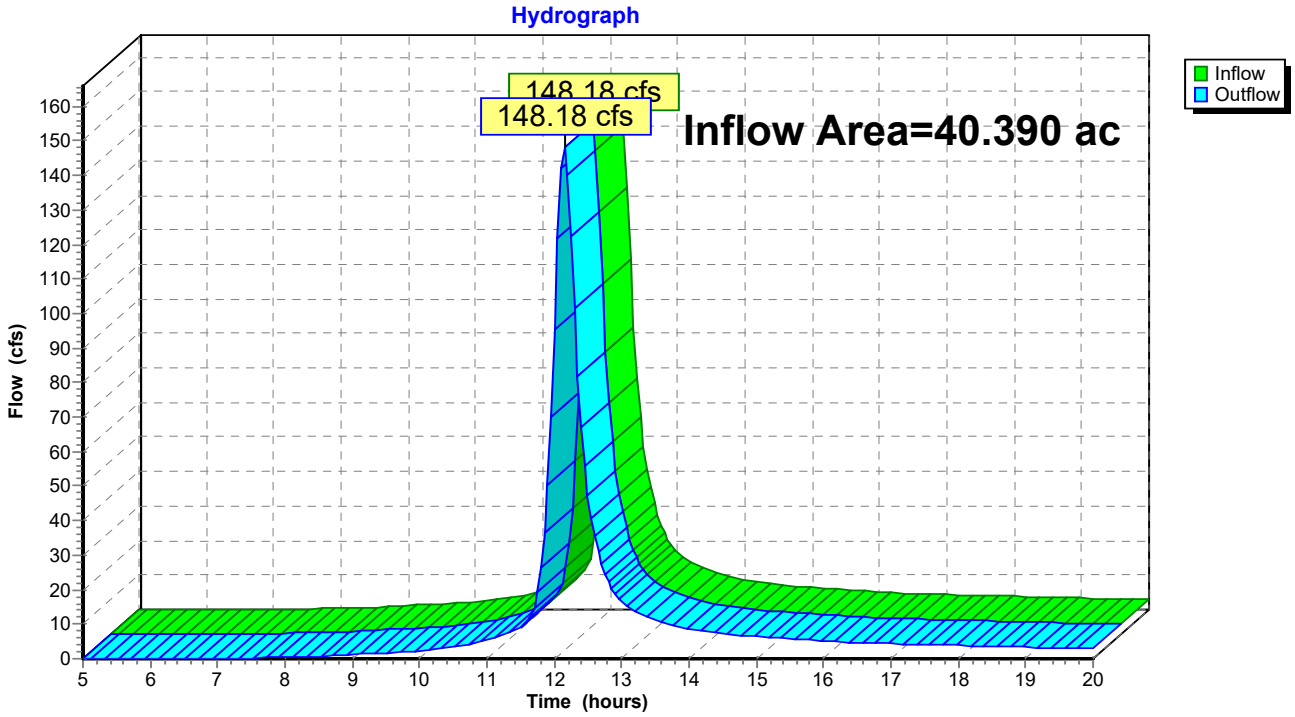


Summary for Reach 5R: Pt of Study 1A

Inflow Area = 40.390 ac, 0.00% Impervious, Inflow Depth > 3.22" for 100-yr event
Inflow = 148.18 cfs @ 12.15 hrs, Volume= 10.830 af
Outflow = 148.18 cfs @ 12.15 hrs, Volume= 10.830 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 5R: Pt of Study 1A

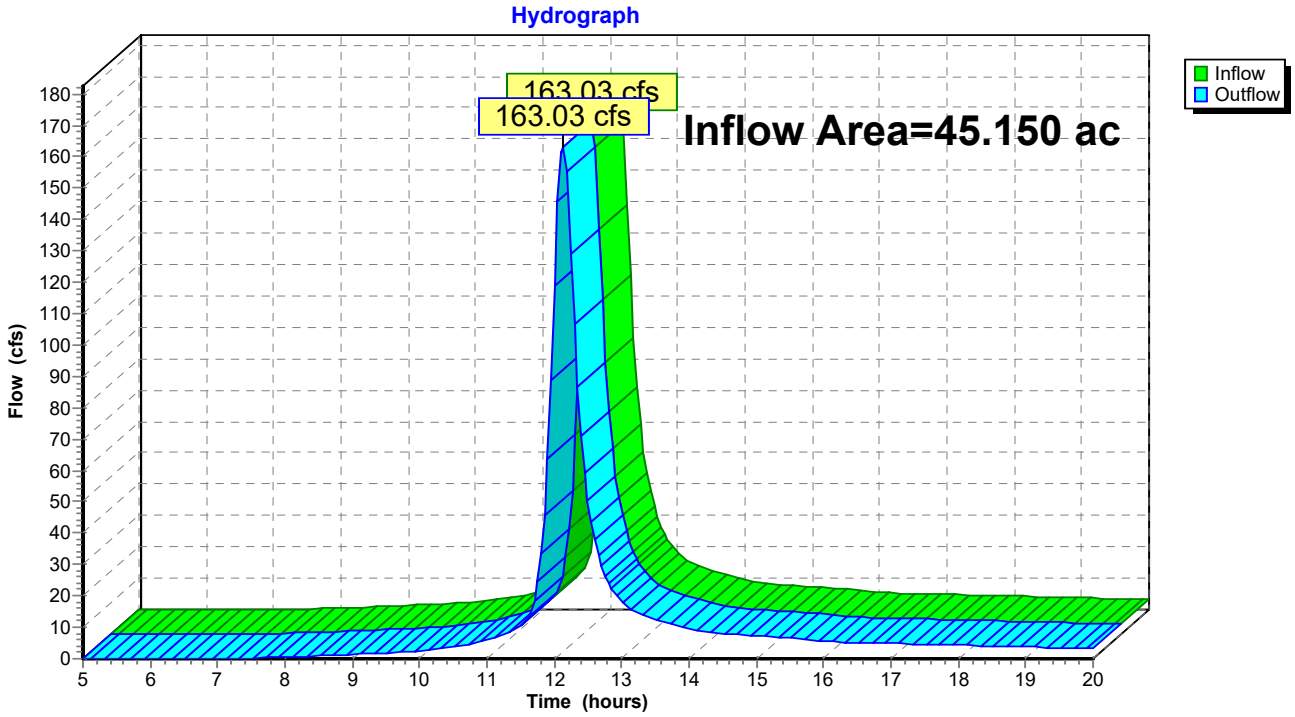


Summary for Reach 6R: Pt of Study 1B

Inflow Area = 45.150 ac, 0.16% Impervious, Inflow Depth > 3.23" for 100-yr event
Inflow = 163.03 cfs @ 12.13 hrs, Volume= 12.149 af
Outflow = 163.03 cfs @ 12.13 hrs, Volume= 12.149 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 6R: Pt of Study 1B

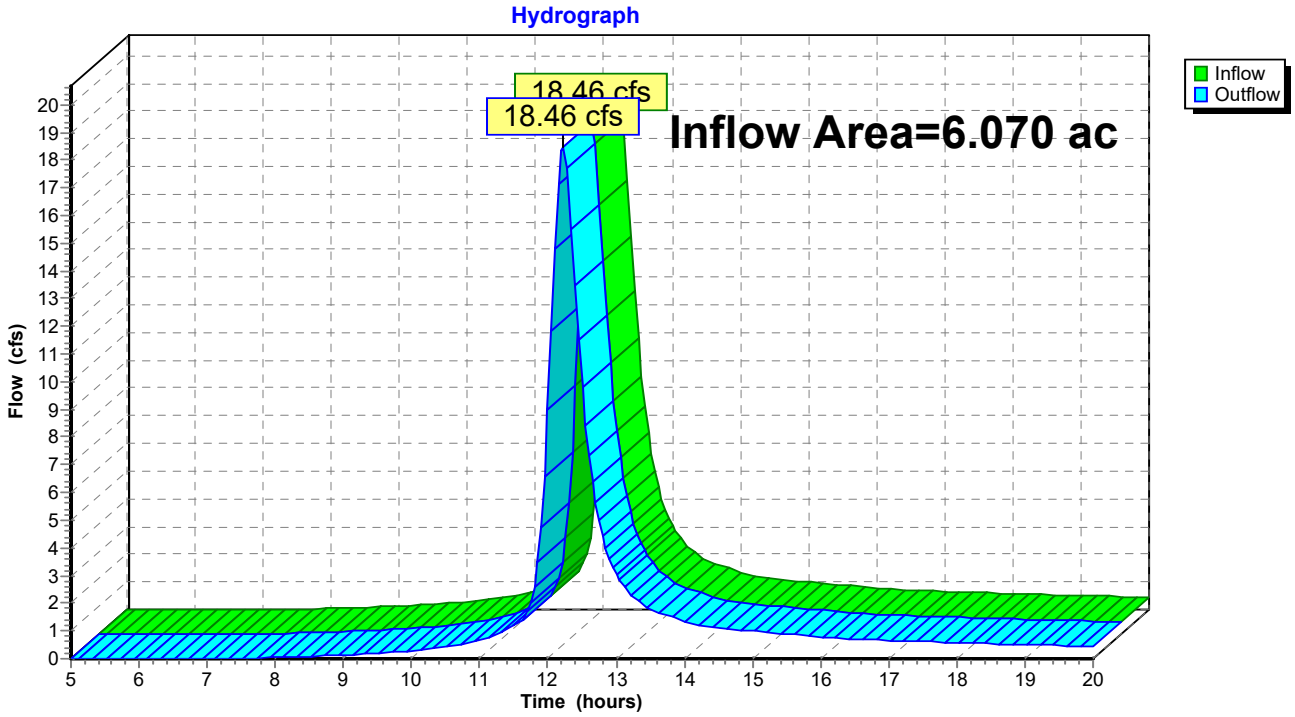


Summary for Reach 7R: Pt of Study 2

Inflow Area = 6.070 ac, 0.00% Impervious, Inflow Depth > 3.11" for 100-yr event
Inflow = 18.46 cfs @ 12.22 hrs, Volume= 1.576 af
Outflow = 18.46 cfs @ 12.22 hrs, Volume= 1.576 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 7R: Pt of Study 2

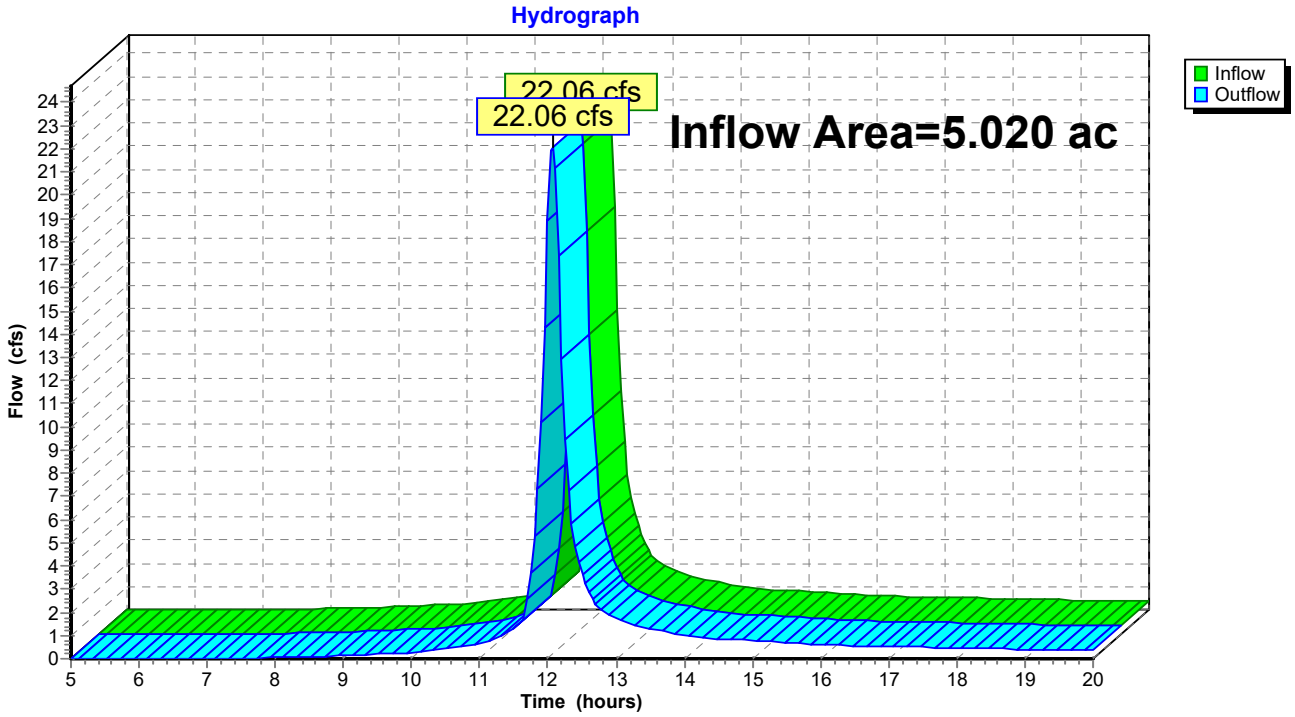


Summary for Reach 8R: Pt of Study 3

Inflow Area = 5.020 ac, 0.00% Impervious, Inflow Depth > 3.13" for 100-yr event
Inflow = 22.06 cfs @ 12.07 hrs, Volume= 1.309 af
Outflow = 22.06 cfs @ 12.07 hrs, Volume= 1.309 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 8R: Pt of Study 3



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APPENDIX B: HYDRO CAD – PROPOSED CONDITIONS

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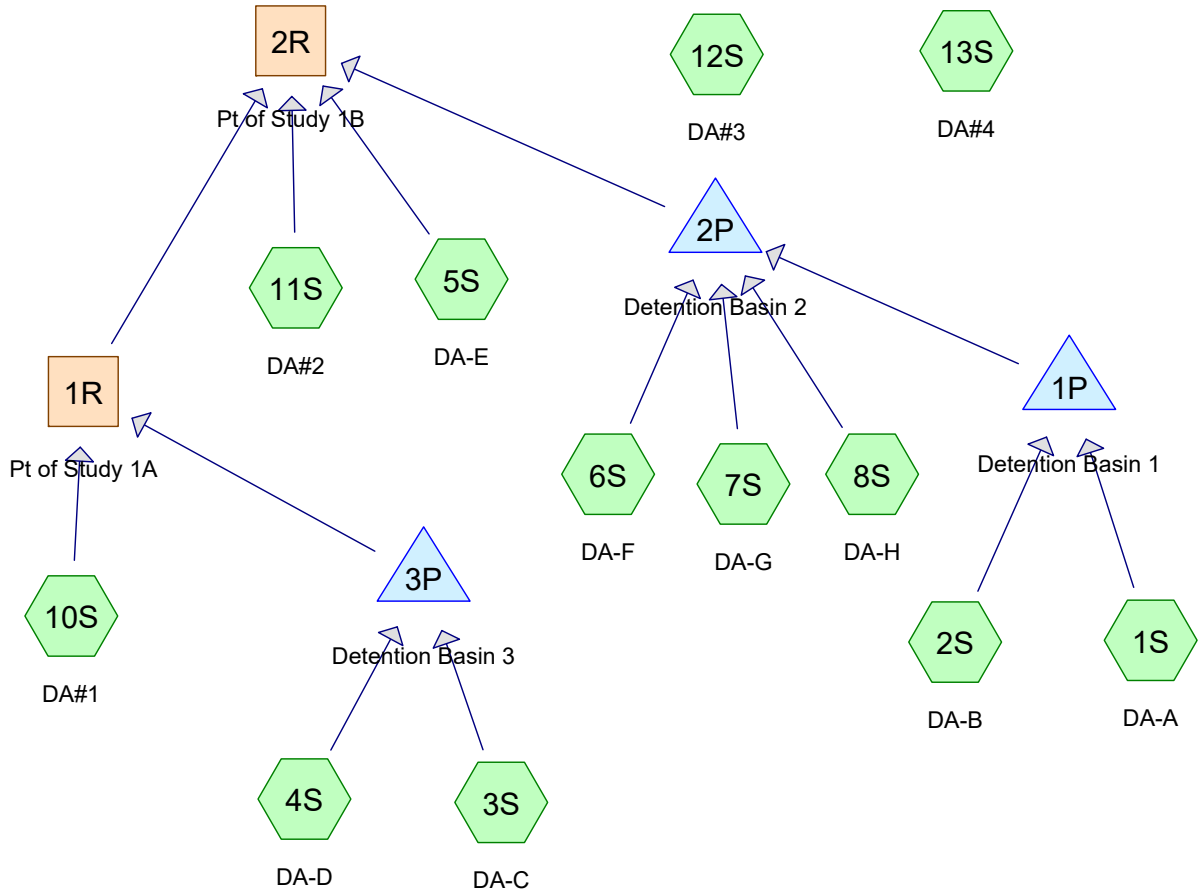
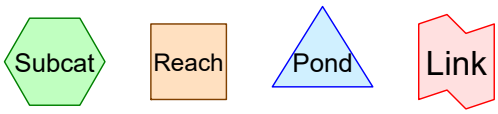




Routing Diagram for Proposed Drainage Areas
Prepared by Napierala Consulting, P.C., Printed 9/10/2020
HydroCAD® 10.00-18 s/n 01332 © 2016 HydroCAD Software Solutions LLC

Summary for Subcatchment 1S: DA-A

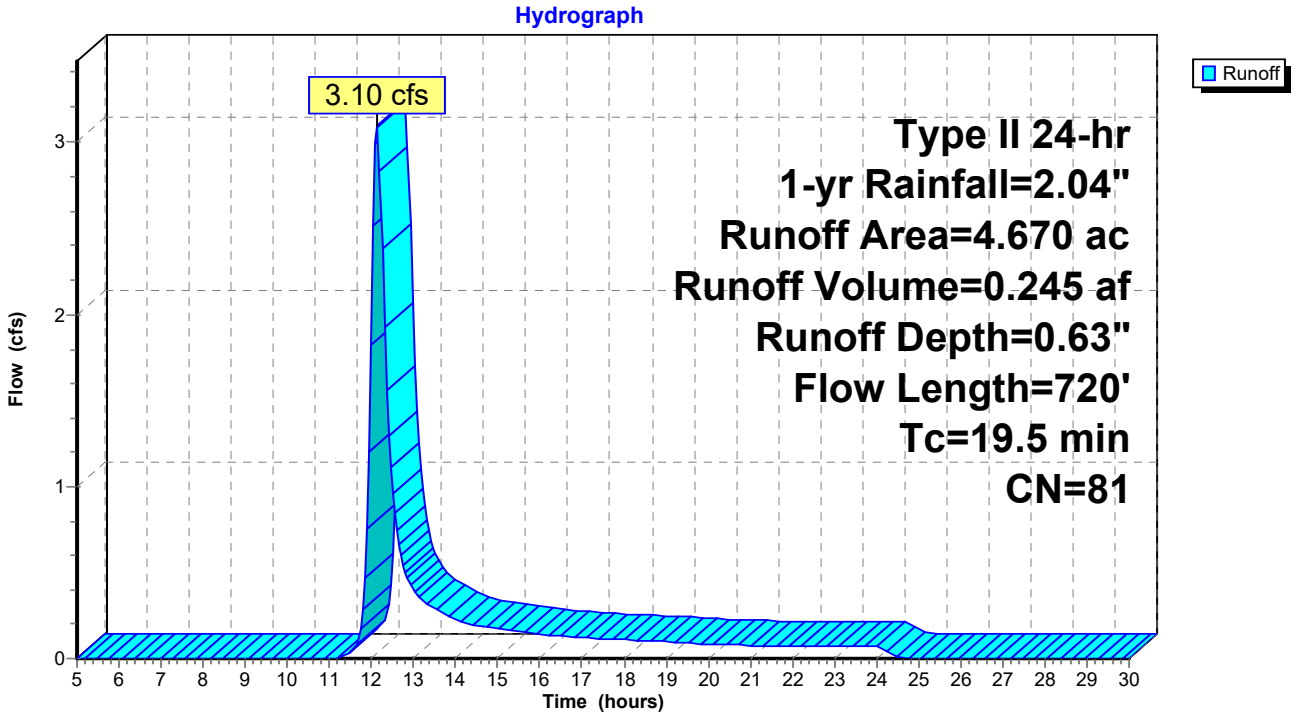
Runoff = 3.10 cfs @ 12.14 hrs, Volume= 0.245 af, Depth= 0.63"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 1-yr Rainfall=2.04"

Area (ac)	CN	Description
0.270	98	Paved parking, HSG D
2.580	80	>75% Grass cover, Good, HSG D
1.540	77	Woods, Good, HSG D
0.280	98	Roofs, HSG D
4.670	81	Weighted Average
4.120		88.22% Pervious Area
0.550		11.78% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.0	100	0.0600	0.10		**Sheet Flow, SHEET FLOW** Woods: Light underbrush n= 0.400 P2= 2.39"
2.5	188	0.0650	1.27		**Shallow Concentrated Flow, SCF** Woodland Kv= 5.0 fps
0.8	202	0.0650	4.10		**Shallow Concentrated Flow, SCF** Unpaved Kv= 16.1 fps
0.2	230	0.0200	16.17	32.33	**Channel Flow, GUTTER** Area= 2.0 sf Perim= 2.0' r= 1.00' n= 0.013 Asphalt, smooth
19.5	720	Total			

Subcatchment 1S: DA-A



Summary for Subcatchment 2S: DA-B

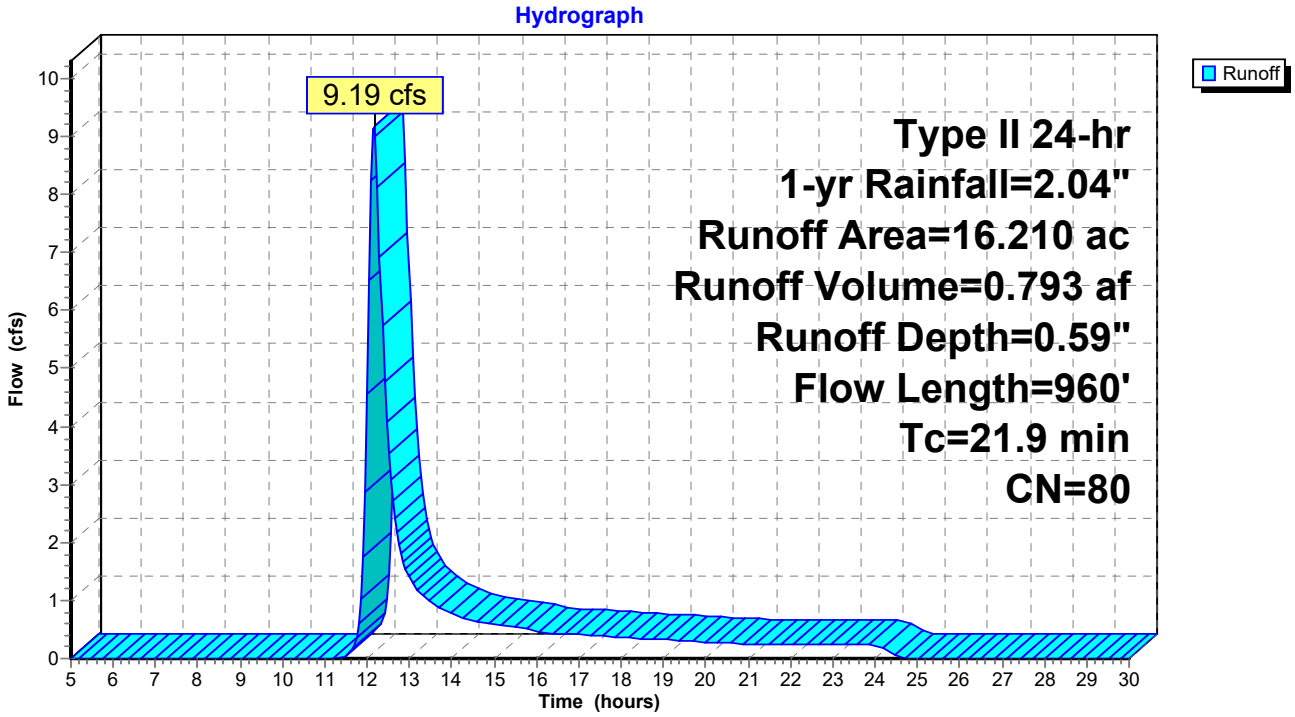
Runoff = 9.19 cfs @ 12.17 hrs, Volume= 0.793 af, Depth= 0.59"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 1-yr Rainfall=2.04"

Area (ac)	CN	Description
0.740	98	Paved parking, HSG D
7.140	80	>75% Grass cover, Good, HSG D
7.840	77	Woods, Good, HSG D
0.490	98	Roofs, HSG D
16.210	80	Weighted Average
14.980		92.41% Pervious Area
1.230		7.59% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.0	100	0.0600	0.10		**Sheet Flow, SHEET FLOW** Woods: Light underbrush n= 0.400 P2= 2.39"
4.8	370	0.0650	1.27		**Shallow Concentrated Flow, SCF** Woodland Kv= 5.0 fps
0.8	200	0.0650	4.10		**Shallow Concentrated Flow, SCF** Unpaved Kv= 16.1 fps
0.3	290	0.0200	16.17	32.33	**Channel Flow, GUTTER** Area= 2.0 sf Perim= 2.0' r= 1.00' n= 0.013 Asphalt, smooth
21.9	960	Total			

Subcatchment 2S: DA-B



Summary for Subcatchment 3S: DA-C

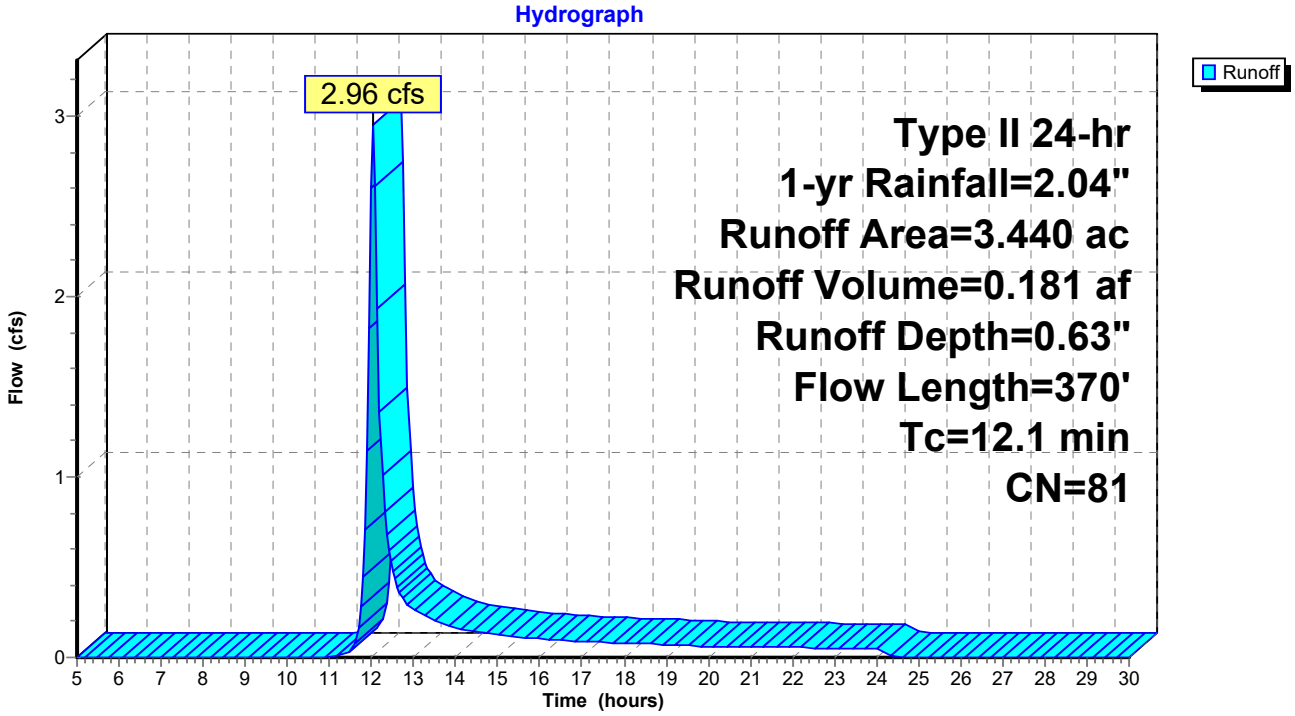
Runoff = 2.96 cfs @ 12.05 hrs, Volume= 0.181 af, Depth= 0.63"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 1-yr Rainfall=2.04"

Area (ac)	CN	Description
0.060	98	Paved parking, HSG D
3.200	80	>75% Grass cover, Good, HSG D
0.180	98	Roofs, HSG D
3.440	81	Weighted Average
3.200		93.02% Pervious Area
0.240		6.98% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.6	100	0.0600	0.16		**Sheet Flow, SHEET FLOW** Grass: Dense n= 0.240 P2= 2.39"
1.5	270	0.0370	3.10		**Shallow Concentrated Flow, SCF** Unpaved Kv= 16.1 fps
12.1	370	Total			

Subcatchment 3S: DA-C



Summary for Subcatchment 4S: DA-D

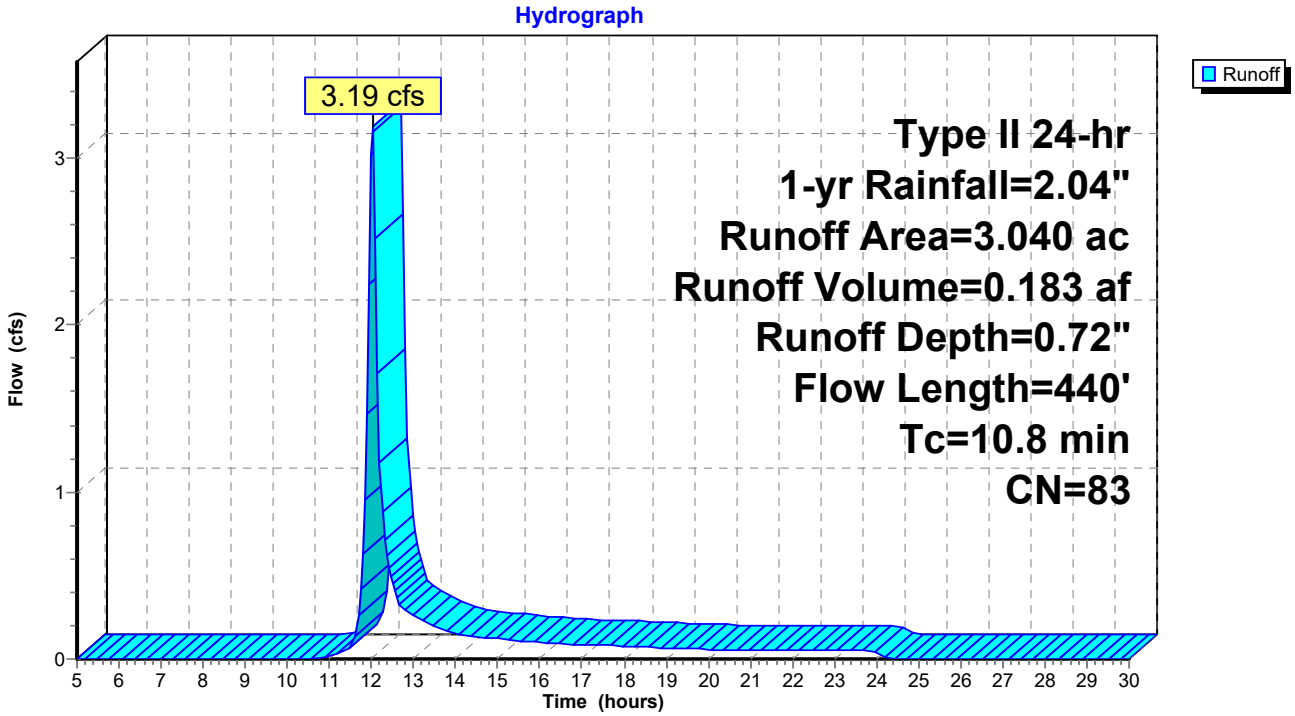
Runoff = 3.19 cfs @ 12.03 hrs, Volume= 0.183 af, Depth= 0.72"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 1-yr Rainfall=2.04"

Area (ac)	CN	Description
0.310	98	Paved parking, HSG D
2.560	80	>75% Grass cover, Good, HSG D
0.170	98	Roofs, HSG D
3.040	83	Weighted Average
2.560		84.21% Pervious Area
0.480		15.79% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0	100	0.0700	0.17		**Sheet Flow, SHEET FLOW** Grass: Dense n= 0.240 P2= 2.39"
0.5	140	0.0900	4.83		**Shallow Concentrated Flow, SCF** Unpaved Kv= 16.1 fps
0.3	200	0.0200	9.55	76.42	**Channel Flow, swale flow** Area= 8.0 sf Perim= 8.0' r= 1.00' n= 0.022 Earth, clean & straight
10.8	440	Total			

Subcatchment 4S: DA-D



Summary for Subcatchment 5S: DA-E

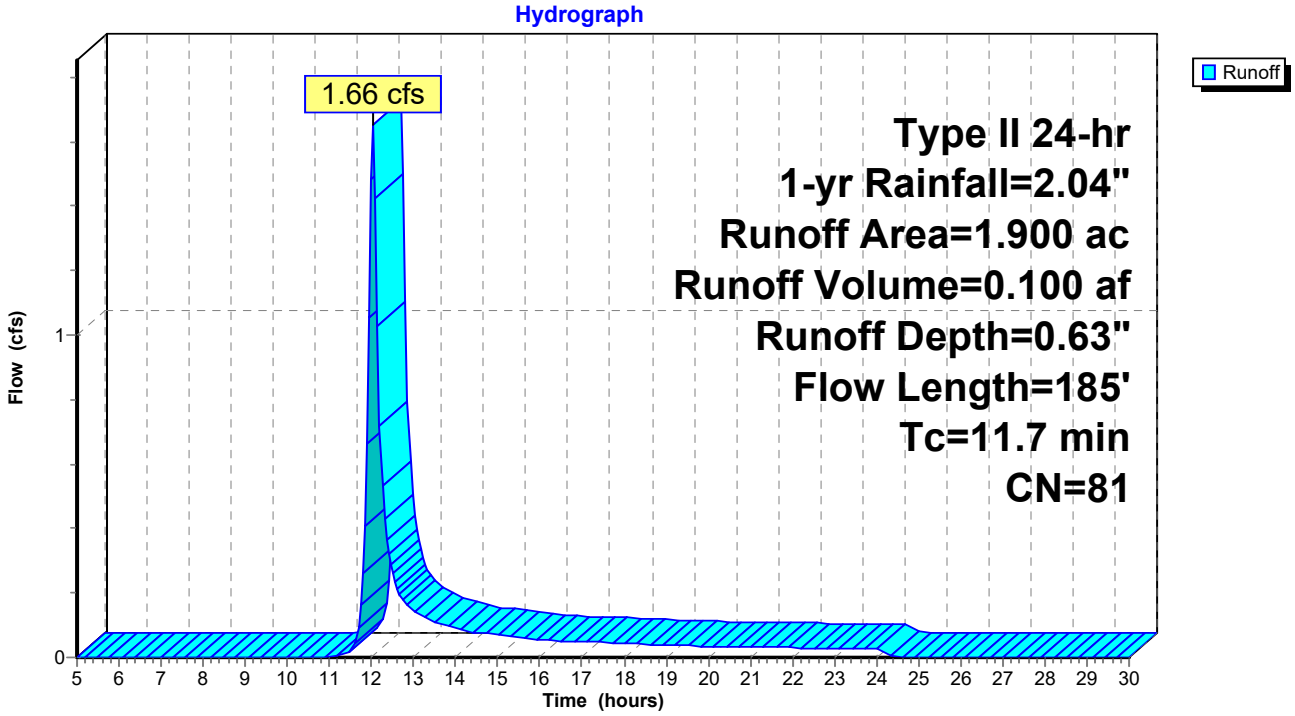
Runoff = 1.66 cfs @ 12.05 hrs, Volume= 0.100 af, Depth= 0.63"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 1-yr Rainfall=2.04"

Area (ac)	CN	Description
0.030	98	Paved parking, HSG D
1.800	80	>75% Grass cover, Good, HSG D
0.070	98	Roofs, HSG D
1.900	81	Weighted Average
1.800		94.74% Pervious Area
0.100		5.26% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.4	100	0.0500	0.15		**Sheet Flow, SHEET FLOW** Grass: Dense n= 0.240 P2= 2.39"
0.3	85	0.0950	4.96		**Shallow Concentrated Flow, SCF** Unpaved Kv= 16.1 fps
11.7	185	Total			

Subcatchment 5S: DA-E



Summary for Subcatchment 6S: DA-F

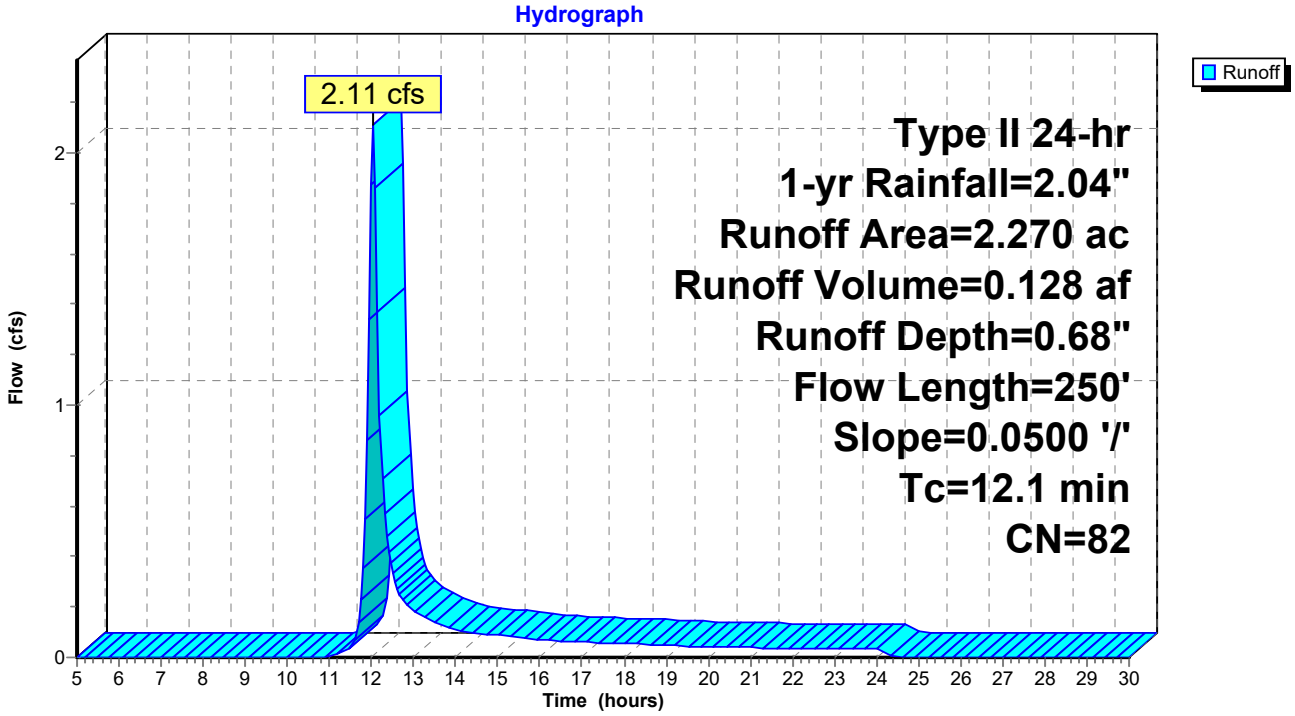
Runoff = 2.11 cfs @ 12.05 hrs, Volume= 0.128 af, Depth= 0.68"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 1-yr Rainfall=2.04"

Area (ac)	CN	Description
0.090	98	Paved parking, HSG D
2.040	80	>75% Grass cover, Good, HSG D
0.140	98	Roofs, HSG D
2.270	82	Weighted Average
2.040		89.87% Pervious Area
0.230		10.13% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.4	100	0.0500	0.15		**Sheet Flow, SHEET FLOW** Grass: Dense n= 0.240 P2= 2.39"
0.7	150	0.0500	3.60		**Shallow Concentrated Flow, SCF** Unpaved Kv= 16.1 fps
12.1	250	Total			

Subcatchment 6S: DA-F



Summary for Subcatchment 7S: DA-G

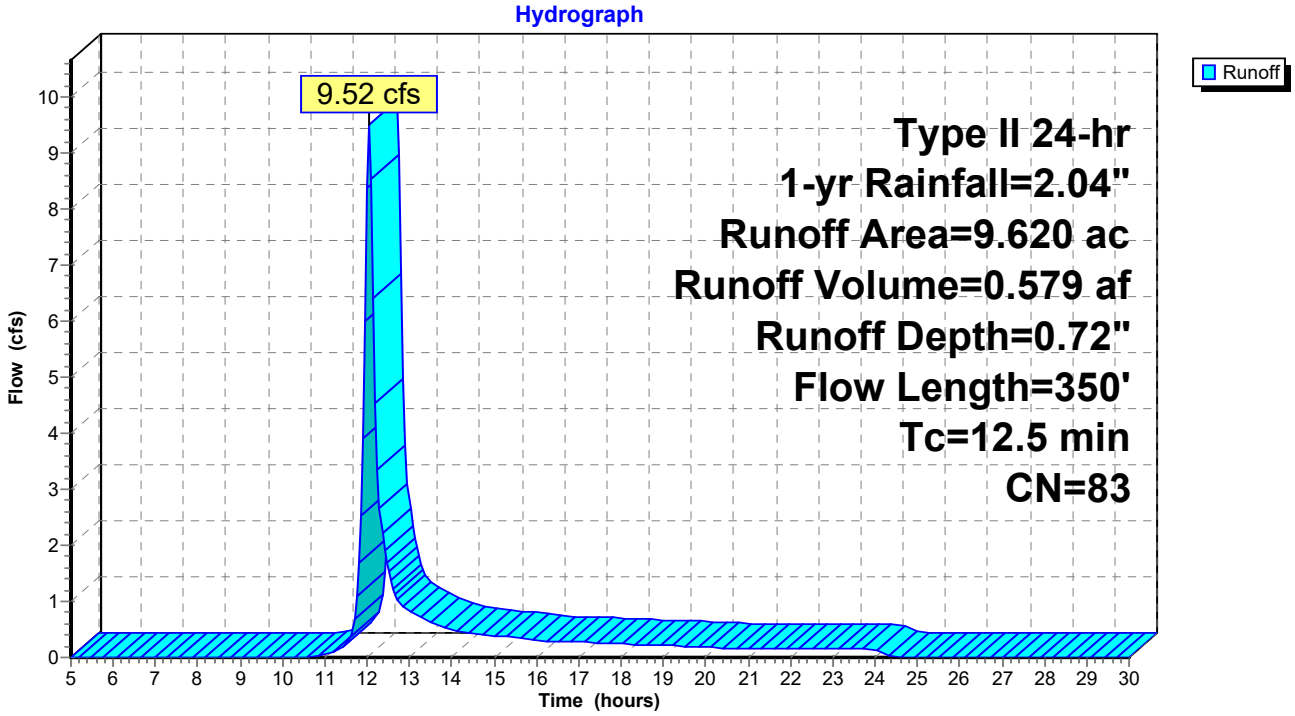
Runoff = 9.52 cfs @ 12.05 hrs, Volume= 0.579 af, Depth= 0.72"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 1-yr Rainfall=2.04"

Area (ac)	CN	Description
1.050	98	Paved parking, HSG D
8.080	80	>75% Grass cover, Good, HSG D
0.490	98	Roofs, HSG D
9.620	83	Weighted Average
8.080		83.99% Pervious Area
1.540		16.01% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.4	100	0.0500	0.15		**Sheet Flow, sheet** Grass: Dense n= 0.240 P2= 2.39"
1.1	250	0.0550	3.78		**Shallow Concentrated Flow, shallow conc flow** Unpaved Kv= 16.1 fps
12.5	350	Total			

Subcatchment 7S: DA-G



Summary for Subcatchment 8S: DA-H

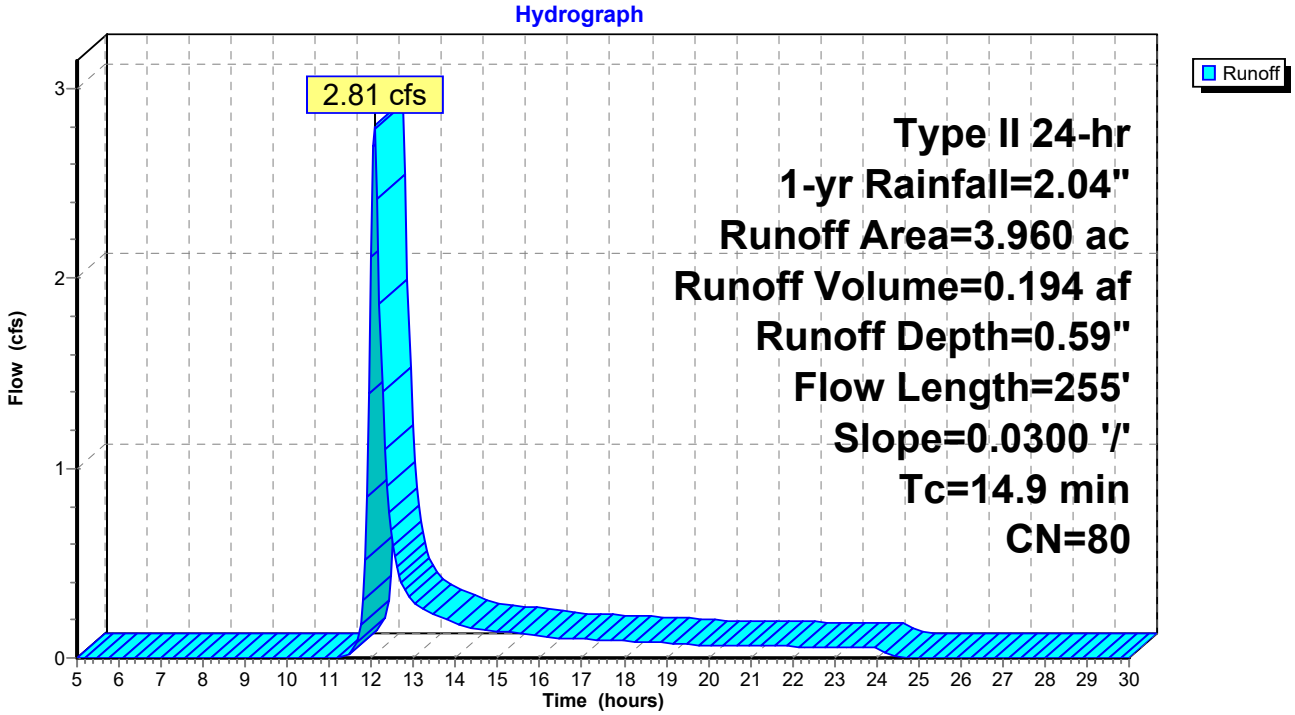
Runoff = 2.81 cfs @ 12.09 hrs, Volume= 0.194 af, Depth= 0.59"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 1-yr Rainfall=2.04"

Area (ac)	CN	Description
0.090	98	Paved parking, HSG D
2.440	80	>75% Grass cover, Good, HSG D
1.220	77	Woods, Good, HSG D
0.210	98	Roofs, HSG D
3.960	80	Weighted Average
3.660		92.42% Pervious Area
0.300		7.58% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.0	100	0.0300	0.12		**Sheet Flow, SHEET FLOW** Grass: Dense n= 0.240 P2= 2.39"
0.9	155	0.0300	2.79		**Shallow Concentrated Flow, SCF** Unpaved Kv= 16.1 fps
14.9	255	Total			

Subcatchment 8S: DA-H



Summary for Subcatchment 10S: DA#1

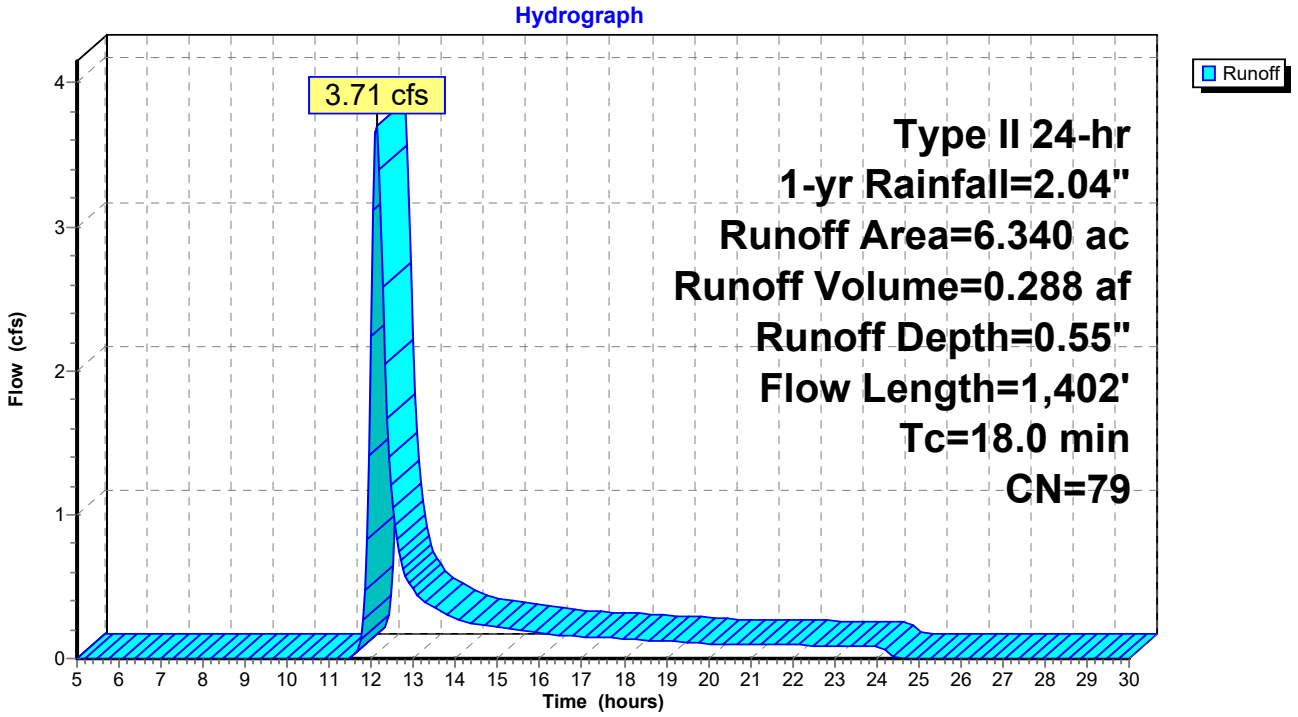
Runoff = 3.71 cfs @ 12.12 hrs, Volume= 0.288 af, Depth= 0.55"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 1-yr Rainfall=2.04"

Area (ac)	CN	Description
3.390	80	>75% Grass cover, Good, HSG D
2.850	77	Woods, Good, HSG D
0.030	98	Paved parking, HSG D
0.070	98	Roofs, HSG D
6.340	79	Weighted Average
6.240		98.42% Pervious Area
0.100		1.58% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.6	100	0.0600	0.16		**Sheet Flow, SHEET FLOW** Grass: Dense n= 0.240 P2= 2.39"
5.4	485	0.0900	1.50		**Shallow Concentrated Flow, SCF** Woodland Kv= 5.0 fps
1.8	517	0.0900	4.83		**Shallow Concentrated Flow, SCF** Unpaved Kv= 16.1 fps
0.2	300	0.0860	27.67	442.73	**Channel Flow, SWALE** Area= 16.0 sf Perim= 8.0' r= 2.00' n= 0.025 Earth, clean & winding
18.0	1,402	Total			

Subcatchment 10S: DA#1



Summary for Subcatchment 11S: DA#2

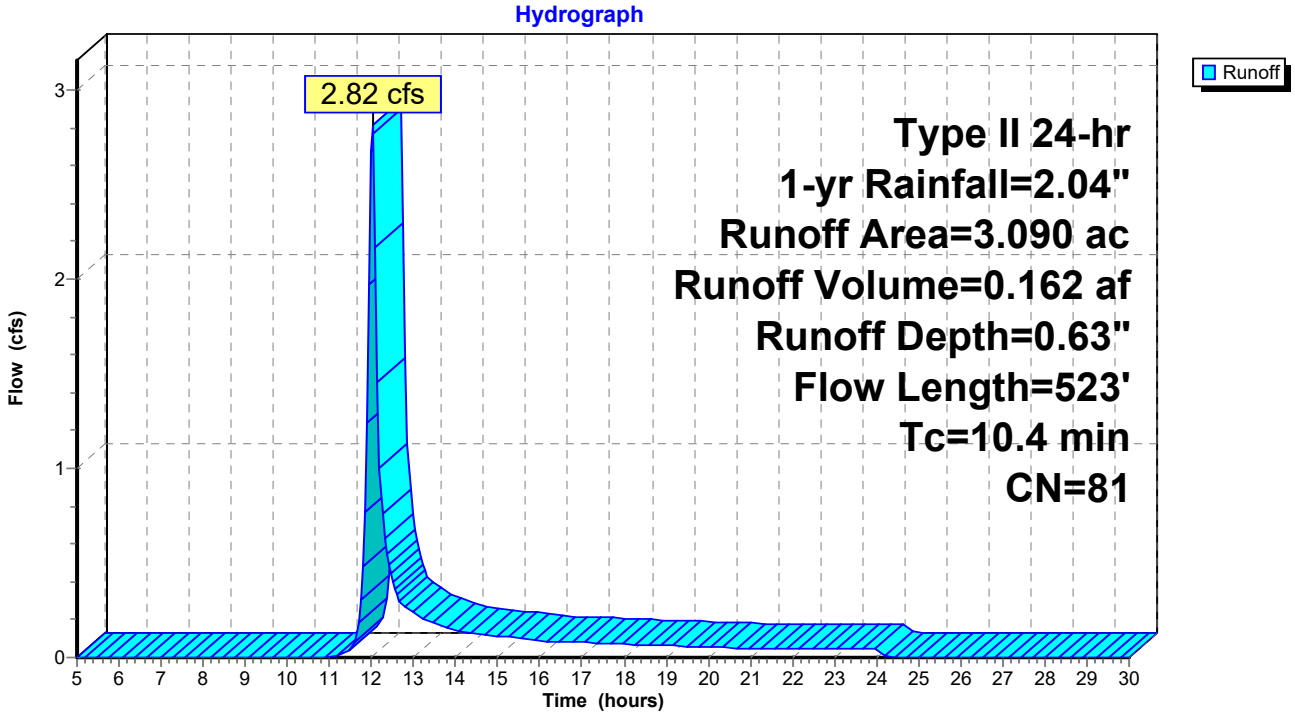
Runoff = 2.82 cfs @ 12.03 hrs, Volume= 0.162 af, Depth= 0.63"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 1-yr Rainfall=2.04"

Area (ac)	CN	Description
2.070	80	>75% Grass cover, Good, HSG D
0.660	77	Woods, Good, HSG D
0.220	98	Paved parking, HSG D
0.140	98	Roofs, HSG D
3.090	81	Weighted Average
2.730		88.35% Pervious Area
0.360		11.65% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0	100	0.0700	0.17		**Sheet Flow, SHEET FLOW** Grass: Dense n= 0.240 P2= 2.39"
0.2	56	0.1300	5.80		**Shallow Concentrated Flow, SCF** Unpaved Kv= 16.1 fps
0.2	367	0.0820	27.02	432.31	**Channel Flow, SWALE** Area= 16.0 sf Perim= 8.0' r= 2.00' n= 0.025 Earth, clean & winding
10.4	523	Total			

Subcatchment 11S: DA#2



Summary for Subcatchment 12S: DA#3

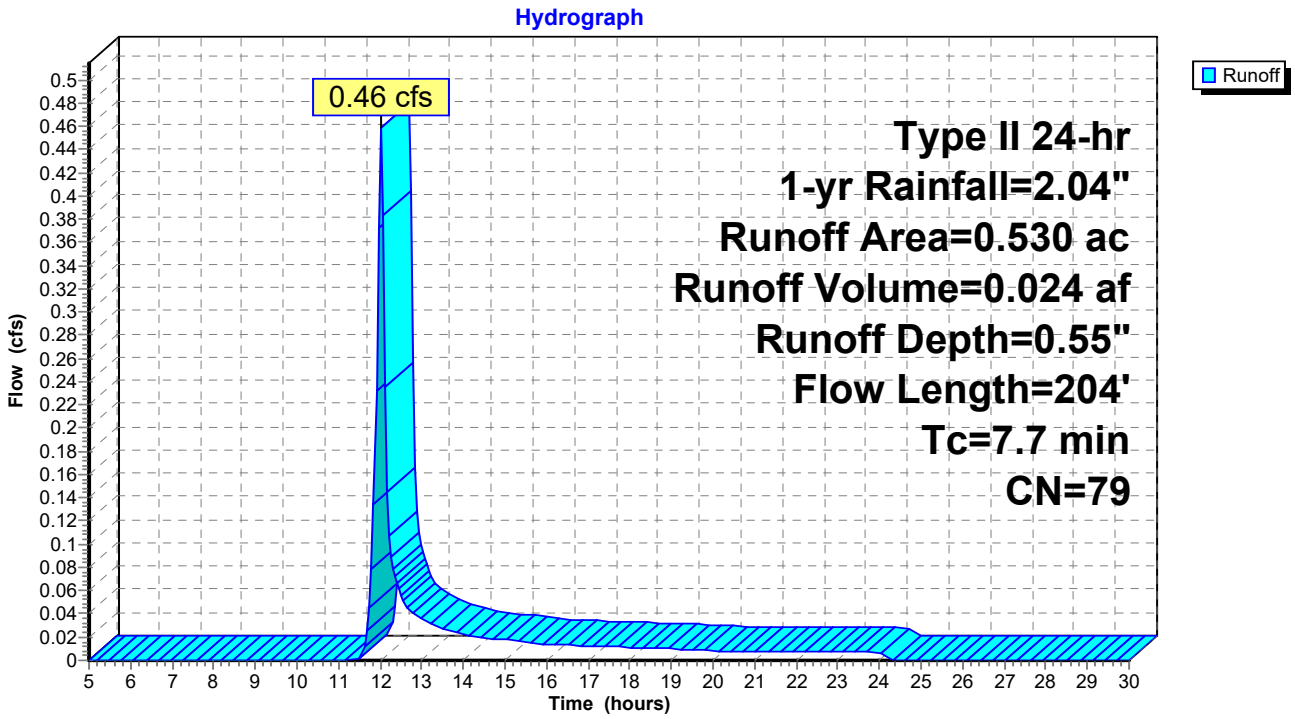
Runoff = 0.46 cfs @ 12.00 hrs, Volume= 0.024 af, Depth= 0.55"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 1-yr Rainfall=2.04"

Area (ac)	CN	Description
0.390	80	>75% Grass cover, Good, HSG D
0.140	77	Woods, Good, HSG D
0.530	79	Weighted Average
0.530		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.4	100	0.1500	0.23		**Sheet Flow, SHEET FLOW** Grass: Dense n= 0.240 P2= 2.39"
0.3	104	0.1300	5.80		**Shallow Concentrated Flow, SCF** Unpaved Kv= 16.1 fps
7.7	204	Total			

Subcatchment 12S: DA#3



Summary for Subcatchment 13S: DA#4

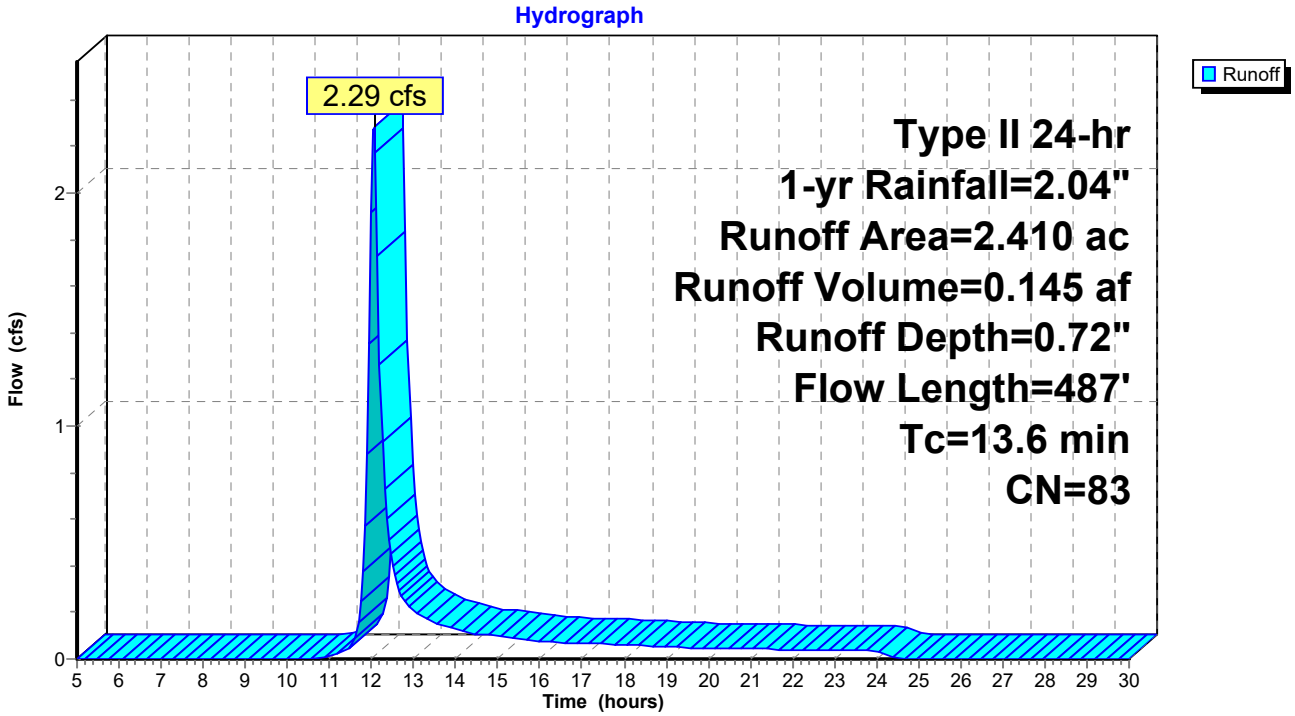
Runoff = 2.29 cfs @ 12.06 hrs, Volume= 0.145 af, Depth= 0.72"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 1-yr Rainfall=2.04"

Area (ac)	CN	Description
2.020	80	>75% Grass cover, Good, HSG D
0.250	98	Paved parking, HSG D
0.140	98	Roofs, HSG D
2.410	83	Weighted Average
2.020		83.82% Pervious Area
0.390		16.18% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.9	100	0.0450	0.14		**Sheet Flow, SHEET FLOW** Grass: Dense n= 0.240 P2= 2.39"
1.5	307	0.0450	3.42		**Shallow Concentrated Flow, SCF** Unpaved Kv= 16.1 fps
0.2	80	0.0200	6.42	5.04	**Pipe Channel, storm pipe** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013 Corrugated PE, smooth interior
13.6	487	Total			

Subcatchment 13S: DA#4

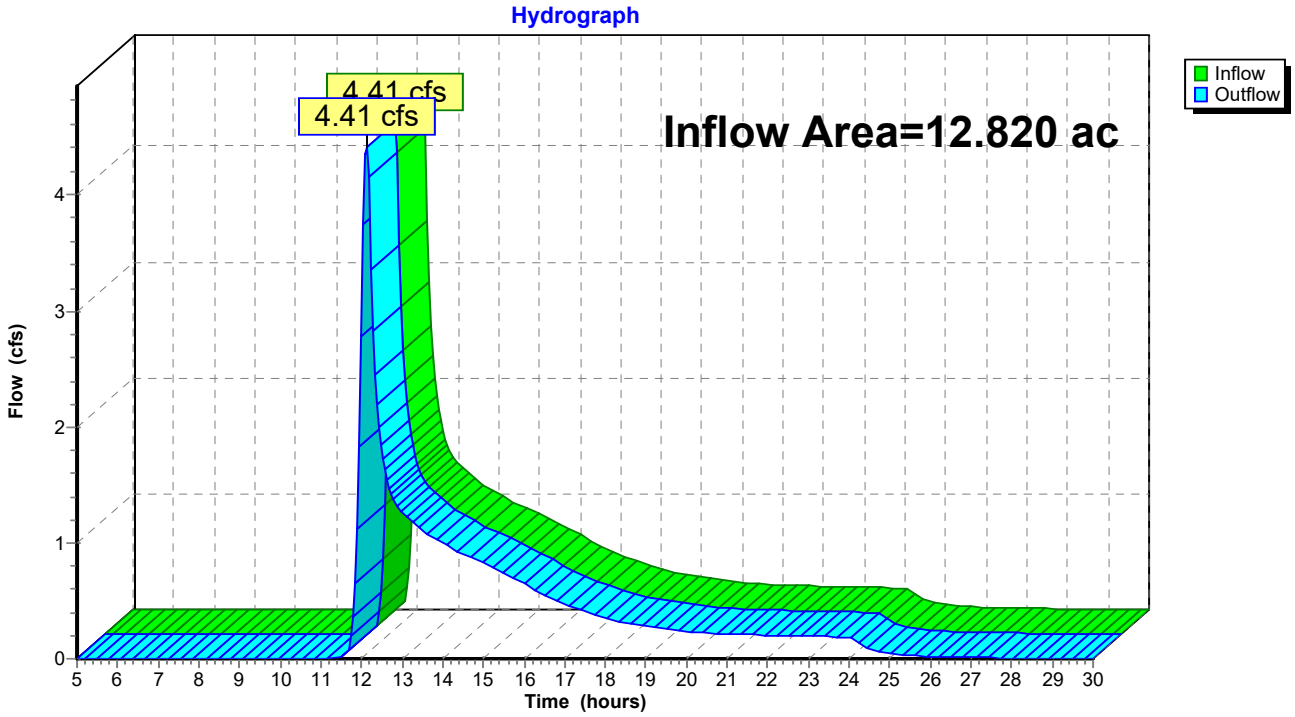


Summary for Reach 1R: Pt of Study 1A

Inflow Area = 12.820 ac, 6.40% Impervious, Inflow Depth > 0.61" for 1-yr event
Inflow = 4.41 cfs @ 12.13 hrs, Volume= 0.650 af
Outflow = 4.41 cfs @ 12.13 hrs, Volume= 0.650 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-30.00 hrs, dt= 0.05 hrs

Reach 1R: Pt of Study 1A

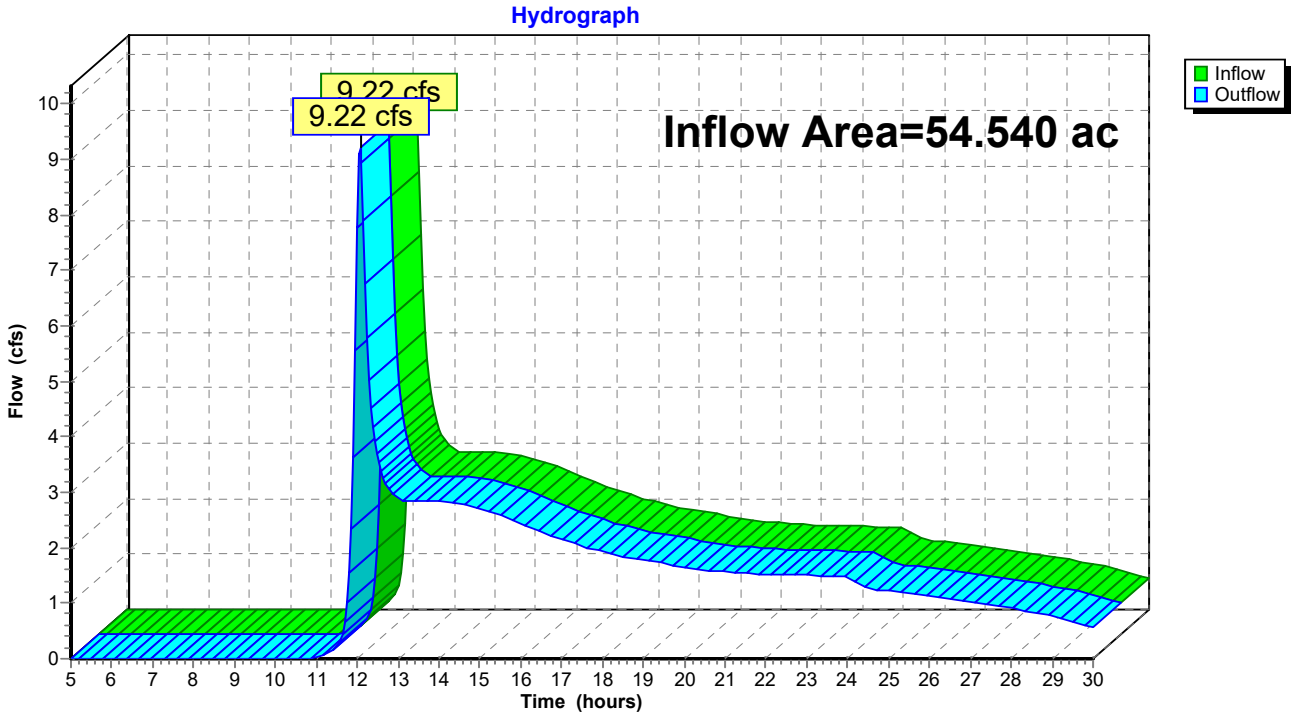


Summary for Reach 2R: Pt of Study 1B

Inflow Area = 54.540 ac, 9.41% Impervious, Inflow Depth > 0.62" for 1-yr event
Inflow = 9.22 cfs @ 12.07 hrs, Volume= 2.811 af
Outflow = 9.22 cfs @ 12.07 hrs, Volume= 2.811 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-30.00 hrs, dt= 0.05 hrs

Reach 2R: Pt of Study 1B



Summary for Pond 1P: Detention Basin 1

Inflow Area = 20.880 ac, 8.52% Impervious, Inflow Depth = 0.60" for 1-yr event
Inflow = 12.24 cfs @ 12.16 hrs, Volume= 1.038 af
Outflow = 1.08 cfs @ 13.84 hrs, Volume= 1.038 af, Atten= 91%, Lag= 100.9 min
Primary = 1.08 cfs @ 13.84 hrs, Volume= 1.038 af
Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 890.90' @ 13.84 hrs Surf.Area= 12,449 sf Storage= 20,168 cf

Plug-Flow detention time= 217.0 min calculated for 1.038 af (100% of inflow)
Center-of-Mass det. time= 216.9 min (1,096.1 - 879.3)

Volume	Invert	Avail.Storage	Storage Description
#1	888.00'	104,203 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

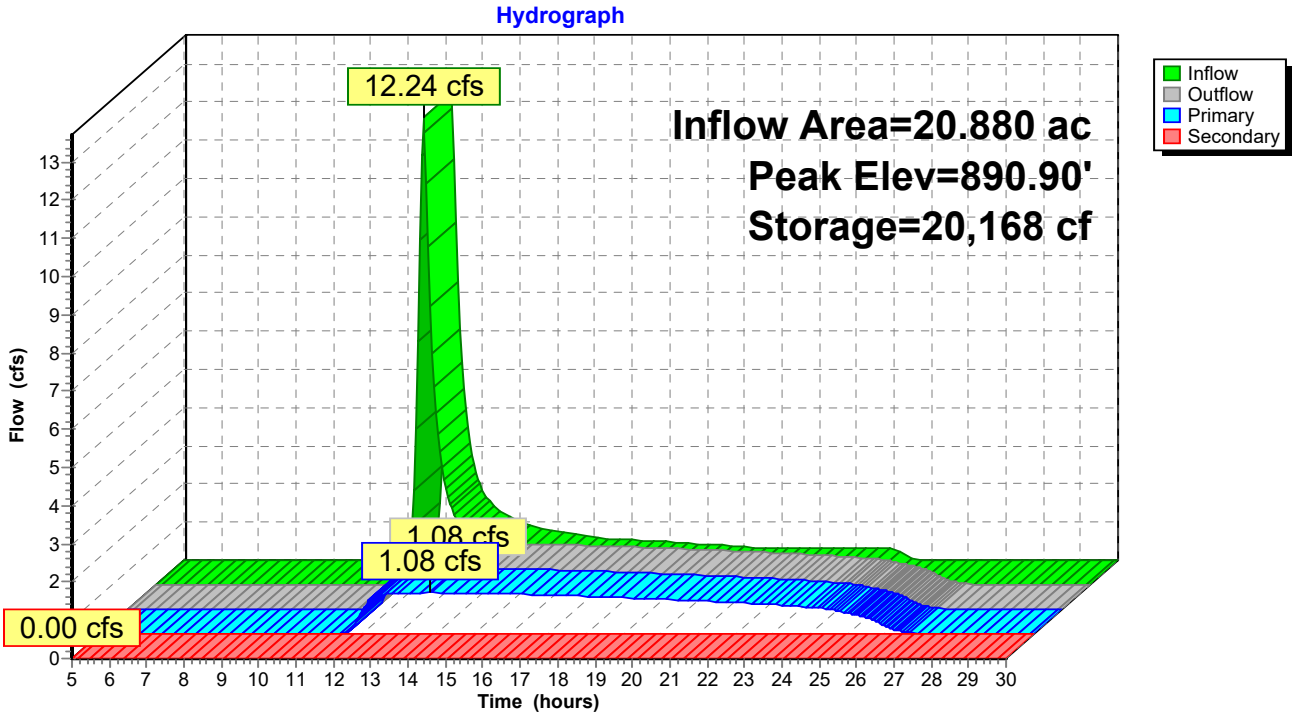
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
888.00	373	0	0
889.00	3,768	2,071	2,071
890.00	11,124	7,446	9,517
891.00	12,590	11,857	21,374
892.00	14,113	13,352	34,725
893.00	15,691	14,902	49,627
894.00	17,327	16,509	66,136
895.00	19,019	18,173	84,309
896.00	20,768	19,894	104,203

Device	Routing	Invert	Outlet Devices
#1	Primary	887.90'	**30.0" Round Culvert** L= 20.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 887.90' / 886.90' S= 0.0500 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 4.91 sf
#2	Device 1	888.00'	**5.0" Vert. Orifice1** C= 0.600
#3	Device 1	891.20'	**15.0" Vert. Orifice2** C= 0.600
#4	Device 1	894.90'	**30.0" x 30.0" Horiz. Grate** C= 0.600 Limited to weir flow at low heads
#5	Secondary	896.00'	**25.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=1.08 cfs @ 13.84 hrs HW=890.90' (Free Discharge)
└─**1=Culvert** (Passes 1.08 cfs of 24.71 cfs potential flow)
  ├─**2=Orifice1** (Orifice Controls 1.08 cfs @ 7.91 fps)
  ├─**3=Orifice2** (Controls 0.00 cfs)
  └─**4=Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=888.00' (Free Discharge)
└─**5=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 1P: Detention Basin 1



Summary for Pond 2P: Detention Basin 2

Inflow Area = 36.730 ac, 10.48% Impervious, Inflow Depth = 0.63" for 1-yr event
Inflow = 15.04 cfs @ 12.06 hrs, Volume= 1.939 af
Outflow = 1.70 cfs @ 14.90 hrs, Volume= 1.899 af, Atten= 89%, Lag= 170.5 min
Primary = 1.70 cfs @ 14.90 hrs, Volume= 1.899 af
Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 867.09' @ 14.90 hrs Surf.Area= 9,939 sf Storage= 23,105 cf

Plug-Flow detention time= 225.1 min calculated for 1.899 af (98% of inflow)
Center-of-Mass det. time= 213.5 min (1,201.4 - 987.8)

Volume	Invert	Avail.Storage	Storage Description
#1	863.00'	98,569 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

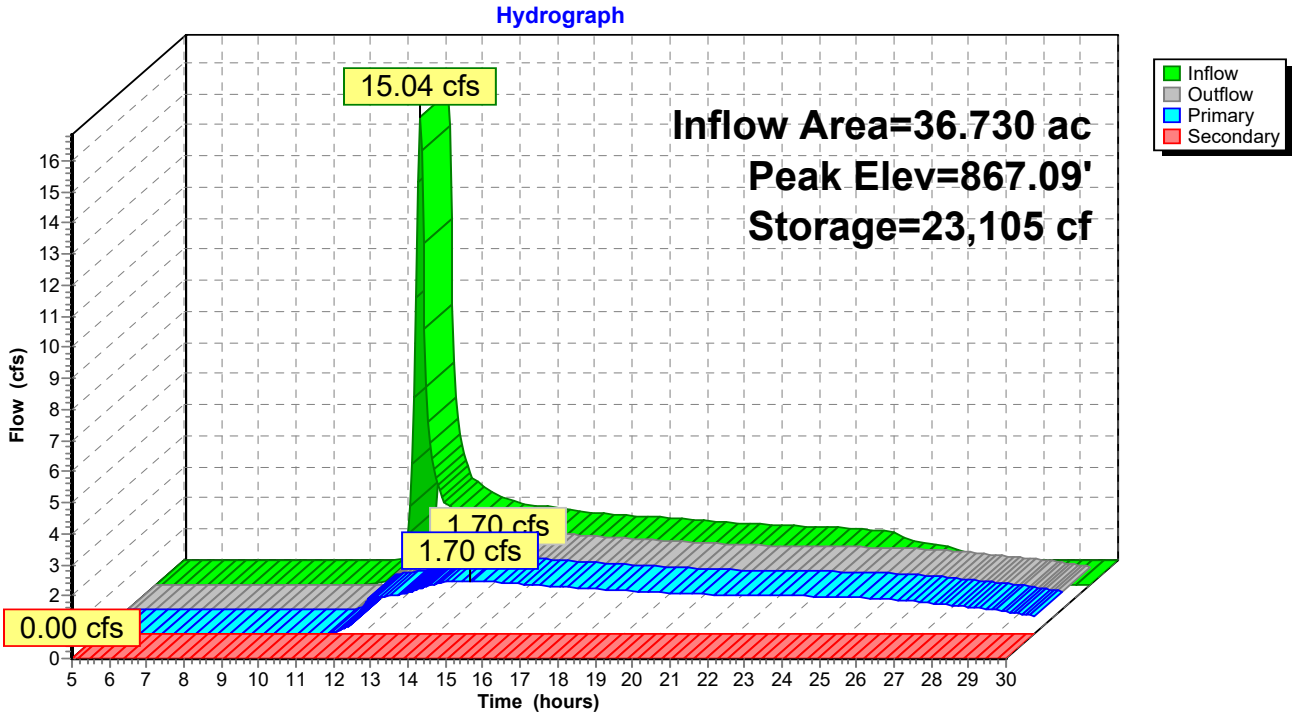
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
863.00	335	0	0
864.00	3,479	1,907	1,907
865.00	5,953	4,716	6,623
866.00	7,741	6,847	13,470
867.00	9,739	8,740	22,210
868.00	11,941	10,840	33,050
869.00	14,156	13,049	46,099
870.00	16,371	15,264	61,362
871.00	18,599	17,485	78,847
872.00	20,845	19,722	98,569

Device	Routing	Invert	Outlet Devices
#1	Secondary	872.00'	**20.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64
#2	Primary	862.90'	**30.0" Round Culvert** L= 20.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 862.90' / 861.00' S= 0.0950 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 4.91 sf
#3	Device 2	863.00'	**5.0" Vert. Orifice1** C= 0.600
#4	Device 2	866.80'	**15.0" Vert. Orifice2** C= 0.600
#5	Device 2	870.00'	**30.0" x 30.0" Horiz. Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=1.69 cfs @ 14.90 hrs HW=867.09' (Free Discharge)
└─**2=Culvert** (Passes 1.69 cfs of 32.00 cfs potential flow)
  ├─**3=Orifice1** (Orifice Controls 1.29 cfs @ 9.49 fps)
  ├─**4=Orifice2** (Orifice Controls 0.40 cfs @ 1.84 fps)
  └─**5=Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=863.00' (Free Discharge)
└─**1=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 2P: Detention Basin 2



Summary for Pond 3P: Detention Basin 3

Inflow Area = 6.480 ac, 11.11% Impervious, Inflow Depth = 0.67" for 1-yr event
Inflow = 6.12 cfs @ 12.04 hrs, Volume= 0.364 af
Outflow = 0.80 cfs @ 12.58 hrs, Volume= 0.362 af, Atten= 87%, Lag= 32.0 min
Primary = 0.80 cfs @ 12.58 hrs, Volume= 0.362 af
Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 901.68' @ 12.58 hrs Surf.Area= 6,282 sf Storage= 6,010 cf

Plug-Flow detention time= 90.6 min calculated for 0.362 af (100% of inflow)
Center-of-Mass det. time= 87.9 min (950.4 - 862.5)

Volume	Invert	Avail.Storage	Storage Description
#1	900.00'	38,589 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

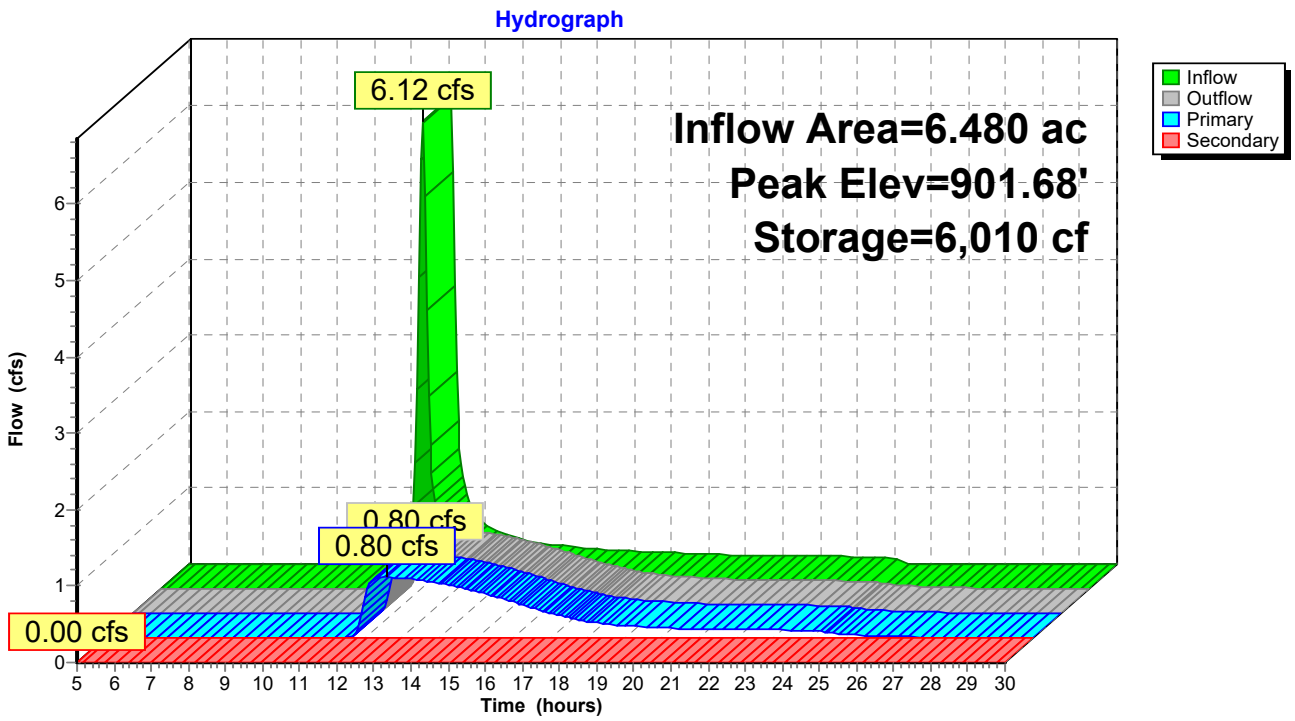
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
900.00	2,381	0	0
901.00	3,197	2,789	2,789
902.00	7,737	5,467	8,256
903.00	9,288	8,513	16,769
904.00	10,896	10,092	26,861
905.00	12,560	11,728	38,589

Device	Routing	Invert	Outlet Devices
#1	Secondary	905.00'	**20.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64
#2	Primary	900.00'	**18.0" Round Culvert** L= 330.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 900.00' / 889.00' S= 0.0333 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf
#3	Device 2	900.00'	**5.0" Vert. Orifice1** C= 0.600
#4	Device 2	901.90'	**10.0" Vert. Orifice2** C= 0.600
#5	Device 2	904.00'	**24.0" x 24.0" Horiz. Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.80 cfs @ 12.58 hrs HW=901.68' (Free Discharge)
└─**2=Culvert** (Passes 0.80 cfs of 6.48 cfs potential flow)
  ├─**3=Orifice1** (Orifice Controls 0.80 cfs @ 5.84 fps)
  ├─**4=Orifice2** (Controls 0.00 cfs)
  └─**5=Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=900.00' (Free Discharge)
└─**1=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 3P: Detention Basin 3



Summary for Subcatchment 1S: DA-A

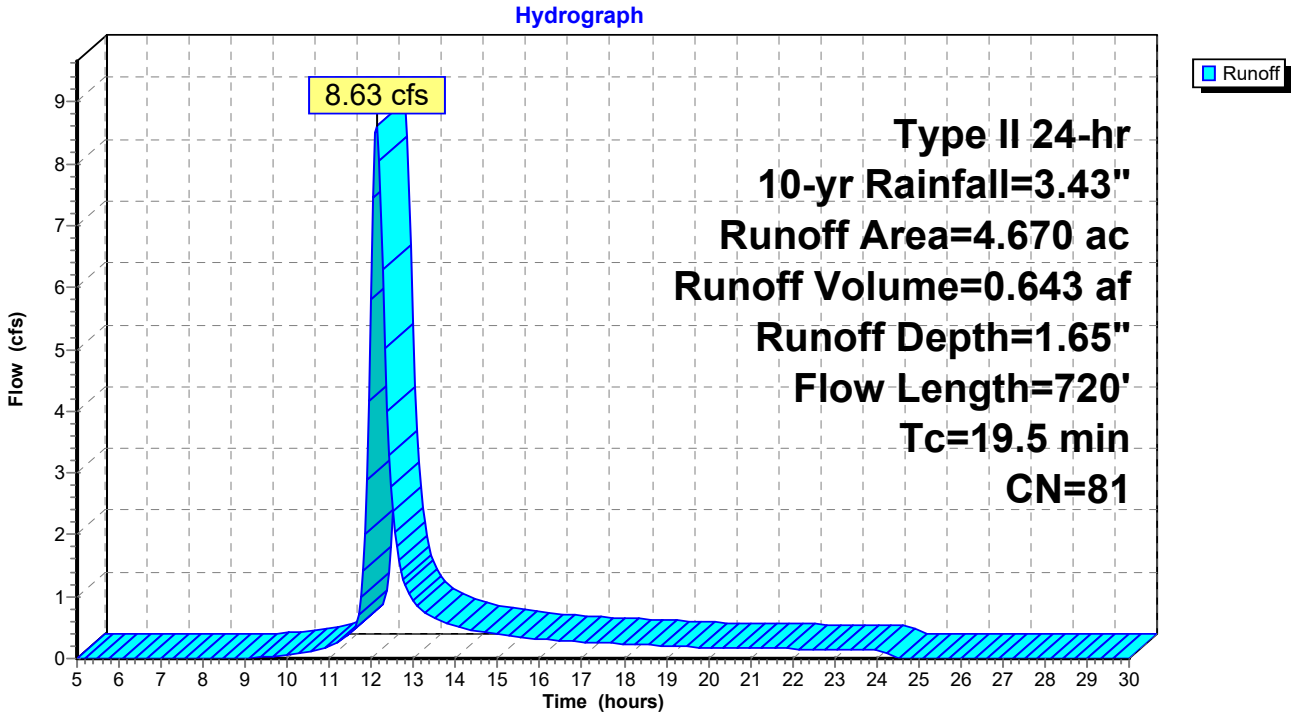
Runoff = 8.63 cfs @ 12.12 hrs, Volume= 0.643 af, Depth= 1.65"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-yr Rainfall=3.43"

Area (ac)	CN	Description
0.270	98	Paved parking, HSG D
2.580	80	>75% Grass cover, Good, HSG D
1.540	77	Woods, Good, HSG D
0.280	98	Roofs, HSG D
4.670	81	Weighted Average
4.120		88.22% Pervious Area
0.550		11.78% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.0	100	0.0600	0.10		**Sheet Flow, SHEET FLOW** Woods: Light underbrush n= 0.400 P2= 2.39"
2.5	188	0.0650	1.27		**Shallow Concentrated Flow, SCF** Woodland Kv= 5.0 fps
0.8	202	0.0650	4.10		**Shallow Concentrated Flow, SCF** Unpaved Kv= 16.1 fps
0.2	230	0.0200	16.17	32.33	**Channel Flow, GUTTER** Area= 2.0 sf Perim= 2.0' r= 1.00' n= 0.013 Asphalt, smooth
19.5	720	Total			

Subcatchment 1S: DA-A



Summary for Subcatchment 2S: DA-B

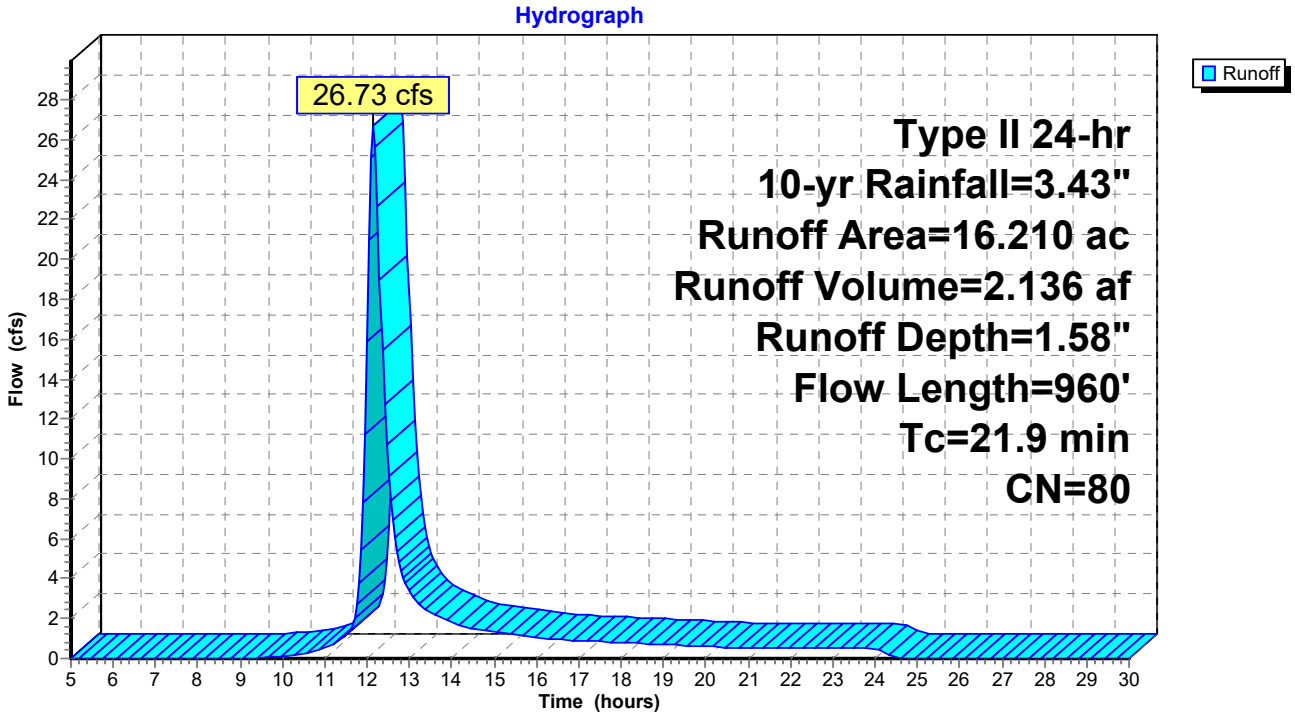
Runoff = 26.73 cfs @ 12.15 hrs, Volume= 2.136 af, Depth= 1.58"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-yr Rainfall=3.43"

Area (ac)	CN	Description
0.740	98	Paved parking, HSG D
7.140	80	>75% Grass cover, Good, HSG D
7.840	77	Woods, Good, HSG D
0.490	98	Roofs, HSG D
16.210	80	Weighted Average
14.980		92.41% Pervious Area
1.230		7.59% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.0	100	0.0600	0.10		**Sheet Flow, SHEET FLOW** Woods: Light underbrush n= 0.400 P2= 2.39"
4.8	370	0.0650	1.27		**Shallow Concentrated Flow, SCF** Woodland Kv= 5.0 fps
0.8	200	0.0650	4.10		**Shallow Concentrated Flow, SCF** Unpaved Kv= 16.1 fps
0.3	290	0.0200	16.17	32.33	**Channel Flow, GUTTER** Area= 2.0 sf Perim= 2.0' r= 1.00' n= 0.013 Asphalt, smooth
21.9	960	Total			

Subcatchment 2S: DA-B



Summary for Subcatchment 3S: DA-C

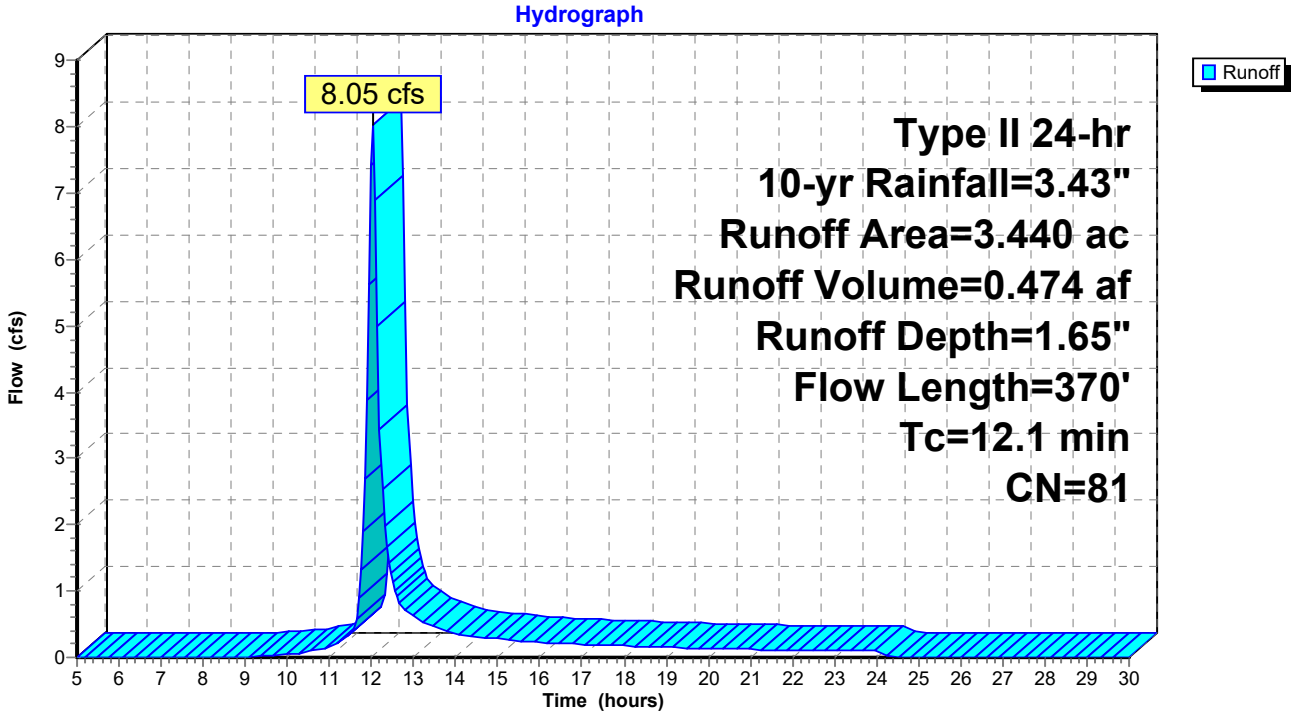
Runoff = 8.05 cfs @ 12.04 hrs, Volume= 0.474 af, Depth= 1.65"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-yr Rainfall=3.43"

Area (ac)	CN	Description
0.060	98	Paved parking, HSG D
3.200	80	>75% Grass cover, Good, HSG D
0.180	98	Roofs, HSG D
3.440	81	Weighted Average
3.200		93.02% Pervious Area
0.240		6.98% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.6	100	0.0600	0.16		**Sheet Flow, SHEET FLOW** Grass: Dense n= 0.240 P2= 2.39"
1.5	270	0.0370	3.10		**Shallow Concentrated Flow, SCF** Unpaved Kv= 16.1 fps
12.1	370	Total			

Subcatchment 3S: DA-C



Summary for Subcatchment 4S: DA-D

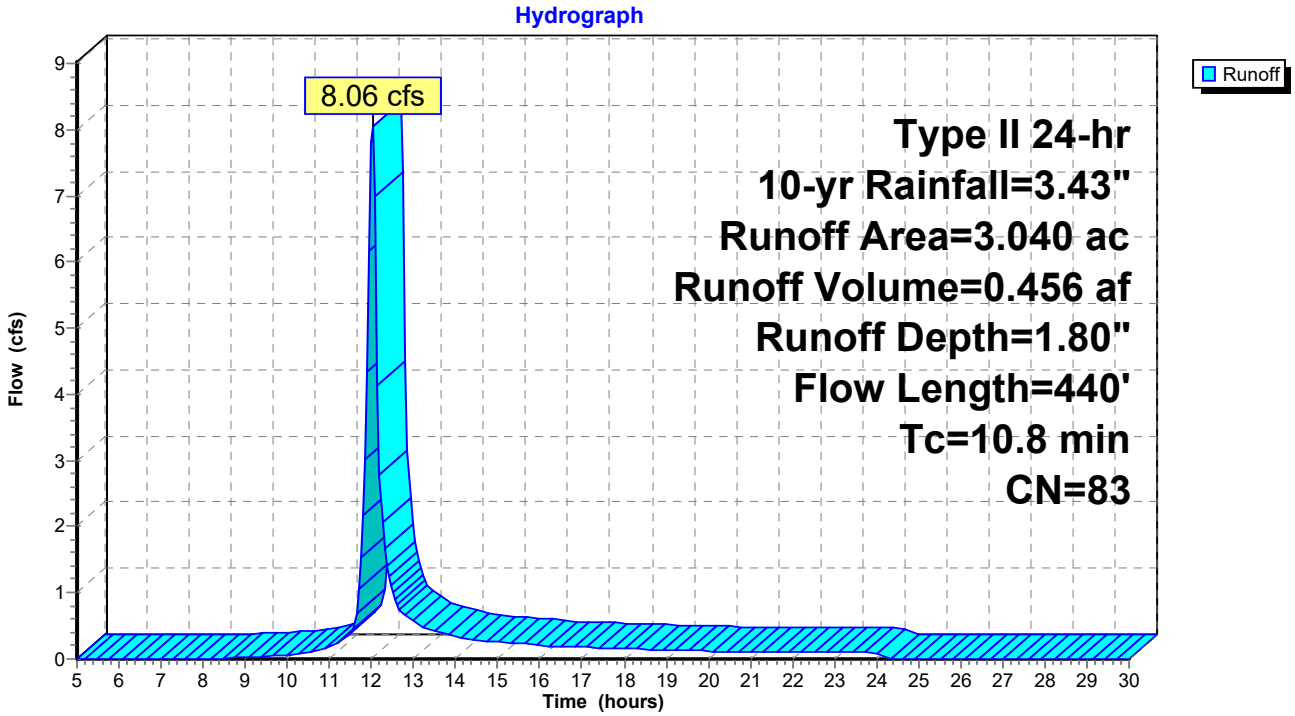
Runoff = 8.06 cfs @ 12.03 hrs, Volume= 0.456 af, Depth= 1.80"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-yr Rainfall=3.43"

Area (ac)	CN	Description
0.310	98	Paved parking, HSG D
2.560	80	>75% Grass cover, Good, HSG D
0.170	98	Roofs, HSG D
3.040	83	Weighted Average
2.560		84.21% Pervious Area
0.480		15.79% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0	100	0.0700	0.17		**Sheet Flow, SHEET FLOW** Grass: Dense n= 0.240 P2= 2.39"
0.5	140	0.0900	4.83		**Shallow Concentrated Flow, SCF** Unpaved Kv= 16.1 fps
0.3	200	0.0200	9.55	76.42	**Channel Flow, swale flow** Area= 8.0 sf Perim= 8.0' r= 1.00' n= 0.022 Earth, clean & straight
10.8	440	Total			

Subcatchment 4S: DA-D



Summary for Subcatchment 5S: DA-E

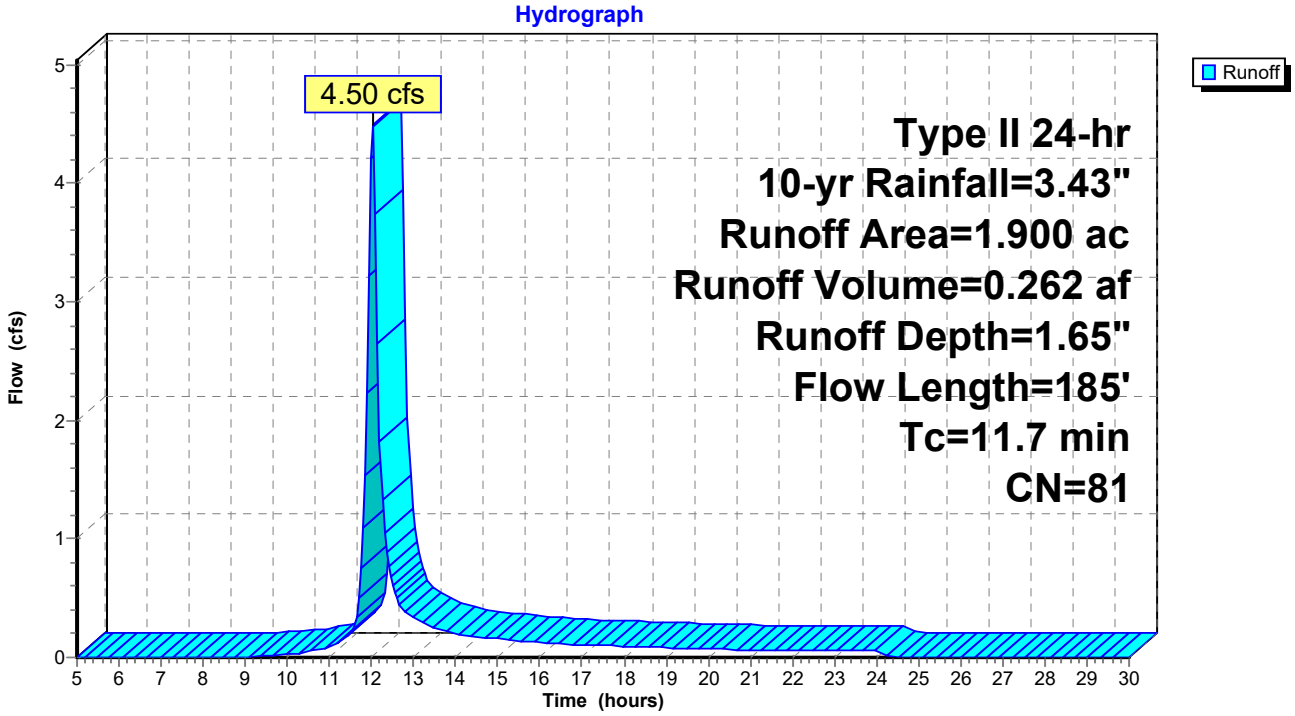
Runoff = 4.50 cfs @ 12.04 hrs, Volume= 0.262 af, Depth= 1.65"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-yr Rainfall=3.43"

Area (ac)	CN	Description
0.030	98	Paved parking, HSG D
1.800	80	>75% Grass cover, Good, HSG D
0.070	98	Roofs, HSG D
1.900	81	Weighted Average
1.800		94.74% Pervious Area
0.100		5.26% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.4	100	0.0500	0.15		**Sheet Flow, SHEET FLOW** Grass: Dense n= 0.240 P2= 2.39"
0.3	85	0.0950	4.96		**Shallow Concentrated Flow, SCF** Unpaved Kv= 16.1 fps
11.7	185	Total			

Subcatchment 5S: DA-E



Summary for Subcatchment 6S: DA-F

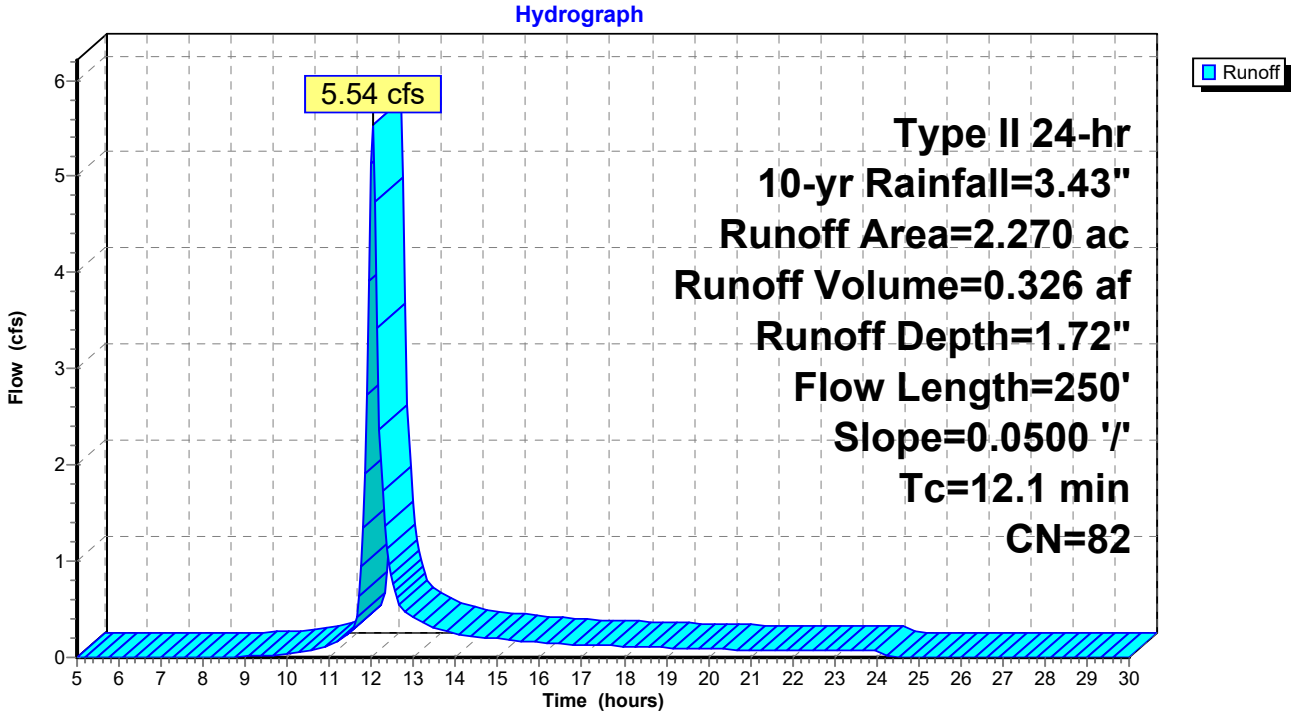
Runoff = 5.54 cfs @ 12.04 hrs, Volume= 0.326 af, Depth= 1.72"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-yr Rainfall=3.43"

Area (ac)	CN	Description
0.090	98	Paved parking, HSG D
2.040	80	>75% Grass cover, Good, HSG D
0.140	98	Roofs, HSG D
2.270	82	Weighted Average
2.040		89.87% Pervious Area
0.230		10.13% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.4	100	0.0500	0.15		**Sheet Flow, SHEET FLOW** Grass: Dense n= 0.240 P2= 2.39"
0.7	150	0.0500	3.60		**Shallow Concentrated Flow, SCF** Unpaved Kv= 16.1 fps
12.1	250	Total			

Subcatchment 6S: DA-F



Summary for Subcatchment 7S: DA-G

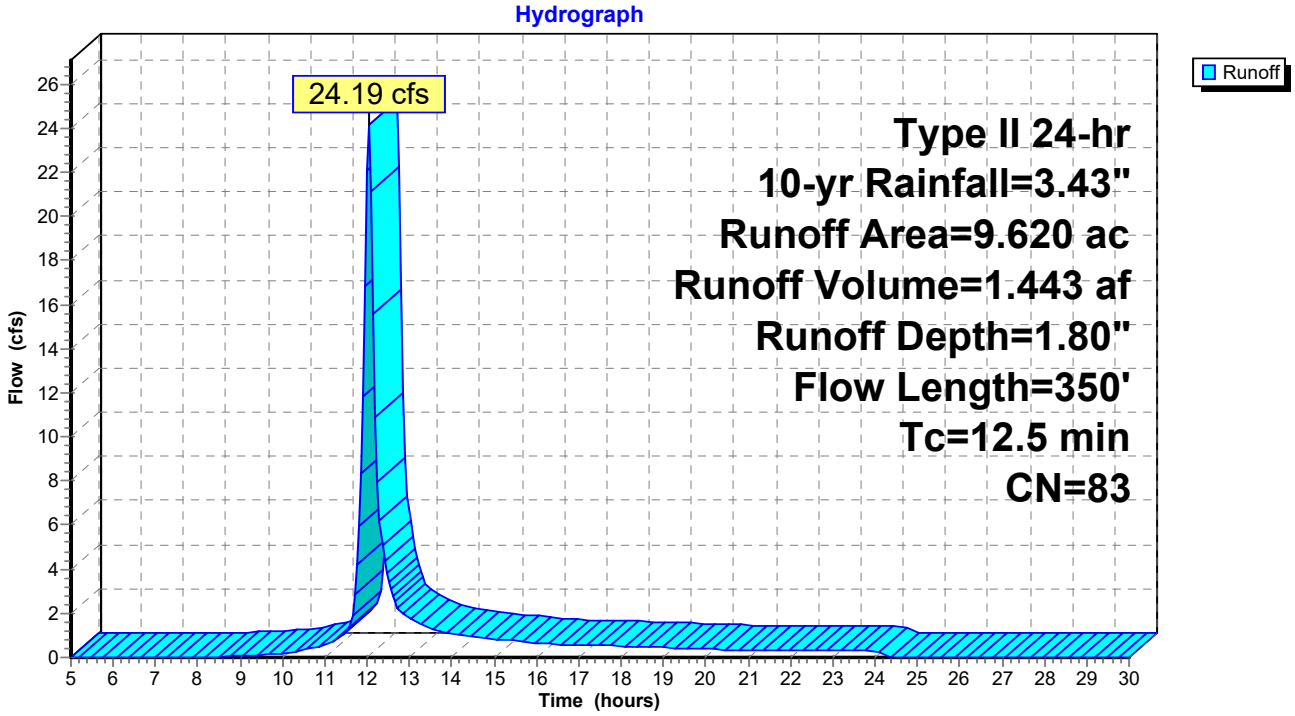
Runoff = 24.19 cfs @ 12.05 hrs, Volume= 1.443 af, Depth= 1.80"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-yr Rainfall=3.43"

Area (ac)	CN	Description
1.050	98	Paved parking, HSG D
8.080	80	>75% Grass cover, Good, HSG D
0.490	98	Roofs, HSG D
9.620	83	Weighted Average
8.080		83.99% Pervious Area
1.540		16.01% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.4	100	0.0500	0.15		**Sheet Flow, sheet** Grass: Dense n= 0.240 P2= 2.39"
1.1	250	0.0550	3.78		**Shallow Concentrated Flow, shallow conc flow** Unpaved Kv= 16.1 fps
12.5	350	Total			

Subcatchment 7S: DA-G



Summary for Subcatchment 8S: DA-H

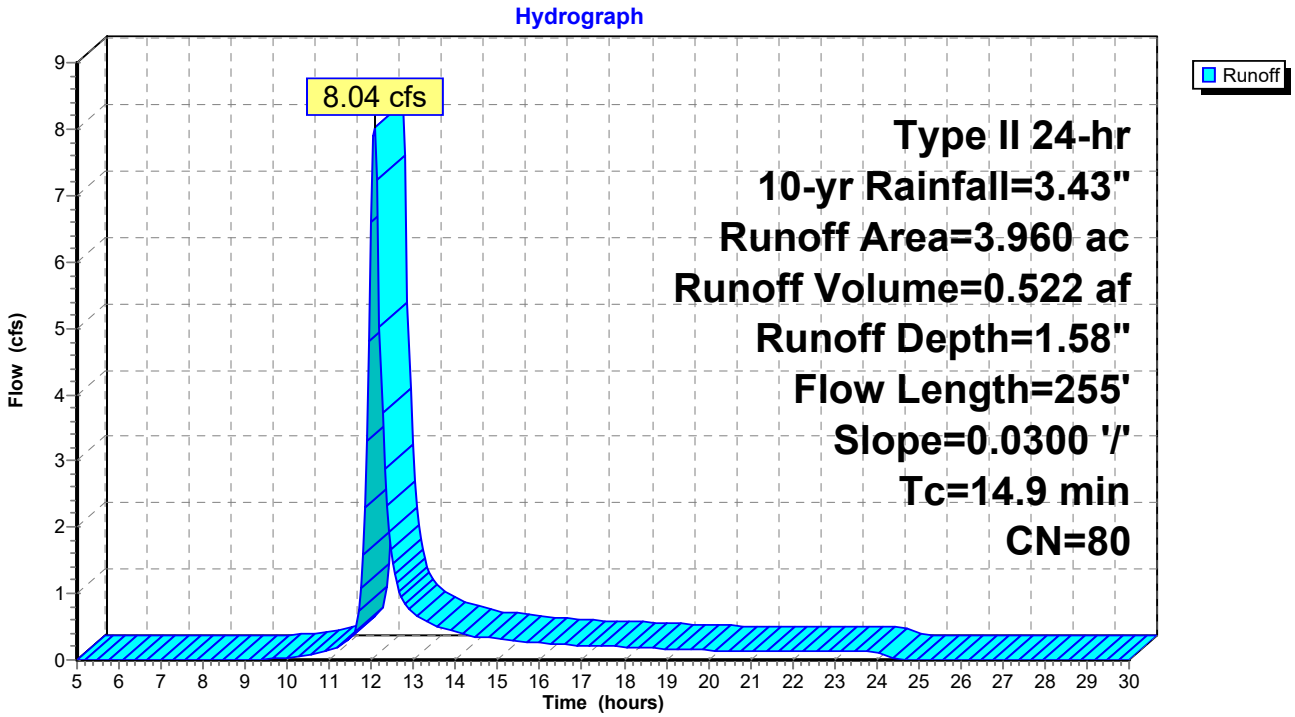
Runoff = 8.04 cfs @ 12.07 hrs, Volume= 0.522 af, Depth= 1.58"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-yr Rainfall=3.43"

Area (ac)	CN	Description
0.090	98	Paved parking, HSG D
2.440	80	>75% Grass cover, Good, HSG D
1.220	77	Woods, Good, HSG D
0.210	98	Roofs, HSG D
3.960	80	Weighted Average
3.660		92.42% Pervious Area
0.300		7.58% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.0	100	0.0300	0.12		**Sheet Flow, SHEET FLOW** Grass: Dense n= 0.240 P2= 2.39"
0.9	155	0.0300	2.79		**Shallow Concentrated Flow, SCF** Unpaved Kv= 16.1 fps
14.9	255	Total			

Subcatchment 8S: DA-H



Summary for Subcatchment 10S: DA#1

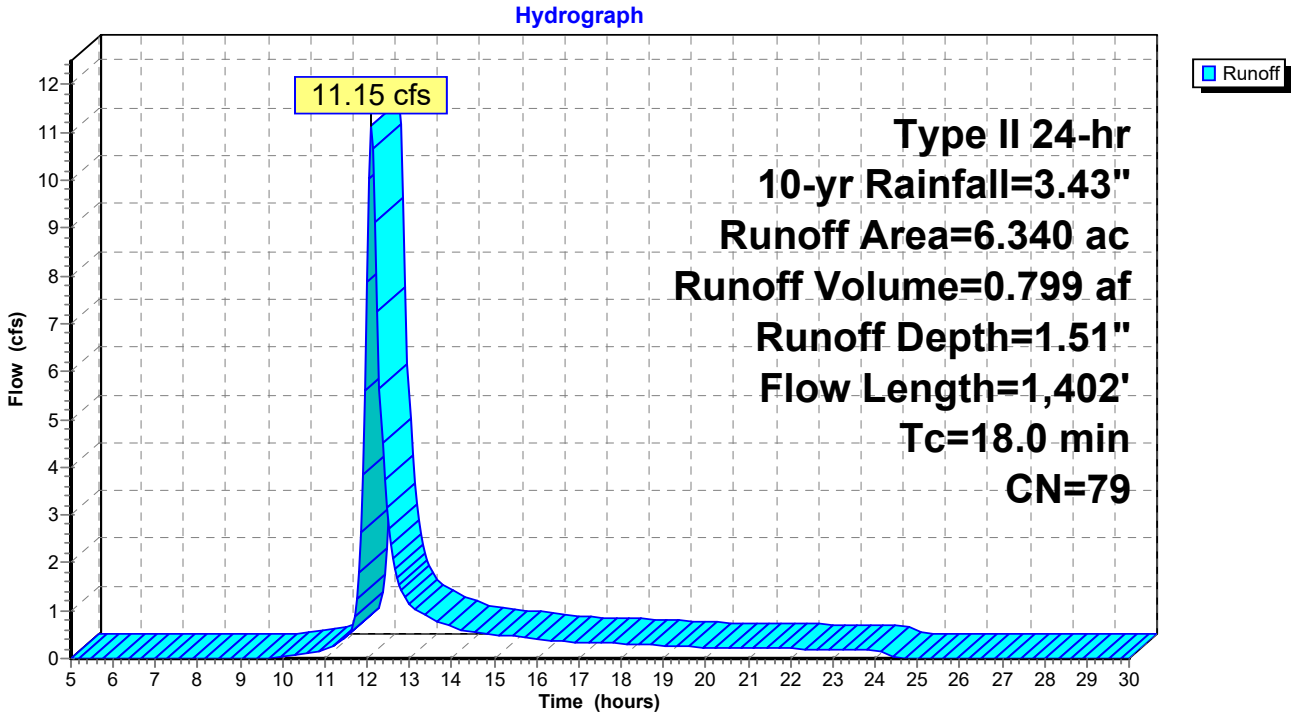
Runoff = 11.15 cfs @ 12.11 hrs, Volume= 0.799 af, Depth= 1.51"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-yr Rainfall=3.43"

Area (ac)	CN	Description
3.390	80	>75% Grass cover, Good, HSG D
2.850	77	Woods, Good, HSG D
0.030	98	Paved parking, HSG D
0.070	98	Roofs, HSG D
6.340	79	Weighted Average
6.240		98.42% Pervious Area
0.100		1.58% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.6	100	0.0600	0.16		**Sheet Flow, SHEET FLOW** Grass: Dense n= 0.240 P2= 2.39"
5.4	485	0.0900	1.50		**Shallow Concentrated Flow, SCF** Woodland Kv= 5.0 fps
1.8	517	0.0900	4.83		**Shallow Concentrated Flow, SCF** Unpaved Kv= 16.1 fps
0.2	300	0.0860	27.67	442.73	**Channel Flow, SWALE** Area= 16.0 sf Perim= 8.0' r= 2.00' n= 0.025 Earth, clean & winding
18.0	1,402	Total			

Subcatchment 10S: DA#1



Summary for Subcatchment 11S: DA#2

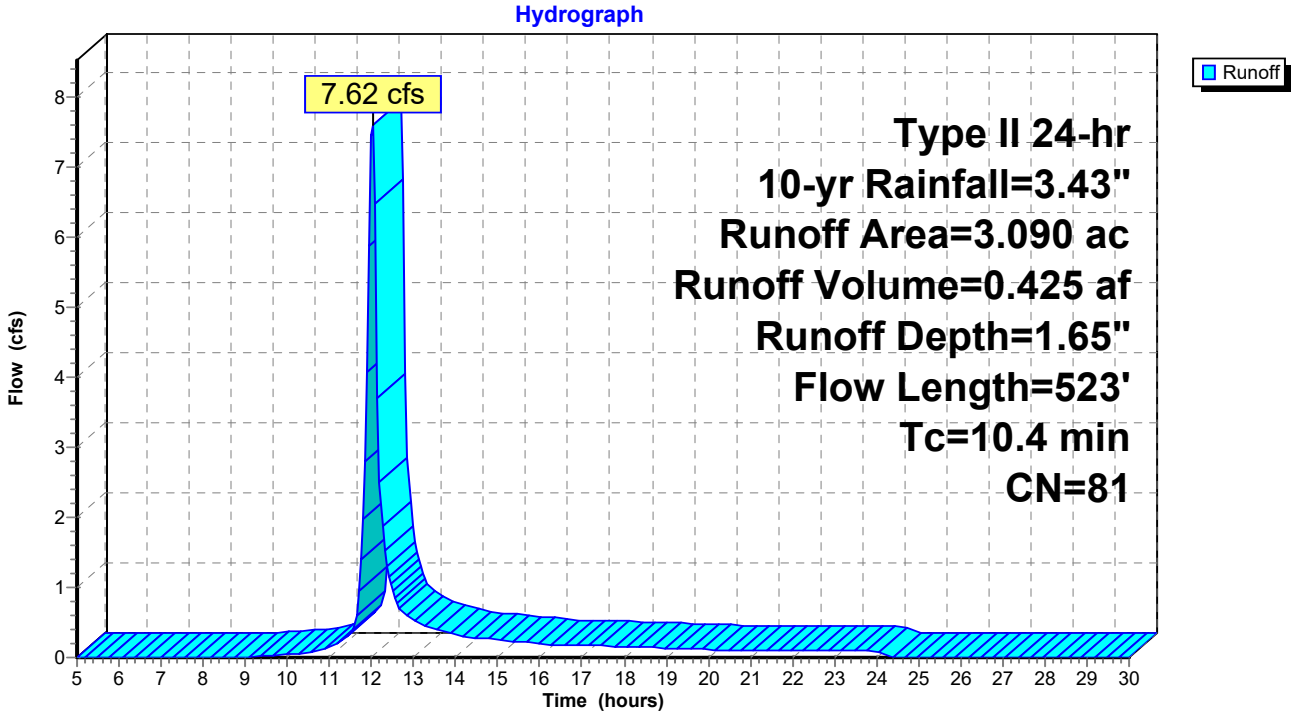
Runoff = 7.62 cfs @ 12.02 hrs, Volume= 0.425 af, Depth= 1.65"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-yr Rainfall=3.43"

Area (ac)	CN	Description
2.070	80	>75% Grass cover, Good, HSG D
0.660	77	Woods, Good, HSG D
0.220	98	Paved parking, HSG D
0.140	98	Roofs, HSG D
3.090	81	Weighted Average
2.730		88.35% Pervious Area
0.360		11.65% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0	100	0.0700	0.17		**Sheet Flow, SHEET FLOW** Grass: Dense n= 0.240 P2= 2.39"
0.2	56	0.1300	5.80		**Shallow Concentrated Flow, SCF** Unpaved Kv= 16.1 fps
0.2	367	0.0820	27.02	432.31	**Channel Flow, SWALE** Area= 16.0 sf Perim= 8.0' r= 2.00' n= 0.025 Earth, clean & winding
10.4	523	Total			

Subcatchment 11S: DA#2



Summary for Subcatchment 12S: DA#3

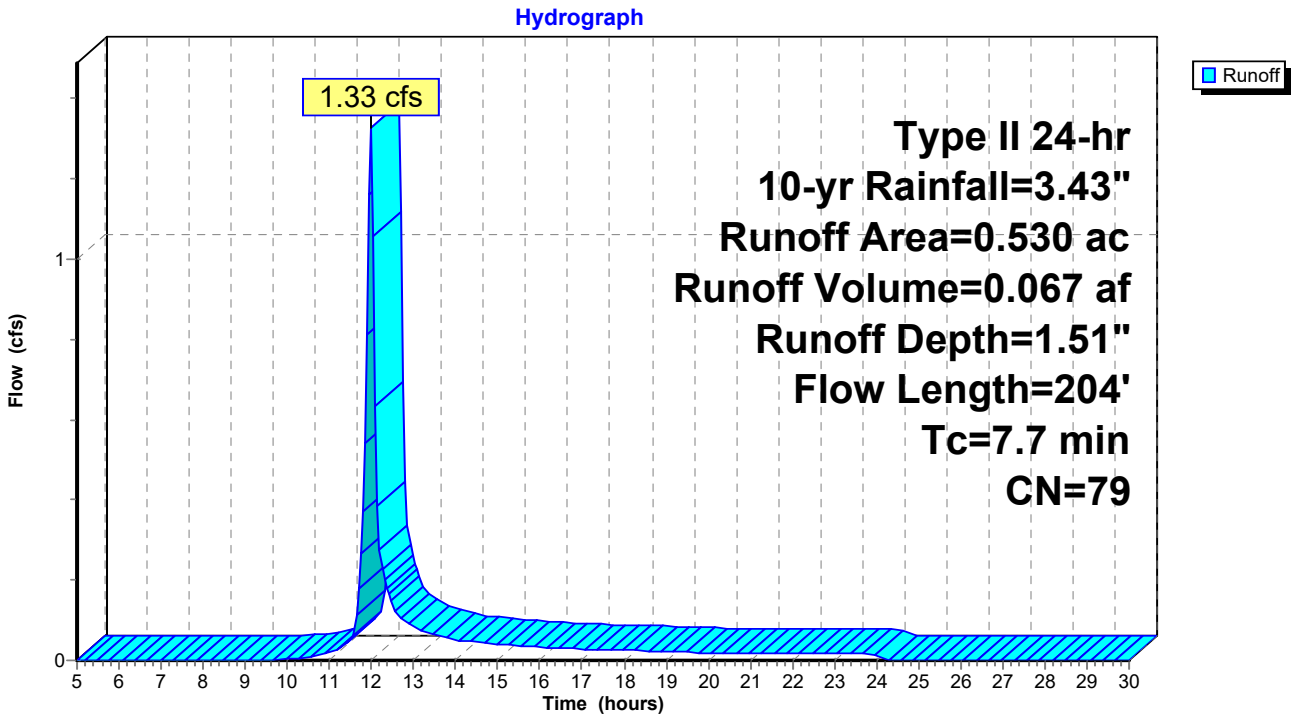
Runoff = 1.33 cfs @ 11.99 hrs, Volume= 0.067 af, Depth= 1.51"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-yr Rainfall=3.43"

Area (ac)	CN	Description
0.390	80	>75% Grass cover, Good, HSG D
0.140	77	Woods, Good, HSG D
0.530	79	Weighted Average
0.530		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.4	100	0.1500	0.23		**Sheet Flow, SHEET FLOW** Grass: Dense n= 0.240 P2= 2.39"
0.3	104	0.1300	5.80		**Shallow Concentrated Flow, SCF** Unpaved Kv= 16.1 fps
7.7	204	Total			

Subcatchment 12S: DA#3



Summary for Subcatchment 13S: DA#4

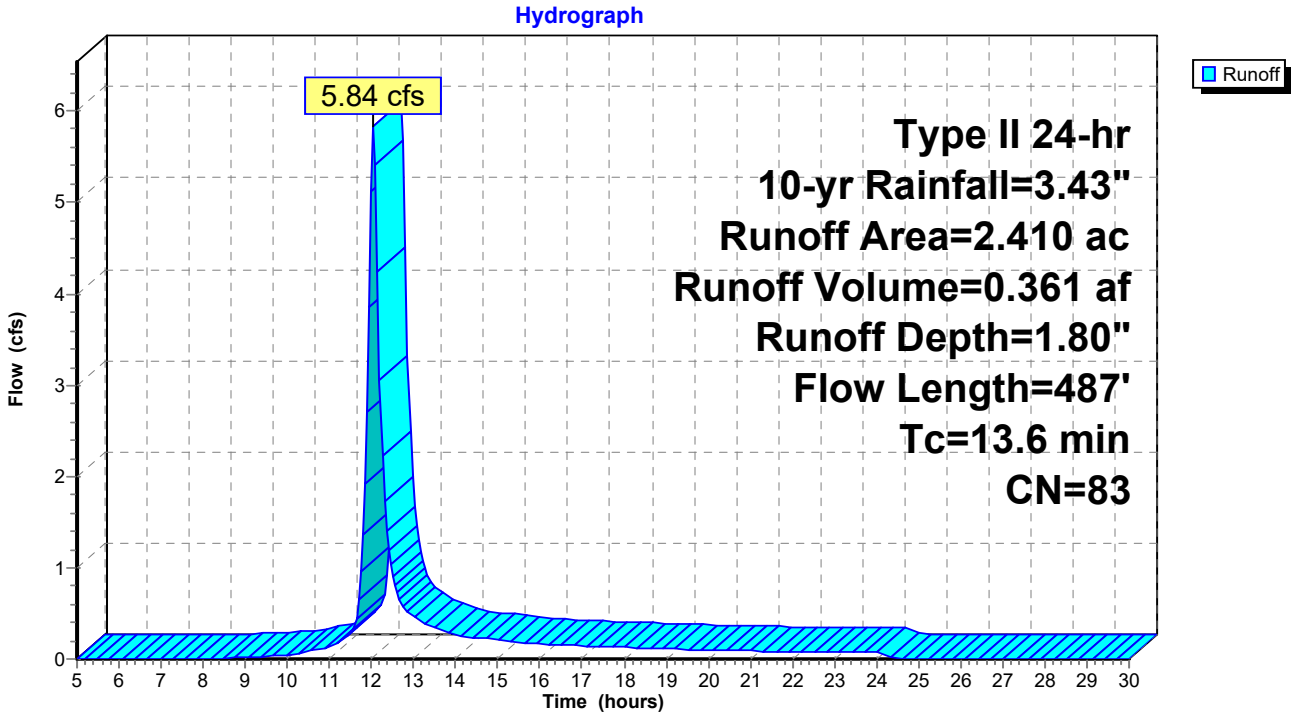
Runoff = 5.84 cfs @ 12.06 hrs, Volume= 0.361 af, Depth= 1.80"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-yr Rainfall=3.43"

Area (ac)	CN	Description
2.020	80	>75% Grass cover, Good, HSG D
0.250	98	Paved parking, HSG D
0.140	98	Roofs, HSG D
2.410	83	Weighted Average
2.020		83.82% Pervious Area
0.390		16.18% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.9	100	0.0450	0.14		**Sheet Flow, SHEET FLOW** Grass: Dense n= 0.240 P2= 2.39"
1.5	307	0.0450	3.42		**Shallow Concentrated Flow, SCF** Unpaved Kv= 16.1 fps
0.2	80	0.0200	6.42	5.04	**Pipe Channel, storm pipe** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013 Corrugated PE, smooth interior
13.6	487	Total			

Subcatchment 13S: DA#4

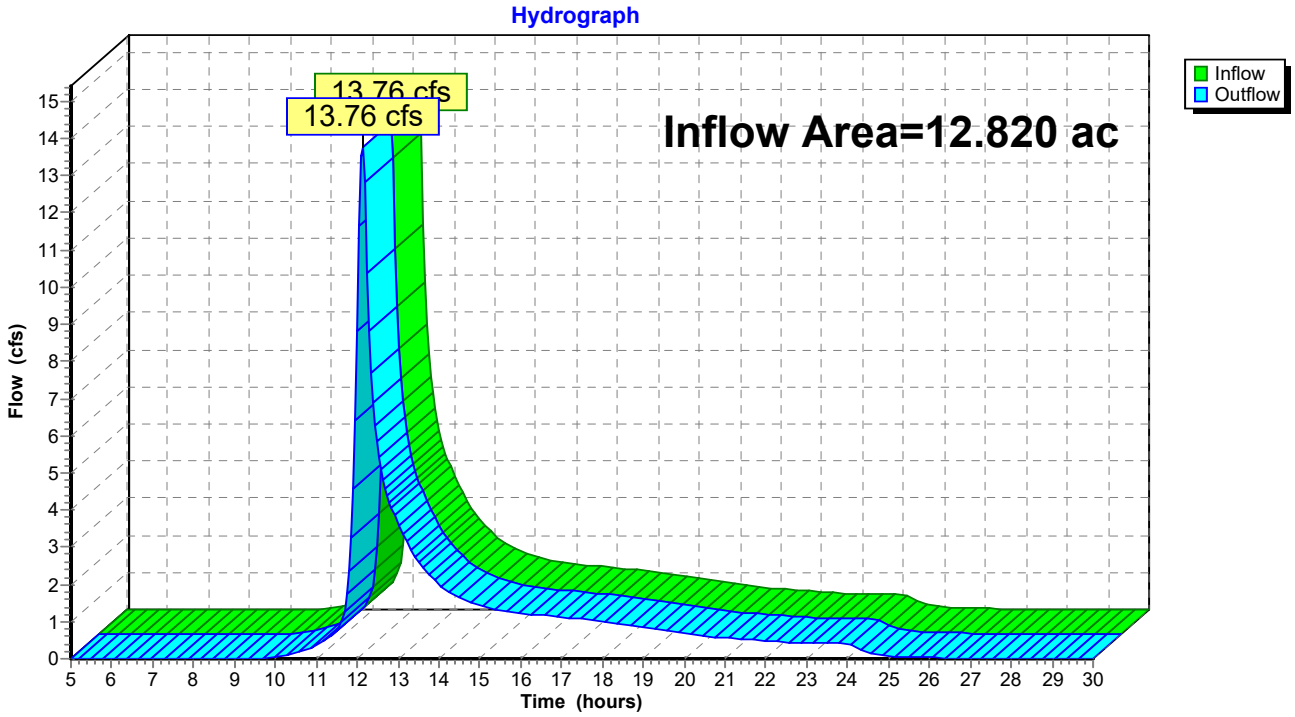


Summary for Reach 1R: Pt of Study 1A

Inflow Area = 12.820 ac, 6.40% Impervious, Inflow Depth > 1.62" for 10-yr event
Inflow = 13.76 cfs @ 12.12 hrs, Volume= 1.726 af
Outflow = 13.76 cfs @ 12.12 hrs, Volume= 1.726 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-30.00 hrs, dt= 0.05 hrs

Reach 1R: Pt of Study 1A

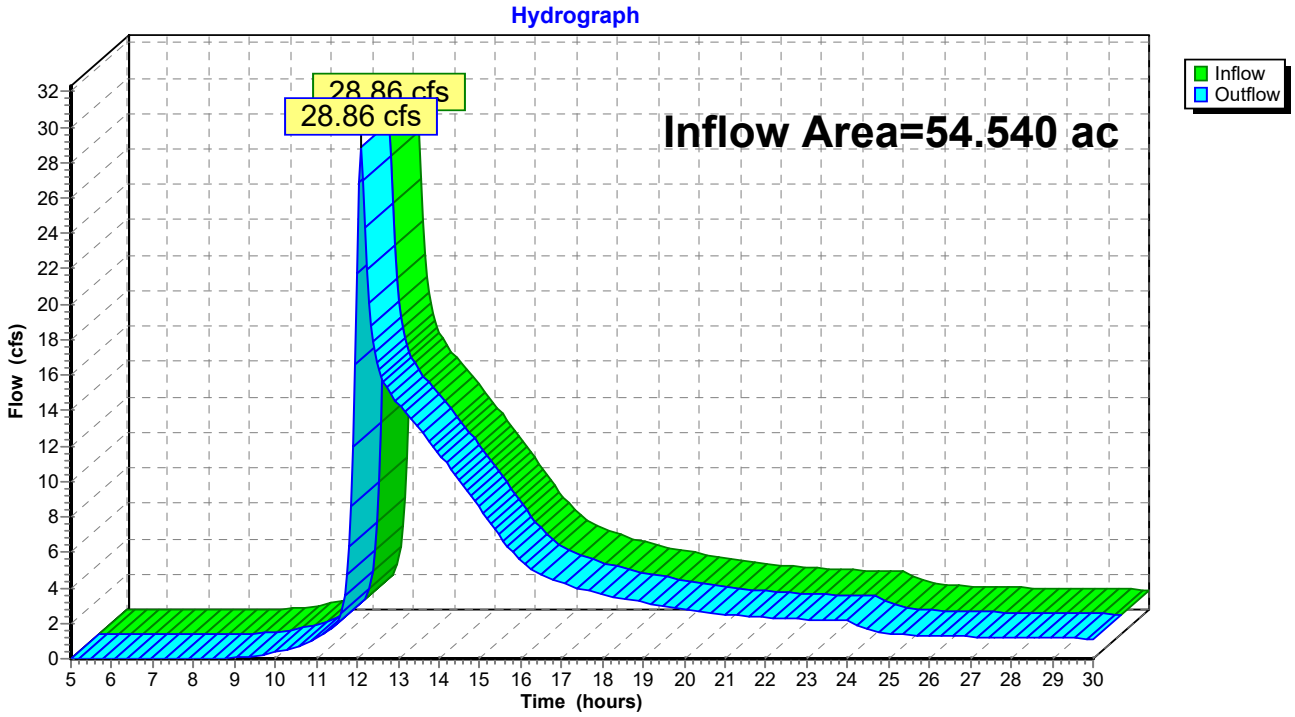


Summary for Reach 2R: Pt of Study 1B

Inflow Area = 54.540 ac, 9.41% Impervious, Inflow Depth > 1.57" for 10-yr event
Inflow = 28.86 cfs @ 12.10 hrs, Volume= 7.139 af
Outflow = 28.86 cfs @ 12.10 hrs, Volume= 7.139 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-30.00 hrs, dt= 0.05 hrs

Reach 2R: Pt of Study 1B



Summary for Pond 1P: Detention Basin 1

Inflow Area =	20.880 ac,	8.52% Impervious,	Inflow Depth =	1.60"	for 10-yr event
Inflow =	35.22 cfs @	12.15 hrs,	Volume=	2.779 af	
Outflow =	7.84 cfs @	12.64 hrs,	Volume=	2.755 af,	Atten= 78%, Lag= 29.8 min
Primary =	7.84 cfs @	12.64 hrs,	Volume=	2.755 af	
Secondary =	0.00 cfs @	5.00 hrs,	Volume=	0.000 af	

Routing by Stor-Ind method, Time Span= 5.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 893.00' @ 12.64 hrs Surf.Area= 15,687 sf Storage= 49,591 cf

Plug-Flow detention time= 194.2 min calculated for 2.755 af (99% of inflow)
Center-of-Mass det. time= 189.2 min (1,038.7 - 849.5)

Volume	Invert	Avail.Storage	Storage Description
#1	888.00'	104,203 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

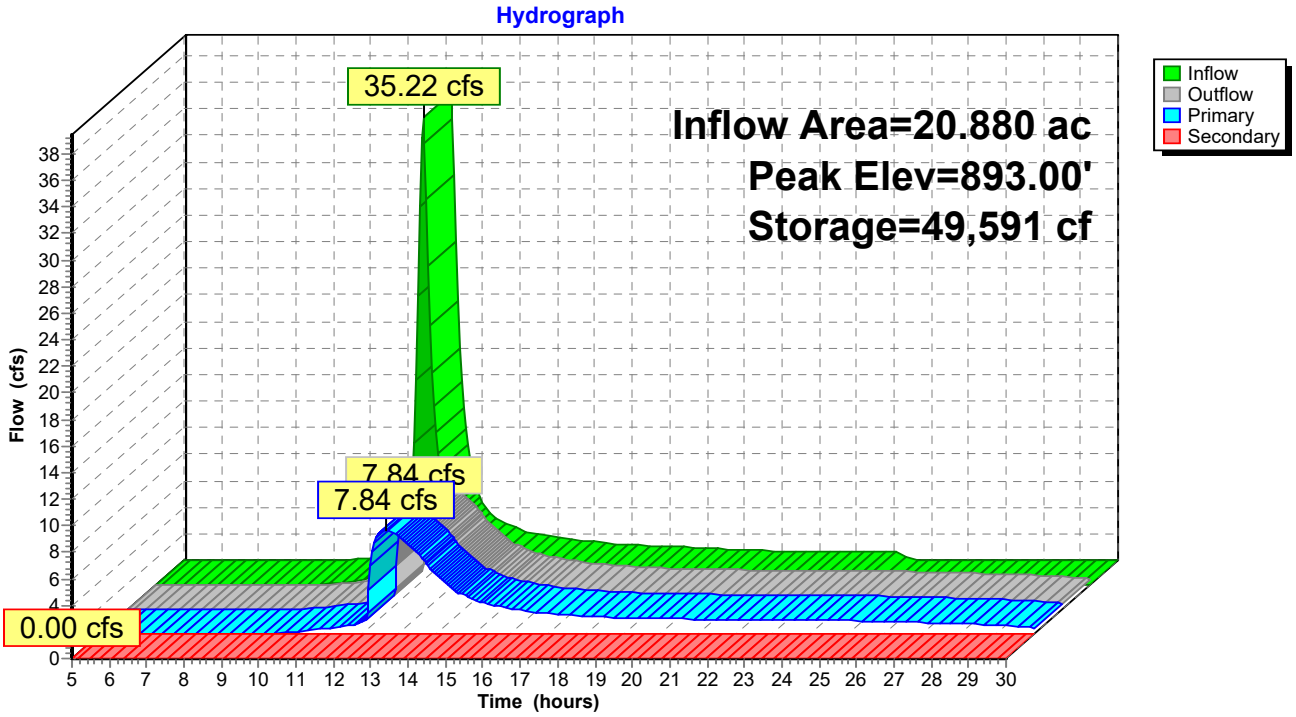
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
888.00	373	0	0
889.00	3,768	2,071	2,071
890.00	11,124	7,446	9,517
891.00	12,590	11,857	21,374
892.00	14,113	13,352	34,725
893.00	15,691	14,902	49,627
894.00	17,327	16,509	66,136
895.00	19,019	18,173	84,309
896.00	20,768	19,894	104,203

Device	Routing	Invert	Outlet Devices
#1	Primary	887.90'	**30.0" Round Culvert** L= 20.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 887.90' / 886.90' S= 0.0500 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 4.91 sf
#2	Device 1	888.00'	**5.0" Vert. Orifice1** C= 0.600
#3	Device 1	891.20'	**15.0" Vert. Orifice2** C= 0.600
#4	Device 1	894.90'	**30.0" x 30.0" Horiz. Grate** C= 0.600 Limited to weir flow at low heads
#5	Secondary	896.00'	**25.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=7.83 cfs @ 12.64 hrs HW=893.00' (Free Discharge)
└─**1=Culvert** (Passes 7.83 cfs of 36.60 cfs potential flow)
  ├─**2=Orifice1** (Orifice Controls 1.44 cfs @ 10.54 fps)
  ├─**3=Orifice2** (Orifice Controls 6.40 cfs @ 5.21 fps)
  └─**4=Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=888.00' (Free Discharge)
└─**5=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 1P: Detention Basin 1



Summary for Pond 2P: Detention Basin 2

Inflow Area = 36.730 ac, 10.48% Impervious, Inflow Depth > 1.65" for 10-yr event
Inflow = 38.60 cfs @ 12.05 hrs, Volume= 5.046 af
Outflow = 9.89 cfs @ 13.09 hrs, Volume= 4.726 af, Atten= 74%, Lag= 62.1 min
Primary = 9.89 cfs @ 13.09 hrs, Volume= 4.726 af
Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 869.38' @ 13.09 hrs Surf.Area= 14,995 sf Storage= 51,620 cf

Plug-Flow detention time= 128.9 min calculated for 4.717 af (93% of inflow)
Center-of-Mass det. time= 82.3 min (1,028.8 - 946.5)

Volume	Invert	Avail.Storage	Storage Description
#1	863.00'	98,569 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

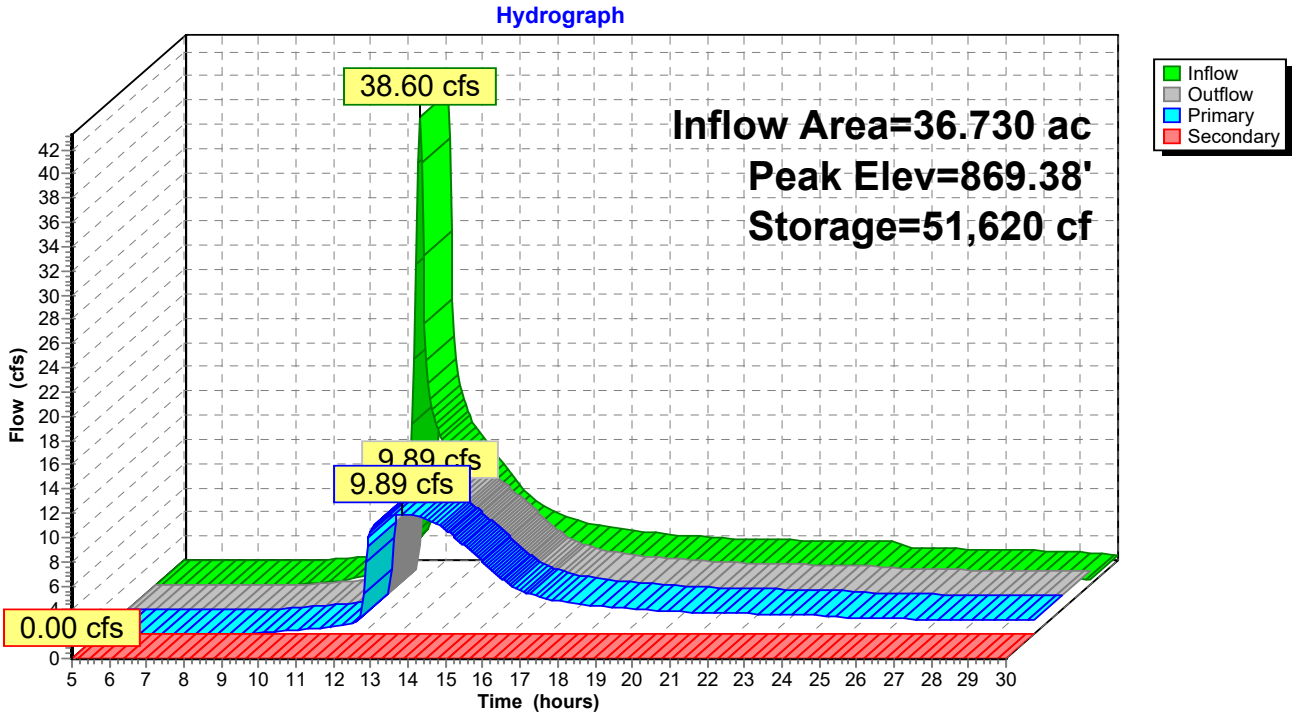
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
863.00	335	0	0
864.00	3,479	1,907	1,907
865.00	5,953	4,716	6,623
866.00	7,741	6,847	13,470
867.00	9,739	8,740	22,210
868.00	11,941	10,840	33,050
869.00	14,156	13,049	46,099
870.00	16,371	15,264	61,362
871.00	18,599	17,485	78,847
872.00	20,845	19,722	98,569

Device	Routing	Invert	Outlet Devices
#1	Secondary	872.00'	**20.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64
#2	Primary	862.90'	**30.0" Round Culvert** L= 20.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 862.90' / 861.00' S= 0.0950 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 4.91 sf
#3	Device 2	863.00'	**5.0" Vert. Orifice1** C= 0.600
#4	Device 2	866.80'	**15.0" Vert. Orifice2** C= 0.600
#5	Device 2	870.00'	**30.0" x 30.0" Horiz. Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=9.89 cfs @ 13.09 hrs HW=869.38' (Free Discharge)
└─**2=Culvert** (Passes 9.89 cfs of 42.67 cfs potential flow)
  ├─**3=Orifice1** (Orifice Controls 1.63 cfs @ 11.96 fps)
  ├─**4=Orifice2** (Orifice Controls 8.26 cfs @ 6.73 fps)
  └─**5=Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=863.00' (Free Discharge)
└─**1=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 2P: Detention Basin 2



Summary for Pond 3P: Detention Basin 3

Inflow Area = 6.480 ac, 11.11% Impervious, Inflow Depth = 1.72" for 10-yr event
Inflow = 16.06 cfs @ 12.03 hrs, Volume= 0.930 af
Outflow = 3.16 cfs @ 12.35 hrs, Volume= 0.928 af, Atten= 80%, Lag= 18.6 min
Primary = 3.16 cfs @ 12.35 hrs, Volume= 0.928 af
Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 902.94' @ 12.35 hrs Surf.Area= 9,197 sf Storage= 16,224 cf

Plug-Flow detention time= 100.3 min calculated for 0.926 af (100% of inflow)
Center-of-Mass det. time= 99.4 min (934.3 - 834.8)

Volume	Invert	Avail.Storage	Storage Description
#1	900.00'	38,589 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

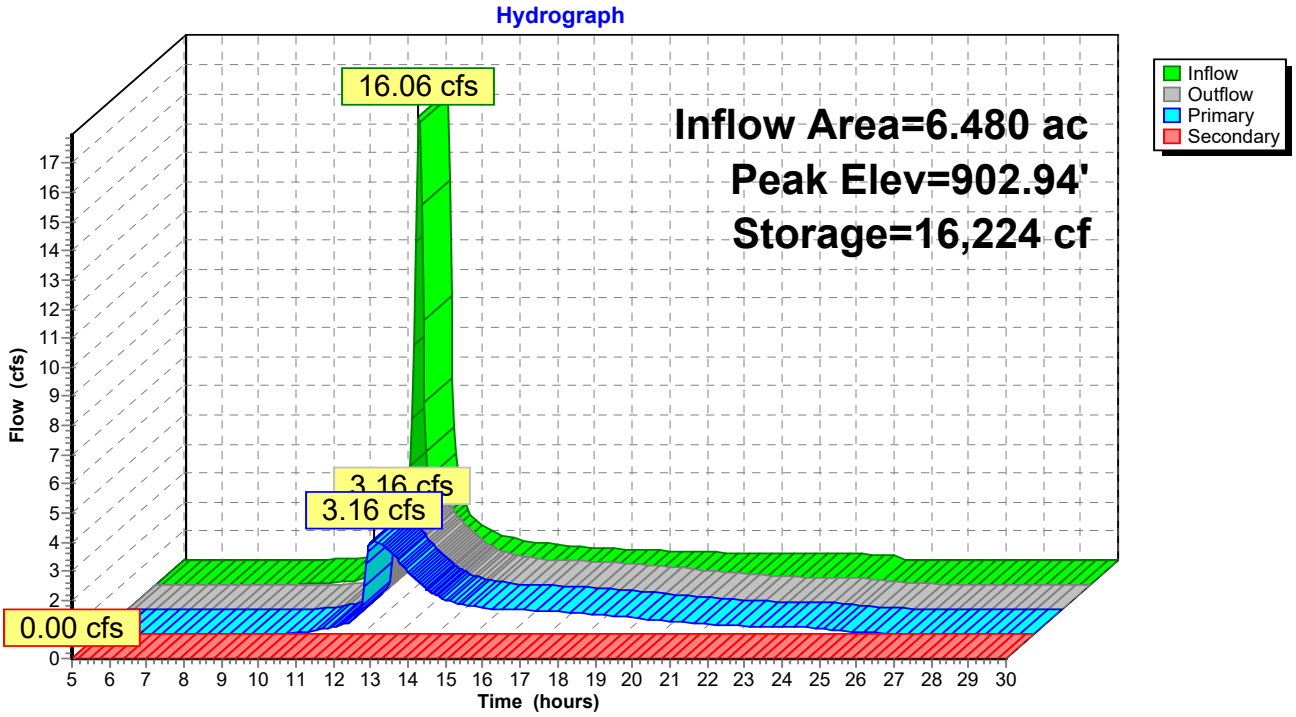
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
900.00	2,381	0	0
901.00	3,197	2,789	2,789
902.00	7,737	5,467	8,256
903.00	9,288	8,513	16,769
904.00	10,896	10,092	26,861
905.00	12,560	11,728	38,589

Device	Routing	Invert	Outlet Devices
#1	Secondary	905.00'	**20.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64
#2	Primary	900.00'	**18.0" Round Culvert** L= 330.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 900.00' / 889.00' S= 0.0333 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf
#3	Device 2	900.00'	**5.0" Vert. Orifice1** C= 0.600
#4	Device 2	901.90'	**10.0" Vert. Orifice2** C= 0.600
#5	Device 2	904.00'	**24.0" x 24.0" Horiz. Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=3.16 cfs @ 12.35 hrs HW=902.94' (Free Discharge)
└─**2=Culvert** (Passes 3.16 cfs of 9.94 cfs potential flow)
  ├─**3=Orifice1** (Orifice Controls 1.09 cfs @ 7.96 fps)
  ├─**4=Orifice2** (Orifice Controls 2.07 cfs @ 3.80 fps)
  └─**5=Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=900.00' (Free Discharge)
└─**1=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 3P: Detention Basin 3



Summary for Subcatchment 1S: DA-A

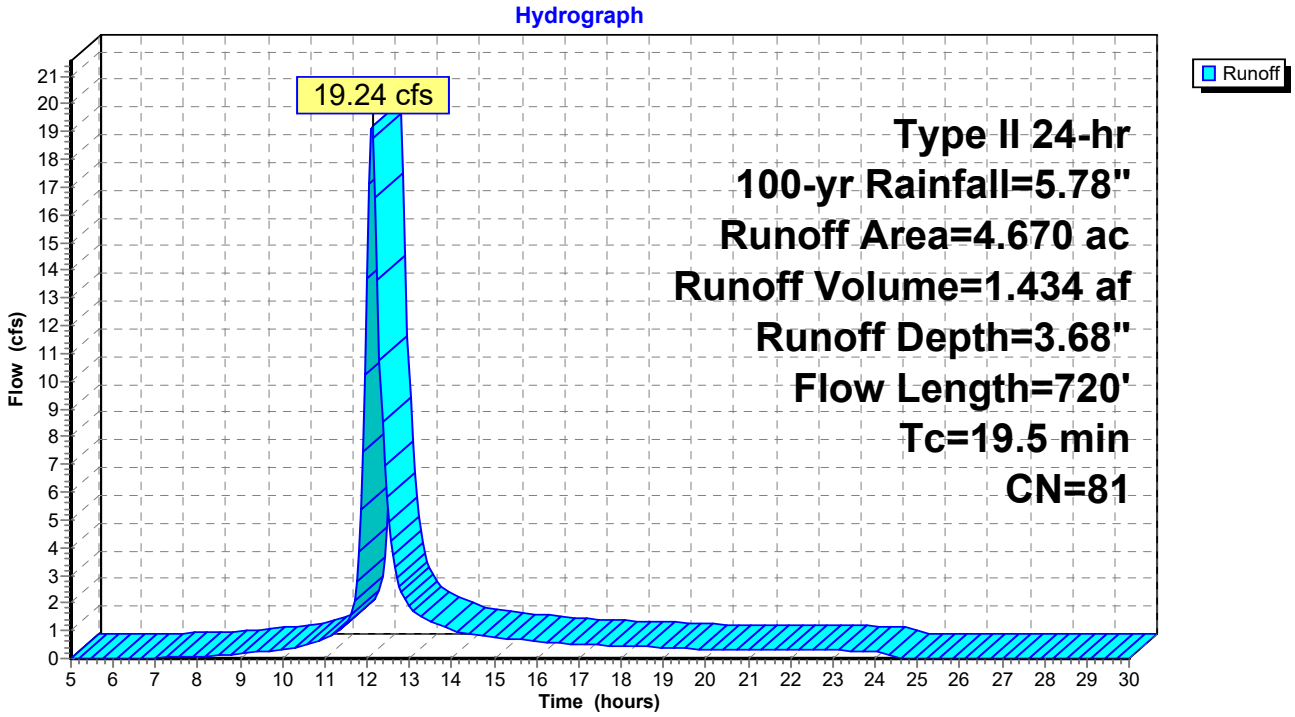
Runoff = 19.24 cfs @ 12.12 hrs, Volume= 1.434 af, Depth= 3.68"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 100-yr Rainfall=5.78"

Area (ac)	CN	Description
0.270	98	Paved parking, HSG D
2.580	80	>75% Grass cover, Good, HSG D
1.540	77	Woods, Good, HSG D
0.280	98	Roofs, HSG D
4.670	81	Weighted Average
4.120		88.22% Pervious Area
0.550		11.78% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.0	100	0.0600	0.10		**Sheet Flow, SHEET FLOW** Woods: Light underbrush n= 0.400 P2= 2.39"
2.5	188	0.0650	1.27		**Shallow Concentrated Flow, SCF** Woodland Kv= 5.0 fps
0.8	202	0.0650	4.10		**Shallow Concentrated Flow, SCF** Unpaved Kv= 16.1 fps
0.2	230	0.0200	16.17	32.33	**Channel Flow, GUTTER** Area= 2.0 sf Perim= 2.0' r= 1.00' n= 0.013 Asphalt, smooth
19.5	720	Total			

Subcatchment 1S: DA-A



Summary for Subcatchment 2S: DA-B

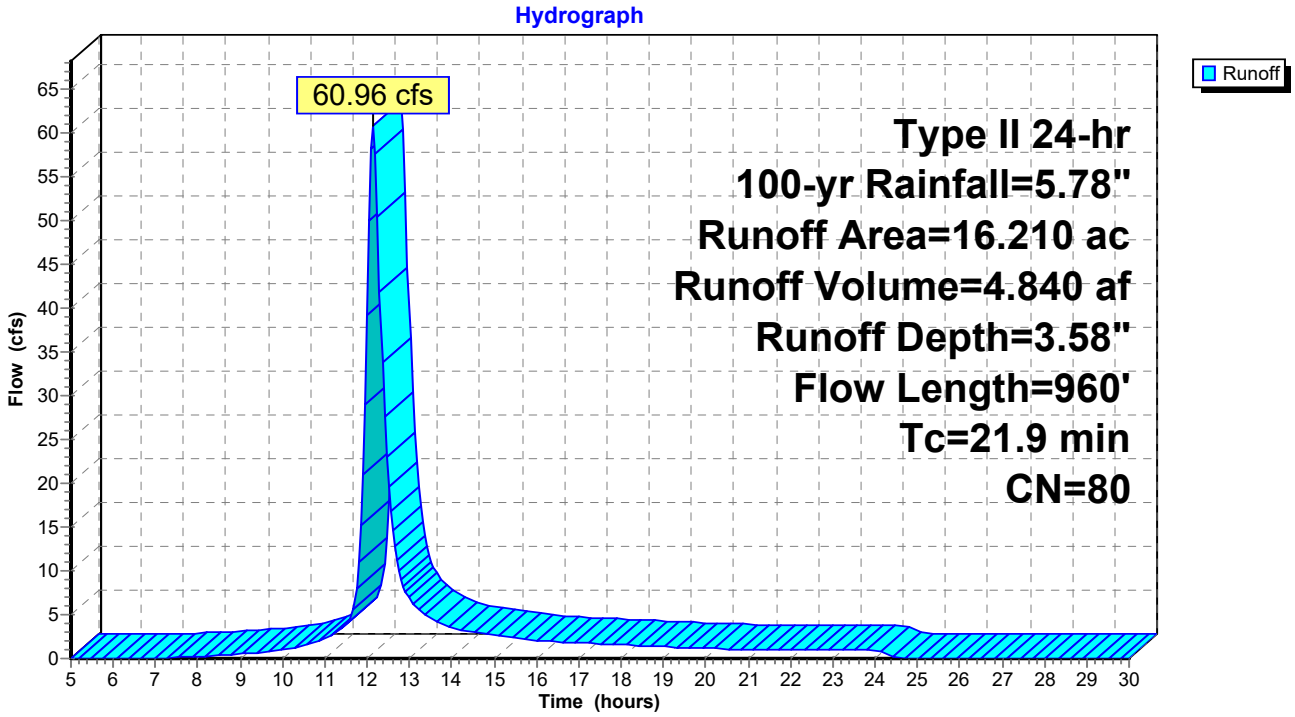
Runoff = 60.96 cfs @ 12.15 hrs, Volume= 4.840 af, Depth= 3.58"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 100-yr Rainfall=5.78"

Area (ac)	CN	Description
0.740	98	Paved parking, HSG D
7.140	80	>75% Grass cover, Good, HSG D
7.840	77	Woods, Good, HSG D
0.490	98	Roofs, HSG D
16.210	80	Weighted Average
14.980		92.41% Pervious Area
1.230		7.59% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.0	100	0.0600	0.10		**Sheet Flow, SHEET FLOW** Woods: Light underbrush n= 0.400 P2= 2.39"
4.8	370	0.0650	1.27		**Shallow Concentrated Flow, SCF** Woodland Kv= 5.0 fps
0.8	200	0.0650	4.10		**Shallow Concentrated Flow, SCF** Unpaved Kv= 16.1 fps
0.3	290	0.0200	16.17	32.33	**Channel Flow, GUTTER** Area= 2.0 sf Perim= 2.0' r= 1.00' n= 0.013 Asphalt, smooth
21.9	960	Total			

Subcatchment 2S: DA-B



Summary for Subcatchment 3S: DA-C

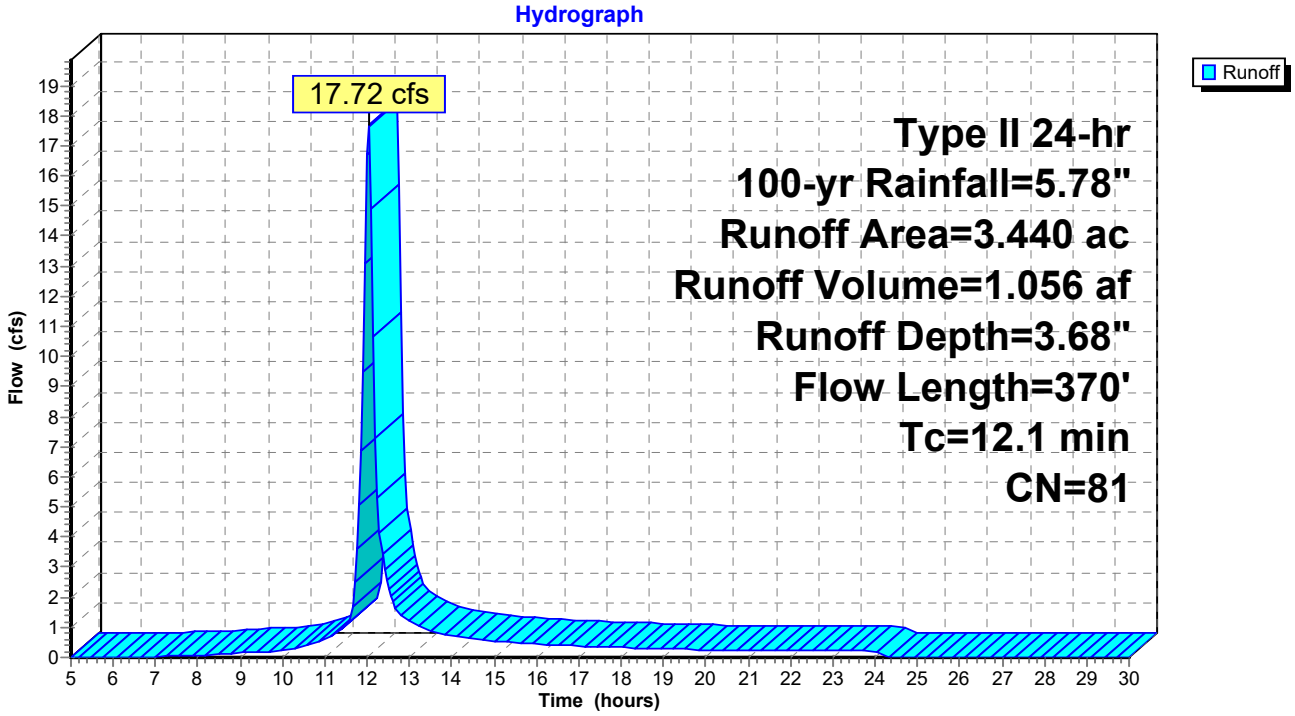
Runoff = 17.72 cfs @ 12.04 hrs, Volume= 1.056 af, Depth= 3.68"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 100-yr Rainfall=5.78"

Area (ac)	CN	Description
0.060	98	Paved parking, HSG D
3.200	80	>75% Grass cover, Good, HSG D
0.180	98	Roofs, HSG D
3.440	81	Weighted Average
3.200		93.02% Pervious Area
0.240		6.98% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.6	100	0.0600	0.16		**Sheet Flow, SHEET FLOW** Grass: Dense n= 0.240 P2= 2.39"
1.5	270	0.0370	3.10		**Shallow Concentrated Flow, SCF** Unpaved Kv= 16.1 fps
12.1	370	Total			

Subcatchment 3S: DA-C



Summary for Subcatchment 4S: DA-D

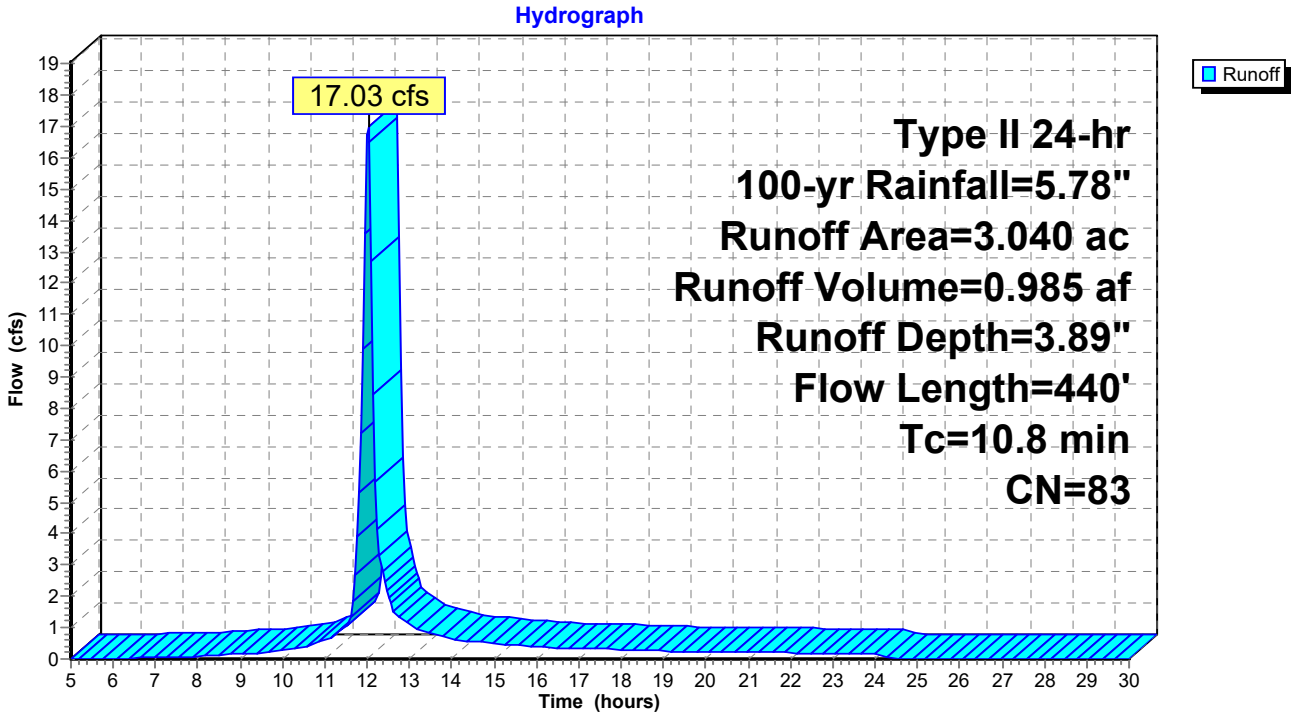
Runoff = 17.03 cfs @ 12.02 hrs, Volume= 0.985 af, Depth= 3.89"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 100-yr Rainfall=5.78"

Area (ac)	CN	Description
0.310	98	Paved parking, HSG D
2.560	80	>75% Grass cover, Good, HSG D
0.170	98	Roofs, HSG D
3.040	83	Weighted Average
2.560		84.21% Pervious Area
0.480		15.79% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0	100	0.0700	0.17		**Sheet Flow, SHEET FLOW** Grass: Dense n= 0.240 P2= 2.39"
0.5	140	0.0900	4.83		**Shallow Concentrated Flow, SCF** Unpaved Kv= 16.1 fps
0.3	200	0.0200	9.55	76.42	**Channel Flow, swale flow** Area= 8.0 sf Perim= 8.0' r= 1.00' n= 0.022 Earth, clean & straight
10.8	440	Total			

Subcatchment 4S: DA-D



Summary for Subcatchment 5S: DA-E

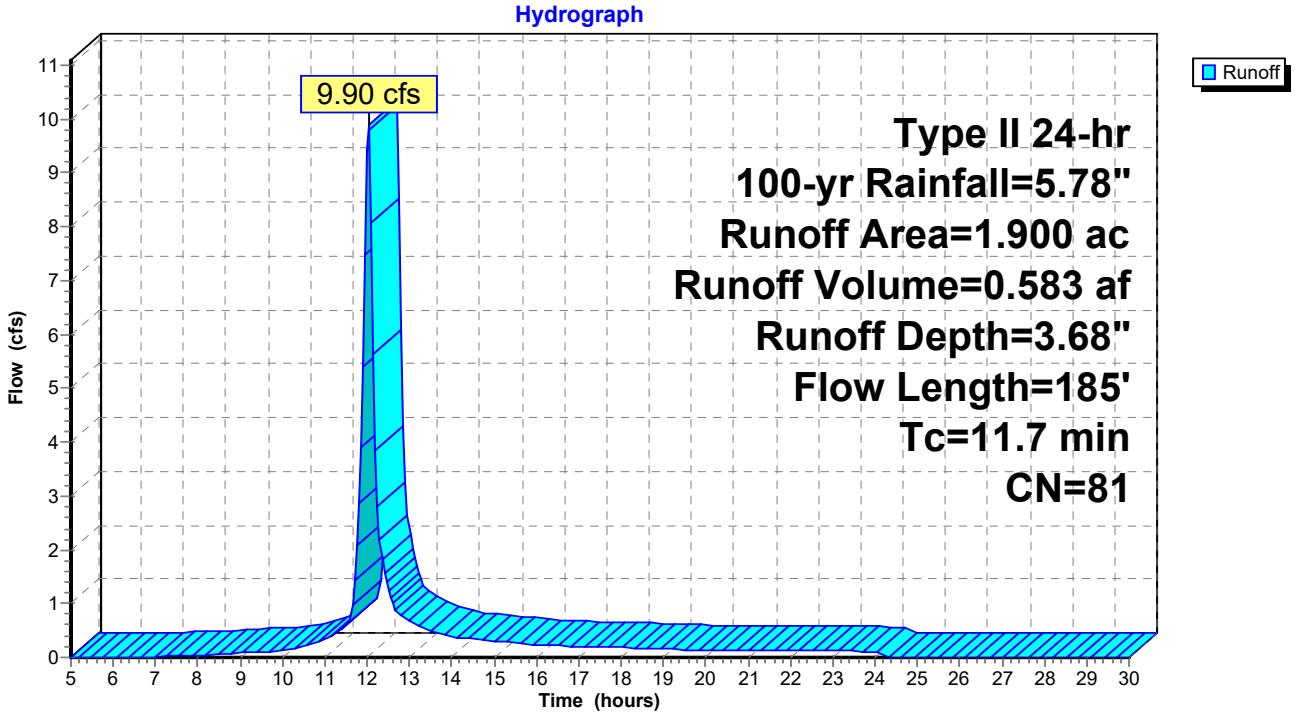
Runoff = 9.90 cfs @ 12.03 hrs, Volume= 0.583 af, Depth= 3.68"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 100-yr Rainfall=5.78"

Area (ac)	CN	Description
0.030	98	Paved parking, HSG D
1.800	80	>75% Grass cover, Good, HSG D
0.070	98	Roofs, HSG D
1.900	81	Weighted Average
1.800		94.74% Pervious Area
0.100		5.26% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.4	100	0.0500	0.15		**Sheet Flow, SHEET FLOW** Grass: Dense n= 0.240 P2= 2.39"
0.3	85	0.0950	4.96		**Shallow Concentrated Flow, SCF** Unpaved Kv= 16.1 fps
11.7	185	Total			

Subcatchment 5S: DA-E



Summary for Subcatchment 6S: DA-F

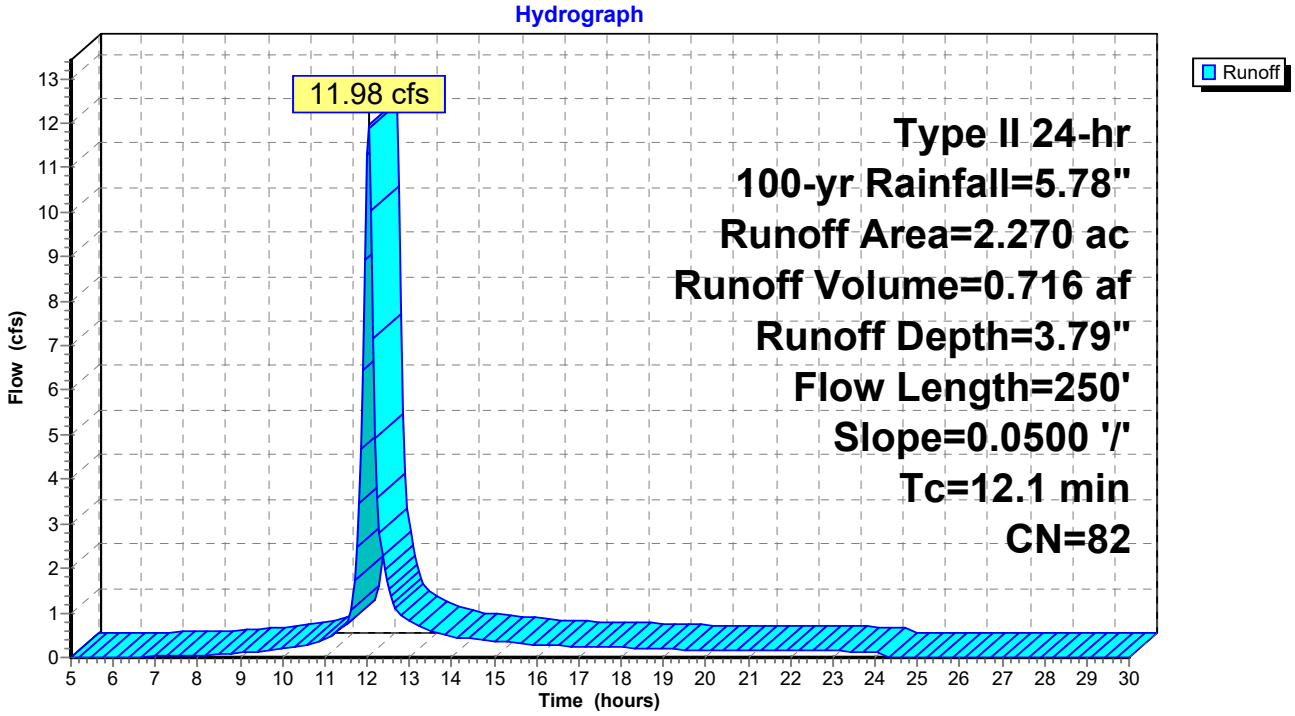
Runoff = 11.98 cfs @ 12.04 hrs, Volume= 0.716 af, Depth= 3.79"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 100-yr Rainfall=5.78"

Area (ac)	CN	Description
0.090	98	Paved parking, HSG D
2.040	80	>75% Grass cover, Good, HSG D
0.140	98	Roofs, HSG D
2.270	82	Weighted Average
2.040		89.87% Pervious Area
0.230		10.13% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.4	100	0.0500	0.15		**Sheet Flow, SHEET FLOW** Grass: Dense n= 0.240 P2= 2.39"
0.7	150	0.0500	3.60		**Shallow Concentrated Flow, SCF** Unpaved Kv= 16.1 fps
12.1	250	Total			

Subcatchment 6S: DA-F



Summary for Subcatchment 7S: DA-G

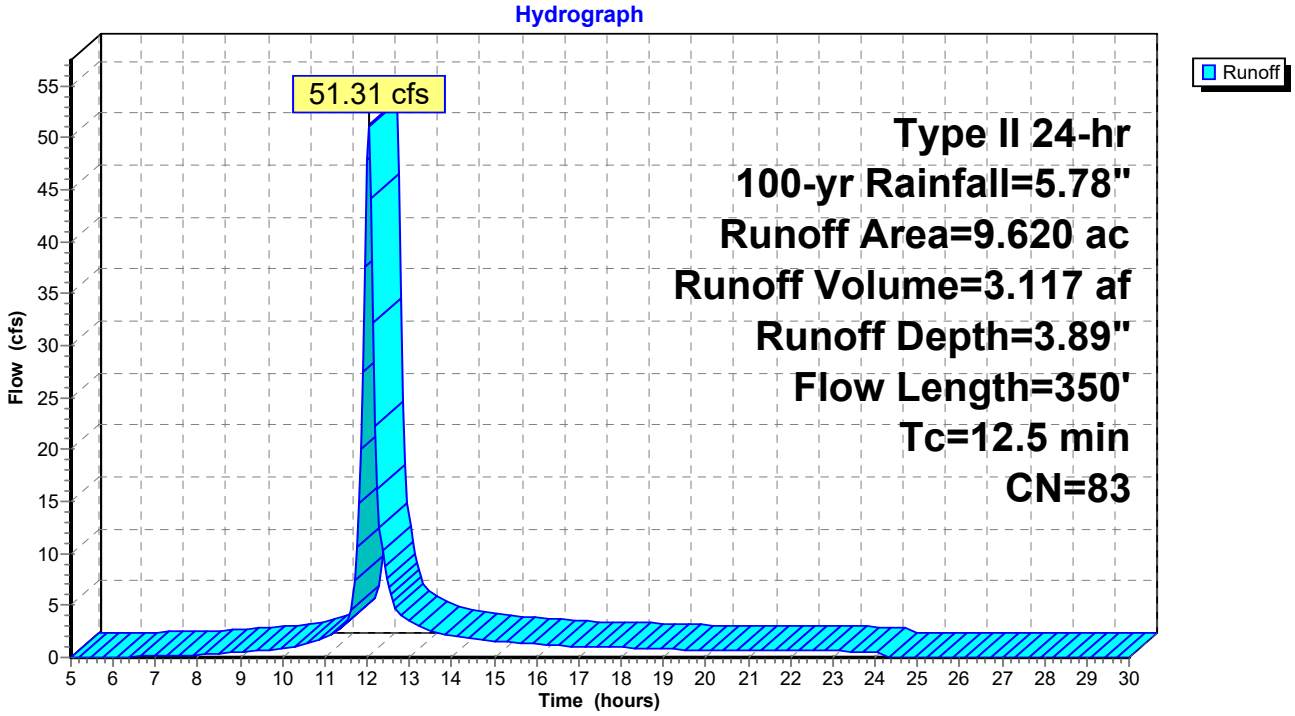
Runoff = 51.31 cfs @ 12.04 hrs, Volume= 3.117 af, Depth= 3.89"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 100-yr Rainfall=5.78"

Area (ac)	CN	Description
1.050	98	Paved parking, HSG D
8.080	80	>75% Grass cover, Good, HSG D
0.490	98	Roofs, HSG D
9.620	83	Weighted Average
8.080		83.99% Pervious Area
1.540		16.01% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.4	100	0.0500	0.15		**Sheet Flow, sheet** Grass: Dense n= 0.240 P2= 2.39"
1.1	250	0.0550	3.78		**Shallow Concentrated Flow, shallow conc flow** Unpaved Kv= 16.1 fps
12.5	350	Total			

Subcatchment 7S: DA-G



Summary for Subcatchment 8S: DA-H

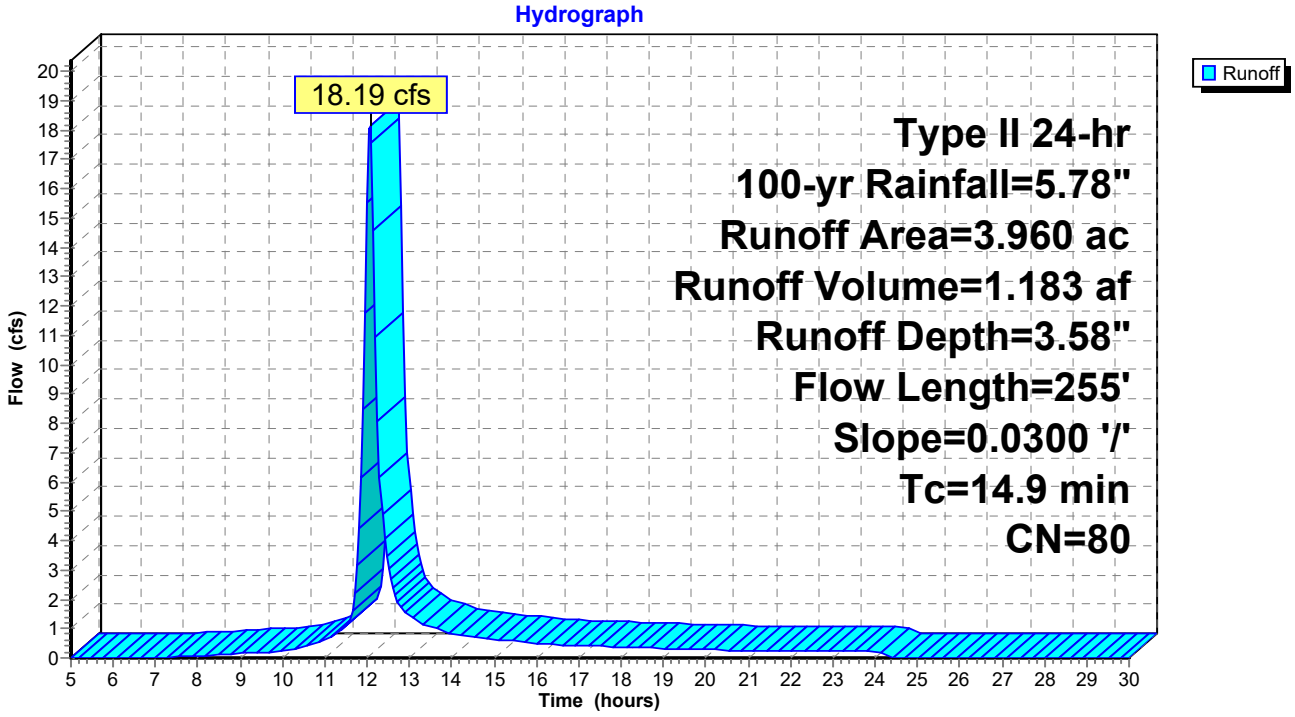
Runoff = 18.19 cfs @ 12.07 hrs, Volume= 1.183 af, Depth= 3.58"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 100-yr Rainfall=5.78"

Area (ac)	CN	Description
0.090	98	Paved parking, HSG D
2.440	80	>75% Grass cover, Good, HSG D
1.220	77	Woods, Good, HSG D
0.210	98	Roofs, HSG D
3.960	80	Weighted Average
3.660		92.42% Pervious Area
0.300		7.58% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.0	100	0.0300	0.12		**Sheet Flow, SHEET FLOW** Grass: Dense n= 0.240 P2= 2.39"
0.9	155	0.0300	2.79		**Shallow Concentrated Flow, SCF** Unpaved Kv= 16.1 fps
14.9	255	Total			

Subcatchment 8S: DA-H



Summary for Subcatchment 10S: DA#1

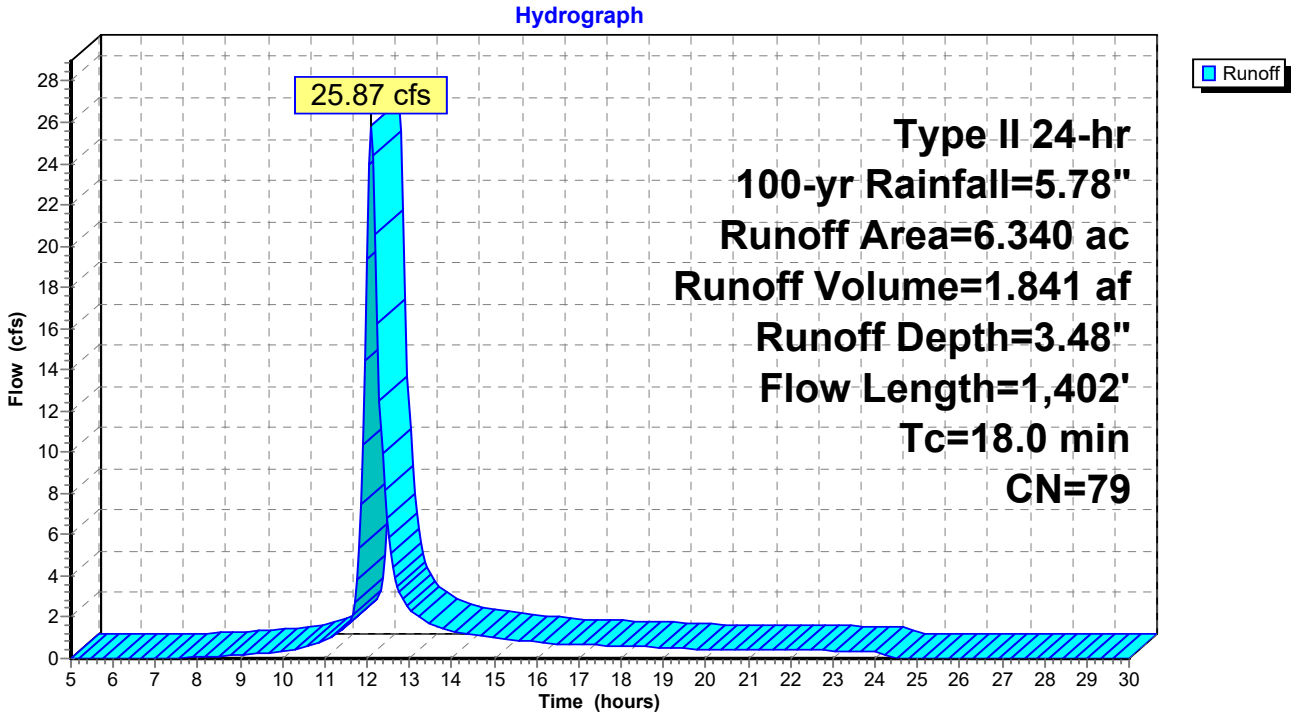
Runoff = 25.87 cfs @ 12.10 hrs, Volume= 1.841 af, Depth= 3.48"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 100-yr Rainfall=5.78"

Area (ac)	CN	Description
3.390	80	>75% Grass cover, Good, HSG D
2.850	77	Woods, Good, HSG D
0.030	98	Paved parking, HSG D
0.070	98	Roofs, HSG D
6.340	79	Weighted Average
6.240		98.42% Pervious Area
0.100		1.58% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.6	100	0.0600	0.16		**Sheet Flow, SHEET FLOW** Grass: Dense n= 0.240 P2= 2.39"
5.4	485	0.0900	1.50		**Shallow Concentrated Flow, SCF** Woodland Kv= 5.0 fps
1.8	517	0.0900	4.83		**Shallow Concentrated Flow, SCF** Unpaved Kv= 16.1 fps
0.2	300	0.0860	27.67	442.73	**Channel Flow, SWALE** Area= 16.0 sf Perim= 8.0' r= 2.00' n= 0.025 Earth, clean & winding
18.0	1,402	Total			

Subcatchment 10S: DA#1



Summary for Subcatchment 11S: DA#2

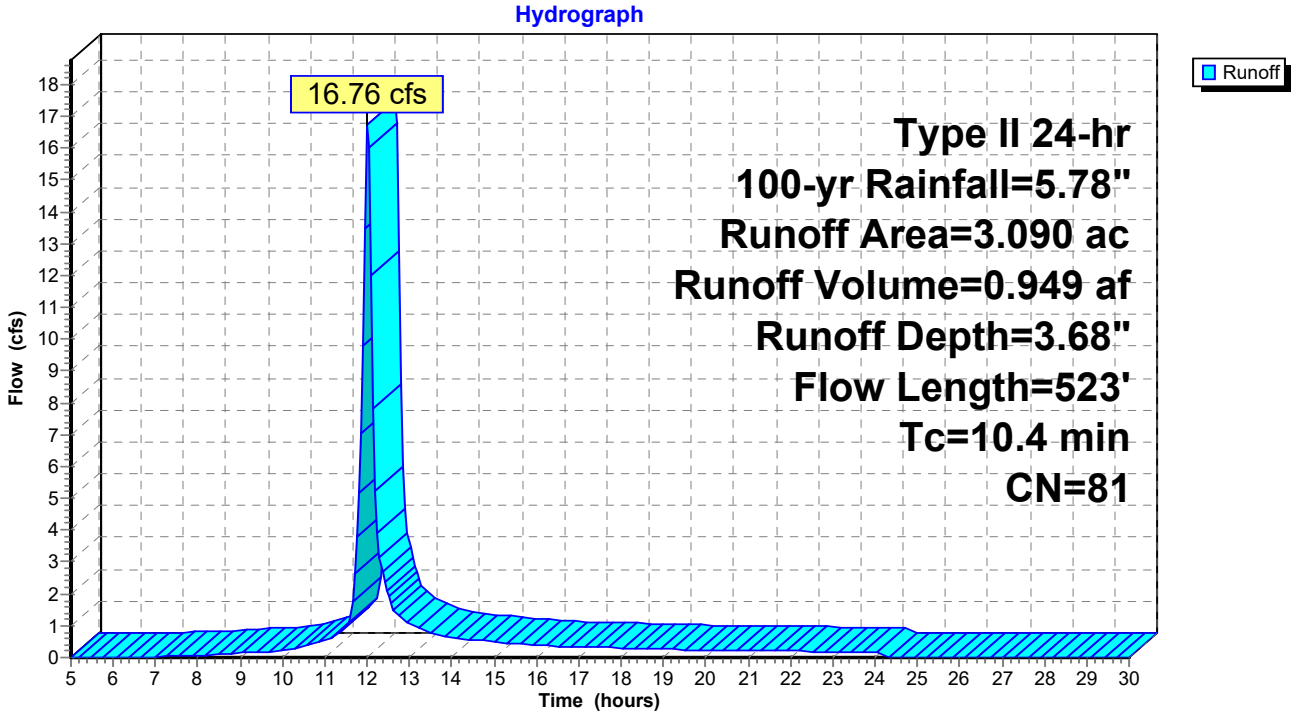
Runoff = 16.76 cfs @ 12.02 hrs, Volume= 0.949 af, Depth= 3.68"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 100-yr Rainfall=5.78"

Area (ac)	CN	Description
2.070	80	>75% Grass cover, Good, HSG D
0.660	77	Woods, Good, HSG D
0.220	98	Paved parking, HSG D
0.140	98	Roofs, HSG D
3.090	81	Weighted Average
2.730		88.35% Pervious Area
0.360		11.65% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0	100	0.0700	0.17		**Sheet Flow, SHEET FLOW** Grass: Dense n= 0.240 P2= 2.39"
0.2	56	0.1300	5.80		**Shallow Concentrated Flow, SCF** Unpaved Kv= 16.1 fps
0.2	367	0.0820	27.02	432.31	**Channel Flow, SWALE** Area= 16.0 sf Perim= 8.0' r= 2.00' n= 0.025 Earth, clean & winding
10.4	523	Total			

Subcatchment 11S: DA#2



Summary for Subcatchment 12S: DA#3

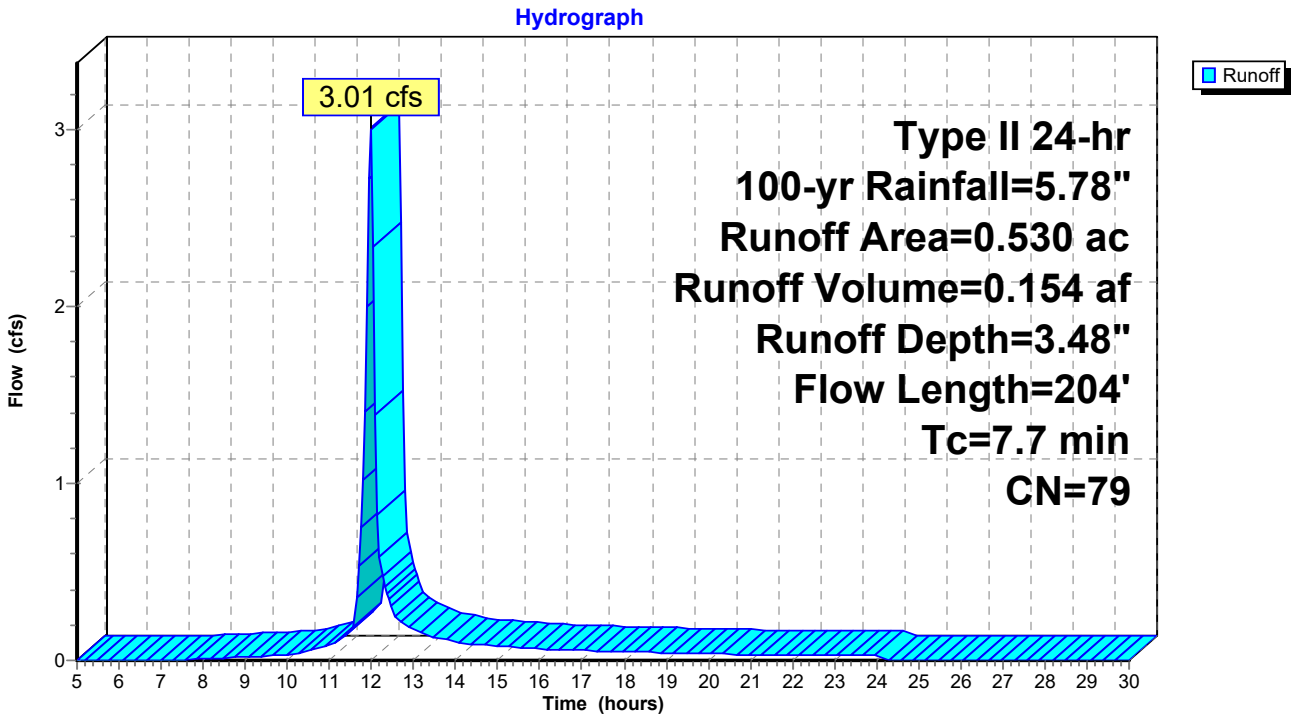
Runoff = 3.01 cfs @ 11.99 hrs, Volume= 0.154 af, Depth= 3.48"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 100-yr Rainfall=5.78"

Area (ac)	CN	Description
0.390	80	>75% Grass cover, Good, HSG D
0.140	77	Woods, Good, HSG D
0.530	79	Weighted Average
0.530		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.4	100	0.1500	0.23		**Sheet Flow, SHEET FLOW** Grass: Dense n= 0.240 P2= 2.39"
0.3	104	0.1300	5.80		**Shallow Concentrated Flow, SCF** Unpaved Kv= 16.1 fps
7.7	204	Total			

Subcatchment 12S: DA#3



Summary for Subcatchment 13S: DA#4

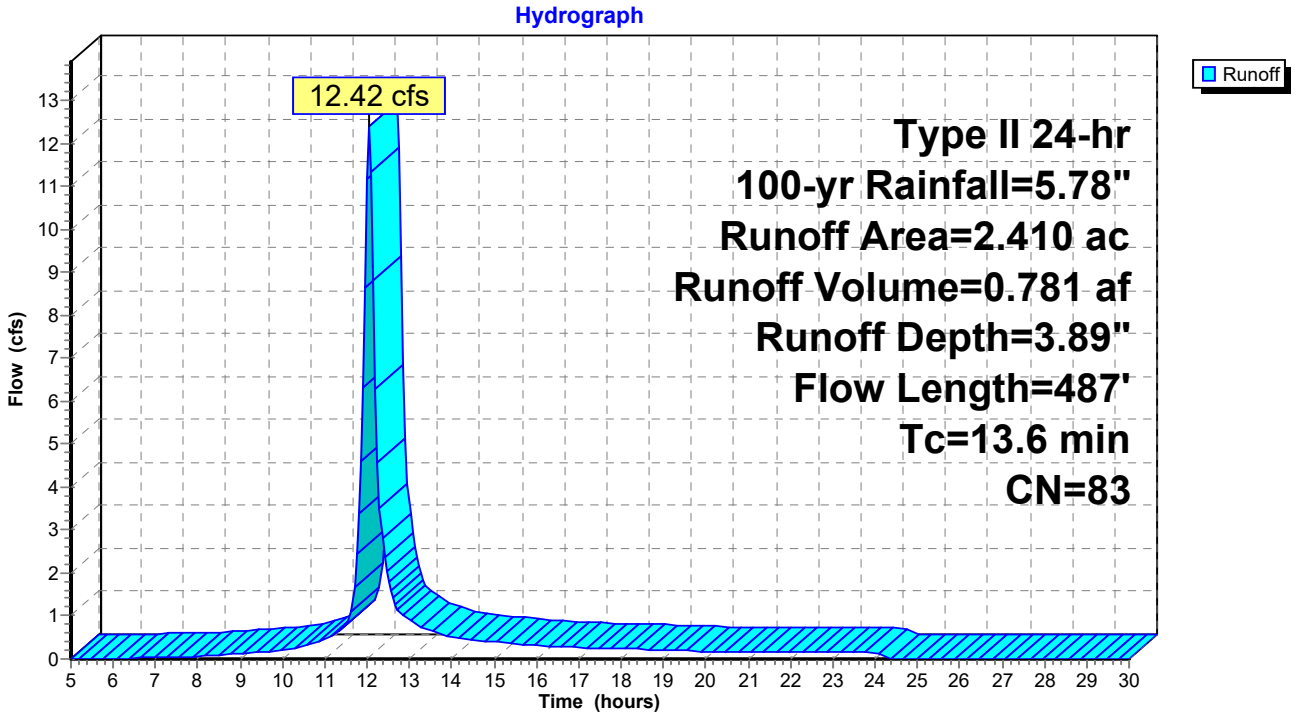
Runoff = 12.42 cfs @ 12.05 hrs, Volume= 0.781 af, Depth= 3.89"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 100-yr Rainfall=5.78"

Area (ac)	CN	Description
2.020	80	>75% Grass cover, Good, HSG D
0.250	98	Paved parking, HSG D
0.140	98	Roofs, HSG D
2.410	83	Weighted Average
2.020		83.82% Pervious Area
0.390		16.18% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.9	100	0.0450	0.14		**Sheet Flow, SHEET FLOW** Grass: Dense n= 0.240 P2= 2.39"
1.5	307	0.0450	3.42		**Shallow Concentrated Flow, SCF** Unpaved Kv= 16.1 fps
0.2	80	0.0200	6.42	5.04	**Pipe Channel, storm pipe** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013 Corrugated PE, smooth interior
13.6	487	Total			

Subcatchment 13S: DA#4

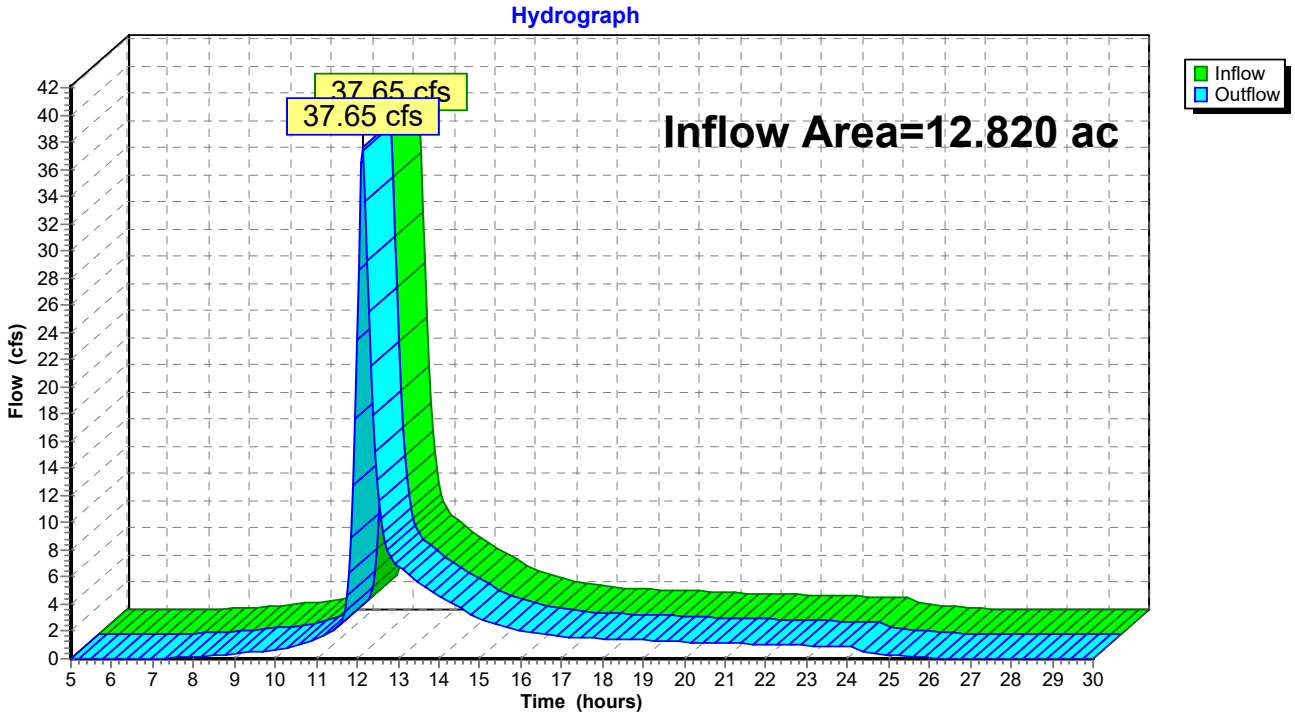


Summary for Reach 1R: Pt of Study 1A

Inflow Area = 12.820 ac, 6.40% Impervious, Inflow Depth > 3.63" for 100-yr event
Inflow = 37.65 cfs @ 12.13 hrs, Volume= 3.879 af
Outflow = 37.65 cfs @ 12.13 hrs, Volume= 3.879 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-30.00 hrs, dt= 0.05 hrs

Reach 1R: Pt of Study 1A

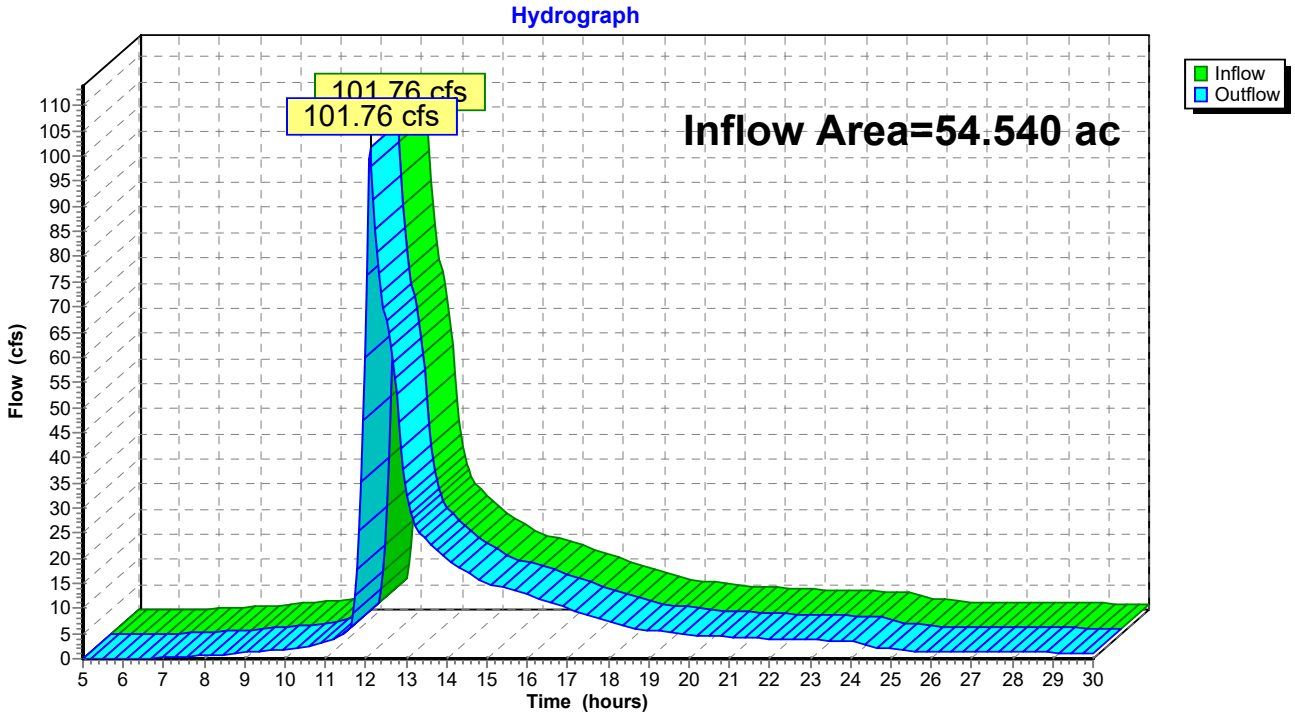


Summary for Reach 2R: Pt of Study 1B

Inflow Area = 54.540 ac, 9.41% Impervious, Inflow Depth > 3.56" for 100-yr event
Inflow = 101.76 cfs @ 12.12 hrs, Volume= 16.174 af
Outflow = 101.76 cfs @ 12.12 hrs, Volume= 16.174 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-30.00 hrs, dt= 0.05 hrs

Reach 2R: Pt of Study 1B



Summary for Pond 1P: Detention Basin 1

Inflow Area =	20.880 ac,	8.52% Impervious,	Inflow Depth =	3.61"	for 100-yr event
Inflow =	79.89 cfs @	12.14 hrs,	Volume=	6.274 af	
Outflow =	41.08 cfs @	12.37 hrs,	Volume=	6.140 af,	Atten= 49%, Lag= 13.6 min
Primary =	41.08 cfs @	12.37 hrs,	Volume=	6.140 af	
Secondary =	0.00 cfs @	5.00 hrs,	Volume=	0.000 af	

Routing by Stor-Ind method, Time Span= 5.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 895.80' @ 12.37 hrs Surf.Area= 20,411 sf Storage= 100,002 cf

Plug-Flow detention time= 127.9 min calculated for 6.127 af (98% of inflow)
Center-of-Mass det. time= 115.5 min (941.7 - 826.2)

Volume	Invert	Avail.Storage	Storage Description
#1	888.00'	104,203 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

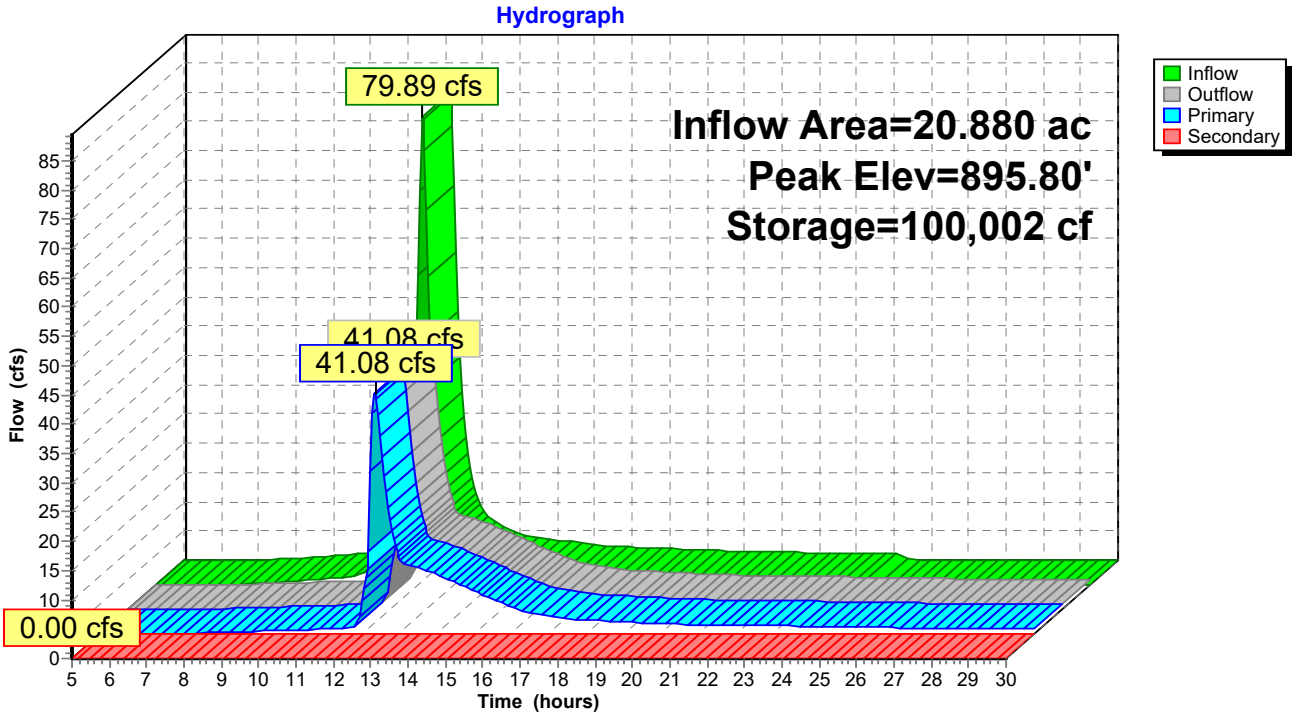
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
888.00	373	0	0
889.00	3,768	2,071	2,071
890.00	11,124	7,446	9,517
891.00	12,590	11,857	21,374
892.00	14,113	13,352	34,725
893.00	15,691	14,902	49,627
894.00	17,327	16,509	66,136
895.00	19,019	18,173	84,309
896.00	20,768	19,894	104,203

Device	Routing	Invert	Outlet Devices
#1	Primary	887.90'	**30.0" Round Culvert** L= 20.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 887.90' / 886.90' S= 0.0500 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 4.91 sf
#2	Device 1	888.00'	**5.0" Vert. Orifice1** C= 0.600
#3	Device 1	891.20'	**15.0" Vert. Orifice2** C= 0.600
#4	Device 1	894.90'	**30.0" x 30.0" Horiz. Grate** C= 0.600 Limited to weir flow at low heads
#5	Secondary	896.00'	**25.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=40.85 cfs @ 12.37 hrs HW=895.79' (Free Discharge)
└─**1=Culvert** (Passes 40.85 cfs of 48.07 cfs potential flow)
  ├─**2=Orifice1** (Orifice Controls 1.81 cfs @ 13.25 fps)
  ├─**3=Orifice2** (Orifice Controls 11.76 cfs @ 9.58 fps)
  └─**4=Grate** (Weir Controls 27.28 cfs @ 3.08 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=888.00' (Free Discharge)
└─**5=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 1P: Detention Basin 1



Summary for Pond 2P: Detention Basin 2

Inflow Area = 36.730 ac, 10.48% Impervious, Inflow Depth > 3.64" for 100-yr event
Inflow = 88.94 cfs @ 12.05 hrs, Volume= 11.155 af
Outflow = 50.98 cfs @ 12.44 hrs, Volume= 10.763 af, Atten= 43%, Lag= 23.4 min
Primary = 50.98 cfs @ 12.44 hrs, Volume= 10.763 af
Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 871.61' @ 12.44 hrs Surf.Area= 19,979 sf Storage= 90,701 cf

Plug-Flow detention time= 79.9 min calculated for 10.763 af (96% of inflow)
Center-of-Mass det. time= 52.2 min (936.2 - 884.0)

Volume	Invert	Avail.Storage	Storage Description
#1	863.00'	98,569 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

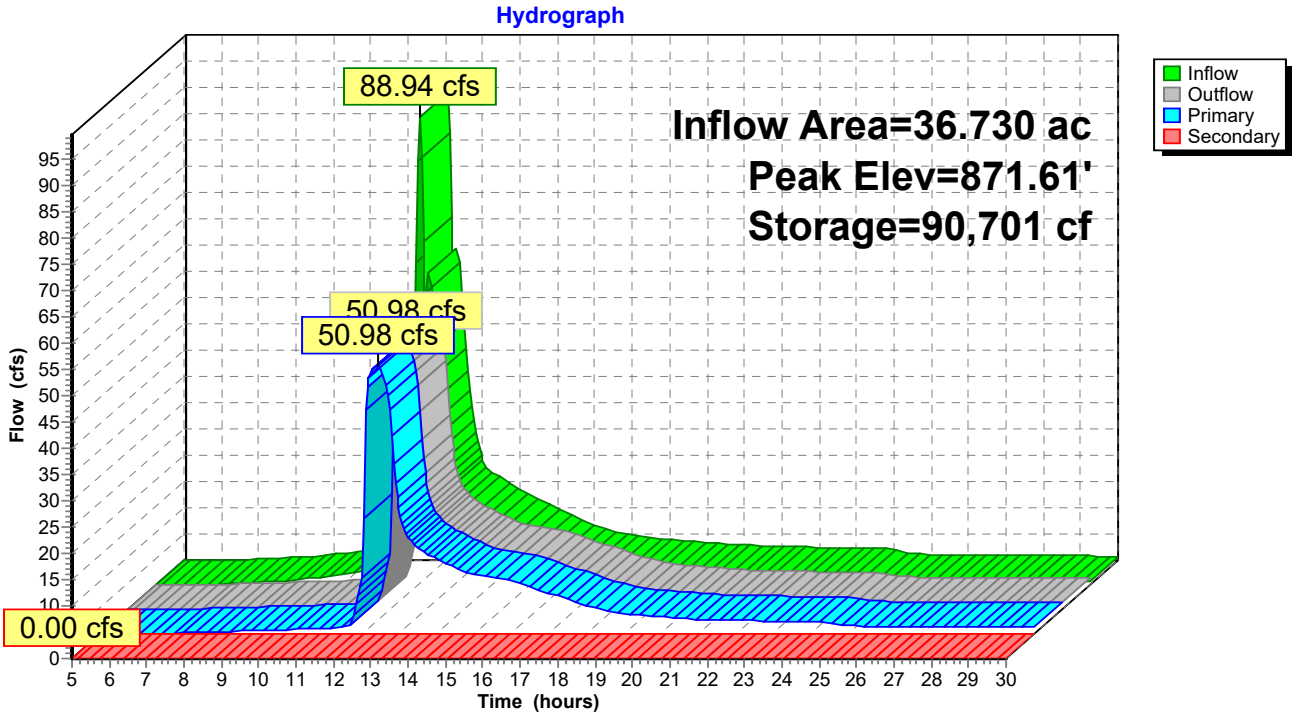
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
863.00	335	0	0
864.00	3,479	1,907	1,907
865.00	5,953	4,716	6,623
866.00	7,741	6,847	13,470
867.00	9,739	8,740	22,210
868.00	11,941	10,840	33,050
869.00	14,156	13,049	46,099
870.00	16,371	15,264	61,362
871.00	18,599	17,485	78,847
872.00	20,845	19,722	98,569

Device	Routing	Invert	Outlet Devices
#1	Secondary	872.00'	**20.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64
#2	Primary	862.90'	**30.0" Round Culvert** L= 20.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 862.90' / 861.00' S= 0.0950 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 4.91 sf
#3	Device 2	863.00'	**5.0" Vert. Orifice1** C= 0.600
#4	Device 2	866.80'	**15.0" Vert. Orifice2** C= 0.600
#5	Device 2	870.00'	**30.0" x 30.0" Horiz. Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=50.97 cfs @ 12.44 hrs HW=871.61' (Free Discharge)
└─**2=Culvert** (Inlet Controls 50.97 cfs @ 10.38 fps)
  ├─**3=Orifice1** (Passes < 1.90 cfs potential flow)
  ├─**4=Orifice2** (Passes < 12.09 cfs potential flow)
  └─**5=Grate** (Passes < 38.20 cfs potential flow)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=863.00' (Free Discharge)
└─**1=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 2P: Detention Basin 2



Summary for Pond 3P: Detention Basin 3

Inflow Area = 6.480 ac, 11.11% Impervious, Inflow Depth = 3.78" for 100-yr event
Inflow = 34.67 cfs @ 12.03 hrs, Volume= 2.041 af
Outflow = 13.14 cfs @ 12.21 hrs, Volume= 2.038 af, Atten= 62%, Lag= 10.5 min
Primary = 13.14 cfs @ 12.21 hrs, Volume= 2.038 af
Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 904.58' @ 12.21 hrs Surf.Area= 11,859 sf Storage= 33,447 cf

Plug-Flow detention time= 89.6 min calculated for 2.038 af (100% of inflow)
Center-of-Mass det. time= 88.8 min (901.3 - 812.5)

Volume	Invert	Avail.Storage	Storage Description
#1	900.00'	38,589 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

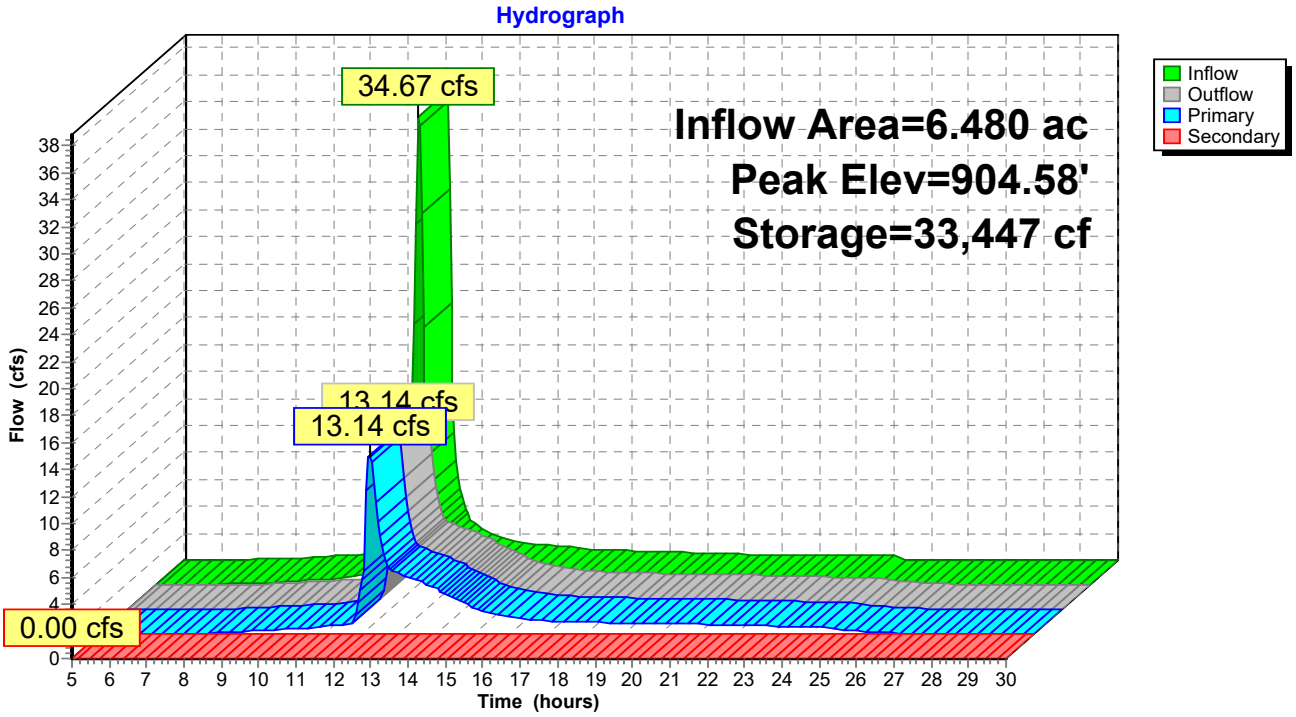
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
900.00	2,381	0	0
901.00	3,197	2,789	2,789
902.00	7,737	5,467	8,256
903.00	9,288	8,513	16,769
904.00	10,896	10,092	26,861
905.00	12,560	11,728	38,589

Device	Routing	Invert	Outlet Devices
#1	Secondary	905.00'	**20.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64
#2	Primary	900.00'	**18.0" Round Culvert** L= 330.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 900.00' / 889.00' S= 0.0333 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf
#3	Device 2	900.00'	**5.0" Vert. Orifice1** C= 0.600
#4	Device 2	901.90'	**10.0" Vert. Orifice2** C= 0.600
#5	Device 2	904.00'	**24.0" x 24.0" Horiz. Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=13.14 cfs @ 12.21 hrs HW=904.58' (Free Discharge)
└─**2=Culvert** (Inlet Controls 13.14 cfs @ 7.43 fps)
  ├─**3=Orifice1** (Passes < 1.37 cfs potential flow)
  ├─**4=Orifice2** (Passes < 3.95 cfs potential flow)
  └─**5=Grate** (Passes < 11.42 cfs potential flow)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=900.00' (Free Discharge)
└─**1=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 3P: Detention Basin 3



APPENDIX C: SOIL DESCRIPTIONS

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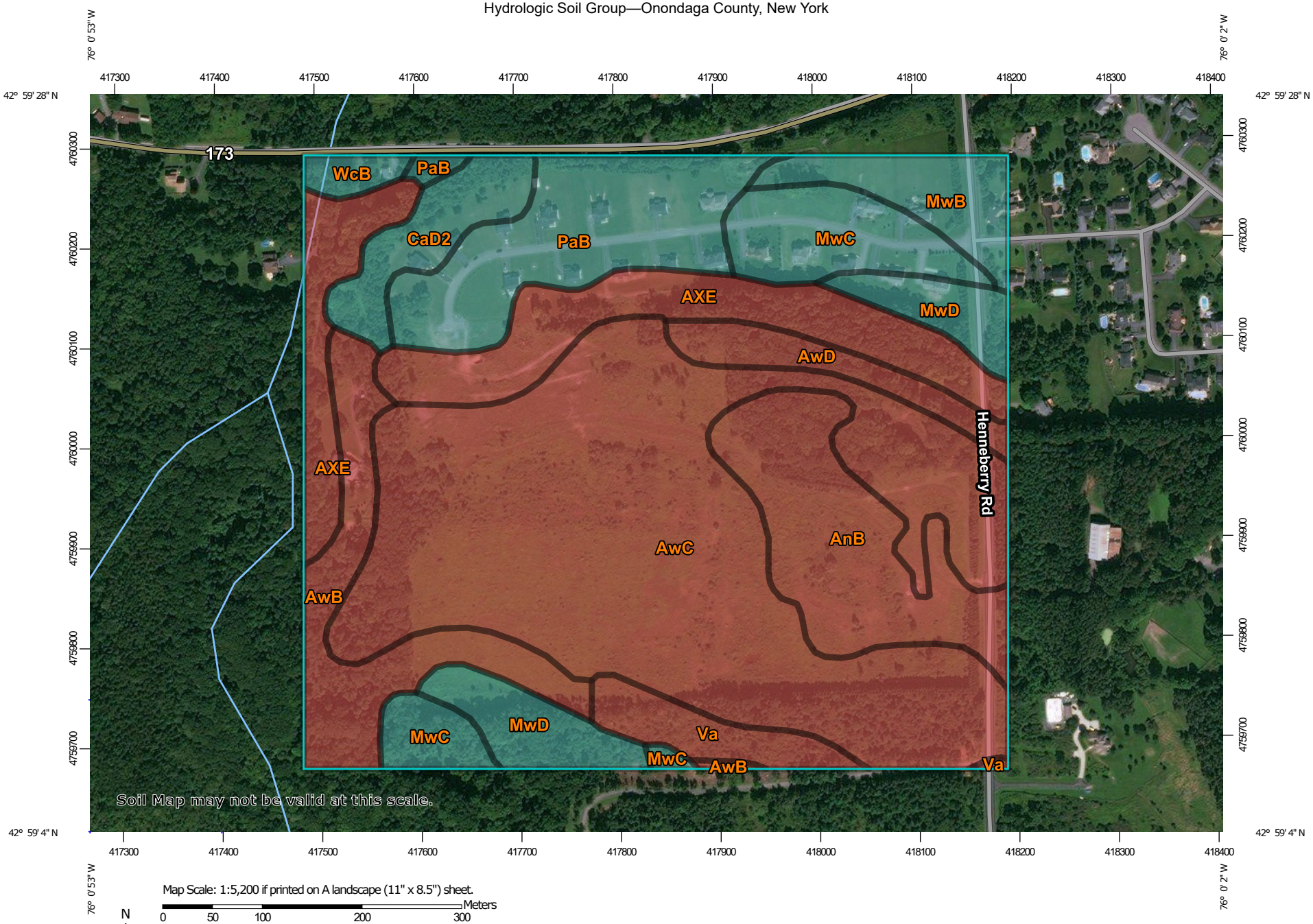
Hydrologic Soil Group—Onondaga County, New York



Map Scale: 1:5,200 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0 50 100 200 300

Feet: 0 250 500 1000 1500

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

MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Rating Polygons

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Lines

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Points

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Water Features

Streams and Canals

Transportation

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

Background

Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

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

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

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

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

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

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

Soil Survey Area: Onondaga County, New York
Survey Area Data: Version 15, Jun 11, 2020

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

Date(s) aerial images were photographed: Jun 18, 2011—Oct 10, 2016

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

Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
AnB	Angola-Darien silt loams, 0 to 6 percent slopes	D	10.0	9.3%
AwB	Aurora silt loam, 0 to 6 percent slopes	D	7.7	7.1%
AwC	Aurora silt loam, 6 to 12 percent slopes	D	41.7	38.7%
AwD	Aurora silt loam, 12 to 18 percent slopes	D	2.9	2.7%
AXE	Aurora-Farmington-Rock outcrop association, steep	D	12.5	11.6%
CaD2	Camillus silt loam, 12 to 18 percent slopes eroded	C	3.7	3.4%
MwB	Mohawk silt loam, 2 to 8 percent slopes	C	3.7	3.4%
MwC	Mohawk silt loam, 8 to 15 percent slopes	C	6.6	6.1%
MwD	Mohawk silt loam, 15 to 25 percent slopes	C	5.3	4.9%
PaB	Palatine shaly silt loam, 2 to 6 percent slopes	C	9.9	9.2%
Va	Varick silt loam	D	2.9	2.6%
WcB	Wassaic silt loam, 0 to 8 percent slopes	C	0.9	0.9%
Totals for Area of Interest			**107.8**	**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.

Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

APPENDIX D: BIORETENTION BASIN CONSTRUCTION AND MAINTENANCE

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NEW YORK STATE OF OPPORTUNITY | Department of Environmental Conservation

Bioretention Stormwater Management Practices
Level 1 Inspection Checklist

SMP ID #		**SMP Owner**		☐ Private ☐ Public
SMP Location (Address; Latitude & Longitude)				
	Latitude		**Longitude**	

Party Responsible for Maintenance	**System Type**		**Type of Site**
☐ Same as SMP Owner ☐ Other _____	☐ Seasonal ☐ Continuous Use ☐ Other	☐ Above Ground ☐ Below Ground	☐ Commercial ☐ Industrial ☐ Residential ☐ State

Inspection Date		**Inspection Time**	
Inspector			
Date of Last Inspection			

BR Drainage Area

Look for areas that are uphill from the Bioretention cell.

Problem (Check if Present)	**Follow-Up Actions**
 ☐ Bare soil, erosion of the ground (rills washing out the dirt)	☐ Seed and mulch areas of bare soil to establish vegetation. ☐ Fill in erosion areas with soil, compact, and seed and straw to establish vegetation. ☐ If a rill or small channel is forming, try to redirect water flowing to this area by creating a small berm or adding topsoil to areas that are heavily compacted. ☐ Other:

BR Drainage Area

Look for areas that are uphill from the Bioretention cell.

Problem (Check if Present)	Follow-Up Actions
	☐ Kick-Out to Level 2 Inspection: Large areas of soil have been eroded, or larger channels are forming. May require rerouting of flow paths.
☐ Piles of grass clippings, mulch, dirt, salt, or other materials	☐ Remove or cover piles of grass clippings, mulch, dirt, etc. ☐ Other:
☐ Open containers of oil, grease, paint, or other substances	☐ Cover or properly dispose of materials; consult your local solid waste authority for guidance on materials that may be toxic or hazardous. ☐ Other:

BR Inlets

Stand in the Bioretention cell itself and look for all the places where water flows in. Often there will be multiple points of inflow to the practice.

Problem (Check if Present)	Follow-Up Actions
 ☐ Inlets collect grit and debris or grass/weeds. Some water may not be getting into the Bioretention cell. The objective is to have a clear pathway for water to flow into the cell.	☐ Use a flat shovel to remove grit and debris (especially at curb inlets or openings). Parking lots generate fine grit that will accumulate at these spots. ☐ Pull out clumps of growing grass or weeds and scoop out the soil or grit that the plants are growing in. ☐ Remove any grass clippings, leaves, sticks, and other debris that is collecting at inlets. ☐ For pipes and ditches, remove sediment and debris that is partially blocking the pipe or ditch opening where it enters the Bioretention cell. ☐ Dispose of all material properly where it will not re-enter the Bioretention cell. ☐ Other: ☐ Kick-Out to Level 2 Inspection: Inlets are blocked to the extent that most of the water does not seem to be entering the Bioretention cell.
 ☐ Some or all of the inlets are eroding so that rills, gullies, and other erosion is present, or there is bare dirt that is washing into the Bioretention cell.	☐ For small areas of erosion, smooth out the eroded part and apply rock or stone (e.g., river cobble) to prevent further erosion. Usually, filter fabric is placed under the rock or stone. ☐ In some cases, reseeding and applying erosion-control matting can be used to prevent further erosion. Some of these materials may be available at a garden center, but it may be best to consult a landscape contractor. ☐ Other: ☐ Kick-Out to Level 2 Inspection: Erosion is occurring at most of the inlets, and it looks like there is too much water that is concentrating at these points. The inlet design may have to be modified.

BR Ponding Area

Examine the entire Bioretention surface and side slopes

Problem (Check if Present)	Follow-Up Actions
 ☐ Mulch (if used) needs to be replaced or replenished. The mulch layer had decomposed or is less than 1-inch thick.	☐ Add new mulch to a total depth (including any existing mulch that is left) of 2 to 3 inches. The mulch should be shredded hardwood mulch that is less likely to float away during rainstorms. ☐ Avoid adding too much mulch so that inlets are obstructed or certain areas become higher than the rest of the Bioretention surface. ☐ Other:
 ☐ Minor areas of sediment, grit, trash, or other debris are accumulating on the bottom.	☐ Use a shovel to scoop out minor areas of sediment or grit, especially in the spring after winter sanding materials may wash in and accumulate. Dispose of the material where it cannot re-enter the Bioretention cell . ☐ If removing the material creates a hole or low area, fill with soil mix that matches original mix and cover with mulch so that the Bioretention surface area is as flat as possible. ☐ Remove trash, vegetative debris, and other undesirable materials. ☐ Other:
	☐ Kick-Out to Level 2 Inspection: Sediment has accumulated more than 2-inches deep and covers 25% or more of the Bioretention surface. ☐ Kick-Out to Level 2 Inspection: The Bioretention cell is too densely vegetated to assess sediment accumulation or ponding; see BR-4, Vegetation.

BR Ponding Area

Examine the entire Bioretention surface and side slopes

Problem (Check if Present)	Follow-Up Actions
 ☐ There is erosion in the bottom or on the side slopes. Water seems to be carving out rills as it flows across the Bioretention surface or on the slopes, or sinkholes are forming in certain areas. ☐ Source: Stormwater Maintenance, LLC.	☐ Try filling the eroded areas with clean topsoil or sand, and cover with mulch. ☐ If the problem recurs, you may have to use stone (e.g., river cobble) to fill in problem areas. ☐ If the erosion is on a side slope, fill with clay that can be compacted and seed and mulch the area. ☐ Other: ☐ Kick-Out to Level 2 Inspection: The problem persists or the erosion is more than 3-inches deep and seems to be an issue with how water enters and moves through the Bioretention cell. ☐ Kick-Out to Level 2 Inspection: The problem does not seem to be caused by flowing water, but a collapse or sinking of the surface (e.g., “sinkhole”) due to some underground problem.
 ☐ The bottom of the Bioretention cell is not flat, and the water pools at one end, along an edge, or in certain pockets. The whole bottom is not uniformly covered with water. See design plan to verify that bioretention surface is intended to be flat. Check during or immediately after a rainstorm.	☐ If the problem is minor (just small, isolated areas are not covered with water), try raking the surface OR adding mulch to low spots to create a more level surface. You may need to remove and replace plantings in order to properly even off the surface. ☐ Check the surface with a string and bubble level to get the surface as flat as possible. ☐ Other: ☐ Kick-Out to Level 2 Inspection: Ponding water is isolated to less than half of the Bioretention surface area, and there seem to be elevation differences of more than a couple of inches across the surface.

BR Ponding Area

Examine the entire Bioretention surface and side slopes

Problem (Check if Present)	Follow-Up Actions
 ☐ Water stands on the surface more than 72 hours after a rainstorm and /or wetland-type vegetation is present. The Bioretention cell does not appear to be draining properly.	☐ Kick-Out to Level 2 Inspection: This is generally a serious problem, and it will be necessary to activate a Level 2 Inspection.

BR Vegetation

Examine all Bioretention cell vegetation.

Problem (Check if Present)	Follow-Up Actions
 ☐ Vegetation requires regular maintenance—pulling weeds, removing dead and diseased plants, replacing mulch around plants, adding plants to fill in areas that are not well vegetated, etc.	☐ If you can identify which plants are weeds or not intended to be part of the planting plan, eliminate these, preferably by hand pulling. ☐ If weeds are widespread, check with the local stormwater authority and/or Extension Office about proper use of herbicides for areas connected with the flow of water. ☐ Even vegetation that is intended to be present can become large, overgrown, and/or crowd out surrounding plants. Prune and thin accordingly. ☐ If weeds or invasive plants have overtaken the whole Bioretention cell , bush-hog the entire area before seedheads form in the spring. It will be necessary to remove the root mat manually or with appropriate herbicides, as noted above. ☐ Re-plant with species that are aesthetically pleasing and seem to be doing well in the Bioretention cell. ☐ Other: ☐ Kick-Out to Level 2 Inspection: You are unsure of the original planting design, or the vegetation maintenance task is beyond your capabilities of time, expertise, or resources. If you are unsure of the health of the vegetation (e.g. salt damage, invasives, which plants are undesirable) or the appropriate season to conduct vegetation management, consult a landscape professional before undertaking any cutting, pruning, mowing, or brush hogging.

BR Vegetation

Examine all Bioretention cell vegetation.

Problem (Check if Present)	Follow-Up Actions
 ☐ Vegetation is too thin, is not healthy, and there are many spots that are not well vegetated.	☐ The original plants are likely not suited for the actual conditions within the Bioretention cell . If you are knowledgeable about plants, select and plant more appropriate vegetation (preferably native plants) so that almost the entire surface area will be covered by the end of the second growing season. ☐ Other:
	☐ Kick-Out to Level 2 Inspection: For all but small practices (e.g., rain gardens), this task will likely require a landscape design professional or horticulturalist.

BR Outlets

Examine outlets that release water out of the Bioretention cell.

Problem (Check if Present)	Follow-Up Actions
☐ Erosion at outlet	☐ Add stone to reduce the impact from the water flowing out of the outlet pipe or weir during storms. ☐ Other:
	☐ Kick-Out to Level 2 Inspection: Rills have formed and erosion problem becomes more severe.
 ☐ Outlet obstructed with mulch, sediment, debris, trash, etc.	☐ Remove the debris and dispose of it where it cannot re-enter the Bioretention cell . ☐ Other:
	☐ Kick-Out to Level 2 Inspection: Outlet is completely clogged or obstructed; there is too much material to remove by hand or with simple hand tools.

Additional Notes:

Inspector:_____ Date: _____

Complete the following if follow-up/corrective actions were identified during this inspection:

Certified Completion of Follow-Up Actions:

"I hereby certify that the follow-up/corrective actions identified in the inspection performed on _____ (DATE) have been completed and any required maintenance deficiencies have been adequately corrected."

Inspector/Operator: _____ Date: _____

NEW YORK STATE OF OPPORTUNITY | Department of Environmental Conservation

Bioretention Stormwater Management Practices
Level 2 Inspection Checklist

SMP ID #		**SMP Owner**		☐ Private ☐ Public
SMP Location (Address; Latitude & Longitude)				
	Latitude		**Longitude**	

Party Responsible for Maintenance	**System Type**		**Type of Site**
☐ Same as SMP Owner ☐ Other _____	☐ Seasonal ☐ Continuous Use ☐ Other	☐ Above Ground ☐ Below Ground	☐ Commercial ☐ Industrial ☐ Residential ☐ State

Inspection Date		**Inspection Time**	
Inspector			
Date of Last Inspection			

Level 2 Inspection: BIORETENTION
NOTE: Key Source for this Information *(CSN, 2013)*

Recommended Repairs	Triggers for Level 3 Inspection
Observed Condition: Water Stands on Surface for More than 72 Hours after Storm	
☐ Condition 1: Small pockets of standing water Use a soil probe or auger to examine the soil profile. If isolated areas have accumulated grit, fines, or vegetative debris or have bad soil media, try scraping off top 3 inches of media and replacing with clean material. Also check to see that surface is level and water is not ponding selectively in certain areas. ☐ Condition 2: Standing water is widespread or covers entire surface Requires diagnosis and resolution of problem: • Clogged underdrain? • Filter fabric between soil media and underdrain stone? • Need to install underdrain if not present? • Too much sediment/grit washing in from drainage area? • Too much ponding depth? • Improper soil media?	• Soil media is clogged and problem is not evident from Level 2 inspection. • Level 2 inspection identifies problem, but it cannot be resolved easily or is associated with the original design of the practice. ☐ Level 3 inspection necessary
Observed Condition: Vegetation is sparse or out of control	
☐ Condition 1: Original design planting plan seems good but has not been maintained, so there are many invasives and/or dead plants Will require some horticultural experience to restore vegetation to intended condition by weeding, pruning, removing plants, and adding new plants. ☐ Condition 2: Original design planting plan is unknown or cannot be actualized A landscape architect or horticulturalist will be needed to redo the planting plan. Will likely require analysis of soil pH, moisture, organic content, sun/shade, and other conditions to make sure plants match conditions. Plan should include invasive plant management and maintenance plan to include mulching, watering, disease intervention, periodic thinning/pruning, etc.	• Vegetation deviates significantly from original planting plan; Bioretention has been neglected and suffered from deferred maintenance. • Owner/responsible party does not know how to maintain the practice. ☐ Level 3 inspection necessary
Observed Condition: Bioretention does not conform to original design plan in surface area or storage	
☐ Condition 1: Level 2 Inspection reveals that practice is too small based on design dimension, does not have adequate storage (e.g., ponding depth) based on the plan, and/or does not treat the drainage area runoff as indicated on the plan Small areas of deviation can be corrected by the property owner or responsible party, but it is likely that a Qualified Professional will have to revisit the design and attempt a redesign that meets original objectives or that can be resubmitted to the municipality for approval.	• More than a 25% departure from the approved plan in surface area, storage, or drainage area; sometimes less than this threshold at the discretion of the Level 2 inspector. ☐ Level 3 inspection necessary

Level 2 Inspection: BIORETENTION
NOTE: Key Source for this Information *(CSN, 2013)*

Recommended Repairs	Triggers for Level 3 Inspection
Observed Condition: Severe erosion of filter bed, inlets, or around outlets	
☐ Condition 1: Erosion at inlets The lining (e.g., grass, matting, stone, rock) may not be adequate for the actual flow velocities coming through the inlets. First line of defense is to try a more non-erosive lining and/or to extend the lining further down to where inlet slopes meet the Bioretention surface. If problem persists, analysis by a Qualified Professional is warranted. ☐ Condition 2: Erosion of Bioretention filter bed This is often caused by "preferential flow paths" through and along the Bioretention surface. The source of flow should be analyzed and methods employed to dissipate energy and disperse the flow (e.g., check dams, rock splash pads). ☐ Condition 3: Erosion on side slopes Again, the issue is likely linked with unanticipated flow paths down the side slopes (probably overland flow that concentrates as it hits the edge of the slope). For small or isolated areas, try filling, compacting, and re-establishing healthy ground cover vegetation. If the problem is more widespread, further analysis is required to determine how to redirect the flow.	• Erosion (rills, gullies) is more than 12 inches deep at inlets or the filter bed or more than 3 inches deep on side slopes. • If the issue is not caused by moving water but some sort of subsurface defect. This may manifest as a sinkhole or linear depression and be associated with problems with the underdrain stone or pipe or underlying soil. ☐ Level 3 inspection necessary
Observed Condition: Significant sediment accumulation, indicating an uncontrolled source of sediment	
☐ Condition 1: Isolated areas of sediment accumulation, generally less than 3-inches deep Sediment source may be from a one-time or isolated event. Remove accumulated sediment and top 2 to 3 inches of Bioretention soil media; replace with clean material. Check drainage area for any ongoing sources of sediment. ☐ Condition 2: Majority of the surface is caked with "hard pan" (thin layer of clogging material) or accumulated sediment that is 3-inches deep or more This can be caused by an improper construction sequence (drainage area not fully stabilized prior to installation of Bioretention soil media) or another chronic source of sediment in the drainage area. Augering several holes down through the media can indicate how severe the problem is; often the damage is confined to the first several inches of soil media. Removing and replacing this top layer (or to the depth where sediment incursion is seen in auger holes) can be adequate, as long as the problem does not recur.	• More than 2 inches of accumulated sediment cover 25% or more of the Bioretention surface area. • "Hard pan" of thin, crusty layer covers majority of Bioretention surface area and seems to be impeding flow of water down through the soil media. • New sources of sediment seem to be accumulating with each significant rainfall event. ☐ Level 3 inspection necessary

Notes:

Inspector:_____ Date: _____

Complete the following if follow-up/corrective actions were identified during this inspection:

Certified Completion of Follow-Up Actions:

"I hereby certify that the follow-up/corrective actions identified in the inspection performed on _____ (DATE) have been completed and any required maintenance deficiencies have been adequately corrected."

Inspector/Operator: _____ Date: _____

NEW YORK STATE OF OPPORTUNITY | Department of Environmental Conservation

Pond and Wetland Stormwater Management Practices Level 1 Inspection Checklist

SMP ID #		**SMP Owner**		☐ Private ☐ Public
SMP Location (Address; Latitude & Longitude)				
	Latitude		**Longitude**	

Party Responsible for Maintenance	**System Type**		**Type of Site**
☐ Same as SMP Owner ☐ Other _____	☐ Seasonal ☐ Continuous Use ☐ Other	☐ Above Ground ☐ Below Ground	☐ Commercial ☐ Industrial ☐ Residential ☐ State

Inspection Date		**Inspection Time**	
Inspector			
Date of Last Inspection			

PW Drainage Area

Look for areas that are uphill from the pond.

Problem (Check if Present)	**Follow-Up Actions**
☐ Bare soil, erosion of the ground (rills washing out the dirt)	☐ Seed and straw areas of bare soil to establish vegetation. ☐ Fill in eroded areas with soil, compact, seed and mulch with straw to establish vegetation. ☐ Other:

☐ Bare soil, erosion of the ground (rills washing out the dirt)	☐ Kick-Out to Level 2 Inspection: If a rill or small channel is forming, try to redirect water flowing to this area by creating a small berm or adding topsoil to areas that are heavily compacted. ☐ If large areas of soil have been eroded or larger channels are forming, this may require rerouting of flow paths or use of an erosion-control seed mat or blanket to reestablish acceptable ground cover or anchor sod where it is practical.
☐ Piles of grass clippings, mulch, dirt, salt, or other materials	☐ Remove or cover piles of grass clippings, mulch, dirt, etc. ☐ Remove excessive vegetation or woody debris that can block drainage systems. ☐ Other:
☐ Open containers of oil, grease, paint, or other substances exposed to rain in the drainage area	☐ Cover or properly dispose of materials; consult your local solid waste authority for guidance on materials that may be toxic or hazardous. ☐ Other:

Pond Inlets

Look for all areas where water flows into the pond during storms. Note that there may be multiple points of inflow and types of structures (e.g., pipes, open ditches, etc.).

Problem (Check if Present)	Follow-Up Actions
☐ Inlets are buried, covered or filled with silt, debris, or trash, or blocked by excessive vegetation.	☐ If the problem can be remedied with hand tools and done in a safe manner, remove vegetation, trash, woody debris, etc. from blocking inlet structures. ☐ Other:
	☐ Kick-Out to Level 2 or 3 Inspection: If the amount of material is too large to handle OR there are ANY safety concerns about working in standing water, soft sediment, etc., the work will likely have to be performed by a qualified contractor.

Pond Inlets

Look for all areas where water flows into the pond during storms. Note that there may be multiple points of inflow and types of structures (e.g., pipes, open ditches, etc.).

Problem (Check if Present)		Follow-Up Actions
	☐ Inlets are buried, covered or filled with silt, debris, or trash, or blocked by excessive vegetation.	☐ Kick-Out to Level 2 or 3 Inspection: If the amount of material is too large to handle OR there are ANY safety concerns about working in standing water, soft sediment, etc., the work will likely have to be performed by a qualified contractor.
	☐ Inlets are broken, and, with pieces of pipe or concrete falling into the pond, there is erosion around the inlet, there is open space under the pipe, or there is erosion where the inlet meets the pond	☐ Kick-Out to Level 2 Inspection: These types of structural or erosion problems are more serious and will require a qualified contractor to repair.

PW Pond Area and Embankments

Examine both interior and exterior pond banks as well as the pond body. Observe from the inlet pipes to the outfall structure and emergency overflow.

Problem (Check if Present)		Follow-Up Actions
	☐ The pretreatment area(s) or forebay(s) are filled with sediment, trash, vegetation, or other debris.	☐ If the problem can be remedied with hand tools and done in a safe manner, use a flat shovel or other equipment to remove small amounts of sediment. ☐ Remove trash and excessive vegetation from forebays if this can be done in a safe manner. ☐ Other:

PW Pond Area and Embankments

Examine both interior and exterior pond banks as well as the pond body. Observe from the inlet pipes to the outfall structure and emergency overflow.

Problem (Check if Present)		Follow-Up Actions
	☐ The pretreatment area(s) or forebay(s) are filled with sediment, trash, vegetation, or other debris.	☐ Kick-Out to Level 2 Inspection: Large amounts of sediment or debris will have to be removed by a qualified contractor. ANY condition that poses a safety concern for working in standing water or soft sediments should be referred to a Level 2 Inspection or qualified contractor.
	☐ The pond area itself has accumulated sediment, trash, debris, or excessive vegetation that is choking the flow of the water, OR the pond area is covered with algae or aquatic plants.	☐ Level 1 includes handling only small amounts of material that can be removed by hand, or with rakes or other hand tools. Do not attempt any repair that poses a safety issue. ☐ Other: ☐ Kick-Out to Level 2 Inspection: Most cases will call for a Level 2 Inspection and/or a qualified contractor. ☐ You are not sure what type and amount of vegetation is supposed to be in the pond. ☐ The algae or aquatic plants should be identified so that proper control techniques can be applied.
	☐ The side slopes of the pond are unstable, eroding, and have areas of bare dirt.	☐ If there are only minor areas, try filling in small rills or gullies with topsoil, compacting, and seeding and mulching all bare dirt areas with an appropriate seed. Alternatively, try using herbaceous plugs to get vegetation established in tricky areas, such as steep slopes. ☐ Other: ☐ Kick-Out to Level 2 Inspection: Erosion and many bare dirt areas on steep side slopes will require a Level 2 Inspection and repair by a qualified contractor.

PW Pond Area and Embankments

Examine both interior and exterior pond banks as well as the pond body. Observe from the inlet pipes to the outfall structure and emergency overflow.

Problem (Check if Present)		Follow-Up Actions
	☐ The riser structure is clogged with trash, debris, sediment, vegetation, etc., OR is open, unlocked, or has a steep drop and poses a safety concern. The pond level may have dropped below its "normal" level.	☐ If you can safely access the riser on foot or with a small boat, clear minor amounts of debris and remove it from the pond area for safe disposal. ☐ Other: ☐ Kick-Out to Level 2 Inspection: The riser cannot be accessed safely, the amount of debris is substantial, or the riser seems to be completely clogged and the water level has risen too high. ☐ There are safety issues with the riser and concern about access to pipes, drops, or any other life safety concern. ☐ The riser is leaning, broken, settling or slumping, corroded, eroded or any other structural problem.
	☐ The dam/embankment is slumping, sinking, settling, eroding, or has medium or large trees growing on it.	☐ If there are small isolated areas, try to fix them by adding clean material (clay and topsoil) and seeding and mulching. ☐ Periodically mow embankments to enable inspection of the banks and to minimize establishment of woody vegetation. ☐ Remove any woody vegetation that has already established on embankments. ☐ Other: ☐ Kick-Out to Level 2 Inspection: Most of these situations will require a Level 2 Inspection or evaluation and repair by a qualified contractor. Seepage through the dam or problems with the pipe through the dam can be a serious issue that should be addressed to avoid possible dam failure.

PW Pond Area and Embankments

Examine both interior and exterior pond banks as well as the pond body. Observe from the inlet pipes to the outfall structure and emergency overflow.

Problem (Check if Present)		Follow-Up Actions
	☐ The emergency spillway or outfall (if it exists) has ☐ Erosion, settlement, or loss of material. Rock-lined spillways have excessive debris or vegetation.	☐ Clear light debris and vegetation. ☐ Other: ☐ Kick-Out to Level 2 Inspection: Displacement of rock lining, excessive vegetation and erosion/settlement may warrant review and decision by Level 2 Inspector to check against original plan. ☐ Any uncertainty about the integrity of the emergency spillway should be referred to a Level 2 Inspector. ☐ Erosion or settlement such that design has been compromised should be reviewed by an engineer.

PW Pond Outlet

Examine the outlet of the pipe on the downstream side of the dam/embankment where it empties into a stream, channel, or drainage system.

Problem (Check if Present)	Follow-Up Actions
 ☐ The pond outlet is clogged with sediment, trash, debris, vegetation, or is eroding, caving in, slumping, or falling apart.	☐ If there is a minor blockage, remove the debris or vegetation to allow free flow of water. ☐ Remove any accumulated trash at the outlet. ☐ Outlet: ☐ Kick-Out to Level 2 Inspection: ☐ If the area at the outlet cannot be easily accessed or if the blockage is substantial, a Level 2 Inspection is warranted. ☐ Erosion at and downstream of the outfall should be evaluated by a qualified professional. ☐ Any structural problems, such as broken pipes, structures falling into the stream, or holes or tunnels around the outfall pipe, should be evaluated by a Level 2 Inspector and will require repair by a qualified contractor. ☐ The pool of water at the outlet pipe is discolored, has an odor, or has excessive algae or vegetative growth.

Additional Notes:

Inspector:_____ Date: _____

Complete the following if follow-up/corrective actions were identified during this inspection:

Certified Completion of Follow-Up Actions:

> "I hereby certify that the follow-up/corrective actions identified in the inspection performed on _____ (DATE) have been completed and any required maintenance deficiencies have been adequately corrected."

Inspector/Operator: _____ Date: _____

NEW YORK STATE OF OPPORTUNITY | Department of Environmental Conservation

Pond and Wetland Stormwater Management Practices Level 2 Inspection Checklist

SMP ID #		**SMP Owner**		☐ Private ☐ Public
SMP Location (Address; Latitude & Longitude)				
	Latitude		**Longitude**	

Party Responsible for Maintenance	**System Type**		**Type of Site**
☐ Same as SMP Owner ☐ Other _____	☐ Seasonal ☐ Continuous Use ☐ Other	☐ Above Ground ☐ Below Ground	☐ Commercial ☐ Industrial ☐ Residential ☐ State

Inspection Date		**Inspection Time**	
Inspector			
Date of Last Inspection			

Level 2 Inspection: PONDS and WETLANDS

Recommended Repairs and Required Skills	Triggers for Level 3 Inspection
Observed Condition: Bare Soil or Erosion in the Drainage Area	
☐ Condition 1: Extensive problem spots, but no channels or rills forming Reseed problem areas. If problem persists or grass does not take, consider hiring a landscape contractor. ☐ Condition 2: Problem is extensive, and rills/channels are beginning to form May be necessary to divert or redirect water that is causing the erosion problem. If it appears that simple regrading—such as installing a berm or leveling a low spot–will fix the problem, make repairs and ensure that the problem is repaired after the next storm.	• Large rills or gullies are forming in the drainage area. • An attempt to regrade the drainage area has been unsuccessful. • Fixing the problem would require major regrading (i.e., redirecting more than a 100-square-foot area. • It is not clear why the problem is occurring. ☐ Level 3 inspection necessary
Observed Condition: Manholes or Inlet Pipe Buried or Covered with Vegetation	
☐ Condition 1: Nearest manhole and inlet pipe not found Consult as-built drawings to get to closest suspected location and use metal detector to search for metal manhole cover. If unsuccessful, identify nearest drain inlets and approximate pipe direction to locate next manhole. ☐ Condition 2: Manhole located and inspected Never enter a manhole, except by following confined-space entry protocols. If outlet pipe is not visible or greater than 25% full of sediment/debris or trash, it will typically require a qualified contractor to flush, clean and clear blockages. ☐ Condition 3: Inlet pipe not found at pond Clear vegetation and brush that may be covering the inlet pipe. Buried inlet pipes may be found through use of a metal probe. ☐ Condition 4: Inlet pipe buried in sediment or blocked by vegetation Once located, the pipe path can be cleared of vegetation with brush hook or other brush tools. Light digging may clear sediment from the end of the pipe.	• To locate buried manholes and lost storm lines, it is sometimes necessary to hire a pipeline inspection contractor with televising equipment or ground-penetrating radar and enter at the closest upstream access point. • Locating a buried inlet pipe may require wading in the edge of the pond and using a metal probe and brush axe to find and expose the pipe. • If other than light digging is necessary to remove accumulated sediment, a contractor with heavy equipment may be required. ☐ Level 3 inspection necessary

Level 2 Inspection: PONDS and WETLANDS	
Recommended Repairs and Required Skills	**Triggers for Level 3 Inspection**
Observed Condition: Pipe or Headwall Settlement, Erosion, Corrosion or Failure	
☐ Condition 1: Pipe or headwall settlement or failure Severe sinkholes, settlement or corrosion should be kicked out to Level 3 Inspection. ☐ Condition 2: Flow not confined to pipe and visible outside pipe wall With flashlight, observe the inside of the pipe and note its condition. Take photographs. Look for sinkholes developing that indicate pipe failure beneath the surface. Kick out to Level 3 inspection.	• Where blockages are visible, a decision is needed on whether to clear them or leave in place. If a third of the pipe is full of sediment, it should be removed by a contractor with pipe-cleaning equipment. • Corrosion of inlet pipes that allows flow around the pipe exterior is a structural concern because it can lead to settlement, sinkholes and undermining pond embankment. Evidence of this type of failure may require specialized pipe-inspection equipment and investigation by an engineer. ☐ Level 3 inspection necessary
Observed Condition: Pond Conditions	
☐ Condition 1: Pond pre-treatment zone is full of sediment or not constructed as shown on as-built drawings. ☐ Condition 2: Excessive buildup of sediment or overgrowth If the pre-treatment area or pond pool is overgrown or filled with sediment so that the original design is compromised, corrective measures are required. If plants have died, then replanting is necessary. If none of the original design exists due to alteration or sediment, kick out to Level 3 inspection.	• It may require inspection by an engineer to determine next steps for clearing, replanting or reconstruction. • Erosion or settlement such that design has been compromised should be reviewed by an engineer. Recurring erosion may require redesign and/or regrading to direct flow away from eroding area. • If sediment has filled more than 50% of the pond's capacity, dredging is likely needed and should be evaluated by a qualified contractor. • Removal or control of excessive algae or aquatic plants can be assessed by a qualified pond maintenance company. ☐ Level 3 inspection necessary

Notes:

Inspector:_____ Date: _____

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Inspector/Operator: _____ Date: _____

NEW YORK STATE OF OPPORTUNITY | Department of Environmental Conservation

Swale Stormwater Management Practices
Level 1 Inspection Checklist

SMP ID #		**SMP Owner**		☐ Private ☐ Public
SMP Location (Address; Latitude & Longitude)				
	Latitude		**Longitude**	

Party Responsible for Maintenance	**System Type**		**Type of Site**
☐ Same as SMP Owner ☐ Other _____	☐ Seasonal ☐ Continuous Use ☐ Other	☐ Above Ground ☐ Below Ground	☐ Commercial ☐ Industrial ☐ Residential ☐ State

Inspection Date		**Inspection Time**	
Inspector			
Date of Last Inspection			

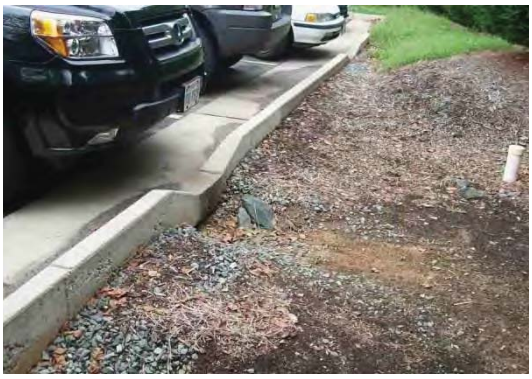
SW Drainage Area

Look at areas that are uphill from the swale.

Problem (Check if Present)	Follow-Up Actions
☐ Bare soil, erosion of the ground (rills washing out the dirt)	☐ Seed and mulch or sod areas of bare soil to establish vegetation. ☐ Fill in erosion areas with soil, compact, and add seed and straw to establish vegetation. ☐ If a rill or small channel is forming, try to redirect water flowing to this area by creating a small berm or adding topsoil to areas that are heavily compacted. ☐ Other: ☐ Kick-Out to Level 2 Inspection: Large areas of soil have been eroded, or larger channels are forming. May require rerouting of flow paths
☐ Piles of grass clippings, mulch, dirt, salt, or other materials	☐ Remove or cover piles of grass clippings, mulch, dirt, etc. ☐ Other:
☐ Open containers of oil, grease, paint, or other substances	☐ Cover or properly dispose of materials; consult your local solid waste authority for guidance on materials that may be toxic or hazardous.
☐ Grass dying at edge of road	☐ Seed and mulch; add topsoil or compost if needed. ☐ Other: ☐ Kick-Out to Level 2 Inspection: Grass on edge of pavement continues to die off for unknown reasons. Swale edge may need to be replaced with other materials (e.g., stone diaphragm).

SW Inlets

Stand in the swale and look for all the places where water flows in.

Problem (Check if Present)	Follow-Up Actions
☐ Inlets or the swale edge are collecting grit, grass clippings, or debris or have grass/weeds growing. Some water may not be getting into the swale. The objective is to have a clear pathway for water to flow into the swale.	☐ Use a flat shovel to remove grit and debris (especially at curb inlets or opening). Parking lots will generate fine grit that will accumulate at these spots. ☐ Pull out clumps of growing grass or weeds, and scoop out the soil or grit that the plants are growing in. ☐ Remove any grass clippings, leaves, sticks, and other debris that is collecting at inlets or along the edge of the swale where water is supposed to enter. ☐ For pipes and ditches, remove sediment and debris that is partially blocking the pipe or ditch opening where it enters the swale. ☐ Dispose of all material properly in an area where it will not re-enter the swale. ☐ Other:
	☐ Kick-Out to Level 2 Inspection: Inlets are blocked to the extent that most of the water does not seem to be entering the swale.
 ☐ Some or all of the inlets are eroding so that rills, gullies, and other erosion are present, or there is bare dirt that is washing into the swale.	☐ For small areas of erosion, smooth out the eroded part and apply rock or stone (e.g., river cobble) to prevent further erosion. Usually, filter fabric is placed under the rock or stone. ☐ In some cases, reseeding and applying an erosion control matting can be used to prevent further erosion. Some of these materials may be available at a garden center, but it may be best to consult a landscape contractor. ☐ Other:
	☐ Level 2 Inspection: Erosion is occurring at most of the inlets or along much of the swale edge. The inlet design may have to be modified.

SW Surface Area

Examine the entire swale surface and side slopes.

Problem (Check if Present)	Follow-Up Actions
☐ Minor areas of sediment, grit, trash, or other debris are accumulating in the swale.	☐ Use a shovel to scoop out minor areas of sediment or grit, especially in the spring after winter sanding materials may wash in and accumulate. Dispose of the material where it cannot re-enter the swale. ☐ If removing the material creates a hole or low area, fill with good topsoil and add seed and straw to re-vegetate. ☐ Remove trash, vegetative debris, and other undesirable materials. ☐ If the swale is densely vegetated, it may be difficult to do the maintenance; check for excessive ponding or other issues described in this section to see if the accumulated material is causing a problem. ☐ Other:
	☐ Kick-Out to Level 2 Inspection: Sediment has accumulated more than 3 inches deep and covers 25% or more of the swale surface. ☐ The source of sediment is unknown or cannot be controlled with simple measures.
 ☐ There is erosion in the bottom or on the side slopes. Water seems to be carving out rills as it flows through the swale or on the slopes.	☐ Try filling the eroded areas with clean topsoil, and then seed and mulch to establish vegetation. ☐ If the problem recurs, you may have to use some type of matting, stone (e.g., river cobble), or other material to fill in eroded areas. ☐ If the erosion is on a side slope, fill with soil and cover with erosion-control matting or at least straw mulch after re-seeding.
	☐ Kick-Out to Level 2 Inspection: The problem persists or the erosion is more than 3 inches deep and seems to be an issue with how water enters and moves through the swale. ☐ Kick-Out to Level 2 Inspection: The problem does not seem to be caused by flowing water, but a collapse or sinking of the surface (e.g., “sinkhole”) due to some underground problem.
☐ Water does not flow evenly down the length of the swale, but ponds in certain areas for long periods of time (e.g., 72 hours after a storm). The swale does not seem to have “positive drainage.” Check during or immediately after a rain storm.	☐ If the problem is minor (just small, isolated areas), try using a metal rake or other tools to create a more even flow path; remove excessive vegetative growth, sediment, or other debris that may be blocking the flow. ☐ Other:
	☐ Kick-Out to Level 2 Inspection: Water ponds in more than 25% of the swale for three days or more after a storm. The issue may be with the underlying soil or the grade of the swale. ☐ Water ponds behind check dams for three days or more after a storm. Check dams may be clogged or not functioning properly.

SW Surface Area

Examine the entire swale surface and side slopes.

Problem (Check if Present)	Follow-Up Actions
 ☐ Check dams (if present): water is flowing around the edges of check dams, creating erosion or sinkholes on the uphill or downhill side, or the check dams are breaking apart or breaching .	☐ If the problem is isolated to just a few check dams, try simple repairs. ☐ It is very important for the center of each check dam (where most of the water flows) to be lower (by at least several inches) than the edges of the check dams where they meet the side slopes. Also, the check dams should be keyed into side slopes so water does not flow between the check dam and side slope. ☐ Use a level to check the right check-dam configuration, as noted above. Repair by moving around stone, filling and compacting soil, or adding new material so that water will be directed to the center of the check dam instead of the edges. ☐ Other: ☐ Kick-Out to Level 2 Inspection: Many check dams are impacted and/or the problem seems to be a design issue with height, spacing, shape, or materials used to construct them.

SW Vegetation

Assess the swale vegetation.

Problem (Check if Present)	Follow-Up Actions
 ☐ Vegetation is too overgrown to access swale for maintenance activities	☐ Mow or bush-hog the path. ☐ Other:

SW Vegetation

Assess the swale vegetation.

Problem (Check if Present)	Follow-Up Actions
 ☐ Vegetation requires regular maintenance: pulling weeds, removing dead and diseased plants, adding plants to fill in areas that are not well vegetated, etc.	☐ If you can identify which plants are weeds or not intended to be part of the planting plan, eliminate these, preferably by hand pulling. ☐ If weeds are widespread, check with the local stormwater authority and/or Extension Office about proper use of herbicides for areas connected with the flow of water. ☐ Even vegetation that is intended to be present can become large, overgrown, block flow, and/or crowd out surrounding plants. Prune and thin accordingly. ☐ If weeds or invasive plants have overtaken the whole swale, bush-hog the entire area before seed heads form in the spring. It will be necessary to remove the root mat manually or with appropriate herbicides, as noted above. ☐ Replant with species that are aesthetically pleasing and seem to be doing well in the swale. ☐ Other:
	☐ Kick-Out to Level 2 Inspection: You are unsure of the original planting design or the vegetation maintenance task is beyond your capabilities of time, expertise, or resources. If you are unsure of the health of the vegetation (e.g. salt damage, invasives, which plants are undesirable) or the appropriate season to conduct vegetation management, consult a landscape professional before undertaking any cutting, pruning, mowing, or brush hogging.
☐ Vegetation is too thin, is not healthy, and there are many spots that are not well vegetated.	☐ The original plants are likely not suited for the actual conditions within the swale. If you are knowledgeable about plants, select and plant more appropriate vegetation (preferably native plants) so that almost the entire surface area will be covered by the end of the second growing season. ☐ Other:
	☐ Kick-Out to Level 2 Inspection: For all but small practices (e.g., in residential yards), this task will likely require a landscape design professional or horticulturalist.

SW Outlets

Examine outlets that release water out of the swale.

Problem (Check if Present)	Follow-Up Actions
☐ Outlet is obstructed with mulch, sediment, debris, trash, etc.	☐ Remove the debris and dispose of it where it cannot re-enter the swale. ☐ Other:
	☐ Kick-Out to Level 2 Inspection: Outlet is completely clogged or obstructed; there is too much material to remove by hand or with simple hand tools.

Additional Notes:

Inspector:_____ Date: _____

Complete the following if follow-up/corrective actions were identified during this inspection:

Certified Completion of Follow-Up Actions:

"I hereby certify that the follow-up/corrective actions identified in the inspection performed on _____ (DATE) have been completed and any required maintenance deficiencies have been adequately corrected."

Inspector/Operator: _____ Date: _____

NEW YORK STATE OF OPPORTUNITY | Department of Environmental Conservation

Swale Stormwater Management Practices
Level 2 Inspection Checklist

SMP ID #		**SMP Owner**		☐ Private ☐ Public
SMP Location (Address; Latitude & Longitude)				
	Latitude		**Longitude**	

Party Responsible for Maintenance	**System Type**		**Type of Site**
☐ Same as SMP Owner ☐ Other _____	☐ Seasonal ☐ Continuous Use ☐ Other	☐ Above Ground ☐ Below Ground	☐ Commercial ☐ Industrial ☐ Residential ☐ State

Inspection Date		**Inspection Time**	
Inspector			
Date of Last Inspection			

Level 2 Inspection: SWALE	
Recommended Repairs	**Triggers for Level 3 Inspection**
Observed Condition: Water Stands on Surface for More than 72 Hours after Storm	
☐ Condition 1: Small pockets of standing water Use a soil probe or auger to examine the soil profile. If isolated areas have accumulated grit, fines, or vegetative debris or have compacted soil, try scraping off top 3 to 6 inches of soil and replacing with clean material. Also check to see that surface is level and water is not ponding selectively in certain areas. ☐ Condition 2: Standing water is widespread or covers entire surface Requires diagnosis and resolution of problem: • Bad or compacted soil • Filter fabric on the swale bottom • Too much sediment/grit washing in from drainage area? • Too much ponding depth? • Longitudinal slope is too flat?	• Soil is overly compacted or clogged and problem is not evident from Level 2 inspection. • Level 2 inspection identifies problem, but it cannot be resolved easily or is associated with the original design of the practice (e.g., not enough slope down through the swale). ☐ Level 3 inspection necessary
Observed Condition: Vegetation is predominantly weeds and invasive species	
For a small area, weed and dig up invasive plants. Replant with natives or plants from original planting plan. If longer than 100 feet, develop a new planting plan and have it professionally reviewed.	• Vegetation deviates significantly from original planting plan; swale has been neglected and suffered from deferred maintenance. • Owner/responsible party does not know how to maintain the practice. • For large area, hire a professional to develop a grading plan and develop a planting plan. ☐ Level 3 inspection necessary

Notes:

Inspector:_____ Date: _____

Complete the following if follow-up/corrective actions were identified during this inspection:

Certified Completion of Follow-Up Actions:

> "I hereby certify that the follow-up/corrective actions identified in the inspection performed on _____ (DATE) have been completed and any required maintenance deficiencies have been adequately corrected."

Inspector/Operator: _____ Date: _____

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APPENDIX E: SWPPP FORMS
Notice of Intent
Notice of Termination
Contractor Forms

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0644089821

NOTICE OF INTENT

New York State Department of Environmental Conservation
Division of Water
625 Broadway, 4th Floor
Albany, New York 12233-3505

NYR ☐☐☐☐☐☐
(for DEC use only)

Stormwater Discharges Associated with Construction Activity Under State Pollutant Discharge Elimination System (SPDES) General Permit # GP-0-20-001

All sections must be completed unless otherwise noted. Failure to complete all items may result in this form being returned to you, thereby delaying your coverage under this General Permit. Applicants must read and understand the conditions of the permit and prepare a Stormwater Pollution Prevention Plan prior to submitting this NOI. Applicants are responsible for identifying and obtaining other DEC permits that may be required.

-IMPORTANT-

RETURN THIS FORM TO THE ADDRESS ABOVE

OWNER/OPERATOR MUST SIGN FORM

Owner/Operator Information

Owner/Operator (Company Name/Private Owner Name/Municipality Name)

Owner/Operator Contact Person Last Name (NOT CONSULTANT)

Owner/Operator Contact Person First Name

Owner/Operator Mailing Address

City

State

Zip -

Phone (Owner/Operator) - -

Fax (Owner/Operator) - -

Email (Owner/Operator)

FED TAX ID - (not required for individuals)

Project Site Information

Project/Site Name

Street Address (NOT P.O. BOX)

Side of Street

○ **North** ○ **South** ○ **East** ○ **West**

City/Town/Village (THAT ISSUES BUILDING PERMIT)

State N Y

Zip -

County

DEC Region

Name of Nearest Cross Street

Distance to Nearest Cross Street (Feet)

Project In Relation to Cross Street

○ **North** ○ **South** ○ **East** ○ **West**

Tax Map Numbers
Section-Block-Parcel

Tax Map Numbers

1. Provide the Geographic Coordinates for the project site in NYTM Units. To do this you **must** go to the NYSDEC Stormwater Interactive Map on the DEC website at:

www.dec.ny.gov/imsmaps/stormwater/viewer.htm

Zoom into your Project Location such that you can accurately click on the centroid of your site. Once you have located your project site, go to the tool boxes on the top and choose "i"(identify). Then click on the center of your site and a new window containing the X, Y coordinates in UTM will pop up. Transcribe these coordinates into the boxes below. For problems with the interactive map use the help function.

X Coordinates (Easting)

Y Coordinates (Northing)

4

2. What is the nature of this construction project?

○ **New Construction**

○ **Redevelopment with increase in impervious area**

○ **Redevelopment with no increase in impervious area**

3. Select the predominant land use for both pre and post development conditions.
SELECT ONLY ONE CHOICE FOR EACH

Pre-Development Existing Land Use

- ○ FOREST
- ○ PASTURE/OPEN LAND
- ○ CULTIVATED LAND
- ○ SINGLE FAMILY HOME
- ○ SINGLE FAMILY SUBDIVISION
- ○ TOWN HOME RESIDENTIAL
- ○ MULTIFAMILY RESIDENTIAL
- ○ INSTITUTIONAL/SCHOOL
- ○ INDUSTRIAL
- ○ COMMERCIAL
- ○ ROAD/HIGHWAY
- ○ RECREATIONAL/SPORTS FIELD
- ○ BIKE PATH/TRAIL
- ○ LINEAR UTILITY
- ○ PARKING LOT
- ○ OTHER

Post-Development Future Land Use

- ○ SINGLE FAMILY HOME
- ○ SINGLE FAMILY SUBDIVISION — Number of Lots
- ○ TOWN HOME RESIDENTIAL
- ○ MULTIFAMILY RESIDENTIAL
- ○ INSTITUTIONAL/SCHOOL
- ○ INDUSTRIAL
- ○ COMMERCIAL
- ○ MUNICIPAL
- ○ ROAD/HIGHWAY
- ○ RECREATIONAL/SPORTS FIELD
- ○ BIKE PATH/TRAIL
- ○ LINEAR UTILITY (water, sewer, gas, etc.)
- ○ PARKING LOT
- ○ CLEARING/GRADING ONLY
- ○ DEMOLITION, NO REDEVELOPMENT
- ○ WELL DRILLING ACTIVITY *(Oil, Gas, etc.)
- ○ OTHER

***Note**: for gas well drilling, non-high volume hydraulic fractured wells only

4. In accordance with the larger common plan of development or sale, enter the total project site area; the total area to be disturbed; existing impervious area to be disturbed (for redevelopment activities); and the future impervious area constructed within the disturbed area. (Round to the nearest tenth of an acre.)

Total Site Area	Total Area To Be Disturbed	Existing Impervious Area To Be Disturbed	Future Impervious Area Within Disturbed Area
____.__	____.__	____.__	____.__

5. Do you plan to disturb more than 5 acres of soil at any one time? ○ **Yes** ○ **No**

6. Indicate the percentage of each Hydrologic Soil Group(HSG) at the site.

A	B	C	D
___ %	___ %	___ %	___ %

7. Is this a phased project? ○ **Yes** ○ **No**

8. Enter the planned start and end dates of the disturbance activities.

Start Date __ / __ / ____ – **End Date** __ / __ / ____

9. Identify the nearest surface waterbody(ies) to which construction site runoff will discharge.

Name

9a. Type of waterbody identified in Question 9?

- ○ Wetland / State Jurisdiction On Site (Answer 9b)
- ○ Wetland / State Jurisdiction Off Site
- ○ Wetland / Federal Jurisdiction On Site (Answer 9b)
- ○ Wetland / Federal Jurisdiction Off Site
- ○ Stream / Creek On Site
- ○ Stream / Creek Off Site
- ○ River On Site
- ○ River Off Site
- ○ Lake On Site
- ○ Lake Off Site
- ○ Other Type On Site
- ○ Other Type Off Site

9b. How was the wetland identified?

- ○ Regulatory Map
- ○ Delineated by Consultant
- ○ Delineated by Army Corps of Engineers
- ○ Other (identify)

10. Has the surface waterbody(ies) in question 9 been identified as a 303(d) segment in Appendix E of GP-0-20-001? ○ **Yes** ○ **No**

11. Is this project located in one of the Watersheds identified in Appendix C of GP-0-20-001? ○ **Yes** ○ **No**

12. Is the project located in one of the watershed areas associated with AA and AA-S classified waters? ○ **Yes** ○ **No**
If no, skip question 13.

13. Does this construction activity disturb land with no existing impervious cover and where the Soil Slope Phase is identified as an E or F on the USDA Soil Survey? ○ **Yes** ○ **No**
If Yes, what is the acreage to be disturbed?

.

14. Will the project disturb soils within a State regulated wetland or the protected 100 foot adjacent area? ○ **Yes** ○ **No**

15. Does the site runoff enter a separate storm sewer system (including roadside drains, swales, ditches, culverts, etc)? ○ **Yes** ○ **No** ○ **Unknown**

16. What is the name of the municipality/entity that owns the separate storm sewer system?

17. Does any runoff from the site enter a sewer classified as a Combined Sewer? ○ **Yes** ○ **No** ○ **Unknown**

18. Will future use of this site be an agricultural property as defined by the NYS Agriculture and Markets Law? ○ **Yes** ○ **No**

19. Is this property owned by a state authority, state agency, federal government or local government? ○ **Yes** ○ **No**

20. Is this a remediation project being done under a Department approved work plan? (i.e. CERCLA, RCRA, Voluntary Cleanup Agreement, etc.) ○ **Yes** ○ **No**

21. 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** ○ **No**

22. Does this construction activity require the development of a SWPPP that includes the post-construction stormwater management practice component (i.e. Runoff Reduction, Water Quality and Quantity Control practices/techniques)? ○ **Yes** ○ **No**
If No, skip questions 23 and 27-39.

23. Has the post-construction stormwater management practice component of the SWPPP been developed in conformance with the current NYS Stormwater Management Design Manual? ○ **Yes** ○ **No**

24. The Stormwater Pollution Prevention Plan (SWPPP) was prepared by:

- ○ **Professional Engineer (P.E.)**
- ○ **Soil and Water Conservation District (SWCD)**
- ○ **Registered Landscape Architect (R.L.A)**
- ○ **Certified Professional in Erosion and Sediment Control (CPESC)**
- ○ **Owner/Operator**
- ○ **Other**

SWPPP Preparer

Contact Name (Last, Space, First)

Mailing Address

City

State Zip -

Phone - -

Fax - -

Email

SWPPP Preparer Certification

I hereby certify that the Stormwater Pollution Prevention Plan (SWPPP) for this project has been prepared in accordance with the terms and conditions of the GP-0-20-001. Furthermore, I understand that certifying false, incorrect or inaccurate information is a violation of this permit and the laws of the State of New York and could subject me to criminal, civil and/or administrative proceedings.

First Name **MI**

Last Name

Signature

Date / /

25. Has a construction sequence schedule for the planned management practices been prepared? ○ **Yes** ○ **No**

26. Select **all** of the erosion and sediment control practices that will be employed on the project site:

Temporary Structural

- ○ **Check Dams**
- ○ **Construction Road Stabilization**
- ○ **Dust Control**
- ○ **Earth Dike**
- ○ **Level Spreader**
- ○ **Perimeter Dike/Swale**
- ○ **Pipe Slope Drain**
- ○ **Portable Sediment Tank**
- ○ **Rock Dam**
- ○ **Sediment Basin**
- ○ **Sediment Traps**
- ○ **Silt Fence**
- ○ **Stabilized Construction Entrance**
- ○ **Storm Drain Inlet Protection**
- ○ **Straw/Hay Bale Dike**
- ○ **Temporary Access Waterway Crossing**
- ○ **Temporary Stormdrain Diversion**
- ○ **Temporary Swale**
- ○ **Turbidity Curtain**
- ○ **Water bars**

Biotechnical

- ○ **Brush Matting**
- ○ **Wattling**

Vegetative Measures

- ○ **Brush Matting**
- ○ **Dune Stabilization**
- ○ **Grassed Waterway**
- ○ **Mulching**
- ○ **Protecting Vegetation**
- ○ **Recreation Area Improvement**
- ○ **Seeding**
- ○ **Sodding**
- ○ **Straw/Hay Bale Dike**
- ○ **Streambank Protection**
- ○ **Temporary Swale**
- ○ **Topsoiling**
- ○ **Vegetating Waterways**

Permanent Structural

- ○ **Debris Basin**
- ○ **Diversion**
- ○ **Grade Stabilization Structure**
- ○ **Land Grading**
- ○ **Lined Waterway (Rock)**
- ○ **Paved Channel (Concrete)**
- ○ **Paved Flume**
- ○ **Retaining Wall**
- ○ **Riprap Slope Protection**
- ○ **Rock Outlet Protection**
- ○ **Streambank Protection**

Other

Post-construction Stormwater Management Practice (SMP) Requirements

Important: Completion of Questions 27-39 is not required if response to Question 22 is No.

27. Identify all site planning practices that were used to prepare the final site plan/layout for the project.

- ○ **Preservation of Undisturbed Areas**
- ○ **Preservation of Buffers**
- ○ **Reduction of Clearing and Grading**
- ○ **Locating Development in Less Sensitive Areas**
- ○ **Roadway Reduction**
- ○ **Sidewalk Reduction**
- ○ **Driveway Reduction**
- ○ **Cul-de-sac Reduction**
- ○ **Building Footprint Reduction**
- ○ **Parking Reduction**

27a. 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 (2010 version).

- ○ 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).
- ○ Compacted areas were considered as impervious cover when calculating the **WQv Required**, and the compacted areas were assigned a post-construction Hydrologic Soil Group (HSG) designation that is one level less permeable than existing conditions for the hydrology analysis.

28. Provide the total Water Quality Volume (WQv) required for this project (based on final site plan/layout).

Total WQv Required

☐☐☐.☐☐☐ **acre-feet**

29. Identify the RR techniques (Area Reduction), RR techniques(Volume Reduction) and Standard SMPs with RRv Capacity in Table 1 (See Page 9) that were used to reduce the Total WQv Required(#28).

Also, provide in Table 1 the total impervious area that contributes runoff to each technique/practice selected. For the Area Reduction Techniques, provide the total contributing area (includes pervious area) and, if applicable, the total impervious area that contributes runoff to the technique/practice.

Note: Redevelopment projects shall use Tables 1 and 2 to identify the SMPs used to treat and/or reduce the WQv required. If runoff reduction techniques will not be used to reduce the required WQv, skip to question 33a after identifying the SMPs.

Table 1 - Runoff Reduction (RR) Techniques and Standard Stormwater Management Practices (SMPs)

	Total Contributing Area (acres)		Total Contributing Impervious Area (acres)
RR Techniques (Area Reduction)			
○ Conservation of Natural Areas (RR-1) ...	___.___	and/or	___.___
○ Sheetflow to Riparian Buffers/Filters Strips (RR-2)	___.___	and/or	___.___
○ Tree Planting/Tree Pit (RR-3)	___.___	and/or	___.___
○ Disconnection of Rooftop Runoff (RR-4) ..	___.___	and/or	___.___
RR Techniques (Volume Reduction)			
○ Vegetated Swale (RR-5)			___.___
○ Rain Garden (RR-6)			___.___
○ Stormwater Planter (RR-7)			___.___
○ Rain Barrel/Cistern (RR-8)			___.___
○ Porous Pavement (RR-9)			___.___
○ Green Roof (RR-10)			___.___
Standard SMPs with RRv Capacity			
○ Infiltration Trench (I-1)			___.___
○ Infiltration Basin (I-2)			___.___
○ Dry Well (I-3)			___.___
○ Underground Infiltration System (I-4)			___.___
○ Bioretention (F-5)			___.___
○ Dry Swale (O-1)			___.___
Standard SMPs			
○ Micropool Extended Detention (P-1)			___.___
○ Wet Pond (P-2)			___.___
○ Wet Extended Detention (P-3)			___.___
○ Multiple Pond System (P-4)			___.___
○ Pocket Pond (P-5)			___.___
○ Surface Sand Filter (F-1)			___.___
○ Underground Sand Filter (F-2)			___.___
○ Perimeter Sand Filter (F-3)			___.___
○ Organic Filter (F-4)			___.___
○ Shallow Wetland (W-1)			___.___
○ Extended Detention Wetland (W-2)			___.___
○ Pond/Wetland System (W-3)			___.___
○ Pocket Wetland (W-4)			___.___
○ Wet Swale (O-2)			___.___

Table 2 - Alternative SMPs (DO NOT INCLUDE PRACTICES BEING USED FOR PRETREATMENT ONLY)

Alternative SMP	Total Contributing Impervious Area (acres)
○ **Hydrodynamic**	___ . ___
○ **Wet Vault**	___ . ___
○ **Media Filter**	___ . ___
○ **Other** _____	___ . ___

Provide the name and manufacturer of the Alternative SMPs (i.e. proprietary practice(s)) being used for WQv treatment.

Name _____

Manufacturer _____

Note: Redevelopment projects which do not use RR techniques, shall use questions 28, 29, 33 and 33a to provide SMPs used, total WQv required and total WQv provided for the project.

30. Indicate the Total RRv provided by the RR techniques (Area/Volume Reduction) and Standard SMPs with RRv capacity identified in question 29.

Total RRv provided

___ . ___ **acre-feet**

31. Is the Total RRv provided (#30) greater than or equal to the total WQv required (#28).

○ **Yes** ○ **No**

If Yes, go to question 36.
If No, go to question 32.

32. Provide the Minimum RRv required based on HSG.
[Minimum RRv Required = (P)(0.95)(Ai)/12, Ai=(S)(Aic)]

Minimum RRv Required

___ . ___ **acre-feet**

32a. Is the Total RRv provided (#30) greater than or equal to the Minimum RRv Required (#32)?

○ **Yes** ○ **No**

If Yes, go to question 33.
Note: Use the space provided in question #39 to summarize the specific site limitations and justification for not reducing 100% of WQv required (#28). A detailed evaluation of the specific site limitations and justification for not reducing 100% of the WQv required (#28) must also be included in the SWPPP.
If No, sizing criteria has not been met, so NOI can not be processed. SWPPP preparer must modify design to meet sizing criteria.

33. Identify the Standard SMPs in Table 1 and, if applicable, the Alternative SMPs in Table 2 that were used to treat the remaining total WQv(=Total WQv Required in 28 - Total RRv Provided in 30).

Also, provide in Table 1 and 2 the total impervious area that contributes runoff to each practice selected.

Note: Use Tables 1 and 2 to identify the SMPs used on Redevelopment projects.

33a. Indicate the Total WQv provided (i.e. WQv treated) by the SMPs identified in question #33 and Standard SMPs with RRv Capacity identified in question 29.

WQv Provided

☐☐☐.☐☐☐ **acre-feet**

Note: For the standard SMPs with RRv capacity, the WQv provided by each practice = the WQv calculated using the contributing drainage area to the practice - RRv provided by the practice. (See Table 3.5 in Design Manual)

34. Provide the sum of the Total RRv provided (#30) and the WQv provided (#33a). ☐☐☐.☐☐☐

35. Is the sum of the RRv provided (#30) and the WQv provided (#33a) greater than or equal to the total WQv required (#28)? ○ **Yes** ○ **No**

If Yes, go to question 36.
If No, sizing criteria has not been met, so NOI can not be processed. SWPPP preparer must modify design to meet sizing criteria.

36. Provide the total Channel Protection Storage Volume (CPv) required and provided or select waiver (36a), if applicable.

CPv Required

☐☐☐.☐☐☐ **acre-feet**

CPv Provided

☐☐☐.☐☐☐ **acre-feet**

36a. The need to provide channel protection has been waived because:

○ Site discharges directly to tidal waters or a fifth order or larger stream.

○ Reduction of the total CPv is achieved on site through runoff reduction techniques or infiltration systems.

37. Provide the Overbank Flood (Qp) and Extreme Flood (Qf) control criteria or select waiver (37a), if applicable.

Total Overbank Flood Control Criteria (Qp)

Pre-Development

☐☐☐.☐☐☐ **CFS**

Post-development

☐☐☐.☐☐☐ **CFS**

Total Extreme Flood Control Criteria (Qf)

Pre-Development

☐☐☐.☐☐☐ **CFS**

Post-development

☐☐☐.☐☐☐ **CFS**

37a. The need to meet the Qp and Qf criteria has been waived because:

- ○ Site discharges directly to tidal waters or a fifth order or larger stream.
- ○ Downstream analysis reveals that the Qp and Qf controls are not required

38. Has a long term Operation and Maintenance Plan for the post-construction stormwater management practice(s) been developed? ○ **Yes** ○ **No**

If Yes, Identify the entity responsible for the long term Operation and Maintenance

39. Use this space to summarize the specific site limitations and justification for not reducing 100% of WQv required(#28). (See question 32a) This space can also be used for other pertinent project information.

40. Identify other DEC permits, existing and new, that are required for this project/facility.

- ○ Air Pollution Control
- ○ Coastal Erosion
- ○ Hazardous Waste
- ○ Long Island Wells
- ○ Mined Land Reclamation
- ○ Solid Waste
- ○ Navigable Waters Protection / Article 15
- ○ Water Quality Certificate
- ○ Dam Safety
- ○ Water Supply
- ○ Freshwater Wetlands/Article 24
- ○ Tidal Wetlands
- ○ Wild, Scenic and Recreational Rivers
- ○ Stream Bed or Bank Protection / Article 15
- ○ Endangered or Threatened Species(Incidental Take Permit)
- ○ Individual SPDES
- ○ SPDES Multi-Sector GP N Y R
- ○ Other
- ○ None

41. Does this project require a US Army Corps of Engineers Wetland Permit? ○ **Yes** ○ **No**
If Yes, Indicate Size of Impact. .

42. Is this project subject to the requirements of a regulated, traditional land use control MS4? ○ **Yes** ○ **No**
(If No, skip question 43)

43. Has the "MS4 SWPPP Acceptance" form been signed by the principal executive officer or ranking elected official and submitted along with this NOI? ○ **Yes** ○ **No**

44. If this NOI is being submitted for the purpose of continuing or transferring coverage under a general permit for stormwater runoff from construction activities, please indicate the former SPDES number assigned. N Y R

Owner/Operator Certification

I have read or been advised of the permit conditions and believe that I understand them. I also understand that, under the terms of the permit, there may be reporting requirements. I hereby certify that this document and the corresponding documents were prepared under my direction or supervision. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations. I further understand that coverage under the general permit will be identified in the acknowledgment that I will receive as a result of submitting this NOI and can be as long as sixty (60) business days as provided for in the general permit. I also understand that, by submitting this NOI, I am acknowledging that the SWPPP has been developed and will be implemented as the first element of construction, and agreeing to comply with all the terms and conditions of the general permit for which this NOI is being submitted.

Print First Name

MI

Print Last Name

Owner/Operator Signature

Date

/ /

NYS Department of Environmental Conservation
Division of Water
625 Broadway, 4th Floor
Albany, New York 12233-3505

MS4 Stormwater Pollution Prevention Plan (SWPPP) Acceptance Form

for

Construction Activities Seeking Authorization Under SPDES General Permit

*(NOTE: Attach Completed Form to Notice Of Intent and Submit to Address Above)

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:
12. MS4 SPDES Permit Identification Number: NYR20A
13. Contact Person:
14. Street Address:
15. City/State/Zip:
16. 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 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. Additional Information

(NYS DEC - MS4 SWPPP Acceptance Form - January 2015)

New York State Department of Environmental Conservation
Division of Water
625 Broadway, 4th Floor
Albany, New York 12233-3505
(NOTE: Submit completed form to address above)

NOTICE OF TERMINATION for Storm Water Discharges Authorized under the SPDES General Permit for Construction Activity

Please indicate your permit identification number: NYR ___ ___ ___ ___ ___ ___

I. Owner or Operator Information

1. Owner/Operator Name:

2. Street Address:

3. City/State/Zip:

4. Contact Person:	4a.Telephone:

4b. Contact Person E-Mail:

II. Project Site Information

5. Project/Site Name:

6. Street Address:

7. City/Zip:

8. County:

III. Reason for Termination

9a. □ All disturbed areas have achieved final stabilization in accordance with the general permit and SWPPP. ***Date final stabilization completed** (month/year): _____

9b. □ Permit coverage has been transferred to new owner/operator. Indicate new owner/operator's permit identification number: NYR ___ ___ ___ ___ ___ ___
(Note: Permit coverage can not be terminated by owner identified in I.1. above until new owner/operator obtains coverage under the general permit)

9c. □ Other (Explain on Page 2)

IV. Final Site Information:

10a. Did this construction activity require the development of a SWPPP that includes post-construction stormwater management practices? □ yes □ no (If no, go to question 10f.)

10b. Have all post-construction stormwater management practices included in the final SWPPP been constructed? □ yes □ no (If no, explain on Page 2)

10c. Identify the entity responsible for long-term operation and maintenance of practice(s)?

_____

NOTICE OF TERMINATION for Storm Water Discharges Authorized under the SPDES General Permit for Construction Activity - continued

10d. Has the entity responsible for long-term operation and maintenance been given a copy of the operation and maintenance plan required by the general permit? □ yes □ no

10e. Indicate the method used to ensure long-term operation and maintenance of the post-construction stormwater management practice(s):

□ Post-construction stormwater management practice(s) and any right-of-way(s) needed to maintain practice(s) have been deeded to the municipality.

□ Executed maintenance agreement is in place with the municipality that will maintain the post-construction stormwater management practice(s).

□ For post-construction stormwater management practices that are privately owned, a mechanism is 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.

□ For post-construction stormwater management practices that are owned by a public or private institution (e.g. school, university or hospital), government agency or authority, or public utility; policy and procedures are in place that ensures operation and maintenance of the practice(s) in accordance with the operation and maintenance plan.

10f. Provide the total area of impervious surface (i.e. roof, pavement, concrete, gravel, etc.) constructed within the disturbance area? _____ (acres)

11. Is this project subject to the requirements of a regulated, traditional land use control MS4? □ yes □ no

(If Yes, complete section VI - "MS4 Acceptance" statement

V. Additional Information/Explanation:

(Use this section to answer questions 9c. and 10b., if applicable)

VI. MS4 Acceptance - MS4 Official (principal executive officer or ranking elected official) or Duly Authorized Representative (Note: Not required when 9b. is checked -transfer of coverage)

I have determined that it is acceptable for the owner or operator of the construction project identified in question 5 to submit the Notice of Termination at this time.

Printed Name:

Title/Position:

Signature:	Date:

NOTICE OF TERMINATION for Storm Water Discharges Authorized under the SPDES General Permit for Construction Activity - continued	
VII. Qualified Inspector Certification - Final Stabilization:	
I hereby certify that all disturbed areas have achieved final stabilization as defined in the current version of the general permit, and that all temporary, structural erosion and sediment control measures have been removed. 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.	
Printed Name:	
Title/Position:	
Signature:	Date:
VIII. Qualified Inspector Certification - Post-construction Stormwater Management Practice(s):	
I hereby certify that all post-construction stormwater management practices have been constructed in conformance with the SWPPP. 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.	
Printed Name:	
Title/Position:	
Signature:	Date:
IX. Owner or Operator Certification	
I hereby certify that this document was prepared by me or under my direction or supervision. My determination, based upon my inquiry of the person(s) who managed the construction activity, or those persons directly responsible for gathering the information, is that the information provided in this document is true, accurate and complete. 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.	
Printed Name:	
Title/Position:	
Signature:	Date:

(NYS DEC Notice of Termination - January 2015)

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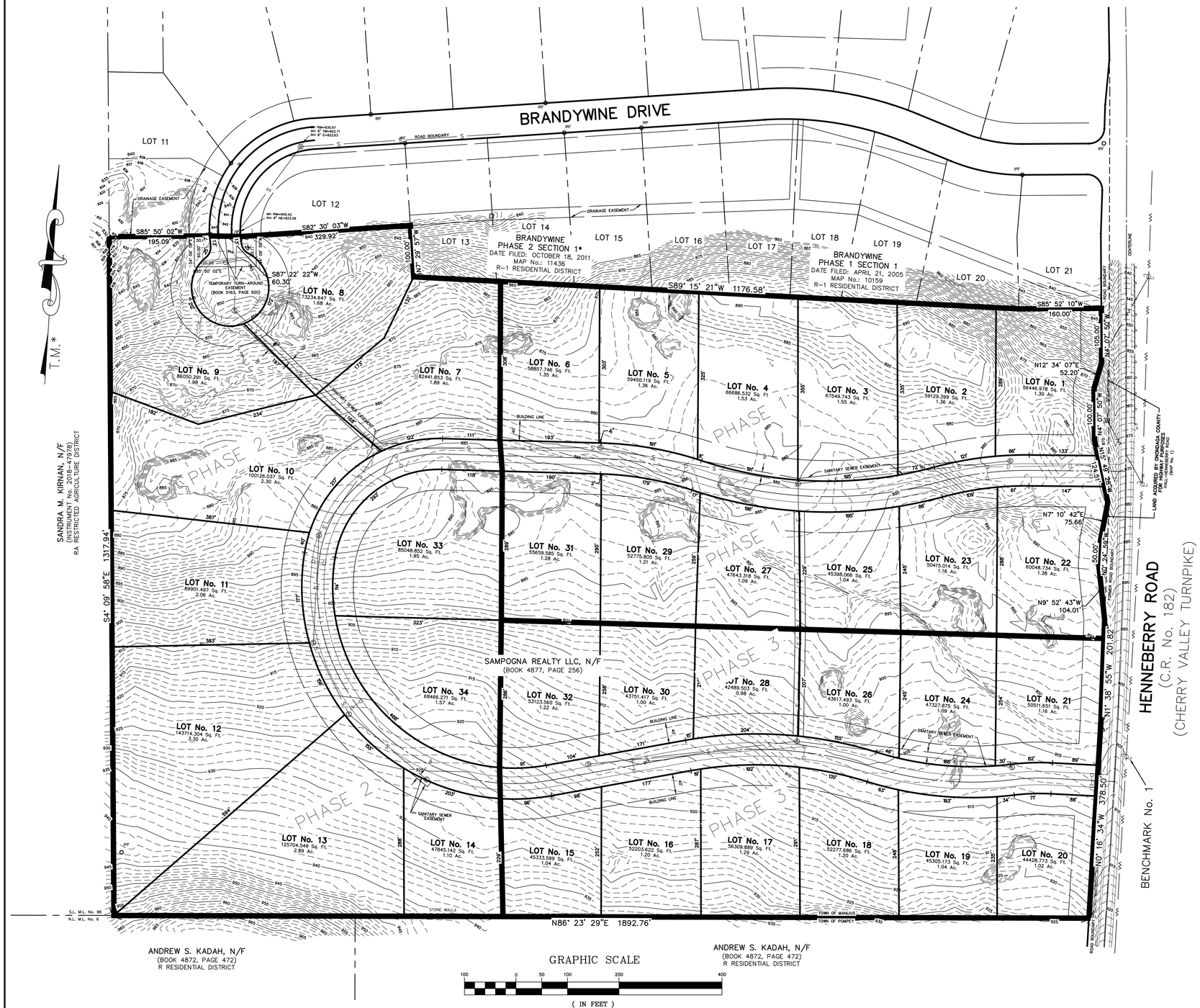
BENCHMARKS:

BENCHMARK NO. 1 – RAILROAD SPIKE SET
1.9' UP ON W/S UTILITY POLE LI 141 NG 6
ELEV=906.26

NOTES:

Total area: 54.746± acres.
Total number of lots: 1
Present Zone: R-1 Residential District
Elevations referred to NAVD 88.
Location of underground utilities taken by field measurement where practicable, otherwise taken from various other sources and are approximate only.
The premises shown hereon is within Zone "X" (Areas determined to be outside the 0.2% annual chance floodplain.)according to Federal Emergency Management Agency National Flood Insurance Program Flood Insurance Rate Map Community Panel No. 360584 357 F, Effective date: November 4, 2016.
Tax Map No. 109.-02-7.1



GRAPHIC SCALE
100 0 50 100 200 400
(IN FEET)
1 inch = 100 ft.

LEGEND:

- indicates original grade
- indicates light stand
- indicates utility pole, anchor & overhead lines
- indicates iron pipe and/or monument found
- indicates bollard
- indicates sign
- indicates storm culvert
- indicates gas main, gas valve & gas line marker
- indicates water main, water valve & hydrant
- indicates storm sewer, catch basin & manhole
- indicates sanitary sewer, sewer vent & manhole
- indicates underground telephone line, manhole & box
- indicates underground electric line & manhole
- indicates underground television cable & box
- indicates monument to be set
- indicates boundary line
- indicates adjacent parcel line
- indicates old/original parcel line
- indicates easement line
- indicates centerline road

Subject to any statement of facts an accurate and up to date abstract of title will show.

Unauthorized alteration or addition to a survey map bearing a licensed land surveyor's seal is a violation of section 7209, sub-division 2, of the New York State Education Law.

\\Server\Civil 3D Projects\ONONDAGA COUNTY\TRACTS\BRANDYWINE\PHASE 3\dwg\BRANDYWINE PHASE 3_PP.dwg

REVISIONS	
	7-1-2020

PRELIMINARY PLAN

BRANDYWINE
PHASE 3
PART OF FARM LOT No. 96
TOWN OF MANLIUS
ONONDAGA COUNTY, NEW YORK

STATE OF NEW YORK · TIMOTHY J. COYER · 050656 · LICENSED LAND SURVEYOR

IANUZI & ROMANS LAND SURVEYING, P.C.
5251 WITZ DRIVE
NORTH SYRACUSE, NY 13212
PHONE: (315) 457-7200
FAX: (315) 457-9251
EMAIL: mail@romanspc.com

DATE: APRIL 28, 2020
SCALE: 1" = 100'
FILE No.: 1215.054
SHEET No.
F.B. No. 1304

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 which 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: Harrington Homes at Brandywine		
Project Location (describe, and attach a location map): Henneberry Road		
Brief Description of Proposed Action: subdivision of 34 single family home lots		
Name of Applicant or Sponsor: Napierala Consutling	Telephone: 315-682-5580 E-Mail: nzinsmeyer@napcon.com	
Address: 110 Fayette Streeet		
City/PO: Manlius	State: NY	Zip Code: 13104

	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: NYSDEC OCDOT OCWEP	☐	☑

3. a. Total acreage of the site of the proposed action? 54 acres
   b. Total acreage to be physically disturbed? 20 acres
   c. Total acreage (project site and any contiguous properties) owned or controlled by the applicant or project sponsor? 54 acres

4. Check all land uses that occur on, are adjoining or near the proposed action:

5. ☑ 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?	☐	☑
7. Is the site of the proposed action located in, or does it adjoin, a state listed Critical Environmental Area? If Yes, identify: _____	☑	☐
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?	☑	☐
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: _____ _____	☐	☑
10. Will the proposed action connect to an existing public/private water supply? If No, describe method for providing potable water: _____ individual wells for each proposed single family home lot _____	☑	☐
11. Will the proposed action connect to existing wastewater utilities? If No, describe method for providing wastewater treatment: _____ _____	☐	☑
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?	☐	☑
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 flood plan?	☑	☐
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: stormwater management systems designed to current standards	☐	☑
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: stormwater management	☐	☑
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:	☑	☐

I CERTIFY THAT THE INFORMATION PROVIDED ABOVE IS TRUE AND ACCURATE TO THE BEST OF MY KNOWLEDGE

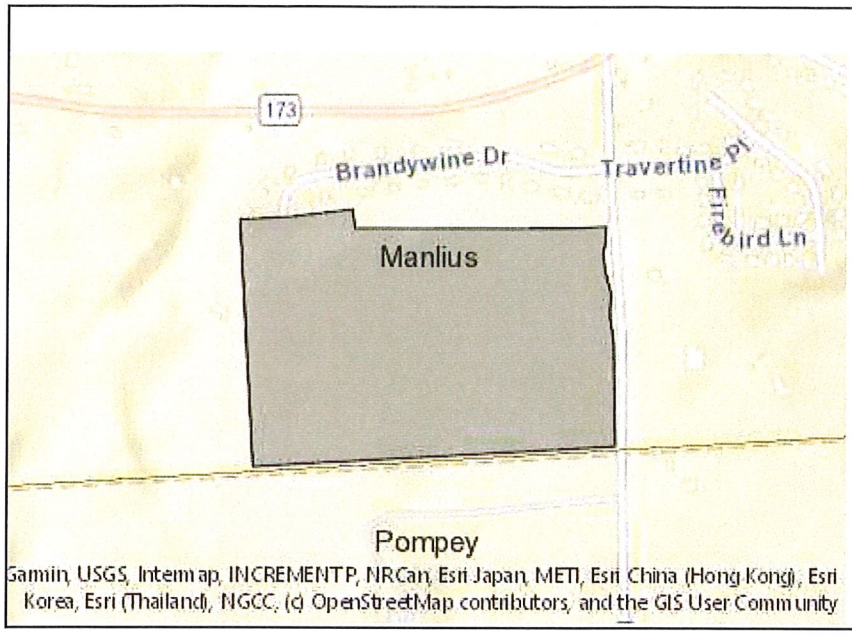
Applicant/sponsor/name: Napierala Consulting Date: 09/11/2020

Signature: Title: Project Engineer

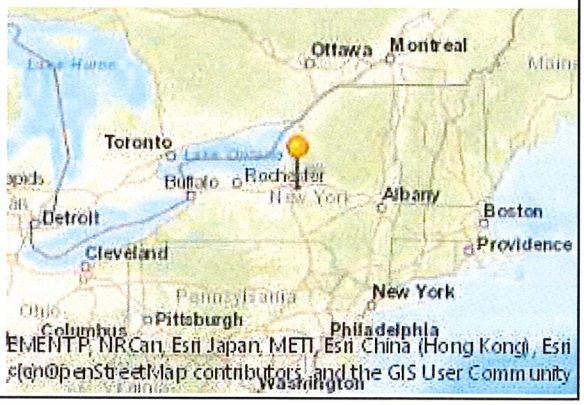
PRINT FORM

EAF Mapper Summary Report

Friday, September 11, 2020 2:31 PM



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 in order to obtain data not provided by the Mapper. Digital data is not a substitute for agency determinations.



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 and federal wetlands and waterbodies is known to be incomplete. Refer to 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 Year Flood Plain]	No
Part 1 / Question 20 [Remediation Site]	No

Expected Fee: _____

TOWN OF MANLIUS
PLANNING DEPARTMENT
INITIAL APPEARANCE APPLICATION

DATE: 09/16/20

Name of Project: Harrington Homes at Brandywine

Applicant must submit 12 copies of all site plans, surveys, and supporting data with the final application before a planning board meeting can be scheduled.

Location of Project: Henneberry Road

Type of Project:

● Division of Land ● Subdivision ○ Accessory Use ○ Zone Change ● Site Review ○ Other _____

Developer: Harrington Homes (Mark Harrington) Phone: 315-682-8851

Address: 3848 Henneberry Road, Jamesville, NY Zip: 13078

Tax Map Number(#)/s: 109.-02-07.1

Present Zoning: R-1 Desired Zoning: N/A

Total Acreage: 54 Total Number of Lots: 34

Property Owner/s: Same as Developer above Phone: _____

Address: _____ Zip: _____

Tax Map#(s): _____ Owner's Signature: X

Printed Name: MARK HARRINGTON

Property Owner/s: _____ Phone: _____

Address: _____ Zip: _____

Tax Map#(s): _____ Owner's Signature: _____

Printed Name: MARK HARRINGTON

Use next page for additional known property owners' information

---

Planning Board Meeting Date Assignment: _____

Fee: _____ Paid: _____ Per: ○ Credit/Debit Card ○ Check ○ Cash

TOWN OF MANLIUS
PLANNING DEPARTMENT
INITIAL APPEARANCE APPLICATION
(continued)

Property Owner/s: MARK HARRINGTON Phone: 315 682 8851

Address: 3848 HONEYBERRY RD JAMESVILLE NY Zip: 13078

Tax Map#(s): Owner's Signature:

Printed Name: MARK HARRINGTON

Property Owner/s: Phone:

Address: Zip:

Tax Map#(s): Owner's Signature:

Printed Name:

Property Owner/s: Phone:

Address: Zip:

Tax Map#(s): Owner's Signature:

Printed Name:

Property Owner/s: Phone:

Address: Zip:

Tax Map#(s): Owner's Signature:

Printed Name:

Property Owner/s: Phone:

Address: Zip:

Tax Map#(s): Owner's Signature:

Printed Name:

Property Owner/s: Phone:

Address: Zip:

Tax Map#(s): Owner's Signature:

Printed Name:

CORPORATE ACKNOWLEDGEMENT

STATE OF NEW YORK)
) SS:
COUNTY OF ONONDAGA)

MARK HARRINGTON, being duly sworn, deposes and says the s(he) is the OFFICER of HARRINGTON HOMES OF SYRACUSE INC corporation named in the within Application/Petition, that s(he) has read the foregoing affidavit and knows the contents thereof; that the same is true of s(he) own knowledge, except as to those matters therein stated to be alleged upon information and belief, and as to those matters s(he) believes it to be true.

Applicant Signature

Subscribed to me before this day
Of 14th SEPTEMBER, 2020

Notary Public

PARUL PATEL
NOTARY PUBLIC-STATE OF NEW YORK
No. 01PA6350018
Qualified in Onondaga County
My Commission Expires 10-31-2020

06/29/16 LB

III. That no Town of Manlius officer, employee or a relative of either, as defined in Section 809 General Municipal Law has any interest in this application.

-OR-

If a Town of Manlius officer, employee or relative of either as defined in Section 809 General Municipal law has any interest in this application, the full particulars are provided on an attached sheet.

Date: 9/14, 2020.

MARK HARRINGTON
(Print Name)

(Signature)

HARRINGTON HOMES OF JAMESVILLE INC
(Entity Name)

By (Officer) (Title)

3848 HENNEBERRY RD. JAMESVILLE NY 13078
(Mailing Address of Applicant)

315-682-8851
(Telephone Number)

Date: ——, 20——.

(Print Name)

(Signature)

(Entity Name)

By (Officer) (Title)

(Mailing Address of Applicant)

(Telephone Number)

ACKNOWLEDGEMENTS

STATE OF NEW YORK)
) SS:
COUNTY OF ONONDAGA)

On this 14th day of SEPTEMBER in the year 2020, before me, the undersigned, a notary public in and for said state, personally appeared HARRINGTON, MARK, SMYTH, and —— personally known to me or proved to me on the basis of satisfactory evidence to be the individual whose name is subscribed to the within Petition and acknowledged to me the he/she/they executed the same in his/her/their capacity, and that by his/her/their signature(s) on the Petition, the individual or the persons upon behalf of which the individual acted executed the instrument.

Notary Public

PARUL PATEL
NOTARY PUBLIC-STATE OF NEW YORK
No. 01PA6350018
Qualified in Onondaga County
My Commission Expires 10-31-2020

TOWN OF MANLIUS

DISCLOSURE AFFIDAVIT

This affidavit is a part of and must be completed and attached to every application, petition, request submitted for a *site plan, variance, amendment, change of zoning, approval of a plat, exemption from a plat or official map, license* or *permit.*

STATE OF NEW YORK)
) SS:
COUNTY OF ONONDAGA)

I. MARK HARRINGTON, being duly sworn, deposes and says that (s) he is:

_____
(applicant, petitioner, corporation officer, property owner, *etc.)*

II. That deponent has read and is familiar with the provisions of the General Municipal Law, Section 809 which states:

A. Every application, petition or request submitted for a site plan, variance, amendment, change of zoning, approval of a plat, exemption from a plat or official map, license or permit, pursuant to the provisions or any ordinance, local law, rule or regulation constituting the zoning and planning regulations of a municipality shall state the name, residence and the nature and extent of the interest of any state officer or any officer or employee of such municipality is a part, in the person, partnership or association making such application, petition or request (hereinafter called the applicant) to the extent known to such applicant.

B. For the purpose of this action an officer or employee shall be deemed to have an interest in the applicant when (s)he, his/her spouse, or their brothers, sisters, parents, children, grandchildren, or the spouse of any of them:

1) is the applicant, or
2) is an officer, director, partner or employee of the applicant, or
3) legally or beneficially owns or controls stock of a corporate applicant or is a member of a partnership or association applicant, or
4) is a party to an agreement with such an applicant, express or implied, whereby (s) he may receive any payment or other benefit, whether or not for services rendered, or contingent upon the favorable approval of such application, petition or request.

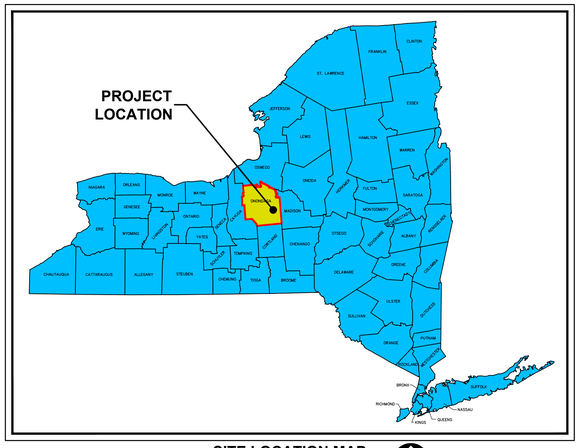
C. Ownership of less than five percent (5%) of the stock of a corporation whose stock is listed on the New York or American Stock Exchanges shall not constitute an interest for the purposes of this section.

D. A person who knowingly and intentionally violates this section shall be guilty of a misdemeanor.

PROPOSED BRANDYWINE ESTATES
PHASE 2 - 34 LOT SUBDIVISION

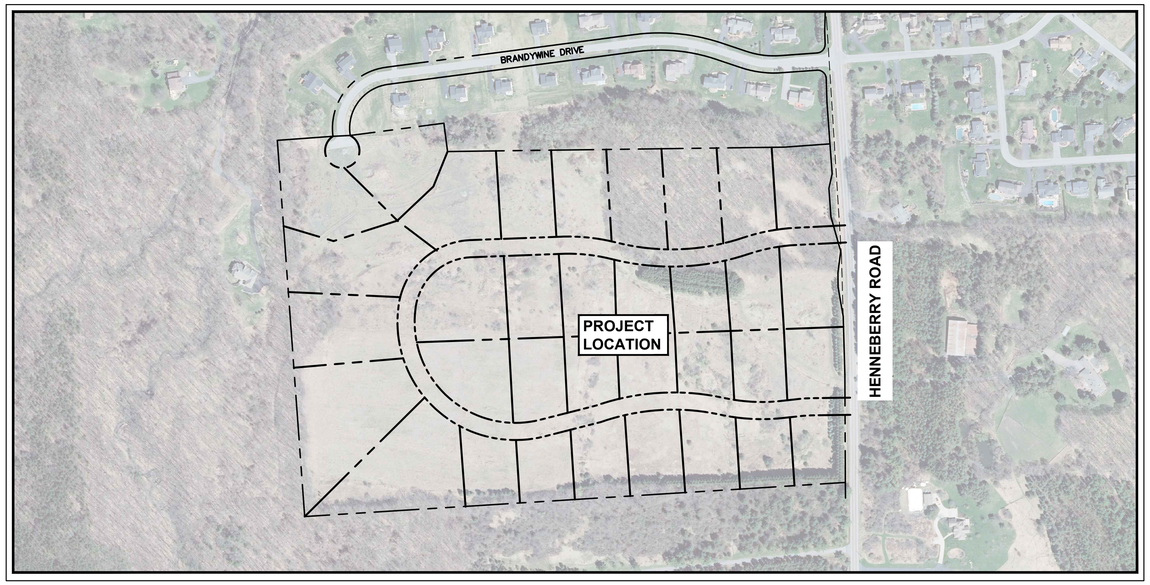
HENNEBERRY ROAD
TAX ID: 109.-02-07.1

TOWN OF MANLIUS
ONONDAGA COUNTY
NEW YORK STATE



SITE LOCATION MAP
NOT TO SCALE

PROJECT LOCATION MAP
NOT TO SCALE



AERIAL MAP
1"=250'

PREPARED BY:

NAPIERALA CONSULTING
PROFESSIONAL ENGINEER, P.C.
SITE • DESIGN • ENGINEERING
110 FAYETTE STREET
MANLIUS, NEW YORK 13104

email: MNAP@NAPCON.COM
PH: (315) 682-5580 FAX: (315) 682-5544

PREPARED FOR:

HARRINGTON HOMES
Your Builder for Life

3848 HENNEBERRY ROAD
JAMESVILLE, NY 13078

SHEET INDEX:

TITLE SHEET	C-0
GENERAL NOTES	C-1
OVERALL GRADING PLAN	C-2
OVERALL UTILITY PLAN	C-3
OVERALL ROAD PROFILE	C-4
ROAD PROFILE PLANS	C-5.0 THRU C-5.2
SEWER PROFILE PLANS	C-6.0 THRU C-6.1
SITE DETAILS	C-7.0 THRU C-7.2

PRELIMINARY PLANS - FINAL APPROVAL
REQUIRED BY ALL JURISDICTIONS

Dig Safely. New York
Call 811 before you dig

APPROVED BY OWNER

NAME DATE

SHEET TITLE:

TITLE SHEET

NO.	REVISION/ISSUE	DATE

COPYRIGHT © 2020
NAPIERALA CONSULTING PROFESSIONAL ENGINEER, P.C.

IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS ACTING UNDER THE DIRECTION OF A LICENSED ARCHITECT, PROFESSIONAL ENGINEER, LANDSCAPE ARCHITECT, OR LAND SURVEYOR TO ALTER ANY ITEM ON THIS DOCUMENT IN ANY WAY.

ANY LICENSEE WHO ALTERS THIS DOCUMENT IS REQUIRED BY LAW TO AFFIX HIS OR HER SEAL AND THE NOTATION "ALTERED BY" FOLLOWED BY HIS OR HER SIGNATURE AND SPECIFIC DESCRIPTION OF THE ALTERATIONS.

PLAN SEAL BY:
NEAL H. ZINSMEYER, JR., P.E.
NYS REGISTRATION # 087211

PROJECT NO.	DATE
20-1906	17 SEP 2020

PROPOSED BRANDYWINE ESTATES PHASE 2

HENNEBERRY ROAD
TOWN OF MANLIUS
ONONDAGA COUNTY, NY

SHEET
C-0

GENERAL NOTES

1. PROPERTY LINE INFORMATION TAKEN FROM A PLAN ENTITLED "TOPOGRAPHIC SURVEY, BRANDYWINE PHASE 3 – SECTION 1 PART OF FARM LOT NUMBER 96, TOWN OF MANLIUS" PREPARED BY IANUZI & ROMANS LAND SURVEYING, P.C.

2. THE PLANS SHOW SUBSURFACE STRUCTURES, ABOVEGROUND STRUCTURES, AND/OR UTILITIES FROM FIELD LOCATION AND RECORD MAPPING. EXACT LOCATION MAY VARY FROM THE LOCATIONS INDICATED. IN PARTICULAR, THE CONTRACTOR IS WARNED THAT THE EXACT OR EVEN APPROXIMATE LOCATION OF SUCH PIPELINES, SUBSURFACE STRUCTURES AND/OR UTILITIES IN THE AREA MAY BE DIFFERENT FROM THAT SHOWN OR MAY NOT BE SHOWN AND IT SHALL BE HIS RESPONSIBILITY TO PROCEED WITH GREAT CARE IN EXECUTING ANY WORK. THE CONTRACTOR IS TO CALL DIG SAFELY NY AT 1–800–962–7962 A MINIMUM OF 72 HOURS BEFORE DIGGING, DRILLING, OR BLASTING.

3. THE ENGINEER SHALL BE NOTIFIED IN WRITING OF ANY CONDITIONS THAT VARY FROM THOSE SHOWN ON THE PLANS. THE CONTRACTOR'S WORK SHALL NOT VARY FROM THE PLANS WITHOUT THE EXPRESSED APPROVAL OF THE ENGINEER.

4. THE CONTRACTOR IS INSTRUCTED TO COOPERATE WITH ANY AND ALL OTHER CONTRACTORS PERFORMING WORK ON THIS JOB SITE DURING THE PERFORMANCE OF THIS CONTRACT.

5. THE CONTRACTOR SHALL RESTORE LAWNS, DRIVEWAYS, CULVERTS, SIGNS, AND OTHER PUBLIC OR PRIVATE PROPERTY DAMAGED OR REMOVED TO AT LEAST AS GOOD A CONDITION AS BEFORE BEING DISTURBED AS DETERMINED BY THE ENGINEER. ANY DAMAGED TREES, SHRUBS, AND/OR HEDGES SHALL BE REPLACED AT THE CONTRACTOR'S EXPENSE.

6. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING AND INCURRING THE COST OF ALL REQUIRED PERMITS, INSPECTIONS, CERTIFICATES, ETC. AND SHALL COMPLY WITH ALL PERMITS.

7. ALL WORK SHALL BE DONE IN STRICT COMPLIANCE WITH ALL APPLICABLE NATIONAL, STATE, AND LOCAL CODES, STANDARDS, ORDINANCES, RULES, AND REGULATIONS.

8. ALL PROPOSED UTILITIES AND APPURTENANCES ARE TO BE CONSTRUCTED IN COMPLIANCE WITH THE LOCAL MUNICIPALITY'S CODES AND REGULATIONS GOVERNING THE INSTALLATION OF SUCH UTILITIES.

9. THE ENGINEER RESERVES THE RIGHT TO EXAMINE ANY WORK DONE ON THIS PROJECT AT ANY TIME TO DETERMINE CONFORMANCE WITH THE REQUIREMENTS OF THE CONTRACT DOCUMENTS OF THIS PROJECT AS INTENDED AND INTERPRETED BY THE ENGINEER.

10. MISCELLANEOUS WORK NOT SPECIFICALLY SHOWN ON THE CONTRACT DRAWINGS SUCH AS PATCHING, BLOCKING, TRIMMING, ETC. SHALL BE PERFORMED AS REQUIRED TO MAKE THE WORK COMPLETE.

11. THE CONTRACTOR SHALL PROTECT EXISTING PROPERTY LINE INFORMATION. ANY MONUMENTATION DISTURBED OR DESTROYED, AS JUDGED BY THE ENGINEER OR OWNER, SHALL BE REPLACED AT THE CONTRACTOR'S EXPENSE UNDER THE SUPERVISION OF A NEW YORK STATE LICENSED LAND SURVEYOR.

12. IT IS THE CONTRACTOR'S RESPONSIBILITY TO EXAMINE ALL PLAN SHEETS AND COORDINATE WORK WITH ALL OTHER CONTRACTS FOR THE SITE.

13. THE CONTRACTOR SHALL:
    A. VERIFY ALL CONDITIONS IN THE FIELD PRIOR TO COMMENCEMENT OF WORK AND NOTIFY THE ENGINEER OF ANY DISCREPANCIES.
    B. EXAMINE THE SITE AND INCLUDE IN HIS WORK THE EFFECT OF ALL EXISTING CONDITIONS ON THE WORK.
    C. PROVIDE AND INSTALL ALL MATERIALS AND PERFORM ALL WORK IN ACCORDANCE WITH RECOGNIZED GOOD STANDARD PRACTICE.
    D. HOLD THE OWNER HARMLESS AGAINST ANY AND ALL CLAIMS ARISING FROM WORK DONE BY THE CONTRACTOR ON THE SITE.

14. ALL TRENCH EXCAVATION AND ANY REQUIRED SHEETING AND SHORING SHALL BE DONE IN ACCORDANCE WITH THE LATEST REVISIONS OF NEW YORK STATE INDUSTRIAL CODE RULE 23 AND OSHA REGULATIONS FOR CONSTRUCTION. SHEET PILING SHALL BE DESIGNED AND SEALED BY A NEW YORK STATE PROFESSIONAL ENGINEER.

15. CONTRACTOR SHALL BE RESPONSIBLE FOR DEWATERING AND THE MAINTENANCE OF SURFACE DRAINAGE DURING THE COURSE OF WORK. HE SHALL SUBMIT A DEWATERING PLAN DESIGNED AND SEALED BY A NEW YORK STATE PROFESSIONAL ENGINEER. CONTRACTOR SHALL MAINTAIN EXISTING SITE DRAINAGE PATTERNS THROUGHOUT CONSTRUCTION.

16. ALL BACKFILL USED IN TRENCHES EXCAVATED IN EXISTING ROADWAYS SHALL BE PLACED IN MAXIMUM 6–INCH LIFTS AND COMPACTED BY MEANS OF A MECHANICAL COMPACTOR BETWEEN LIFTS TO 90% STANDARD PROCTOR COMPACTION.

17. WHEN BACKFILLING AROUND PROPOSED OR EXISTING STRUCTURES, MATERIAL SHALL BE PLACED IN MAXIMUM 6–INCH LIFTS AND COMPACTED BY MEANS OF A MECHANICAL COMPACTOR BETWEEN LIFTS TO 90% STANDARD PROCTOR COMPACTION.

18. ALL UTILITY WORK INVOLVING CONNECTIONS TO EXISTING SYSTEMS SHALL BE COORDINATED WITH THE ENGINEER AND THE UTILITY OWNER. NOTIFY THE ENGINEER AND THE UTILITY OWNER 72 HOURS BEFORE EACH AND EVERY CONNECTION TO AN EXISTING SYSTEM IS MADE.

19. CONSTRUCTION OF ALL PROPOSED UTILITIES MUST BEGIN AT ITS POINT OF CONNECTION TO THE EXISTING UTILITY OR AT THE LOWEST POINT IN THE SYSTEM. RIMS, GRATES, INVERTS, CLEARANCES, AND LOCATION AT CROSSINGS MUST BE VERIFIED PRIOR TO THE BEGINNING OF CONSTRUCTION.

20. MAINTAIN FLOW FOR ALL EXISTING UTILITIES.

21. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING ALL FIELD LAYOUT. THE CONTRACTOR SHALL TAKE TIES TO ALL UTILITY CONNECTIONS AND PROVIDE MARKED–UP AS–BUILT PLANS FOR ALL UTILITIES SHOWING TIES TO CONNECTIONS, BENDS, VALVES, LENGTHS OF LINES, AND INVERTS. THE OWNER AND HIS REPRESENTATIVES SHALL REVIEW AS–BUILT PLANS SHOWING ALL UNDERGROUND UTILITIES INSTALLED OR ENCOUNTERED. THE CONTRACTOR SHALL PROVIDE ANY CORRECTION OR OMISSIONS TO THE SATISFACTION OF THE OWNER AND HIS REPRESENTATIVES BEFORE UTILITIES WILL BE ACCEPTED.

22. THE CONTRACTOR SHALL MAINTAIN ALL TRAFFIC IN ALL AREAS IN ACCORDANCE WITH THE NYSDOT MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES.

23. THE CONTRACTOR SHALL MAINTAIN ACCESS TO ALL COMMERCIAL, RESIDENTIAL, AND PUBLIC PROPERTIES OR AS DIRECTED BY THE ENGINEER.

24. ALL EXCAVATIONS SHALL BE BACKFILLED TO EXISTING GRADE AT THE END OF EACH WORKDAY.

25. THE CONTRACTOR SHALL TAKE CARE TO PREVENT DAMAGE TO EXISTING UTILITIES. DAMAGED UTILITIES SHALL BE IMMEDIATELY REPAIRED BY THE CONTRACTOR AT THE CONTRACTOR'S EXPENSE.

SITE DEMOLITION NOTES

1. THE GENERAL CONSTRUCTION CONTRACTOR RESPONSIBLE FOR ANY CLEARING OR DEMOLITION WORK AS NOTED ON THIS PLAN.

2. EXISTING FEATURES ARE BASED ON A SURVEY BY IANUZI & ROMANS LAND SURVEYING, P.C.

3. OWNER WILL PROVIDE AN 'ALL CLEAR' PRIOR TO ANY CLEARING OR DEMOLITION.

4. THE CONTRACTOR SHALL CONTACT DIG SAFELY NEW YORK AT 811 FOR UTILITY STAKEOUTS A MINIMUM OF THREE (3) BUSINESS DAYS PRIOR TO ANY DEMOLITION WORK, SITE WORK, OR EXCAVATION.

5. THE CONTRACTOR SHALL COORDINATE WITH ALL PUBLIC AND PRIVATE UTILITIES FOR RESPECTIVE REQUIREMENTS FOR THE REMOVAL/ABANDONMENT OF UTILITY MAINS/LATERALS SERVICING THE SITE.

GRADING NOTES

1. MAXIMUM SLOPE FOR ALL CUT AND FILL LAWN AREAS SHALL BE 3H:1V UNLESS SHOWN OTHERWISE ON PLANS.

2. SLOPES GREATER THAN 4H:1V SHALL BE STABILIZED IMMEDIATELY AFTER GRADING OCCURS IN ACCORDANCE WITH THE NEW YORK STANDARDS AND SPECIFICATIONS FOR EROSION AND SEDIMENT CONTROL.

3. CONTRACTOR SHALL OBTAIN A COPY OF THE GEOTECHNICAL REPORT AND BECOME FAMILIAR WITH THE SOIL CONDITIONS ON THE SITE. CONTRACTOR SHALL FOLLOW ALL RECOMMENDATIONS AND REQUIREMENTS FROM THE GEOTECHNICAL ENGINEER.

4. UNLESS OTHERWISE NOTED, LIMITS OF DISTURBANCE ARE AS REPRESENTED BY PROPOSED GRADES. NO GRADING SHALL TAKE PLACE BEYOND LIMITS SHOWN.

5. ALL SLOPES STEEPER THAN 3H:1V SHALL BE TREATED WITH AN EROSION CONTROL PRACTICE SUCH AS A ROLLED EROSION CONTROL BLANKET OR RIPRAP. SEE DESIGNATED AREAS ON PLANS.

UTILITY NOTES

1. ALL CONSTRUCTION SHALL CONFORM WITH APPROPRIATE CODE AND REGULATORY REQUIREMENTS.

2. ALL UTILITIES SHALL BE INSTALLED IN ACCORDANCE WITH MUNICIPAL REGULATIONS AND THE STANDARDS OF THE PRIVATE UTILITY COMPANIES.

3. PRIVATE UTILITY SERVICE FINAL LOCATION, SIZE AND DEPTH ARE SUBJECT TO THE APPROVAL OF THE UTILITY COMPANY.

4. EXTERIOR BUILDING LIGHTING LUMINARIES SHALL BE OF SIZE AND TYPE, AND AT LOCATIONS SPECIFIED BY THE ARCHITECTS ELECTRICAL SITE PLAN AND SHALL CONFORM TO THE MUNICIPAL ZONING REQUIREMENTS.

5. WATER
   WATER LINES, FITTINGS AND APPURTENANCES TO BE IN CONFORMANCE WITH APPROPRIATE CODE AND REGULATORY REQUIREMENTS. VERIFY EXISTING LINE SIZE AND LOCATION PRIOR TO CONSTRUCTION. ALL WATER LINES MUST MAINTAIN A MINIMUM 10' HORIZONTAL SEPARATION WITH SANITARY SEWER AND STORM SEWER LINES. ALL WATER MAIN AND SERVICE WORK MUST BE COORDINATED WITH THE MUNICIPAL WATER DEPARTMENT.

6. SOME LOTS SHALL BE SERVED BY INDIVIDUAL WATER SUPPLY WELLS, WITH THE EXCEPTION OF LOTS #8 AND #9 WHICH CAN BE SERVED BY OCWA PUBLIC WATER SUPPLY.

7. SANITARY SEWER
   SANITARY SEWERS SHALL BE PVC PER ASTM D3034 SDR 35 UNLESS OTHERWISE NOTED. SUITABLE COUPLINGS AND ADAPTERS SHALL BE PROVIDED AT BUILDING CONNECTIONS.

8. STORM DRAINAGE
   STORM DRAINAGE PIPING SHALL BE SMOOTH INTERIOR CORRUGATED PLASTIC PIPE (SICPP) UNLESS OTHERWISE NOTED (SICPP). PIPE JOINTS AND FITTINGS SHALL CONFORM TO AASHTO M252 OR AASHTO M294.

9. ELECTRIC AND GAS
   ALL ELECTRIC AND GAS INSTALLATION SHALL BE COORDINATED WITH NATIONAL GRID.

LEGEND: PROPOSED
(SEE EXISTING CONDITION SURVEY FOR LEGEND OF EXISTING ELEMENTS)

- ----- PROPOSED BUILDING
- ----- PROPERTY LINE
- ----- PROPOSED EASEMENT LINE
- ----- PROPOSED STORM INLET
- ----- PROPOSED MANHOLE (STORM OR SEWER AS NOTED)
- SAN ----- PROPOSED SANITARY PIPE
- ST ----- PROPOSED STORM PIPE
- W ----- PROPOSED WATER PIPE
- G ----- PROPOSED GAS PIPE
- UGE ----- PROPOSED UNDERGROUND ELECTRIC
- ----- PROPOSED STOCKADE FENCE

LANDSCAPE NOTES

TEMPORARY SEEDING MIXTURES

	LBS./ACRE	LBS./1000 SQ. FT
FOR SPRING, SUMMER OR EARLY FALL SEEDINGS:		
A. ANNUAL RYEGRASS –OR–	30	0.70
B. PERENNIAL RYEGRASS	30	0.70
FOR LATE FALL OR EARLY WINTER		
A. WINTER RYE (AROOSTOOK)	100	2.50

MULCH THE AREA WITH HAY OR STRAW AT 2 TONS/ACRE (APPROXIMATELY 2 LARGE ROLLED BALES/ACRE).

MULCH ANCHORING IS REQUIRED WHERE WIND OR AREAS OF CONCENTRATED WATER ARE OF CONCERN.

PERMANENT SEEDINGS SHOULD TAKE PLACE IN EARLY SPRING. PROPER MULCHING AND ADAQUATE MOISTURE MUST BE PROVIDED FOR PERMANENT SEEDING. RESEEDING OF FAILED AREAS SHALL TAKE PLACE DURING LATE SUMMER/EARLY FALL OR DURING THE FOLLOWING SPRING.

FERTILIZER:
5% NITROGEN
0% PHOSPHORUS
5% POTASH

HYDROMULCH
HYDROMULCH SHALL BE A WOOD–FIBER COMPOSITION (50% PAPER – 50% WOOD)
IF MULCHING IS NOT APPLIED WITH HYDROSEED MIXTURE, APPROVED MULCHING, CONSISTING OF STALKS OF WHEAT, OATS, OR RYE, SHALL BE SPREAD EVENLY AT A RATE OF 2 TONS PER ACRE. MULCH IS TO BE TACKED INTO PLACE.

PERMANENT SEEDING MIXTURES

	LBS./ACRE
SEED MIXTURE NO. 1	
CREEPING RED FESCUE (var. ENSYLVA)	10
PERENNIAL RYE GRASS (var. PENNFINE)	10
SEED MIXTURE NO. 2	
SWITCHGRASS (var. SHELTER, PATHFINDER, TRAILBLAZER, OR BLACKWELL)	20
SEED MIXTURE NO. 3	
BIRDSFOOT TREFOIL (var. EMPIRE, PARDEE)	10
REDTOP	2
TALL FESCUE (var. KY 31, REBEL)	20
SEED MIXTURE NO. 4	
CREEPING RED FESCUE (var. ENSYLVA)	20
CHEWINGS FESCUE (COMMON)	20
PERENNIAL RYE GRASS (var. PENNFINE)	5
RED CLOVER (COMMON)	10

SEED MIXTURE 1 TO BE APPLIED TO SHADED AREAS.

SEED MIXTURE 2 IS IN PURE LIVE SEED. TO BE APPLIED TO AREAS UPLAND OF WETLANDS AND ALONG STORMWATER MITIGATION BASIN BANKS.

SEED MIXTURE 3 TO BE APPLIED TO ALL SWALES AND WATERWAYS. WHITE CLOVER OR LADINO CLOVER MAY BE SUBSTITUTED FOR BRIDSFOOT TREFOIL AND SEEDED AT THE SAME RATE
PERENNIAL RYEGRASS MAY BE SUBSTITUTED FOR REDTOP BUT INCREASE SEEDING RATE TO 5 LBS./ACRE (0.1 LBS./1000 SQ. FT)

SEED MIXTURE 4 TO BE APPLIED TO ALL AREAS. (NOT FOR USE IN PLAYGROUNDS OR AS TURF)

METHOD OF SEEDING
BROADCAST, DRILLING WITH A CULTIPACK TYPE SEEDER, OR HYDROSEEDING ARE ACCEPTABLE. GOOD SOIL TO SEED CONTACT IS THE KEY TO SUCCESSFUL SEEDINGS.

MULCHING
APPLY STRAW MULCH AT A RATE OF 2 TON/ACRE (90 LBS./1,000 SF) ANCHORED WITH WOOD FIBER MULCH (HYDROMULCH) AT 500 – 750 LBS./ACRE (11 – 17 LBS./1,000 SF). THE WOOD FIBER MULCH MUST BE APPLIED THROUGH A HYDROSEEDER AFTER MULCHING.

IRRIGATION
WATERING MAY BE ESSENTIAL TO ESTABLISH TO NEW SEEDING. WEATHER CONDITIONS WILL DICTATE WHEN TO WATER. EACH APPLICATION MUST BE UNIFORMLY APPLIED AND 1 TO 2 INCHES OF WATER SHOULD BE APPLIED PER APPLICATION.

PERMANENT SEEDING TO OCCUR AFTER FINAL GRADING HAS OCCURRED. PERMANENT SEEDING WILL INCLUDE:
SITE PREPARATION
A. SCARIFY ALL COMPACT, SLOWLY PERMEABLE, MEDIUM AND FINE TEXTURED SUBSOIL AREAS. SCARIFY AT APPROXIMATELY RIGHT ANGLES TO THE SLOPE DIRECTION IN SOIL AREAS THAT ARE STEEPER THAN 5 PERCENT.
B. REMOVE REFUSE, WOOD PLANT PARTS, STONES OVER 3 INCHES IN DIAMETER, AND OTHER LITTER.

TOPSOIL MATERIALS
A. TOPSOIL SHALL HAVE AT LEAST 2 PERCENT AND NO GREATER THAN 6 PERCENT BY WEIGHT OF FINE TEXTURED STABLE ORGANIC MATERIAL.
B. TOPSOIL SHALL HAVE NOT LESS THAN 20 PERCENT FINE TEXTURED MATERIAL (PASSING THE NO. 200 SIEVE) AND NOT MORE THAN 15 PERCENT CLAY.
C. TOPSOIL TREATED WITH SOIL STERILANTS OR HERBICIDES SHALL BE SO IDENTIFIED TO THE PURCHASER.
D. TOPSOIL SHALL BE RELATIVELY FREE OF STONES OVER 1½" INCHES IN DIAMETER, TRASH, NOXIOUS WEEDS SUCH AS NUTSEDGE AND QUACKGRASS, AND WILL HAVE LESS THAN 10% GRAVEL BY VOLUME.
E. TOPSOIL CONTAINING SOLUBLE SALTS GREATER THAN 500 PPM SHALL NOT BE USED.

APPLICATION AND GRADING
A. TOPSOIL SHALL BE DISTRIBUTED TO A UNIFORM DEPTH OVER THE AREA. IT SHALL NOT BE PLACED WHEN IT IS PARTLY FROZEN, MUDDY, OR ON FROZEN SLOPES OR OVER ICE, SNOW, OR STANDING WATER PUDDLES.
B. TOPSOIL PLACED AND GRADED ON SLOPES STEEPER THAN 5% SHALL BE PROMPTLY FERTILIZED, SEEDED, MULCHED AND STABILIZED BY "TRACKING" WITH SUITABLE EQUIPMENT.
C. A MINIMUM OF 4 INCHES OF TOPSOIL IS TO BE USED IN ALL AREAS.

SOIL AMENDMENTS
A. LIME TO A pH OF 7.0. LIME IS NOT TO BE APPLIED WITHIN 50 FEET OF STREAMS AND WETLANDS.
B. FERTILIZER APPLICATION RATE TO BE BASED ON SOIL TESTS.
   1. IN NO CASE SHALL FERTILIZER BE APPLIED BETWEEN DECEMBER 1 AND APRIL 1 ANNUALLY.
   2. FERTILIZER SHALL NOT BE SPREAD WITHIN 20 FEET OF A SURFACE WATER.
   3. ANY FERTILIZER FALLING OR SPILLED INTO IMPERVIOUS SURFACE AREAS SUCH AS PARKING LOTS, ROADWAYS, AND SIDEWALKS SHALL BE IMMEDIATELY CONTAINED AND LEGALLY APPLIED OR PLACED IN AN APPROPRIATE CONTAINER.
   4. INCORPORATE THE FERTILIZER, AND LIME IF SPECIFIED, INTO THE TOP 2 – 4 INCHES OF THE TOPSOIL OR SOIL PROFILE.
   5. WHEN APPLYING FERTILIZER BY HYDROSEEDING CARE SHOULD BE TAKEN TO APPLY MIX ONLY TO SEED BED AREAS AT AN APPROPRIATE FLOW RATE TO PREVENT EROSION AND SPRAYING ONTO IMPERVIOUS AREAS.

PROJECT TITLE:
BRANDYWINE ESTATES PHASE 2
HENNEBERRY ROAD
TOWN OF MANLIUS — ONONDAGA COUNTY, NY

PREPARED FOR:
HARRINGTON HOMES
3848 HENNEBERRY ROAD
JAMESVILLE, NY 13078

SHEET TITLE:
GENERAL NOTES

NO.	REVISION/ISSUE	DATE

PREPARED BY:
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PROJECT NO. 20-1906
DATE 17 SEP 2020
SCALE NTS

PLAN SEAL BY:
NEAL H. ZINSMEYER, JR., P.E.
NYS REGISTRATION # 087211

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SHEET **C-1**

SITE CRITERIA CHECKLIST

PROJECT SITE INFORMATION		
ADDRESS	HENNEBERRY ROAD (COUNTY ROUTE 182)	
TAX MAP ID NO.	109.-02.-07.1	
BOUNDARY SURVEY	PROPERTY LINE INFORMATION TAKEN FROM SURVEY BY IANUZI AND ROMANS	
TOTAL SITE AREA	54.746 ACRES	
LAND USE	SINGLE FAMILY RESIDENTIAL – 34 LOTS	
ZONING INFORMATION		
ZONING DISTRICT	R-1, RESIDENTIAL DISTRICT	
	REQUIRED	PROVIDED
MIN. LOT FRONTAGE	150'	150' MIN.
MIN. LOT AREA	40,000 SF	40,000 SF MIN.
MINIMUM FRONT YARD	40'	40' MIN.
MINIMUM REAR YARD	40'	40' MIN.
MINIMUM SIDE YARD	20'	20' MIN.

PROJECT TITLE:
BRANDYWINE ESTATES PHASE 2
HENNEBERRY ROAD
TOWN OF MANLIUS — ONONDAGA COUNTY, NY

PREPARED FOR:
HARRINGTON HOMES
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SHEET TITLE:
PRELIMINARY OVERALL GRADING PLAN

NO.	REVISION/ISSUE	DATE

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PROJECT NO.	DATE	SCALE
20-1906	17 SEP 2020	1" = 80'

SHEET
C-2

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NOTE:

STORM CONVEYANCE SYSTEM PIPE SLOPE, RIM, AND INVERT ELEVATIONS CAN BE SEEN ON THE OVERALL GRADING PLAN, SHEET C-2.

GRAPHIC SCALE
0 80' 160'
(IN FEET)
1 inch = 80 ft

PROJECT TITLE:
BRANDYWINE ESTATES PHASE 2
HENNEBERRY ROAD
TOWN OF MANLIUS ONONDAGA COUNTY, NY

PREPARED FOR:
HARRINGTON HOMES
3848 HENNEBERRY ROAD
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SHEET TITLE:
PRELIMINARY OVERALL UTILITY PLAN

NO.	REVISION/ISSUE	DATE

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PROJECT NO. 20-1906
DATE 17 SEP 2020
SCALE 1" = 80'

SHEET C-3

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1 C-6.0 OVERALL ROAD PLAN
SCALE: 1"=100'

2 C-6.0 OVERALL ROAD PROFILE
SCALE: H: 1"=120' V:1"=12'

PROJECT TITLE:
BRANDYWINE ESTATES PHASE 2
HENNEBERRY ROAD
TOWN OF MANLIUS — ONONDAGA COUNTY, NY

PREPARED FOR:
HARRINGTON HOMES
3848 HENNEBERRY ROAD
JAMESVILLE, NY 13078

SHEET TITLE:
OVERALL ROAD PROFILE

NO.	REVISION/ISSUE	DATE

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PROJECT NO. 20-1906
DATE 17 SEP 2020
SCALE AS NOTED

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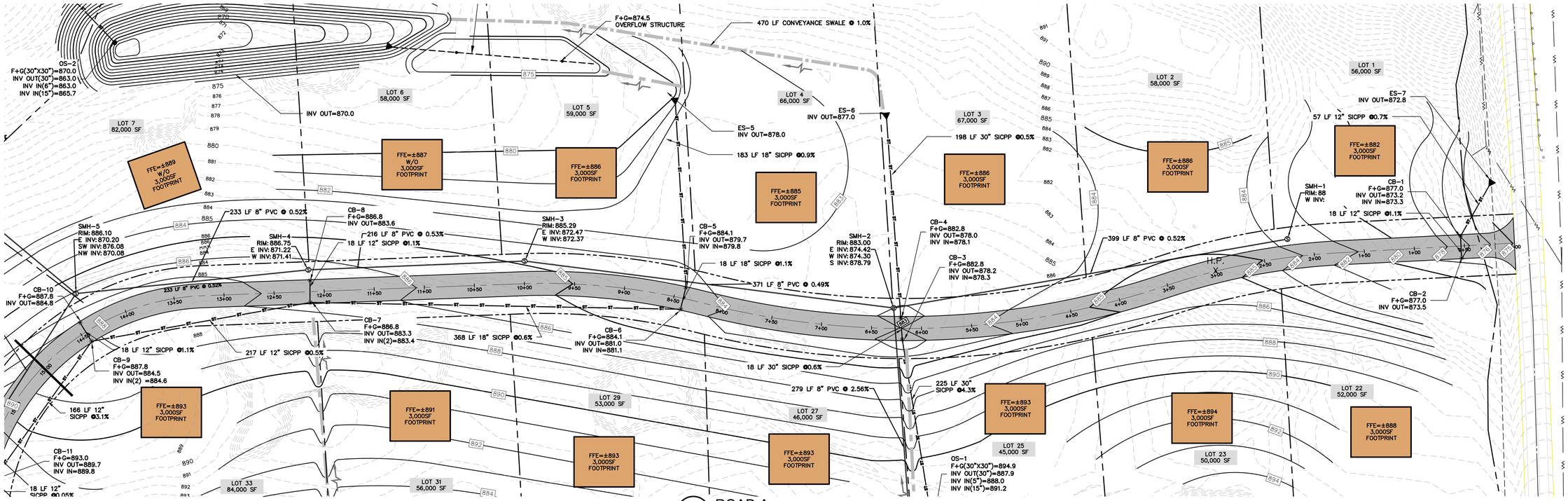
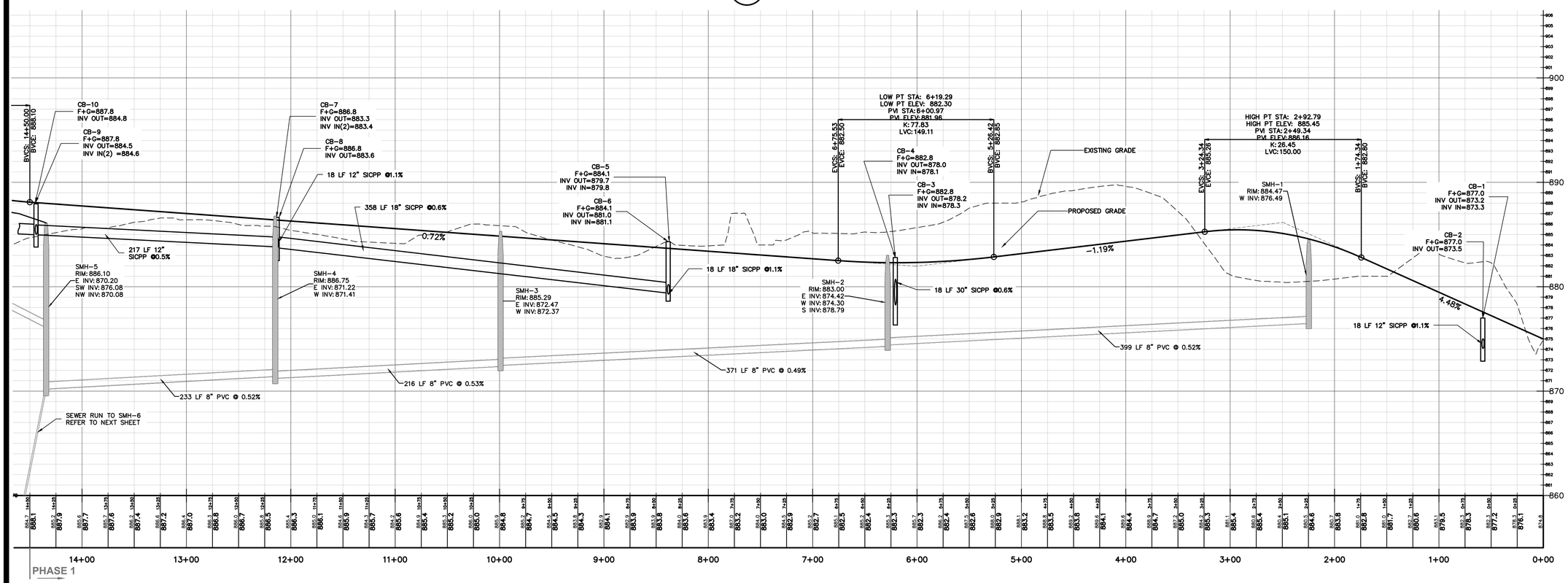
ADDITIONS TO THIS DOCUMENT BY OTHERS THE DOCUMENT BEARING THE SEAL OF JAMY TOLMATCH, 76 TIMBER RIDGE DRIVE, CHITTENANGO, NY 13037 IS PROHIBITED WITHOUT THE WRITTEN CONSENT OF THE ALTERATIONS.

SHEET **C-4**



1 ROAD A
C-5.0 SCALE: 1"=50'



2 ROAD A PROFILE - SUBDIVISION PHASE 1
C-5.0 SCALE: H:1"=50' V:1"=5'

GRAPHIC SCALE
0 50' 100'
(IN FEET)
1 inch = 50 ft

PROJECT TITLE:
BRANDYWINE ESTATES PHASE 2
HENNEBERRY ROAD
TOWN OF MANLIUS — ONONDAGA COUNTY, NY

PREPARED FOR:
HARRINGTON HOMES
3848 HENNEBERRY ROAD
JAMESVILLE, NY 13078

SHEET TITLE:
ROAD PROFILE PLAN

NO.	REVISION/ISSUE	DATE

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PROJECT NO. 20-1906
DATE 17 SEP 2020
SCALE 1" = 50'
SHEET C-5.0

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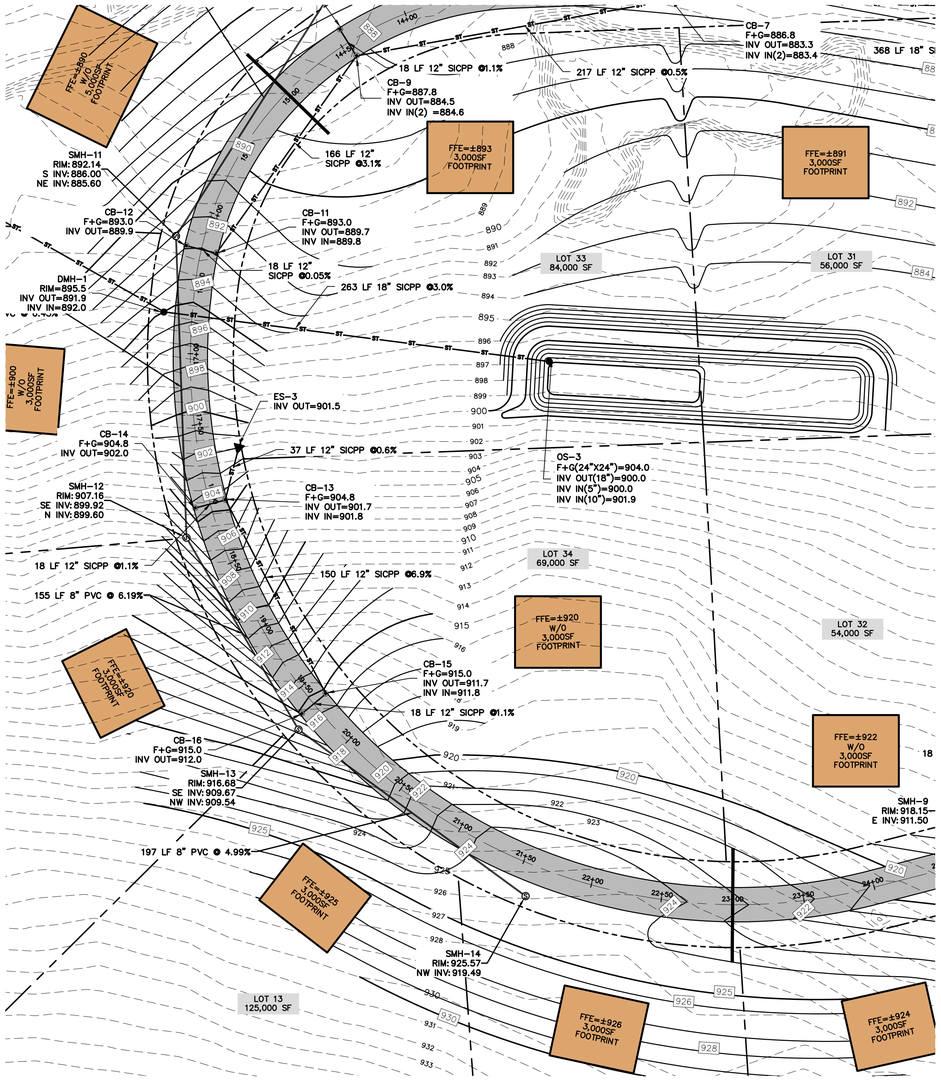
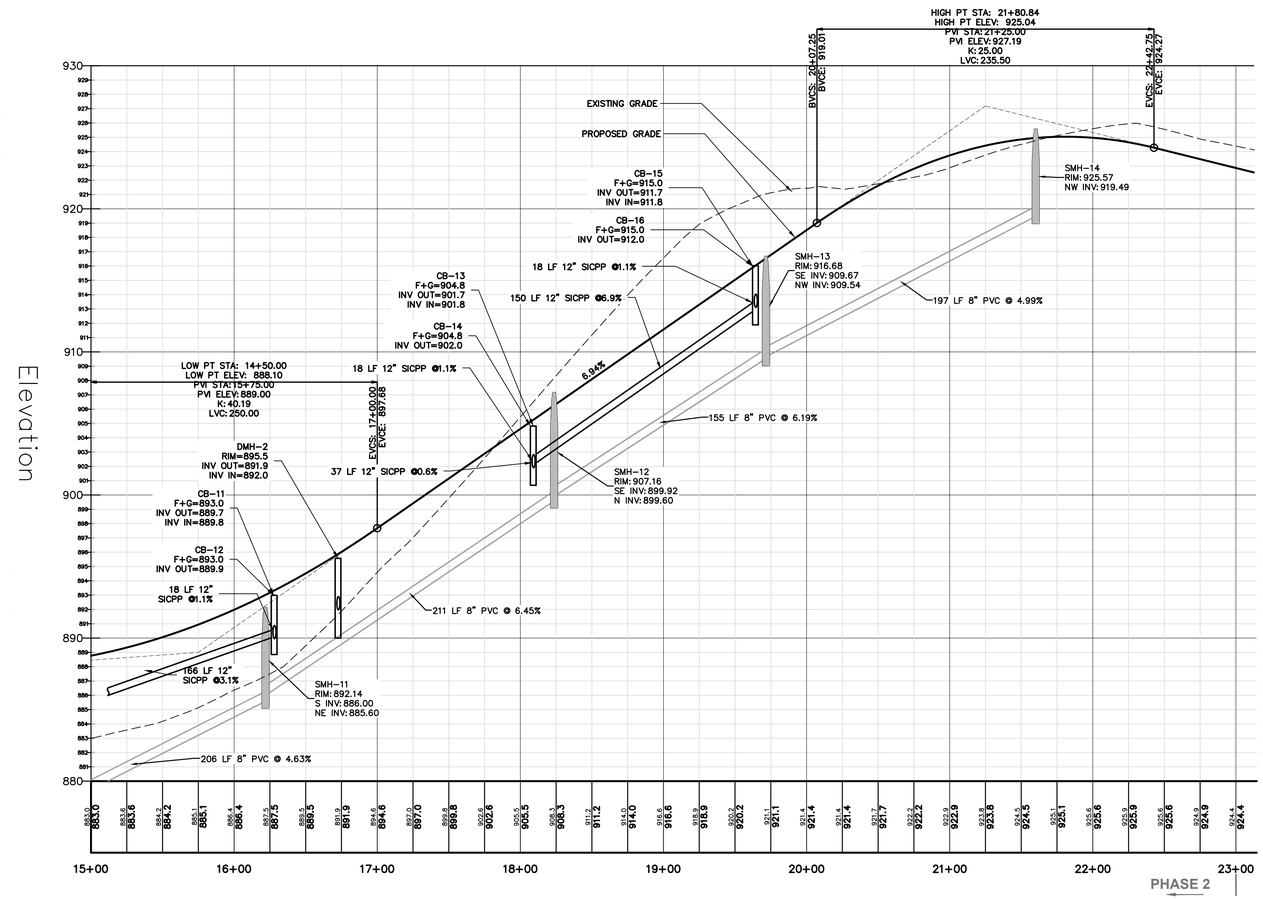


1 C-5.1 ROAD A PLAN
SCALE: 1"=50'



2 C-5.1 ROAD A PROFILE - SUBDIVISION PHASE 2
SCALE: H: 1"=50' V: 1"=5'

GRAPHIC SCALE
0 50' 100'
(IN FEET)
1 inch = 50 ft

PRELIMINARY
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PLAN SEAL BY:
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PROJECT TITLE:
BRANDYWINE ESTATES PHASE 2
HENNEBERRY ROAD
TOWN OF MANLIUS — ONONDAGA COUNTY, NY

PREPARED FOR:
HARRINGTON HOMES
3848 HENNEBERRY ROAD
JAMESVILLE, NY 13078

SHEET TITLE:
ROAD PROFILE PLAN

NO.	REVISION/ISSUE	DATE

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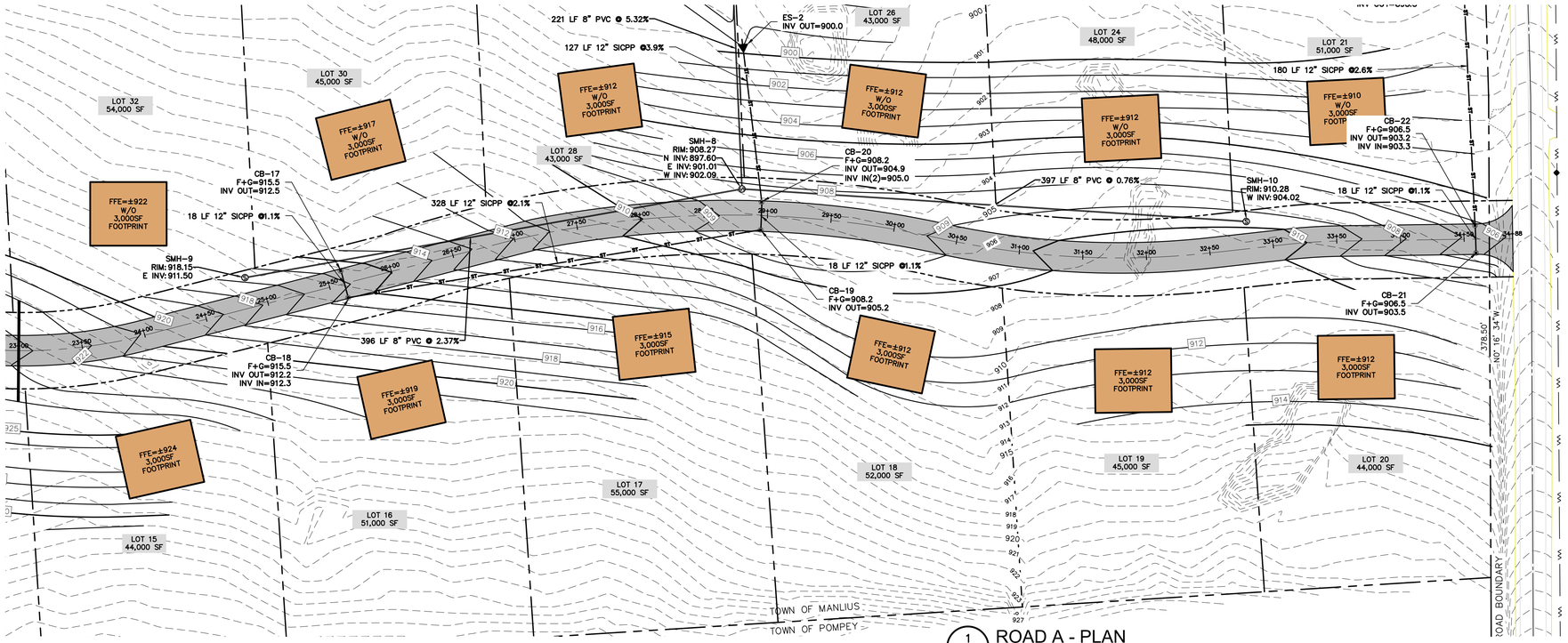
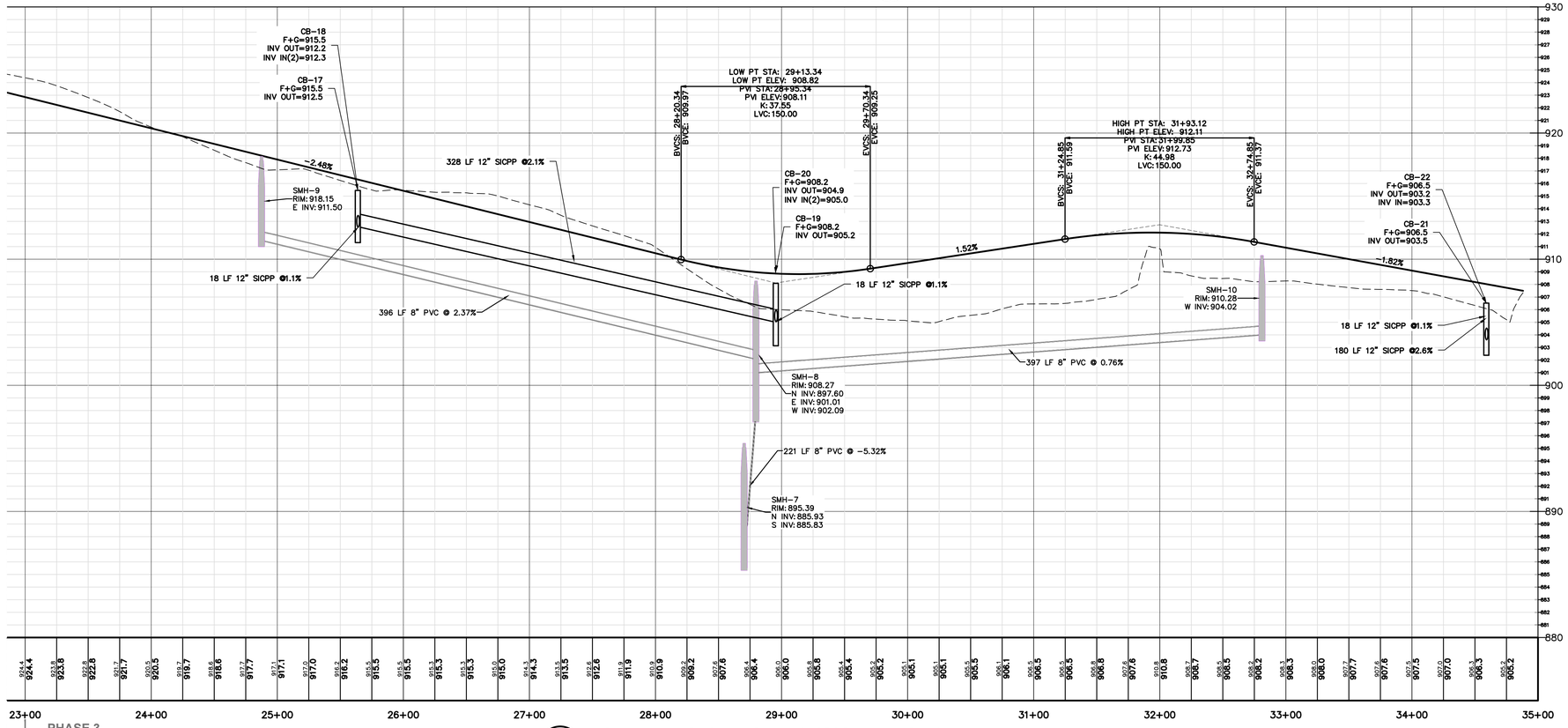
PROJECT NO. 20-1906
DATE 17 SEP 2020
SCALE 1" = 50'

SHEET C-5.1



1 C-5.2 ROAD A - PLAN
SCALE: 1"=50'



2 C-5.2 ROAD A PROFILE - SUBDIVISION PHASE 3
SCALE: H:1"=50' V:1"=5'

GRAPHIC SCALE
0 50' 100'
(IN FEET)
1 inch = 50 ft

PROJECT TITLE:
BRANDYWINE ESTATES PHASE 2
HENNEBERRY ROAD
TOWN OF MANLIUS — ONONDAGA COUNTY, NY

PREPARED FOR:
HARRINGTON HOMES
3848 HENNEBERRY ROAD
JAMESVILLE, NY 13078

SHEET TITLE:
ROAD PROFILE PLAN

NO.	REVISION/ISSUE	DATE

PREPARED BY:
NAPIERALA CONSULTING
PROFESSIONAL ENGINEER, P.C.
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PRELIMINARY
NOT FOR CONSTRUCTION

PLAN SEAL BY:
NEAL H. ZINSMEYER, JR. P.E.
NYS REGISTRATION # 087211

PROJECT NO. 20-1906
DATE 17 SEP 2020
SCALE 1" = 50'

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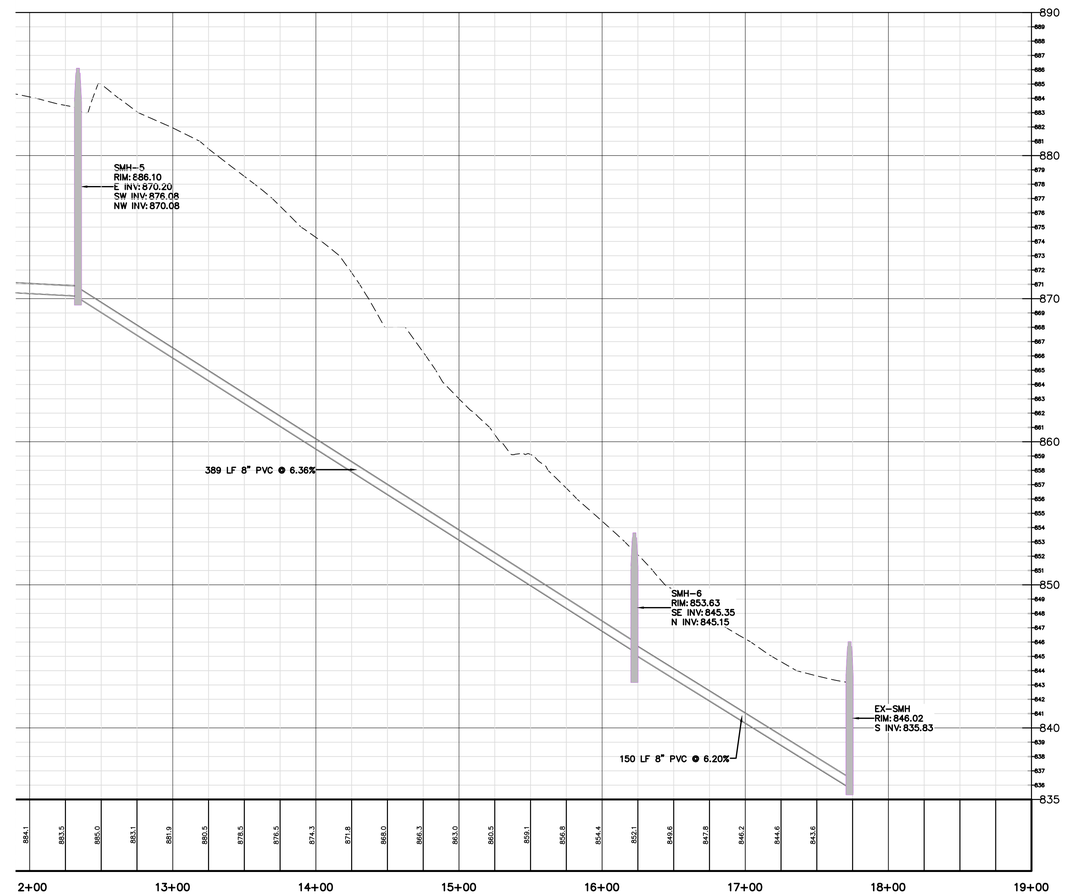
SHEET C-5.2

2 C-6.0 SEWER PLAN
SCALE: 1"=50'



3 C-6.0 SEWER PROFILE
SCALE: H: 1"=50' V: 1"=5'

1 C-6.0 OVERALL SEWER LAYOUT
SCALE: NTS

PROJECT TITLE:
BRANDYWINE ESTATES PHASE 2
HENNEBERRY ROAD
TOWN OF MANLIUS — ONONDAGA COUNTY, NY

PREPARED FOR:
HARRINGTON HOMES
3848 HENNEBERRY ROAD
JAMESVILLE, NY 13078

SHEET TITLE:
SEWER PROFILE PLAN

NO.	REVISION/ISSUE	DATE

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PLAN SEAL BY:
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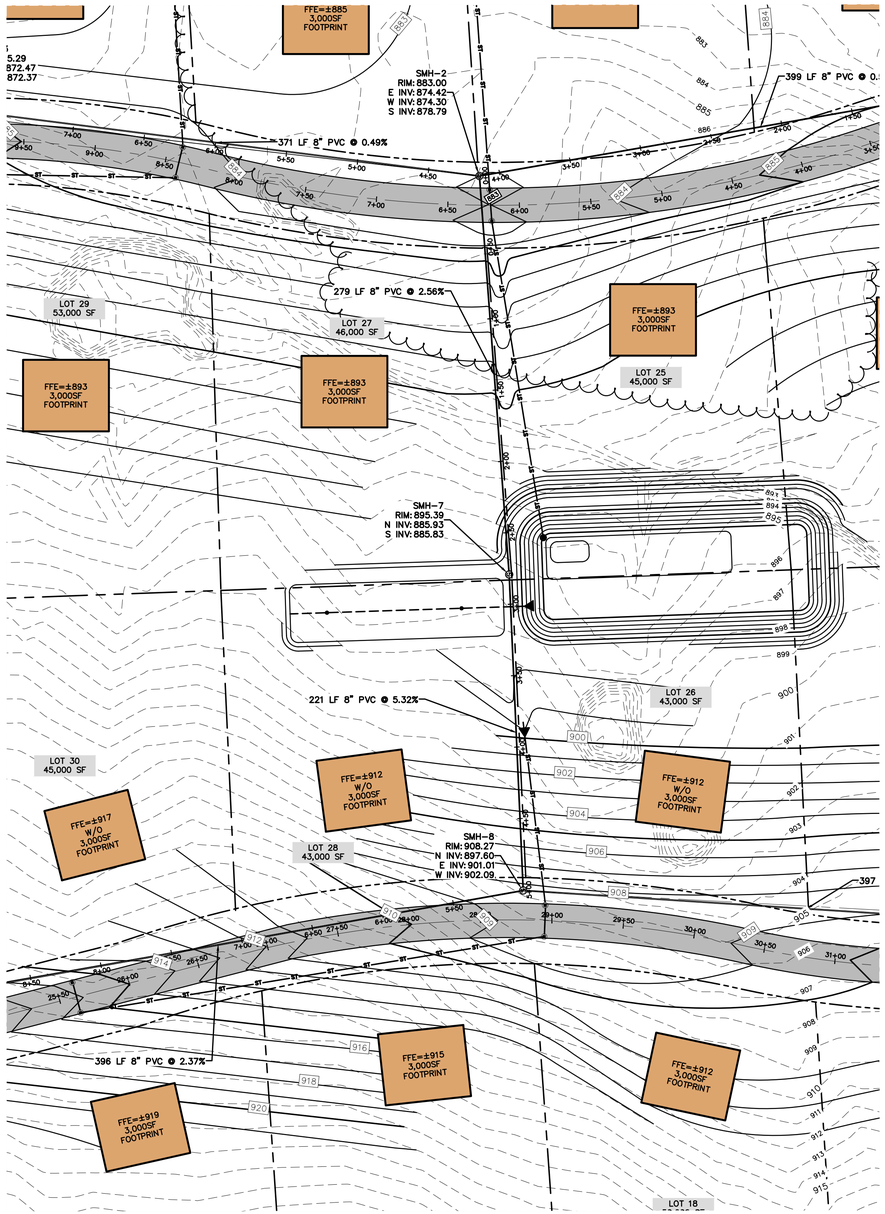
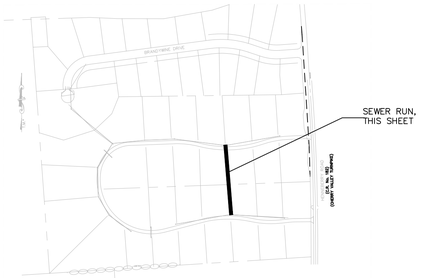
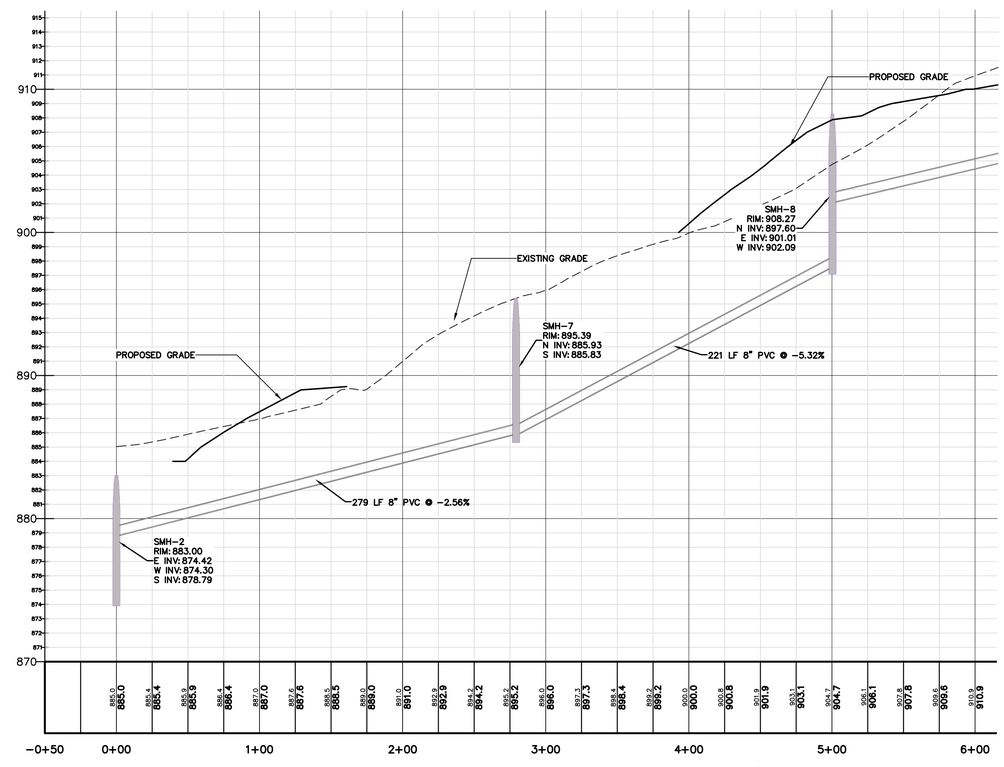
PROJECT NO. 20-1906
DATE 15 SEP 2020
SCALE 1" = 50'
SHEET C-6.0



2 C-6.1 SANITARY SEWER PLAN
SCALE: 1"=50'



1 C-6.1 OVERALL SEWER LAYOUT
SCALE: NTS



3 C-6.1 SANITARY SEWER PROFILE
SCALE: H: 1"=50' V: 1"=5'

PROJECT TITLE:
BRANDYWINE ESTATES PHASE 2
HENNEBERRY ROAD
TOWN OF MANLIUS — ONONDAGA COUNTY, NY

PREPARED FOR:
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3848 HENNEBERRY ROAD
JAMESVILLE, NY 13078

SHEET TITLE:
SEWER PROFILE PLAN

NO.	REVISION/ISSUE	DATE

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PROJECT NO. 20-1906
DATE 15 SEP 2020
SCALE 1" = 50'

SHEET C-6.1

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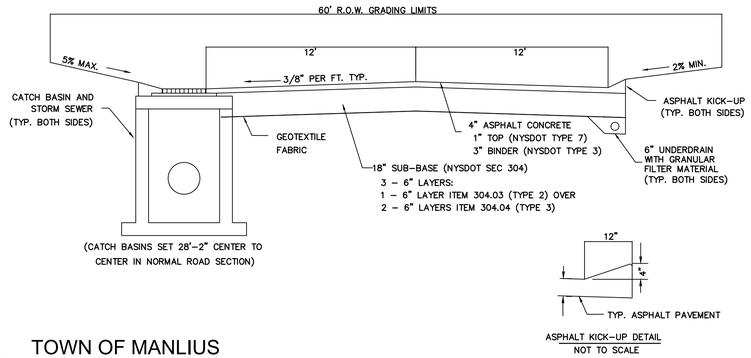
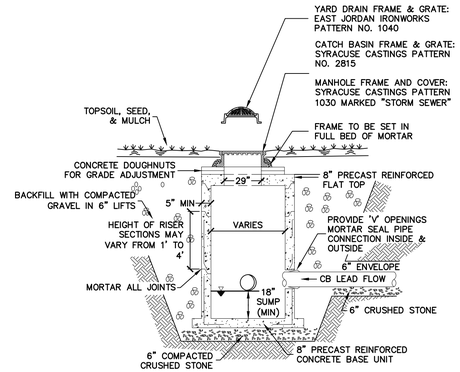


1 C-7.0 TOWN OF MANLIUS RESIDENTIAL STREET CROSS SECTION

SCALE: NTS

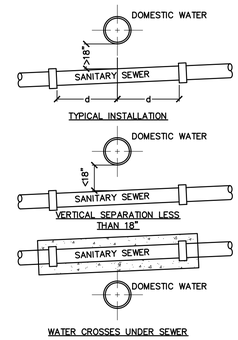


DRAINAGE STRUCTURE GENERAL NOTES

1. ALL STRUCTURES SHALL BE RATED FOR H–20 LOADING
2. REINFORCING FOR ALL SECTIONS SHALL BE AS FOLLOWS:
   TOP: #3 BARS SPACED AT 4" IN BOTH DIRECTIONS.
   BOTTOM: #3 BARS SPACED AT 4" IN BOTH DIRECTIONS.
   SIDES: #3 BARS SPACED AT 8" IN BOTH HORIZONTAL AND VERTICAL.
3. ALL REINFORCEMENT SHALL BE PLACED SO IT WILL HAVE A MINIMUM COVER OF 2" AND BE LOCATED APPROXIMATELY WITHIN THE CENTER OF THE SECTION.
4. TOP SLAB AND/OR FRAME ADJUSTMENT: FOR ALL DRAINAGE STRUCTURES A MAXIMUM OF 6 INCHES OF BRICK AND MORTAR OR A MAXIMUM OF 2 INCHES OF MORTAR ALONE SHALL BE USED FOR TOP SLAB AND/OR FRAME & GRATE ADJUSTMENT. FOR ADJUSTMENTS OVER 6 INCHES AND NOT TO EXCEED 12 INCHES, PRECAST CONCRETE ADJUSTMENT ELEMENT(S) MANUFACTURED IN ACCORDANCE WITH NYS–DOT STANDARD SPEC SUB–SECTION #706–04 SHALL BE USED; A MAXIMUM OF 2 INCHES OF MORTAR SHALL BE ALLOWED ON BOTH THE TOP AND BOTTOM OF THE PRECAST DEVICES. BRICK SHALL BE PRECAST PAVERS CONFORMING TO NYS–DOT STANDARD SPEC SUB–SECTION #704–13 AND MORTAR SHALL BE MORTAR FOR CONCRETE MASONRY CONFORMING TO NYS–DOT STANDARD SPEC SUB–SECTION #705–21.
5. MANHOLE STEPS SHALL BE REQUIRED IN ALL DRAINAGE STRUCTURES DEEPER THAN 4 FEET. STEPS SHALL CONFORM TO NYS–DOT STANDARD SPEC SUB–SECTION #725–02.
6. BASE OF PRECAST CATCH BASIN SHALL REST ON BASE MATERIAL COMPACTED IN PLACE WITH A VIBRATORY MECHANICAL TAMPER IN LIFTS NOT TO EXCEED 6" AT A TIME.
7. TRENCH SIDES SHALL CONFORM TO NYS DEPT OF LABOR AND OSHA SAFETY REGULATIONS.
8. MANHOLE INLET AND OUTLET PIPE CONNECTIONS MUST BE JOINED TO THE MANHOLE WITH A GASKETED, FLEXIBLE, WATERTIGHT CONNECTION OR IN ANY WATERTIGHT ARRANGEMENT THAT ALLOWS DIFFERENTIAL SETTLING OF THE MANHOLE WALL AND PIPE TO TAKE PLACE.

2 C-7.0 CATCH BASIN

SCALE: NTS



TYPICAL INSTALLATION

1. MINIMUM VERTICAL SEPARATION IS 18" FROM TOP OF PIPE TO BOTTOM OF PIPE.
2. SEWER JOINTS ARE TO SPACED EQUIDISTANT AND AS FAR AS POSSIBLE FROM THE WATER MAIN JOINTS.

VERTICAL SEPARATION LESS THAN 18"

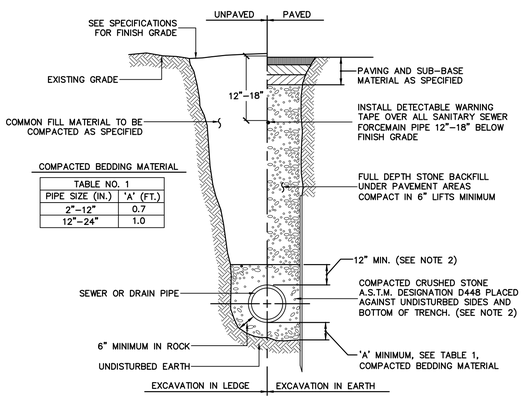
1. SEWER SHALL BE DESIGNED AND CONSTRUCTED EQUAL TO THE WATER PIPE, AND SHALL BE PRESSURE TESTED AT 150 PSI TO ASSURE WATER TIGHTNESS PRIOR TO BACKFILLING.
2. SEWER JOINTS ARE TO SPACED EQUIDISTANT AND AS FAR AS POSSIBLE FROM THE WATER MAIN JOINTS.

WATER CROSSES UNDER SEWER

1. SEWER SHALL BE DESIGNED AND CONSTRUCTED EQUAL TO THE WATER PIPE, AND SHALL BE PRESSURE TESTED AT 150 PSI TO ASSURE WATER TIGHTNESS PRIOR TO BACKFILLING.
2. SEWER JOINTS ARE TO SPACED EQUIDISTANT AND AS FAR AS POSSIBLE FROM THE WATER MAIN JOINTS.
3. PROVIDE ADEQUATE STRUCTURAL SUPPORT FOR SEWER TO MAINTAIN LINE AND GRADE

3 C-7.0 WATER AND SEWER SEPARATION

SCALE: NTS



COMPACTED BEDDING MATERIAL

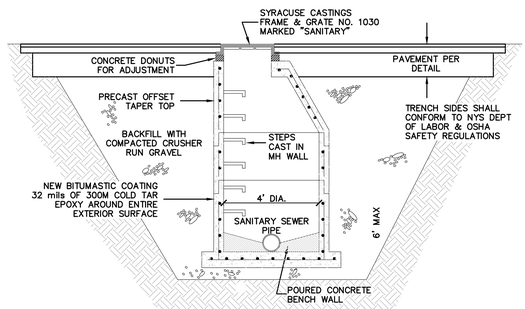
TABLE NO. 1	
PIPE SIZE (IN.)	'A' (FT.)
2"–12"	0.7
12"–24"	1.0

NOTES:

1. 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.
2. WHEN APPROVED BY THE ENGINEER FOR PIPES OTHER THAN PVC SELECTED GRAVEL FILL MATERIAL MAY BE USED FROM MID–DIAMETER OF PIPE TO 12" ABOVE TOP OF PIPE. NO STONES LARGER THAN 2 INCHES IN ANY DIMENSION WILL BE PERMITTED IN THIS AREA 3. TRENCHES LOCATED ON THE ROAD SHOULDER SHALL BE TREATED THE SAME AS EXCEPT FOR PAVING.
4. PROVIDE AT LEAST ONE IMPERVIOUS DAM IN GRAVEL BEDDING BETWEEN EACH MANHOLE WHERE DIRECTED, OR EVERY 300 FEET, WHICHEVER IS LESS. SEE DETAIL.
5. BEDDING MATERIAL FOR PVC PIPE SHALL MEET THE REQUIREMENTS OF ASTM D2321 CLASS I OR CLASS II EMBEDMENT MATERIALS.

4 C-7.0 TYPICAL SEWER AND DRAIN TRENCH

SCALE: NTS

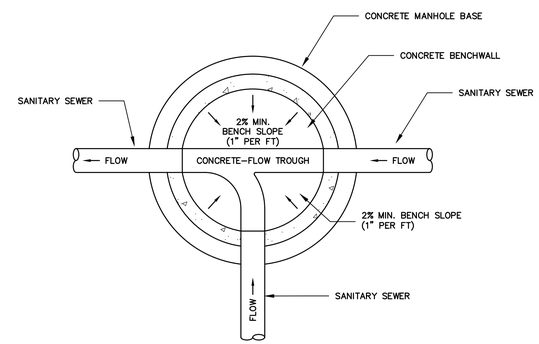


SANITARY MANHOLE GENERAL NOTES

1. ALL SANITARY SEWER MANHOLES TO BE RATED FOR H–20 LOADING
2. PRECAST REINFORCED CONCRETE OFFSET TAPER TOP TO BE MANUFACTURED IN ACCORDANCE WITH ASTM C–478. TOP SECTION IS TO BE 3' LONG.
3. PRECAST REINFORCED CONCRETE MANHOLE RISER SECTIONS ARE TO BE MANUFACTURED IN ACCORDANCE WITH ASTM C–478. RISER SECTIONS ARE TO HAVE A 48" INSIDE DIAMETER x 5" WALL AVAILABLE IN 2', 3', OR 4' LENGTHS.
4. PRECAST REINFORCED CONCRETE MANHOLE BASE IS TO MANUFACTURED IN ACCORDANCE WITH ASTM C–478. BASE IS TO HAVE A 48" INSIDE DIAMETER x 5" WALL WITH RUBBER BOOTS AS REQUIRED.
5. REINFORCING FOR ALL SECTIONS SHALL BE 2X4, ⅝ W.W. MESH.
6. ALL REINFORCEMENT SHALL BE PLACED SO IT WILL HAVE A MINIMUM COVER OF 2" AND BE LOCATED APPROXIMATELY WITHIN THE CENTER OF THE SECTION.
7. COURSES OF BRICK OR CONCRETE DONUTS ARE TO BE USED FOR RIM GRADE ADJUSTMENTS.
8. BASE OF PRECAST MANHOLE SHALL REST ON UNDISTURBED UNIFORM VIRGIN SOIL OR COMPACTED GRAVEL, COMPACTED IN PLACE WITH VIBRATORY MECHANICAL TAMPERS IN LIFTS NOT TO EXCEED 6" AT A TIME.
9. TRENCH SIDES SHALL CONFORM TO NYS LABOR DEPARTMENT SAFETY REGULATIONS.

5 C-7.0 SANITARY MANHOLE STRUCTURE

SCALE: NTS



6 C-7.0 SANITARY SEWER MANHOLE BENCH

SCALE: NTS

PROJECT TITLE:
BRANDYWINE ESTATES PHASE 2
HENNEBERRY ROAD
TOWN OF MANLIUS — ONONDAGA COUNTY, NY

PREPARED FOR:
HARRINGTON HOMES
3848 HENNEBERRY ROAD
JAMESVILLE, NY 13078

SHEET TITLE:
SITE DETAILS

NO.	REVISION/ISSUE	DATE

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PLAN SEAL BY:
NEALE F. ZINSMEISTER, JR., P.E.
NYS LICENSED PROFESSIONAL ENGINEER

PROJECT NO.	DATE	SCALE
20-1906	17 SEP 2020	NTS

SHEET **C-7.0**

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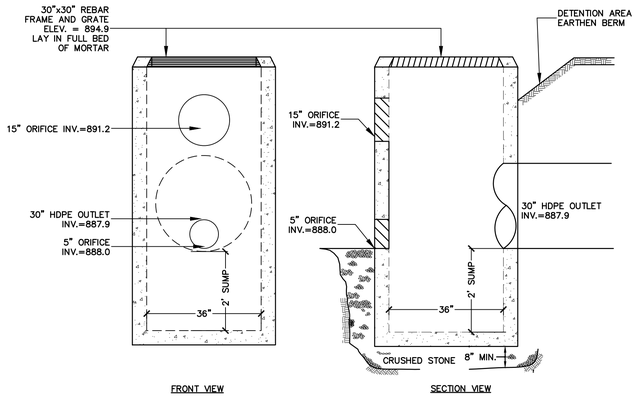
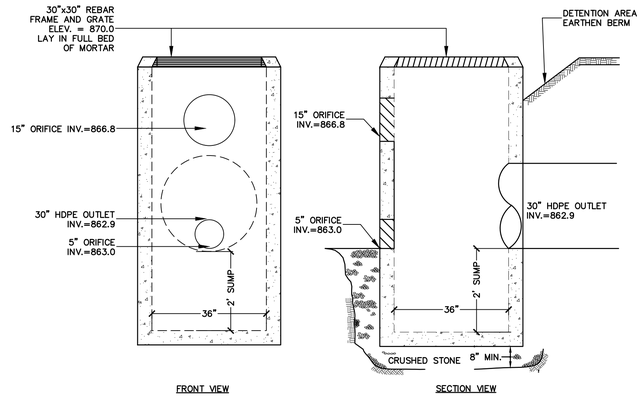
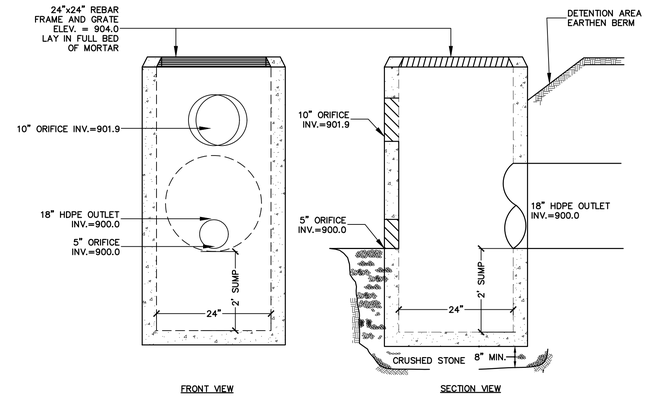


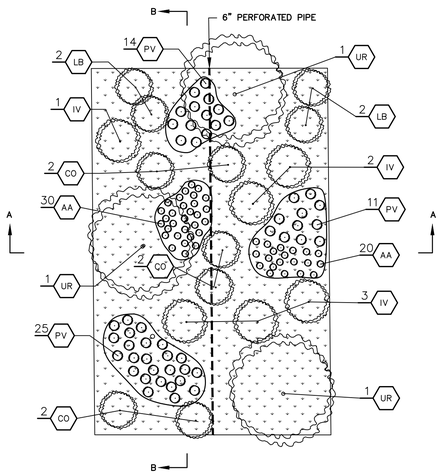
1 C-7.1 DETENTION BASIN #1
PRECAST CONCRETE OUTLET STRUCTURE
SCALE: NTS



2 C-7.1 DETENTION BASIN #2
PRECAST CONCRETE OUTLET STRUCTURE
SCALE: NTS



3 C-7.1 DETENTION BASIN #3
PRECAST CONCRETE OUTLET STRUCTURE
SCALE: NTS



*PLANTING QUANTITIES SHOWN IN THE GRAPHIC ABOVE ARE FOR A TYPICAL 1,000 SF BIORETENTION AREA. SPECIFIC QUANTITIES FOR THE BIORETENTION AREA ARE PROVIDED IN THE CORRESPONDING LANDSCAPING TABLE.

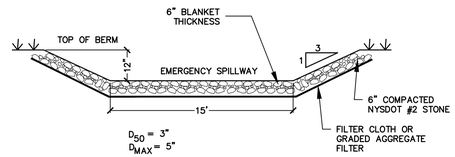
BIORETENTION AREA #1 (±6,250 SF) – LANDSCAPE TABLE

KEY	QUANTITY*	LATIN NAME	COMMON NAME	CALIPER	HEIGHT
TREES					
UR	6	ULMUS RUBRA	SLIPPERY ELM	6'–8'	B&B
SHRUBS					
LB	25	LINDERA BENZOIN	COMMON SPICE	18"–24"	B&B
IV	30	ILEX VERTICILLATA	WINTER BERRY	2'–3'	B&B
CO	25	CEPHALANTHUS OCCIDENTALIS	BUTTONBUSH	18"–24"	B&B
HERBACEOUS PLANTS					
PV	300	PANICUM VIRGATUM	SWITCH GRASS		
AA	300	AGROSTIS ALBA	REDTOP		

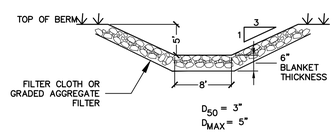
BIORETENTION AREA #2 (±5,400 SF) – LANDSCAPE TABLE

KEY	QUANTITY*	LATIN NAME	COMMON NAME	CALIPER	HEIGHT
TREES					
UR	5	ULMUS RUBRA	SLIPPERY ELM	6'–8'	B&B
SHRUBS					
LB	25	LINDERA BENZOIN	COMMON SPICE	18"–24"	B&B
IV	25	ILEX VERTICILLATA	WINTER BERRY	2'–3'	B&B
CO	25	CEPHALANTHUS OCCIDENTALIS	BUTTONBUSH	18"–24"	B&B
HERBACEOUS PLANTS					
PV	250	PANICUM VIRGATUM	SWITCH GRASS		
AA	250	AGROSTIS ALBA	REDTOP		

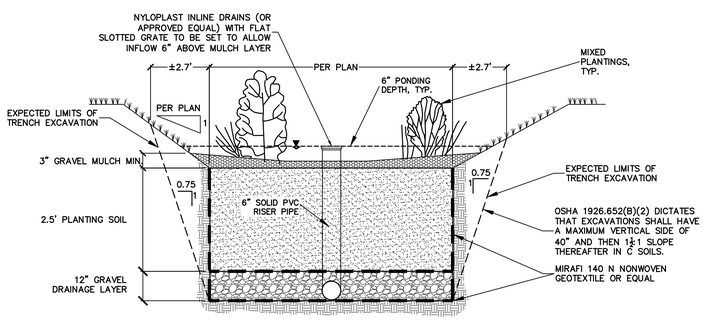
4 C-7.1 BIORETENTION FILTER SPECIES
SCALE: NTS



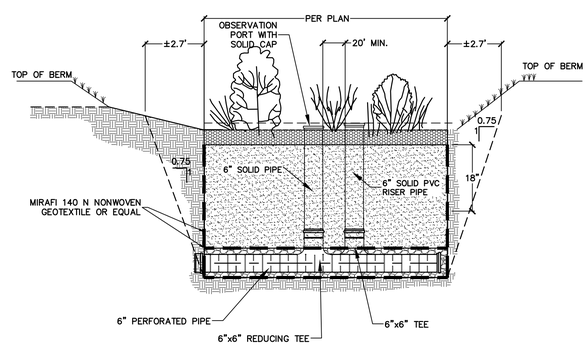
5 C-7.1 RIP RAP EMERGENCY SPILLWAY
SCALE: NTS



6 C-7.1 RIP RAP BIORETENTION SPILLWAY
SCALE: NTS



PROFILE VIEW SECTION A–A



PROFILE VIEW SECTION B–B

7 C-7.1 BIORETENTION FILTER CROSS SECTIONS
SCALE: NTS

BIORETENTION NOTES:

1. PLANTING SOIL MEDIA SHALL BE:
   A.) 85% TO 88% COARSE TO MEDIUM SAND
   B.) 12%–15% LEAF COMPOST OR TOPSOIL
2. PEA GRAVEL MULCH CONFORMING TO ASTM D 448 No. 6.
3. UNDERDRAIN GRAVEL TO BE AASHTO M–43 No. 67, 0.25" TO 0.75".
4. GEOTEXTILE FILTER FABRIC (SEPARATION LAYER):
   ASTM D–751 (PUNCTURE STRENGTH – 125 LB)
   ASTM D–1117 (MULLEN BURST STRENGTH – 400 PSI)
   ASTM D–1682 (TENSILE STRENGTH – 300 LB)
   SIZE – 0.08" THICK; EQUIVALENT OPENING SIZE OF #80 SIEVE
5. COMPACT WITH WATER–FILLED HAND ROLLER. COMPACTION TO BE FIRM BUT EASY (UTILIZE PENCIL TEST).
6. ENGINEER TO TEST IN PLACE COMPACTION AND INFILTRATION OF PLANTING SOIL.
7. ENGINEER TO PERFORM INSPECTION OF BIORETENTION PLANTING SOIL IMMEDIATELY FOLLOWING PLACEMENT AND PERFORM AN IN PLACE PERCOLATION TEST TO CONFIRM THAT THE IN PLACE MATERIAL PERCOLATES AT A RATE FASTER THAN 10 MIN/INCH.

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BRANDYWINE ESTATES PHASE 2
HENNEBERRY ROAD
TOWN OF MANLIUS ONONDAGA COUNTY, NY

PREPARED FOR:
HARRINGTON HOMES
3848 HENNEBERRY ROAD
JAMESVILLE, NY 13078

SHEET TITLE:
SITE DETAILS

NO.	REVISION/ISSUE	DATE

PREPARED BY:
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PROJECT NO. 20-1906
DATE 17 SEP 2020
SCALE AS SHOWN

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SHEET
C-7.1

EROSION CONTROL NOTES

EROSION AND SEDIMENT CONTROLS

1. STABILIZATION PRACTICES (TEMPORARY)
   a) TEMPORARY SEEDING AND PLANTING OF ALL UNPAVED AREAS WHEN CONSTRUCTION ACTIVITY HAS CEASED, OR WILL CEASE, IN AN AREA FOR 14 DAYS. SEEDING MIXTURES AND APPLICATION RATES ARE LISTED ON SHEET C–2.
   b) MULCHING EXPOSED AREAS.
   c) FREQUENT WATERING TO MINIMIZE WIND EROSION DURING CONSTRUCTION.

2. STABILIZATION PRACTICES (PERMANENT)
   a) LAND CLEARING ACTIVITIES SHALL BE DONE ONLY IN AREAS WHERE EARTHWORK WILL BE PERFORMED AND SHALL PROGRESS AS EARTHWORK IS NEEDED.
   b) PERMANENT SEEDING AND PLANTING OF ALL UNPAVED AREAS.

3. STRUCTURAL MEASURES TEMPORARY
   a. STABILIZED CONSTRUCTION ENTRANCE: AT THE ENTRANCE TO THE ALL DISTURBED AREAS FROM AN EXISTING ROADWAY A STABILIZED CONSTRUCTION ENTRANCE SHALL BE PROVIDED. THE PURPOSE OF THE STABILIZED CONSTRUCTION ENTRANCE IS TO REDUCE OR ELIMINATE THE TRACKING OF SEDIMENT ONTO THE PUBLIC RIGHT–OF–WAY.
   b. SILT FENCE: SILT FENCE SHALL BE INSTALLED AS SHOWN ON THE EROSION CONTROL PLAN . THE FABRIC SHALL MEET THE SPECIFICATIONS NOTED ON THE DETAILS UNLESS OTHERWISE APPROVED BY THE APPROPRIATE EROSION AND SEDIMENT CONTROL PLAN APPROVAL AUTHORITY. SUCH APPROVAL SHALL NOT CONSTITUTE STATEWIDE ACCEPTANCE.
   c. DUST CONTROL: DUST CONTROL IS THE CONTROL OF DUST RESULTING FROM LAND–DISTURBING ACTIVITIES. THE PURPOSE IS TO PREVENT SURFACE AND AIR MOVEMENT OF DUST FROM DISTURBED SOIL SURFACES THAT MAY CAUSE OFF–SITE DAMAGE, HEALTH HAZARDS, AND TRAFFIC SAFETY PROBLEMS.
   d. SEDIMENT TRAP: SEDIMENT TRAP TO BE INSTALLED IN DETENTION BASIN AREA FOR USE DURING CONSTRUCTION. STONE OUTLET SEDIMENT TRAP TO BE INSTALLED AS PER DETAIL TO ELIMINATE SEDIMENT DISCHARGE TO DOWNSTREAM AREAS DURING CONSTRUCTION PHASE.

4. STRUCTURAL PRACTICES (PERMANENT)
   a. ROCK OUTLET PROTECTION: ROCK OUTLET PROTECTION IS A SECTION OF ROCK PROTECTION PLACED AT THE OUTLET END OF CULVERTS, CONDUITS, OR CHANNELS. THE PURPOSE OF THE ROCK OUTLET PROTECTION IS TO REDUCE THE DEPTH, VELOCITY, AND ENERGY OF WATER, SUCH THAT THE FLOW WILL NOT ERODE THE RECEIVING DOWNSTREAM REACH.
   b. REINFORCED SLOPE PROTECTION: A TEMPORARY PROTECTIVE COVERING PLACED ON A PREPARED PLANTING AREA THAT IS ANCHORED IN PLACE BY STAPLES OR OTHER MEANS TO AID IN CONTROLLING EROSION BY ABSORBING RAIN SPLASH ENERGY AND WITHSTAND OVERLAND FLOW AS WELL AS PROVIDE A MICROCLIMATE TO PROTECT AND PROMOTE SEED ESTABLISHMENT.
   c. LAND GRADING: PERMANENT RESHAPING OF THE EXISTING LAND SURFACE BY GRADING IN ACCORDANCE WITH AN ENGINEERING TOPOGRAPHIC PLAN AND SPECIFICATION TO PROVIDE EROSION CONTROL AND VEGETATIVE ESTABLISHMENT ON DISTURBED, RESHAPED AREAS.

5. SEQUENCE OF MAJOR ACTIVITIES
   THE CONTRACTOR SHALL BE RESPONSIBLE FOR IMPLEMENTING THE ABOVE LISTED EROSION AND SEDIMENT CONTROL PRACTICES. THE CONTRACTOR MAY DESIGNATE THESE TASKS TO CERTAIN SUBCONTRACTORS AS IS SEEN FIT, BUT THE ULTIMATE RESPONSIBILITY FOR IMPLEMENTING THESE CONTROLS AND ENSURING THEIR PROPER FUNCTION REMAINS WITH THE CONTRACTOR. THE ORDER OF ACTIVITIES WILL BE AS FOLLOWS:
   a) CONDUCT PRECONSTRUCTION MEETING
   b) CONSTRUCT TEMPORARY CONSTRUCTION ENTRANCE/EXIT AT THE LOCATION SHOWN ON THE PLAN.
   c) INSTALL PERIMETER SILT FENCE AND SECURITY CONSTRUCTION FENCE IN THE LOCATIONS SHOWN ON THE PLAN.
   d) ESTABLISH STAGING AREA ON PROJECT SITE
   e) CONSTRUCT TEMPORARY SEDIMENT TRAP
   f) REMOVE TOPSOIL, STOCKPILE AND STABILIZE
   g) SITE GRADING. IMPORT OF FILL MATERIAL TO RAISE SITE TO PROPOSED GRADE (OR SUB–GRADE, AS APPROPRIATE).
   h) BUILDING FOUNDATION EXCAVATION (BUILDING CONSTRUCTION TO CONTINUE CONCURRENTLY WITH REMAINING SITE WORK).
   i) DISTURBED AREAS OF THE SITE WHERE CONSTRUCTION ACTIVITY HAS CEASED FOR MORE THAN 14 DAYS SHALL BE TEMPORARILY SEEDED AND WATERED.
   j) UNDERGROUND UTILITY INSTALLATIONS.
   k) INSTALL FILTER FABRIC DROP INLET PROTECTION AT ALL STORM INLETS.
   l) COMPACT GRAVEL ALONG ALL DRIVE AISLES AND PARKING AREAS
   m) SITE CONCRETE CONSTRUCTION.
   n) FINALIZE PAVEMENT SUBGRADE PREPARATION.
   o) REMOVE INLET PROTECTION NO MORE THAN 24 HOURS PRIOR TO PLACING ASPHALT PAVEMENT.
   p) PAVE AREAS NOTED ON PLAN.
   q) DEEP RIPPING OF NON–PAVED AREAS AS REQUIRED (NON–PAVED AREAS THAT HAVE BEEN COMPACTED DURING CONSTRUCTION VIA CONSTRUCTION TRAFFIC).
   r) FINAL GRADING, SEEDING, AND PLANTING.
   s) CONSTRUCT BIORETENTION BASINS AND OUTLET CONTROLS UPON UPSTREAM STABILIZATION OF SITE
   t) REMOVE SEDIMENT TRAP AND FINALIZE GRADING OF DETENTION BASIN
   u) REMOVE SILT FENCE ONLY AFTER ALL PAVING IS COMPLETE AND EXPOSED SURFACES ARE STABILIZED.

MAINTENANCE/INSPECTION PROCEDURES

THE FOLLOWING INSPECTION AND MAINTENANCE PRACTICES WILL BE USED TO MAINTAIN EROSION AND SEDIMENT CONTROLS AND STABILIZATION MEASURES.

1. ALL CONTROL MEASURES WILL BE INSPECTED AT LEAST TWICE EVERY SEVEN (7) CALENDAR DAYS
2. ALL MEASURES WILL BE MAINTAINED IN GOOD WORKING ORDER; IF REPAIRS OR OTHER EROSION CONTROL MEASURES ARE FOUND TO BE NECESSARY, THEY WILL BE INITIATED WITHIN 24 HOURS OF REPORT.
3. BUILT UP SEDIMENT WILL BE REMOVED FROM SILT FENCE WHEN IT HAS REACHED ONE–THIRD THE HEIGHT OF THE FENCE.
4. SILT FENCES WILL BE INSPECTED FOR DEPTH OF SEDIMENT, TEARS, ETC., TO SEE IF THE FABRIC IS SECURELY ATTACHED TO THE FENCE POSTS, AND TO SEE THAT THE FENCE POSTS ARE SECURELY IN THE GROUND.
5. TEMPORARY AND PERMANENT SEEDING AND ALL OTHER STABILIZATION MEASURES WILL BE INSPECTED FOR BARE SPOTS, WASHOUTS, AND HEALTHY GROWTH.
6. A MAINTENANCE INSPECTION REPORT WILL BE MADE AFTER EACH INSPECTION. COPIES OF THE REPORT FORMS TO BE COMPLETED BY THE INSPECTOR ARE INCLUDED IN THIS SWPPP.
7. THE OPERATOR SHALL HAVE A "QUALIFIED PROFESSIONAL" CONDUCT SITE INSPECTIONS FOLLOWING THE COMMENCEMENT OF CONSTRUCTION. A "QUALIFIED PROFESSIONAL" IS A PERSON KNOWLEDGEABLE IN THE PRINCIPLES AND PRACTICE OF EROSION AND SEDIMENT CONTROLS, SUCH AS A LICENSED PROFESSIONAL ENGINEER, CERTIFIED PROFESSIONAL IN EROSION AND SEDIMENT CONTROL (CPESC), OR SOIL SCIENTIST.
8. DISTURBED AREAS AND MATERIALS STORAGE AREAS WILL BE INSPECTED FOR EVIDENCE OF OR POTENTIAL FOR POLLUTANTS ENTERING STORMWATER SYSTEMS.
9. REPORT TO NYS DEC WITHIN 24 HOURS ANY NONCOMPLIANCE WITH THE SWPPP THAT WILL ENDANGER PUBLIC HEALTH OR THE ENVIRONMENT. FOLLOW UP WITH A WRITTEN REPORT WITHIN 5 DAYS OF THE NONCOMPLIANCE EVENT. THE FOLLOWING EVENTS REQUIRE 24 HOUR REPORTING: A) ANY UNANTICIPATED BYPASS WHICH EXCEEDS ANY EFFLUENT LIMITATION IN THE PERMIT, B) ANY UPSET WHICH EXCEEDS ANY EFFLUENT LIMITATION IN THE PERMIT, AND C) A VIOLATION OF A MAXIMUM DAILY DISCHARGE LIMITATION FOR ANY OF THE POLLUTANTS LISTED BY THE EPA IN THE PERMIT TO BE REPORTED WITHIN 24 HOURS. THE WRITTEN SUBMISSION MUST CONTAIN A DESCRIPTION OF THE NON–COMPLIANCE AND ITS CAUSE; THE PERIOD OF NON–COMPLIANCE, INCLUDING EXACT DATES AND TIMES, AND IF THE NON–COMPLIANCE HAS NOT BEEN CORRECTED, THE ANTICIPATED TIME IT IS EXPECTED TO CONTINUE; AND STEPS TAKEN OR PLANNED TO REDUCE, ELIMINATE, AND PREVENT RECURRENCE OF THE NON–COMPLIANCE.
10. RELEASES OF HAZARDOUS SUBSTANCES OR OIL IN EXCESS OF REPORTABLE QUANTITIES (AS ESTABLISHED UNDER 40 CFR 110, 40 CFR 117 OR 40 CFR 302) MUST BE REPORTED. FORM G–1 PROVIDES FURTHER DETAILS ON THE NOTIFICATION AND REPORTING PROCESS.

INSPECTION AND MAINTENANCE REPORT FORMS

ONCE INSTALLATION OF ANY REQUIRED OR OPTIONAL EROSION CONTROL DEVICE OR MEASURE HAS BEEN IMPLEMENTED, AT LEAST ONCE EVERY SEVEN (7) CALENDAR DAYS AND SHALL BE PERFORMED BY A QUALIFIED PROFESSIONAL. THE FORMS FOUND IN THIS SWPPP SHALL BE USED BY THE INSPECTORS TO INVENTORY AND REPORT THE CONDITION OF EACH MEASURE TO ASSIST IN MAINTAINING THE EROSION AND SEDIMENT CONTROL MEASURES IN GOOD WORKING ORDER.

THESE REPORT FORMS SHALL BECOME AN INTEGRAL PART OF THE SWPPP AND SHALL BE MADE READILY ACCESSIBLE TO GOVERNMENTAL INSPECTION OFFICIALS, THE OPERATOR'S ENGINEER, AND THE OPERATOR FOR REVIEW UPON REQUEST DURING VISITS TO THE PROJECT SITE. IN ADDITION, COPIES OF THE REPORTS SHALL BE PROVIDED TO ANY OF THESE PERSONS, UPON REQUEST, VIA MAIL OR FACSIMILE TRANSMISSION. INSPECTION AND MAINTENANCE REPORT FORMS ARE TO BE MAINTAINED BY THE PERMITTEE FOR FIVE YEARS FOLLOWING THE FINAL STABILIZATION OF THE SITE.

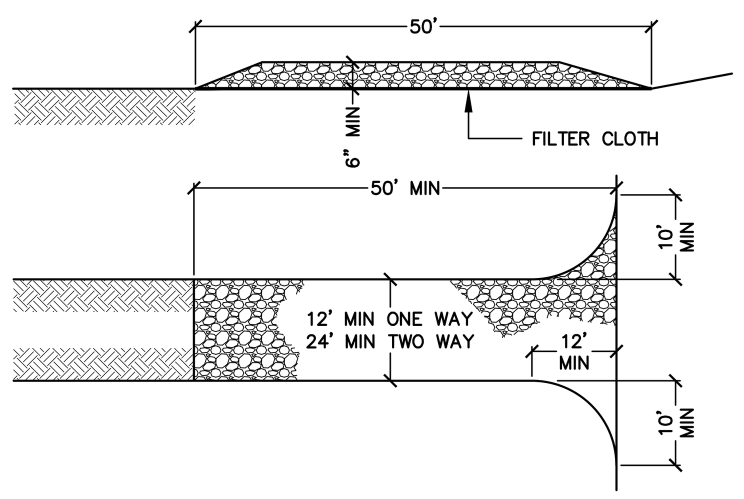
OTHER RECORD–KEEPING REQUIREMENTS

THE CONTRACTOR SHALL KEEP THE FOLLOWING RECORDS RELATED TO CONSTRUCTION ACTIVITIES AT THE SITE:

– DATES WHEN MAJOR GRADING ACTIVITIES OCCUR AND THE AREAS WHICH WERE GRADED
– DATES AND DETAILS CONCERNING THE INSTALLATION OF STRUCTURAL CONTROLS
– DATES WHEN CONSTRUCTION ACTIVITIES CEASE IN AN AREA
– DATES WHEN AN AREAS IS STABILIZED, EITHER TEMPORARILY OR PERMANENTLY
– DATES OF RAINFALL AND THE AMOUNT OF RAINFALL
– DATES AND DESCRIPTIONS OF THE CHARACTER AND AMOUNT OF ANY SPILLS OF HAZARDOUS MATERIALS
– RECORDS OF REPORTS FILED WITH REGULATORY AGENCIES IF REPORTABLE QUANTITIES OF HAZARDOUS MATERIALS SPILLED

EROSION CONTROL NOTES

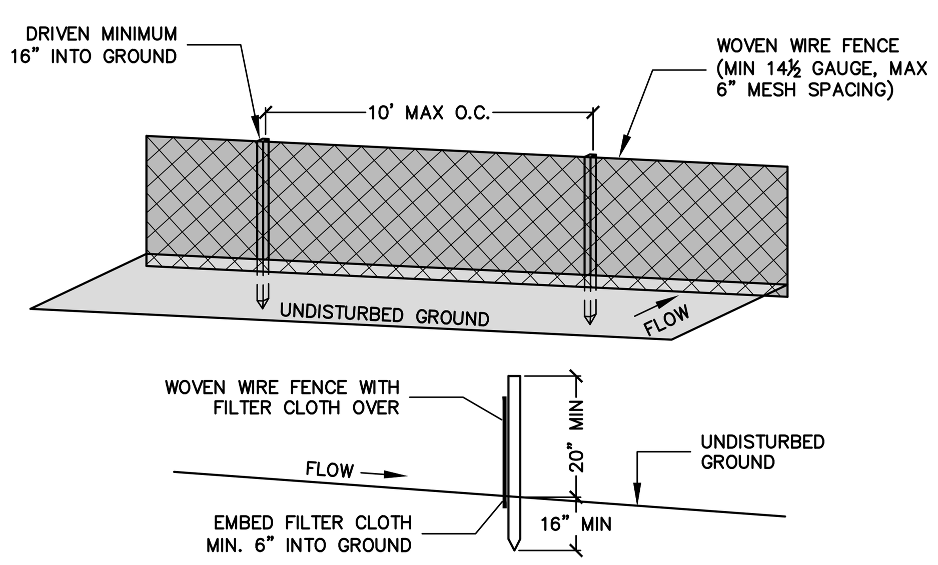
1. LAND DISTURBING ACTIVITIES SHALL NOT COMMENCE UNTIL APPROVAL TO DO SO HAS BEEN RECEIVED BY GOVERNING AUTHORITIES. THE GENERAL CONTRACTOR SHALL STRICTLY ADHERE TO THE APPROVED SWPPP DRAWINGS DURING CONSTRUCTION OPERATIONS.
2. NO LAND CLEARING OR GRADING SHALL BEGIN UNTIL THE APPROPRIATE EROSION CONTROL MEASURES HAVE BEEN INSTALLED.
3. ALL EXPOSED AREAS SHALL BE SEEDED AS SPECIFIED WITHIN 7 DAYS OF FINAL GRADING.
4. SHOULD CONSTRUCTION STOP FOR LONGER THAN 14 DAYS, THE SITE SHALL BE SEEDED AS SPECIFIED.
5. MAINTAIN EROSION CONTROL MEASURES AFTER EACH RAIN AND AT LEAST ONCE A WEEK.
6. THIS PLAN SHALL NOT BE CONSIDERED ALL INCLUSIVE AS THE GENERAL CONTRACTOR SHALL TAKE ALL NECESSARY PRECAUTIONS TO PREVENT SEDIMENT FROM LEAVING THE SITE.
7. GENERAL CONTRACTOR SHALL COMPLY WITH ALL STATE AND LOCAL ORDINANCES THAT APPLY.
8. ADDITIONAL EROSION AND SEDIMENT CONTROL MEASURES WILL BE INSTALLED IF DEEMED NECESSARY BY ON SITE INSPECTION.
9. IF INSTALLATION OF STORM DRAINAGE SYSTEM SHOULD BE INTERRUPTED BY WEATHER OR NIGHTFALL, THE PIPE ENDS SHALL BE COVERED WITH FILTER FABRIC.
10. GENERAL CONTRACTOR SHALL BE RESPONSIBLE TO TAKE WHATEVER MEANS NECESSARY TO ESTABLISH PERMANENT SOIL STABILIZATION.
11. ALL WORK TO BE DONE IN STRICT ACCORDANCE WITH THE NEW YORK STANDARDS AND SPECIFICATIONS FOR EROSION AND SEDIMENT CONTROL.



1. STONE SIZE – USE 2" STONE, OR RECLAIMED OR RECYCLED CONCRETE EQUIVALENT.
2. LENGTH – NOT LESS THAN 50 FEET.
3. THICKNESS – NOT LESS THAN SIX (6) INCHES.
4. WIDTH – 24 FEET MINIMUM.
5. FILTER CLOTH – WILL BE PLACED OVER THE ENTIRE AREA PRIOR TO PLACING OF STONE.
6. SURFACE WATER – ALL SURFACE WATER FLOWING OR DIVERTED TOWARD CONSTRUCTION ENTRANCES SHALL BE PIPED ACROSS THE ENTRANCE. IF PIPING IS IMPRACTICAL, A MOUNTABLE BERM WITH 5:1 SLOPES WILL BE PERMITTED.
7. MAINTENANCE – THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION WHICH WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHTS–OF–WAY. ALL SEDIMENT SPILLED, DROPPED, WASHED, OR TRACKED ONTO PUBLIC RIGHTS–OF–WAY MUST BE REMOVED IMMEDIATELY.
8. WHEN WASHING IS REQUIRED, IT SHALL BE DONE ON AN AREA STABILIZED WITH STONE AND WHICH DRAINS INTO AN APPROVED SEDIMENT TRAPPING DEVICE.
9. PERIODIC INSPECTION AND NEEDED MAINTENANCE SHALL BE PROVIDED AFTER EACH RAIN.

1 C–7.2 CONSTRUCTION ENTRANCE

SCALE: NTS



POSTS: STEEL, EITHER "T" OR "U" TYPE OR 2" HARDWOOD

FENCE: WOVEN WIRE, 14 1/2 GAUGE, 6" MAX. MESH OPENING

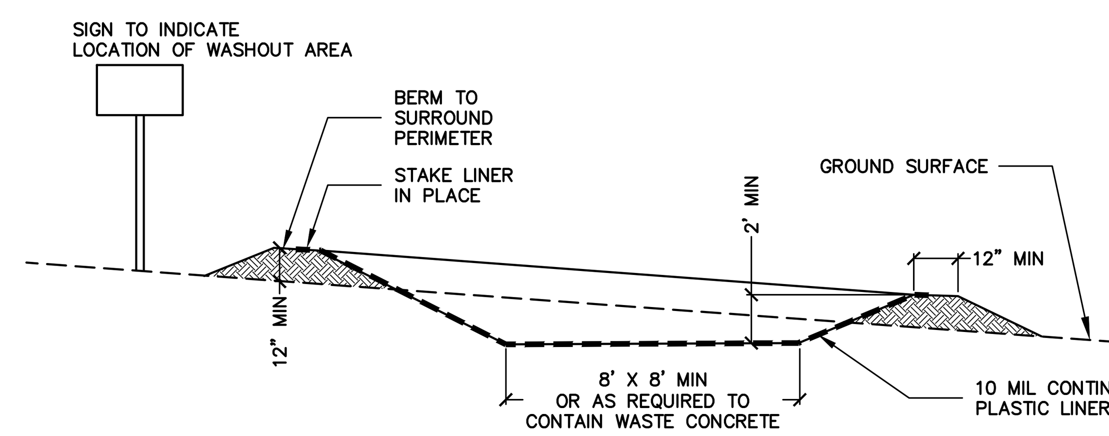
FILTER CLOTH: FILTER X., MIRAFI 100X, STABILINKA T140N OR APPROVED EQUAL

PREFABRICATED UNIT: GEOFAB, ENVIROFENCE, OR APPROVED EQUAL

1. WOVEN WIRE FENCE TO BE FASTENED SECURELY TO FENCE POSTS WITH WIRE TIES OR STAPLES.
2. FILTER CLOTH IS TO BE FASTENED SECURELY TO WOVEN WIRE FENCE WITH TIES SPACED EVERY 24" AT TOP AND MID SECTION.
3. WHEN TWO SECTIONS OF FILTER CLOTH ADJOIN EACH OTHER, THEY SHALL BE OVERLAPPED BY SIX INCHES AND FOLDED.
4. MAINTENANCE SHALL BE PERFORMED AS NEEDED AND MATERIAL REMOVED WHEN "BULGES" DEVELOP IN THE SILT FENCE.

2 C–7.2 SILT FENCE

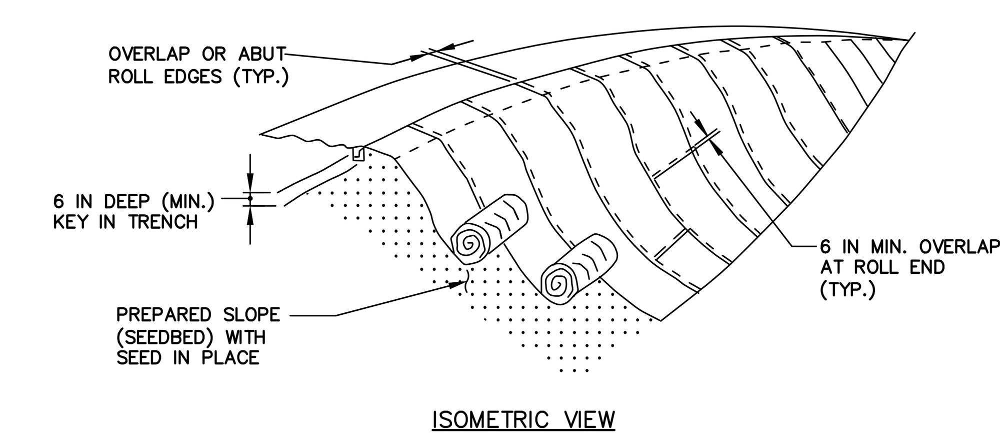
SCALE: NTS



NOTES:
1. CONCRETE WAHSOUT AREA SHALL BE INSTALLED PRIOR TO ANY CONCRETE PLACEMENT ON SITE.
2. CONCRETE WASHOUT OUT AREA SHALL BE LINED WITH A 10 MIL IMPERMEABLE LINER AND STAKED IN PLACE.
3. SIGNS SHALL BE PLACED AT THE CONSTRUCTION ENTRANCE, AT THE WASHOUT AREA, AND ELSEWHERE AS NECESSARY TO CLEARLY INDICATE LOCATION OF CONCRETE WASHOUT AREA TO OPERATORS OF CONCRETE TRUCKS AND PUMP RIGS.
4. THE CONCRETE WAHSOUT AREA SHALL BE REPAIRED AND ENLARGED OR CLEANED OUT AS NECESSARY TO MAINTAIN CAPACITY FOR WASTED CONCRETE.
5. AT THE END OF CONSTRUCTION, ALL CONCRETE SHALL BE REMOVED FROM SITE AND DISPOSED OF AT AN ACCEPTED WASTE SITE.
6. WHEN THE CONCRETE WASHOUT AREA IS REMOVED, THE DISTURBED AREA SHALL BE SEEDED AND MULCHED OR OTHERWISE STABILIZED.

3 C–7.2 CONCRETE WASHOUT AREA

SCALE: NTS



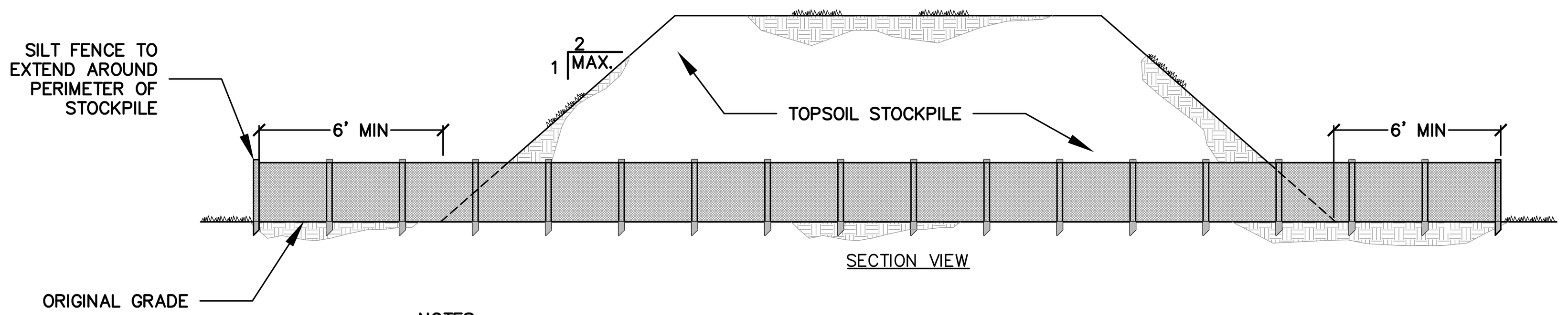
ISOMETRIC VIEW

CONSTRUCTION SPECIFICATIONS

1. USE TEMPORARY SOIL STABILIZATION MATTING MADE OF DEGRADABLE (LASTS 6 MONTHS MINIMUM) NATURAL OR MAN–MADE FIBERS (MOSTLY ORGANIC).
2. PERFORM FINAL GRADING, TOPSOIL APPLICATION, SEEDBED PREPARATION, AND PERMANENT SEEDING IN ACCORDANCE WITH SPECIFICATIONS. PLACE MATTING WITHIN 48 HOURS OF COMPLETING SEEDING OPERATIONS UNLESS END OF WORKDAY STABILIZATION IS SPECIFIED ON THE APPROVED EROSION & SEDIMENT CONTROL PLAN.
3. OVERLAP OR ABUT ROLL EDGES PER MANUFACTURER RECOMMENDATIONS. OVERLAP ROLL ENDS BY 6 INCHES (MINIMUM), WITH THE UPSLOPE MAT OVERLAPPING ON TOP OF THE DOWNSLOPE MAT.

4 C–7.2 SLOPE STABILIZATION MATTING

SCALE: NTS

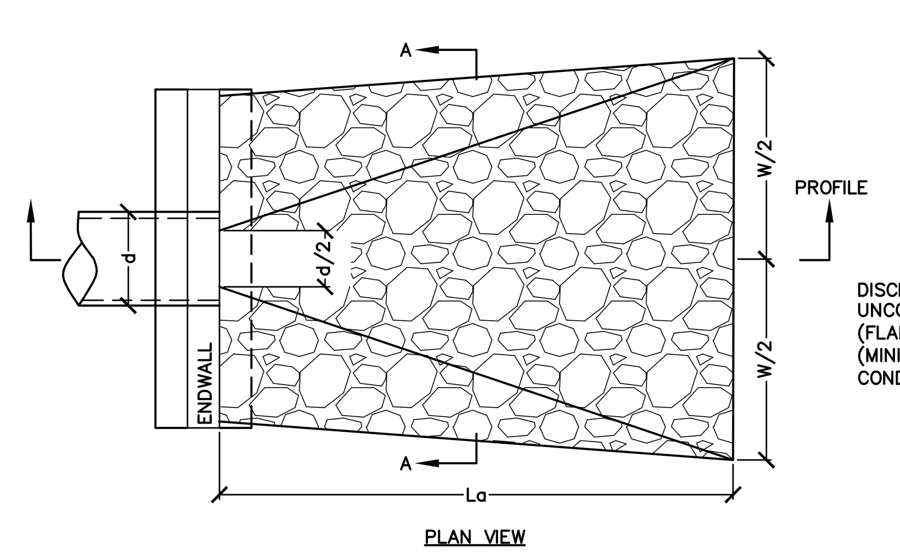


SECTION VIEW

NOTES:
1. SEE EROSION CONTROL PLAN FOR LOCATION OF STOCKPILE
2. REFER TO SILT FENCE DETAIL FOR INSTALLATION OF SILT FENCE
3. IF THE STOCKPILE IS TO REMAIN FOR MORE THAN 14 DAYS IT SHALL BE TEMPORARILY SEEDED FOR STABILIZATION
4. SILT FENCES TO BE MAINTAINED IN PLACE UNTIL TOPSOIL STOCKPILE HAS BEEN REMOVED

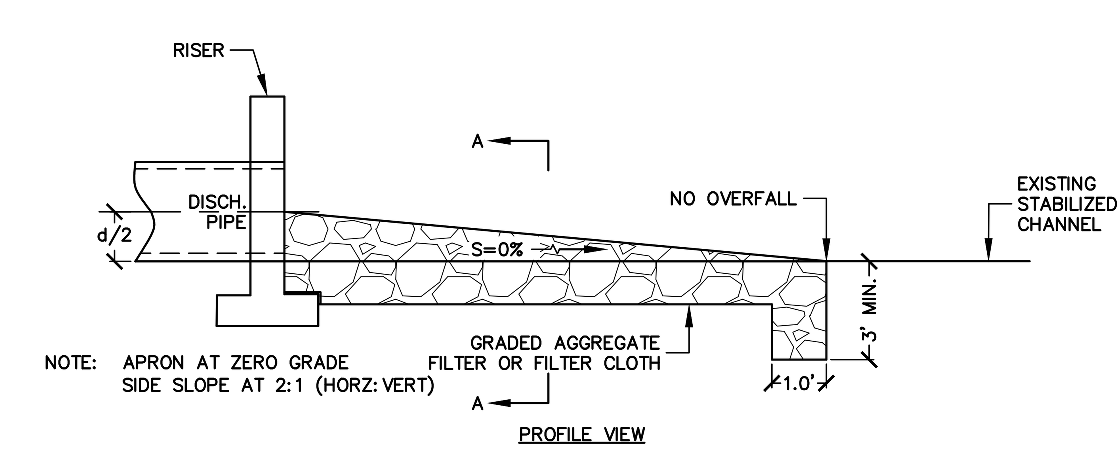
5 C–7.2 TYPICAL TOPSOIL STOCKPILE

SCALE: NTS



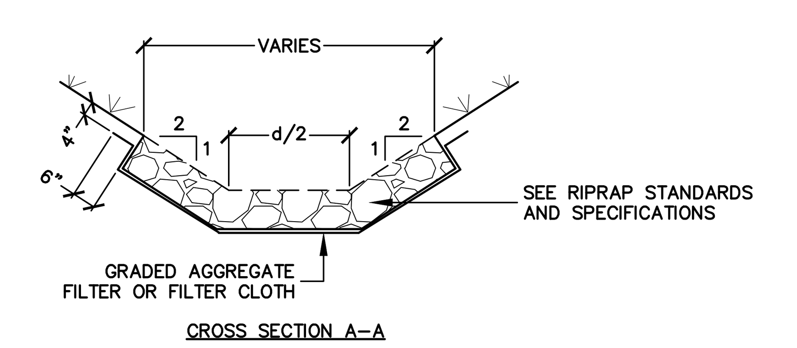
PLAN VIEW

DISCHARGE TO UNCONFINED SECTION (FLARED OUTLET) (MINIMUM TAILWATER CONDITION)



NOTE: APRON AT ZERO GRADE SIDE SLOPE AT 2:1 (HORZ: VERT)

PROFILE VIEW



CROSS SECTION A–A

6 C–7.2 ROCK RIPRAP OUTLET PROTECTION UNCONFINED DOWNSTREAM SECTION

SCALE: NTS

PRELIMINARY
FOR PLANNING PURPOSES ONLY, NOT FOR CONSTRUCTION.

PROJECT TITLE: BRANDYWINE ESTATES PHASE 2 HENNEBERRY ROAD

TOWN OF MANLIUS ONONDAGA COUNTY, NY

PREPARED FOR: HARRINGTON HOMES 3848 HENNEBERRY ROAD JAMESVILLE, NY 13078

SHEET TITLE: SITE DETAILS

NO.	REVISION/ISSUE	DATE

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PROJECT NO. 20-1906

DATE 17 SEP 2020

SCALE AS SHOWN

SHEET C-7.2

DW Stoner
& Associates, LLC

1012 Branch Brook Road
Groton, Vermont 05046
Phone: 315-447-8733

November 14, 2021

Mr. Mark Harrington, President
Harrington Homes Inc.
3848 Henneberry Road
Manlius, New York 13078

RE: Comments by G. Gould relative to Pumping test results and reporting

Dear Mr. Harrington,

The purpose of this letter is to respond to two sets of comments made by G. Gould about the pumping test and subsequent report relative to the groundwater supply underlying the proposed Brandywine Estates Phase 2 project. My responses to Mr. Gould's original comments were included in a letter prepared by Mr. Napierala and addressed to the Planning Board on October 4, 2021.

It occurred to me that we are using terms that are not necessarily familiar to the Planning Board so I am including a definition of some terms as follow:

AQUIFER

An aquifer is a groundwater bearing geologic formation sufficiently permeable to transmit and yield water in usable quantities.

DEWATERING

For an aquifer dewatering would involve a rate of removal of water that would result in the material becoming (effectively) dry.

DRAWDOWN

Drawdown is referring to the lowering of the water level in a well. The water level is measured in the well that is being pumped (the pumping well) and observation wells located at some distance from the pumping well. The drawdown produced at a certain pumping rate in the well being pumped and the observation wells (in this instance the wells installed on two adjacent lots, lots 6 and 29) can be used to calculate the permeability of the aquifer, the porosity of the aquifer and can aid in forecasting the performance of the aquifer.

MAXIMUM DAILY WATER USE

Each home uses a certain amount of water on a daily basis. The total amount has been estimated by a number of entities. The American Water Works Association

estimates the per capita use, including both indoor and outdoor use a 110 gallons/person/day. There is no regulatory standard that establishes daily household water use standard but the NYSDOH sets a standard for design of onsite wastewater disposal at 110 gallons per bedroom per day. The Brandywine Phase 2 project is planned for 3-4 bedroom homes or 330-440 gallons per day. For purposes of our calculations we are assuming that each home will use an average of 500 gallons per day and that is the daily total that is withdrawn from each well.

PEAK DEMAND

In terms of water use there are times of the day when there is zero water use (late at night) and times of the day when a number of people may be using showers, toilets, faucets and washing machines all during the same time period. The AWWA estimates that peak demand for a four bedroom house may be 110 gallons per hour. We are estimating that for short periods of time each home may be using 5-10 gallons/minute but the daily total is still less than 500 gallons per home per day.

PERMEABILITY

The permeability of any water bearing material is its ability to transmit water. For sake of illustration gravel has a high permeability and clay has a low permeability.

POROSITY/AQUIFER STORAGE

Porosity is the portion or percentage of a soil or rock material that is occupied by pores or interstices. It is possible for a material to have a low permeability but a high porosity such as a clay or a relatively high permeability but relatively low porosity such as karstic carbonate rock.

PUMPING TEST

A pumping test is a method of measuring the performance of an aquifer. It is typically carried out by installing a water well and pumping that well at a set rate while measuring both the well discharge and the drawdown over time. One or more observation wells are measured to see how much drawdown occurs. As previously mentioned the results can be used to calculate the permeability and porosity of the aquifer and those results were included in my August 11, 2021 report. Those calculations are done using one of a number of formulas. The Theim equation that I used was included in the software package referenced by Mr. Gould.

RECHARGE

Any aquifer is replenished by infiltrating water. It is challenging to determine how much recharge is occurring in any given location. Recharge can be localized or some aquifers can be recharged in areas at some distance from where the water is withdrawn.

RECOVERY

During a pumping test, at a certain time the well discharge is ceased and the water levels in the pumping well and any observation wells are measured to see how quickly the water levels rise back to the pre-pumping elevations. If a well is being pumped at a rate that is effectively dewatering the aquifer or pumping at a rate faster than recharge is occurring the well recovery will show this. If a pumping test is run for a certain period of time (say 24 hours) then the amount of recovery after the pump is turned off is the best indicator of how the aquifer is performing and whether a lack of recharge is resulting in dewatering of the aquifer. If the water level in the pumping well is lower than the pre-pumping test water level 24 hours after the pumping has ceased then the rate of withdrawal has exceeded the recharge rate of the aquifer.

Pumping test approach and procedures

There are no existing rules, regulations or standards at the state, county or local level, applicable to Individual Supply Wells, that set procedures for conducting a pumping test such as the one we conducted. We wrote a workplan to describe the approach we would take to conduct an aquifer test based on technical practices appropriate for a development of this size. That workplan, including the methods to be used were approved in a memo from Doug Miller to the Planning Board dated February 9, 2021. With the exception of the well locations that needed to be adjusted due to site access issues the workplan was carried out as proposed. Mr. Gould has suggested that the work should have been carried out in accordance with a NYSDEC document entitled “Pumping Test Procedures for Water Withdrawal Permit Applications”. That document applies to groundwater withdrawals of 100,000 gallons per day or greater. The Brandywine phase 2 project will withdraw less than 17,000 gallons per day. While it is possible that individual homes may withdraw 5-10 gallons per minute during peak use times the maximum daily use will not exceed 440 gallons per day. This number is based on NYSDOH handbook for Residential onsite system design. The design standard of 110 gallons per bedroom per day is intended to conservatively estimate water use ie is unlikely to be exceeded. To add a margin of safety we will assume that the average daily use of groundwater, per home, per day will be 500 gallons. The idea, suggested by Mr. Gould that we should evaluate this project by assuming that 34 wells are pumping 5 gallons per minute, 24 hours per day is unrealistic and unfair. On average each well will be withdrawing 0.34 gallons per minute continuously.

Data Accuracy

As previously reported the pumping test was carried out by Mr. Mark Shute, a licensed and highly respected water well driller in consultation with me. Water levels were measured with a water level indicator, data loggers were used for

the duration of the drawdown and recovery. Mr. Gould has suggested that the data logger cables could have stretched and that the flow meter could have malfunctioned, that excessive rainfall could have recharged the aquifer during the pumping test and that surface water could have affected or could be affected by pumping wells. In response to these concerns we do not think that the cables stretched, or that the flow meter was malfunctioning or that surface water or recharge events could have affected the aquifer which is over 200 feet below the ground surface and protected by glacial till and shale that is fairly impermeable.

Pumping Test Results and What They Mean

There are some key facts that need to be highlighted:

1. The pumping well pumped at 12 gallons per minute for 23 hours and produced a drawdown of less than 2.5 feet out of a water column of 35 feet.
2. If 34 homes were built and each home used 500 gallons per day the total average withdrawal from the entire subdivision would be slightly less than 12 gallons per minute.
3. Mr. Gould has expressed concern that over the long term the aquifer will be depleted because the rate of withdrawal exceeds the recharge. If that were true then that depletion would show up in the well recovery data. If the water level in the pumping well did not recover to the pre-pumping elevation within 23 hours after pumping had ceased it would show that the aquifer was being depleted. However in less than 19 hours after the pumping had ceased in well #5 the water level had recovered to the pre-pumping elevation.

A Proposal to address Town Concerns

NYSDOH Individual Water Supply Wells Fact sheet #2 states that a water well that can produce 5 gallons per minute or more should be adequate to meet Peak Demand. It is also important that any future wells used on the Brandywine Phase 2 property perform in a similar fashion to the Well that was installed on lot #5. To account for some variability it seems reasonable to expect that each new well will produce at least 5 gallons per minute with no more than 10 feet of drawdown. As you are aware Harrington is proposing that Brandywine Phase 2 be built as a phased development. We are suggesting that each phase be approved contingent on the installation of a well on each lot that demonstrates a yield of 5 gallons per minute with no more than 10 feet of drawdown and that the well logs demonstrate that each well is

installed in geologic strata similar to that encountered during the installation of well #5. For any well that does not meet this requirement additional storage can be considered in consultation between the Town and Harrington. A contingent approval should be a way to demonstrate to the town that all 34 lots will have wells that will provide adequate sources of water supply to each home.

We look forward to moving forward with an approval that is adequately protective of future homeowners in Brandywine Phase 2.

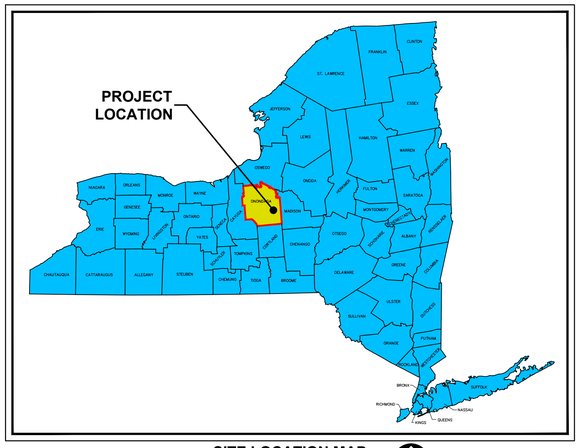
Very Truly Yours,

David W. Stoner, P.G.

PROPOSED BRANDYWINE ESTATES
PHASE 2 - 34 LOT SUBDIVISION

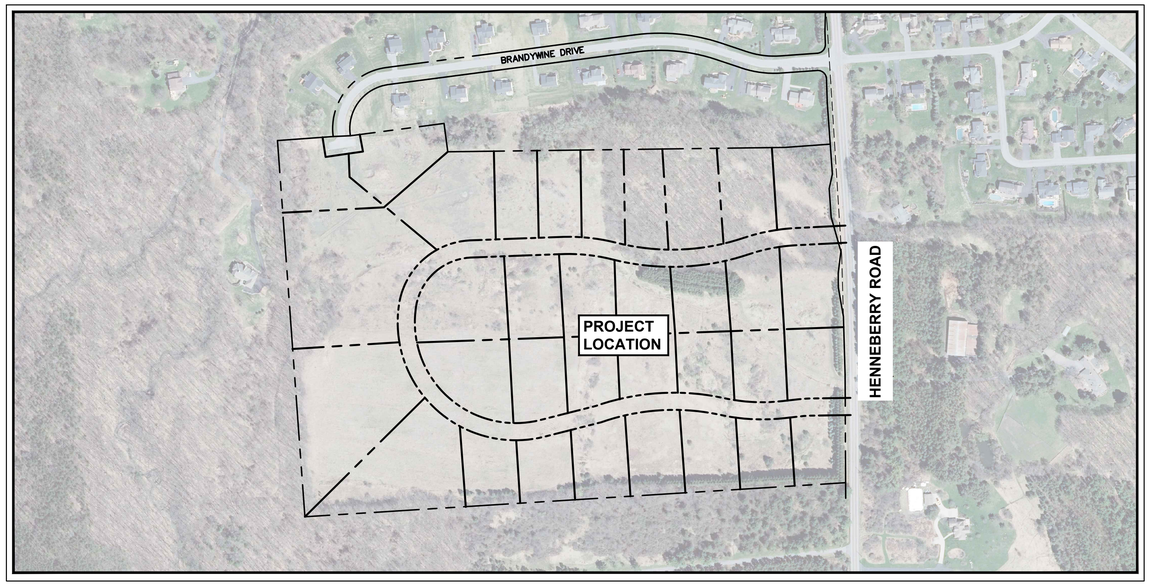
HENNEBERRY ROAD
TAX ID: 109.-02-07.1

TOWN OF MANLIUS
ONONDAGA COUNTY
NEW YORK STATE



SITE LOCATION MAP
NOT TO SCALE

PROJECT LOCATION MAP
NOT TO SCALE



AERIAL MAP
1"=250'

PREPARED BY:

NAPIERALA CONSULTING
PROFESSIONAL ENGINEER, P.C.
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110 FAYETTE STREET
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PREPARED FOR:

HARRINGTON HOMES
Your Builder for Life

3848 HENNEBERRY ROAD
JAMESVILLE, NY 13078

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PRELIMINARY PLANS - FINAL APPROVAL
REQUIRED BY ALL JURISDICTIONS

Dig Safely. New York
Call 811 before you dig

APPROVED BY OWNER

NAME DATE

SHEET TITLE:

TITLE SHEET

NO.	REVISION/ISSUE	DATE
1	GENERAL REVISIONS	12/01/2021

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PRELIMINARY
NOT FOR CONSTRUCTION

PLAN SEAL BY:
NEAL H. ZINSMEYER, JR., P.E.
NYS REGISTRATION # 087211

PROJECT NO.	DATE	SHEET
20-1906	17 SEP 2020	C-0

PROPOSED BRANDYWINE ESTATES PHASE 2

HENNEBERRY ROAD
TOWN OF MANLIUS
ONONDAGA COUNTY, NY

GENERAL NOTES

1. PROPERTY LINE INFORMATION TAKEN FROM A PLAN ENTITLED "TOPOGRAPHIC SURVEY, BRANDYWINE PHASE 3 – SECTION 1 PART OF FARM LOT NUMBER 96, TOWN OF MANLIUS" PREPARED BY IANUZI & ROMANS LAND SURVEYING, P.C.
2. THE PLANS SHOW SUBSURFACE STRUCTURES, ABOVEGROUND STRUCTURES, AND/OR UTILITIES FROM FIELD LOCATION AND RECORD MAPPING. EXACT LOCATION MAY VARY FROM THE LOCATIONS INDICATED. IN PARTICULAR, THE CONTRACTOR IS WARNED THAT THE EXACT OR EVEN APPROXIMATE LOCATION OF SUCH PIPELINES, SUBSURFACE STRUCTURES AND/OR UTILITIES IN THE AREA MAY BE DIFFERENT FROM THAT SHOWN OR MAY NOT BE SHOWN AND IT SHALL BE HIS RESPONSIBILITY TO PROCEED WITH GREAT CARE IN EXECUTING ANY WORK. THE CONTRACTOR IS TO CALL DIG SAFELY NY AT 1–800–962–7962 A MINIMUM OF 72 HOURS BEFORE DIGGING, DRILLING, OR BLASTING.
3. THE ENGINEER SHALL BE NOTIFIED IN WRITING OF ANY CONDITIONS THAT VARY FROM THOSE SHOWN ON THE PLANS. THE CONTRACTOR'S WORK SHALL NOT VARY FROM THE PLANS WITHOUT THE EXPRESSED APPROVAL OF THE ENGINEER.
4. THE CONTRACTOR IS INSTRUCTED TO COOPERATE WITH ANY AND ALL OTHER CONTRACTORS PERFORMING WORK ON THIS JOB SITE DURING THE PERFORMANCE OF THIS CONTRACT.
5. THE CONTRACTOR SHALL RESTORE LAWNS, DRIVEWAYS, CULVERTS, SIGNS, AND OTHER PUBLIC OR PRIVATE PROPERTY DAMAGED OR REMOVED TO AT LEAST AS GOOD A CONDITION AS BEFORE BEING DISTURBED AS DETERMINED BY THE ENGINEER. ANY DAMAGED TREES, SHRUBS, AND/OR HEDGES SHALL BE REPLACED AT THE CONTRACTOR'S EXPENSE.
6. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING AND INCURRING THE COST OF ALL REQUIRED PERMITS, INSPECTIONS, CERTIFICATES, ETC. AND SHALL COMPLY WITH ALL PERMITS.
7. ALL WORK SHALL BE DONE IN STRICT COMPLIANCE WITH ALL APPLICABLE NATIONAL, STATE, AND LOCAL CODES, STANDARDS, ORDINANCES, RULES, AND REGULATIONS.
8. ALL PROPOSED UTILITIES AND APPURTENANCES ARE TO BE CONSTRUCTED IN COMPLIANCE WITH THE LOCAL MUNICIPALITY'S CODES AND REGULATIONS GOVERNING THE INSTALLATION OF SUCH UTILITIES.
9. THE ENGINEER RESERVES THE RIGHT TO EXAMINE ANY WORK DONE ON THIS PROJECT AT ANY TIME TO DETERMINE CONFORMANCE WITH THE REQUIREMENTS OF THE CONTRACT DOCUMENTS OF THIS PROJECT AS INTENDED AND INTERPRETED BY THE ENGINEER.
10. MISCELLANEOUS WORK NOT SPECIFICALLY SHOWN ON THE CONTRACT DRAWINGS SUCH AS PATCHING, BLOCKING, TRIMMING, ETC. SHALL BE PERFORMED AS REQUIRED TO MAKE THE WORK COMPLETE.
11. THE CONTRACTOR SHALL PROTECT EXISTING PROPERTY LINE INFORMATION. ANY MONUMENTATION DISTURBED OR DESTROYED, AS JUDGED BY THE ENGINEER OR OWNER, SHALL BE REPLACED AT THE CONTRACTOR'S EXPENSE UNDER THE SUPERVISION OF A NEW YORK STATE LICENSED LAND SURVEYOR.
12. IT IS THE CONTRACTOR'S RESPONSIBILITY TO EXAMINE ALL PLAN SHEETS AND COORDINATE WORK WITH ALL OTHER CONTRACTS FOR THE SITE.
13. THE CONTRACTOR SHALL:
    A. VERIFY ALL CONDITIONS IN THE FIELD PRIOR TO COMMENCEMENT OF WORK AND NOTIFY THE ENGINEER OF ANY DISCREPANCIES.
    B. EXAMINE THE SITE AND INCLUDE IN HIS WORK THE EFFECT OF ALL EXISTING CONDITIONS ON THE WORK.
    C. PROVIDE AND INSTALL ALL MATERIALS AND PERFORM ALL WORK IN ACCORDANCE WITH RECOGNIZED GOOD STANDARD PRACTICE.
    D. HOLD THE OWNER HARMLESS AGAINST ANY AND ALL CLAIMS ARISING FROM WORK DONE BY THE CONTRACTOR ON THE SITE.
14. ALL TRENCH EXCAVATION AND ANY REQUIRED SHEETING AND SHORING SHALL BE DONE IN ACCORDANCE WITH THE LATEST REVISIONS OF NEW YORK STATE INDUSTRIAL CODE RULE 23 AND OSHA REGULATIONS FOR CONSTRUCTION. SHEET PILING SHALL BE DESIGNED AND SEALED BY A NEW YORK STATE PROFESSIONAL ENGINEER.
15. CONTRACTOR SHALL BE RESPONSIBLE FOR DEWATERING AND THE MAINTENANCE OF SURFACE DRAINAGE DURING THE COURSE OF WORK. HE SHALL SUBMIT A DEWATERING PLAN DESIGNED AND SEALED BY A NEW YORK STATE PROFESSIONAL ENGINEER. CONTRACTOR SHALL MAINTAIN EXISTING SITE DRAINAGE PATTERNS THROUGHOUT CONSTRUCTION.
16. ALL BACKFILL USED IN TRENCHES EXCAVATED IN EXISTING ROADWAYS SHALL BE PLACED IN MAXIMUM 6–INCH LIFTS AND COMPACTED BY MEANS OF A MECHANICAL COMPACTOR BETWEEN LIFTS TO 90% STANDARD PROCTOR COMPACTION.
17. WHEN BACKFILLING AROUND PROPOSED OR EXISTING STRUCTURES, MATERIAL SHALL BE PLACED IN MAXIMUM 6–INCH LIFTS AND COMPACTED BY MEANS OF A MECHANICAL COMPACTOR BETWEEN LIFTS TO 90% STANDARD PROCTOR COMPACTION.
18. ALL UTILITY WORK INVOLVING CONNECTIONS TO EXISTING SYSTEMS SHALL BE COORDINATED WITH THE ENGINEER AND THE UTILITY OWNER. NOTIFY THE ENGINEER AND THE UTILITY OWNER 72 HOURS BEFORE EACH AND EVERY CONNECTION TO AN EXISTING SYSTEM IS MADE.
19. CONSTRUCTION OF ALL PROPOSED UTILITIES MUST BEGIN AT ITS POINT OF CONNECTION TO THE EXISTING UTILITY OR AT THE LOWEST POINT IN THE SYSTEM. RIMS, GRATES, INVERTS, CLEARANCES, AND LOCATION AT CROSSINGS MUST BE VERIFIED PRIOR TO THE BEGINNING OF CONSTRUCTION.
20. MAINTAIN FLOW FOR ALL EXISTING UTILITIES.
21. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING ALL FIELD LAYOUT. THE CONTRACTOR SHALL TAKE TIES TO ALL UTILITY CONNECTIONS AND PROVIDE MARKED–UP AS–BUILT PLANS FOR ALL UTILITIES SHOWING TIES TO CONNECTIONS, BENDS, VALVES, LENGTHS OF LINES, AND INVERTS. THE OWNER AND HIS REPRESENTATIVES SHALL REVIEW AS–BUILT PLANS SHOWING ALL UNDERGROUND UTILITIES INSTALLED OR ENCOUNTERED. THE CONTRACTOR SHALL PROVIDE ANY CORRECTION OR OMISSIONS TO THE SATISFACTION OF THE OWNER AND HIS REPRESENTATIVES BEFORE UTILITIES WILL BE ACCEPTED.
22. THE CONTRACTOR SHALL MAINTAIN ALL TRAFFIC IN ALL AREAS IN ACCORDANCE WITH THE NYSDOT MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES.
23. THE CONTRACTOR SHALL MAINTAIN ACCESS TO ALL COMMERCIAL, RESIDENTIAL, AND PUBLIC PROPERTIES OR AS DIRECTED BY THE ENGINEER.
24. ALL EXCAVATIONS SHALL BE BACKFILLED TO EXISTING GRADE AT THE END OF EACH WORKDAY.
25. THE CONTRACTOR SHALL TAKE CARE TO PREVENT DAMAGE TO EXISTING UTILITIES. DAMAGED UTILITIES SHALL BE IMMEDIATELY REPAIRED BY THE CONTRACTOR AT THE CONTRACTOR'S EXPENSE.

SITE DEMOLITION NOTES

1. THE GENERAL CONSTRUCTION CONTRACTOR RESPONSIBLE FOR ANY CLEARING OR DEMOLITION WORK AS NOTED ON THIS PLAN.
2. EXISTING FEATURES ARE BASED ON A SURVEY BY IANUZI & ROMANS LAND SURVEYING, P.C.
3. OWNER WILL PROVIDE AN 'ALL CLEAR' PRIOR TO ANY CLEARING OR DEMOLITION.
4. THE CONTRACTOR SHALL CONTACT DIG SAFELY NEW YORK AT 811 FOR UTILITY STAKEOUTS A MINIMUM OF THREE (3) BUSINESS DAYS PRIOR TO ANY DEMOLITION WORK, SITE WORK, OR EXCAVATION.
5. THE CONTRACTOR SHALL COORDINATE WITH ALL PUBLIC AND PRIVATE UTILITIES FOR RESPECTIVE REQUIREMENTS FOR THE REMOVAL/ABANDONMENT OF UTILITY MAINS/LATERALS SERVICING THE SITE.

GRADING NOTES

1. MAXIMUM SLOPE FOR ALL CUT AND FILL LAWN AREAS SHALL BE 3H:1V UNLESS SHOWN OTHERWISE ON PLANS.
2. SLOPES GREATER THAN 4H:1V SHALL BE STABILIZED IMMEDIATELY AFTER GRADING OCCURS IN ACCORDANCE WITH THE NEW YORK STANDARDS AND SPECIFICATIONS FOR EROSION AND SEDIMENT CONTROL.
3. CONTRACTOR SHALL OBTAIN A COPY OF THE GEOTECHNICAL REPORT AND BECOME FAMILIAR WITH THE SOIL CONDITIONS ON THE SITE. CONTRACTOR SHALL FOLLOW ALL RECOMMENDATIONS AND REQUIREMENTS FROM THE GEOTECHNICAL ENGINEER.
4. UNLESS OTHERWISE NOTED, LIMITS OF DISTURBANCE ARE AS REPRESENTED BY PROPOSED GRADES. NO GRADING SHALL TAKE PLACE BEYOND LIMITS SHOWN.
5. ALL SLOPES STEEPER THAN 3H:1V SHALL BE TREATED WITH AN EROSION CONTROL PRACTICE SUCH AS A ROLLED EROSION CONTROL BLANKET OR RIPRAP. SEE DESIGNATED AREAS ON PLANS.

UTILITY NOTES

1. ALL CONSTRUCTION SHALL CONFORM WITH APPROPRIATE CODE AND REGULATORY REQUIREMENTS.
2. ALL UTILITIES SHALL BE INSTALLED IN ACCORDANCE WITH MUNICIPAL REGULATIONS AND THE STANDARDS OF THE PRIVATE UTILITY COMPANIES.
3. PRIVATE UTILITY SERVICE FINAL LOCATION, SIZE AND DEPTH ARE SUBJECT TO THE APPROVAL OF THE UTILITY COMPANY.
4. EXTERIOR BUILDING LIGHTING LUMINARIES SHALL BE OF SIZE AND TYPE, AND AT LOCATIONS SPECIFIED BY THE ARCHITECTS ELECTRICAL SITE PLAN AND SHALL CONFORM TO THE MUNICIPAL ZONING REQUIREMENTS.
5. WATER
   WATER LINES, FITTINGS AND APPURTENANCES TO BE IN CONFORMANCE WITH APPROPRIATE CODE AND REGULATORY REQUIREMENTS. VERIFY EXISTING LINE SIZE AND LOCATION PRIOR TO CONSTRUCTION. ALL WATER LINES MUST MAINTAIN A MINIMUM 10' HORIZONTAL SEPARATION WITH SANITARY SEWER AND STORM SEWER LINES. ALL WATER MAIN AND SERVICE WORK MUST BE COORDINATED WITH THE MUNICIPAL WATER DEPARTMENT.
6. SOME LOTS SHALL BE SERVED BY INDIVIDUAL WATER SUPPLY WELLS, WITH THE EXCEPTION OF LOTS #8 AND #9 WHICH CAN BE SERVED BY OCWA PUBLIC WATER SUPPLY.
7. SANITARY SEWER
   SANITARY SEWERS SHALL BE PVC PER ASTM D3034 SDR 35 UNLESS OTHERWISE NOTED. SUITABLE COUPLINGS AND ADAPTERS SHALL BE PROVIDED AT BUILDING CONNECTIONS.
8. STORM DRAINAGE
   STORM DRAINAGE PIPING SHALL BE SMOOTH INTERIOR CORRUGATED PLASTIC PIPE (SICPP) UNLESS OTHERWISE NOTED (SICPP). PIPE JOINTS AND FITTINGS SHALL CONFORM TO AASHTO M252 OR AASHTO M294.
9. ELECTRIC AND GAS
   ALL ELECTRIC AND GAS INSTALLATION SHALL BE COORDINATED WITH NATIONAL GRID.

LEGEND: PROPOSED
(SEE EXISTING CONDITION SURVEY FOR LEGEND OF EXISTING ELEMENTS)

Symbol	Description
(rectangle)	PROPOSED BUILDING
— · · — · · —	PROPERTY LINE
— — — — —	PROPOSED EASEMENT LINE
(circle with grate)	PROPOSED STORM INLET
(circle with dot)	PROPOSED MANHOLE (STORM OR SEWER AS NOTED)
——SAN——	PROPOSED SANITARY PIPE
——ST——	PROPOSED STORM PIPE
——W——	PROPOSED WATER PIPE
—— G ——	PROPOSED GAS PIPE
——UGE——	PROPOSED UNDERGROUND ELECTRIC

LANDSCAPE NOTES

TEMPORARY SEEDING MIXTURES

	LBS./ACRE	LBS./1000 SQ. FT
FOR SPRING, SUMMER OR EARLY FALL SEEDINGS:		
A. ANNUAL RYEGRASS –OR–	30	0.70
B. PERENNIAL RYEGRASS	30	0.70
FOR LATE FALL OR EARLY WINTER		
A. WINTER RYE (AROOSTOOK)	100	2.50

MULCH THE AREA WITH HAY OR STRAW AT 2 TONS/ACRE (APPROXIMATELY 2 LARGE ROLLED BALES/ACRE).

MULCH ANCHORING IS REQUIRED WHERE WIND OR AREAS OF CONCENTRATED WATER ARE OF CONCERN.

PERMANENT SEEDINGS SHOULD TAKE PLACE IN EARLY SPRING. PROPER MULCHING AND ADAQUATE MOISTURE MUST BE PROVIDED FOR PERMANENT SEEDING. RESEEDING OF FAILED AREAS SHALL TAKE PLACE DURING LATE SUMMER/EARLY FALL OR DURING THE FOLLOWING SPRING.

FERTILIZER:
5% NITROGEN
0% PHOSPHORUS
5% POTASH
HYDROMULCH
HYDROMULCH SHALL BE A WOOD–FIBER COMPOSITION (50% PAPER – 50% WOOD)
IF MULCHING IS NOT APPLIED WITH HYDROSEED MIXTURE, APPROVED MULCHING, CONSISTING OF STALKS OF WHEAT, OATS, OR RYE, SHALL BE SPREAD EVENLY AT A RATE OF 2 TONS PER ACRE. MULCH IS TO BE TACKED INTO PLACE.

PERMANENT SEEDING MIXTURES

	LBS./ACRE
SEED MIXTURE NO. 1	
CREEPING RED FESCUE (var. ENSYLVA)	10
PERENNIAL RYE GRASS (var. PENNFINE)	10
SEED MIXTURE NO. 2	
SWITCHGRASS (var. SHELTER, PATHFINDER, TRAILBLAZER, OR BLACKWELL)	20
SEED MIXTURE NO. 3	
BIRDSFOOT TREFOIL (var. EMPIRE, PARDEE)	10
REDTOP	2
TALL FESCUE (var. KY 31, REBEL)	20
SEED MIXTURE NO. 4	
CREEPING RED FESCUE (var. ENSYLVA)	20
CHEWINGS FESCUE (COMMON)	20
PERENNIAL RYE GRASS (var. PENNFINE)	5
RED CLOVER (COMMON)	10

SEED MIXTURE 1 TO BE APPLIED TO SHADED AREAS.

SEED MIXTURE 2 IS IN PURE LIVE SEED. TO BE APPLIED TO AREAS UPLAND OF WETLANDS AND ALONG STORMWATER MITIGATION BASIN BANKS.

SEED MIXTURE 3 TO BE APPLIED TO ALL SWALES AND WATERWAYS. WHITE CLOVER OR LADINO CLOVER MAY BE SUBSTITUTED FOR BRIDSFOOT TREFOIL AND SEEDED AT THE SAME RATE PERENNIAL RYEGRASS MAY BE SUBSTITUTED FOR REDTOP BUT INCREASE SEEDING RATE TO 5 LBS./ACRE (0.1 LBS./1000 SQ. FT)

SEED MIXTURE 4 TO BE APPLIED TO ALL AREAS. (NOT FOR USE IN PLAYGROUNDS OR AS TURF)

METHOD OF SEEDING
BROADCAST, DRILLING WITH A CULTIPACK TYPE SEEDER, OR HYDROSEEDING ARE ACCEPTABLE. GOOD SOIL TO SEED CONTACT IS THE KEY TO SUCCESSFUL SEEDINGS.

MULCHING
APPLY STRAW MULCH AT A RATE OF 2 TON/ACRE (90 LBS./1,000 SF) ANCHORED WITH WOOD FIBER MULCH (HYDROMULCH) AT 500 – 750 LBS./ACRE (11 – 17 LBS./1,000 SF). THE WOOD FIBER MULCH MUST BE APPLIED THROUGH A HYDROSEEDER AFTER MULCHING.

IRRIGATION
WATERING MAY BE ESSENTIAL TO ESTABLISH TO NEW SEEDING. WEATHER CONDITIONS WILL DICTATE WHEN TO WATER. EACH APPLICATION MUST BE UNIFORMLY APPLIED AND 1 TO 2 INCHES OF WATER SHOULD BE APPLIED PER APPLICATION.

PERMANENT SEEDING TO OCCUR AFTER FINAL GRADING HAS OCCURRED. PERMANENT SEEDING WILL INCLUDE:
SITE PREPARATION
A. SCARIFY ALL COMPACT, SLOWLY PERMEABLE, MEDIUM AND FINE TEXTURED SUBSOIL AREAS. SCARIFY AT APPROXIMATELY RIGHT ANGLES TO THE SLOPE DIRECTION IN SOIL AREAS THAT ARE STEEPER THAN 5 PERCENT.
B. REMOVE REFUSE, WOOD PLANT PARTS, STONES OVER 3 INCHES IN DIAMETER, AND OTHER LITTER.

TOPSOIL MATERIALS
A. TOPSOIL SHALL HAVE AT LEAST 2 PERCENT AND NO GREATER THAN 6 PERCENT BY WEIGHT OF FINE TEXTURED STABLE ORGANIC MATERIAL.
B. TOPSOIL SHALL HAVE NOT LESS THAN 20 PERCENT FINE TEXTURED MATERIAL (PASSING THE NO. 200 SIEVE) AND NOT MORE THAN 15 PERCENT CLAY.
C. TOPSOIL TREATED WITH SOIL STERILANTS OR HERBICIDES SHALL BE SO IDENTIFIED TO THE PURCHASER.
D. TOPSOIL SHALL BE RELATIVELY FREE OF STONES OVER 1½" INCHES IN DIAMETER, TRASH, NOXIOUS WEEDS SUCH AS NUTSEDGE AND QUACKGRASS, AND WILL HAVE LESS THAN 10% GRAVEL BY VOLUME.
E. TOPSOIL CONTAINING SOLUBLE SALTS GREATER THAN 500 PPM SHALL NOT BE USED.

APPLICATION AND GRADING
A. TOPSOIL SHALL BE DISTRIBUTED TO A UNIFORM DEPTH OVER THE AREA. IT SHALL NOT BE PLACED WHEN IT IS PARTLY FROZEN, MUDDY, OR ON FROZEN SLOPES OR OVER ICE, SNOW, OR STANDING WATER PUDDLES.
B. TOPSOIL PLACED AND GRADED ON SLOPES STEEPER THAN 5% SHALL BE PROMPTLY FERTILIZED, SEEDED, MULCHED AND STABILIZED BY "TRACKING" WITH SUITABLE EQUIPMENT.
C. A MINIMUM OF 4 INCHES OF TOPSOIL IS TO BE USED IN ALL AREAS.

SOIL AMENDMENTS
A. LIME TO A pH OF 7.0. LIME IS NOT TO BE APPLIED WITHIN 50 FEET OF STREAMS AND WETLANDS.
B. FERTILIZER APPLICATION RATE TO BE BASED ON SOIL TESTS.
   1. IN NO CASE SHALL FERTILIZER BE APPLIED BETWEEN DECEMBER 1 AND APRIL 1 ANNUALLY.
   2. FERTILIZER SHALL NOT BE SPREAD WITHIN 20 FEET OF A SURFACE WATER.
   3. ANY FERTILIZER FALLING OR SPILLED INTO IMPERVIOUS SURFACE AREAS SUCH AS PARKING LOTS, ROADWAYS, AND SIDEWALKS SHALL BE IMMEDIATELY CONTAINED AND LEGALLY APPLIED OR PLACED IN AN APPROPRIATE CONTAINER.
   4. INCORPORATE THE FERTILIZER, AND LIME IF SPECIFIED, INTO THE TOP 2 – 4 INCHES OF THE TOPSOIL OR SOIL PROFILE.
   5. WHEN APPLYING FERTILIZER BY HYDROSEEDING CARE SHOULD BE TAKEN TO APPLY MIX ONLY TO SEED BED AREAS AT AN APPROPRIATE FLOW RATE TO PREVENT EROSION AND SPRAYING ONTO IMPERVIOUS AREAS.

PROJECT TITLE:
BRANDYWINE ESTATES PHASE 2
HENNEBERRY ROAD
TOWN OF MANLIUS ONONDAGA COUNTY, NY

PREPARED FOR:
HARRINGTON HOMES
3848 HENNEBERRY ROAD
JAMESVILLE, NY 13078

SHEET TITLE:
GENERAL NOTES

NO.	REVISION/ISSUE	DATE
1	GENERAL REVISIONS	12/01/2021

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PRELIMINARY
NOT FOR CONSTRUCTION

PLAN SEAL BY:
NEAL H. ZINSMEYER, JR., P.E.
NYS REGISTRATION # 087211

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PROFESSIONAL ENGINEER, PC

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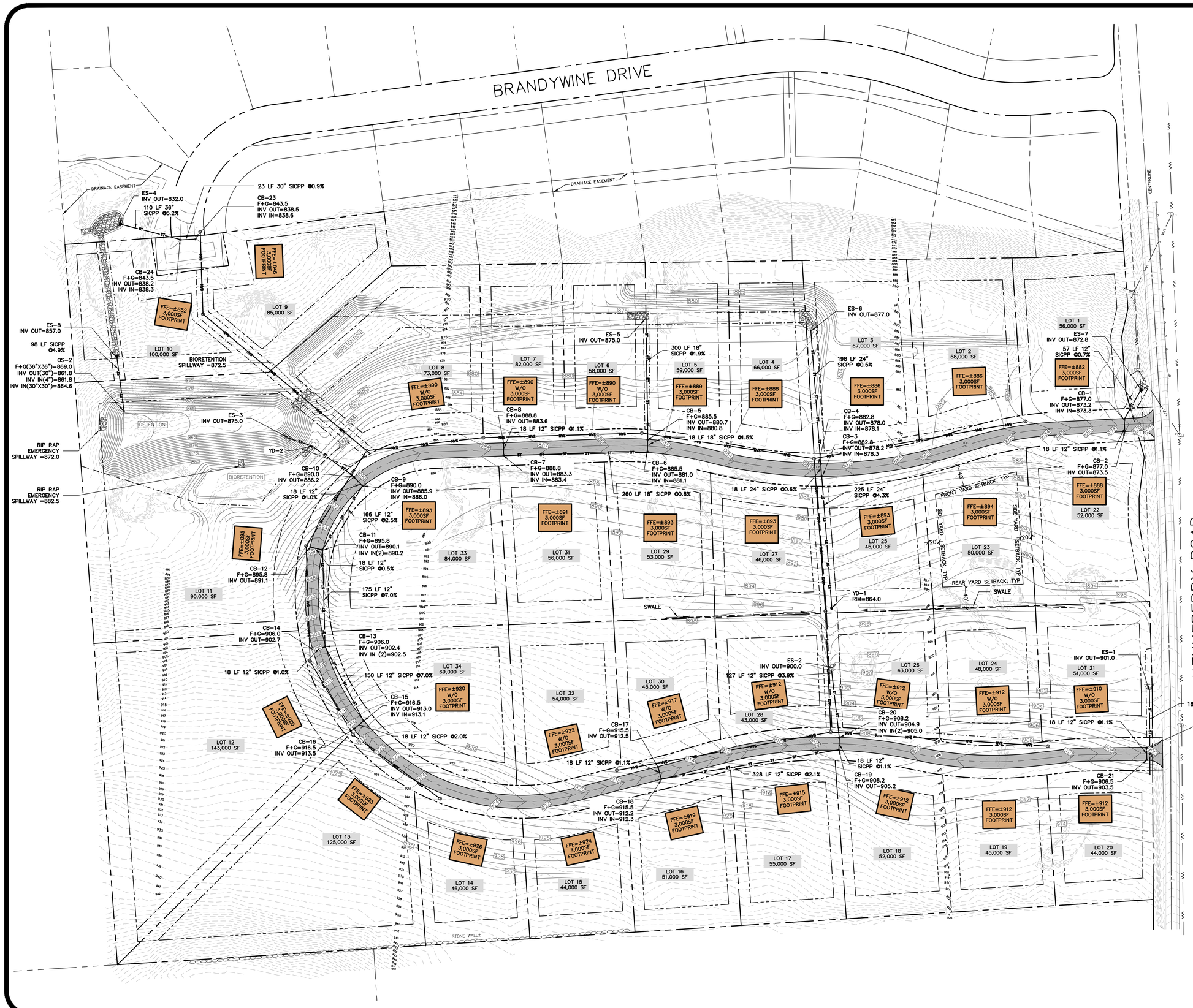
PROJECT NO. 20-1906
DATE 17 SEP 2020
SCALE NTS
SHEET C-1



SITE CRITERIA CHECKLIST

PROJECT SITE INFORMATION		
ADDRESS	HENNEBERRY ROAD (COUNTY ROUTE 182)	
TAX MAP ID NO.	109.-02.-07.1	
BOUNDARY SURVEY	PROPERTY LINE INFORMATION TAKEN FROM SURVEY BY IANUZI AND ROMANS	
TOTAL SITE AREA	54.746 ACRES	
LAND USE	SINGLE FAMILY RESIDENTIAL – 34 LOTS	
ZONING INFORMATION		
ZONING DISTRICT	R-1, RESIDENTIAL DISTRICT	
	REQUIRED	PROVIDED
MIN. LOT FRONTAGE	150'	150' MIN.
MIN. LOT AREA	40,000 SF	40,000 SF MIN.
MINIMUM FRONT YARD	40'	40' MIN.
MINIMUM REAR YARD	40'	40' MIN.
MINIMUM SIDE YARD	20'	20' MIN.

PROJECT TITLE:
BRANDYWINE ESTATES PHASE 2
HENNEBERRY ROAD
TOWN OF MANLIUS — ONONDAGA COUNTY, NY

PREPARED FOR:
HARRINGTON HOMES
3848 HENNEBERRY ROAD
JAMESVILLE, NY 13078

SHEET TITLE:
OVERALL GRADING PLAN

NO.	REVISION/ISSUE	DATE
1	GENERAL REVISIONS	12/31/2021

GRAPHIC SCALE
0 — 80' — 160'
(IN FEET)
1 inch = 80 ft

PREPARED BY:
NAPIERALA CONSULTING
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SITE • DESIGN • ENGINEERING
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PH: (315) 682-5580 FAX: (315) 682-5544

PRELIMINARY
NOT FOR CONSTRUCTION

PLAN SEAL BY:
NEAL H. ZINSMEYER, JR., P.E.
NYS REGISTRATION # 087211

PROJECT NO. 20-1906
DATE 17 SEP 2020
SCALE 1" = 80'

SHEET C-2

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NOTE:

STORM CONVEYANCE SYSTEM PIPE SLOPE, RIM, AND INVERT ELEVATIONS CAN BE SEEN ON THE OVERALL GRADING PLAN, SHEET C-2.

GRAPHIC SCALE

0 80' 160'

(IN FEET)
1 inch = 80 ft

PROJECT TITLE:
BRANDYWINE ESTATES PHASE 2 HENNEBERRY ROAD

TOWN OF MANLIUS ONONDAGA COUNTY, NY

PREPARED FOR:
HARRINGTON HOMES

3848 HENNEBERRY ROAD
JAMESVILLE, NY 13078

SHEET TITLE:
OVERALL UTILITY PLAN

NO.	REVISION/ISSUE	DATE
1	GENERAL REVISIONS	12/01/2021

PREPARED BY:

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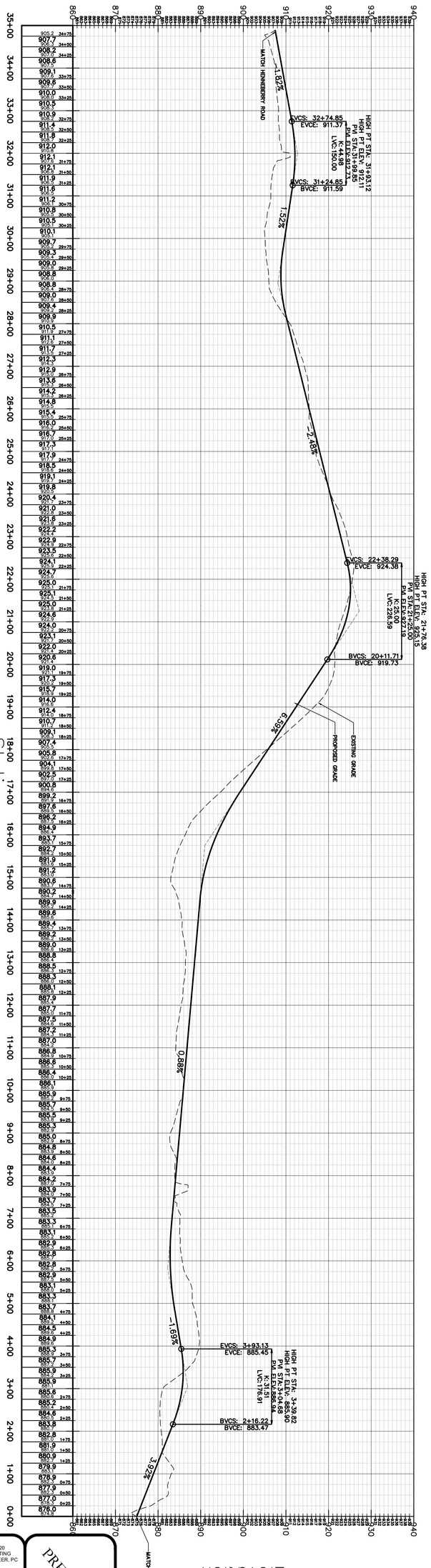
PROJECT NO. 20-1906

DATE 17 SEP 2020

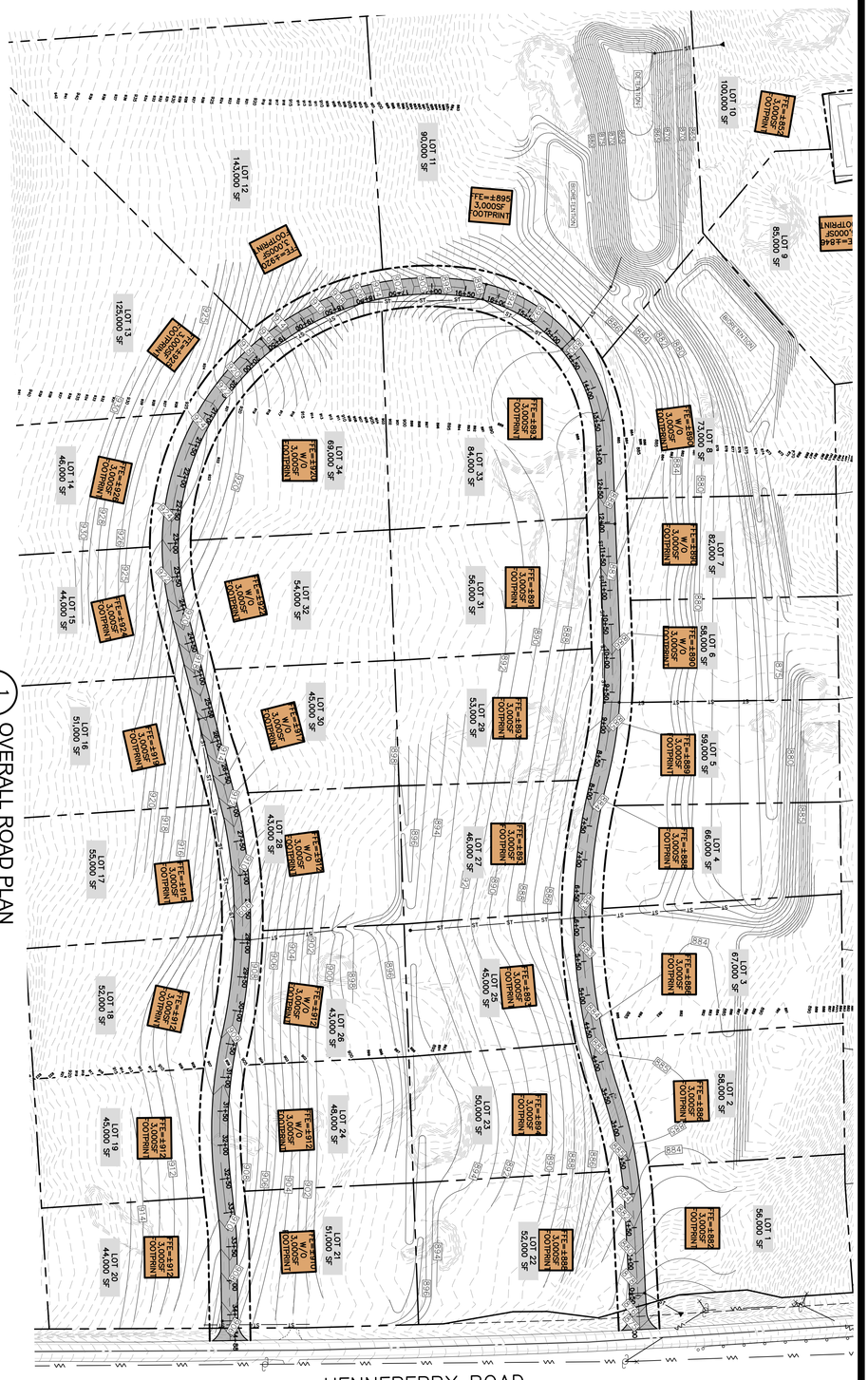
SCALE 1" = 80'

SHEET **C-3**



2 C-4 OVERALL ROAD PROFILE

SCALE: H: 1"=120' V:1"=12'



1 C-4 OVERALL ROAD PLAN

SCALE: 1"=100'

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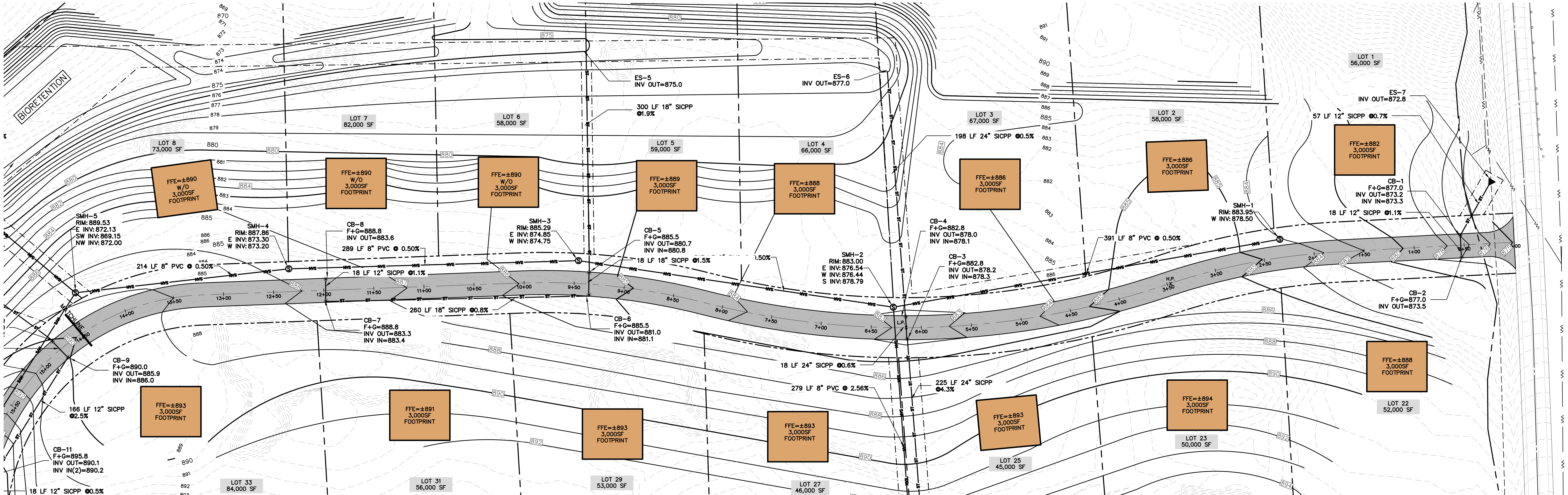
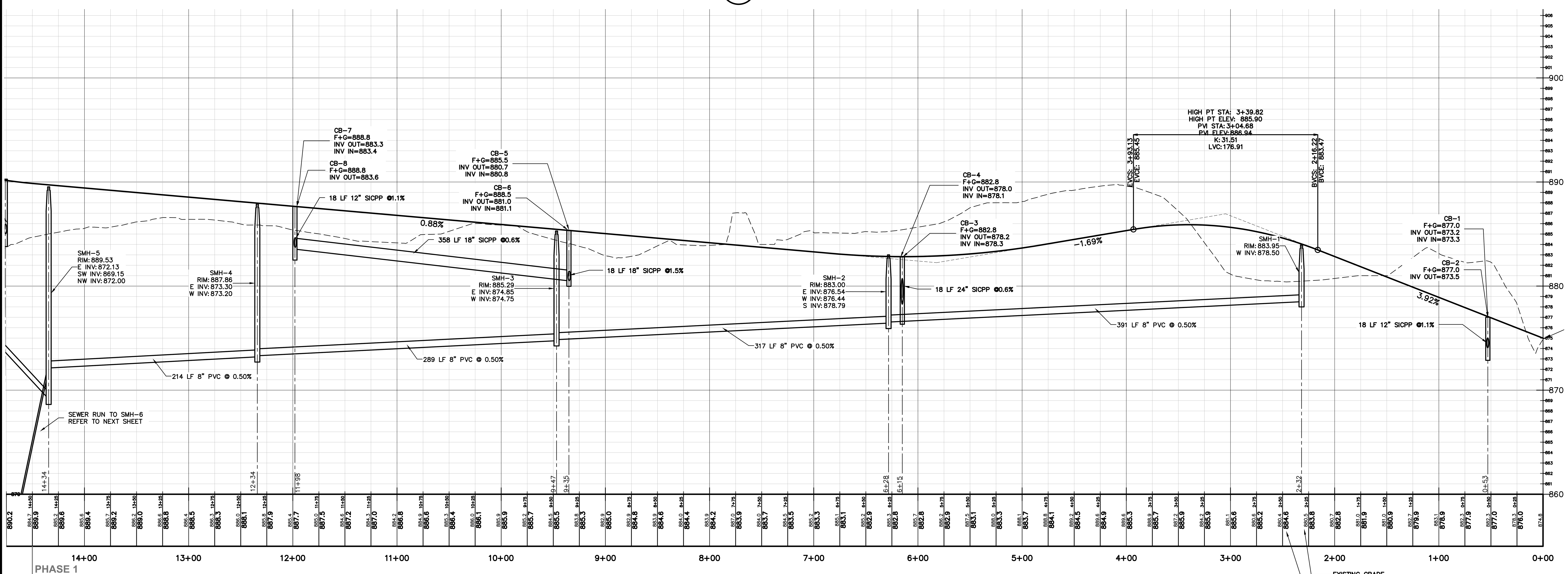
PLAN SEAL BY:
NEAL H. ZINSMEYER, JR., P.E.
NYS REGISTRATION # 087211

SHEET	PROJECT NO.	PREPARED BY:			SHEET TITLE:	PROJECT TITLE:
C-4	20-1906	NAPIERALA CONSULTING PROFESSIONAL ENGINEER, P.C. SITE • DESIGN • ENGINEERING	1	GENERAL REVISIONS	12/01/2021	OVERALL ROAD PROFILE	BRANDYWINE ESTATES PHASE 2 HENNEBERRY ROAD
	DATE 17 SEP 2020	110 FAYETTE STREET MANLIUS, NEW YORK 13104	NO.	REVISION/ISSUE	DATE		TOWN OF MANLIUS ONONDAGA COUNTY, NY
	SCALE AS NOTED	email: MNAP@NAPCON.COM PH: (315) 682-5580 FAX: (315) 682-5544					PREPARED FOR: HARRINGTON HOMES 3848 HENNEBERRY ROAD JAMESVILLE, NY 13078



1 ROAD A
C-5.0 SCALE: 1"=50'



2 ROAD A PROFILE - SUBDIVISION PHASE 1
C-5.0 SCALE: H:1"=50' V:1"=5'

GRAPHIC SCALE
0 50' 100'
(IN FEET)
1 inch = 50 ft

PROJECT TITLE:
BRANDYWINE ESTATES PHASE 2
HENNEBERRY ROAD
TOWN OF MANLIUS ONONDAGA COUNTY, NY

PREPARED FOR:
HARRINGTON HOMES
3848 HENNEBERRY ROAD
JAMESVILLE, NY 13078

SHEET TITLE:
ROAD PROFILE PLAN

NO.	REVISION/ISSUE	DATE
1	GENERAL REVISIONS	12/01/2021

PREPARED BY:
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PLAN SEAL BY:
NEAL H. ZINSMEYER, JR., P.E.
NYS REGISTRATION # 087211

PROJECT NO. 20-1906
DATE 17 SEP 2020
SCALE 1" = 50'
SHEET **C-5.0**

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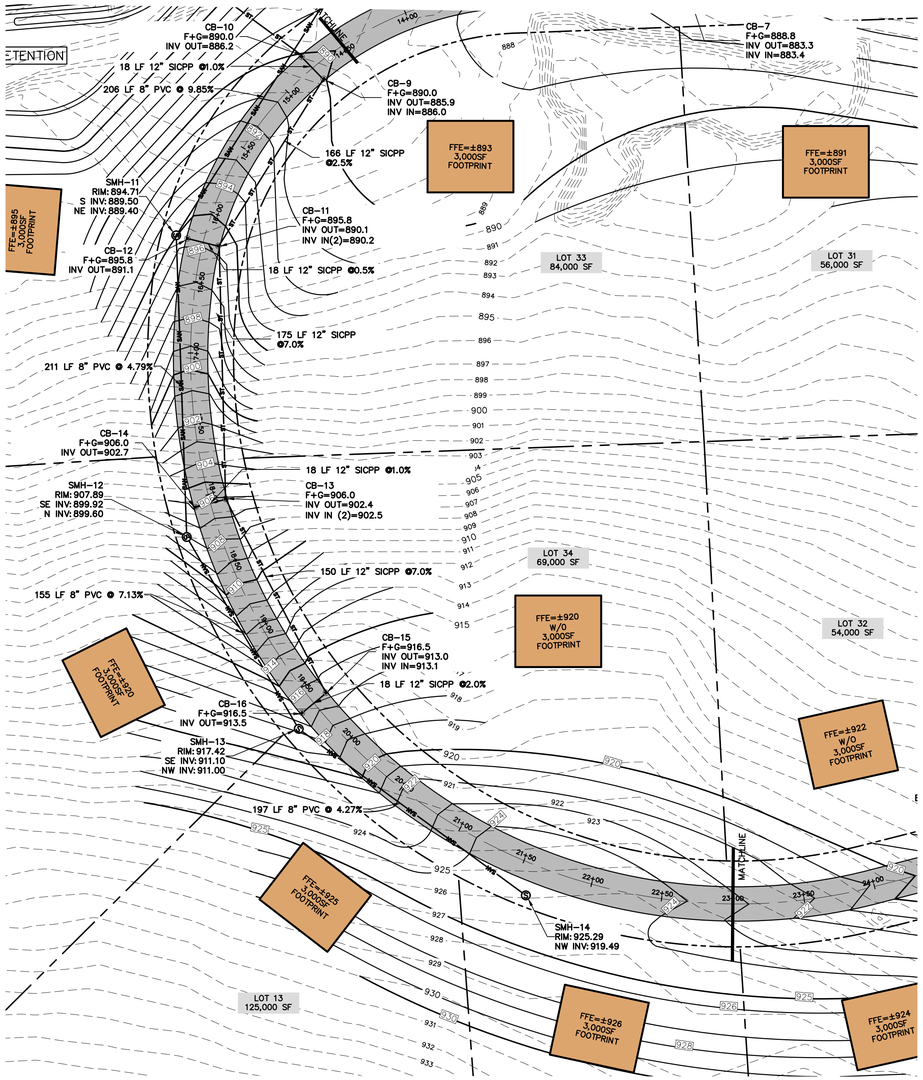
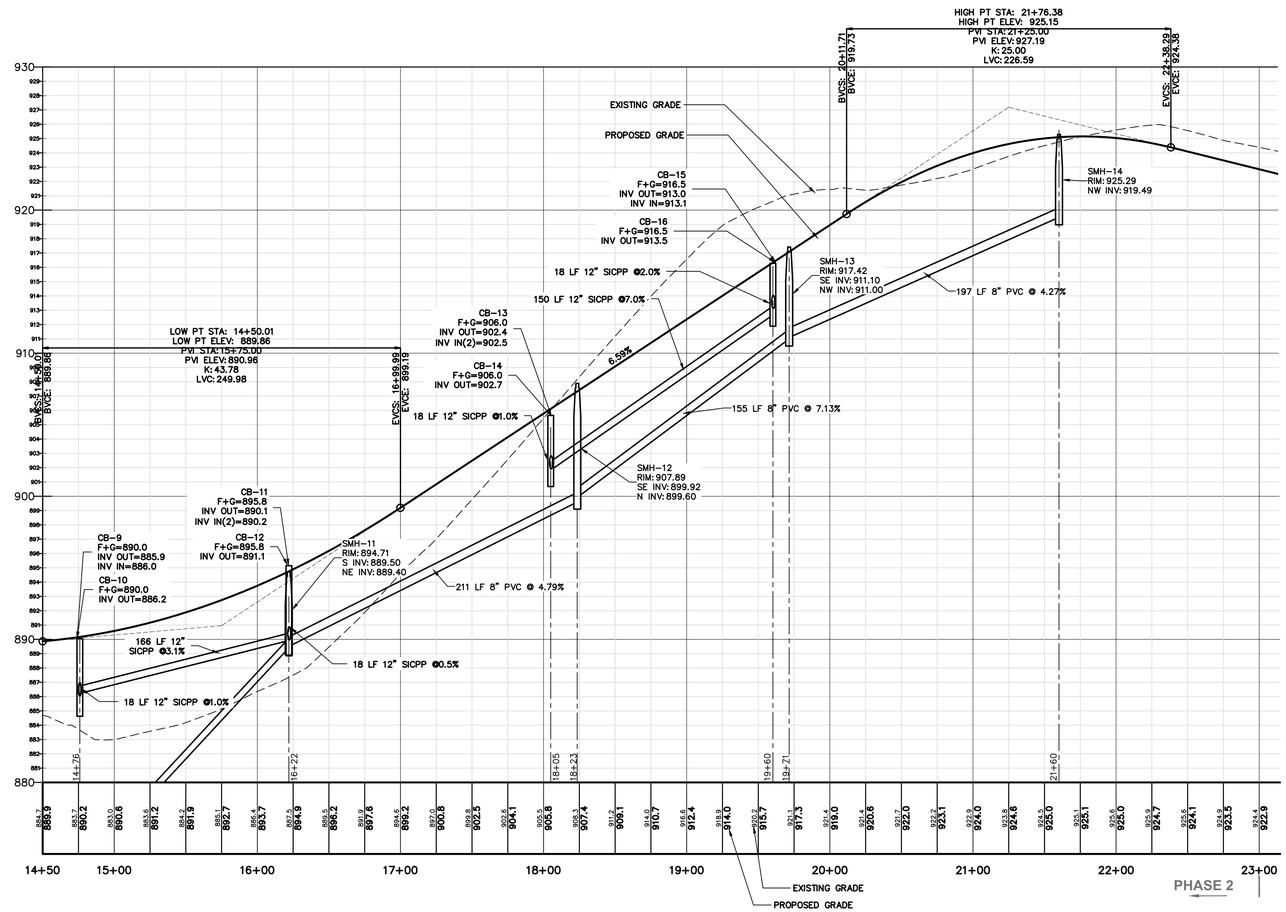


1 C-5.1 ROAD A PLAN
SCALE: 1"=50'



2 C-5.1 ROAD A PROFILE - SUBDIVISION PHASE 2
SCALE: H: 1"=50' V: 1"=5'

GRAPHIC SCALE
0 50' 100'
(IN FEET)
1 inch = 50 ft

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PROJECT TITLE:
BRANDYWINE ESTATES PHASE 2
HENNEBERRY ROAD
TOWN OF MANLIUS — ONONDAGA COUNTY, NY

PREPARED FOR:
HARRINGTON HOMES
3848 HENNEBERRY ROAD
JAMESVILLE, NY 13078

SHEET TITLE:
ROAD PROFILE PLAN

NO.	REVISION/ISSUE	DATE
1	GENERAL REVISIONS	12/01/2021

PREPARED BY:
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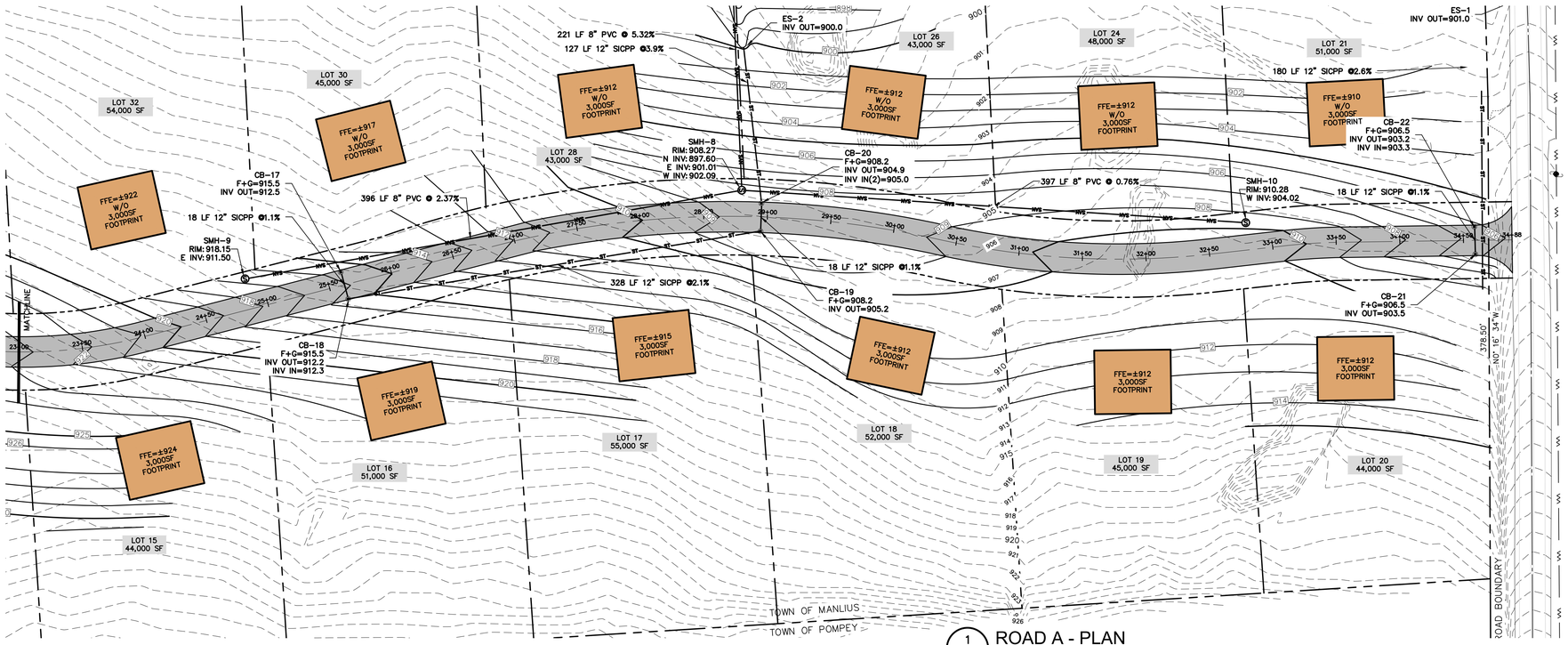
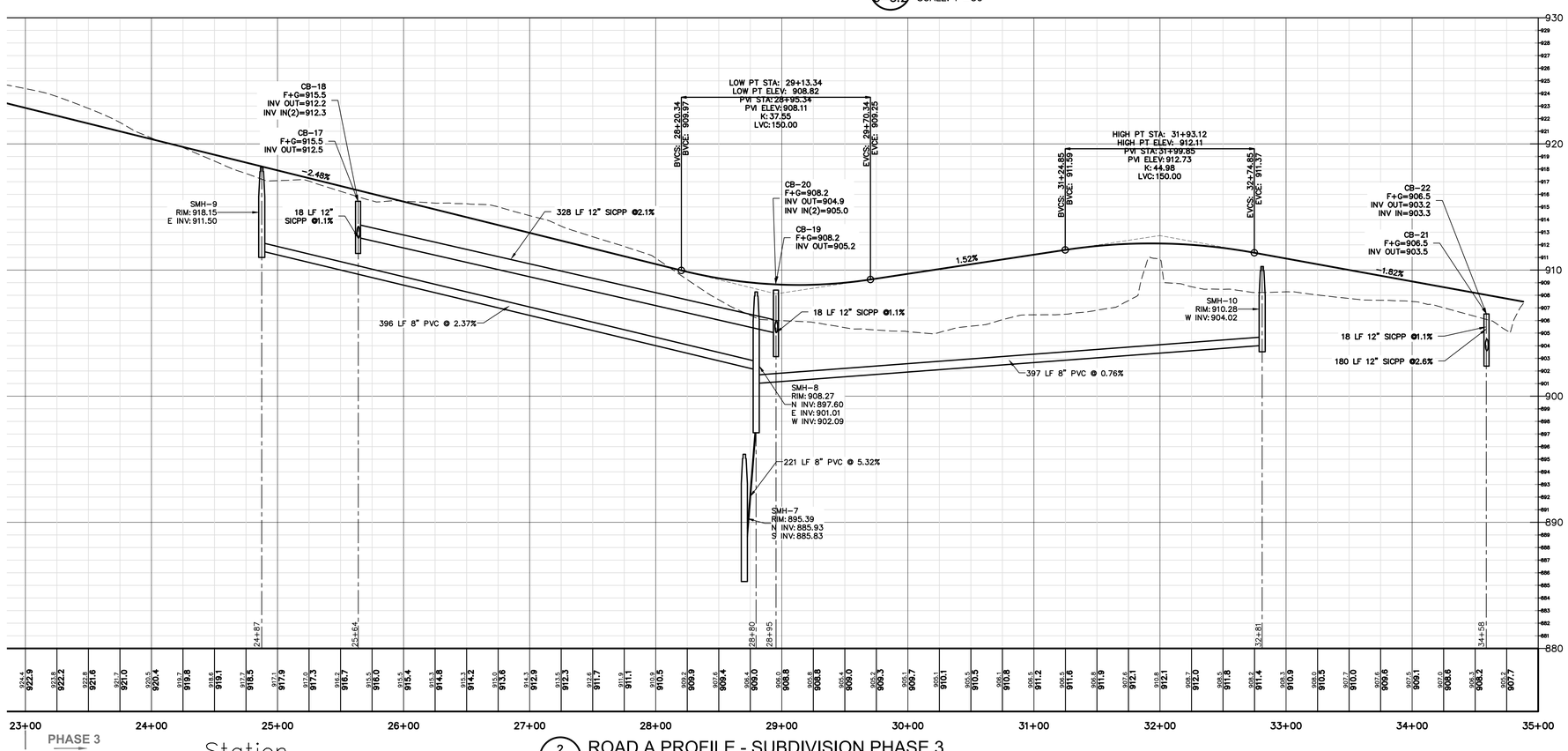
PROJECT NO. 20-1906
DATE 17 SEP 2020
SCALE 1" = 50'
SHEET C-5.1



1 C-5.2 ROAD A - PLAN
SCALE: 1"=50'



2 C-5.2 ROAD A PROFILE - SUBDIVISION PHASE 3
SCALE: H:1"=50' V:1"=5'

GRAPHIC SCALE
0 50' 100'
(IN FEET)
1 inch = 50 ft

PROJECT TITLE:
BRANDYWINE ESTATES PHASE 2
HENNEBERRY ROAD
TOWN OF MANLIUS — ONONDAGA COUNTY, NY

PREPARED FOR:
HARRINGTON HOMES
3848 HENNEBERRY ROAD
JAMESVILLE, NY 13078

SHEET TITLE:
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NO.	REVISION/ISSUE	DATE
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PLAN SEAL BY:
NEAL H. ZINSMEYER, JR. P.E.
NYS REGISTRATION # 087211

PROJECT NO. 20-1906
DATE 17 SEP 2020
SCALE 1" = 50'

SHEET C-5.2

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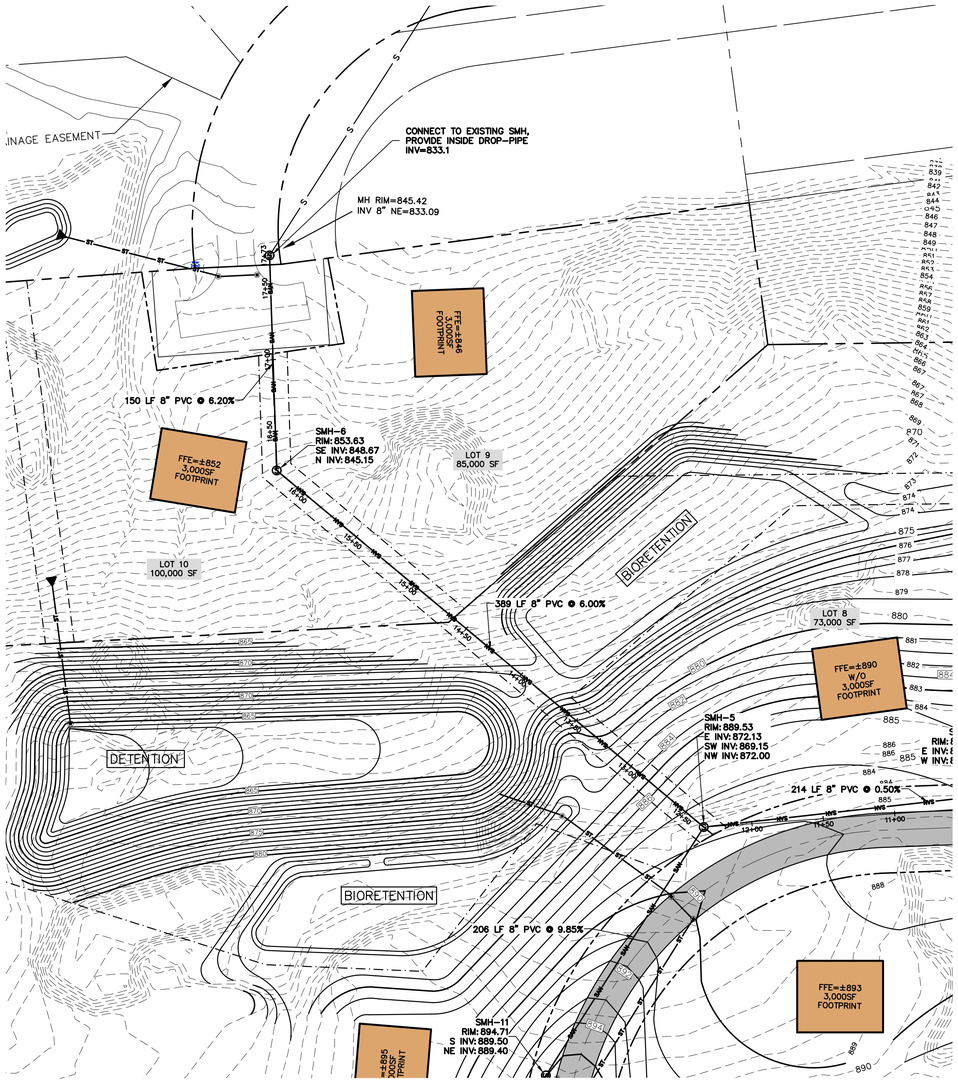
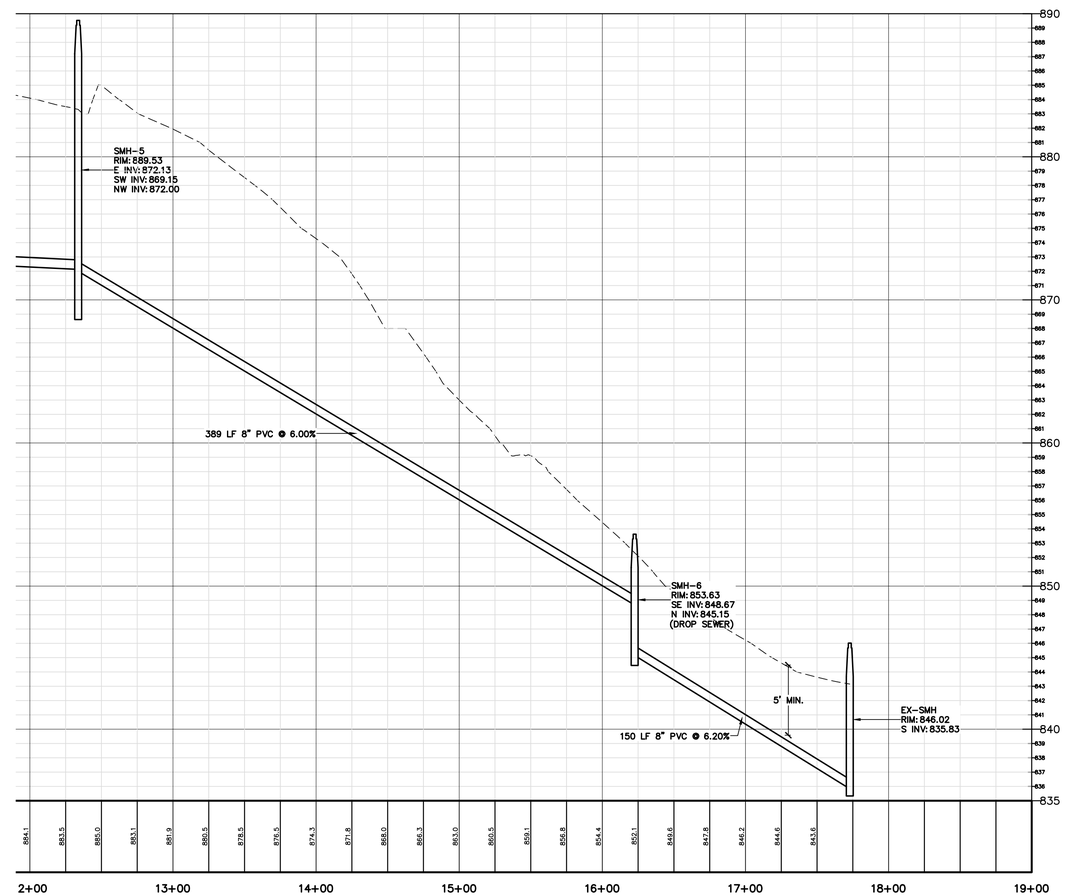


2 C-6.0 SEWER PLAN
SCALE: 1"=50'



3 C-6.0 SEWER PROFILE
SCALE: H: 1"=50' V: 1"=5'

1 C-6.0 OVERALL SEWER LAYOUT
SCALE: NTS

PROJECT TITLE:
BRANDYWINE ESTATES PHASE 2
HENNEBERRY ROAD
TOWN OF MANLIUS — ONONDAGA COUNTY, NY

PREPARED FOR:
HARRINGTON HOMES
3848 HENNEBERRY ROAD
JAMESVILLE, NY 13078

SHEET TITLE:
SEWER PROFILE PLAN

NO.	REVISION/ISSUE	DATE
1	GENERAL REVISIONS	12/31/2021

PREPARED BY:
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PLAN SEAL BY:
NEAL H. ZINSMEYER, JR., P.E.
NYS REGISTRATION # 087211

PROJECT NO. 20-1906
DATE 15 SEP 2020
SCALE 1" = 50'

SHEET C-6.0

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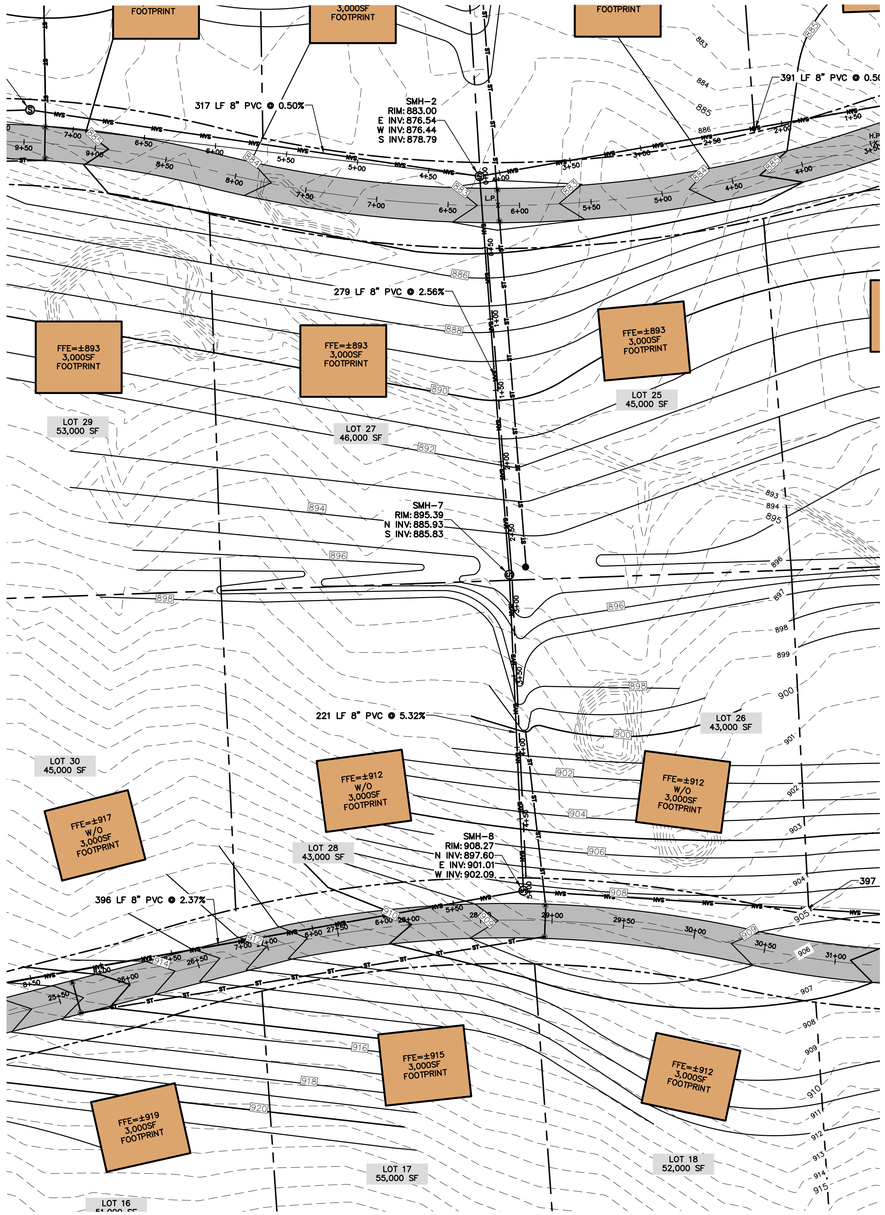
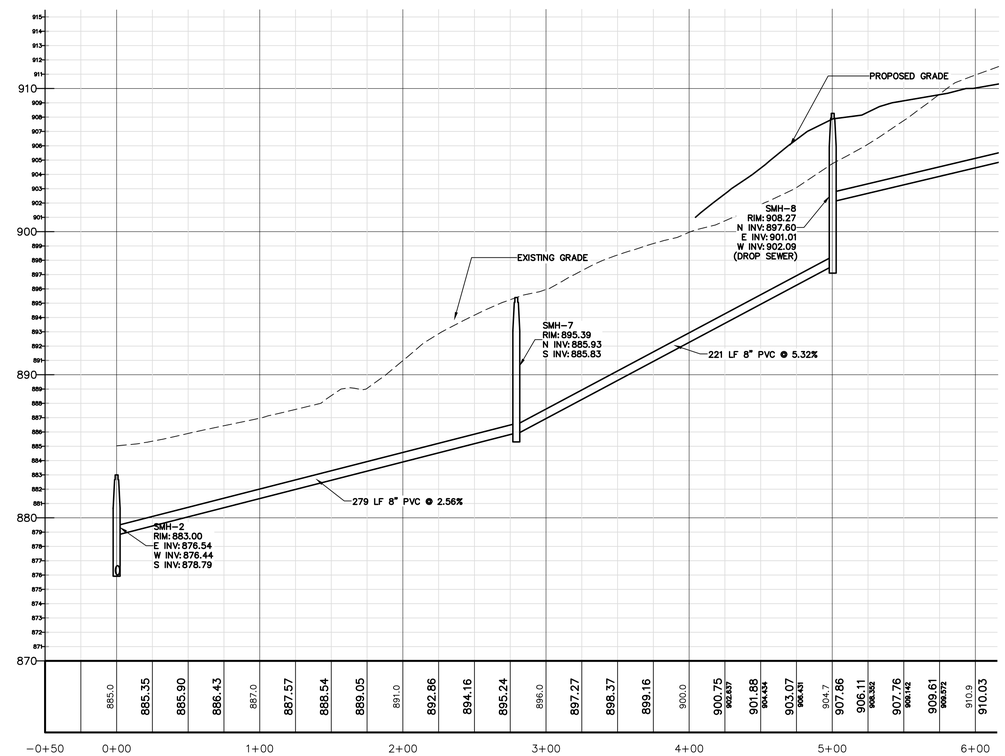
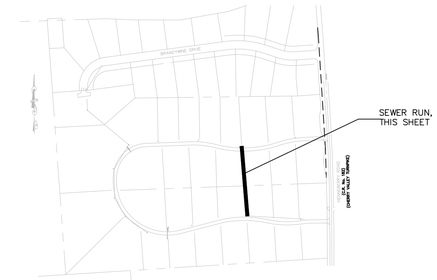


2 C-6.1 SANITARY SEWER PLAN
SCALE: 1"=50'



3 C-6.1 SANITARY SEWER PROFILE
SCALE: H:1"=50' V:1"=5'



1 C-6.1 OVERALL SEWER LAYOUT
SCALE: NTS

PROJECT TITLE:
BRANDYWINE ESTATES PHASE 2
HENNEBERRY ROAD
TOWN OF MANLIUS — ONONDAGA COUNTY, NY

PREPARED FOR:
HARRINGTON HOMES
3848 HENNEBERRY ROAD
JAMESVILLE, NY 13078

SHEET TITLE:
SEWER PROFILE PLAN

NO.	REVISION/ISSUE	DATE
1	GENERAL REVISIONS	12/31/2021

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PROFESSIONAL ENGINEER, P.C.
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PLAN SEAL BY:
NEAL H. ZINSMEYER, JR., P.E.
NYS REGISTRATION # 087217

PROJECT NO. 20-1906
DATE 15 SEP 2020
SCALE 1" = 50'

SHEET C-6.1

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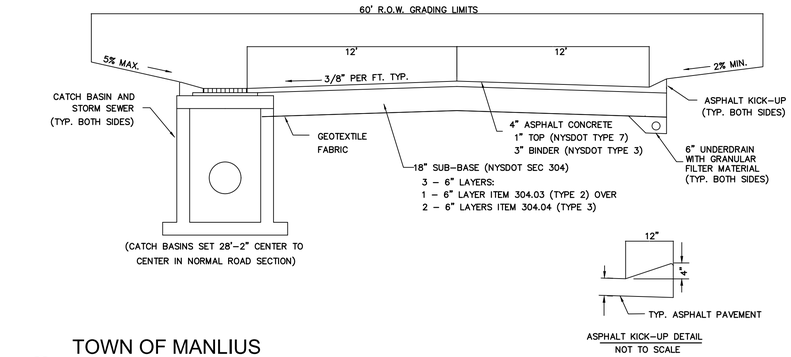
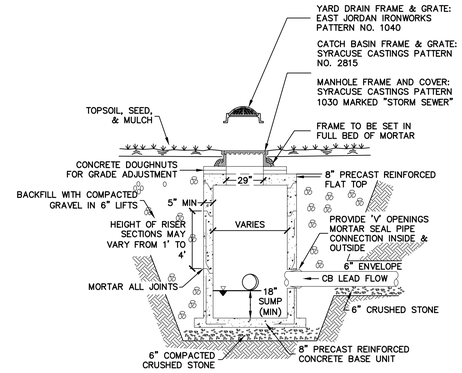


1 C-7.0 TOWN OF MANLIUS RESIDENTIAL STREET CROSS SECTION

SCALE: NTS

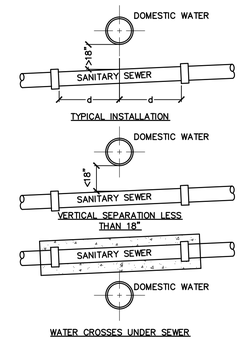


DRAINAGE STRUCTURE GENERAL NOTES

1. ALL STRUCTURES SHALL BE RATED FOR H-20 LOADING
2. REINFORCING FOR ALL SECTIONS SHALL BE AS FOLLOWS:
   TOP: #3 BARS SPACED AT 4" IN BOTH DIRECTIONS.
   BOTTOM: #3 BARS SPACED AT 4" IN BOTH DIRECTIONS.
   SIDES: #3 BARS SPACED AT 8" IN BOTH HORIZONTAL AND VERTICAL.
3. ALL REINFORCEMENT SHALL BE PLACED SO IT WILL HAVE A MINIMUM COVER OF 2" AND BE LOCATED APPROXIMATELY WITHIN THE CENTER OF THE SECTION.
4. TOP SLAB AND/OR FRAME ADJUSTMENT: FOR ALL DRAINAGE STRUCTURES A MAXIMUM OF 6 INCHES OF BRICK AND MORTAR OR A MAXIMUM OF 2 INCHES OF MORTAR ALONE SHALL BE USED FOR TOP SLAB AND/OR FRAME & GRATE ADJUSTMENT. FOR ADJUSTMENTS OVER 6 INCHES AND NOT TO EXCEED 12 INCHES, PRECAST CONCRETE ADJUSTMENT ELEMENT(S) MANUFACTURED IN ACCORDANCE WITH NYS-DOT STANDARD SPEC SUB-SECTION #706-04 SHALL BE USED; A MAXIMUM OF 2 INCHES OF MORTAR SHALL BE ALLOWED ON BOTH THE TOP AND BOTTOM OF THE PRECAST DEVICES. BRICK SHALL BE PRECAST PAVERS CONFORMING TO NYS-DOT STANDARD SPEC SUB-SECTION #704-13 AND MORTAR SHALL BE MORTAR FOR CONCRETE MASONRY CONFORMING TO NYS-DOT STANDARD SPEC SUB-SECTION #705-21.
5. MANHOLE STEPS SHALL BE REQUIRED IN ALL DRAINAGE STRUCTURES DEEPER THAN 4 FEET. STEPS SHALL CONFORM TO NYS-DOT STANDARD SPEC SUB-SECTION #725-02.
6. BASE OF PRECAST CATCH BASIN SHALL REST ON BASE MATERIAL COMPACTED IN PLACE WITH A VIBRATORY MECHANICAL TAMPER IN LIFTS NOT TO EXCEED 6" AT A TIME.
7. TRENCH SIDES SHALL CONFORM TO NYS DEPT OF LABOR AND OSHA SAFETY REGULATIONS.
8. MANHOLE INLET AND OUTLET PIPE CONNECTIONS MUST BE JOINED TO THE MANHOLE WITH A GASKETED, FLEXIBLE, WATERTIGHT CONNECTION OR IN ANY WATERTIGHT ARRANGEMENT THAT ALLOWS DIFFERENTIAL SETTLING OF THE MANHOLE WALL AND PIPE TO TAKE PLACE.

2 C-7.0 CATCH BASIN

SCALE: NTS



TYPICAL INSTALLATION

1. MINIMUM VERTICAL SEPARATION IS 18" FROM TOP OF PIPE TO BOTTOM OF PIPE.
2. SEWER JOINTS ARE TO SPACED EQUIDISTANT AND AS FAR AS POSSIBLE FROM THE WATER MAIN JOINTS.

VERTICAL SEPARATION LESS THAN 18"

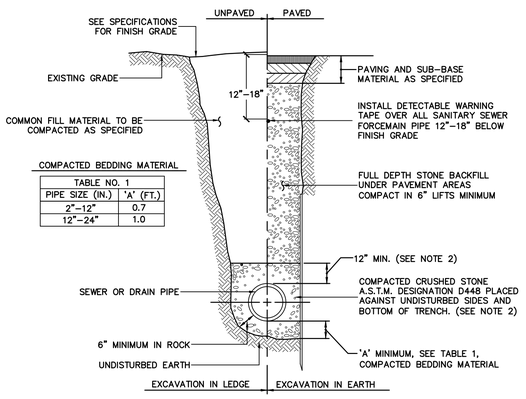
1. SEWER SHALL BE DESIGNED AND CONSTRUCTED EQUAL TO THE WATER PIPE, AND SHALL BE PRESSURE TESTED AT 150 PSI TO ASSURE WATER TIGHTNESS PRIOR TO BACKFILLING.
2. SEWER JOINTS ARE TO SPACED EQUIDISTANT AND AS FAR AS POSSIBLE FROM THE WATER MAIN JOINTS.

WATER CROSSES UNDER SEWER

1. SEWER SHALL BE DESIGNED AND CONSTRUCTED EQUAL TO THE WATER PIPE, AND SHALL BE PRESSURE TESTED AT 150 PSI TO ASSURE WATER TIGHTNESS PRIOR TO BACKFILLING.
2. SEWER JOINTS ARE TO SPACED EQUIDISTANT AND AS FAR AS POSSIBLE FROM THE WATER MAIN JOINTS.
3. PROVIDE ADEQUATE STRUCTURAL SUPPORT FOR SEWER TO MAINTAIN LINE AND GRADE

3 C-7.0 WATER AND SEWER SEPARATION

SCALE: NTS



COMPACTED BEDDING MATERIAL

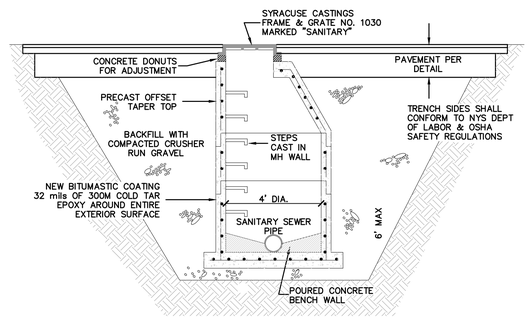
TABLE NO. 1	
PIPE SIZE (IN.)	'A' (FT.)
2"-12"	0.7
12"-24"	1.0

NOTES:

1. 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.
2. WHEN APPROVED BY THE ENGINEER FOR PIPES OTHER THAN PVC SELECTED GRAVEL FILL MATERIAL MAY BE USED FROM MID-DIAMETER OF PIPE TO 12" ABOVE TOP OF PIPE. NO STONES LARGER THAN 2 INCHES IN ANY DIMENSION WILL BE PERMITTED IN THIS AREA 3. TRENCHES LOCATED ON THE ROAD SHOULDER SHALL BE TREATED THE SAME AS EXCEPT FOR PAVING.
4. PROVIDE AT LEAST ONE IMPERVIOUS DAM IN GRAVEL BEDDING BETWEEN EACH MANHOLE WHERE DIRECTED, OR EVERY 300 FEET, WHICHEVER IS LESS. SEE DETAIL.
5. BEDDING MATERIAL FOR PVC PIPE SHALL MEET THE REQUIREMENTS OF ASTM D2321 CLASS I OR CLASS II EMBEDMENT MATERIALS.

4 C-7.0 TYPICAL SEWER AND DRAIN TRENCH

SCALE: NTS

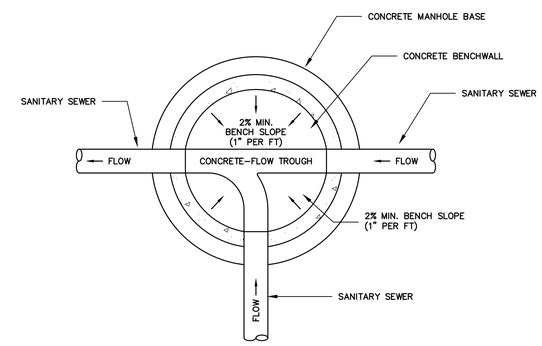


SANITARY MANHOLE GENERAL NOTES

1. ALL SANITARY SEWER MANHOLES TO BE RATED FOR H-20 LOADING
2. PRECAST REINFORCED CONCRETE OFFSET TAPER TOP TO BE MANUFACTURED IN ACCORDANCE WITH ASTM C-478. TOP SECTION IS TO BE 3' LONG.
3. PRECAST REINFORCED CONCRETE MANHOLE RISER SECTIONS ARE TO BE MANUFACTURED IN ACCORDANCE WITH ASTM C-478. RISER SECTIONS ARE TO HAVE A 48" INSIDE DIAMETER x 5" WALL AVAILABLE IN 2', 3', OR 4' LENGTHS.
4. PRECAST REINFORCED CONCRETE MANHOLE BASE IS TO MANUFACTURED IN ACCORDANCE WITH ASTM C-478. BASE IS TO HAVE A 48" INSIDE DIAMETER x 5" WALL WITH RUBBER BOOTS AS REQUIRED.
5. REINFORCING FOR ALL SECTIONS SHALL BE 2X4, 16 W.W. MESH.
6. ALL REINFORCEMENT SHALL BE PLACED SO IT WILL HAVE A MINIMUM COVER OF 2" AND BE LOCATED APPROXIMATELY WITHIN THE CENTER OF THE SECTION.
7. COURSES OF BRICK OR CONCRETE DONUTS ARE TO BE USED FOR RIM GRADE ADJUSTMENTS.
8. BASE OF PRECAST MANHOLE SHALL REST ON UNDISTURBED UNIFORM VIRGIN SOIL OR COMPACTED GRAVEL, COMPACTED IN PLACE WITH VIBRATORY MECHANICAL TAMPERS IN LIFTS NOT TO EXCEED 6" AT A TIME.
9. TRENCH SIDES SHALL CONFORM TO NYS LABOR DEPARTMENT SAFETY REGULATIONS.

5 C-7.0 SANITARY MANHOLE STRUCTURE

SCALE: NTS



6 C-7.0 SANITARY SEWER MANHOLE BENCH

SCALE: NTS

PROJECT TITLE:
BRANDYWINE ESTATES PHASE 2
HENNEBERRY ROAD
TOWN OF MANLIUS — ONONDAGA COUNTY, NY

PREPARED FOR:
HARRINGTON HOMES
3848 HENNEBERRY ROAD
JAMESVILLE, NY 13078

SHEET TITLE:
SITE DETAILS

NO.	REVISION/ISSUE	DATE
1	GENERAL REVISIONS	12/31/2021

PREPARED BY:
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PRELIMINARY
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PLAN SEAL BY:
NEAL H. ZINSMEYER, JR. P.E.
NYS REGISTRATION # 92721

PROJECT NO. 20-1906
DATE 17 SEP 2020
SCALE NTS

SHEET C-7.0

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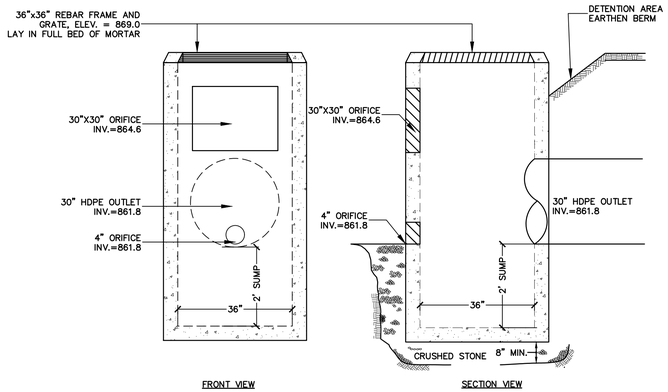
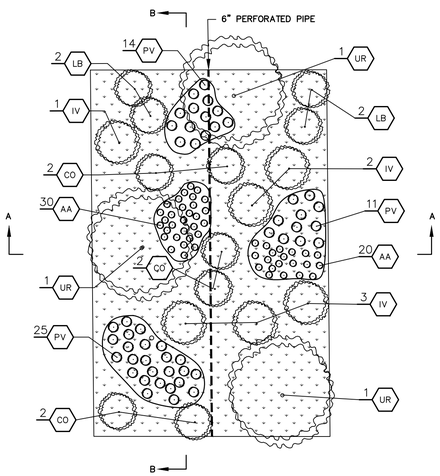


DETENTION BASIN #1 PRECAST CONCRETE OUTLET STRUCTURE

1 / C-7.1 SCALE: NTS



*PLANTING QUANTITIES SHOWN IN THE GRAPHIC ABOVE ARE FOR A TYPICAL 1,000 SF BIORETENTION AREA. SPECIFIC QUANTITIES FOR THE BIORETENTION AREA ARE PROVIDED IN THE CORRESPONDING LANDSCAPING TABLE.

BIORETENTION AREA #1 (±12,800 SF) – LANDSCAPE TABLE

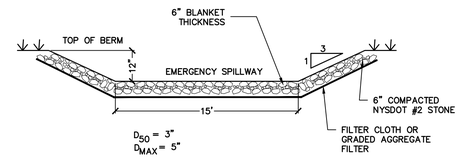
KEY	QUANTITY*	LATIN NAME	COMMON NAME	CALIPER	HEIGHT
TREES					
UR	16	ULMUS RUBRA	SLIPPERY ELM	6'–8'	B&B
SHRUBS					
LB	45	LINDERA BENZOIN	COMMON SPICE	18"–24"	B&B
IV	65	ILEX VERTICILLATA	WINTER BERRY	2'–3'	B&B
CO	65	CEPHALANTHUS OCCIDENTALIS	BUTTONBUSH	18"–24"	B&B
HERBACEOUS PLANTS					
PV	600	PANICUM VIRGATUM	SWITCH GRASS		
AA	600	AGROSTIS ALBA	REDTOP		

BIORETENTION AREA #2 (±6,200 SF) – LANDSCAPE TABLE

KEY	QUANTITY*	LATIN NAME	COMMON NAME	CALIPER	HEIGHT
TREES					
UR	8	ULMUS RUBRA	SLIPPERY ELM	6'–8'	B&B
SHRUBS					
LB	25	LINDERA BENZOIN	COMMON SPICE	18"–24"	B&B
IV	35	ILEX VERTICILLATA	WINTER BERRY	2'–3'	B&B
CO	30	CEPHALANTHUS OCCIDENTALIS	BUTTONBUSH	18"–24"	B&B
HERBACEOUS PLANTS					
PV	300	PANICUM VIRGATUM	SWITCH GRASS		
AA	300	AGROSTIS ALBA	REDTOP		

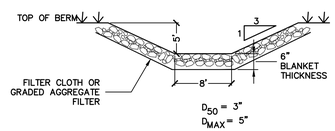
BIORETENTION FILTER SPECIES

2 / C-7.1 SCALE: NTS



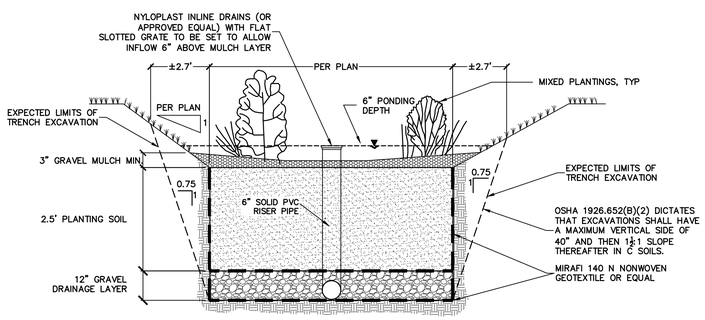
RIP RAP EMERGENCY SPILLWAY

3 / C-7.1 SCALE: NTS

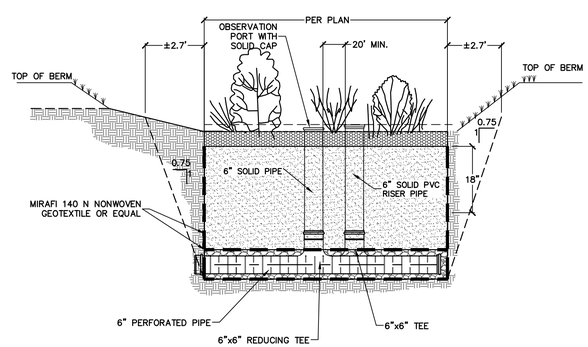


RIP RAP BIORETENTION SPILLWAY

4 / C-7.1 SCALE: NTS



PROFILE VIEW SECTION A–A



PROFILE VIEW SECTION B–B

BIORETENTION FILTER CROSS SECTIONS

5 / C-7.1 SCALE: NTS

BIORETENTION NOTES:

1. PLANTING SOIL MEDIA SHALL BE:
   A.) 85% TO 88% COARSE TO MEDIUM SAND
   B.) 12%–15% LEAF COMPOST OR TOPSOIL
2. PEA GRAVEL MULCH CONFORMING TO ASTM D 448 No. 6.
3. UNDERDRAIN GRAVEL TO BE AASHTO M–43 No. 67, 0.25" TO 0.75".
4. GEOTEXTILE FILTER FABRIC (SEPARATION LAYER):
   ASTM D–751 (PUNCTURE STRENGTH – 125 LB)
   ASTM D–1117 (MULLEN BURST STRENGTH – 400 PSI)
   ASTM D–1682 (TENSILE STRENGTH – 300 LB)
   SIZE – 0.08" THICK; EQUIVALENT OPENING SIZE OF #80 SIEVE
5. COMPACT WITH WATER–FILLED HAND ROLLER. COMPACTION TO BE FIRM BUT EASY (UTILIZE PENCIL TEST).
6. ENGINEER TO TEST IN PLACE COMPACTION AND INFILTRATION OF PLANTING SOIL.
7. ENGINEER TO PERFORM INSPECTION OF BIORETENTION PLANTING SOIL IMMEDIATELY FOLLOWING PLACEMENT AND PERFORM AN IN PLACE PERCOLATION TEST TO CONFIRM THAT THE IN PLACE MATERIAL PERCOLATES AT A RATE FASTER THAN 10 MIN/INCH.

PROJECT TITLE:
BRANDYWINE ESTATES PHASE 2
HENNEBERRY ROAD
TOWN OF MANLIUS — ONONDAGA COUNTY, NY

PREPARED FOR:
HARRINGTON HOMES
3848 HENNEBERRY ROAD
JAMESVILLE, NY 13078

SHEET TITLE:
SITE DETAILS

NO.	REVISION/ISSUE	GENERAL REVISIONS	DATE
1			12/31/2021

PREPARED BY:
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PRELIMINARY
NOT FOR CONSTRUCTION

PLAN SEAL BY:
NEAL H. ZINSMEYER, JR. P.E.
NYS REGISTRATION # 67271

PROJECT NO. 20-1906
DATE 17 SEP 2020
SCALE AS SHOWN

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SHEET C-7.1

EROSION CONTROL NOTES

EROSION AND SEDIMENT CONTROLS

1. STABILIZATION PRACTICES (TEMPORARY)
   a) TEMPORARY SEEDING AND PLANTING OF ALL UNPAVED AREAS WHEN CONSTRUCTION ACTIVITY HAS CEASED, OR WILL CEASE, IN AN AREA FOR 14 DAYS. SEEDING MIXTURES AND APPLICATION RATES ARE LISTED ON SHEET C-2.
   b) MULCHING EXPOSED AREAS.
   c) FREQUENT WATERING TO MINIMIZE WIND EROSION DURING CONSTRUCTION.

2. STABILIZATION PRACTICES (PERMANENT)
   a) LAND CLEARING ACTIVITIES SHALL BE DONE ONLY IN AREAS WHERE EARTHWORK WILL BE PERFORMED AND SHALL PROGRESS AS EARTHWORK IS NEEDED.
   b) PERMANENT SEEDING AND PLANTING OF ALL UNPAVED AREAS.

3. STRUCTURAL MEASURES TEMPORARY
   a. STABILIZED CONSTRUCTION ENTRANCE: AT THE ENTRANCE TO THE ALL DISTURBED AREAS FROM AN EXISTING ROADWAY A STABILIZED CONSTRUCTION ENTRANCE SHALL BE PROVIDED. THE PURPOSE OF THE STABILIZED CONSTRUCTION ENTRANCE IS TO REDUCE OR ELIMINATE THE TRACKING OF SEDIMENT ONTO THE PUBLIC RIGHT-OF-WAY.
   b. SILT FENCE: SILT FENCE SHALL BE INSTALLED AS SHOWN ON THE EROSION CONTROL PLAN . THE FABRIC SHALL MEET THE SPECIFICATIONS NOTED ON THE DETAILS UNLESS OTHERWISE APPROVED BY THE APPROPRIATE EROSION AND SEDIMENT CONTROL PLAN APPROVAL AUTHORITY. SUCH APPROVAL SHALL NOT CONSTITUTE STATEWIDE ACCEPTANCE.
   c. DUST CONTROL: DUST CONTROL IS THE CONTROL OF DUST RESULTING FROM LAND-DISTURBING ACTIVITIES. THE PURPOSE IS TO PREVENT SURFACE AND AIR MOVEMENT OF DUST FROM DISTURBED SOIL SURFACES THAT MAY CAUSE OFF-SITE DAMAGE, HEALTH HAZARDS, AND TRAFFIC SAFETY PROBLEMS.
   d. SEDIMENT TRAP: SEDIMENT TRAP TO BE INSTALLED IN DETENTION BASIN AREA FOR USE DURING CONSTRUCTION. STONE OUTLET SEDIMENT TRAP TO BE INSTALLED AS PER DETAIL TO ELIMINATE SEDIMENT DISCHARGE TO DOWNSTREAM AREAS DURING CONSTRUCTION PHASE.

4. STRUCTURAL PRACTICES (PERMANENT)
   a. ROCK OUTLET PROTECTION: ROCK OUTLET PROTECTION IS A SECTION OF ROCK PROTECTION PLACED AT THE OUTLET END OF CULVERTS, CONDUITS, OR CHANNELS. THE PURPOSE OF THE ROCK OUTLET PROTECTION IS TO REDUCE THE DEPTH, VELOCITY, AND ENERGY OF WATER, SUCH THAT THE FLOW WILL NOT ERODE THE RECEIVING DOWNSTREAM REACH.
   b. REINFORCED SLOPE PROTECTION: A TEMPORARY PROTECTIVE COVERING PLACED ON A PREPARED PLANTING AREA THAT IS ANCHORED IN PLACE BY STAPLES OR OTHER MEANS TO AID IN CONTROLLING EROSION BY ABSORBING RAIN SPLASH ENERGY AND WITHSTAND OVERLAND FLOW AS WELL AS PROVIDE A MICROCLIMATE TO PROTECT AND PROMOTE SEED ESTABLISHMENT.
   c. LAND GRADING: PERMANENT RESHAPING OF THE EXISTING LAND SURFACE BY GRADING IN ACCORDANCE WITH AN ENGINEERING TOPOGRAPHIC PLAN AND SPECIFICATION TO PROVIDE EROSION CONTROL AND VEGETATIVE ESTABLISHMENT ON DISTURBED, RESHAPED AREAS.

5. SEQUENCE OF MAJOR ACTIVITIES
   THE CONTRACTOR SHALL BE RESPONSIBLE FOR IMPLEMENTING THE ABOVE LISTED EROSION AND SEDIMENT CONTROL PRACTICES. THE CONTRACTOR MAY DESIGNATE THESE TASKS TO CERTAIN SUBCONTRACTORS AS IS SEEN FIT, BUT THE ULTIMATE RESPONSIBILITY FOR IMPLEMENTING THESE CONTROLS AND ENSURING THEIR PROPER FUNCTION REMAINS WITH THE CONTRACTOR. THE ORDER OF ACTIVITIES WILL BE AS FOLLOWS:
   a) CONDUCT PRECONSTRUCTION MEETING
   b) CONSTRUCT TEMPORARY CONSTRUCTION ENTRANCE/EXIT AT THE LOCATION SHOWN ON THE PLAN.
   c) INSTALL PERIMETER SILT FENCE AND SECURITY CONSTRUCTION FENCE IN THE LOCATIONS SHOWN ON THE PLAN.
   d) ESTABLISH STAGING AREA ON PROJECT SITE
   e) CONSTRUCT TEMPORARY SEDIMENT TRAP
   f) REMOVE TOPSOIL, STOCKPILE AND STABILIZE
   g) SITE GRADING. IMPORT OF FILL MATERIAL TO RAISE SITE TO PROPOSED GRADE (OR SUB-GRADE, AS APPROPRIATE).
   h) BUILDING FOUNDATION EXCAVATION (BUILDING CONSTRUCTION TO CONTINUE CONCURRENTLY WITH REMAINING SITE WORK).
   i) DISTURBED AREAS OF THE SITE WHERE CONSTRUCTION ACTIVITY HAS CEASED FOR MORE THAN 14 DAYS SHALL BE TEMPORARILY SEEDED AND WATERED.
   j) UNDERGROUND UTILITY INSTALLATIONS.
   k) INSTALL FILTER FABRIC DROP INLET PROTECTION AT ALL STORM INLETS.
   l) COMPACT GRAVEL ALONG ALL DRIVE AISLES AND PARKING AREAS
   m) SITE CONCRETE CONSTRUCTION.
   n) FINALIZE PAVEMENT SUBGRADE PREPARATION.
   o) REMOVE INLET PROTECTION NO MORE THAN 24 HOURS PRIOR TO PLACING ASPHALT PAVEMENT.
   p) PAVE AREAS NOTED ON PLAN.
   q) DEEP RIPPING OF NON-PAVED AREAS AS REQUIRED (NON-PAVED AREAS THAT HAVE BEEN COMPACTED DURING CONSTRUCTION VIA CONSTRUCTION TRAFFIC).
   r) FINAL GRADING, SEEDING, AND PLANTING.
   s) CONSTRUCT BIORETENTION BASINS AND OUTLET CONTROLS UPON UPSTREAM STABILIZATION OF SITE
   t) REMOVE SEDIMENT TRAP AND FINALIZE GRADING OF DETENTION BASIN
   u) REMOVE SILT FENCE ONLY AFTER ALL PAVING IS COMPLETE AND EXPOSED SURFACES ARE STABILIZED.

MAINTENANCE/INSPECTION PROCEDURES

THE FOLLOWING INSPECTION AND MAINTENANCE PRACTICES WILL BE USED TO MAINTAIN EROSION AND SEDIMENT CONTROLS AND STABILIZATION MEASURES.

1. ALL CONTROL MEASURES WILL BE INSPECTED AT LEAST TWICE EVERY SEVEN (7) CALENDAR DAYS
2. ALL MEASURES WILL BE MAINTAINED IN GOOD WORKING ORDER; IF REPAIRS OR OTHER EROSION CONTROL MEASURES ARE FOUND TO BE NECESSARY, THEY WILL BE INITIATED WITHIN 24 HOURS OF REPORT.
3. BUILT UP SEDIMENT WILL BE REMOVED FROM SILT FENCE WHEN IT HAS REACHED ONE-THIRD THE HEIGHT OF THE FENCE.
4. SILT FENCES WILL BE INSPECTED FOR DEPTH OF SEDIMENT, TEARS, ETC., TO SEE IF THE FABRIC IS SECURELY ATTACHED TO THE FENCE POSTS, AND TO SEE THAT THE FENCE POSTS ARE SECURELY IN THE GROUND.
5. TEMPORARY AND PERMANENT SEEDING AND ALL OTHER STABILIZATION MEASURES WILL BE INSPECTED FOR BARE SPOTS, WASHOUTS, AND HEALTHY GROWTH.
6. A MAINTENANCE INSPECTION REPORT WILL BE MADE AFTER EACH INSPECTION. COPIES OF THE REPORT FORMS TO BE COMPLETED BY THE INSPECTOR ARE INCLUDED IN THIS SWPPP.
7. THE OPERATOR SHALL HAVE A "QUALIFIED PROFESSIONAL" CONDUCT SITE INSPECTIONS FOLLOWING THE COMMENCEMENT OF CONSTRUCTION. A "QUALIFIED PROFESSIONAL" IS A PERSON KNOWLEDGEABLE IN THE PRINCIPLES AND PRACTICE OF EROSION AND SEDIMENT CONTROLS, SUCH AS A LICENSED PROFESSIONAL ENGINEER, CERTIFIED PROFESSIONAL IN EROSION AND SEDIMENT CONTROL (CPESC), OR SOIL SCIENTIST.
8. DISTURBED AREAS AND MATERIALS STORAGE AREAS WILL BE INSPECTED FOR EVIDENCE OF OR POTENTIAL FOR POLLUTANTS ENTERING STORMWATER SYSTEMS.
9. REPORT TO NYS DEC WITHIN 24 HOURS ANY NONCOMPLIANCE WITH THE SWPPP THAT WILL ENDANGER PUBLIC HEALTH OR THE ENVIRONMENT. FOLLOW UP WITH A WRITTEN REPORT WITHIN 5 DAYS OF THE NONCOMPLIANCE EVENT. THE FOLLOWING EVENTS REQUIRE 24 HOUR REPORTING: A) ANY UNANTICIPATED BYPASS WHICH EXCEEDS ANY EFFLUENT LIMITATION IN THE PERMIT, B) ANY UPSET WHICH EXCEEDS ANY EFFLUENT LIMITATION IN THE PERMIT, AND C) A VIOLATION OF A MAXIMUM DAILY DISCHARGE LIMITATION FOR ANY OF THE POLLUTANTS LISTED BY THE EPA IN THE PERMIT TO BE REPORTED WITHIN 24 HOURS. THE WRITTEN SUBMISSION MUST CONTAIN A DESCRIPTION OF THE NON-COMPLIANCE AND ITS CAUSE; THE PERIOD OF NON-COMPLIANCE, INCLUDING EXACT DATES AND TIMES, AND IF THE NON-COMPLIANCE HAS NOT BEEN CORRECTED, THE ANTICIPATED TIME IT IS EXPECTED TO CONTINUE; AND STEPS TAKEN OR PLANNED TO REDUCE, ELIMINATE, AND PREVENT RECURRENCE OF THE NON-COMPLIANCE.
10. RELEASES OF HAZARDOUS SUBSTANCES OR OIL IN EXCESS OF REPORTABLE QUANTITIES (AS ESTABLISHED UNDER 40 CFR 110, 40 CFR 117 OR 40 CFR 302) MUST BE REPORTED. FORM G-1 PROVIDES FURTHER DETAILS ON THE NOTIFICATION AND REPORTING PROCESS.

INSPECTION AND MAINTENANCE REPORT FORMS

ONCE INSTALLATION OF ANY REQUIRED OR OPTIONAL EROSION CONTROL DEVICE OR MEASURE HAS BEEN IMPLEMENTED, AT LEAST ONCE EVERY SEVEN (7) CALENDAR DAYS AND SHALL BE PERFORMED BY A QUALIFIED PROFESSIONAL. THE FORMS FOUND IN THIS SWPPP SHALL BE USED BY THE INSPECTORS TO INVENTORY AND REPORT THE CONDITION OF EACH MEASURE TO ASSIST IN MAINTAINING THE EROSION AND SEDIMENT CONTROL MEASURES IN GOOD WORKING ORDER.

THESE REPORT FORMS SHALL BECOME AN INTEGRAL PART OF THE SWPPP AND SHALL BE MADE READILY ACCESSIBLE TO GOVERNMENTAL INSPECTION OFFICIALS, THE OPERATOR'S ENGINEER, AND THE OPERATOR FOR REVIEW UPON REQUEST DURING VISITS TO THE PROJECT SITE. IN ADDITION, COPIES OF THE REPORTS SHALL BE PROVIDED TO ANY OF THESE PERSONS, UPON REQUEST, VIA MAIL OR FACSIMILE TRANSMISSION. INSPECTION AND MAINTENANCE REPORT FORMS ARE TO BE MAINTAINED BY THE PERMITTEE FOR FIVE YEARS FOLLOWING THE FINAL STABILIZATION OF THE SITE.

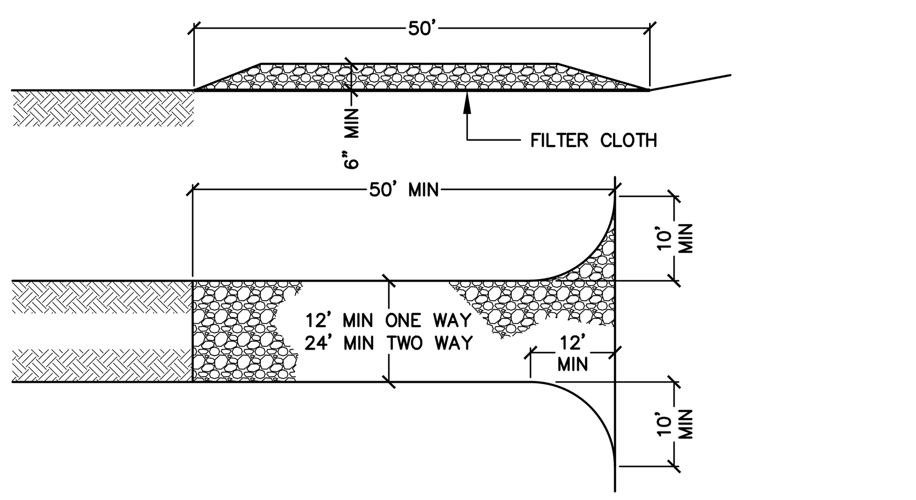
OTHER RECORD-KEEPING REQUIREMENTS

THE CONTRACTOR SHALL KEEP THE FOLLOWING RECORDS RELATED TO CONSTRUCTION ACTIVITIES AT THE SITE:

- DATES WHEN MAJOR GRADING ACTIVITIES OCCUR AND THE AREAS WHICH WERE GRADED
- DATES AND DETAILS CONCERNING THE INSTALLATION OF STRUCTURAL CONTROLS
- DATES WHEN CONSTRUCTION ACTIVITIES CEASE IN AN AREA
- DATES WHEN AN AREAS IS STABILIZED, EITHER TEMPORARILY OR PERMANENTLY
- DATES OF RAINFALL AND THE AMOUNT OF RAINFALL
- DATES AND DESCRIPTIONS OF THE CHARACTER AND AMOUNT OF ANY SPILLS OF HAZARDOUS MATERIALS
- RECORDS OF REPORTS FILED WITH REGULATORY AGENCIES IF REPORTABLE QUANTITIES OF HAZARDOUS MATERIALS SPILLED

EROSION CONTROL NOTES

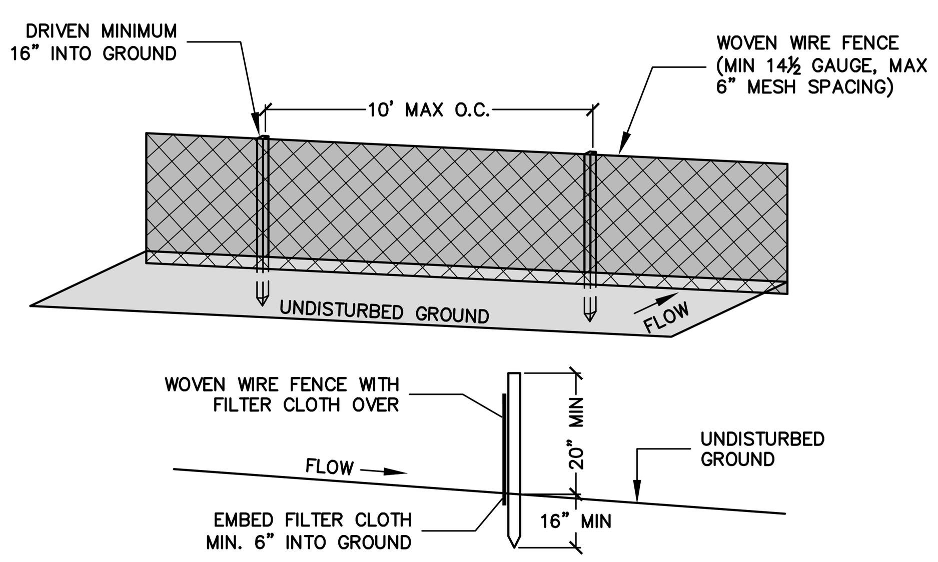
1. LAND DISTURBING ACTIVITIES SHALL NOT COMMENCE UNTIL APPROVAL TO DO SO HAS BEEN RECEIVED BY GOVERNING AUTHORITIES. THE GENERAL CONTRACTOR SHALL STRICTLY ADHERE TO THE APPROVED SWPPP DRAWINGS DURING CONSTRUCTION OPERATIONS.
2. NO LAND CLEARING OR GRADING SHALL BEGIN UNTIL THE APPROPRIATE EROSION CONTROL MEASURES HAVE BEEN INSTALLED.
3. ALL EXPOSED AREAS SHALL BE SEEDED AS SPECIFIED WITHIN 7 DAYS OF FINAL GRADING.
4. SHOULD CONSTRUCTION STOP FOR LONGER THAN 14 DAYS, THE SITE SHALL BE SEEDED AS SPECIFIED.
5. MAINTAIN EROSION CONTROL MEASURES AFTER EACH RAIN AND AT LEAST ONCE A WEEK.
6. THIS PLAN SHALL NOT BE CONSIDERED ALL INCLUSIVE AS THE GENERAL CONTRACTOR SHALL TAKE ALL NECESSARY PRECAUTIONS TO PREVENT SEDIMENT FROM LEAVING THE SITE.
7. GENERAL CONTRACTOR SHALL COMPLY WITH ALL STATE AND LOCAL ORDINANCES THAT APPLY.
8. ADDITIONAL EROSION AND SEDIMENT CONTROL MEASURES WILL BE INSTALLED IF DEEMED NECESSARY BY ON SITE INSPECTION.
9. IF INSTALLATION OF STORM DRAINAGE SYSTEM SHOULD BE INTERRUPTED BY WEATHER OR NIGHTFALL, THE PIPE ENDS SHALL BE COVERED WITH FILTER FABRIC.
10. GENERAL CONTRACTOR SHALL BE RESPONSIBLE TO TAKE WHATEVER MEANS NECESSARY TO ESTABLISH PERMANENT SOIL STABILIZATION.
11. ALL WORK TO BE DONE IN STRICT ACCORDANCE WITH THE NEW YORK STANDARDS AND SPECIFICATIONS FOR EROSION AND SEDIMENT CONTROL.



1. STONE SIZE – USE 2" STONE, OR RECLAIMED OR RECYCLED CONCRETE EQUIVALENT.
2. LENGTH – NOT LESS THAN 50 FEET.
3. THICKNESS – NOT LESS THAN SIX (6) INCHES.
4. WIDTH – 24 FEET MINIMUM.
5. FILTER CLOTH – WILL BE PLACED OVER THE ENTIRE AREA PRIOR TO PLACING OF STONE.
6. SURFACE WATER – ALL SURFACE WATER FLOWING OR DIVERTED TOWARD CONSTRUCTION ENTRANCES SHALL BE PIPED ACROSS THE ENTRANCE. IF PIPING IS IMPRACTICAL, A MOUNTABLE BERM WITH 5:1 SLOPES WILL BE PERMITTED.
7. MAINTENANCE – THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION WHICH WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHTS-OF-WAY. ALL SEDIMENT SPILLED, DROPPED, WASHED, OR TRACKED ONTO PUBLIC RIGHTS-OF-WAY MUST BE REMOVED IMMEDIATELY.
8. WHEN WASHING IS REQUIRED, IT SHALL BE DONE ON AN AREA STABILIZED WITH STONE AND WHICH DRAINS INTO AN APPROVED SEDIMENT TRAPPING DEVICE.
9. PERIODIC INSPECTION AND NEEDED MAINTENANCE SHALL BE PROVIDED AFTER EACH RAIN.

1 / C-7.2 CONSTRUCTION ENTRANCE

SCALE: NTS



POSTS: STEEL, EITHER "T" OR "U" TYPE OR 2" HARDWOOD

FENCE: WOVEN WIRE, 14 1/2 GAUGE, 6" MAX. MESH OPENING

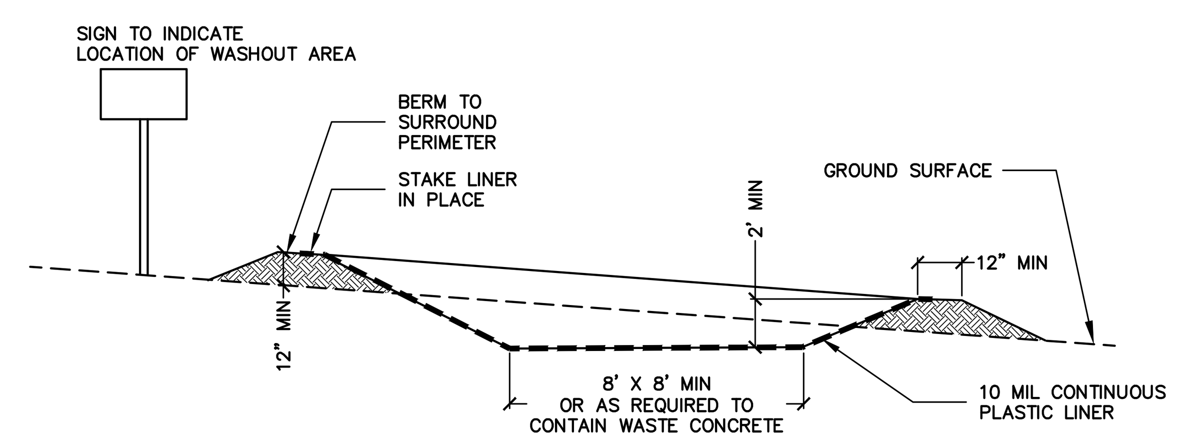
FILTER CLOTH: FILTER X., MIRAFI 100X, STABILINKA T140N OR APPROVED EQUAL

PREFABRICATED UNIT: GEOFAB, ENVIROFENCE, OR APPROVED EQUAL

1. WOVEN WIRE FENCE TO BE FASTENED SECURELY TO FENCE POSTS WITH WIRE TIES OR STAPLES.
2. FILTER CLOTH IS TO BE FASTENED SECURELY TO WOVEN WIRE FENCE WITH TIES SPACED EVERY 24" AT TOP AND MID SECTION.
3. WHEN TWO SECTIONS OF FILTER CLOTH ADJOIN EACH OTHER, THEY SHALL BE OVERLAPPED BY SIX INCHES AND FOLDED.
4. MAINTENANCE SHALL BE PERFORMED AS NEEDED AND MATERIAL REMOVED WHEN "BULGES" DEVELOP IN THE SILT FENCE.

2 / C-7.2 SILT FENCE

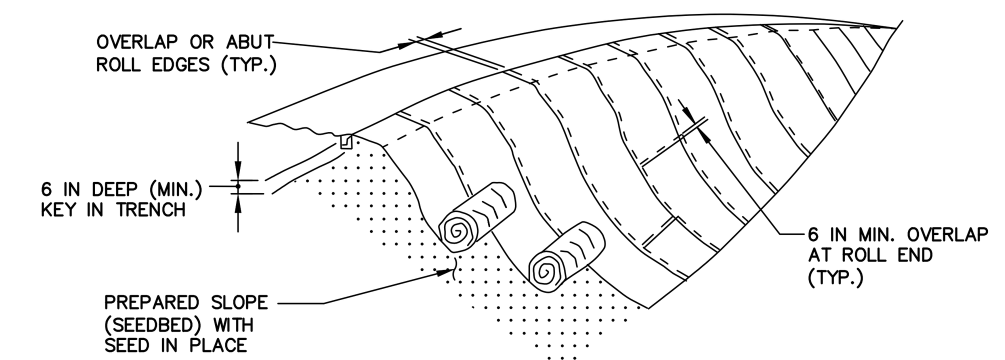
SCALE: NTS



NOTES:
1. CONCRETE WAHSOUT AREA SHALL BE INSTALLED PRIOR TO ANY CONCRETE PLACEMENT ON SITE.
2. CONCRETE WASHOUT OUT AREA SHALL BE LINED WITH A 10 MIL IMPERMEABLE LINER AND STAKED IN PLACE.
3. SIGNS SHALL BE PLACED AT THE CONSTRUCTION ENTRANCE, AT THE WASHOUT AREA, AND ELSEWHERE AS NECESSARY TO CLEARLY INDICATE LOCATION OF CONCRETE WASHOUT AREA TO OPERATORS OF CONCRETE TRUCKS AND PUMP RIGS.
4. THE CONCRETE WAHSOUT AREA SHALL BE REPAIRED AND ENLARGED OR CLEANED OUT AS NECESSARY TO MAINTAIN CAPACITY FOR WASTED CONCRETE.
5. AT THE END OF CONSTRUCTION, ALL CONCRETE SHALL BE REMOVED FROM SITE AND DISPOSED OF AT AN ACCEPTED WASTE SITE.
6. WHEN THE CONCRETE WASHOUT AREA IS REMOVED, THE DISTURBED AREA SHALL BE SEEDED AND MULCHED OR OTHERWISE STABILIZED.

3 / C-7.2 CONCRETE WASHOUT AREA

SCALE: NTS



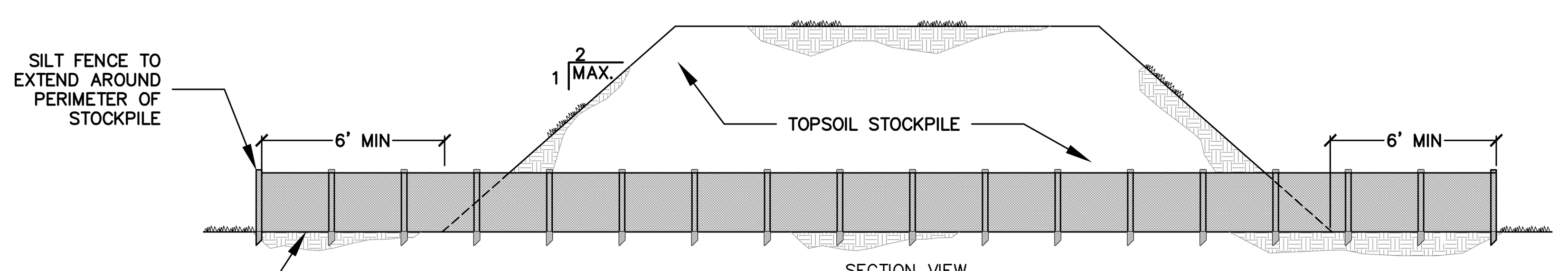
ISOMETRIC VIEW

CONSTRUCTION SPECIFICATIONS

1. USE TEMPORARY SOIL STABILIZATION MATTING MADE OF DEGRADABLE (LASTS 6 MONTHS MINIMUM) NATURAL OR MAN-MADE FIBERS (MOSTLY ORGANIC).
2. PERFORM FINAL GRADING, TOPSOIL APPLICATION, SEEDBED PREPARATION, AND PERMANENT SEEDING IN ACCORDANCE WITH SPECIFICATIONS. PLACE MATTING WITHIN 48 HOURS OF COMPLETING SEEDING OPERATIONS UNLESS END OF WORKDAY STABILIZATION IS SPECIFIED ON THE APPROVED EROSION & SEDIMENT CONTROL PLAN.
3. OVERLAP OR ABUT ROLL EDGES PER MANUFACTURER RECOMMENDATIONS. OVERLAP ROLL ENDS BY 6 INCHES (MINIMUM), WITH THE UPSLOPE MAT OVERLAPPING ON TOP OF THE DOWNSLOPE MAT.

4 / C-7.2 SLOPE STABILIZATION MATTING

SCALE: NTS

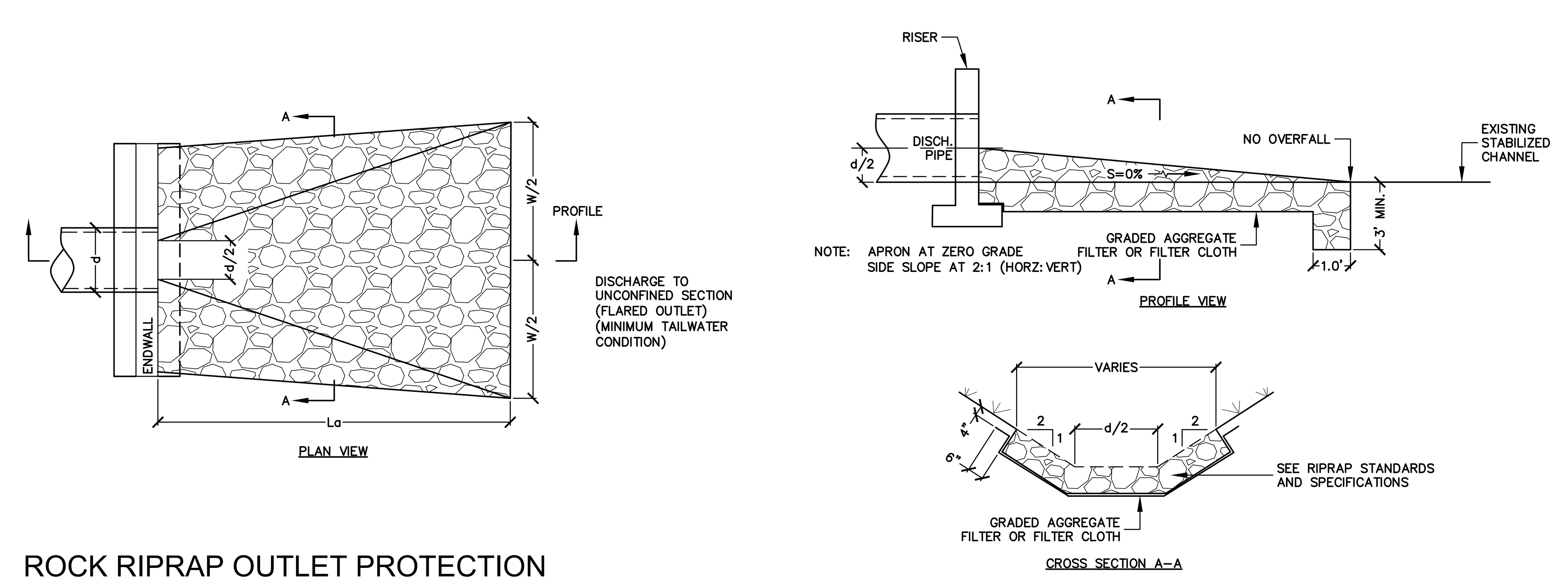


SECTION VIEW

NOTES:
1. SEE EROSION CONTROL PLAN FOR LOCATION OF STOCKPILE
2. REFER TO SILT FENCE DETAIL FOR INSTALLATION OF SILT FENCE
3. IF THE STOCKPILE IS TO REMAIN FOR MORE THAN 14 DAYS IT SHALL BE TEMPORARILY SEEDED FOR STABILIZATION
4. SILT FENCES TO BE MAINTAINED IN PLACE UNTIL TOPSOIL STOCKPILE HAS BEEN REMOVED

5 / C-7.2 TYPICAL TOPSOIL STOCKPILE

SCALE: NTS



6 / C-7.2 ROCK RIPRAP OUTLET PROTECTION UNCONFINED DOWNSTREAM SECTION

SCALE: NTS

PRELIMINARY
NOT FOR CONSTRUCTION

PLAN SEAL BY:
NEAL H. ZINSMEYER, JR., P.E.
NYS REGISTRATION # 087211

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NAPIERALA CONSULTING
PROFESSIONAL ENGINEER, PC

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ANY LICENSEE WHO ALTERS THIS DOCUMENT IS REQUIRED BY LAW TO AFFIX HIS OR HER SEAL AND THE NOTATION "ALTERED BY" FOLLOWED BY HIS OR HER SIGNATURE AND SPECIFIC DESCRIPTION OF THE ALTERATIONS.

PROJECT TITLE:
BRANDYWINE ESTATES PHASE 2 HENNEBERRY ROAD
TOWN OF MANLIUS ONONDAGA COUNTY, NY

PREPARED FOR:
HARRINGTON HOMES
3848 HENNEBERRY ROAD
JAMESVILLE, NY 13078

SHEET TITLE:
SITE DETAILS

NO.	REVISION/ISSUE	DATE
1	GENERAL REVISIONS	12/01/2021

PREPARED BY:
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PH: (315) 682-5580 FAX: (315) 682-5544

PROJECT NO.: 20-1906

DATE: 17 SEP 2020

SCALE: AS SHOWN

SHEET: **C-7.2**

STORMWATER POLLUTION PREVENTION PLAN

For the:

Proposed Brandywine Estates – Phase 2
Henneberry Road
Town of Manlius

Prepared for:

HARRINGTON HOMES

Your Builder for Life

Harrington Homes, Inc
3848 Henneberry Road
Jamesville, NY 13078

Prepared by:

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Project No. 20-1906

Revised December 2021

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EXECUTIVE SUMMARY

A. Purpose

The following Stormwater Pollution Prevention Plan (SWPPP) has been developed to control stormwater runoff and pollutants from a site during and after construction activities. The objective of this SWPPP is to comply with the NYSDEC SPDES Stormwater Permit from Construction Activities by planning and implementing standard design practices.

B. Project Description

The ±54 acre property is located on the west side of Henneberry Road in the Town of Manlius, Onondaga County, NY. This project consists of the subdivision and development of 34 single family homes. The development will also include necessary amenities such as public street(s), public/private utility extensions/connections, and applicable stormwater management facilities.

C. Stormwater Practices

Stormwater practices are categorized as either temporary construction measures or permanent operation measures. The temporary measures that will be used on this site for erosion and sediment control include (but are not limited to): stabilized construction entrance, silt fencing, and temporary sediment basins. The permanent stormwater practices to be installed are a series of two bioretention areas, and an above ground grass-line detention basin which will provide water quality, runoff reduction, and storage for quantity control. All practices, both the temporary construction measures and the permanent operation measures, have been designed in accordance with the established standards.

D. Water Quality Treatment

The water quality volume treatment characteristics are summarized below. The entire water quality descriptions and calculations are further detailed in Section III.E and F.

Water Quality Volume	
Required WQv (ac-ft)	**Total Provided WQv (ac-ft)**
0.469	0.469

E. Runoff Reduction Volume (RRv)

The NYSDEC regulation requires all construction projects that disturb greater than one acre of land to provide runoff reduction through the implementation of green infrastructure practices. Runoff reduction volume for this project is achieved using bioretention areas. This volume is summarized below and further detailed in Section III.D, E, and F.

Runoff Reduction Volume	
Required RRv (ac-ft)	**Total Provided RRv (ac-ft)**
0.054	0.188

F. Stormwater Quantity

The impacts to stormwater runoff quantity (i.e. peak flows) will be mitigated in the aboveground grass-lined detention basins throughout the site. The detention basins will be constructed with sufficient volume to store additional runoff from the site and discharge it in a controlled manner. The chart below summarizes the stormwater discharges from the site and is further detailed in Section III.G and H.

	Existing Peak Runoff Rate (cfs)			**Proposed Peak Runoff Rate (cfs)**		
Point of Study	Pt. 1B	Pt. 2	Pt. 3	Pt. 1B	Pt. 2	Pt. 3
10-Year Storm	75.01	7.68	9.35	45.27	2.07	9.31
100-Year Storm	175.87	18.46	22.06	86.52	4.70	21.06

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Section I. SCOPE

A. PURPOSE

Napierala Consulting, Professional Engineer, P.C., has prepared this Stormwater Pollution Prevention Plan (SWPPP) in compliance with the New York State Department of Environmental Conservation (NYSDEC) State Pollutant Discharge Elimination System (SPDES) Construction General Permit governing stormwater discharges during construction. The contractor's participation and adherence to this plan is mandatory. Non-compliance with the plan is subject to various remedies including, without limitation, monetary set-offs, withholding payments, reimbursement for costs, expenses (including reasonable attorney's fees), fines and civil penalties incurred and/or liquidated damages. This section provides a descriptive explanation of the Stormwater Pollution Prevention Plan and required contractor participation.

B. SPDES GENERAL PERMIT GP-0-20-001

Regulations enacted by the New York State Department of Environmental Conservation require permitting for the discharge of stormwater from construction activities on sites where an area of one acre or more of soil disturbance is proposed. To comply with these regulations, the developer of the site must request coverage under the NYSDEC SPDES General Permit for Stormwater Discharges from Construction Activity (GP-0-20-001). In order to obtain coverage under the General Permit a Stormwater Pollution Prevention Plan (SWPPP) for the site must be prepared following the requirements of the New York State Stormwater Management Design Manual and the New York State Standards and Specifications for Erosion and Sediment Control.

The NOI, the SWPPP, and any amendments to the SWPPP, as well as any reports required by the SPDES General Permit for Stormwater Discharges from Construction Activity, must also be submitted concurrently to the local governing body and any other authorized agency having jurisdiction or regulatory control over the construction project.

C. RESPONSIBILITIES OF THE OWNER

The owner/operator shall 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. The owner/operator shall identify the contractor(s) and subcontractor(s) that will be responsible for constructing the post-construction stormwater management practices included in the SWPPP. The owner/operator shall have each of the contractors and subcontractors identify at least one person from their company that will be responsible for implementation of the SWPPP. The owner/operator shall ensure that at least one trained contractor is on site on a daily basis when soil disturbance activities are being performed. The owner/operator shall have a qualified inspector conduct site inspections.

D. RESPONSIBILITIES OF THE CONTRACTOR

The contractor shall manage the discharge of stormwater from the site in accordance with the NYSDEC SPDES General Permit for Stormwater Discharges from Construction Activity. The owner shall be responsible for conducting the stormwater management practices in accordance with the permit. The contractor shall be responsible for providing qualified inspectors to conduct the inspections required by the SWPPP. The contractor shall be responsible for any enforcement action taken or imposed by federal, state, or local agencies, including the cost of fines, construction delays, and remedial actions resulting from the contractor's failure to comply with the permit provisions. It shall be the responsibility of the contractor to make any changes to the SWPPP necessary when the contractor or any of his subcontractors elects to use borrow or fill or material storage sites, either contiguous to or remote from the construction

site, when such sites are used solely for this construction site. Such sites are considered to be part of the construction site covered by the permit and this SWPPP. Off-site borrow, fill, or material storage sites which are used for multiple construction projects are not subject to this requirement, unless specifically required by state or local jurisdictional entity regulations. The contractor should consider this requirement in negotiating with earthwork subcontractors, since the choice of an off-site borrow, fill, or material storage site may impact their duty to implement, make changes to, and perform inspections required by the SWPPP for the site.

The SWPPP shall provide forms for both the general contractor and subcontractor(s) identifying the company name, business address and telephone number along with the responsible person for the contractor and all subcontractors' who will implement the measures identified in the SWPPP. **The general contractor shall sign the "General Contractor's Certification" and all subcontractors shall sign the "Subcontractor's Certification",** verifying they have been instructed on how to comply with and fully understand the requirements of the NYSDEC and SWPPP. **This certification must be signed, by a fully qualified individual on behalf of each entity, prior to the beginning of any construction activities and shall be filed in the projects SWPPP.**

The SWPPP is meant to be a working document that shall be maintained at the site of the construction activities at all times throughout the project, shall be readily available upon request by the operator's personnel or NYSDEC or any other agency with regulatory authority over storm water issues, and shall be kept on-site until the site complies with the Final Stabilization section of this document. **A sign or other notice must be posted near the main entrance of the construction site which contains a completed NOI, the location of the SWPPP and the name and phone number of a contact person responsible for scheduling SWPPP viewing times, and any other state specific requirements.**

E. NOTICE OF INTENT

The operator has petitioned the NYSDEC for the stormwater discharges during construction at this site to be covered by the NYSDEC SPDES General Permit for Stormwater Discharges from Construction Activity. A **Notice of Intent** (NOI) to be covered under this permit has been filed by the operator. The signatory on the NOI must sign all documents (i.e., inspection reports) associated with the SWPPP. If the signatory chooses not to sign all documents, he/she must designate a duly authorized representative to sign all relevant documents. This designation must be made in writing and be included in the SWPPP. The duly authorized representative may be either a named individual or any individual occupying a named position. Additionally, the written designation must be submitted to the NYSDEC.

F. STORMWATER INSPECTIONS

1. Inspection Procedures

Inspections of the erosion control practices are required every seven days by a qualified professional. All inspections will continue until the site complies with the final stabilization section of this document. **Weekly Inspections must be conducted by a "Qualified Professional". "Qualified Professional" means a person knowledgeable in the principles and practice of erosion and sediment controls, such as a licensed Professional Engineer (PE), Certified Professional in Erosion and Sediment Control (CPESC), or soil scientist.** Each inspection must be followed up by a report documenting the inspector's findings and request the required maintenance and/or repair for the erosion and sedimentation control measures. It is imperative that the contractor documents the inspection and maintenance of all erosion and sedimentation control measures as soon as possible after the inspection and/or maintenance have been completed. These records are used to prove that the required inspection and maintenance were performed. The records shall be placed in the SWPPP. In addition to inspection and maintenance reports, records should be kept of the construction activities that occur on the site. The operator shall post at the site, in a publicly-accessible location, a summary of the site inspection activities on a monthly basis.

2. Record Keeping

The operator shall also prepare a written summary of its status with respect to compliance with this

general permit at a minimum frequency of every three months during which coverage under the NYSDEC SPDES General Permit for Stormwater Discharges from Construction Activity exists. The summary should address the status of achieving each component of the SWPPP. The reports shall be signed by the signatory of the NOI or a duly-authorized person and be retained at the construction site.
The contractor shall retain copies of the SWPPP, all reports and data for a minimum of five (5) years after the project. The following list identifies the required inspection and maintenance documentation that must be maintained by the contractor under this SWPPP.

- Inspection Report
- Stabilization Schedule
- Implementation Schedule
- Status Report

G. SWPPP MODIFICATIONS

The inspection report should also identify if any revisions to the SWPPP are warranted due to unexpected conditions. The SWPPP is meant to be a dynamic working guide that is to be kept current and amended whenever:

- The NYSDEC provides notification that the SWPPP does not comply with the minimum permit requirements.
- The design, construction, operation, or maintenance of the site changes in a way which significantly affects the potential for the discharge of pollutants or when the plan proves to be ineffective in eliminating or significantly minimizing pollutant discharges
- Within seven (7) calendar days of knowledge of a reportable release.

Any such changes to the SWPPP must be made in writing within seven (7) days of the date such modification or amendment is made. The contractor's failure to monitor or report deficiencies to the operator will result in the contractor being liable for fines and construction delays resulting from any federal, state, or local agency enforcement action.

H. FINAL STABILIZATION AND TERMINATION OF PERMIT COVERAGE

A site can be considered stabilized when all soil disturbing activities have been completed and a uniform perennial vegetative cover with a density of 80% over the unpaved areas and areas not covered by permanent structures has been established or equivalent permanent stabilization measures have been established and the facility no longer discharges stormwater associated with construction activities, and a **Notice of Termination** (NOT) form has been filed by the operator(s) with the NYSDEC. Prior to filing of the Notice of Termination, the operator shall have the qualified professional perform a final site inspection. The qualified professional shall certify that the site has undergone final stabilization using either vegetative or structural stabilization methods and that all temporary erosion and sediment controls (such as silt fence) not needed for long-term erosion control have been removed. The filing of the NOT terminates coverage under the General Permit and terminates the contractor's responsibility to implement the SWPPP, but the requirements of the SWPPP, including periodic inspections, must be continued until the NOT is filed. Upon achieving this milestone, the contractor shall also submit "Final Stabilization Certification/Termination Checklist". Final payment and/or the release of any retainer will be withheld until all provisions of the SWPPP have been submitted, completed and accepted by the operator.

Section II. SITE DESCRIPTION

A. PROJECT NAME AND LOCATION

Harrington Homes, Inc
Brandywine Estates, Phase 2
Henneberry Road
Town of Manlius
Onondaga County, New York

UTM Coordinates from NYSDEC Interactive Map: E: 417962; N: 4759972
NYSDEC Region 7

The ±54 acre property is located on the west side of Henneberry Road in the Town of Manlius, Onondaga County, NY. Figure 1 shows the project location on a street map and Figure 2 shows an aerial image of the proposed site in its existing condition.

B. OWNER/OPERATOR NAME AND ADDRESS

Harrington Homes, Inc
3848 Henneberry Road
Jamesville, NY 10378

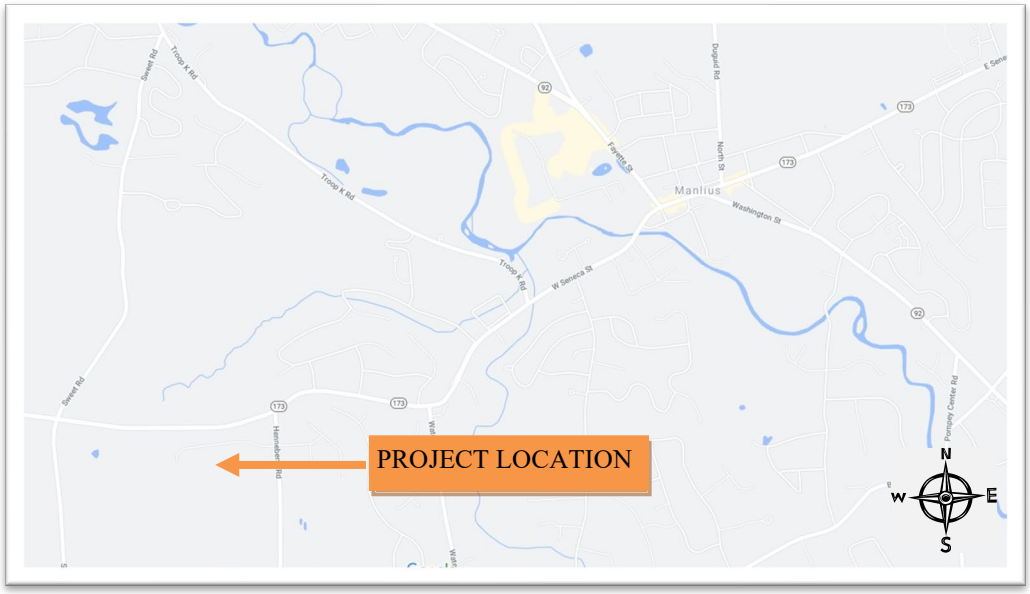


Figure 1: Site Location Map

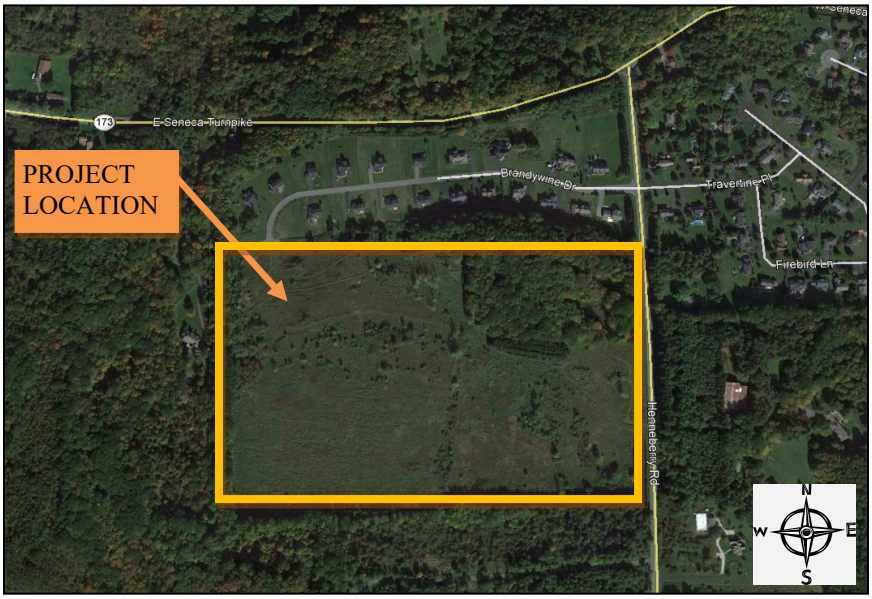


Figure 2: Proposed Site Aerial Image - Google Earth

C. PROJECT DESCRIPTION

The ±54 acre property is located on the west side of Henneberry Road in the Town of Manlius, Onondaga County, NY. This project consists of the subdivision and development of 34 single family homes. The development will also include necessary amenities such as public street(s), public/private utility extensions/connections, and applicable stormwater management facilities.

D. RECEIVING WATERS

Runoff from the site generally flows to the north toward Limestone Creek. This site is within a regulated MS4 (municipal separate storm sewer system). Figure 3 shows the project site location in relation to certain environmental boundaries using the NYSDEC Environmental Resource Mapper. The NYSDEC Environmental Resource Mapper shows that no regulated wetlands are within the vicinity of the project.

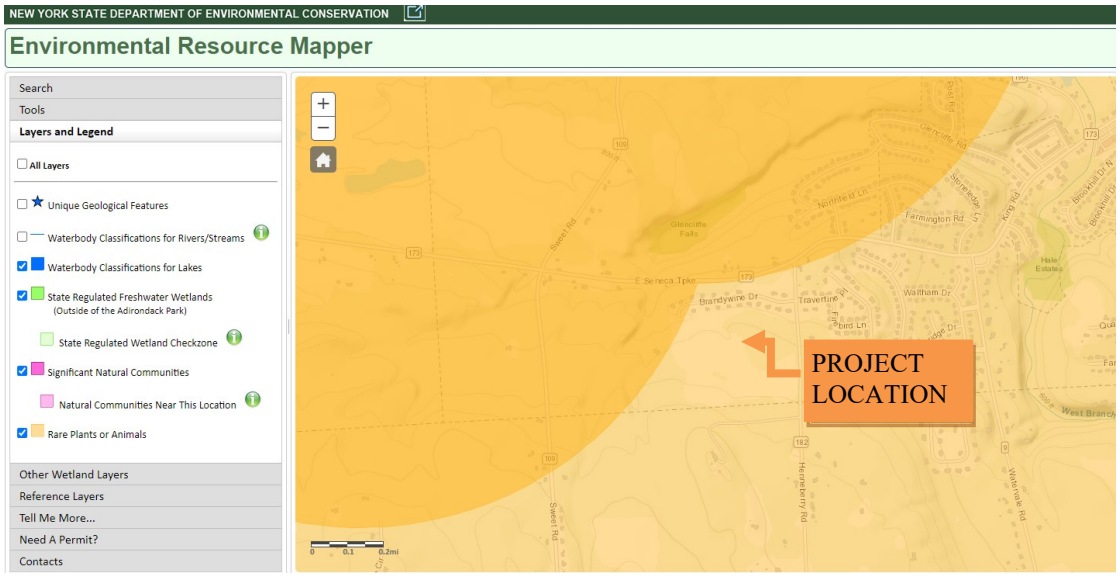


Figure 3: NYS DEC Environmental Resource Mapper

E. ENDANGERED OR THREATENED SPECIES

The NYS DEC Environmental Resource Mapper does not identify the site as containing any rare significant natural communities but is within the check zone for rare plants or animals. We have received a letter from the DEC which states that hibernacula of the Indiana Bat and the Northern Long-Eared Bat exist within 2.5 miles of the site. Due to this, there is a seasonal restriction on tree clearing: trees can only be cut down between October 15 and March 31 in order to protect potential roosting trees.

F. FEDERAL AND STATE HISTORIC PRESERVATION

The SPDES (State Pollutant Discharge Elimination System) GP-0-20-001 requires that the discharge from construction activities shall not influence properties listed as or eligible for listing on the State or National Register of Historic Places. Figure 4 shows the SHPO (State Historic Preservation) map which indicates the project is within an archeological check zone. The project will be further investigated accordingly.

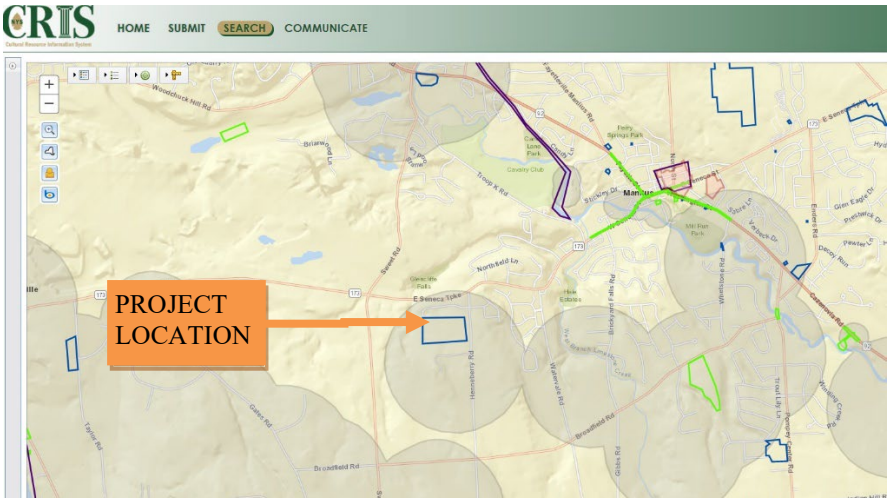


Figure 4: State Historic Preservation Office Map

G. FEMA

Based on local GIS mapping, there are no floodplain/floodway boundaries on this property, as shown on Figure 5 below. This is also confirmed on the site survey by Ianuzi and Romans Land Surveying, P.C., noting the project is in Zone X.

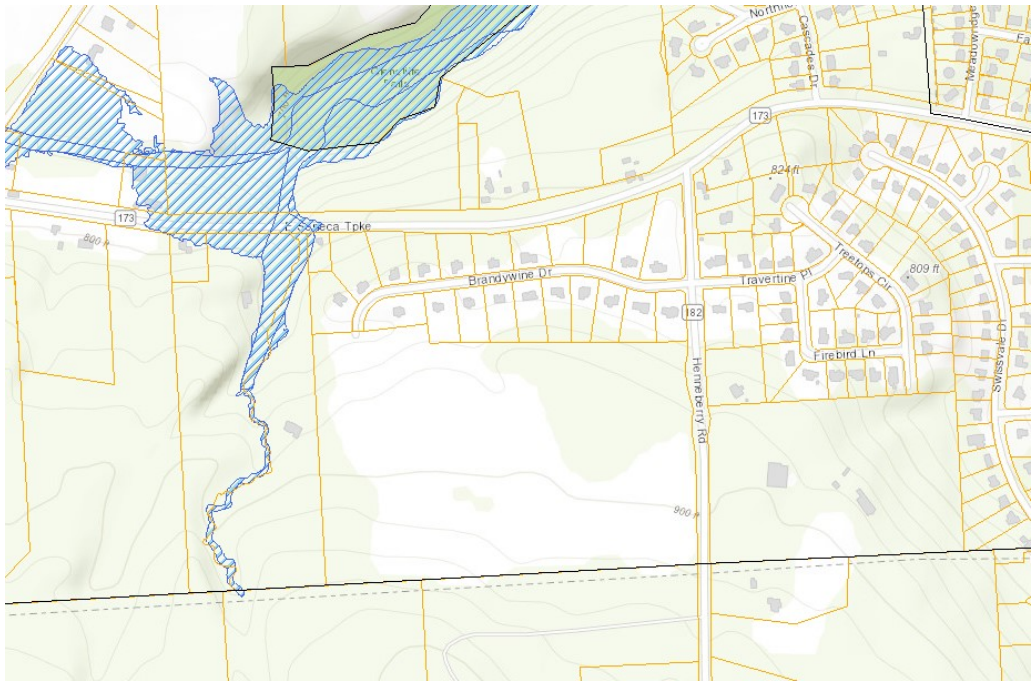


Figure 5: Onondaga County GIS Mapping

Section III. STORMWATER MANAGEMENT

A. METHODOLOGY

1. Hydrologic Conditions

The peak runoff rates for the site were calculated for the existing and proposed hydrologic conditions using HydroCAD software. The HydroCAD program uses the standard SCS TR-55 Curve Number Method for calculation of the time of concentration, composite curve number, and peak runoff rates for the drainage area(s) based on input by the user. The input data was taken from soil maps, detailed topographic and utility survey information, rainfall distribution maps, and aerial images. The required Water Quality Volume (WQ_v) was calculated in accordance with the New York State Stormwater Management Design Manual. The Channel Protection Volume (Cp_v) was calculated based on the release of the 1-year storm runoff volume over a 24-hour period. The hydrologic conditions are used to assess the impacts to the runoff characteristics and to design appropriate measures to mitigate these impacts. The NYS SPDES General Permit for Stormwater Discharges from Construction Activity requires that a stormwater mitigation system meet the following five design criteria.

a. Water Quality Volume: The system must capture and treat 90% of the average annual runoff volume.
b. Runoff Reduction Volume: The system must apply green infrastructure techniques and Stormwater Management Practices to replicate pre-development hydrology.
c. Provide 24-hour extended detention of the runoff from the one-year, 24-hour rainfall event.
d. Attenuation of the post-development 10-year, 24-hour peak discharge rate to predevelopment levels.
e. Attenuation of the post-development 100-year, 24-hour peak discharge rate to predevelopment levels.

2. Rainfall Information

The following table shows the rainfall values used in the design of the stormwater mitigation basin. These values are taken from rainfall distribution maps provided by the Northeast Regional Climate Center and the New York State Stormwater Management Design Manual, which can be seen on the following page. These values are applied to a Type II 24-hour rainfall distribution in the modeling of the watersheds using the HydroCAD program.

Table 1: Rainfall Information

Precipitation Event	Rainfall in inches
90% Rainfall (WQ_v)	1.0
1-Yr, 24-Hr (Cp_v)	2.04
10-Yr, 24-Hr (Q_p)	3.43
50-Yr, 24-Hr	4.94
100-Yr, 24-Hr (Q_f)	5.78

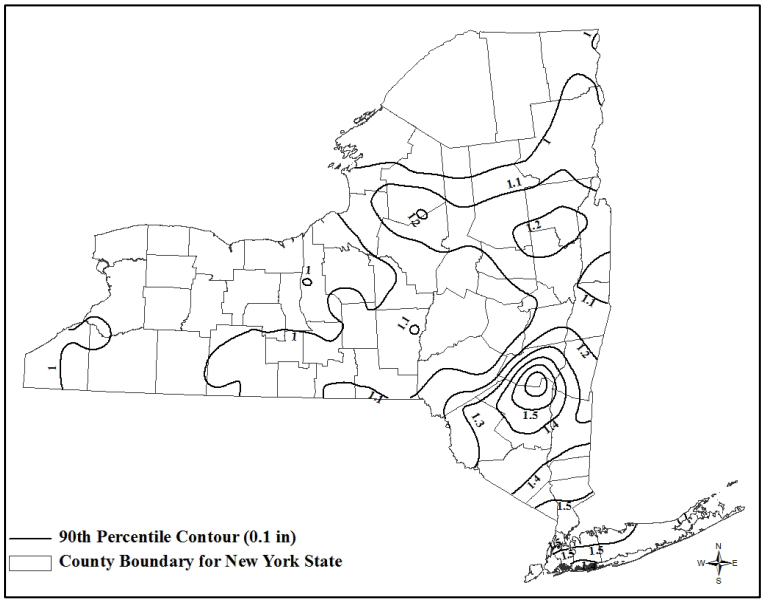


Figure 6: New York State 90% Rainfall Map

Extreme Precipitation Tables

Northeast Regional Climate Center

Data represents point estimates calculated from partial duration series. All precipitation amounts are displayed in inches.

Smoothing	Yes
State	New York
Location	
Longitude	76.007 degrees West
Latitude	42.988 degrees North
Elevation	0 feet
Date/Time	Thu, 20 Aug 2020 10:25:27 -0400

Extreme Precipitation Estimates

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr
1yr	0.28	0.43	0.53	0.69	0.86	1.06	**1yr**	0.75	0.96	1.21	1.45	1.73	2.04	2.29
2yr	0.33	0.50	0.63	0.82	1.04	1.28	**2yr**	0.89	1.16	1.44	1.73	2.04	2.39	2.68
5yr	0.39	0.61	0.76	1.02	1.31	1.61	**5yr**	1.13	1.44	1.83	2.17	2.54	2.93	3.31
10yr	0.44	0.70	0.88	1.20	1.55	1.93	**10yr**	1.34	1.69	2.19	2.59	3.00	3.43	3.88
25yr	0.53	0.84	1.07	1.48	1.96	2.44	**25yr**	1.69	2.10	2.76	3.25	3.73	4.22	4.80
50yr	0.60	0.97	1.24	1.74	2.34	2.93	**50yr**	2.02	2.48	3.32	3.88	4.41	4.94	5.63
100yr	0.70	1.13	1.46	2.06	2.80	3.51	**100yr**	2.42	2.94	3.96	4.60	5.21	5.78	6.62
200yr	0.80	1.31	1.69	2.43	3.35	4.20	**200yr**	2.89	3.47	4.74	5.48	6.15	6.77	7.78
500yr	0.98	1.61	2.09	3.04	4.25	5.33	**500yr**	3.67	4.35	5.99	6.88	7.65	8.35	9.65

Figure 7: Northeast Regional Climate Center Design Storms

3. Soil Information

The majority of the soils within the project site area consist of Aurora silt loam and Angola-Darien silt loams which are classified as Hydrologic Soil Group D. This indicates that the site should have low transmissive soils if undeveloped. The NRCS Soil Survey Map is shown in Figure 8 below and the soil descriptions can be reviewed in Appendix C.

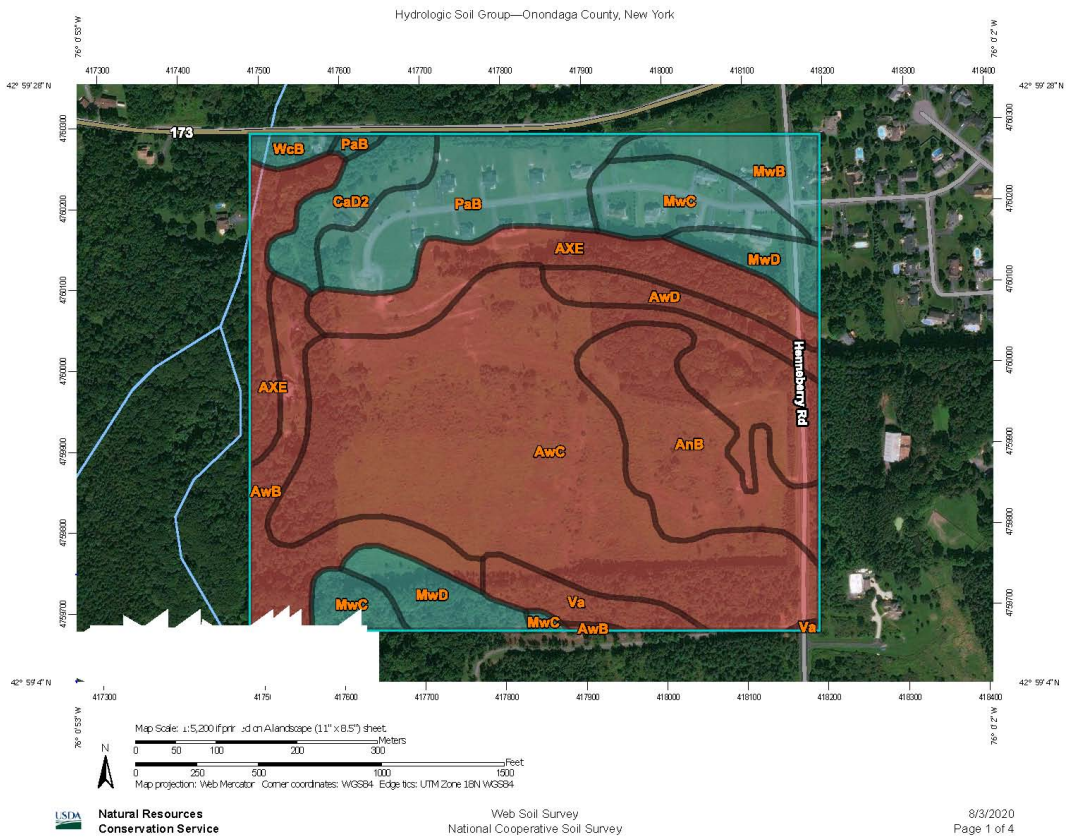


Figure 8: Project Site NRCS Soil Survey Map

B. EXISTING CONDITIONS

The existing project area consists of mixed woods, brush, and grass area located on the west side of Henneberry Road and to the south of the existing Brandywine Drive subdivision. The overall drainage area has three main points of study at which the peak runoff rates for pre and post-development conditions were analyzed. Drainage Area 1 (DA-1) is tributary to point of study #1, which is located within a small creek to the northwest of the subject site. This creek flows to the north under Route 173 and is ultimately tributary to Limestone Creek. Drainage Area 2 (DA-2) is tributary to point of study #2, located within a drainage ditch on the south side of the existing Brandywine subdivision. Drainage area 3 (DA-3) is tributary to point of study #3, located within the drainage ditch on the west side of the Henneberry Road right-of-way. The only existing impervious area is the hammerhead at the end of Brandywine Drive and is located in the northwest portion of DA-1. The entirety of the subject site slopes generally towards the north at grades varying between ±3% and 13%. An existing drainage ditch cuts across the entirety of the site from east to west and conveys stormwater runoff from the site towards point of study #1.

DA-1 includes a significant amount of off-site wooded area to the south and west of the project site. This area sheet flows to the existing grass area on-site before being channelized in a drainage ditch that flows from east to west across the width of the project site. This ditch discharges to an offsite creek to the west of the subject site before reaching point of study #1.

Table 2: Existing Drainage Area 1 Curve Number Calculation

Area (ac)	CN	Description
21.210	77	Woods, Good, HSG D
35.420	80	>75% Grass cover, Good, HSG D
56.630	79	Weighted Average
56.630		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.0	100	0.0600	0.10		**Sheet Flow, Sheet Flow** Woods: Light underbrush n= 0.400 P2= 2.39"
4.6	410	0.0900	1.50		**Shallow Concentrated Flow, Shallow** Woodland Kv= 5.0 fps
6.7	840	0.0900	2.10		**Shallow Concentrated Flow, Shallow** Short Grass Pasture Kv= 7.0 fps
1.3	1,405	0.0750	17.78	213.31	**Channel Flow, Swale** Area= 12.0 sf Perim= 8.0' r= 1.50' n= 0.030 Earth, clean & winding
28.6	2,755	Total			

DA-2 includes wooded, grass, and brush area that drain to the north towards point of study #2. There is a series of existing drainage swales that channelize flow towards this point of study. This area is located to the north of the existing drainage ditch that cuts through the site.

Table 3: Existing Drainage Area 2 Curve Number Calculation

Area (ac)	CN	Description
3.330	77	Woods, Good, HSG D
2.740	80	>75% Grass cover, Good, HSG D
6.070	78	Weighted Average
6.070		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.5	100	0.0400	0.13		**Sheet Flow, Sheet Flow** Grass: Dense n= 0.240 P2= 2.39"
14.2	555	0.0170	0.65		**Shallow Concentrated Flow, Shallow** Woodland Kv= 5.0 fps
1.5	281	0.0360	3.05		**Shallow Concentrated Flow, Shallow** Unpaved Kv= 16.1 fps
0.2	280	0.1210	20.51	205.13	**Channel Flow, Swale** Area= 10.0 sf Perim= 5.0' r= 2.00' n= 0.040 Earth, dense weeds
28.4	1,216	Total			

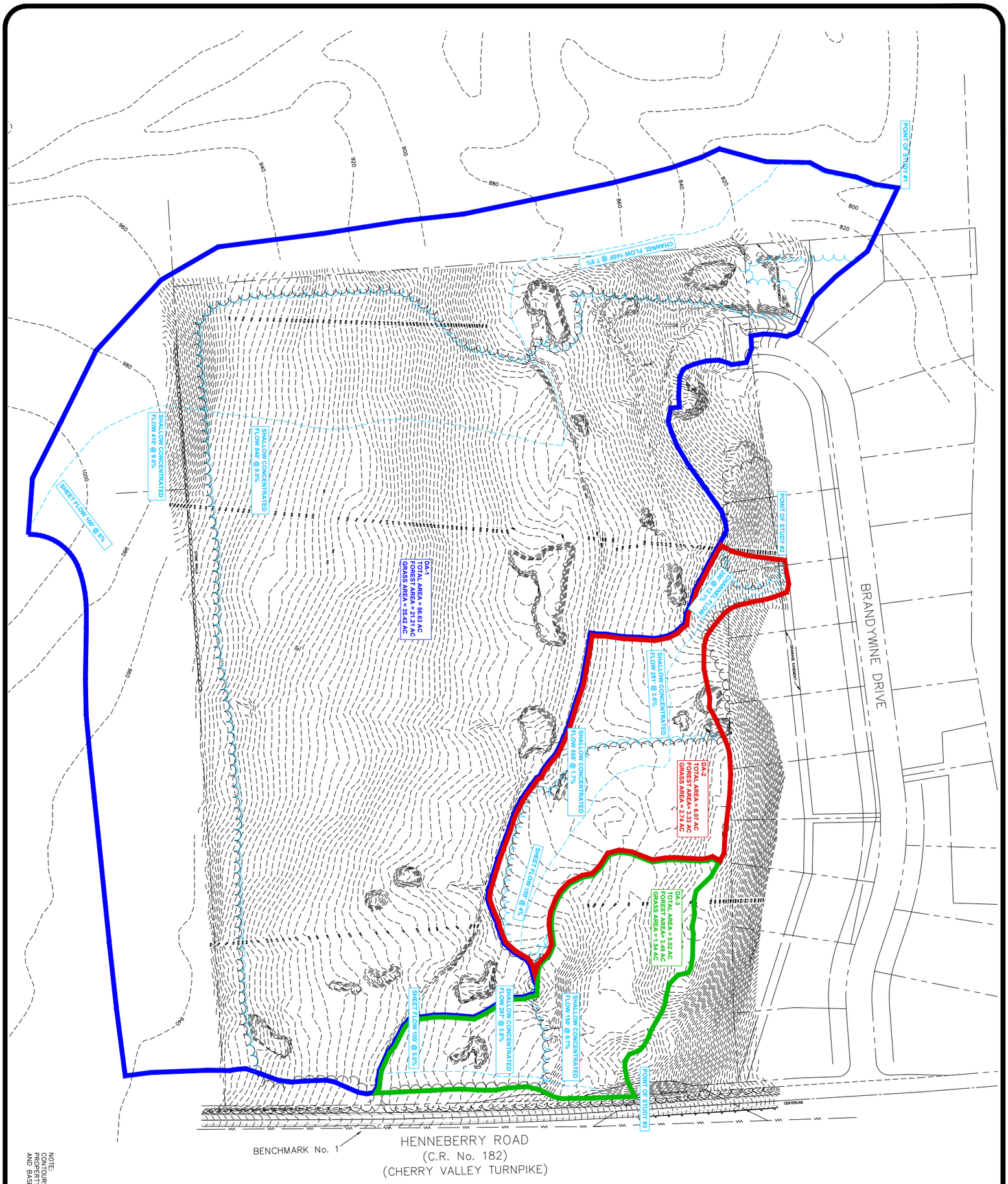
DA-3 consists of wooded and shrub area in the northeast corner of the subject site and is tributary to point of study # 3 which is located within the Henneberry Road right-of-way.

Table 4: Existing Drainage Area 3 Curve Number Calculation

Area (ac)	CN	Description
3.480	77	Woods, Good, HSG D
1.540	80	>75% Grass cover, Good, HSG D
5.020	78	Weighted Average
5.020		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.4	100	0.0500	0.15		**Sheet Flow, Sheet Flow** Grass: Dense n= 0.240 P2= 2.39"
1.5	287	0.0380	3.14		**Shallow Concentrated Flow, Shallow** Unpaved Kv= 16.1 fps
1.7	150	0.0870	1.47		**Shallow Concentrated Flow, Shallow** Woodland Kv= 5.0 fps
14.6	537	Total			

Figure 9 on the following page summarizes the hydrology of the existing condition watershed.



NOTE:
CONTOURS OUTSIDE OF THE SUBJECT PROPERTY BOUNDARY IS APPROXIMATE, AND BASED ON USGS TOPOGRAPHY MAPS.

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PLAN SEAL BY:
NEAL H. ZINSMEYER, JR., P.E.
NYS REGISTRATION # 087211

GRAPHIC SCALE
0 100' 200'
(IN FEET)
1 inch = 100 ft

SHEET	PROJECT NO.	PREPARED BY:		SHEET TITLE:	PROJECT TITLE:
FIG-1	20-1906	NAPIERALA CONSULTING PROFESSIONAL ENGINEER, P.C. SITE • DESIGN • ENGINEERING 110 FAYETTE STREET MANLIUS, NEW YORK 13104 email: MNAP@NAPCON.COM PH: (315) 682-5580 FAX: (315) 682-5544		EXISTING DRAINAGE AREA	BRANDYWINE ESTATES PHASE 2 HENNEBERRY ROAD
	DATE 29 NOV 2021				TOWN OF MANLIUS ONONDAGA COUNTY, NY
	SCALE 1" = 100'				PREPARED FOR: HARRINGTON HOMES 3848 HENNEBERRY ROAD JAMESVILLE, NY 13078

NO.	REVISION/ISSUE	DATE

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C. PROPOSED CONDITIONS

This project consists of the construction of a 34-lot subdivision of single-family homes. The impervious area on each lot will consist of rooftop area, which will be properly disconnected via gutter discharge to grass buffer strips, and asphalt driveway area, which is assumed to be approximately 1,800 square-feet (about 0.04 acres) for each individual lot. The development will also include necessary amenities such as public street(s), public/private utility extensions/connections, and applicable stormwater management facilities. The stormwater mitigation area will collect and treat runoff in order to meet the objectives of the SPDES General Permit for Stormwater Discharges from Construction Activity and local regulations.

The stormwater management system includes several management practices to capture, treat and control the release of runoff from the site. Runoff from the impervious areas, both rooftop and asphalt, will be directed to practices to provide infiltration/runoff reduction, water quality treatment and water quantity storage. The following stormwater management practices will be constructed:

- Bioretention Areas: Bioretention filters are considered a standard stormwater management practice with runoff reduction capacity to decrease stormwater quantity and improve water quality (NYSDEC Stormwater Management Design Manual, p. 5-97)[1]. The filters collect runoff from rainfall events, temporarily store it, and filter it through the root structure of the plants and the planting soil media. Through the plants' uptake of runoff and the filtering through the soil media, the amount of runoff the site generates is reduced and the remaining runoff from these frequent, but less intense, rainfall events is treated to remove pollutants such as suspended solids and phosphorus. The runoff in excess of the water quality event (the 90th-percentile rain event) will discharge to the downstream detention basin.
- Detention Basin: The detention basin will collect runoff from the more intense but less frequent rainfall events and temporarily store and released in a controlled manner such that the peak rates of runoff to the downstream design points will not be adversely impacted.

DA-1A includes a large off-site, upland wooded area and a majority of the proposed development on the subject property. This area is collected via conveyance systems in the roadway and is ultimately tributary to Bioretention Area #1 and Detention Basin #1.

Table 5: Proposed Drainage Area 1A Curve Number Calculations

Area (ac)	CN	Description
2.050	98	Paved parking, HSG D
1.940	98	Unconnected roofs, HSG D
22.870	80	>75% Grass cover, Good, HSG D
8.960	77	Woods, Good, HSG D
35.820	81	Weighted Average
31.830		88.86% Pervious Area
3.990		11.14% Impervious Area
1.940		48.62% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
27.9	100	0.0600	0.06		**Sheet Flow, SHEET FLOW** Woods: Dense underbrush n= 0.800 P2= 2.39"
4.8	370	0.0650	1.27		**Shallow Concentrated Flow, SCF** Woodland Kv= 5.0 fps
1.9	200	0.0650	1.78		**Shallow Concentrated Flow, SCF** Short Grass Pasture Kv= 7.0 fps
0.2	295	0.0300	19.80	79.19	**Channel Flow, curb and gutter flow** Area= 4.0 sf Perim= 4.0' r= 1.00' n= 0.013 Asphalt, smooth
1.7	1,100	0.0345	11.04	19.51	**Pipe Channel, Pipe Flow** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013 Corrugated PE, smooth interior
3.8	955	0.0050	4.20	50.44	**Channel Flow,** Area= 12.0 sf Perim= 12.0' r= 1.00' n= 0.025 Earth, grassed & winding
40.3	3,020	Total			

[1] The "biogeochemical process" in terms of stormwater management is the pathway by which water is recycled through plant material where the plant can consume it or return it to the atmosphere through evapotranspiration.

DA-1B includes the western portion of the proposed development and a section of wooded area upland and to the south of the subject property. This area is ultimately tributary to Bioretention Area #2 and Detention Basin #1.

Table 6: Proposed Drainage Area 1B Curve Number Calculations

Area (ac)	CN	Description
0.710	98	Paved parking, HSG D
0.340	98	Unconnected roofs, HSG D
7.820	80	>75% Grass cover, Good, HSG D
2.040	77	Woods, Good, HSG D
10.910	81	Weighted Average
9.860		90.38% Pervious Area
1.050		9.62% Impervious Area
0.340		32.38% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.6	100	0.0600	0.16		**Sheet Flow, SHEET FLOW** Grass: Dense n= 0.240 P2= 2.39"
4.6	410	0.0900	1.50		**Shallow Concentrated Flow, SCF** Woodland Kv= 5.0 fps
5.6	710	0.0920	2.12		**Shallow Concentrated Flow, SCF** Short Grass Pasture Kv= 7.0 fps
0.3	170	0.0200	9.55	76.42	**Channel Flow, swale flow** Area= 8.0 sf Perim= 8.0' r= 1.00' n= 0.022 Earth, clean & straight
21.1	1,390	Total			

DA-1C consists of the grassy area within the detention basin and is not tributary to a bioretention area.

Table 7: Proposed Drainage Area 1C Curve Number Calculations

Area (ac)	CN	Description
0.960	80	>75% Grass cover, Good, HSG D
0.120	77	Woods, Good, HSG D
1.080	80	Weighted Average
1.080		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Min TR 55 Value**

DA-1D consists largely of wooded area and lawn area that is located on the western part of the subject site and just off-site to the west. This drainage area is not tributary to any on-site stormwater management practices and is directly tributary to point of study #1.

Table 8: Proposed Drainage Area 1D Curve Number Calculations

Area (ac)	CN	Description
5.930	80	>75% Grass cover, Good, HSG D
8.910	77	Woods, Good, HSG D
0.160	98	Paved parking, HSG D
15.000	78	Weighted Average
14.840		98.93% Pervious Area
0.160		1.07% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
27.9	100	0.0600	0.06		**Sheet Flow, SHEET FLOW** Woods: Dense underbrush n= 0.800 P2= 2.39"
5.4	485	0.0900	1.50		**Shallow Concentrated Flow, SCF** Woodland Kv= 5.0 fps
4.1	517	0.0900	2.10		**Shallow Concentrated Flow, SCF** Short Grass Pasture Kv= 7.0 fps
1.2	1,155	0.0750	16.28	260.45	**Channel Flow, SWALE** Area= 16.0 sf Perim= 16.0' r= 1.00' n= 0.025 Earth, clean & winding
38.6	2,257	Total			

DA-2 consists of the small amount of wooded and lawn area that is still tributary to point of study #2 to the north of the subject site.

Table 9: Proposed Drainage Area 2 Curve Number Calculations

Area (ac)	CN	Description
0.690	80	>75% Grass cover, Good, HSG D
0.140	77	Woods, Good, HSG D
0.830	79	Weighted Average
0.830		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.4	100	0.1500	0.23		**Sheet Flow, SHEET FLOW** Grass: Dense n= 0.240 P2= 2.39"
0.7	104	0.1300	2.52		**Shallow Concentrated Flow, SCF** Short Grass Pasture Kv= 7.0 fps
8.1	204	Total			

DA-3A includes a small amount of off-site wooded area and the southeastern-most proposed house within the development. The runoff from this area is collected by the loop road conveyance system, discharges into the drainage ditch within the right-of-way, and is ultimately tributary to point of study #3.

Table 10: Proposed Drainage Area 3A Curve Number Calculations

Area (ac)	CN	Adj	Description
0.920	80		>75% Grass cover, Good, HSG D
0.180	98		Paved parking, HSG D
0.070	98		Unconnected roofs, HSG D
1.030	77		Woods, Good, HSG D
2.200	81	80	Weighted Average, UI Adjusted
1.950			88.64% Pervious Area
0.250			11.36% Impervious Area
0.070			28.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.9	100	0.0450	0.14		**Sheet Flow, SHEET FLOW** Grass: Dense n= 0.240 P2= 2.39"
2.5	188	0.0650	1.27		**Shallow Concentrated Flow, SCF** Woodland Kv= 5.0 fps
1.9	202	0.0650	1.78		**Shallow Concentrated Flow, SCF** Short Grass Pasture Kv= 7.0 fps
0.2	232	0.0220	16.95	50.86	**Channel Flow, curb flow** Area= 3.0 sf Perim= 3.0' r= 1.00' n= 0.013 Asphalt, smooth
16.5	722	Total			

DA-3B includes a small portion of the northeastern portion of the proposed development. This area is directly tributary to point of study #3 within the right-of-way.

Table 11: Proposed Drainage Area 3B Curve Number Calculations

Area (ac)	CN	Adj	Description
2.230	80		>75% Grass cover, Good, HSG D
0.230	98		Paved parking, HSG D
0.140	98		Unconnected roofs, HSG D
2.600	83	82	Weighted Average, UI Adjusted
2.230			85.77% Pervious Area
0.370			14.23% Impervious Area
0.140			37.84% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.4	100	0.0500	0.15		**Sheet Flow, SHEET FLOW** Grass: Dense n= 0.240 P2= 2.39"
5.1	475	0.0500	1.57		**Shallow Concentrated Flow, SCF** Short Grass Pasture Kv= 7.0 fps
0.2	82	0.0200	6.42	5.04	**Pipe Channel, pipe flow** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013 Corrugated PE, smooth interior
16.7	657	Total			

Figure 10 on the following page summarizes the hydrology of the proposed condition watershed.

NOTE:
CONTOURS OUTSIDE OF THE SUBJECT PROPERTY BOUNDARY IS APPROXIMATE AND BASED ON USGS TOPOGRAPHY MAPS.

PROJECT TITLE:
BRANDYWINE ESTATES PHASE 2
HENNEBERRY ROAD
TOWN OF MANLIUS — ONONDAGA COUNTY, NY

PREPARED FOR:
HARRINGTON HOMES
3848 HENNEBERRY ROAD
JAMESVILLE, NY 13078

SHEET TITLE:
PROPOSED DRAINAGE AREA

NO.	REVISION/ISSUE	DATE

PREPARED BY:
NAPIERALA CONSULTING
PROFESSIONAL ENGINEER, P.C.
SITE • DESIGN • ENGINEERING
110 FAYETTE STREET
MANLIUS, NEW YORK 13104
e-mail: MNAPIERALA@TWC.COM
PH: (315) 682-5589 FAX: (315) 682-5544

PLAN REVIEW BY:
NEAL H. ZUBKOWITZER, JR., P.E.
NYS REGISTRATION # 087251

PROJECT NO. 20-1906
DATE 29 NOV 2021
SCALE 1" = 100'

SHEET **FIG-2**

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D. RUNOFF REDUCTION VOLUME (RRV)

The NYSDEC implemented regulations effective March 1, 2011 that requires all construction projects that disturb greater than one acre of land to provide runoff reduction through the implementation of green infrastructure practices. The goal of the runoff reduction volume criteria is to implement stormwater management practices and green infrastructure techniques to replicate pre-development hydrology. The NYS Stormwater Management Design Manual provides the acceptable green planning techniques and green infrastructure techniques to meet the runoff reduction volume criteria. The following narrative and calculations detail the implementation of the planning and infrastructure techniques on the site to achieve the minimum runoff reduction volume. The narrative follows the Design Manual, Chapter 5.

PLANNING

1. Plan to preserve, avoid, and minimize:

	Applicable	Not Applicable
a. Preserve undisturbed, natural buffer, and critical environmental areas.	☐	☒
b. Employ open space, conservation, and clustering site design techniques.	☒	☐
c. Avoid developing in environmentally sensitive areas: floodplain, steep slopes, habitat, ecosystems, bedrock, wetlands, shorelines, shallow groundwater, impervious soils and unstable soils.	☒	☐
d. Minimize impervious surfaces: building footprints, parking, roads, sidewalks, and driveways.	☒	☐
e. Minimize clearing and grading	☒	☐

Discussion:

a. The project does not have any critical environmental areas.

b. Open space is used in projects on tracts of land where the development can be concentrated in a portion of the site while maintaining large portions of undisturbed land. Open space design was taking into consideration when planning the subdivision of the property. Town code requires lot sizes to be a minimum of 40,000 square feet and this plan proposes lots between 43,000 sf and 100,000 sf.

c. The project does not have any critical environmental areas with the exception of steep slopes. Development in steep slopes will be minimized as much as possible and is limited to areas of the individual homes.

d. The NYS Stormwater Design Manual discusses building footprint reduction in terms of building multiple floors to achieve the same, or comparable, square footage as a single-floor footprint. The majority of these house are expected to be two-story homes to reduce the footprint and achieve more square foot area of the house.

e. The proposed grading plan for the project minimizes the amount of grading to the maximum extent practicable. Grade requirements for a functional site, including slopes to meet the buildable lots, were taken into account during the design phase. The off-grading was designed to catch up to the existing grade in the shortest distance possible (i.e., minimize off-grading) while still meeting acceptable standards for slope stabilization and erosion control.

Disconnection of Rooftop Runoff

All direct runoff from residential rooftop areas has been designed to be distributed to surrounding pervious areas to promote overland vegetative filtering and infiltration. As such, all rooftop impervious area is treated as pervious lawn area when calculating the required water quality volume and runoff reduction volume. The rooftop impervious area is not deducted when calculating the water quantity mitigation in the detention basin.

E. WATER QUALITY VOLUME (WQ_v) REQUIRED:

1. **Calculate the required water quality volume for new impervious area within drainage areas DA-1A.**

$$WQ_v = \frac{PR_vA}{12}$$

90-th Percentile Rainfall (P) = 1.0 inch

Drainage Area (A) = 35.82 acres

Impervious Area (A_I) = 2.26 acres

$$R_v = 0.05 + 0.9\left(\frac{A_I}{A}\right)$$

$$R_v = 0.05 + 0.9(0.063)$$

$R_v = 0.107$

therefore:

$$WQ_v = \frac{1.0*0.107*35.82}{12}$$

Total WQ_v Required= 0.319 ac·ft (13,890 cf)

2. **Minimum RR_v requirements**

Calculate minimum required Runoff Reduction Volume (RR_v) for DA-1A, 1B, & 1C using:

$$RR_v = \frac{P \cdot Rv \cdot S \cdot A_I}{12}$$

A_I = total impervious area

S = 0.55 (A Soils), 0.40 (B Soils), 0.30 (C Soils), 0.20 (D Soils), or weighted HSG average in drainage area

$$RR_v = \frac{1.0(0.95)(0.20)(2.26)}{12}$$

Total Minimum RR_v required = 0.036 ac·ft (1,560 cf)

1. **Calculate the required water quality volume for the remaining new impervious area within drainage areas DA-1B, DA-3A, & DA-3B. The impervious area within DA-3 cannot feasibly be captured and treated due to steep slopes, therefore the bioretention area collecting runoff from DA-1B will be oversized to compensate for the required water quality treatment volume of DA-3.**

$$WQ_v = \frac{PR_vA}{12}$$

90-th Percentile Rainfall (P) = 1.0 inch

Drainage Area (A) = 15.71 acres

Impervious Area (A_I) = 1.12 acres (Total from DA-1B and DA-3)

$$R_v = 0.05 + 0.9\left(\frac{A_I}{A}\right)$$

$$R_v = 0.05 + 0.9(0.071)$$

$R_v = 0.114$

therefore:

$$WQ_v = \frac{1.0*0.114*15.71}{12}$$

Total WQ_v Required= 0.150 ac·ft (6,510 cf)

2. **Minimum RR_v requirements**

Calculate minimum required Runoff Reduction Volume (RR_v) for DA-1A, 1B, & 1C using:

$$RR_v = \frac{P \cdot Rv \cdot S \cdot A_I}{12}$$

A_I = total impervious area

S = 0.55 (A Soils), 0.40 (B Soils), 0.30 (C Soils), 0.20 (D Soils), or weighted HSG average in drainage area

$$RR_v = \frac{1.0(0.95)(0.20)(1.12)}{12}$$

Total Minimum RR_v required = 0.018 ac·ft (775 cf)

F. WATER QUALITY VOLUME (WQV) PROVIDED

Water quality treatment for the runoff from proposed impervious surfaces will be provided by a combination of two bioretention areas. Rooftop area is assumed to be properly disconnected from nearby impervious surfaces and is therefore treated as pervious area in analysis.

Bioretention Basin #1 (DA-1A)

$$A_f = \frac{(WQ_v)(d_f)}{(k)(h_f + d_f)(t_f)}$$

Where,

A_f	=	Area of the filter (ft^2)
WQ_v	=	Water Quality Volume (ft^3)
d_f	=	depth of the bioretention soil media (2.5 ft as required in NYS Design Manual)
k	=	coefficient of permeability (0.5 ft/day per NYS Design Manual)
h_f	=	average height of water above the filter bed (0.125 ft)
t_f	=	design filter bed drain time (2 days per NYS Design Manual)

$$A_f = \frac{(13{,}890\ ft^3)(2.5\ ft)}{\left(0.5\ \frac{ft}{day}\right)(0.25\ ft + 2.5\ ft)(2\ days)}$$

Total A_f = 12,630 ft^2 *required*

Total A_f provided = 12,800 ft^2

Therefore,

WQv = 13,890 ft^3 (0.319 ac·ft) *Provided*

The RR_v provided is calculated as follows:

Bioretention areas in C and D soils have a RRv factor of 0.4*WQv.

$RR_v = 0.4 * 13{,}890\ ft^3$

RR_v provided = 5,555 ft^3 = 0.128 ac·ft

Bioretention Basin #2 (DA-1B, 3A, & 3B)

$$A_f = \frac{(WQ_v)(d_f)}{(k)(h_f + d_f)(t_f)}$$

Where,

A_f	=	Area of the filter (ft^2)
WQ_v	=	Water Quality Volume (ft^3)
d_f	=	depth of the bioretention soil media (2.5 ft as required in NYS Design Manual)
k	=	coefficient of permeability (0.5 ft/day per NYS Design Manual)
h_f	=	average height of water above the filter bed (0.125 ft)
t_f	=	design filter bed drain time (2 days per NYS Design Manual)

$$A_f = \frac{(6{,}510\ ft^3)(2.5\ ft)}{\left(0.5\ \frac{ft}{day}\right)(0.25\ ft + 2.5\ ft)(2\ days)}$$

Total $A_f = 5{,}920\ ft^2$ *required*

Total A_f provided = 6,200 ft^2

Therefore,

WQv = 6,510 ft^3 (0.150 ac·ft) *Provided*

The RR_v provided is calculated as follows:

Bioretention areas in C and D soils have a RRv factor of 0.4*WQv.

$RR_v = 0.4 * 6{,}510\ ft^3$

RR_v provided = 2,605 ft^3 = 0.060 ac·ft

G. CHANNEL PROTECTION VOLUME (CP_V)

The proposed project must provide sufficient storage of the channel protection volume (CPv), which is accomplished by providing 24-hour extended detention of the one-year, 24-hour storm event, remained from runoff reduction. The NYS Stormwater Design Manual methodology for determining the storage volume was used (Appendix B.1) and is discussed below. Below is a summary of the calculations for DA-1.

Proposed Detention Basin 1

Tributary Area = 47.70 acres, CN = 81, & t_c = 35 minutes

I_a = 0.469, P = 1.0"

$$\frac{I_a}{P} = 0.469$$

Using I_a/P and T_c, q_u = 260 csm/in (TR-55, Exhibit 4-II)

Using q_u and T = 24 hr, q_o/q_i = 0.07 (Design Manual, Figure B.1)

Using formula 2.1.16 (Design Manual, Appendix B.1), calculate V_s/V_r

$$\frac{V_s}{V_r} = 0.590$$

Using formula 2.1.17 (Design Manual, Appendix B.1), calculate V_s

$$V_s = \frac{\left(\frac{V_s}{V_r}\right) Q_d A}{12}$$

$V_s = (0.59)2.268\ \text{ac} \cdot \text{ft}$ (total tributary from HydroCAD)

$V_s = 1.33\ \text{ac} \cdot \text{ft}$ (57,930 cf)

CPv required = CPv - RR_V Provided

CPv required = 57,930 ft^3 – 8,160 ft^3 = **49,770 ft^3 required**

CPv Provided in Bioretention #1 = 5,250 ft^3

CPv Provided in Bioretention #2 = 11,675 ft^3

CPv Provided in Detention #1 = 33,240 ft^3

Total* CPv = 50,165 ft^3 *Provided

H. PEAK FLOW MITIGATION (Q_{p10} and Q_{p100})

The remaining two requirements of the NYSDEC SPDES General Permit for Stormwater Discharges from Construction Activity are that the stormwater system cannot discharge runoff from the site during the 10-year and 100-year, 24-hour rainfall events at rates higher than the existing condition peak rates of runoff during the correlating rainfall events. To meet these requirements, the underground stormwater chamber system will act as a detention basin that capture the runoff, temporarily store it, and release the runoff in a controlled manner to the existing drainage ditch such that the proposed project will not adversely impact the downstream areas. The following tables summarize the HydroCAD results for the 10-year and 100-year rainfall events.

Table 12: Peak Flow Rates for 10-Year & 100-Year Rainfall Events

	Existing Peak Runoff Rate (cfs)			**Proposed Peak Runoff Rate (cfs)**		
Point of Study	Pt. 1	Pt. 2	Pt. 3	Pt. 1	Pt. 2	Pt. 3
10-Year Storm	75.01	7.68	9.35	45.27	2.07	9.31
100-Year Storm	175.87	18.46	22.06	86.52	4.70	21.06

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
861.80	1,260	0	0
862.00	2,891	415	415
863.00	6,366	4,629	5,044
864.00	11,515	8,941	13,984
865.00	16,570	14,043	28,027
866.00	18,777	17,674	45,700
867.00	21,040	19,909	65,609
868.00	23,360	22,200	87,809
869.00	25,736	24,548	112,357
870.00	28,169	26,953	139,309
871.00	30,658	29,414	168,723
872.00	33,204	31,931	200,654
873.00	35,805	34,505	235,158

Device	Routing	Invert	Outlet Devices
#1	Secondary	872.00'	**30.0' long x 12.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.57 2.62 2.70 2.67 2.66 2.67 2.66 2.64
#2	Primary	861.80'	**30.0" Round Culvert** L= 98.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 861.80' / 857.00' S= 0.0490 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 4.91 sf
#3	Device 2	861.80'	**4.0" Vert. Orifice1** C= 0.600 Limited to weir flow at low heads
#4	Device 2	864.60'	**30.0" W x 30.0" H Vert. Orifice2** C= 0.600 Limited to weir flow at low heads
#5	Device 2	869.00'	**36.0" x 36.0" Horiz. Grate** C= 0.600 Limited to weir flow at low heads

Figure 11: Proposed Detention Basin #1 Summary

Section IV. CONTROLS

A. EROSION AND SEDIMENT CONTROLS

Prior to the commencement of construction, the operator will identify the contractor(s) and subcontractor(s) that will implement each erosion and sediment control measure identified in this SWPPP. All contractors and subcontractors identified in the SWPPP must sign a copy of the certification statement in Part III.E. of the NYS DEC SPDES General Permit for Stormwater Discharges from Construction Activities in accordance with Part V.H. of the SPDES General Permit.

1. Stabilization Practices (Permanent)
   Permanent stabilization practices for this site include:
   a. Land clearing activities shall be done only in areas where earthwork will be performed and shall progress as earthwork is needed.
   b. Permanent seeding and planting of all unpaved areas.

2. Stabilization Practices (Temporary) Temporary stabilization practices for this site include:
   a. Temporary seeding and planting of all unpaved areas when construction activity has ceased, or will cease, in an area for 14 days. Seeding mixtures and application rates are listed in the erosion and sediment control notes on the plans.
   b. Mulching exposed areas. Mulching rates are listed in the erosion and sediment control notes on the plan sheet C-15.
   c. Frequent watering to minimize wind erosion during construction.

3. Structural Practices (Permanent)Permanent structural practices for this site include:
   a. Bioretention Areas. Bioretention filters are considered a standard stormwater management practice with runoff reduction capacity to decrease stormwater quantity and improve water quality.
   b. Land grading. Land grading is the reshaping of the existing land surface in accordance with a plan as determined by the engineering survey and layout. The purpose of a land grading specification is to provide erosion control and vegetative establishment on areas where the existing land is to be reshaped according to the plan.

4. Structural Practices (Temporary)
   Temporary structural practices for this site include:
   a. Silt fence. Silt fence is a temporary barrier of geotextile fabric installed on the contours across from a slope used to intercept sediment laden runoff from small drainage areas of disturbed soil. The purpose of silt fence is to reduce runoff velocity and effect deposition of transported sediment load.
   b. Stabilized construction entrance/exit. A stabilized construction entrance/exit is a stabilized pad of aggregate underlain with geotextile located at any point where traffic will be entering or leaving a construction site to or from a public right-of-way, street, alley, sidewalk, or parking area. The purpose of the stabilized construction entrance is to reduce or eliminate the tracking of sediment onto public rights-of-way or streets
      1. Aggregate size: Use a matrix of one to four-inch stone, or reclaimed or recycled equivalent
      2. Thickness: Not less than six inches
      3. Width: 24-foot minimum
      4. Length: As required, but not less than 50 feet
      5. Geotextile: To be placed over the entire area to be covered with aggregate. Piping of surface water under entrance shall be provided as necessary.

c. Sediment trap. The detention basins will be used as a sediment trap during construction. The sediment basin will have a riprap outlet sediment trap in place of the emergency spillway. Upon completion of construction, the sediment basin will be cleaned of all sediment buildup and the basin shall be finalized per plans.
d. Concrete washout area. A temporary excavated or above ground lined constructed pit where concrete truck mixers and equipment can be washed after their loads have been discharged to prevent highly alkaline runoff from entering storm drainage systems or leaching into the soil.
    1. The washout facility is sized to contain solids, wash water and rainfall. The maximum size shall be eight feet by eight feet at the bottom and two feet deep. If excavated, then the side slopes shall be 2:1 (horizontal to vertical).
    2. The facility shall be located a minimum of 100 feet from drainage swales, storm drain inlets, wetlands, streams, and other surface waters. Surface waters shall be prevented from entering the structure except got the access road. Appropriate access shall be provided with a gravel access road sloped down to the structure. Signs shall be placed to direct drivers to the facility after their load is discharged.
    3. All washout facilities will be lined to prevent leaching of liquids into the ground. The liner shall be plastic sheeting with a minimum thickness of 10 mils with no holes or tears, and anchored beyond the top of the pit with an earthen berm, sand bags, stone, or other structural appurtenance except at the access point.

5. Sequence of Major Activities
The contractor will be responsible for implementing the above listed erosion and sediment control practices. The contractor may designate these tasks to certain subcontractors as is seen fit, but the ultimate responsibility for implementing these controls and ensuring their proper function remains with the contractor. The order of activities shall be as follows:

a. Conduct a preconstruction meeting with all involved parties
b. Delineate boundaries of disturbance as per the layout and grading plans
c. Construct construction entrance at the location shown on the erosion and sediment control plan
d. Install silt fence in locations shown on the layout and grading plans
e. Establish staging areas on the project site
f. Construct sediment trap(s) and overflow spillways for use during construction
g. Excavate detention basin and install overflow spillway
h. Remove topsoil, stockpile and stabilize
i. Rough grade site including swales and provide temporary stabilization when idle for more than 7 days
j. Building foundation excavation
k. Install underground stormwater management system
l. Compact gravel along driveways and parking areas
m. Utility installations.
n. Install concrete washout, complete concrete site work.
o. Complete final grading of the site
p. Restore all compacted soils in accordance with section 5.1.6 of the NYS Stormwater Design Manual
q. Provide final stabilization and landscaping of new area
r. Site Paving
s. Provide final stabilization of disturbed areas via seeding mulching.
t. Construct bioretention basins and outlet controls upon upstream stabilization
u. Remove all temporary stabilization control practices

Disturbed areas of the site where construction activity has ceased for more than seven (7) days shall be temporarily seeded and mulched. The Erosion & Sediment Control plan is shown in Appendix F.

B. INSPECTION AND MAINTENANCE REQUIREMENTS

Best management practices, both construction and operational, must be inspected and maintained on a routine basis to ensure continued compliance with the NYS SPDES General Permit for Stormwater Discharges from Construction Activity. The contractor is responsible for inspecting the erosion and sediment control practices, the operator/owner is responsible for providing a qualified professional, as defined in the SPDES General Permit, to perform the required weekly inspections of the construction site from the time earth-disturbing activities begin until final stabilization is achieved and the Notice of Termination is filed. The contractor will obtain copies of all local and state regulations that are applicable to stormwater management, erosion control, and pollution minimization at this job site and will comply fully with such regulations. The contractor will submit written evidence of such compliance if requested by the operator or any agent of a regulatory body. The contractor will comply with all conditions of the NYSDEC SPDES General Permit for Stormwater Discharges from Construction Activity, including the conditions related to maintaining the SWPPP and evidence of compliance with the SWPPP at the job site and allowing regulatory personnel access to the job site and to records to determine compliance.

C. CONSTRUCTION MAINTENANCE/INSPECTION PROCEDURES

The operator shall maintain a record of all inspection reports in a site logbook. The logbook shall be maintained on site and be made available to the permitting authority upon request. Prior to the commencement of construction, the operator shall certify in the site logbook that the SWPPP, prepared in accordance with Part III.D. of the NYS DEC SPDES General Permit for Discharges from Construction Activities, meets all Federal, State and local erosion and sediment control requirements. The operator shall post at the site, in a publicly accessible location, a summary of the site inspection activities monthly. The following inspection and maintenance practices will be used to maintain erosion and sediment controls and stabilization measures.

1. Inspection and Maintenance Practices
    a. Inspections shall occur once every seven calendar days.
    b. 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 waterbodies located within or immediately adjacent to the property boundaries of the construction site, and all points of discharge from the construction site.
    c. The qualified inspector shall prepare an inspection report subsequent to each and every inspection. At a minimum, the inspection report shall include and/or address the following:
        i. Date and time of inspection;
        ii. Name and title of person(s) performing inspection;
        iii. A description of the weather and soil conditions (e.g. dry, wet, saturated) at the time of the inspection;
        iv. 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;
        v. 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;
        vi. Identification of all erosion and sediment control practices that need repair or maintenance;
        vii. Identification of all erosion and sediment control practices that were not installed or are not functioning as designed and need to be reinstalled or replaced;
        viii. Description and sketch of areas that are disturbed at the time of the inspection and areas that have been stabilized (temporarily and/or final) since the last inspection;

ix. Current phase of construction of all post-construction stormwater management practices and identification of all construction that is not in conformance with the SWPPP and technical standards;

x. 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); and

xi. 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.

d. Within one business day of the completion of an inspection, the qualified inspector shall notify the owner or operator and appropriate contractor or subcontractor of any corrective actions that need to be taken. The contractor or subcontractor shall begin implementing the corrective actions within one business day of this notification and shall complete the corrective actions in a reasonable time frame.

e. All inspection reports shall be signed by the qualified inspector. The inspection reports shall be maintained on the site.

f. Erosion and Sediment Control Inspection/Maintenance

i. Silt Fence: Silt fence shall be inspected for depth of sediment, tears, etc., to see if the fabric is securely attached to the fence posts, and to see that the fence posts are securely in the ground. Built up sediment will be removed from silt fence when it has reached one-third the height of the fence.

ii. Stabilized Construction Entrance/Exit: The entrance shall be maintained in a condition which will prevent tracking of sediment onto public rights-of-way. This may require periodic top dressing with additional aggregate. All sediment spilled, dropped, or washed onto public rights-of-way must be removed immediately. When necessary, wheels must 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 aggregate, which drains into an approved sediment-trapping device. All sediment shall be prevented from entering storm drains, ditches, or water courses.

iii. Seeding: Temporary and permanent seeding and all other stabilization measures will be inspected for bare spots, washouts, and healthy growth.

2. Inspection and Maintenance Report Forms

- Once installation of any required or optional erosion control device or measure has been implemented, at least twice every seven calendar days a Qualified Professional shall inspect each practice. The inspector shall use the forms found in this SWPPP to inventory and report the condition of each measure to assist in maintaining the erosion and sediment control measures in good working order.
- These report forms shall become an integral part of the SWPPP and shall be made readily accessible to governmental inspection officials, the operator's engineer, and the operator for review upon request during visits to the project site. In addition, copies of the reports shall be provided to any of these persons upon requires, via mail or facsimile transmission. Inspection and maintenance report forms are to be maintained by the permittee for three years following the final stabilization of the site.
- The operator shall also prepare a written summary of its status with respect to compliance with the NYSDEC SPDES General Permit for Stormwater Discharges from Construction Activity at a minimum frequency of every three months during which coverage under the SPDES General Permit exists. The summary should address the status of achieving each

component of the SWPPP. The reports shall be signed by the signatory of the NOI or a duly authorized person and be retained at the construction site.

1. Other Record Keeping Requirements

   The contractor shall keep the following records related to construction activities at the site:
   - Dates when major grading activities occur and the areas which were graded.
   - Dates and details concerning the installation of structural controls.
   - Dates when construction activities cease in an area.
   - Dates when an area is stabilized, either temporarily or permanently.
   - Dates of rainfall and the amount of rainfall.
   - Dates and descriptions of the character and amount of any spills of hazardous materials.
   - Records of reports filed with regulatory agencies if reportable quantities of hazardous materials are spilled.

D. OPERATION MAINTENANCE AND INSPECTION PROCEDURES

Long-term maintenance of the stormwater mitigation basins and swales will be the responsibility of the owner and/or the tenant. Maintenance and inspection check lists have been included in Appendix D.

1. Embankments and emergency spillways will be inspected annually and after major storm events. Items to be inspected include:
   a. Vegetation and ground cover is adequate to prevent erosion.
   b. No embankment erosion has occurred.
   c. No animal burrows into embankments.
   d. No unauthorized planting.
   e. No cracking, bulging or sliding of dam.
   f. Emergency spillway is in good condition, free of silt buildup and debris.
   g. No leaks or seepage is occurring on downstream face.
   h. All slope protection and riprap is intact and no failure has occurred.

2. Bioretention basins will be inspected monthly and after major storm events. Items to be inspected include:
   a. Debris and undesirable vegetative growth shall be removed.
   b. Sediment depth shall be noted. Sediment shall be removed prior to reaching 50% of the design depth.
   c. No visible pollution within basins.

3. Grass lined swales shall be inspected and maintained as follows:
   a. All channels are free of debris on monthly basis.
   b. No visible evidence of erosion.
   c. Mowing shall be performed as needed. Inspect to ensure minimum mowing depth has not been exceeded.
   d. Dewatering of swales between storms. Inspect monthly or as necessary.
   e. Inspect swales for sediment deposition annually and clean as necessary.

Section V. MATERIALS MANAGEMENT PLAN

A. MATERIALS COVERED

The following materials or substances are expected to be present onsite during construction:

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

B. MATERIAL MANAGEMENT PRACTICES

The following are the material management practices that will be 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. Good Housekeeping
   The following good housekeeping practices will be followed onsite during the construction project.
   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 their lids on when not in use. Drip pans shall be provided under all dispensers.
   c. Products will be kept in their original containers with the original manufacturer's label in legible condition.
   d. Substances will not be mixed with one another unless recommended by the manufacturer.
   e. Whenever possible, all of a product will be used up before disposing of the container.
   f. Manufacturer's recommendations for proper use and disposal will be followed.
   g. The job site superintendent will be responsible for daily inspections to ensure proper use and disposal of materials.

2. Hazardous Products
   These practices will be used to reduce the risks associated with hazardous materials. 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. An MSDS will be posted in the immediate area where such product is stored and/or used and another copy of each MSDS will be maintained in the SWPPP file at the job site construction trailer office. Each employee who must handle a substance with hazardous properties will be instructed on the use of MSDS sheets and the specific information in the applicable MSDS for the product he/she is using, particularly regarding spill control techniques.
   a. Products will be kept in original containers with the original labels in legible condition.
   b. Original labels and material safety data sheets (MSDS's) will be procured and used for each material.
   c. If surplus product must be disposed of, manufacturer's or local/state/federal recommended methods for proper disposal will be followed.

3. Hazardous Waste
   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. Site personnel will be instructed in these practices by the job site superintendent, who will also be responsible for seeing that these practices are followed.

4. Product Specific Practices
   The following product specific practices will be followed on the job site.

   a. Petroleum Products
      All onsite vehicles will be monitored for leaks and receive regular preventative maintenance to reduce the chance of leakage. Petroleum products will be stored in tightly sealed containers, which are clearly labeled. Any petroleum storage tanks used onsite will have a dike or berm containment structure constructed around it to contain any spills, which may occur. Drip pans shall be provided for all dispensers. Any asphalt substances used onsite will be applied per the manufacturer's recommendations.

   b. Fertilizers
      Due to the onsite public water supply that will be constructed as part of this project, the use of fertilizers is not allowed without the written authorization of the operator. Authorization will be based on the specific product's possible contaminants and impacts to the groundwater.

   c. Paints, Paint Solvents, and Cleaning Solvents
      All containers will be tightly sealed and stored when not in use. Excess paint and solvents will not be discharged to the storm sewer system but will be properly disposed of per manufacturer's instructions or state and federal regulations.

5. Concrete Wastes
   Concrete trucks will be allowed to wash out or discharge surplus concrete or drum wash water on the site, but only in either (1) specifically designated area which has been prepared to prevent contact between the concrete and/or washout and stormwater which will be discharged from the site or (2) in locations where waste concrete can be poured into forms to make riprap or other useful concrete products.

   The hardened residue from the concrete washout areas will be disposed of in the same manner as other non-hazardous construction waste materials or may be broken up and used on site as deemed appropriate by the contractor. The job site superintendent will be responsible for seeing that these procedures are followed.

   All concrete washout areas will be in an area where the likelihood of the area contributing to storm water discharges is negligible. If required, additional BMPs must be implemented to prevent concrete wastes from contributing to storm water discharges.

6. Solid and Construction Wastes
   All waste materials will be collected and stored in a securely lidded 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 management regulations.

   All trash and construction debris from the site will be deposited in the dumpster. The dumpster will be emptied a minimum of twice 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 personnel will be instructed regarding the correct procedures for waste disposal.

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

7. Sanitary Wastes
   All sanitary waste will be collected from the portable units a minimum of three times per week by a licensed portable facility provider in complete compliance with local and state regulation.

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

Section VI. SPILL PREVENTION AND RESPONSE PROCEDURES

The contractor will train all personnel in the proper handling and cleanup of spilled materials. No spilled hazardous materials or hazardous wastes will be allowed to come in contact with storm water discharges. If such contact occurs, the storm water discharge will be contained on site until appropriate measures in compliance with state and federal regulations are taken to dispose of such contaminated storm water. It shall be the responsibility of the job site superintendent to properly train all personnel in spill prevention and clean up procedures.

In order to minimize the potential for a spill of hazardous materials to come into contact with storm water, the following steps will be implemented:

1. All materials with hazardous properties (such as pesticides, petroleum products, fertilizers, detergents, construction chemicals, acids, paints, paint solvents, cleaning solvents, additives for soil stabilization, concrete curing compounds and additives, etc.) will be stored in a secure location, with their lids on, preferably under cover, when not in use.
2. The minimum practical quantity of all such materials will be kept on the job site.
3. A spill control and containment kit (containing, for example, absorbent materials, acid neutralizing powder, brooms, dust pans, mops, rags, gloves, goggles, plastic and metal trash containers, etc.) will be provided at the storage site.
4. Manufacturer's recommended methods for spill cleanup will be clearly posted and site personnel will be trained regarding these procedures and the location of the information and cleanup supplies.

In the event of a spill, the following procedures should be followed

1. All spills will be cleaned up immediately after discovery.
2. The spill area will be kept well ventilated and personnel will wear appropriate protective clothing to prevent injury from contact with the hazardous substances.
3. The project manager and the Engineer of Record will be notified immediately.

   Spills of toxic or hazardous materials will be reported to the appropriate federal, state, and/or local government agency, regardless of the size of the spill. Spills of amounts that exceed Reportable Quantities of certain substances specifically mentioned in federal regulations (40 CFR 110, 40 CFR 117, and 40 CFR 302) must be immediately reported to the NYSDEC 24-Hour Spill Hotline at **1-800-457-7362.**

4. If the spill exceeds a Reportable Quantity, the SWPPP must be modified within seven (7) calendar days of knowledge of the discharge to provide a description of the release, the circumstances leading to the release, and the date of the release. The plans must identify measures to prevent the recurrence of such releases and to respond to such releases.

The job site superintendent will be the spill prevention and response coordinator. He will designate the individuals who will receive spill prevention and response training. These individuals will each become responsible for a particular phase of prevention and response. The names of these personnel will be posted in the material storage area and in the office trailer onsite.

Section VII. CONTROL OF NON-STORMWATER DISCHARGES

Certain types of discharges are allowable under the NYS-DEC SPDES General Permit for Stormwater Discharges from Construction Activity, and it is the intent of this SWPPP to allow such discharges. These types of discharges will be allowed under the conditions that no pollutants will be allowed to come in contact with the water prior to or after its discharge. The control measures, which have been outlined previously in this SWPPP, will be strictly followed to ensure that no contamination of these non-stormwater discharges takes place. The following non-storm water discharges are allowed by the NYS-DEC and may occur at the job site:

1. Discharges from firefighting activities
2. Fire hydrant flushing
3. Waters to which cleansers or other components have not been added that are used to wash vehicles or control dust
4. Routine external building wash down which does not use detergents
5. Pavement wash waters where spills or leaks of toxic or hazardous materials have not occurred (unless all spilled material has been removed) and where detergents are not used
6. Air conditioning condensate
7. Springs
8. Foundation or footing drains where flows are not contaminated with process materials such as solvents.

Section VIII. CERTIFICATION AND NOTIFICATION

The New York State Department of Environmental Conservation requires that the operator and the contractor make certifications of knowledge of the contents of this SWPPP and agreement to follow the SWPPP. The terms of the General Permit also require that each contractor sign the SWPPP plan, thereby making them co-permittees and acknowledging their responsibility for certain operational aspects of the plan. These certifications should be signed before the contractor begins activities and should be filed with the site's SWPPP at the jobsite.

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APPENDIX A: HYDRO CAD – EXISTING CONDITIONS

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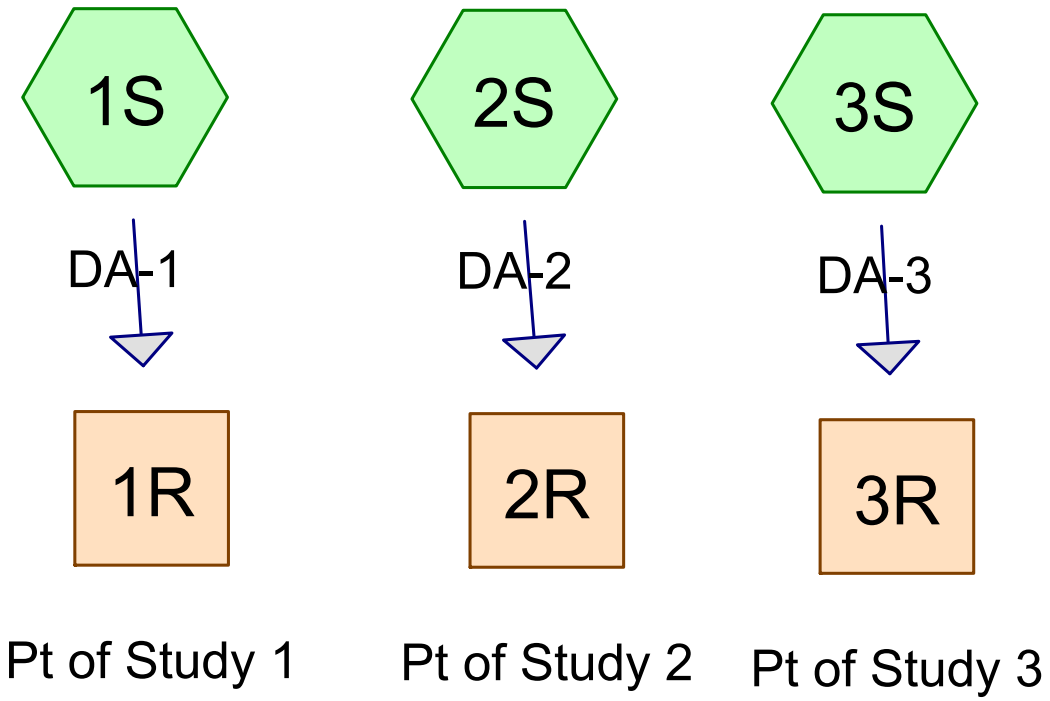
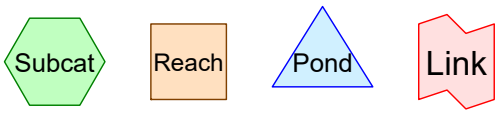




Routing Diagram for Existing Drainage Areas
Prepared by Napierala Consulting, P.C., Printed 12/1/2021
HydroCAD® 10.10-6a s/n 01332 © 2020 HydroCAD Software Solutions LLC

Rainfall Events Listing

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	1-yr	Type II 24-hr		Default	24.00	1	2.04	2
2	10-yr	Type II 24-hr		Default	24.00	1	3.43	2
3	100-yr	Type II 24-hr		Default	24.00	1	5.78	2

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
39.700	80	>75% Grass cover, Good, HSG D (1S, 2S, 3S)
28.020	77	Woods, Good, HSG D (1S, 2S, 3S)
67.720	**79**	**TOTAL AREA**

Summary for Subcatchment 1S: DA-1

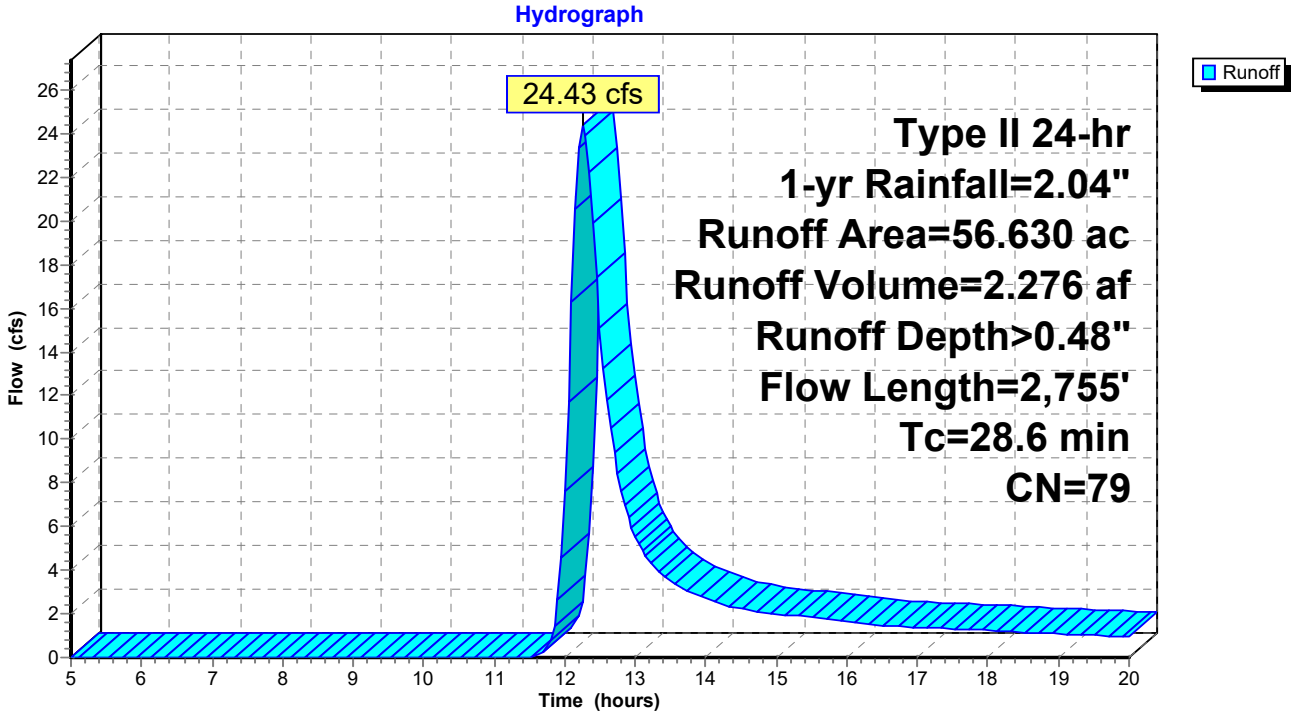
Runoff = 24.43 cfs @ 12.26 hrs, Volume= 2.276 af, Depth> 0.48"
Routed to Reach 1R : Pt of Study 1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 1-yr Rainfall=2.04"

Area (ac)	CN	Description
21.210	77	Woods, Good, HSG D
35.420	80	>75% Grass cover, Good, HSG D
56.630	79	Weighted Average
56.630		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.0	100	0.0600	0.10		**Sheet Flow, Sheet Flow** Woods: Light underbrush n= 0.400 P2= 2.39"
4.6	410	0.0900	1.50		**Shallow Concentrated Flow, Shallow** Woodland Kv= 5.0 fps
6.7	840	0.0900	2.10		**Shallow Concentrated Flow, Shallow** Short Grass Pasture Kv= 7.0 fps
1.3	1,405	0.0750	17.78	213.31	**Channel Flow, Swale** Area= 12.0 sf Perim= 8.0' r= 1.50' n= 0.030 Earth, clean & winding
28.6	2,755	Total			

Subcatchment 1S: DA-1



Summary for Subcatchment 2S: DA-2

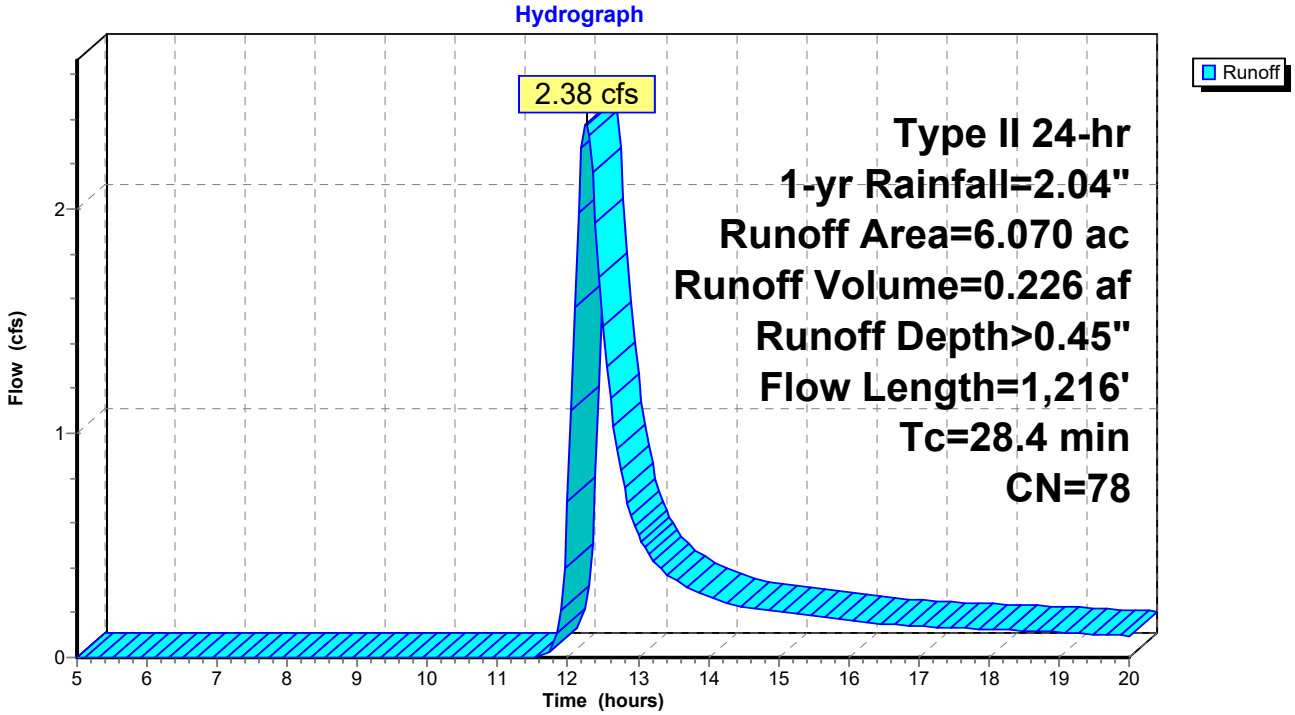
Runoff = 2.38 cfs @ 12.26 hrs, Volume= 0.226 af, Depth> 0.45"
Routed to Reach 2R : Pt of Study 2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 1-yr Rainfall=2.04"

Area (ac)	CN	Description
3.330	77	Woods, Good, HSG D
2.740	80	>75% Grass cover, Good, HSG D
6.070	78	Weighted Average
6.070		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.5	100	0.0400	0.13		**Sheet Flow, Sheet Flow** Grass: Dense n= 0.240 P2= 2.39"
14.2	555	0.0170	0.65		**Shallow Concentrated Flow, Shallow** Woodland Kv= 5.0 fps
1.5	281	0.0360	3.05		**Shallow Concentrated Flow, Shallow** Unpaved Kv= 16.1 fps
0.2	280	0.1210	20.51	205.13	**Channel Flow, Swale** Area= 10.0 sf Perim= 5.0' r= 2.00' n= 0.040 Earth, dense weeds
28.4	1,216	Total			

Subcatchment 2S: DA-2



Summary for Subcatchment 3S: DA-3

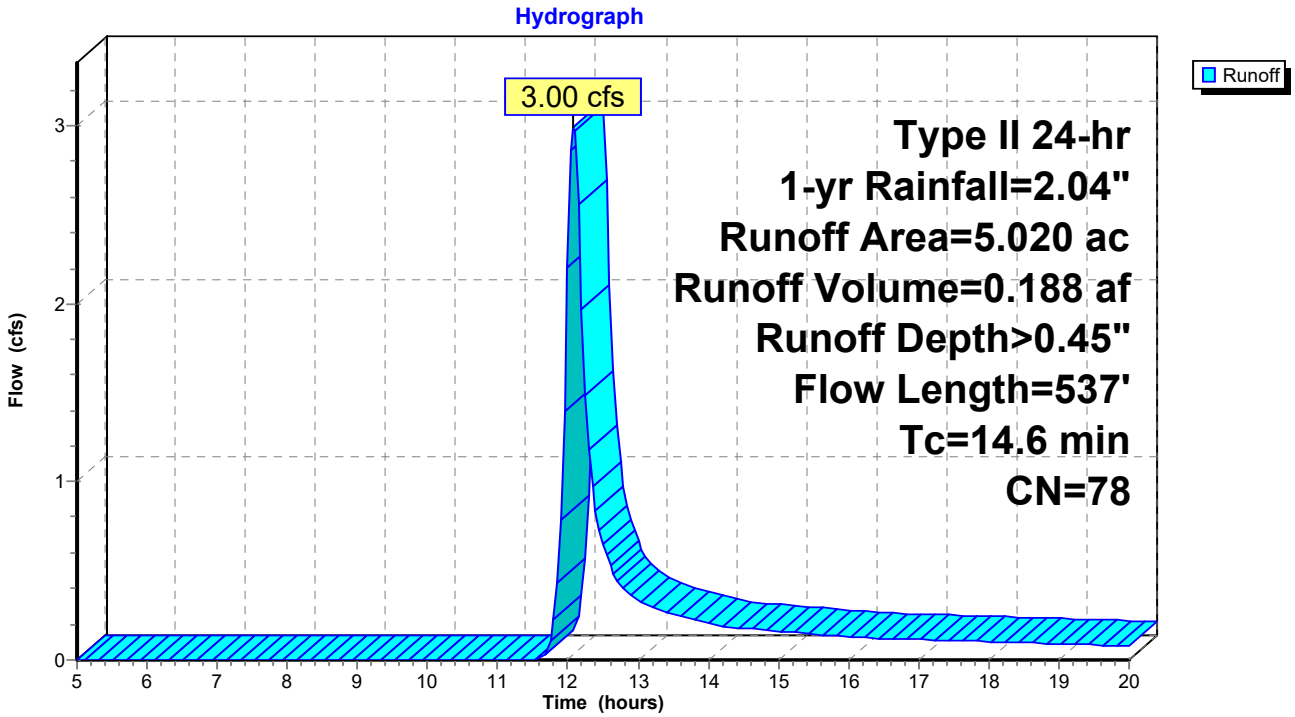
Runoff = 3.00 cfs @ 12.09 hrs, Volume= 0.188 af, Depth> 0.45"
Routed to Reach 3R : Pt of Study 3

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 1-yr Rainfall=2.04"

Area (ac)	CN	Description
3.480	77	Woods, Good, HSG D
1.540	80	>75% Grass cover, Good, HSG D
5.020	78	Weighted Average
5.020		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.4	100	0.0500	0.15		**Sheet Flow, Sheet Flow** Grass: Dense n= 0.240 P2= 2.39"
1.5	287	0.0380	3.14		**Shallow Concentrated Flow, Shallow** Unpaved Kv= 16.1 fps
1.7	150	0.0870	1.47		**Shallow Concentrated Flow, Shallow** Woodland Kv= 5.0 fps
14.6	537	Total			

Subcatchment 3S: DA-3

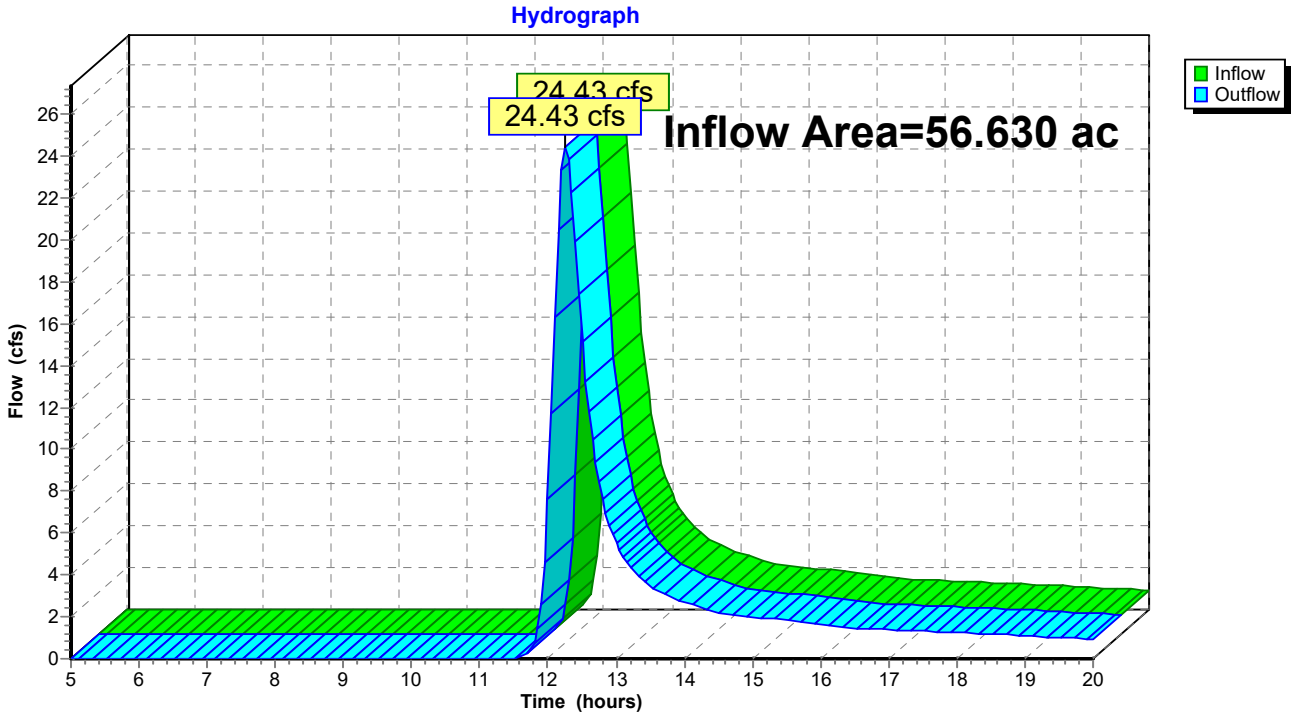


Summary for Reach 1R: Pt of Study 1

Inflow Area = 56.630 ac, 0.00% Impervious, Inflow Depth > 0.48" for 1-yr event
Inflow = 24.43 cfs @ 12.26 hrs, Volume= 2.276 af
Outflow = 24.43 cfs @ 12.26 hrs, Volume= 2.276 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 1R: Pt of Study 1

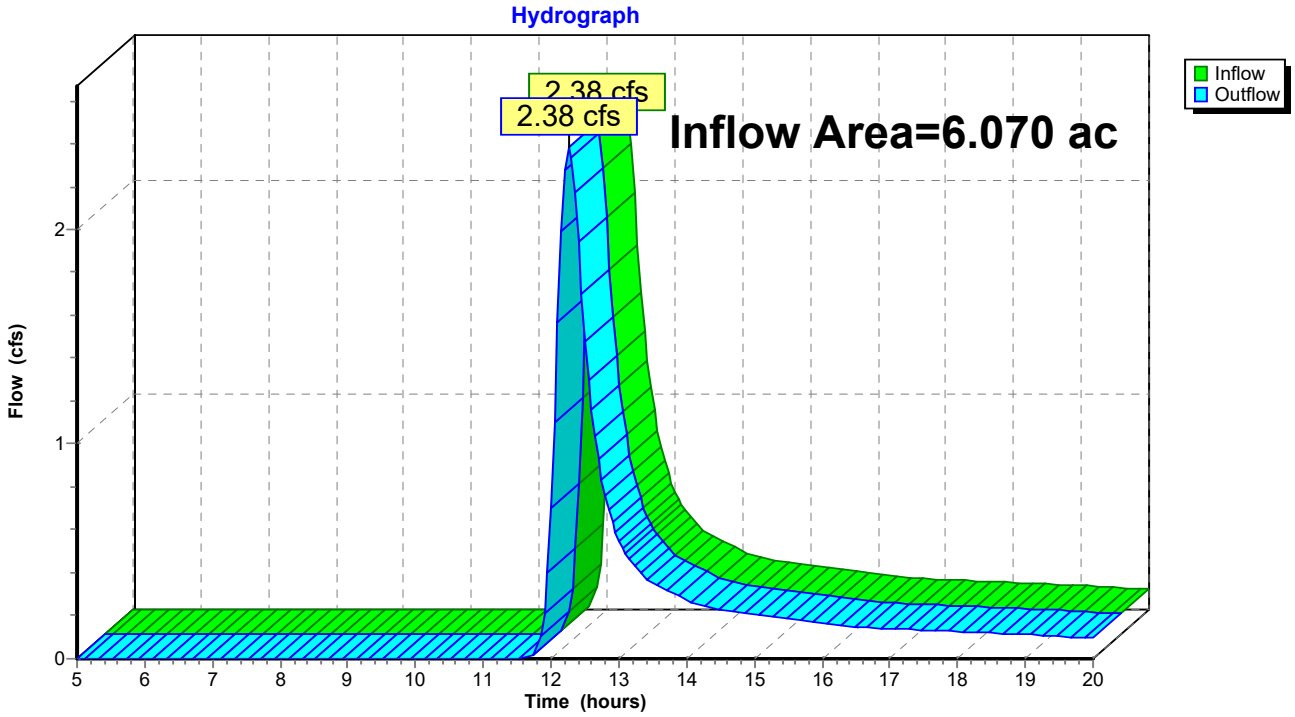


Summary for Reach 2R: Pt of Study 2

Inflow Area = 6.070 ac, 0.00% Impervious, Inflow Depth > 0.45" for 1-yr event
Inflow = 2.38 cfs @ 12.26 hrs, Volume= 0.226 af
Outflow = 2.38 cfs @ 12.26 hrs, Volume= 0.226 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 2R: Pt of Study 2

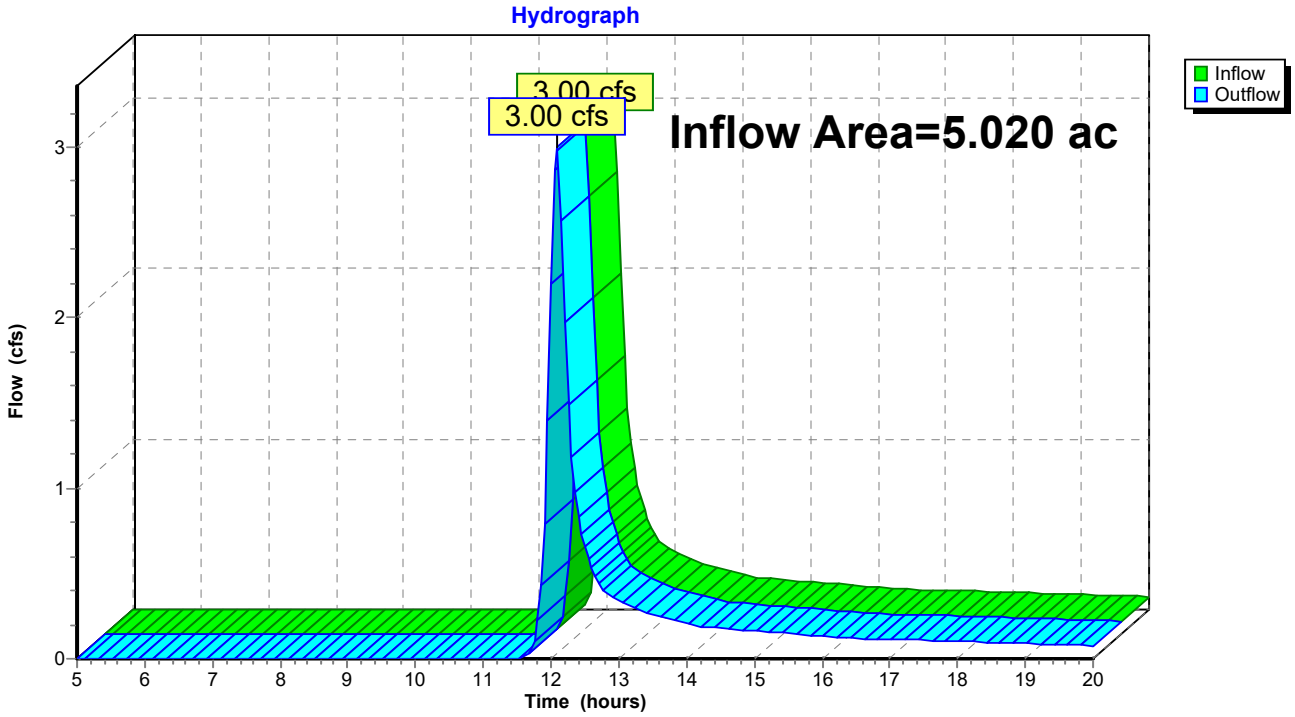


Summary for Reach 3R: Pt of Study 3

Inflow Area = 5.020 ac, 0.00% Impervious, Inflow Depth > 0.45" for 1-yr event
Inflow = 3.00 cfs @ 12.09 hrs, Volume= 0.188 af
Outflow = 3.00 cfs @ 12.09 hrs, Volume= 0.188 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 3R: Pt of Study 3



Summary for Subcatchment 1S: DA-1

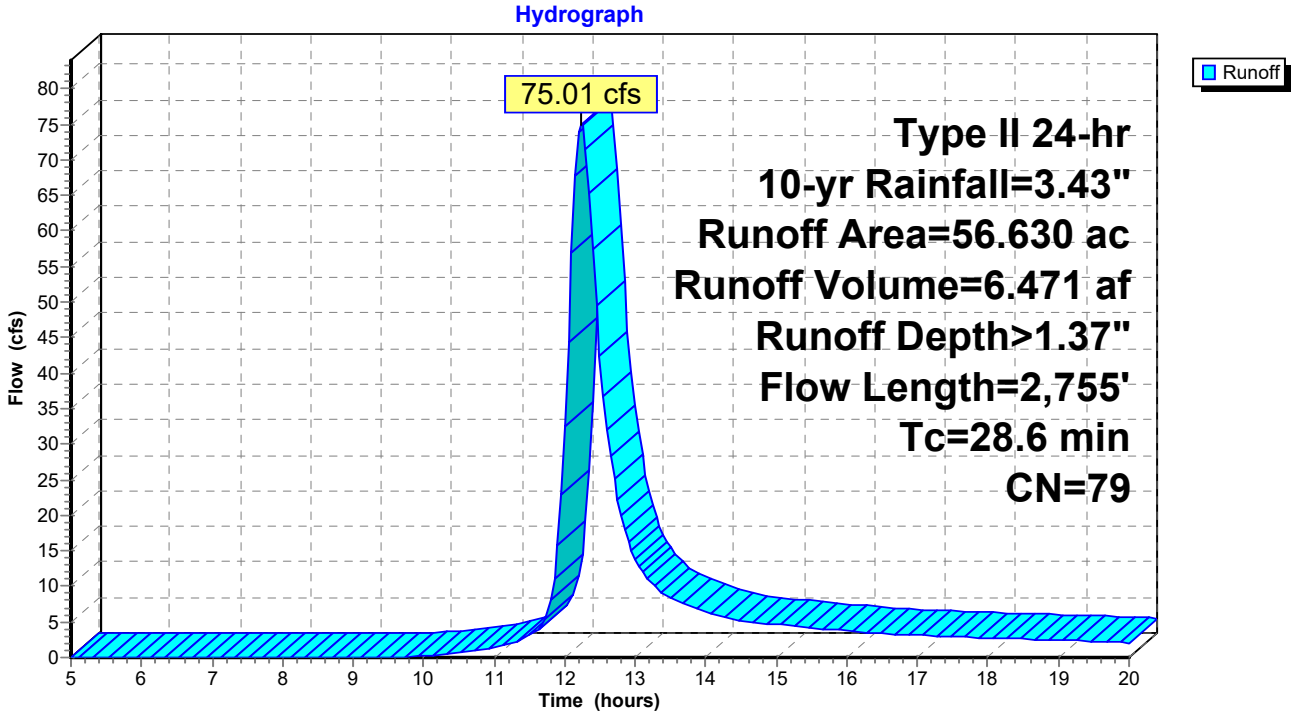
Runoff = 75.01 cfs @ 12.24 hrs, Volume= 6.471 af, Depth> 1.37"
Routed to Reach 1R : Pt of Study 1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-yr Rainfall=3.43"

Area (ac)	CN	Description
21.210	77	Woods, Good, HSG D
35.420	80	>75% Grass cover, Good, HSG D
56.630	79	Weighted Average
56.630		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.0	100	0.0600	0.10		**Sheet Flow, Sheet Flow** Woods: Light underbrush n= 0.400 P2= 2.39"
4.6	410	0.0900	1.50		**Shallow Concentrated Flow, Shallow** Woodland Kv= 5.0 fps
6.7	840	0.0900	2.10		**Shallow Concentrated Flow, Shallow** Short Grass Pasture Kv= 7.0 fps
1.3	1,405	0.0750	17.78	213.31	**Channel Flow, Swale** Area= 12.0 sf Perim= 8.0' r= 1.50' n= 0.030 Earth, clean & winding
28.6	2,755	Total			

Subcatchment 1S: DA-1



Summary for Subcatchment 2S: DA-2

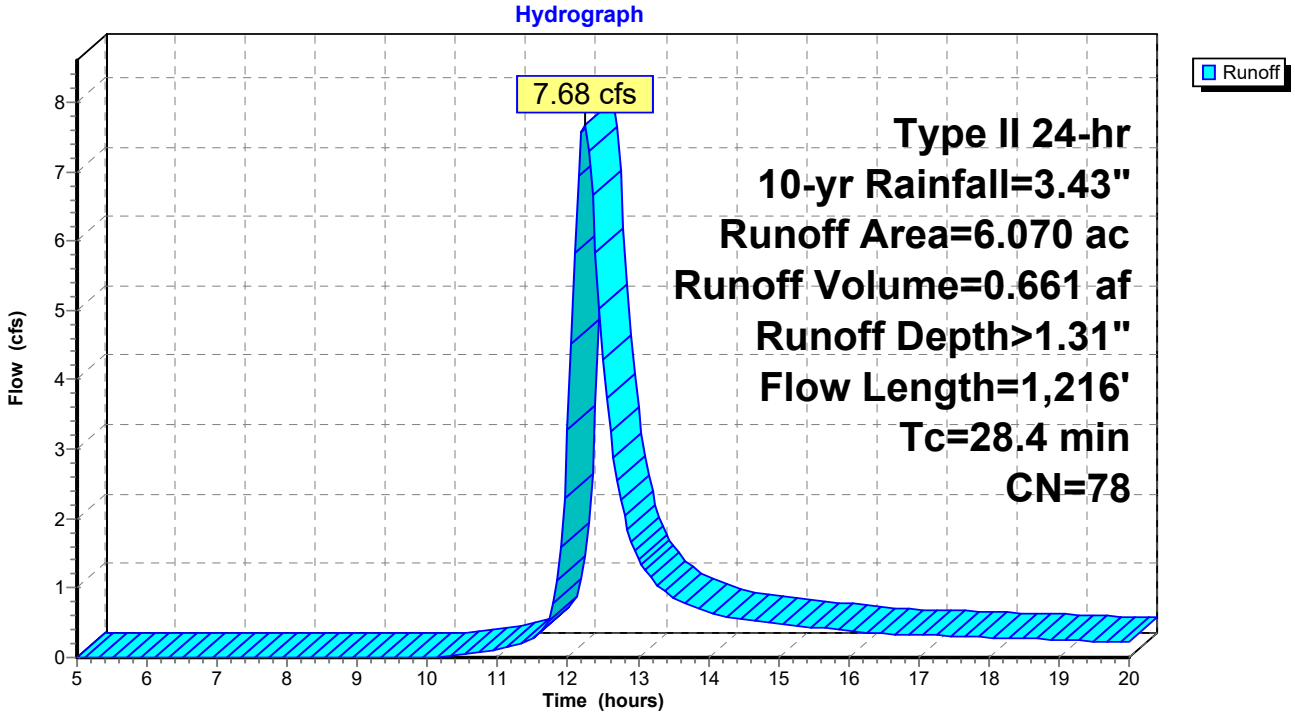
Runoff = 7.68 cfs @ 12.23 hrs, Volume= 0.661 af, Depth> 1.31"
Routed to Reach 2R : Pt of Study 2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-yr Rainfall=3.43"

Area (ac)	CN	Description
3.330	77	Woods, Good, HSG D
2.740	80	>75% Grass cover, Good, HSG D
6.070	78	Weighted Average
6.070		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.5	100	0.0400	0.13		**Sheet Flow, Sheet Flow** Grass: Dense n= 0.240 P2= 2.39"
14.2	555	0.0170	0.65		**Shallow Concentrated Flow, Shallow** Woodland Kv= 5.0 fps
1.5	281	0.0360	3.05		**Shallow Concentrated Flow, Shallow** Unpaved Kv= 16.1 fps
0.2	280	0.1210	20.51	205.13	**Channel Flow, Swale** Area= 10.0 sf Perim= 5.0' r= 2.00' n= 0.040 Earth, dense weeds
28.4	1,216	Total			

Subcatchment 2S: DA-2



Summary for Subcatchment 3S: DA-3

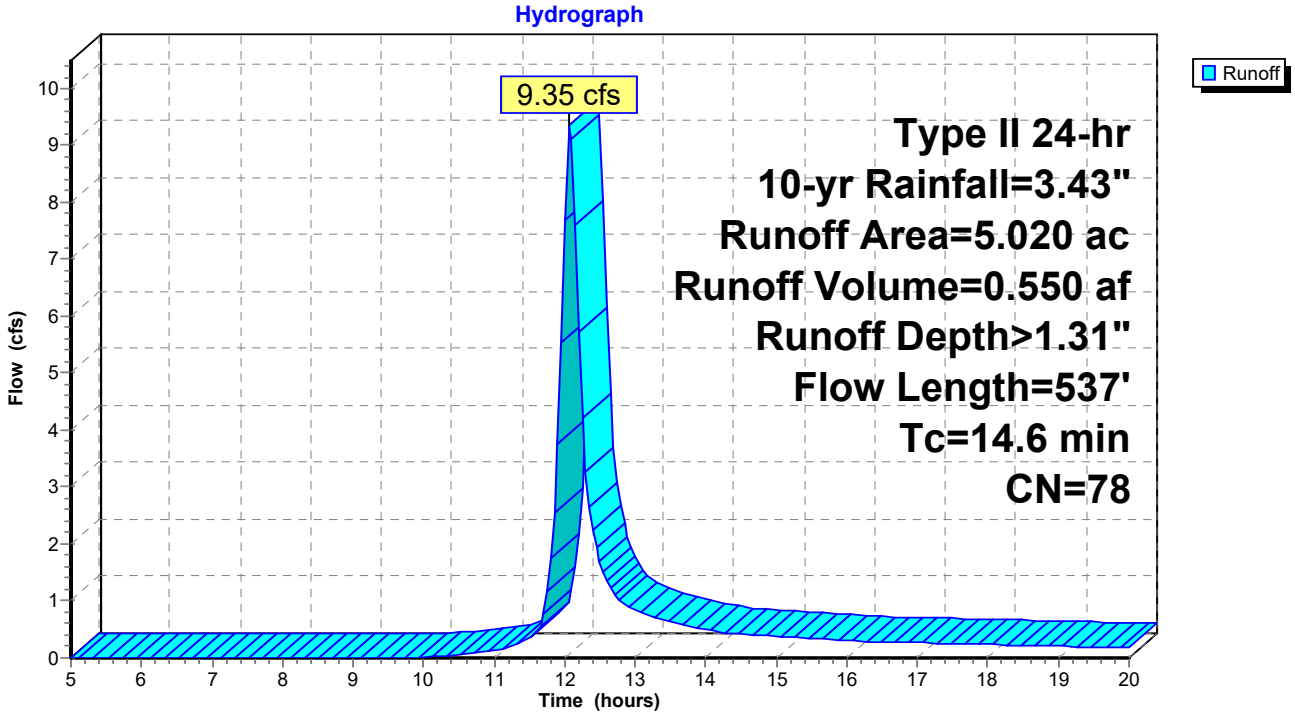
Runoff = 9.35 cfs @ 12.07 hrs, Volume= 0.550 af, Depth> 1.31"
Routed to Reach 3R : Pt of Study 3

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-yr Rainfall=3.43"

Area (ac)	CN	Description
3.480	77	Woods, Good, HSG D
1.540	80	>75% Grass cover, Good, HSG D
5.020	78	Weighted Average
5.020		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.4	100	0.0500	0.15		**Sheet Flow, Sheet Flow** Grass: Dense n= 0.240 P2= 2.39"
1.5	287	0.0380	3.14		**Shallow Concentrated Flow, Shallow** Unpaved Kv= 16.1 fps
1.7	150	0.0870	1.47		**Shallow Concentrated Flow, Shallow** Woodland Kv= 5.0 fps
14.6	537	Total			

Subcatchment 3S: DA-3

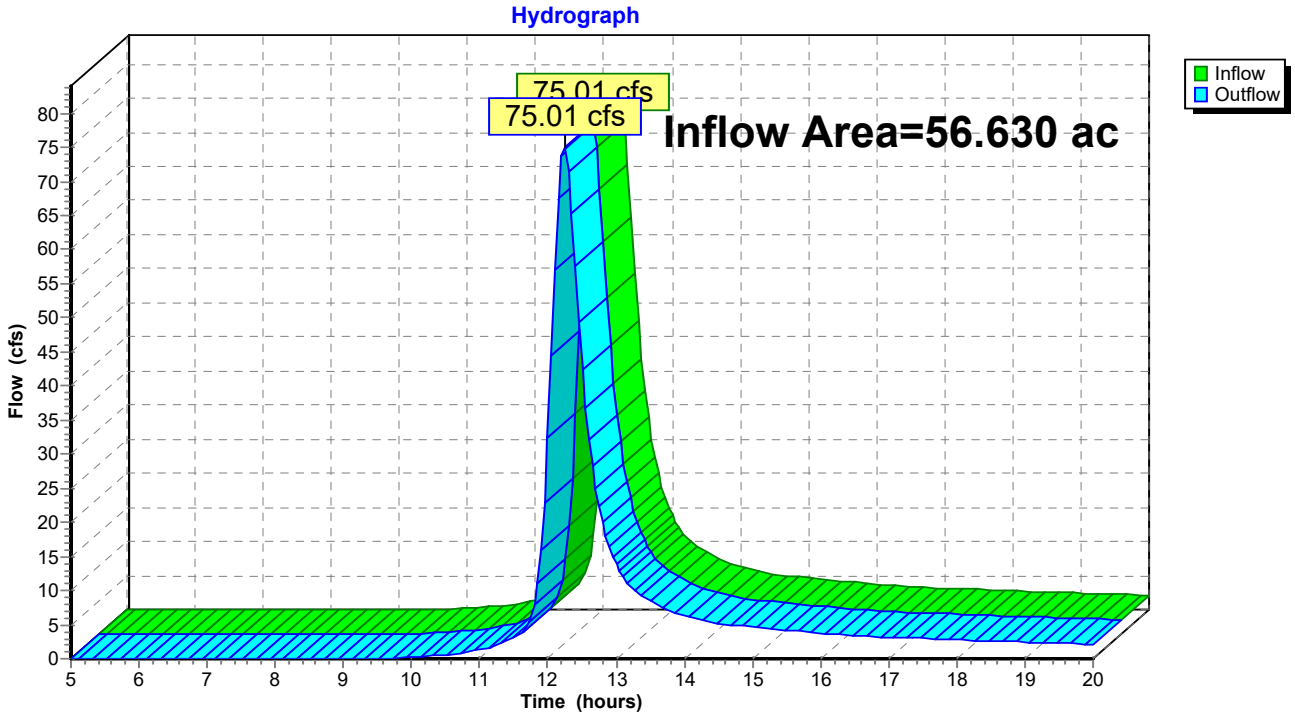


Summary for Reach 1R: Pt of Study 1

Inflow Area = 56.630 ac, 0.00% Impervious, Inflow Depth > 1.37" for 10-yr event
Inflow = 75.01 cfs @ 12.24 hrs, Volume= 6.471 af
Outflow = 75.01 cfs @ 12.24 hrs, Volume= 6.471 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 1R: Pt of Study 1

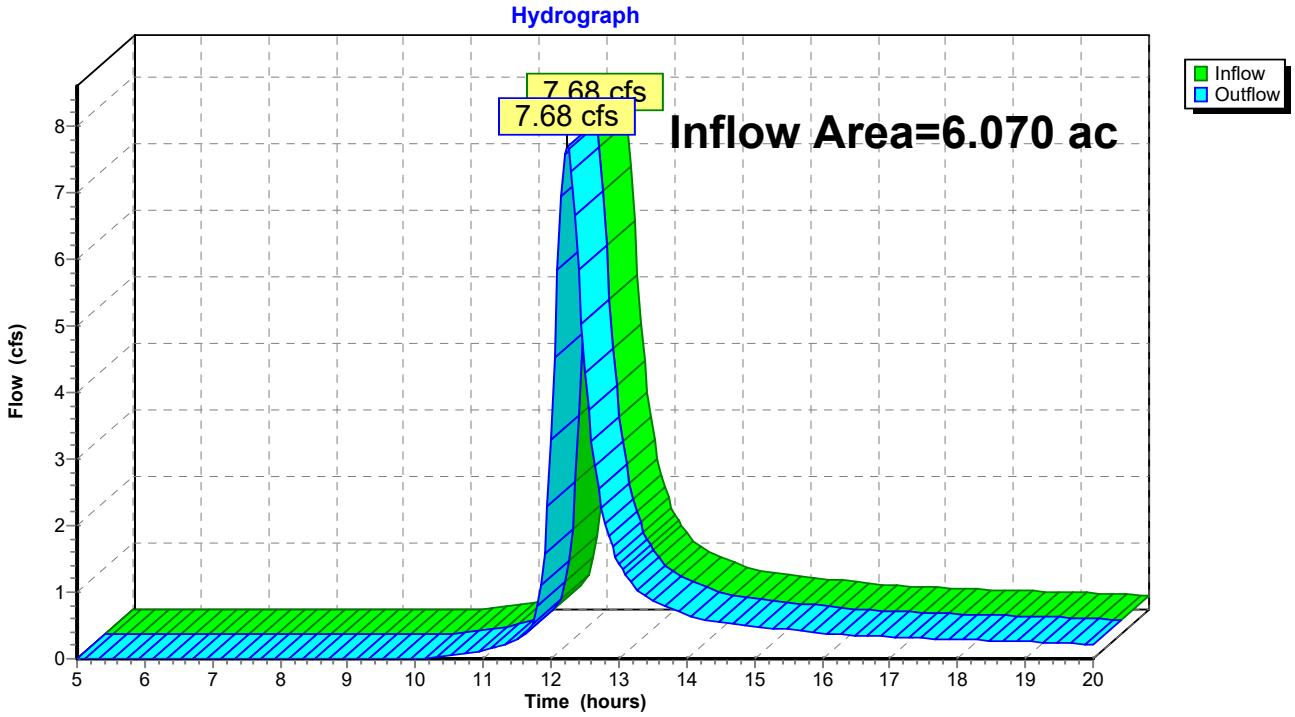


Summary for Reach 2R: Pt of Study 2

Inflow Area = 6.070 ac, 0.00% Impervious, Inflow Depth > 1.31" for 10-yr event
Inflow = 7.68 cfs @ 12.23 hrs, Volume= 0.661 af
Outflow = 7.68 cfs @ 12.23 hrs, Volume= 0.661 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 2R: Pt of Study 2

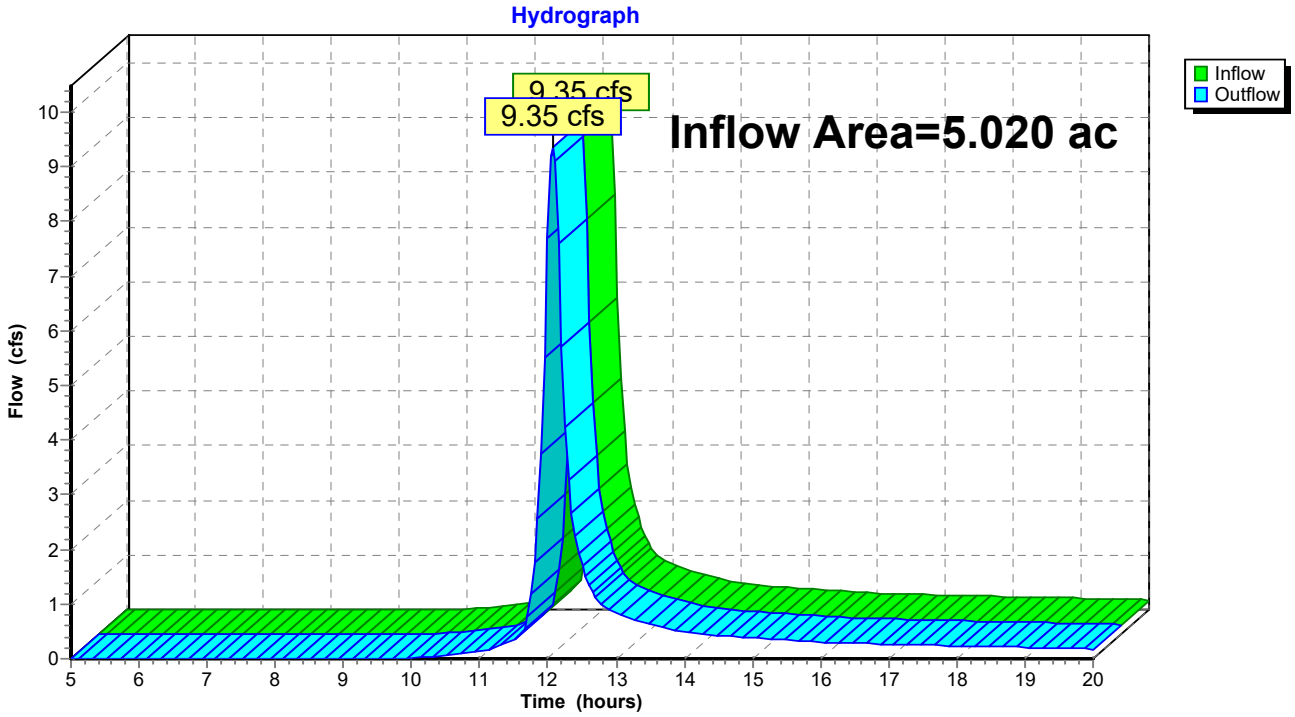


Summary for Reach 3R: Pt of Study 3

Inflow Area = 5.020 ac, 0.00% Impervious, Inflow Depth > 1.31" for 10-yr event
Inflow = 9.35 cfs @ 12.07 hrs, Volume= 0.550 af
Outflow = 9.35 cfs @ 12.07 hrs, Volume= 0.550 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 3R: Pt of Study 3



Summary for Subcatchment 1S: DA-1

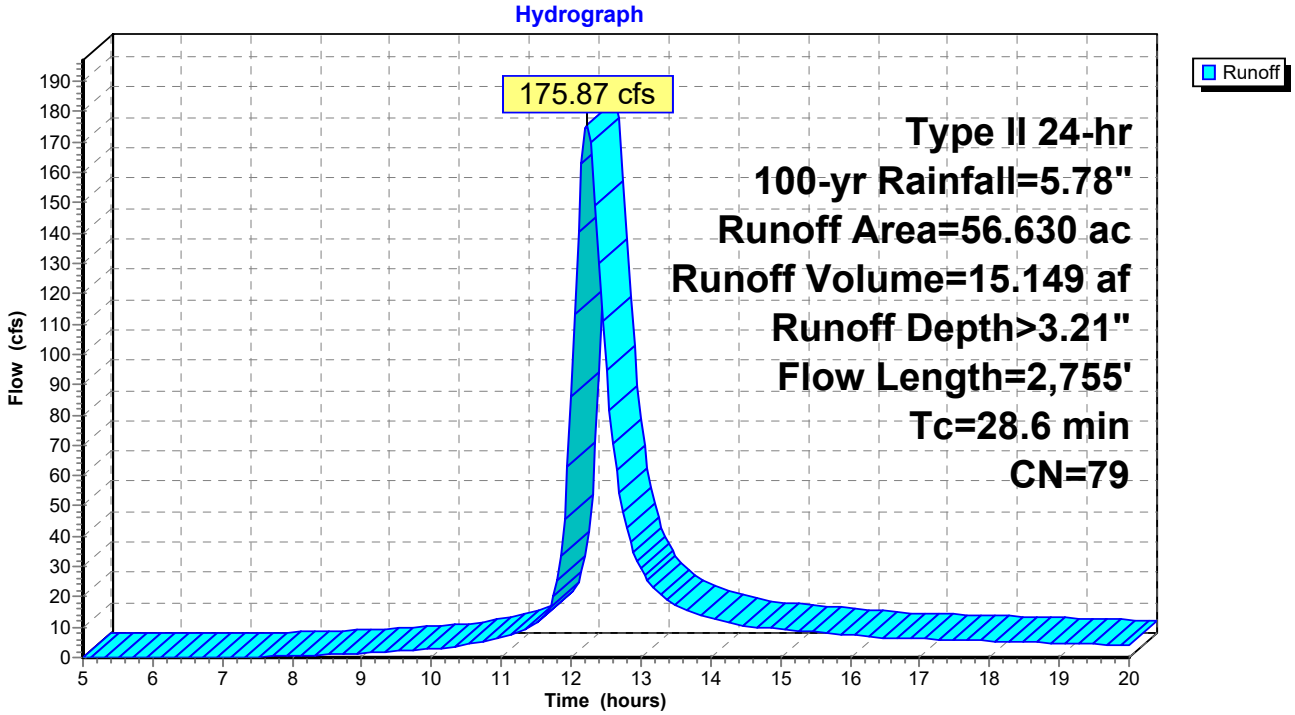
Runoff = 175.87 cfs @ 12.23 hrs, Volume= 15.149 af, Depth> 3.21"
Routed to Reach 1R : Pt of Study 1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 100-yr Rainfall=5.78"

Area (ac)	CN	Description
21.210	77	Woods, Good, HSG D
35.420	80	>75% Grass cover, Good, HSG D
56.630	79	Weighted Average
56.630		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.0	100	0.0600	0.10		**Sheet Flow, Sheet Flow** Woods: Light underbrush n= 0.400 P2= 2.39"
4.6	410	0.0900	1.50		**Shallow Concentrated Flow, Shallow** Woodland Kv= 5.0 fps
6.7	840	0.0900	2.10		**Shallow Concentrated Flow, Shallow** Short Grass Pasture Kv= 7.0 fps
1.3	1,405	0.0750	17.78	213.31	**Channel Flow, Swale** Area= 12.0 sf Perim= 8.0' r= 1.50' n= 0.030 Earth, clean & winding
28.6	2,755	Total			

Subcatchment 1S: DA-1



Summary for Subcatchment 2S: DA-2

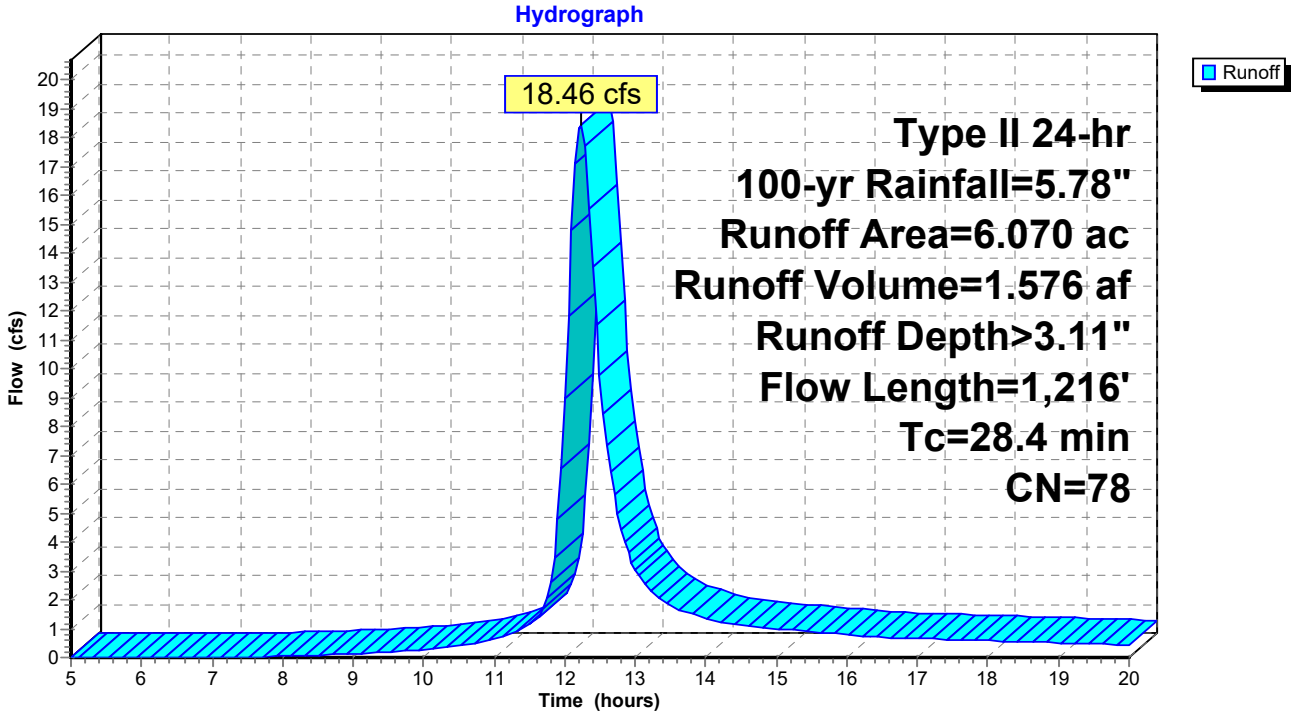
Runoff = 18.46 cfs @ 12.22 hrs, Volume= 1.576 af, Depth> 3.11"
Routed to Reach 2R : Pt of Study 2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 100-yr Rainfall=5.78"

Area (ac)	CN	Description
3.330	77	Woods, Good, HSG D
2.740	80	>75% Grass cover, Good, HSG D
6.070	78	Weighted Average
6.070		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.5	100	0.0400	0.13		**Sheet Flow, Sheet Flow** Grass: Dense n= 0.240 P2= 2.39"
14.2	555	0.0170	0.65		**Shallow Concentrated Flow, Shallow** Woodland Kv= 5.0 fps
1.5	281	0.0360	3.05		**Shallow Concentrated Flow, Shallow** Unpaved Kv= 16.1 fps
0.2	280	0.1210	20.51	205.13	**Channel Flow, Swale** Area= 10.0 sf Perim= 5.0' r= 2.00' n= 0.040 Earth, dense weeds
28.4	1,216	Total			

Subcatchment 2S: DA-2



Summary for Subcatchment 3S: DA-3

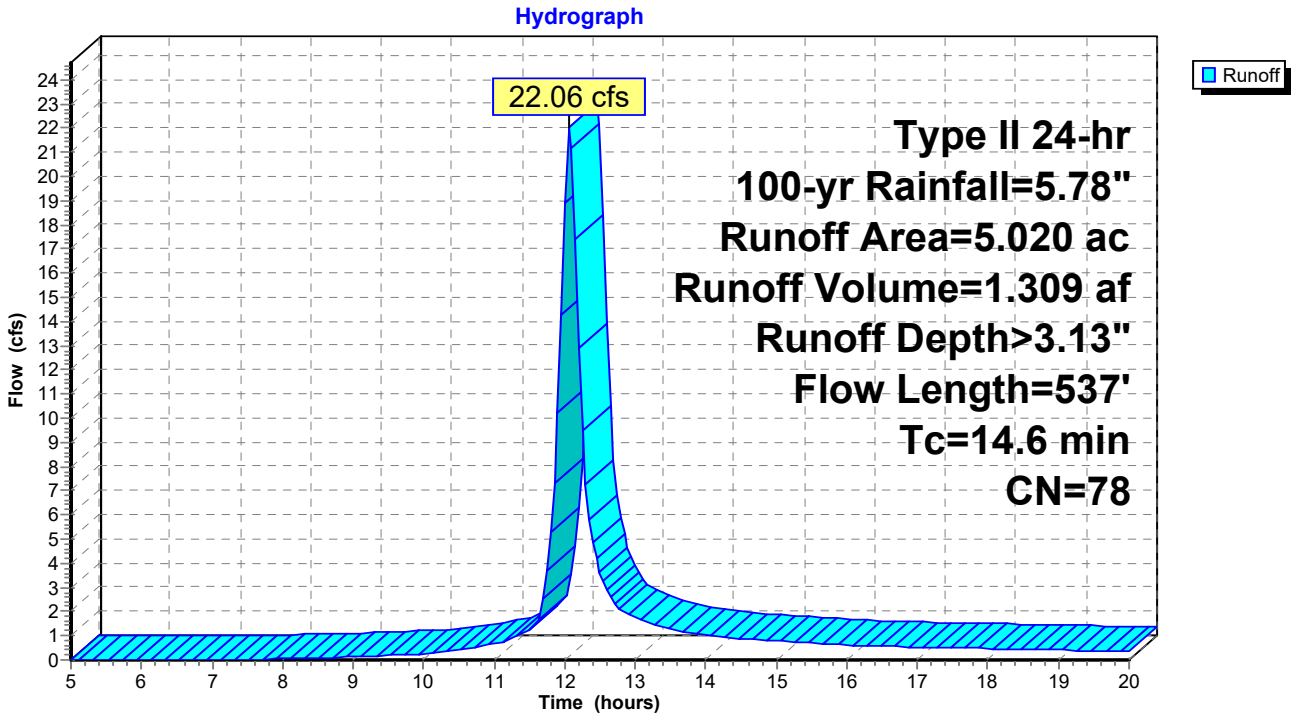
Runoff = 22.06 cfs @ 12.07 hrs, Volume= 1.309 af, Depth> 3.13"
Routed to Reach 3R : Pt of Study 3

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 100-yr Rainfall=5.78"

Area (ac)	CN	Description
3.480	77	Woods, Good, HSG D
1.540	80	>75% Grass cover, Good, HSG D
5.020	78	Weighted Average
5.020		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.4	100	0.0500	0.15		**Sheet Flow, Sheet Flow** Grass: Dense n= 0.240 P2= 2.39"
1.5	287	0.0380	3.14		**Shallow Concentrated Flow, Shallow** Unpaved Kv= 16.1 fps
1.7	150	0.0870	1.47		**Shallow Concentrated Flow, Shallow** Woodland Kv= 5.0 fps
14.6	537	Total			

Subcatchment 3S: DA-3

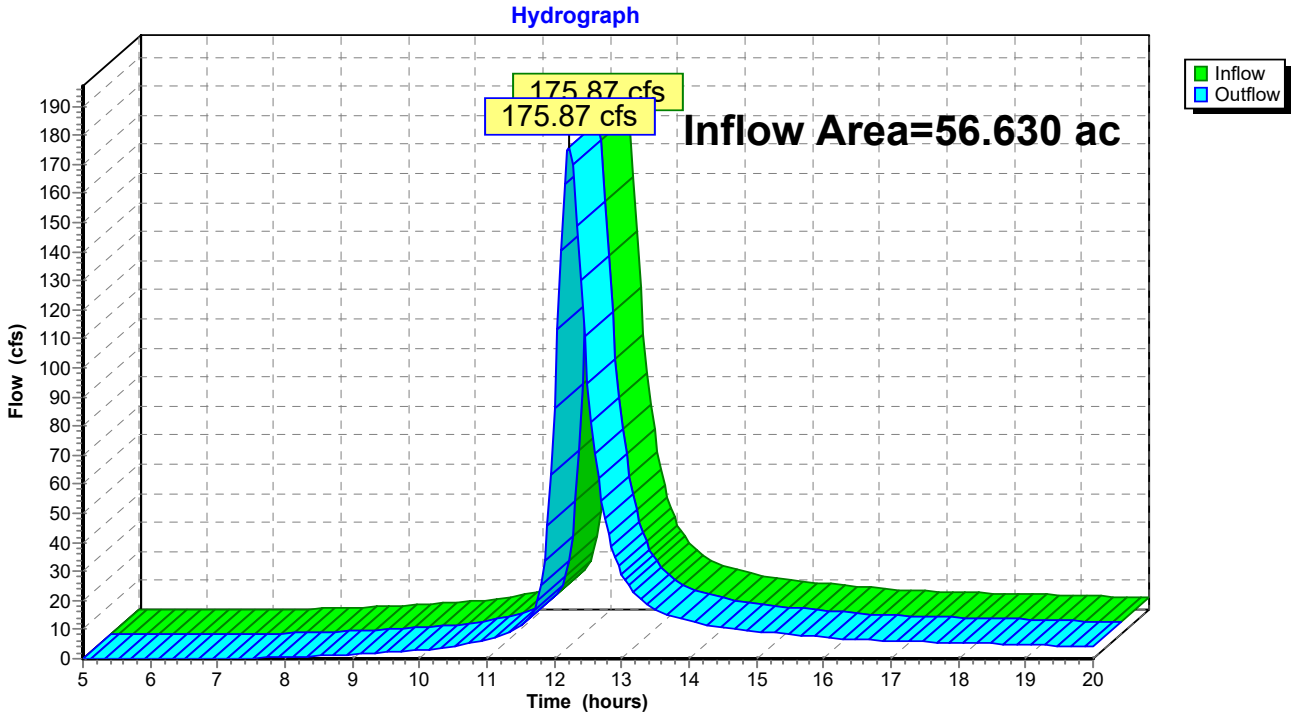


Summary for Reach 1R: Pt of Study 1

Inflow Area = 56.630 ac, 0.00% Impervious, Inflow Depth > 3.21" for 100-yr event
Inflow = 175.87 cfs @ 12.23 hrs, Volume= 15.149 af
Outflow = 175.87 cfs @ 12.23 hrs, Volume= 15.149 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 1R: Pt of Study 1

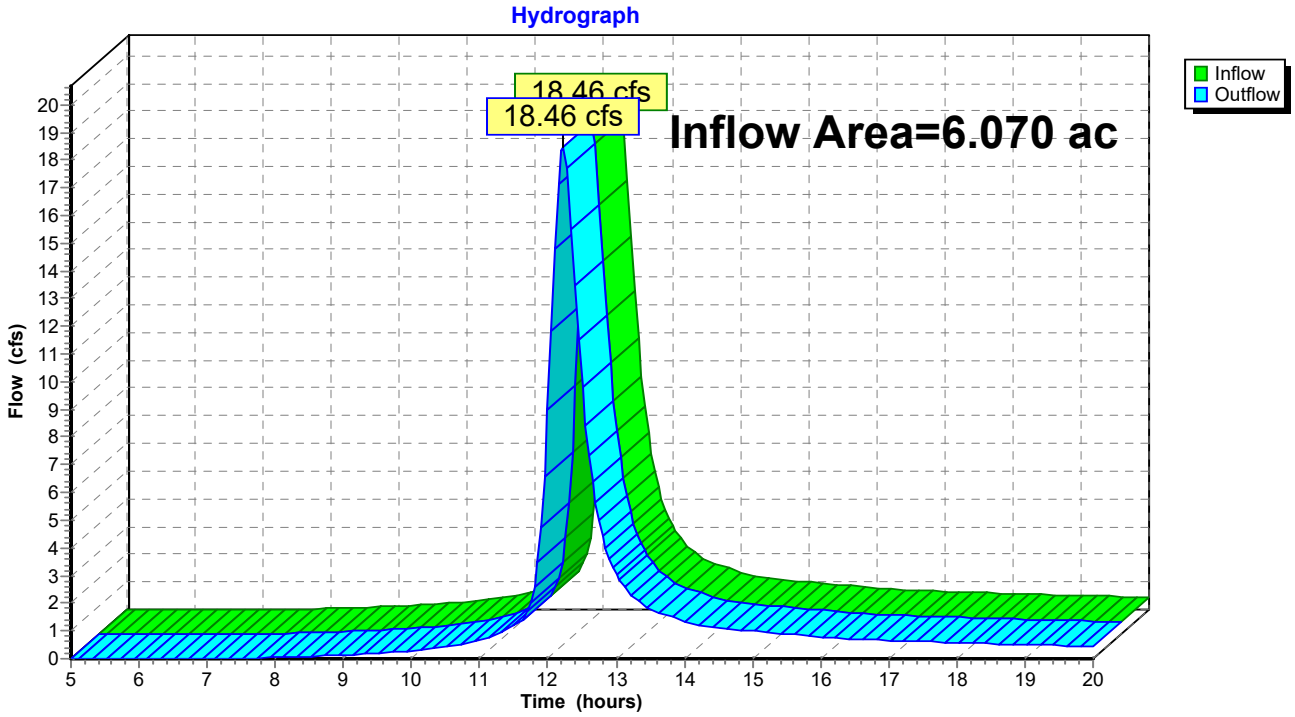


Summary for Reach 2R: Pt of Study 2

Inflow Area = 6.070 ac, 0.00% Impervious, Inflow Depth > 3.11" for 100-yr event
Inflow = 18.46 cfs @ 12.22 hrs, Volume= 1.576 af
Outflow = 18.46 cfs @ 12.22 hrs, Volume= 1.576 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 2R: Pt of Study 2

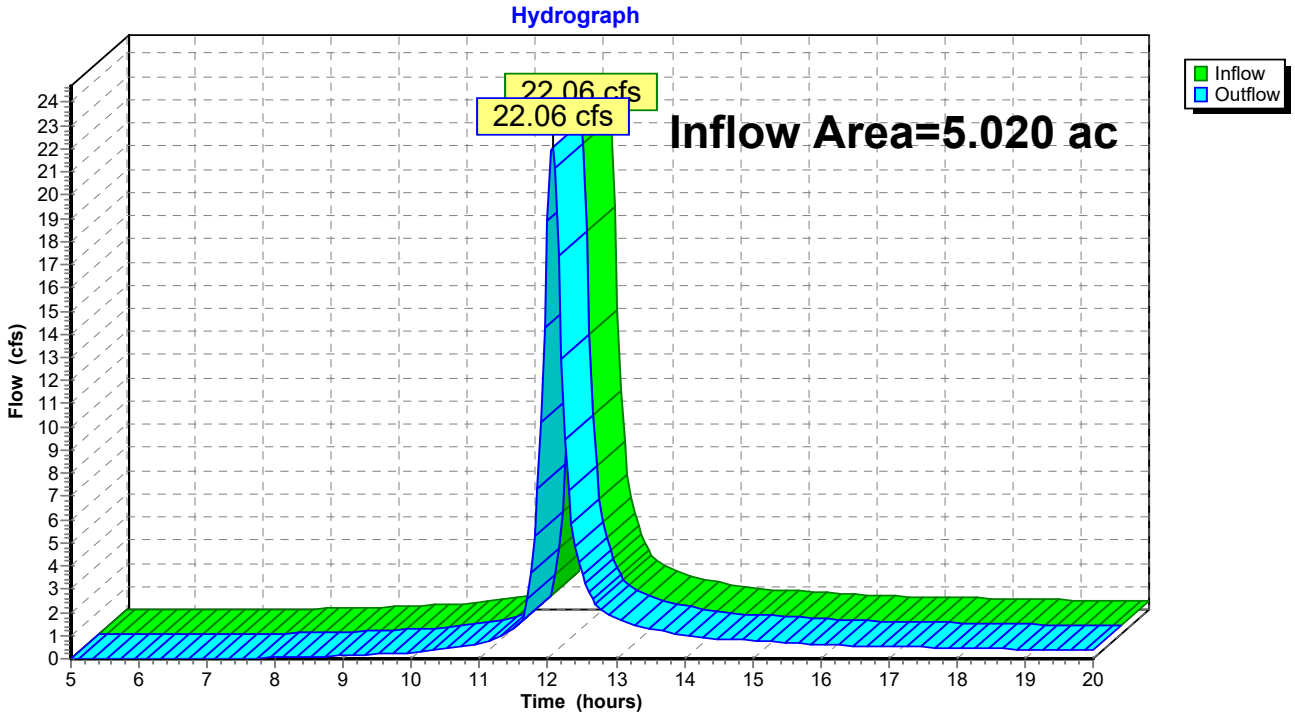


Summary for Reach 3R: Pt of Study 3

Inflow Area = 5.020 ac, 0.00% Impervious, Inflow Depth > 3.13" for 100-yr event
Inflow = 22.06 cfs @ 12.07 hrs, Volume= 1.309 af
Outflow = 22.06 cfs @ 12.07 hrs, Volume= 1.309 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 3R: Pt of Study 3



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APPENDIX B: HYDRO CAD – PROPOSED CONDITIONS

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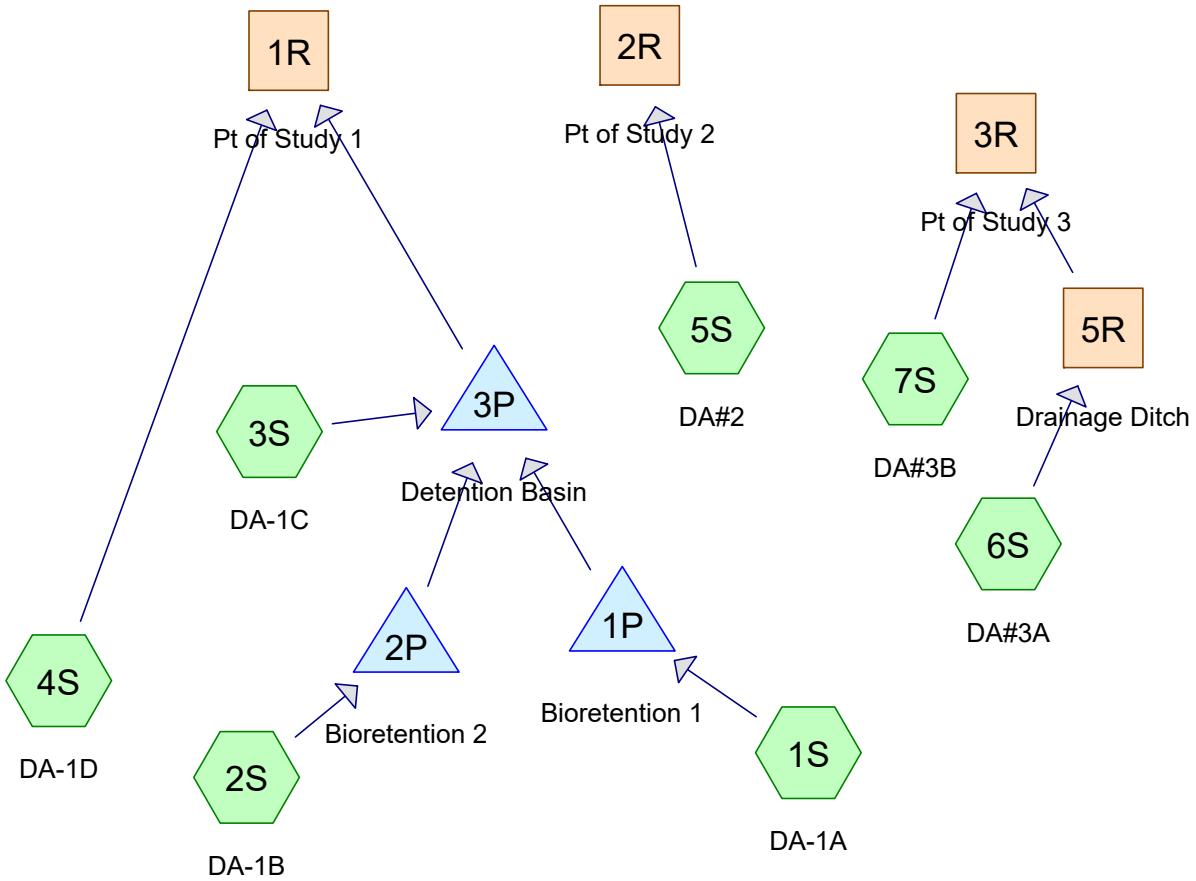
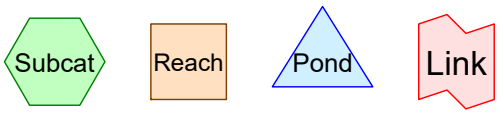




Routing Diagram for Proposed Drainage Areas
Prepared by Napierala Consulting, P.C., Printed 12/1/2021
HydroCAD® 10.10-6a s/n 01332 © 2020 HydroCAD Software Solutions LLC

Rainfall Events Listing

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	1-yr	Type II 24-hr		Default	24.00	1	2.04	2
2	10-yr	Type II 24-hr		Default	24.00	1	3.43	2
3	100-yr	Type II 24-hr		Default	24.00	1	5.78	2

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
41.420	80	>75% Grass cover, Good, HSG D (1S, 2S, 3S, 4S, 5S, 6S, 7S)
3.330	98	Paved parking, HSG D (1S, 2S, 4S, 6S, 7S)
2.490	98	Unconnected roofs, HSG D (1S, 2S, 6S, 7S)
21.200	77	Woods, Good, HSG D (1S, 2S, 3S, 4S, 5S, 6S)
68.440	**81**	**TOTAL AREA**

Summary for Subcatchment 1S: DA-1A

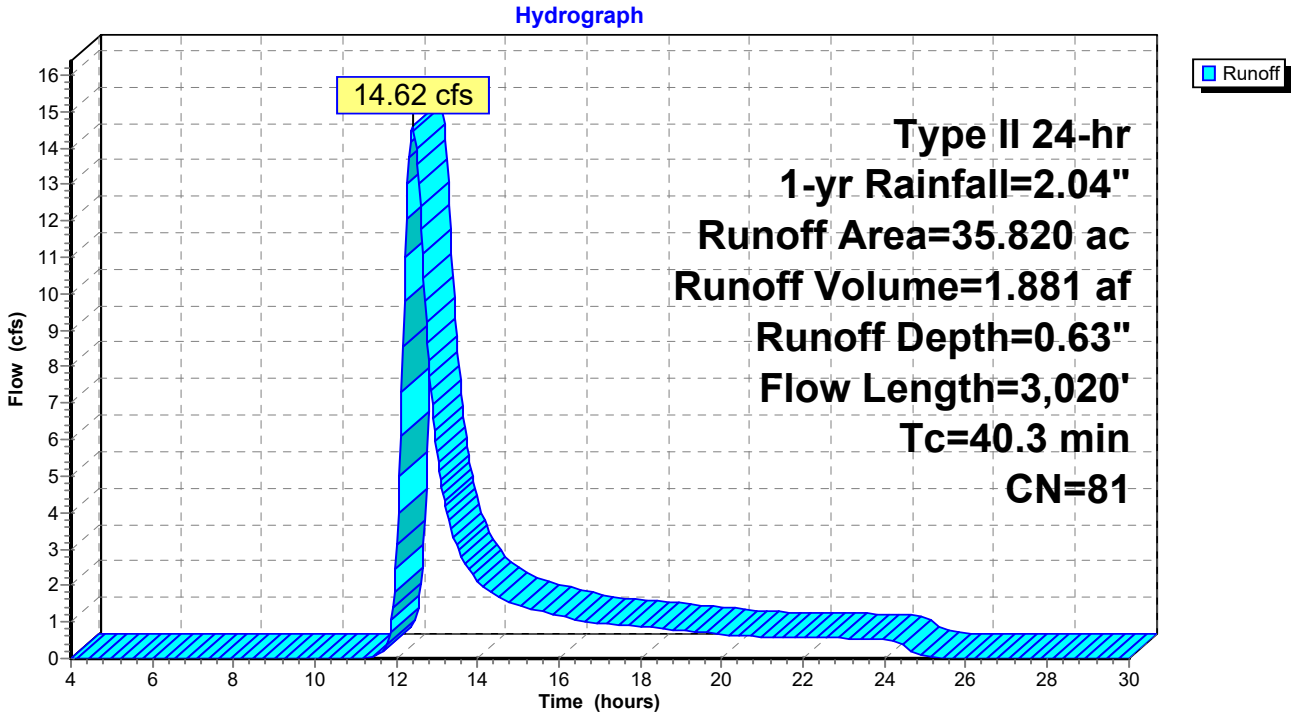
Runoff = 14.62 cfs @ 12.40 hrs, Volume= 1.881 af, Depth= 0.63"
Routed to Pond 1P : Bioretention 1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 4.00-30.01 hrs, dt= 0.03 hrs
Type II 24-hr 1-yr Rainfall=2.04"

Area (ac)	CN	Description
2.050	98	Paved parking, HSG D
1.940	98	Unconnected roofs, HSG D
22.870	80	>75% Grass cover, Good, HSG D
8.960	77	Woods, Good, HSG D
35.820	81	Weighted Average
31.830		88.86% Pervious Area
3.990		11.14% Impervious Area
1.940		48.62% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
27.9	100	0.0600	0.06		**Sheet Flow, SHEET FLOW** Woods: Dense underbrush n= 0.800 P2= 2.39"
4.8	370	0.0650	1.27		**Shallow Concentrated Flow, SCF** Woodland Kv= 5.0 fps
1.9	200	0.0650	1.78		**Shallow Concentrated Flow, SCF** Short Grass Pasture Kv= 7.0 fps
0.2	295	0.0300	19.80	79.19	**Channel Flow, curb and gutter flow** Area= 4.0 sf Perim= 4.0' r= 1.00' n= 0.013 Asphalt, smooth
1.7	1,100	0.0345	11.04	19.51	**Pipe Channel, Pipe Flow** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013 Corrugated PE, smooth interior
3.8	955	0.0050	4.20	50.44	**Channel Flow,** Area= 12.0 sf Perim= 12.0' r= 1.00' n= 0.025 Earth, grassed & winding
40.3	3,020	Total			

Subcatchment 1S: DA-1A



Summary for Subcatchment 2S: DA-1B

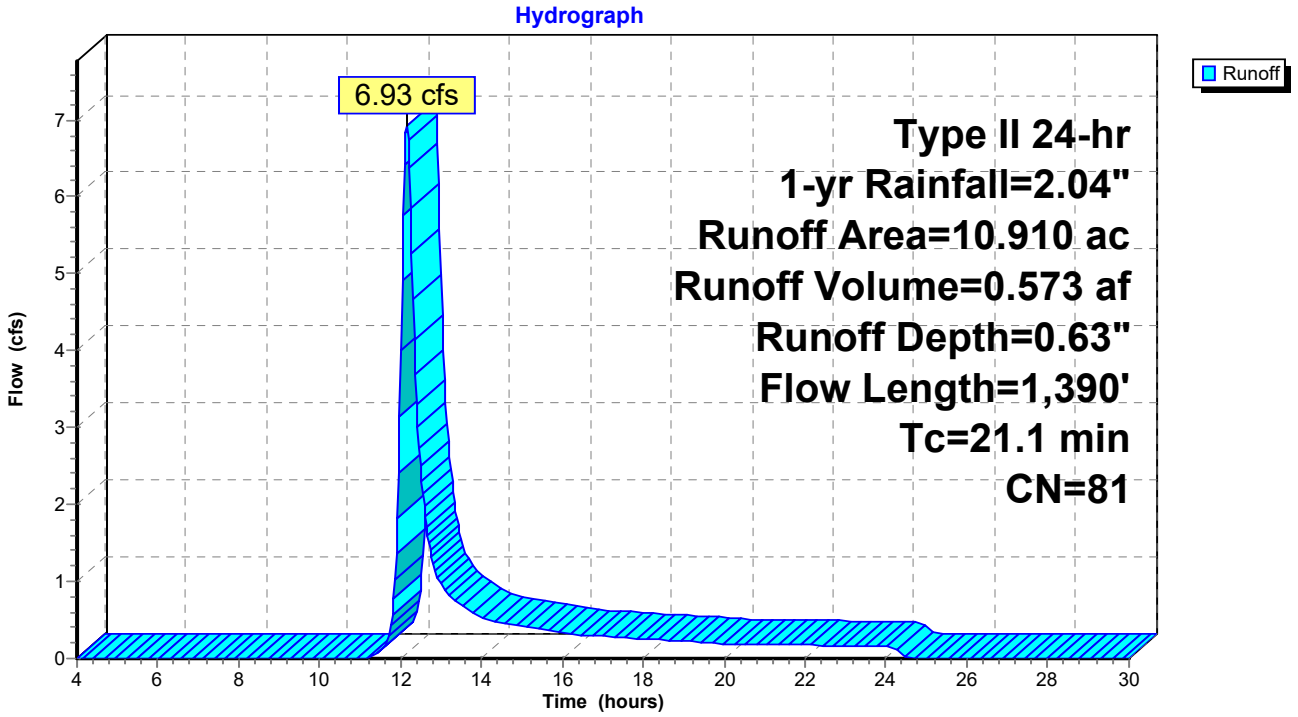
Runoff = 6.93 cfs @ 12.16 hrs, Volume= 0.573 af, Depth= 0.63"
Routed to Pond 2P : Bioretention 2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 4.00-30.01 hrs, dt= 0.03 hrs
Type II 24-hr 1-yr Rainfall=2.04"

Area (ac)	CN	Description
0.710	98	Paved parking, HSG D
0.340	98	Unconnected roofs, HSG D
7.820	80	>75% Grass cover, Good, HSG D
2.040	77	Woods, Good, HSG D
10.910	81	Weighted Average
9.860		90.38% Pervious Area
1.050		9.62% Impervious Area
0.340		32.38% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.6	100	0.0600	0.16		**Sheet Flow, SHEET FLOW** Grass: Dense n= 0.240 P2= 2.39"
4.6	410	0.0900	1.50		**Shallow Concentrated Flow, SCF** Woodland Kv= 5.0 fps
5.6	710	0.0920	2.12		**Shallow Concentrated Flow, SCF** Short Grass Pasture Kv= 7.0 fps
0.3	170	0.0200	9.55	76.42	**Channel Flow, swale flow** Area= 8.0 sf Perim= 8.0' r= 1.00' n= 0.022 Earth, clean & straight
21.1	1,390	Total			

Subcatchment 2S: DA-1B



Summary for Subcatchment 3S: DA-1C

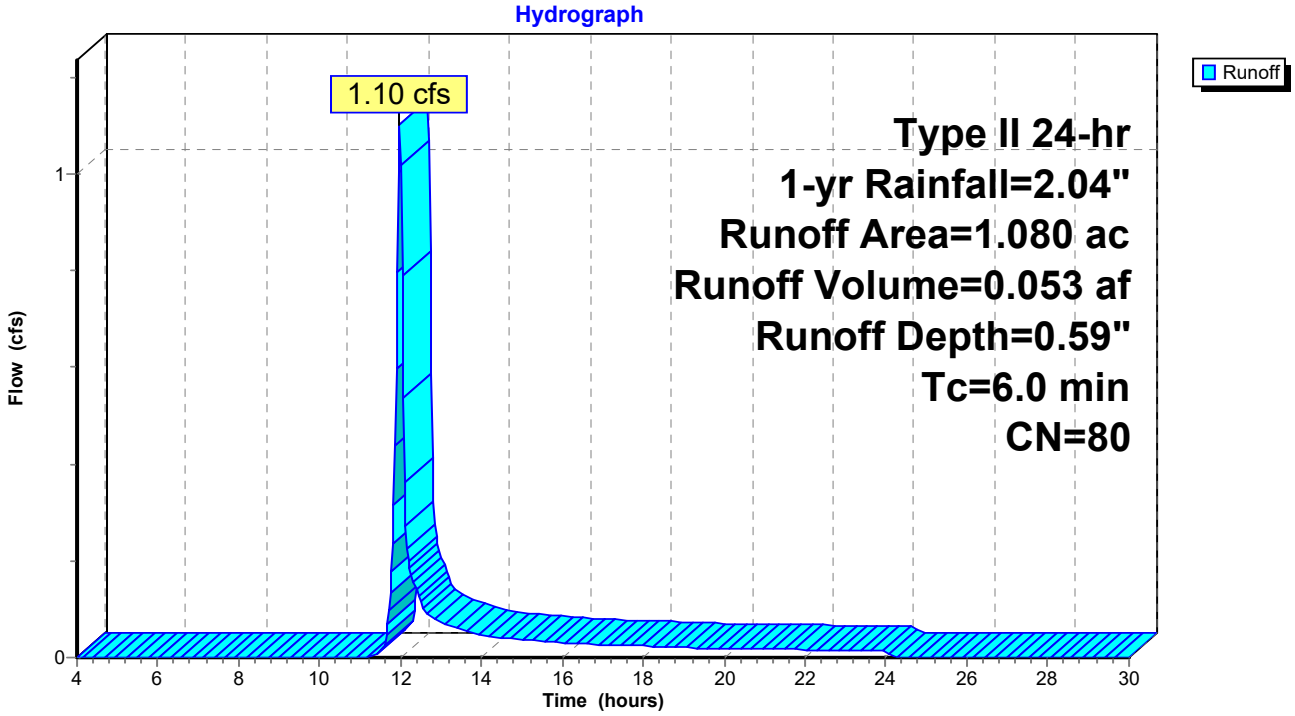
Runoff = 1.10 cfs @ 11.98 hrs, Volume= 0.053 af, Depth= 0.59"
Routed to Pond 3P : Detention Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 4.00-30.01 hrs, dt= 0.03 hrs
Type II 24-hr 1-yr Rainfall=2.04"

Area (ac)	CN	Description
0.960	80	>75% Grass cover, Good, HSG D
0.120	77	Woods, Good, HSG D
1.080	80	Weighted Average
1.080		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Min TR 55 Value**

Subcatchment 3S: DA-1C



Summary for Subcatchment 4S: DA-1D

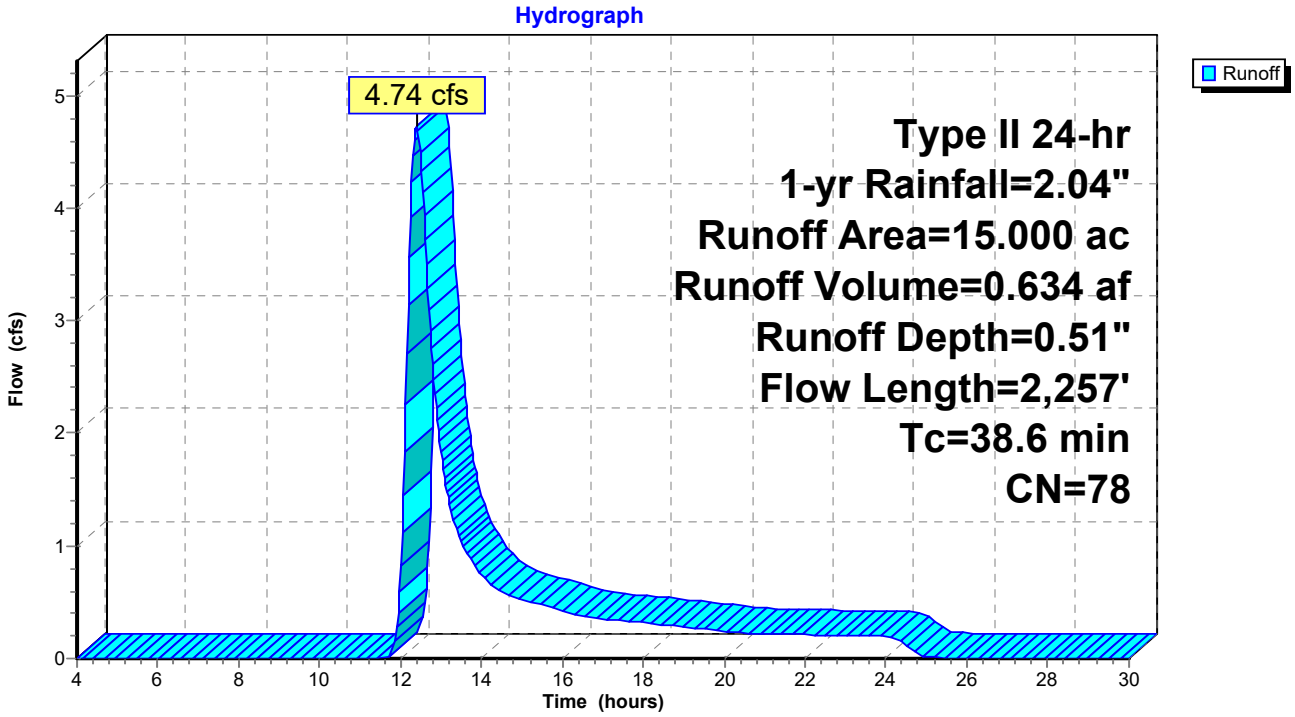
Runoff = 4.74 cfs @ 12.40 hrs, Volume= 0.634 af, Depth= 0.51"
Routed to Reach 1R : Pt of Study 1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 4.00-30.01 hrs, dt= 0.03 hrs
Type II 24-hr 1-yr Rainfall=2.04"

Area (ac)	CN	Description
5.930	80	>75% Grass cover, Good, HSG D
8.910	77	Woods, Good, HSG D
0.160	98	Paved parking, HSG D
15.000	78	Weighted Average
14.840		98.93% Pervious Area
0.160		1.07% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
27.9	100	0.0600	0.06		**Sheet Flow, SHEET FLOW** Woods: Dense underbrush n= 0.800 P2= 2.39"
5.4	485	0.0900	1.50		**Shallow Concentrated Flow, SCF** Woodland Kv= 5.0 fps
4.1	517	0.0900	2.10		**Shallow Concentrated Flow, SCF** Short Grass Pasture Kv= 7.0 fps
1.2	1,155	0.0750	16.28	260.45	**Channel Flow, SWALE** Area= 16.0 sf Perim= 16.0' r= 1.00' n= 0.025 Earth, clean & winding
38.6	2,257	Total			

Subcatchment 4S: DA-1D



Summary for Subcatchment 5S: DA#2

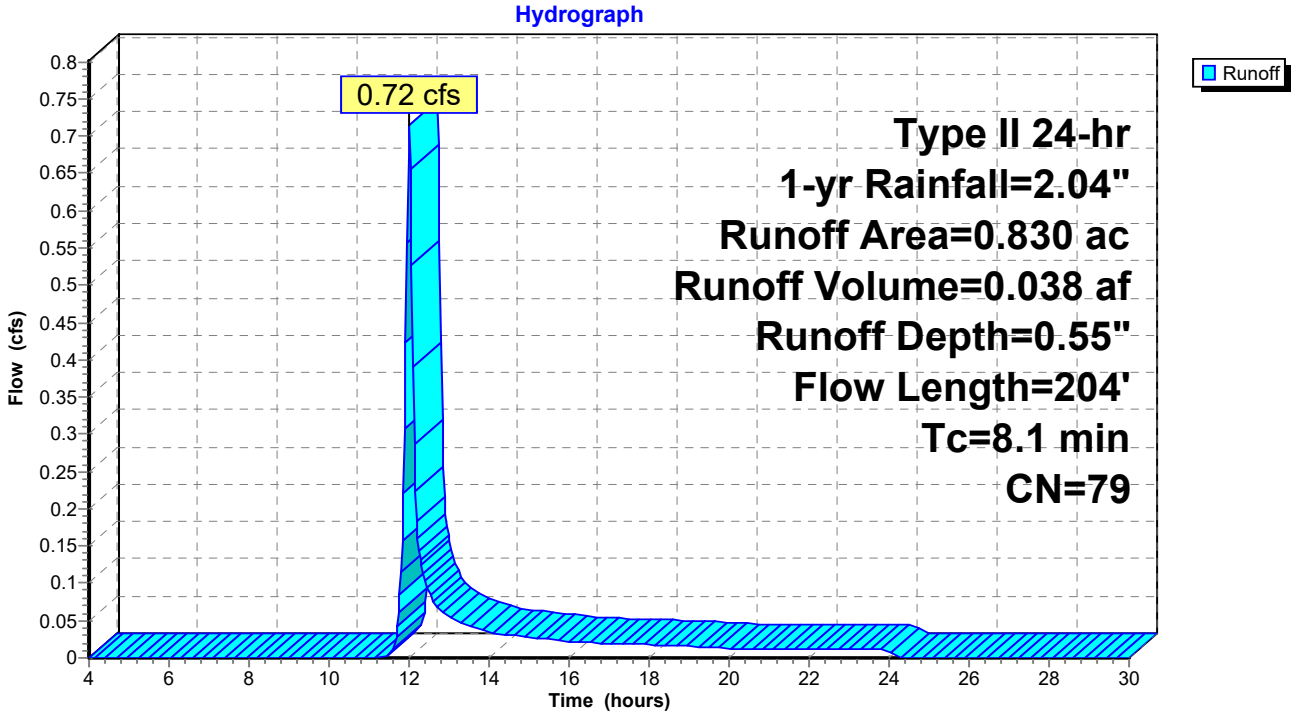
Runoff = 0.72 cfs @ 12.01 hrs, Volume= 0.038 af, Depth= 0.55"
Routed to Reach 2R : Pt of Study 2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 4.00-30.01 hrs, dt= 0.03 hrs
Type II 24-hr 1-yr Rainfall=2.04"

Area (ac)	CN	Description
0.690	80	>75% Grass cover, Good, HSG D
0.140	77	Woods, Good, HSG D
0.830	79	Weighted Average
0.830		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.4	100	0.1500	0.23		**Sheet Flow, SHEET FLOW** Grass: Dense n= 0.240 P2= 2.39"
0.7	104	0.1300	2.52		**Shallow Concentrated Flow, SCF** Short Grass Pasture Kv= 7.0 fps
8.1	204	Total			

Subcatchment 5S: DA#2



Summary for Subcatchment 6S: DA#3A

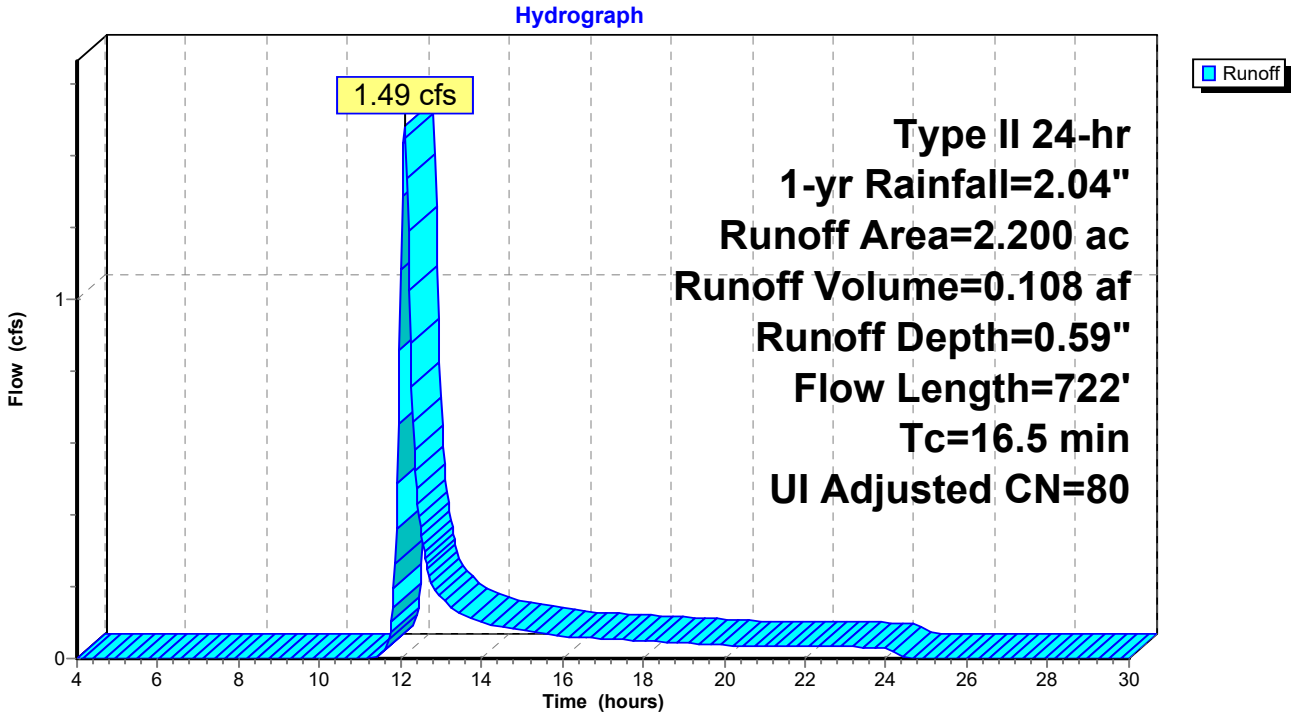
Runoff = 1.49 cfs @ 12.10 hrs, Volume= 0.108 af, Depth= 0.59"
Routed to Reach 5R : Drainage Ditch

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 4.00-30.01 hrs, dt= 0.03 hrs
Type II 24-hr 1-yr Rainfall=2.04"

Area (ac)	CN	Adj	Description
0.920	80		>75% Grass cover, Good, HSG D
0.180	98		Paved parking, HSG D
0.070	98		Unconnected roofs, HSG D
1.030	77		Woods, Good, HSG D
2.200	81	80	Weighted Average, UI Adjusted
1.950			88.64% Pervious Area
0.250			11.36% Impervious Area
0.070			28.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.9	100	0.0450	0.14		**Sheet Flow, SHEET FLOW** Grass: Dense n= 0.240 P2= 2.39"
2.5	188	0.0650	1.27		**Shallow Concentrated Flow, SCF** Woodland Kv= 5.0 fps
1.9	202	0.0650	1.78		**Shallow Concentrated Flow, SCF** Short Grass Pasture Kv= 7.0 fps
0.2	232	0.0220	16.95	50.86	**Channel Flow, curb flow** Area= 3.0 sf Perim= 3.0' r= 1.00' n= 0.013 Asphalt, smooth
16.5	722	Total			

Subcatchment 6S: DA#3A



Summary for Subcatchment 7S: DA#3B

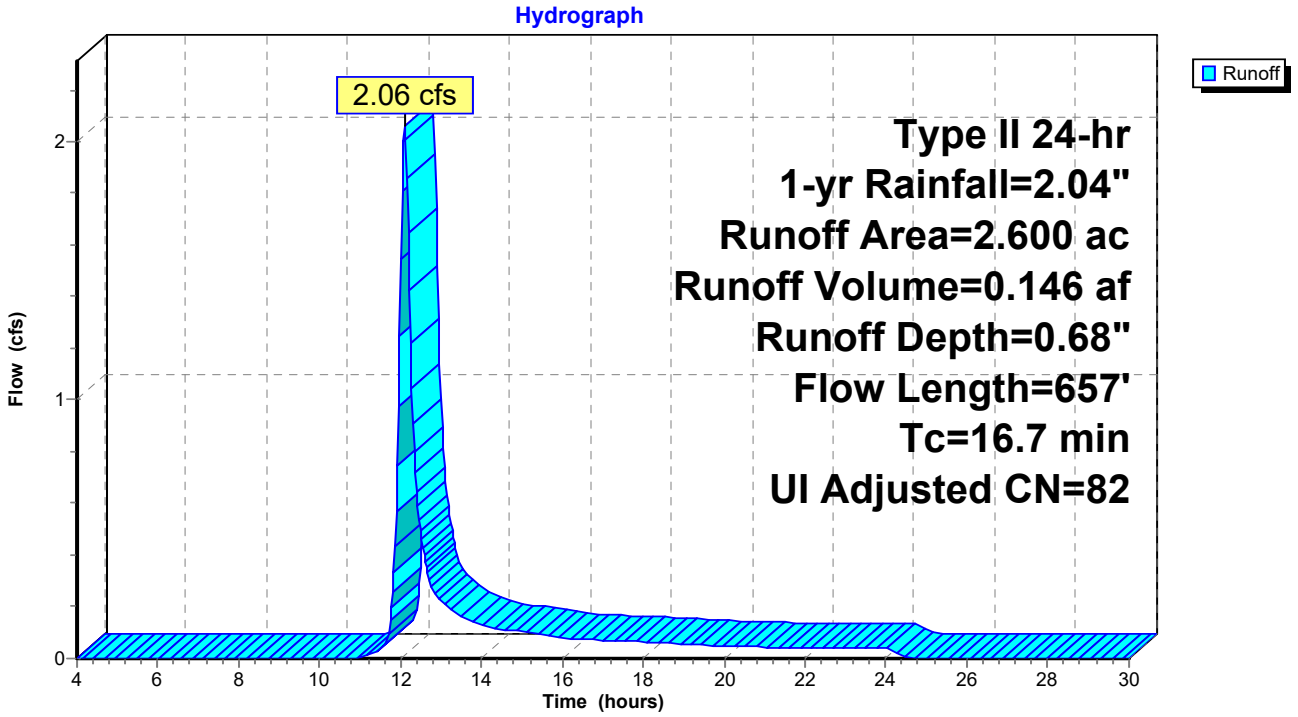
Runoff = 2.06 cfs @ 12.10 hrs, Volume= 0.146 af, Depth= 0.68"
Routed to Reach 3R : Pt of Study 3

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 4.00-30.01 hrs, dt= 0.03 hrs
Type II 24-hr 1-yr Rainfall=2.04"

Area (ac)	CN	Adj	Description
2.230	80		>75% Grass cover, Good, HSG D
0.230	98		Paved parking, HSG D
0.140	98		Unconnected roofs, HSG D
2.600	83	82	Weighted Average, UI Adjusted
2.230			85.77% Pervious Area
0.370			14.23% Impervious Area
0.140			37.84% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.4	100	0.0500	0.15		**Sheet Flow, SHEET FLOW** Grass: Dense n= 0.240 P2= 2.39"
5.1	475	0.0500	1.57		**Shallow Concentrated Flow, SCF** Short Grass Pasture Kv= 7.0 fps
0.2	82	0.0200	6.42	5.04	**Pipe Channel, pipe flow** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013 Corrugated PE, smooth interior
16.7	657	Total			

Subcatchment 7S: DA#3B

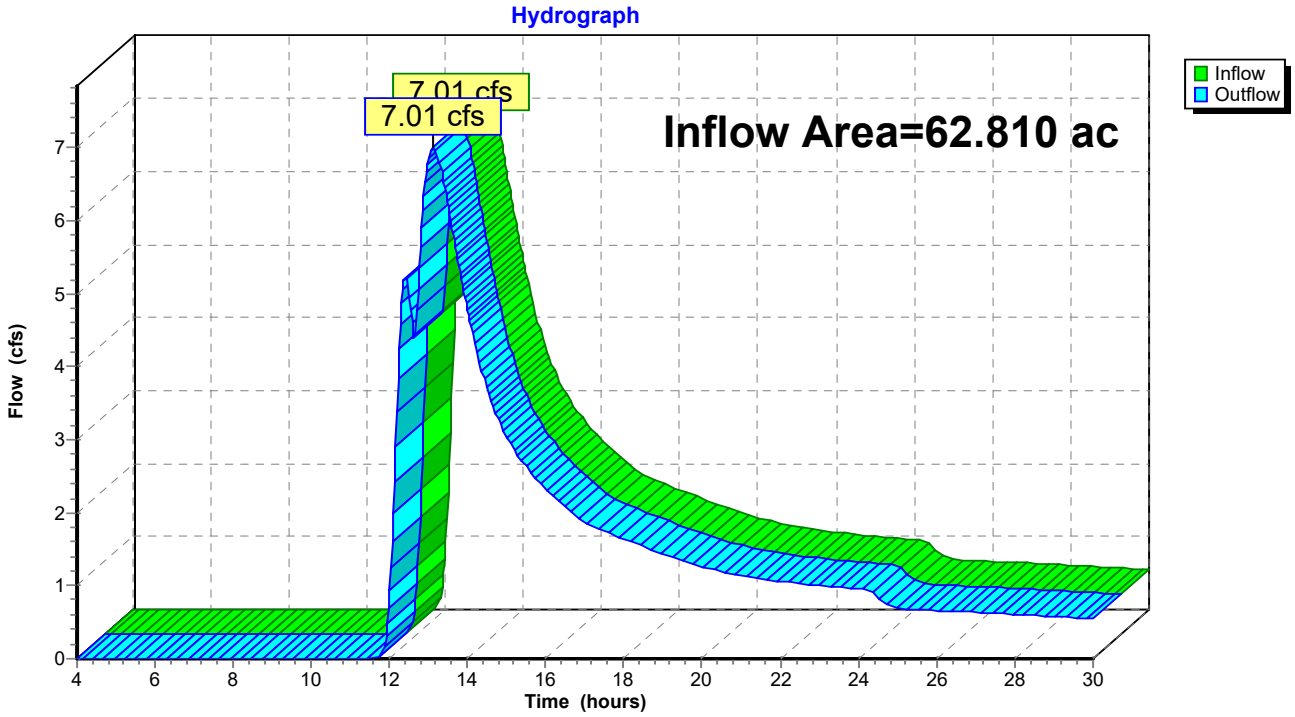


Summary for Reach 1R: Pt of Study 1

Inflow Area = 62.810 ac, 8.28% Impervious, Inflow Depth > 0.51" for 1-yr event
Inflow = 7.01 cfs @ 13.12 hrs, Volume= 2.658 af
Outflow = 7.01 cfs @ 13.12 hrs, Volume= 2.658 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 4.00-30.01 hrs, dt= 0.03 hrs

Reach 1R: Pt of Study 1

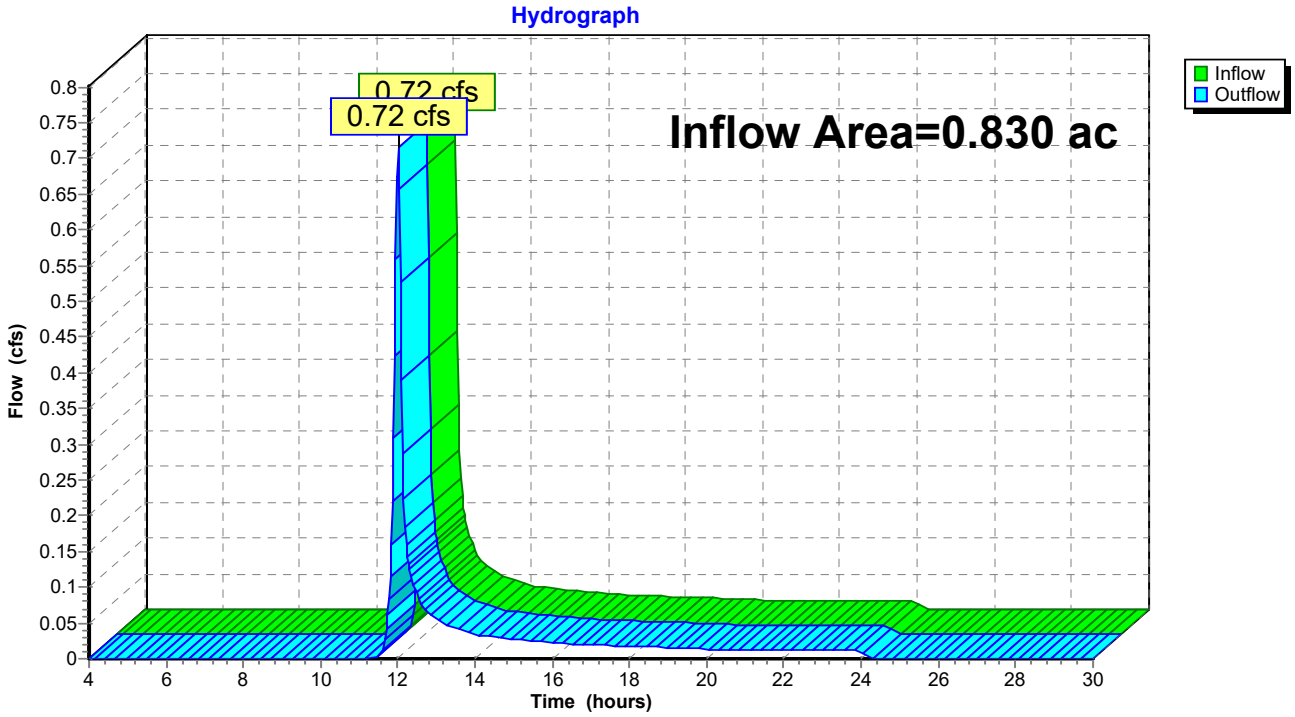


Summary for Reach 2R: Pt of Study 2

Inflow Area = 0.830 ac, 0.00% Impervious, Inflow Depth = 0.55" for 1-yr event
Inflow = 0.72 cfs @ 12.01 hrs, Volume= 0.038 af
Outflow = 0.72 cfs @ 12.01 hrs, Volume= 0.038 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 4.00-30.01 hrs, dt= 0.03 hrs

Reach 2R: Pt of Study 2

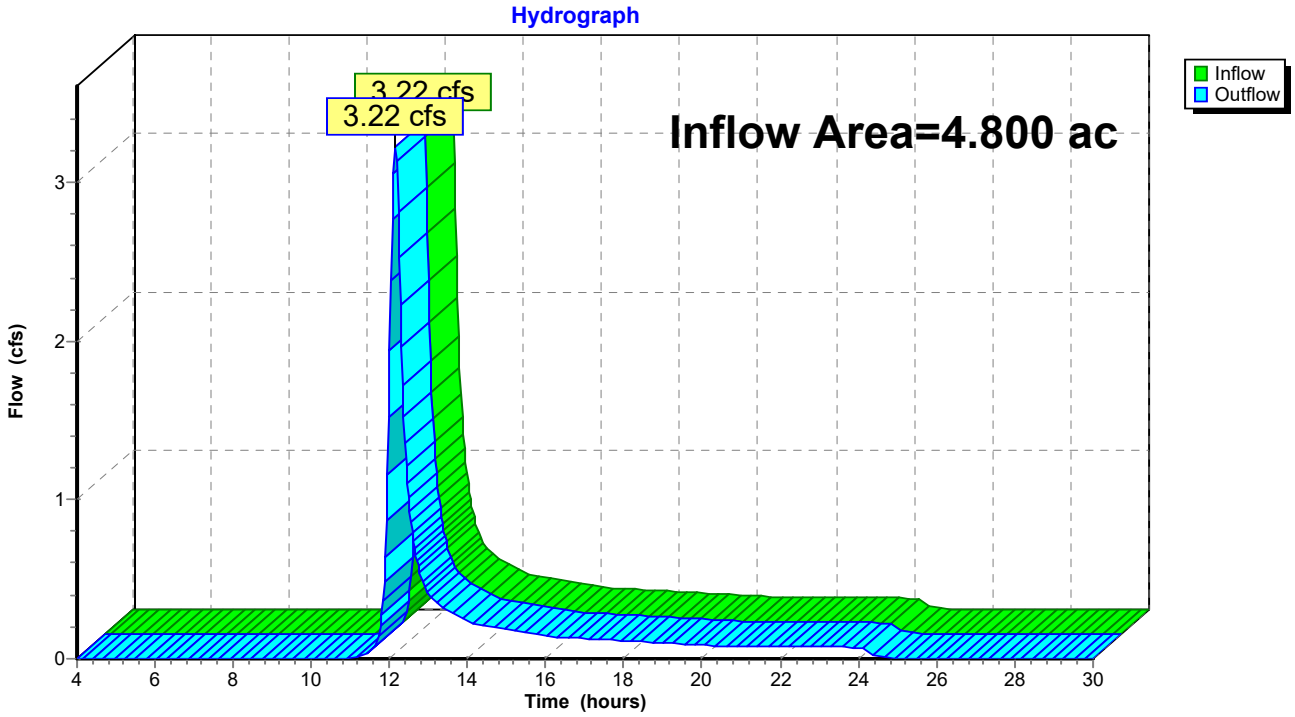


Summary for Reach 3R: Pt of Study 3

Inflow Area = 4.800 ac, 12.92% Impervious, Inflow Depth = 0.63" for 1-yr event
Inflow = 3.22 cfs @ 12.14 hrs, Volume= 0.254 af
Outflow = 3.22 cfs @ 12.14 hrs, Volume= 0.254 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 4.00-30.01 hrs, dt= 0.03 hrs

Reach 3R: Pt of Study 3



Summary for Reach 5R: Drainage Ditch

Inflow Area = 2.200 ac, 11.36% Impervious, Inflow Depth = 0.59" for 1-yr event
Inflow = 1.49 cfs @ 12.10 hrs, Volume= 0.108 af
Outflow = 1.42 cfs @ 12.20 hrs, Volume= 0.108 af, Atten= 5%, Lag= 5.8 min
Routed to Reach 3R : Pt of Study 3

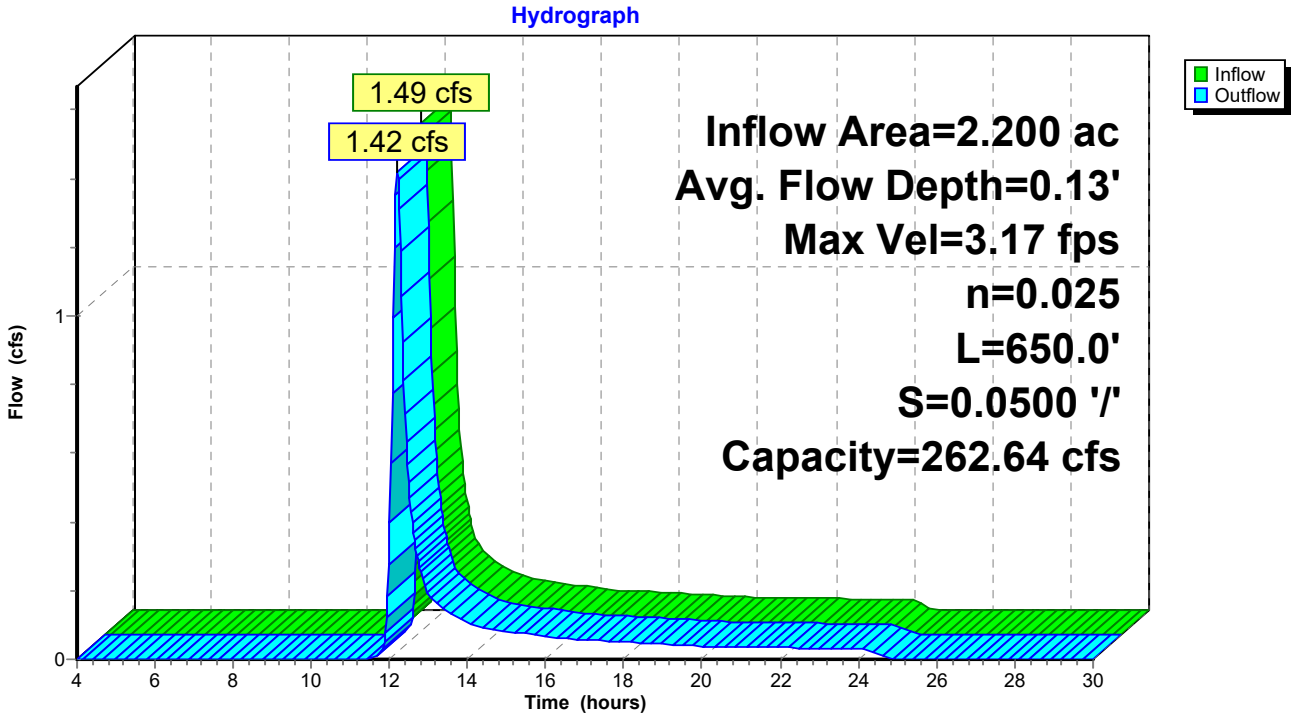
Routing by Stor-Ind+Trans method, Time Span= 4.00-30.01 hrs, dt= 0.03 hrs
Max. Velocity= 3.17 fps, Min. Travel Time= 3.4 min
Avg. Velocity = 1.11 fps, Avg. Travel Time= 9.7 min

Peak Storage= 290 cf @ 12.14 hrs
Average Depth at Peak Storage= 0.13' , Surface Width= 3.79'
Bank-Full Depth= 2.00' Flow Area= 18.0 sf, Capacity= 262.64 cfs

3.00' x 2.00' deep channel, n= 0.025 Earth, clean & straight
Side Slope Z-value= 3.0 '/' Top Width= 15.00'
Length= 650.0' Slope= 0.0500 '/'
Inlet Invert= 0.00', Outlet Invert= -32.50'

‡

Reach 5R: Drainage Ditch



Summary for Pond 1P: Bioretention 1

Inflow Area = 35.820 ac, 11.14% Impervious, Inflow Depth = 0.63" for 1-yr event
Inflow = 14.62 cfs @ 12.40 hrs, Volume= 1.881 af
Outflow = 13.89 cfs @ 12.50 hrs, Volume= 1.725 af, Atten= 5%, Lag= 5.8 min
Primary = 13.89 cfs @ 12.50 hrs, Volume= 1.725 af
Routed to Pond 3P : Detention Basin

Routing by Stor-Ind method, Time Span= 4.00-30.01 hrs, dt= 0.03 hrs
Peak Elev= 872.80' @ 12.50 hrs Surf.Area= 15,752 sf Storage= 11,294 cf

Plug-Flow detention time= 68.4 min calculated for 1.725 af (92% of inflow)
Center-of-Mass det. time= 24.9 min (918.4 - 893.5)

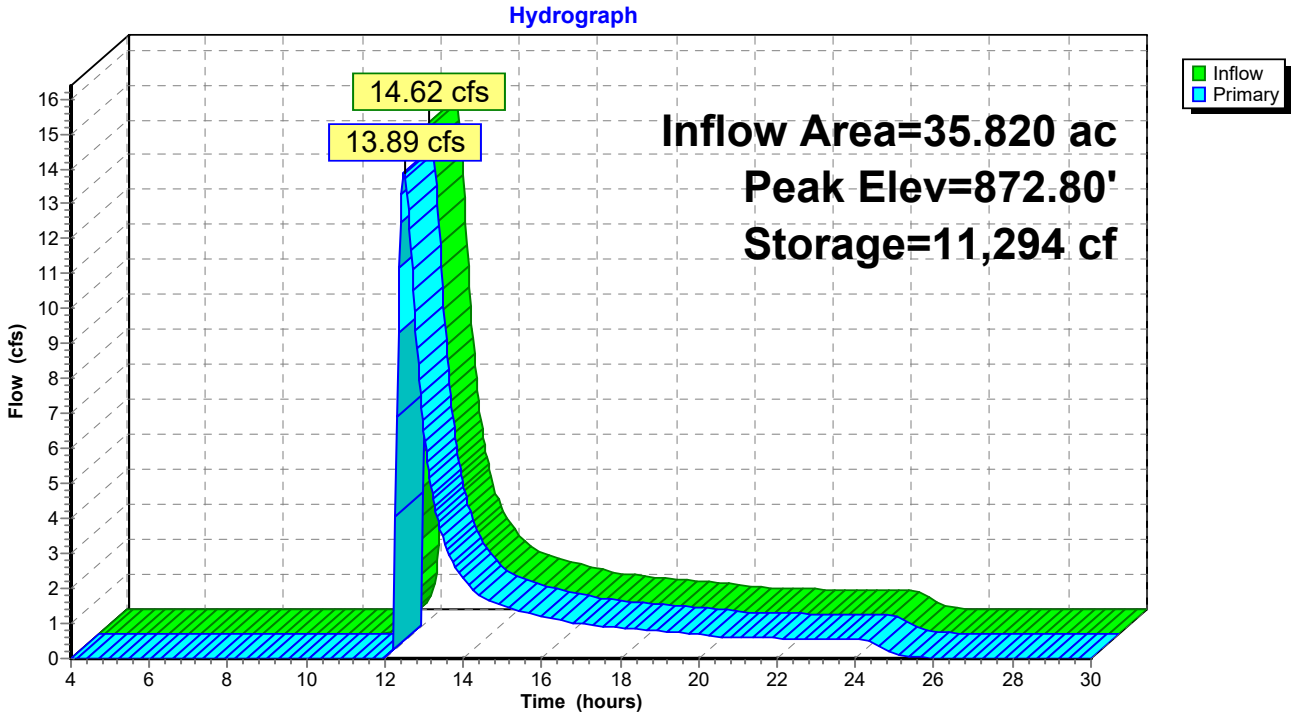
Volume	Invert	Avail.Storage	Storage Description
#1	872.00'	14,540 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
872.00	12,800	0	0
872.50	14,330	6,783	6,783
873.00	16,700	7,758	14,540

Device	Routing	Invert	Outlet Devices
#1	Primary	872.50'	**15.0' long + 3.0 '/' SideZ x 15.0' breadth Broad-Crested Rectangular Weir X 2**
			Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60
			Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=13.87 cfs @ 12.50 hrs HW=872.80' (Free Discharge)
└**1=Broad-Crested Rectangular Weir** (Weir Controls 13.87 cfs @ 1.46 fps)

Pond 1P: Bioretention 1



Summary for Pond 2P: Bioretention 2

Inflow Area = 10.910 ac, 9.62% Impervious, Inflow Depth = 0.63" for 1-yr event
Inflow = 6.93 cfs @ 12.16 hrs, Volume= 0.573 af
Outflow = 5.70 cfs @ 12.26 hrs, Volume= 0.487 af, Atten= 18%, Lag= 6.3 min
Primary = 5.70 cfs @ 12.26 hrs, Volume= 0.487 af
Routed to Pond 3P : Detention Basin

Routing by Stor-Ind method, Time Span= 4.00-30.01 hrs, dt= 0.03 hrs
Peak Elev= 882.67' @ 12.26 hrs Surf.Area= 9,262 sf Storage= 5,249 cf

Plug-Flow detention time= 107.4 min calculated for 0.487 af (85% of inflow)
Center-of-Mass det. time= 36.4 min (912.1 - 875.7)

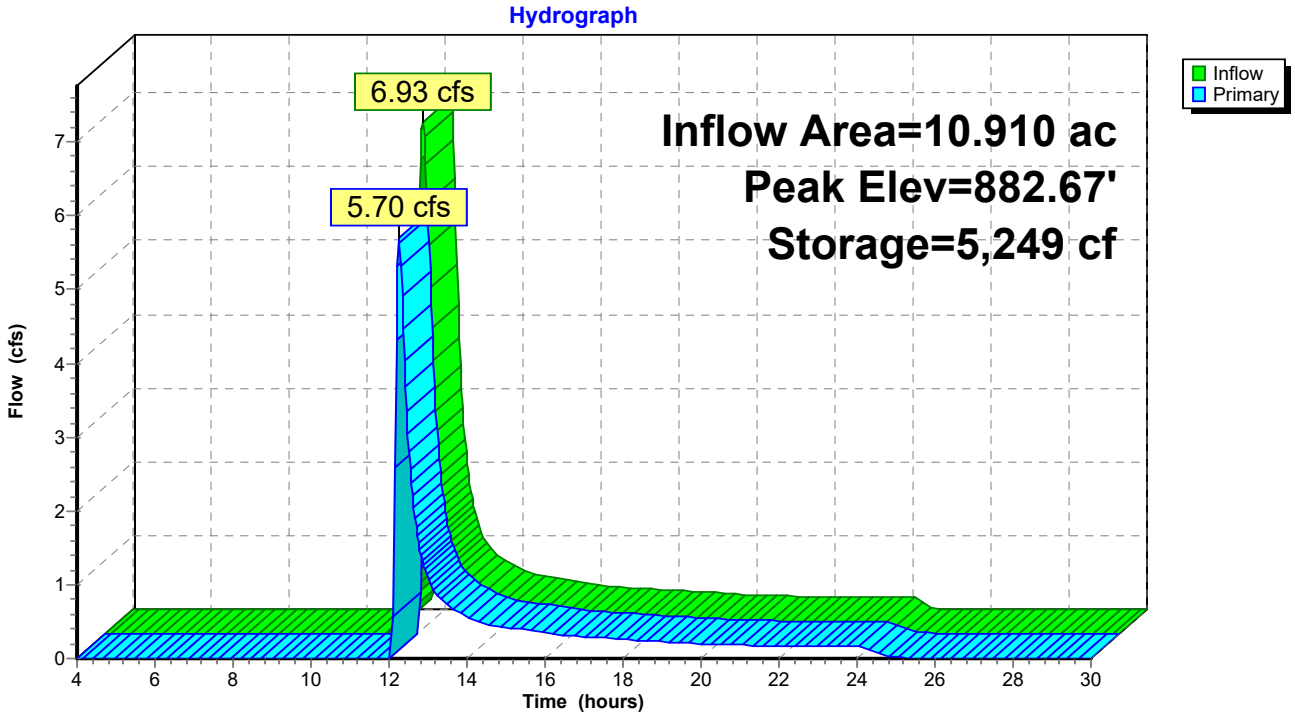
Volume	Invert	Avail.Storage	Storage Description
#1	882.00'	8,493 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
882.00	6,200	0	0
882.50	8,735	3,734	3,734
883.00	10,300	4,759	8,493

Device	Routing	Invert	Outlet Devices
#1	Primary	882.50'	**15.0' long + 3.0 '/' SideZ x 15.0' breadth Broad-Crested Rectangular Weir X 2**
			Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60
			Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=5.65 cfs @ 12.26 hrs HW=882.67' (Free Discharge)
└**1=Broad-Crested Rectangular Weir** (Weir Controls 5.65 cfs @ 1.09 fps)

Pond 2P: Bioretention 2



Summary for Pond 3P: Detention Basin

Inflow Area = 47.810 ac, 10.54% Impervious, Inflow Depth = 0.57" for 1-yr event
Inflow = 17.18 cfs @ 12.46 hrs, Volume= 2.265 af
Outflow = 5.56 cfs @ 13.23 hrs, Volume= 2.025 af, Atten= 68%, Lag= 46.0 min
Primary = 5.56 cfs @ 13.23 hrs, Volume= 2.025 af
Routed to Reach 1R : Pt of Study 1
Secondary = 0.00 cfs @ 4.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 4.00-30.01 hrs, dt= 0.03 hrs
Peak Elev= 865.31' @ 13.23 hrs Surf.Area= 17,251 sf Storage= 33,243 cf

Plug-Flow detention time= 216.7 min calculated for 2.025 af (89% of inflow)
Center-of-Mass det. time= 162.9 min (1,078.8 - 915.8)

Volume	Invert	Avail.Storage	Storage Description
#1	861.80'	235,158 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

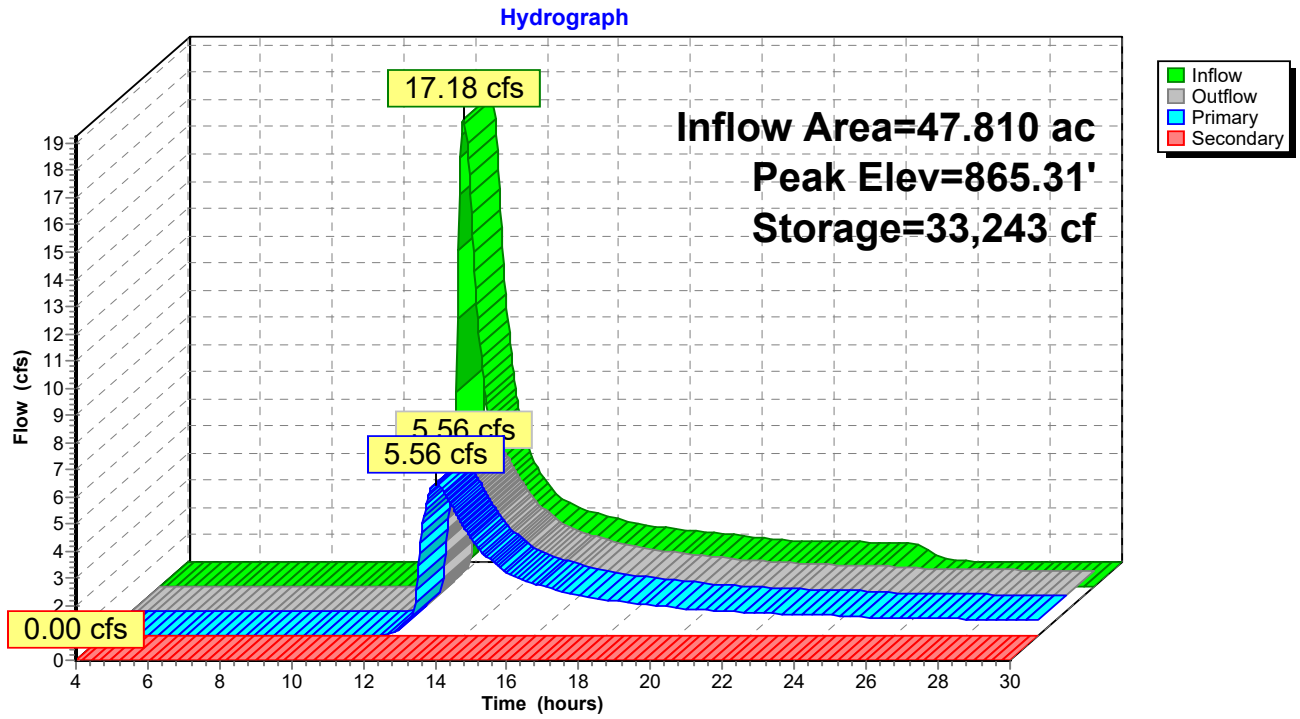
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
861.80	1,260	0	0
862.00	2,891	415	415
863.00	6,366	4,629	5,044
864.00	11,515	8,941	13,984
865.00	16,570	14,043	28,027
866.00	18,777	17,674	45,700
867.00	21,040	19,909	65,609
868.00	23,360	22,200	87,809
869.00	25,736	24,548	112,357
870.00	28,169	26,953	139,309
871.00	30,658	29,414	168,723
872.00	33,204	31,931	200,654
873.00	35,805	34,505	235,158

Device	Routing	Invert	Outlet Devices
#1	Secondary	872.00'	**30.0' long x 12.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.57 2.62 2.70 2.67 2.66 2.67 2.66 2.64
#2	Primary	861.80'	**30.0" Round Culvert** L= 98.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 861.80' / 857.00' S= 0.0490 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 4.91 sf
#3	Device 2	861.80'	**4.0" Vert. Orifice1** C= 0.600 Limited to weir flow at low heads
#4	Device 2	864.60'	**30.0" W x 30.0" H Vert. Orifice2** C= 0.600 Limited to weir flow at low heads
#5	Device 2	869.00'	**36.0" x 36.0" Horiz. Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=5.55 cfs @ 13.23 hrs HW=865.31' (Free Discharge)
└─**2=Culvert** (Passes 5.55 cfs of 28.04 cfs potential flow)
  ├─**3=Orifice1** (Orifice Controls 0.77 cfs @ 8.80 fps)
  ├─**4=Orifice2** (Orifice Controls 4.78 cfs @ 2.70 fps)
  └─**5=Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 4.00 hrs HW=861.80' (Free Discharge)
└─**1=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 3P: Detention Basin



Summary for Subcatchment 1S: DA-1A

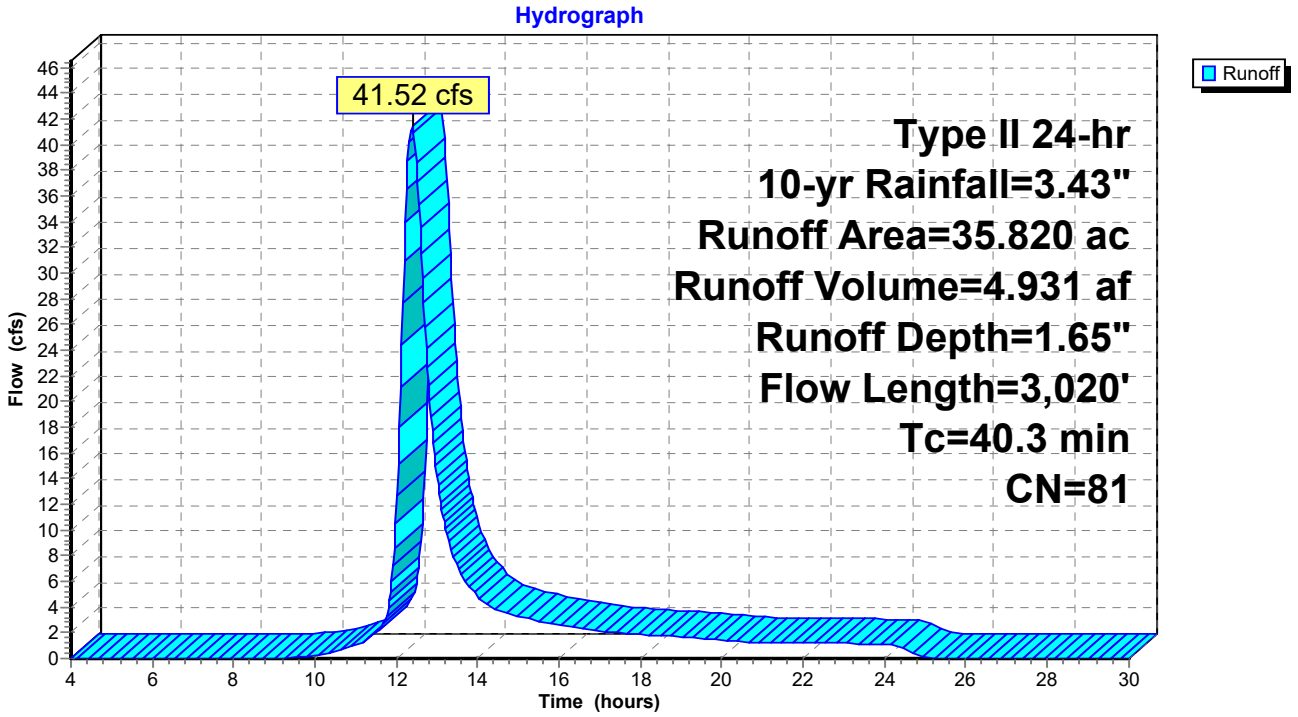
Runoff = 41.52 cfs @ 12.38 hrs, Volume= 4.931 af, Depth= 1.65"
Routed to Pond 1P : Bioretention 1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 4.00-30.01 hrs, dt= 0.03 hrs
Type II 24-hr 10-yr Rainfall=3.43"

Area (ac)	CN	Description
2.050	98	Paved parking, HSG D
1.940	98	Unconnected roofs, HSG D
22.870	80	>75% Grass cover, Good, HSG D
8.960	77	Woods, Good, HSG D
35.820	81	Weighted Average
31.830		88.86% Pervious Area
3.990		11.14% Impervious Area
1.940		48.62% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
27.9	100	0.0600	0.06		**Sheet Flow, SHEET FLOW** Woods: Dense underbrush n= 0.800 P2= 2.39"
4.8	370	0.0650	1.27		**Shallow Concentrated Flow, SCF** Woodland Kv= 5.0 fps
1.9	200	0.0650	1.78		**Shallow Concentrated Flow, SCF** Short Grass Pasture Kv= 7.0 fps
0.2	295	0.0300	19.80	79.19	**Channel Flow, curb and gutter flow** Area= 4.0 sf Perim= 4.0' r= 1.00' n= 0.013 Asphalt, smooth
1.7	1,100	0.0345	11.04	19.51	**Pipe Channel, Pipe Flow** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013 Corrugated PE, smooth interior
3.8	955	0.0050	4.20	50.44	**Channel Flow,** Area= 12.0 sf Perim= 12.0' r= 1.00' n= 0.025 Earth, grassed & winding
40.3	3,020	Total			

Subcatchment 1S: DA-1A



Summary for Subcatchment 2S: DA-1B

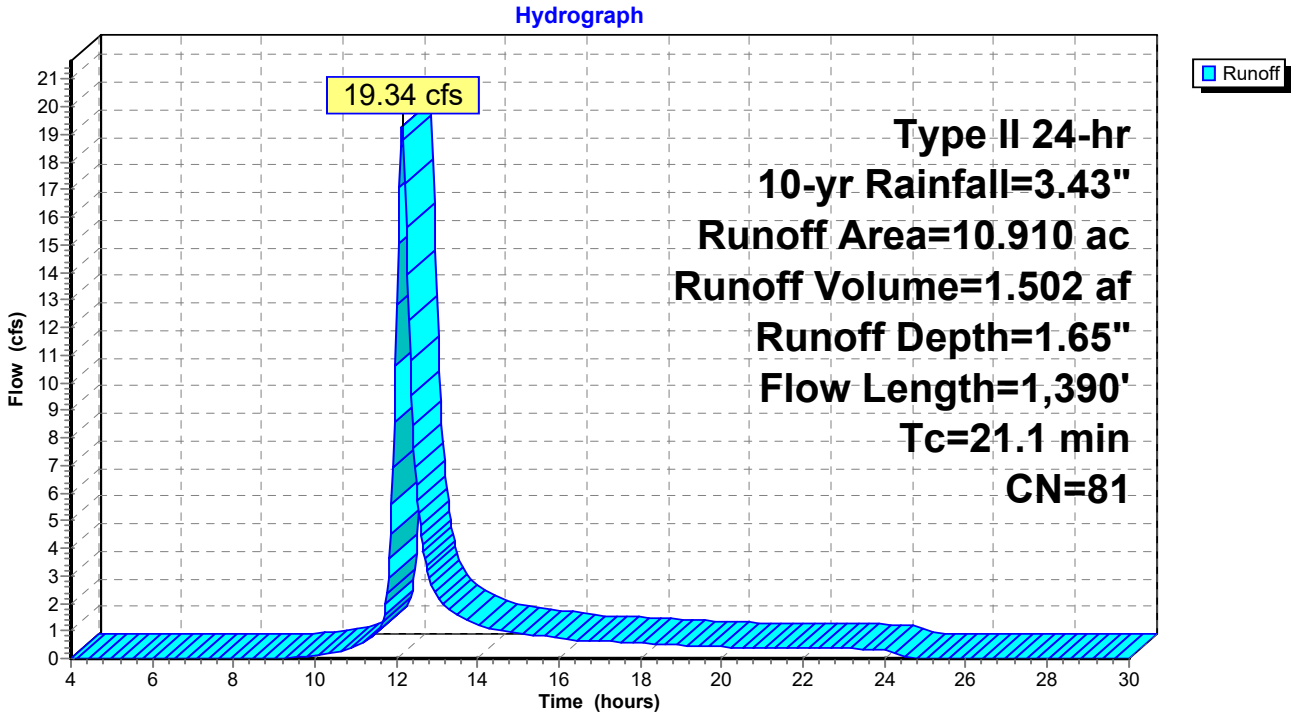
Runoff = 19.34 cfs @ 12.14 hrs, Volume= 1.502 af, Depth= 1.65"
Routed to Pond 2P : Bioretention 2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 4.00-30.01 hrs, dt= 0.03 hrs
Type II 24-hr 10-yr Rainfall=3.43"

Area (ac)	CN	Description
0.710	98	Paved parking, HSG D
0.340	98	Unconnected roofs, HSG D
7.820	80	>75% Grass cover, Good, HSG D
2.040	77	Woods, Good, HSG D
10.910	81	Weighted Average
9.860		90.38% Pervious Area
1.050		9.62% Impervious Area
0.340		32.38% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.6	100	0.0600	0.16		**Sheet Flow, SHEET FLOW** Grass: Dense n= 0.240 P2= 2.39"
4.6	410	0.0900	1.50		**Shallow Concentrated Flow, SCF** Woodland Kv= 5.0 fps
5.6	710	0.0920	2.12		**Shallow Concentrated Flow, SCF** Short Grass Pasture Kv= 7.0 fps
0.3	170	0.0200	9.55	76.42	**Channel Flow, swale flow** Area= 8.0 sf Perim= 8.0' r= 1.00' n= 0.022 Earth, clean & straight
21.1	1,390	Total			

Subcatchment 2S: DA-1B



Summary for Subcatchment 3S: DA-1C

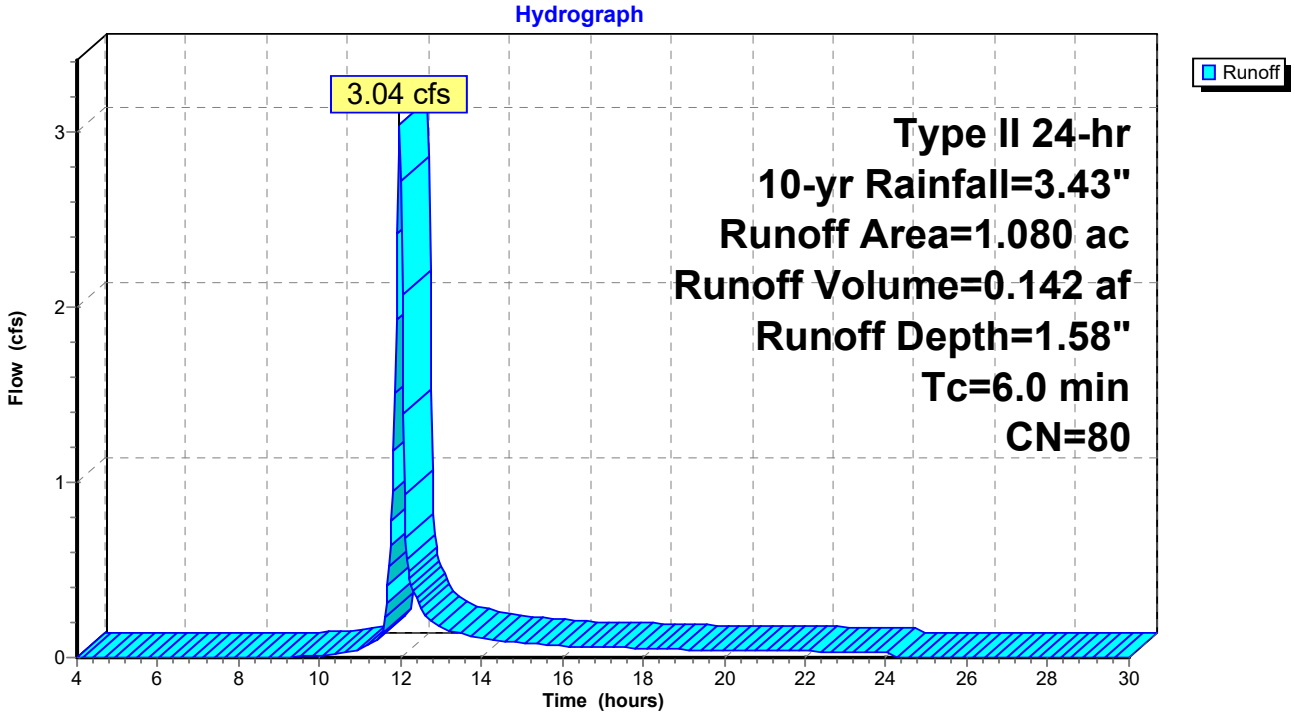
Runoff = 3.04 cfs @ 11.97 hrs, Volume= 0.142 af, Depth= 1.58"
Routed to Pond 3P : Detention Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 4.00-30.01 hrs, dt= 0.03 hrs
Type II 24-hr 10-yr Rainfall=3.43"

Area (ac)	CN	Description
0.960	80	>75% Grass cover, Good, HSG D
0.120	77	Woods, Good, HSG D
1.080	80	Weighted Average
1.080		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Min TR 55 Value**

Subcatchment 3S: DA-1C



Summary for Subcatchment 4S: DA-1D

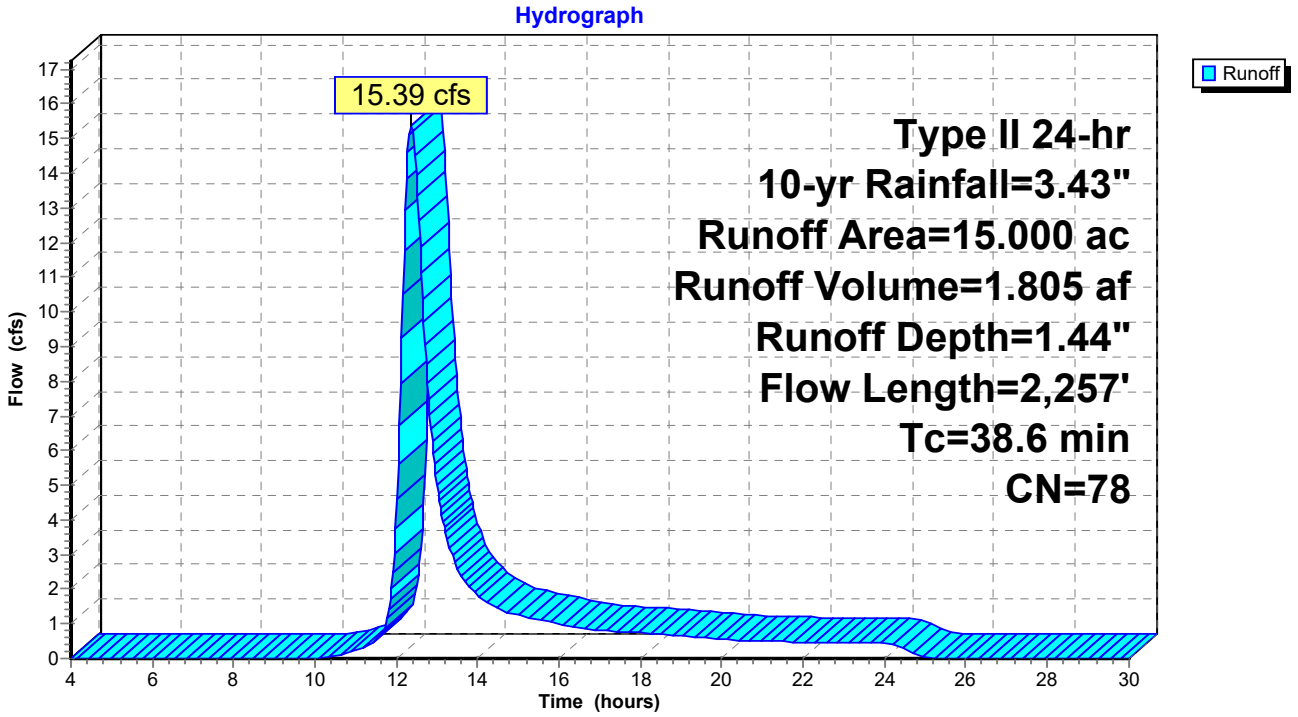
Runoff = 15.39 cfs @ 12.37 hrs, Volume= 1.805 af, Depth= 1.44"
Routed to Reach 1R : Pt of Study 1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 4.00-30.01 hrs, dt= 0.03 hrs
Type II 24-hr 10-yr Rainfall=3.43"

Area (ac)	CN	Description
5.930	80	>75% Grass cover, Good, HSG D
8.910	77	Woods, Good, HSG D
0.160	98	Paved parking, HSG D
15.000	78	Weighted Average
14.840		98.93% Pervious Area
0.160		1.07% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
27.9	100	0.0600	0.06		**Sheet Flow, SHEET FLOW** Woods: Dense underbrush n= 0.800 P2= 2.39"
5.4	485	0.0900	1.50		**Shallow Concentrated Flow, SCF** Woodland Kv= 5.0 fps
4.1	517	0.0900	2.10		**Shallow Concentrated Flow, SCF** Short Grass Pasture Kv= 7.0 fps
1.2	1,155	0.0750	16.28	260.45	**Channel Flow, SWALE** Area= 16.0 sf Perim= 16.0' r= 1.00' n= 0.025 Earth, clean & winding
38.6	2,257	Total			

Subcatchment 4S: DA-1D



Summary for Subcatchment 5S: DA#2

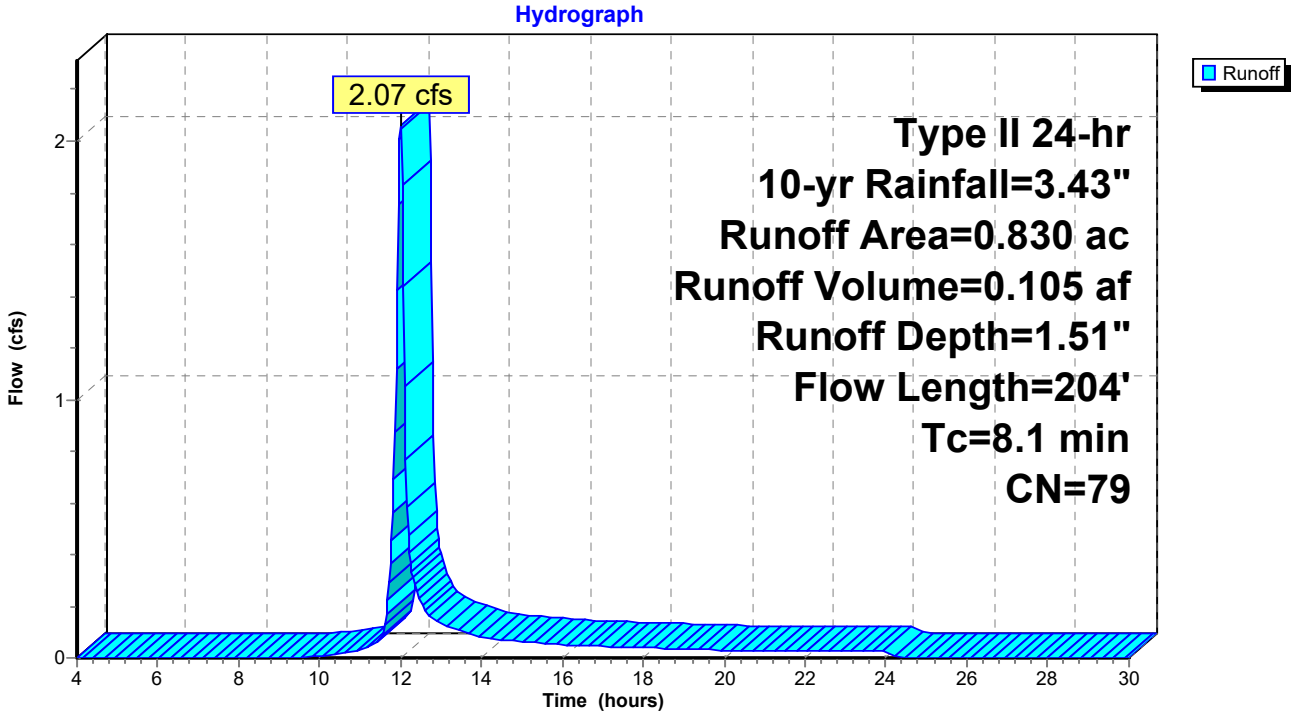
Runoff = 2.07 cfs @ 12.00 hrs, Volume= 0.105 af, Depth= 1.51"
Routed to Reach 2R : Pt of Study 2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 4.00-30.01 hrs, dt= 0.03 hrs
Type II 24-hr 10-yr Rainfall=3.43"

Area (ac)	CN	Description
0.690	80	>75% Grass cover, Good, HSG D
0.140	77	Woods, Good, HSG D
0.830	79	Weighted Average
0.830		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.4	100	0.1500	0.23		**Sheet Flow, SHEET FLOW** Grass: Dense n= 0.240 P2= 2.39"
0.7	104	0.1300	2.52		**Shallow Concentrated Flow, SCF** Short Grass Pasture Kv= 7.0 fps
8.1	204	Total			

Subcatchment 5S: DA#2



Summary for Subcatchment 6S: DA#3A

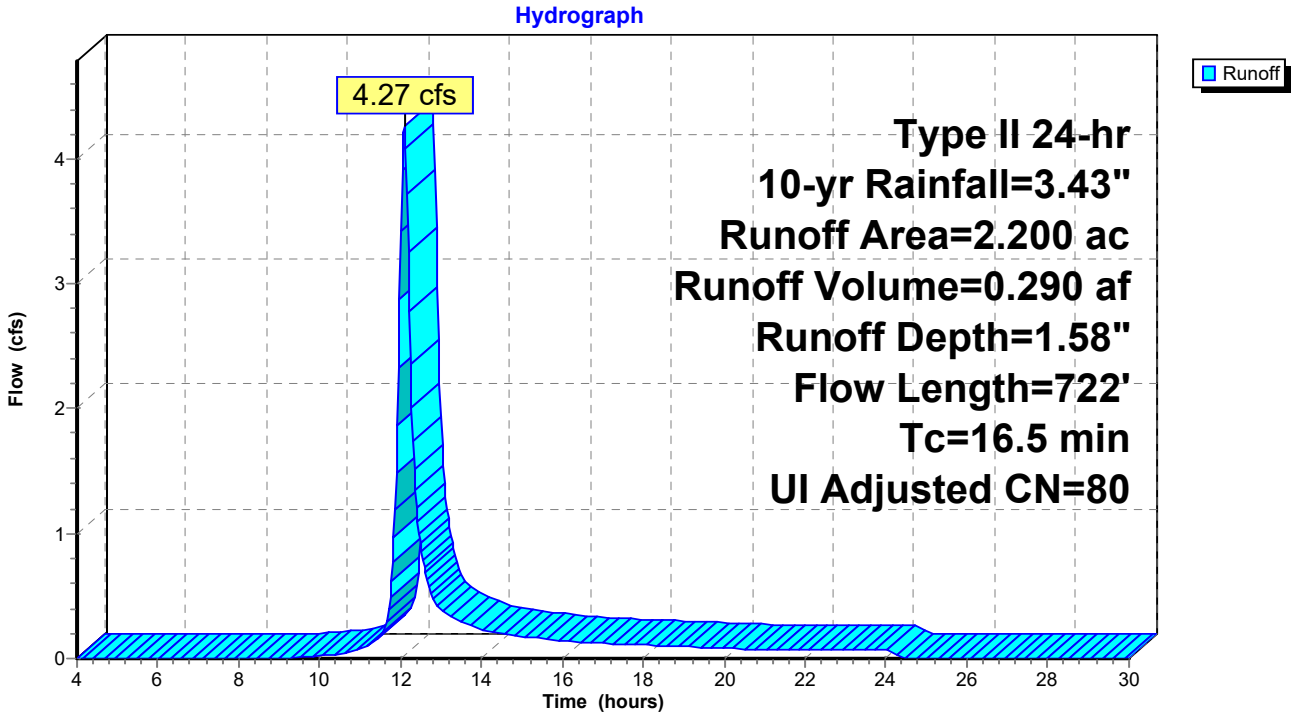
Runoff = 4.27 cfs @ 12.09 hrs, Volume= 0.290 af, Depth= 1.58"
Routed to Reach 5R : Drainage Ditch

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 4.00-30.01 hrs, dt= 0.03 hrs
Type II 24-hr 10-yr Rainfall=3.43"

Area (ac)	CN	Adj	Description
0.920	80		>75% Grass cover, Good, HSG D
0.180	98		Paved parking, HSG D
0.070	98		Unconnected roofs, HSG D
1.030	77		Woods, Good, HSG D
2.200	81	80	Weighted Average, UI Adjusted
1.950			88.64% Pervious Area
0.250			11.36% Impervious Area
0.070			28.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.9	100	0.0450	0.14		**Sheet Flow, SHEET FLOW** Grass: Dense n= 0.240 P2= 2.39"
2.5	188	0.0650	1.27		**Shallow Concentrated Flow, SCF** Woodland Kv= 5.0 fps
1.9	202	0.0650	1.78		**Shallow Concentrated Flow, SCF** Short Grass Pasture Kv= 7.0 fps
0.2	232	0.0220	16.95	50.86	**Channel Flow, curb flow** Area= 3.0 sf Perim= 3.0' r= 1.00' n= 0.013 Asphalt, smooth
16.5	722	Total			

Subcatchment 6S: DA#3A



Summary for Subcatchment 7S: DA#3B

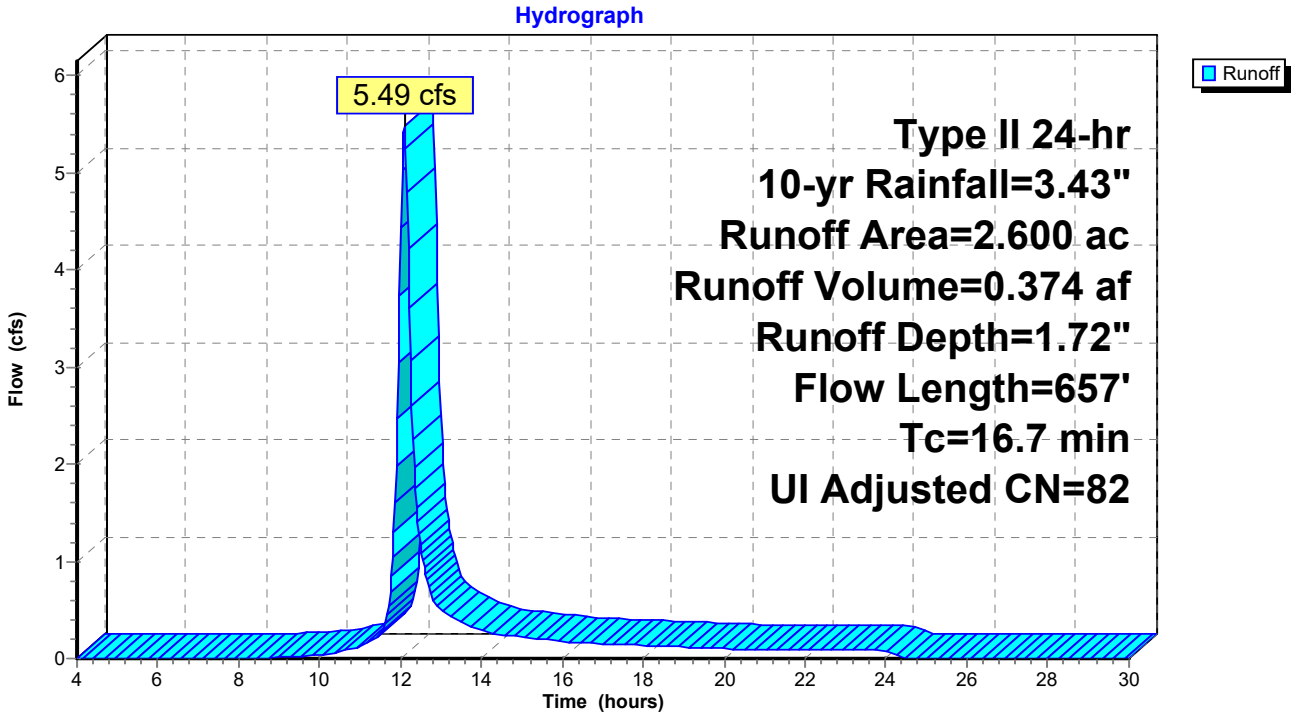
Runoff = 5.49 cfs @ 12.09 hrs, Volume= 0.374 af, Depth= 1.72"
Routed to Reach 3R : Pt of Study 3

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 4.00-30.01 hrs, dt= 0.03 hrs
Type II 24-hr 10-yr Rainfall=3.43"

Area (ac)	CN	Adj	Description
2.230	80		>75% Grass cover, Good, HSG D
0.230	98		Paved parking, HSG D
0.140	98		Unconnected roofs, HSG D
2.600	83	82	Weighted Average, UI Adjusted
2.230			85.77% Pervious Area
0.370			14.23% Impervious Area
0.140			37.84% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.4	100	0.0500	0.15		**Sheet Flow, SHEET FLOW** Grass: Dense n= 0.240 P2= 2.39"
5.1	475	0.0500	1.57		**Shallow Concentrated Flow, SCF** Short Grass Pasture Kv= 7.0 fps
0.2	82	0.0200	6.42	5.04	**Pipe Channel, pipe flow** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013 Corrugated PE, smooth interior
16.7	657	Total			

Subcatchment 7S: DA#3B

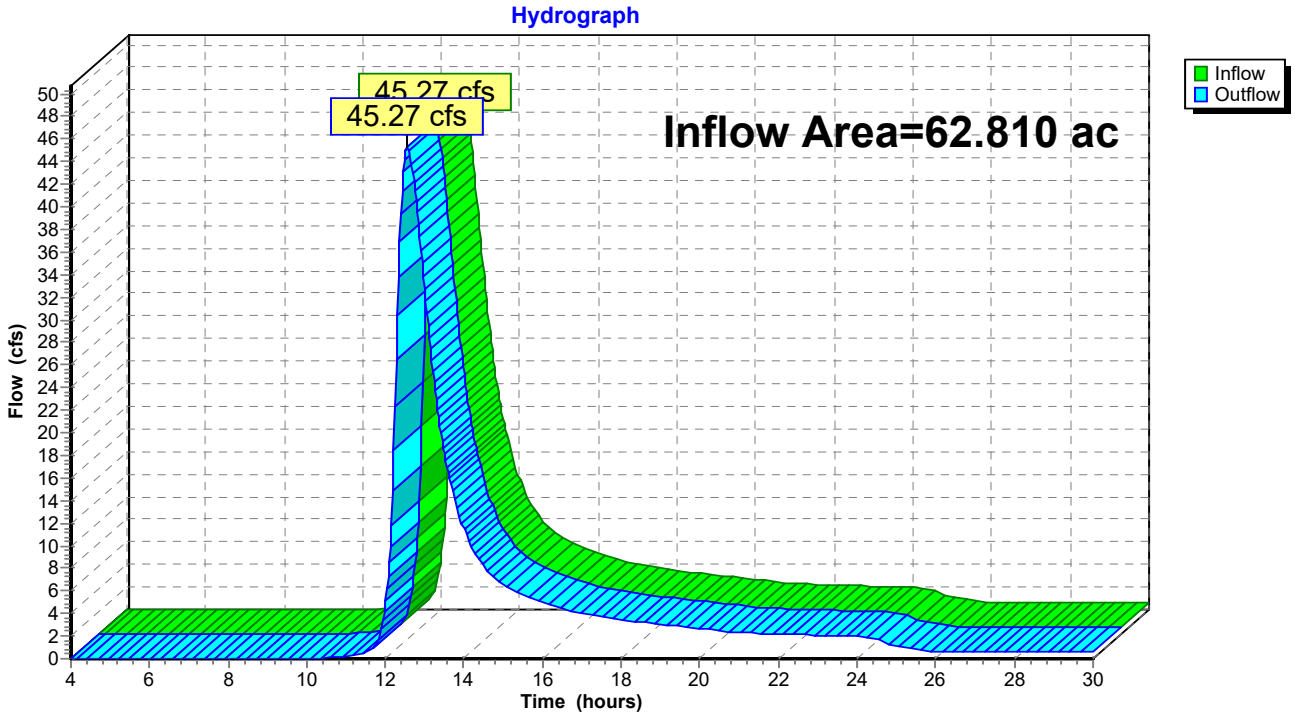


Summary for Reach 1R: Pt of Study 1

Inflow Area = 62.810 ac, 8.28% Impervious, Inflow Depth > 1.50" for 10-yr event
Inflow = 45.27 cfs @ 12.56 hrs, Volume= 7.862 af
Outflow = 45.27 cfs @ 12.56 hrs, Volume= 7.862 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 4.00-30.01 hrs, dt= 0.03 hrs

Reach 1R: Pt of Study 1

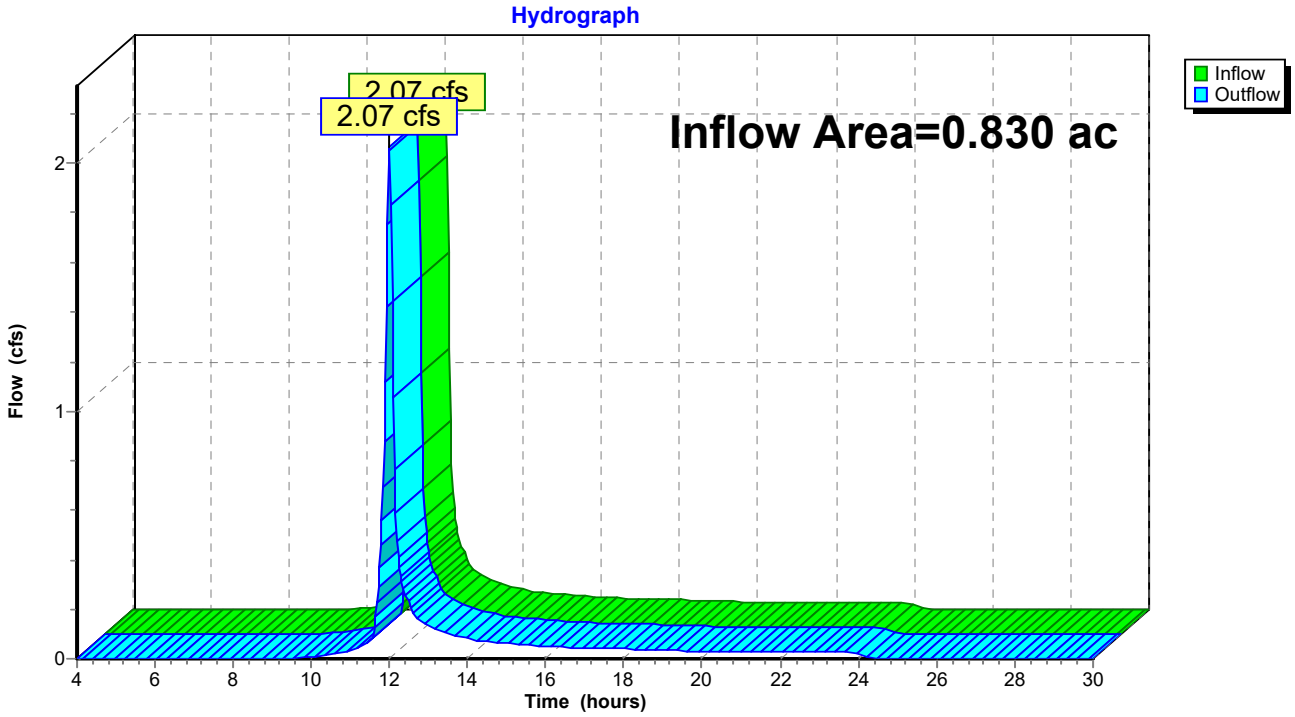


Summary for Reach 2R: Pt of Study 2

Inflow Area = 0.830 ac, 0.00% Impervious, Inflow Depth = 1.51" for 10-yr event
Inflow = 2.07 cfs @ 12.00 hrs, Volume= 0.105 af
Outflow = 2.07 cfs @ 12.00 hrs, Volume= 0.105 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 4.00-30.01 hrs, dt= 0.03 hrs

Reach 2R: Pt of Study 2

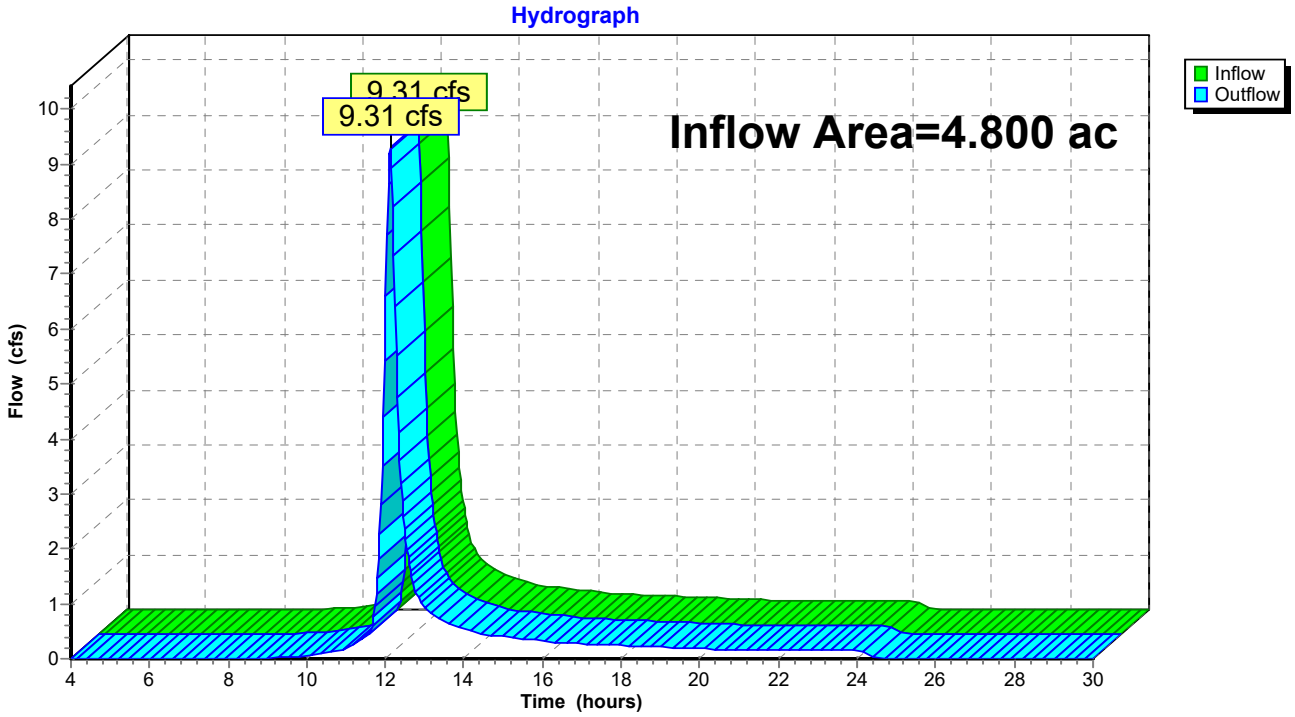


Summary for Reach 3R: Pt of Study 3

Inflow Area = 4.800 ac, 12.92% Impervious, Inflow Depth = 1.66" for 10-yr event
Inflow = 9.31 cfs @ 12.12 hrs, Volume= 0.664 af
Outflow = 9.31 cfs @ 12.12 hrs, Volume= 0.664 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 4.00-30.01 hrs, dt= 0.03 hrs

Reach 3R: Pt of Study 3



Summary for Reach 5R: Drainage Ditch

Inflow Area = 2.200 ac, 11.36% Impervious, Inflow Depth = 1.58" for 10-yr event
Inflow = 4.27 cfs @ 12.09 hrs, Volume= 0.290 af
Outflow = 4.15 cfs @ 12.16 hrs, Volume= 0.290 af, Atten= 3%, Lag= 4.1 min
Routed to Reach 3R : Pt of Study 3

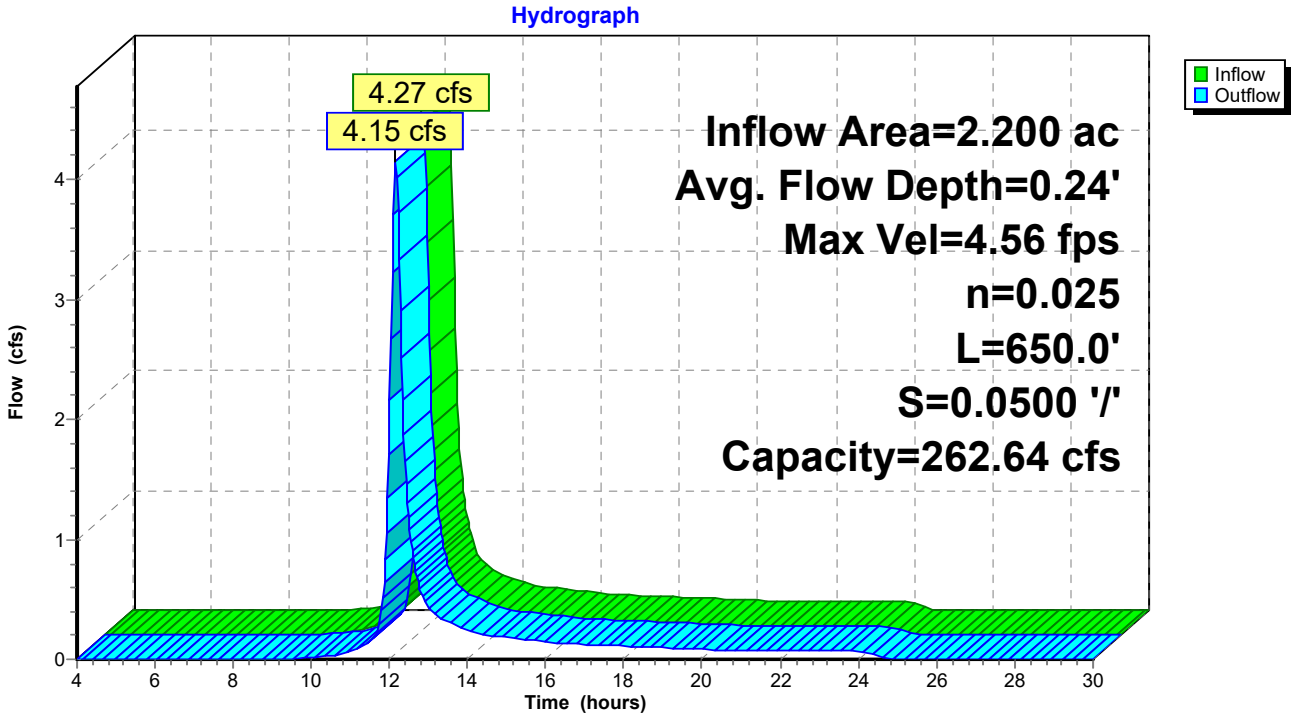
Routing by Stor-Ind+Trans method, Time Span= 4.00-30.01 hrs, dt= 0.03 hrs
Max. Velocity= 4.56 fps, Min. Travel Time= 2.4 min
Avg. Velocity = 1.36 fps, Avg. Travel Time= 8.0 min

Peak Storage= 594 cf @ 12.12 hrs
Average Depth at Peak Storage= 0.24' , Surface Width= 4.47'
Bank-Full Depth= 2.00' Flow Area= 18.0 sf, Capacity= 262.64 cfs

3.00' x 2.00' deep channel, n= 0.025 Earth, clean & straight
Side Slope Z-value= 3.0 '/' Top Width= 15.00'
Length= 650.0' Slope= 0.0500 '/'
Inlet Invert= 0.00', Outlet Invert= -32.50'

‡

Reach 5R: Drainage Ditch



Summary for Pond 1P: Bioretention 1

Inflow Area = 35.820 ac, 11.14% Impervious, Inflow Depth = 1.65" for 10-yr event
Inflow = 41.52 cfs @ 12.38 hrs, Volume= 4.931 af
Outflow = 43.71 cfs @ 12.40 hrs, Volume= 4.776 af, Atten= 0%, Lag= 0.9 min
Primary = 43.71 cfs @ 12.40 hrs, Volume= 4.776 af
Routed to Pond 3P : Detention Basin

Routing by Stor-Ind method, Time Span= 4.00-30.01 hrs, dt= 0.03 hrs
Peak Elev= 873.12' @ 12.40 hrs Surf.Area= 16,700 sf Storage= 14,540 cf

Plug-Flow detention time= 31.3 min calculated for 4.770 af (97% of inflow)
Center-of-Mass det. time= 13.2 min (877.8 - 864.7)

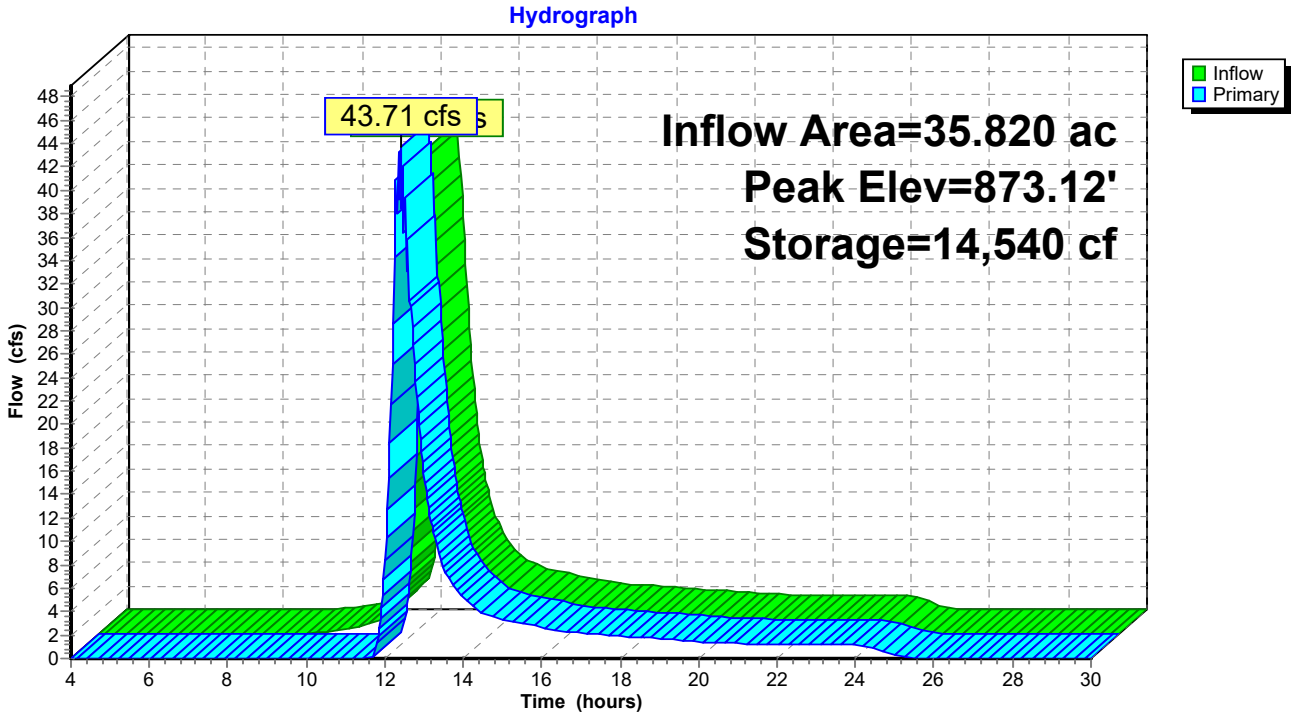
Volume	Invert	Avail.Storage	Storage Description
#1	872.00'	14,540 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
872.00	12,800	0	0
872.50	14,330	6,783	6,783
873.00	16,700	7,758	14,540

Device	Routing	Invert	Outlet Devices
#1	Primary	872.50'	**15.0' long + 3.0 '/' SideZ x 15.0' breadth Broad-Crested Rectangular Weir X 2** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=43.54 cfs @ 12.40 hrs HW=873.12' (Free Discharge)
└**1=Broad-Crested Rectangular Weir** (Weir Controls 43.54 cfs @ 2.08 fps)

Pond 1P: Bioretention 1



Summary for Pond 2P: Bioretention 2

Inflow Area = 10.910 ac, 9.62% Impervious, Inflow Depth = 1.65" for 10-yr event
Inflow = 19.34 cfs @ 12.14 hrs, Volume= 1.502 af
Outflow = 18.83 cfs @ 12.18 hrs, Volume= 1.416 af, Atten= 3%, Lag= 2.1 min
Primary = 18.83 cfs @ 12.18 hrs, Volume= 1.416 af
Routed to Pond 3P : Detention Basin

Routing by Stor-Ind method, Time Span= 4.00-30.01 hrs, dt= 0.03 hrs
Peak Elev= 882.86' @ 12.18 hrs Surf.Area= 9,875 sf Storage= 7,124 cf

Plug-Flow detention time= 48.3 min calculated for 1.416 af (94% of inflow)
Center-of-Mass det. time= 16.5 min (863.4 - 846.9)

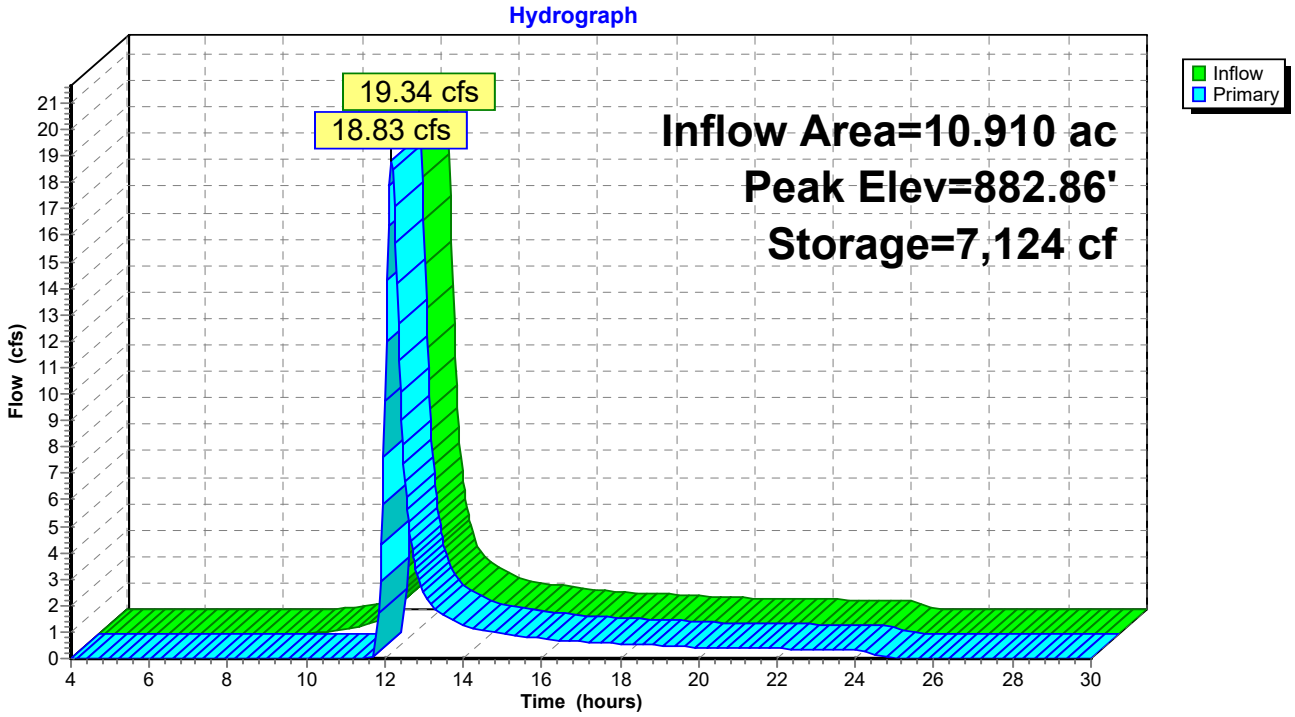
Volume	Invert	Avail.Storage	Storage Description
#1	882.00'	8,493 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
882.00	6,200	0	0
882.50	8,735	3,734	3,734
883.00	10,300	4,759	8,493

Device	Routing	Invert	Outlet Devices
#1	Primary	882.50'	**15.0' long + 3.0 '/' SideZ x 15.0' breadth Broad-Crested Rectangular Weir X 2**
			Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60
			Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=18.75 cfs @ 12.18 hrs HW=882.86' (Free Discharge)
└**1=Broad-Crested Rectangular Weir** (Weir Controls 18.75 cfs @ 1.60 fps)

Pond 2P: Bioretention 2



Summary for Pond 3P: Detention Basin

Inflow Area = 47.810 ac, 10.54% Impervious, Inflow Depth = 1.59" for 10-yr event
Inflow = 57.03 cfs @ 12.28 hrs, Volume= 6.334 af
Outflow = 34.02 cfs @ 12.67 hrs, Volume= 6.056 af, Atten= 40%, Lag= 23.6 min
Primary = 34.02 cfs @ 12.67 hrs, Volume= 6.056 af
Routed to Reach 1R : Pt of Study 1
Secondary = 0.00 cfs @ 4.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 4.00-30.01 hrs, dt= 0.03 hrs
Peak Elev= 867.18' @ 12.67 hrs Surf.Area= 21,457 sf Storage= 69,424 cf

Plug-Flow detention time= 95.6 min calculated for 6.056 af (96% of inflow)
Center-of-Mass det. time= 70.6 min (944.3 - 873.7)

Volume	Invert	Avail.Storage	Storage Description
#1	861.80'	235,158 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

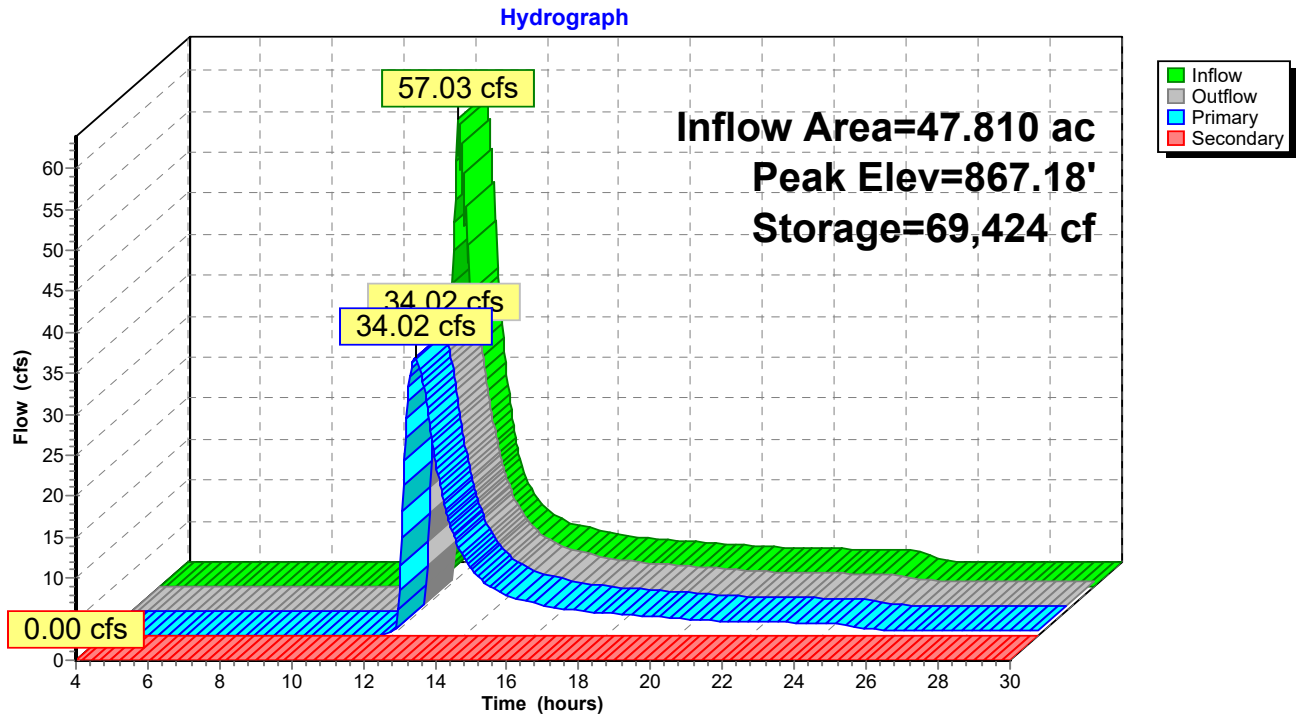
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
861.80	1,260	0	0
862.00	2,891	415	415
863.00	6,366	4,629	5,044
864.00	11,515	8,941	13,984
865.00	16,570	14,043	28,027
866.00	18,777	17,674	45,700
867.00	21,040	19,909	65,609
868.00	23,360	22,200	87,809
869.00	25,736	24,548	112,357
870.00	28,169	26,953	139,309
871.00	30,658	29,414	168,723
872.00	33,204	31,931	200,654
873.00	35,805	34,505	235,158

Device	Routing	Invert	Outlet Devices
#1	Secondary	872.00'	**30.0' long x 12.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.57 2.62 2.70 2.67 2.66 2.67 2.66 2.64
#2	Primary	861.80'	**30.0" Round Culvert** L= 98.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 861.80' / 857.00' S= 0.0490 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 4.91 sf
#3	Device 2	861.80'	**4.0" Vert. Orifice1** C= 0.600 Limited to weir flow at low heads
#4	Device 2	864.60'	**30.0" W x 30.0" H Vert. Orifice2** C= 0.600 Limited to weir flow at low heads
#5	Device 2	869.00'	**36.0" x 36.0" Horiz. Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=34.02 cfs @ 12.67 hrs HW=867.18' (Free Discharge)
└─**2=Culvert** (Passes 34.02 cfs of 37.92 cfs potential flow)
  ├─**3=Orifice1** (Orifice Controls 0.96 cfs @ 10.99 fps)
  ├─**4=Orifice2** (Orifice Controls 33.06 cfs @ 5.29 fps)
  └─**5=Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 4.00 hrs HW=861.80' (Free Discharge)
└─**1=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 3P: Detention Basin



Summary for Subcatchment 1S: DA-1A

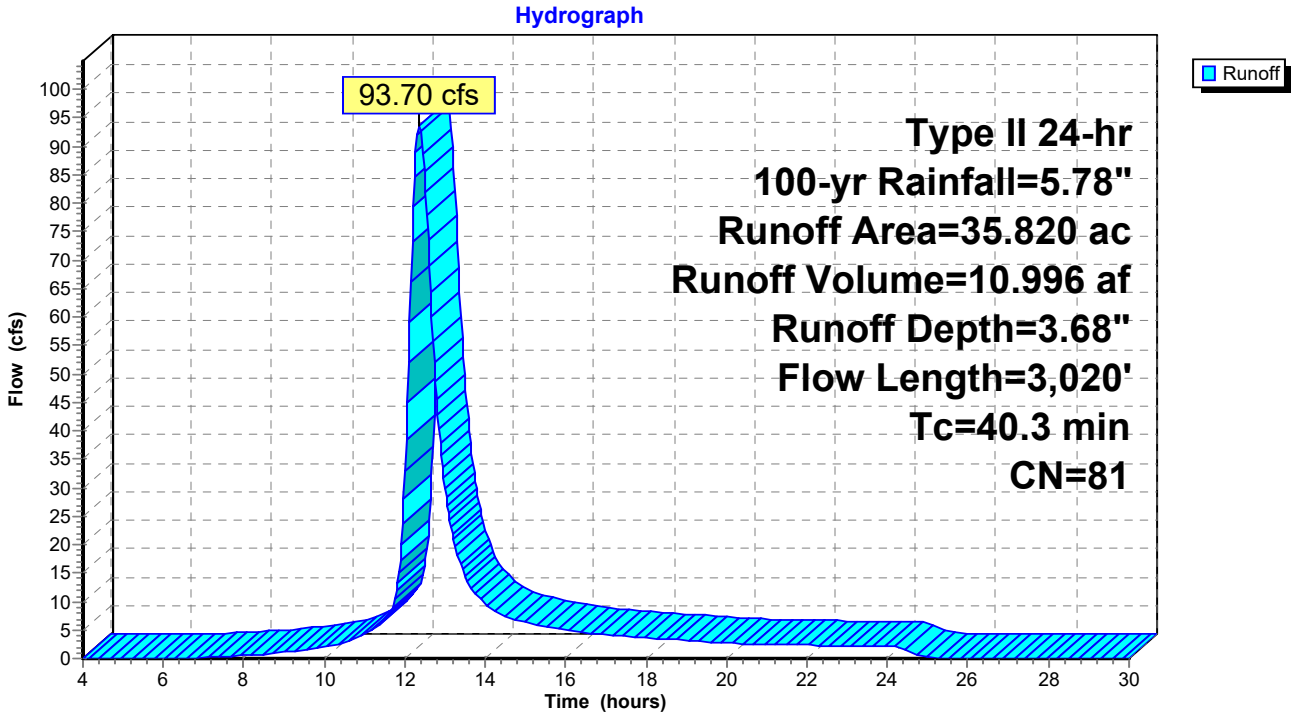
Runoff = 93.70 cfs @ 12.37 hrs, Volume= 10.996 af, Depth= 3.68"
Routed to Pond 1P : Bioretention 1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 4.00-30.01 hrs, dt= 0.03 hrs
Type II 24-hr 100-yr Rainfall=5.78"

Area (ac)	CN	Description
2.050	98	Paved parking, HSG D
1.940	98	Unconnected roofs, HSG D
22.870	80	>75% Grass cover, Good, HSG D
8.960	77	Woods, Good, HSG D
35.820	81	Weighted Average
31.830		88.86% Pervious Area
3.990		11.14% Impervious Area
1.940		48.62% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
27.9	100	0.0600	0.06		**Sheet Flow, SHEET FLOW** Woods: Dense underbrush n= 0.800 P2= 2.39"
4.8	370	0.0650	1.27		**Shallow Concentrated Flow, SCF** Woodland Kv= 5.0 fps
1.9	200	0.0650	1.78		**Shallow Concentrated Flow, SCF** Short Grass Pasture Kv= 7.0 fps
0.2	295	0.0300	19.80	79.19	**Channel Flow, curb and gutter flow** Area= 4.0 sf Perim= 4.0' r= 1.00' n= 0.013 Asphalt, smooth
1.7	1,100	0.0345	11.04	19.51	**Pipe Channel, Pipe Flow** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013 Corrugated PE, smooth interior
3.8	955	0.0050	4.20	50.44	**Channel Flow,** Area= 12.0 sf Perim= 12.0' r= 1.00' n= 0.025 Earth, grassed & winding
40.3	3,020	Total			

Subcatchment 1S: DA-1A



Summary for Subcatchment 2S: DA-1B

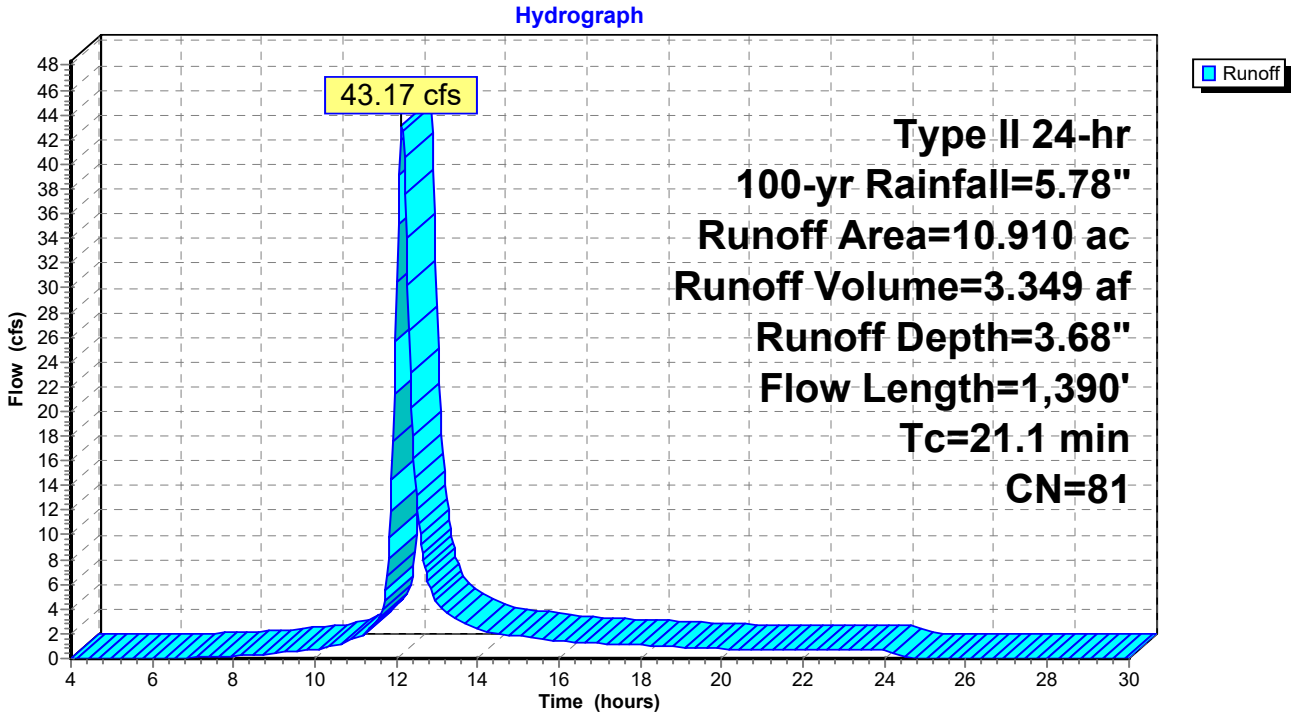
Runoff = 43.17 cfs @ 12.14 hrs, Volume= 3.349 af, Depth= 3.68"
Routed to Pond 2P : Bioretention 2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 4.00-30.01 hrs, dt= 0.03 hrs
Type II 24-hr 100-yr Rainfall=5.78"

Area (ac)	CN	Description
0.710	98	Paved parking, HSG D
0.340	98	Unconnected roofs, HSG D
7.820	80	>75% Grass cover, Good, HSG D
2.040	77	Woods, Good, HSG D
10.910	81	Weighted Average
9.860		90.38% Pervious Area
1.050		9.62% Impervious Area
0.340		32.38% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.6	100	0.0600	0.16		**Sheet Flow, SHEET FLOW** Grass: Dense n= 0.240 P2= 2.39"
4.6	410	0.0900	1.50		**Shallow Concentrated Flow, SCF** Woodland Kv= 5.0 fps
5.6	710	0.0920	2.12		**Shallow Concentrated Flow, SCF** Short Grass Pasture Kv= 7.0 fps
0.3	170	0.0200	9.55	76.42	**Channel Flow, swale flow** Area= 8.0 sf Perim= 8.0' r= 1.00' n= 0.022 Earth, clean & straight
21.1	1,390	Total			

Subcatchment 2S: DA-1B



Summary for Subcatchment 3S: DA-1C

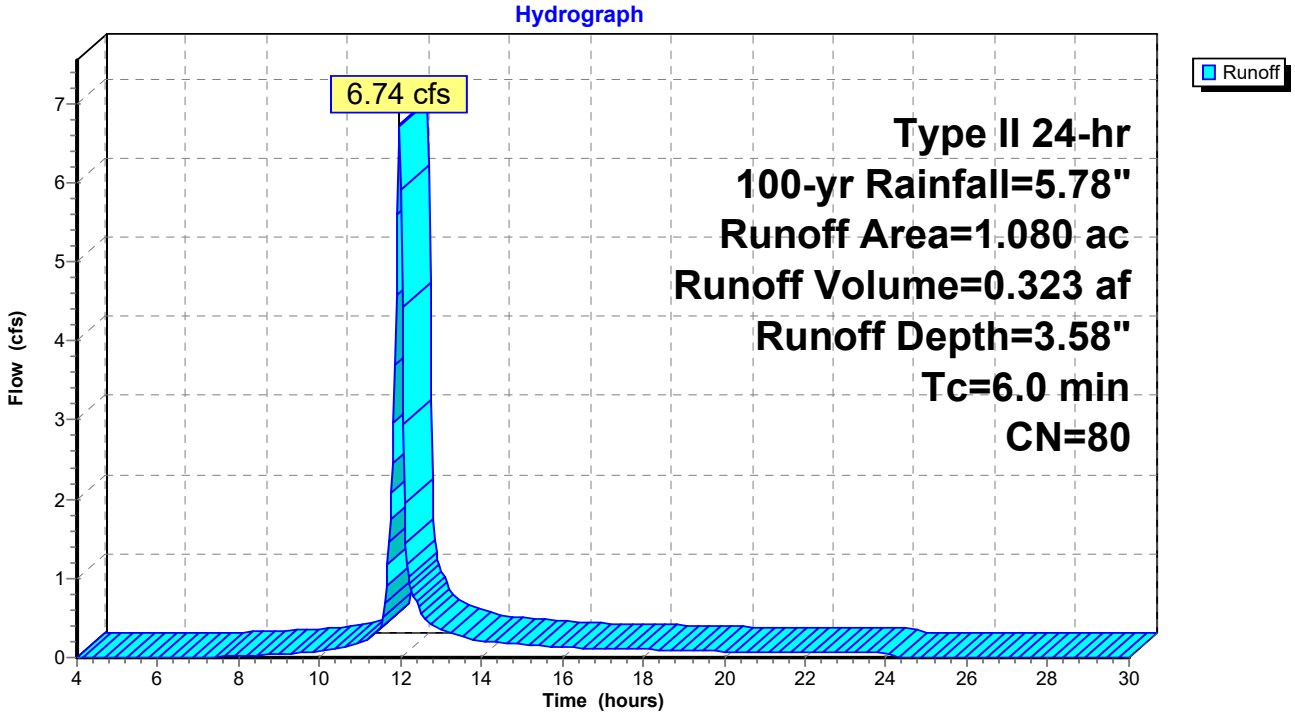
Runoff = 6.74 cfs @ 11.97 hrs, Volume= 0.323 af, Depth= 3.58"
Routed to Pond 3P : Detention Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 4.00-30.01 hrs, dt= 0.03 hrs
Type II 24-hr 100-yr Rainfall=5.78"

Area (ac)	CN	Description
0.960	80	>75% Grass cover, Good, HSG D
0.120	77	Woods, Good, HSG D
1.080	80	Weighted Average
1.080		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Min TR 55 Value**

Subcatchment 3S: DA-1C



Summary for Subcatchment 4S: DA-1D

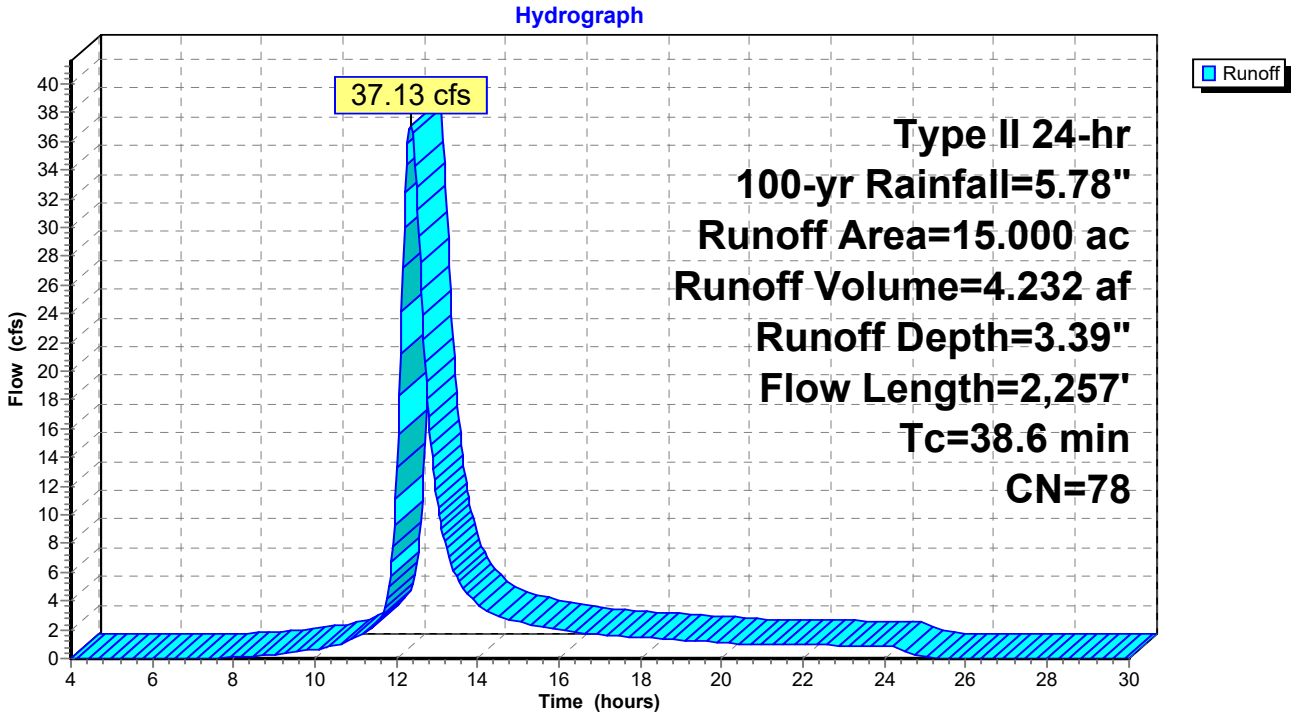
Runoff = 37.13 cfs @ 12.35 hrs, Volume= 4.232 af, Depth= 3.39"
Routed to Reach 1R : Pt of Study 1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 4.00-30.01 hrs, dt= 0.03 hrs
Type II 24-hr 100-yr Rainfall=5.78"

Area (ac)	CN	Description
5.930	80	>75% Grass cover, Good, HSG D
8.910	77	Woods, Good, HSG D
0.160	98	Paved parking, HSG D
15.000	78	Weighted Average
14.840		98.93% Pervious Area
0.160		1.07% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
27.9	100	0.0600	0.06		**Sheet Flow, SHEET FLOW** Woods: Dense underbrush n= 0.800 P2= 2.39"
5.4	485	0.0900	1.50		**Shallow Concentrated Flow, SCF** Woodland Kv= 5.0 fps
4.1	517	0.0900	2.10		**Shallow Concentrated Flow, SCF** Short Grass Pasture Kv= 7.0 fps
1.2	1,155	0.0750	16.28	260.45	**Channel Flow, SWALE** Area= 16.0 sf Perim= 16.0' r= 1.00' n= 0.025 Earth, clean & winding
38.6	2,257	Total			

Subcatchment 4S: DA-1D



Summary for Subcatchment 5S: DA#2

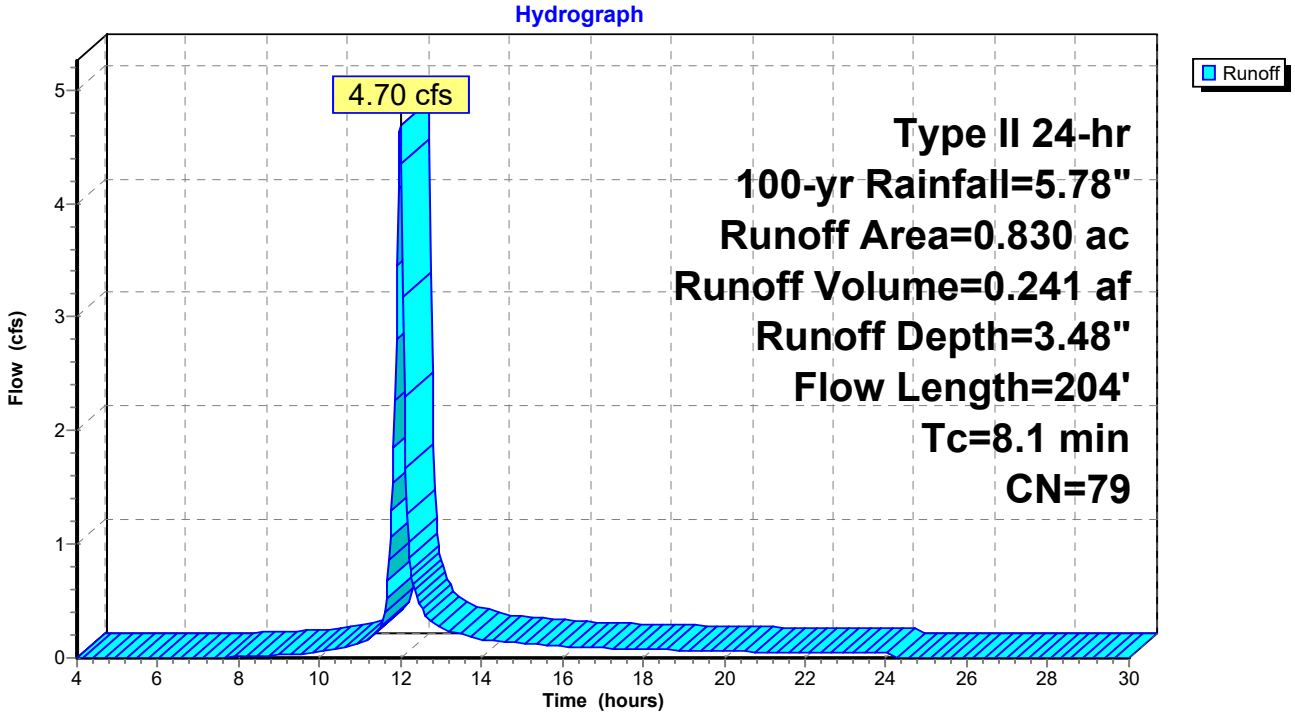
Runoff = 4.70 cfs @ 12.00 hrs, Volume= 0.241 af, Depth= 3.48"
Routed to Reach 2R : Pt of Study 2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 4.00-30.01 hrs, dt= 0.03 hrs
Type II 24-hr 100-yr Rainfall=5.78"

Area (ac)	CN	Description
0.690	80	>75% Grass cover, Good, HSG D
0.140	77	Woods, Good, HSG D
0.830	79	Weighted Average
0.830		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.4	100	0.1500	0.23		**Sheet Flow, SHEET FLOW** Grass: Dense n= 0.240 P2= 2.39"
0.7	104	0.1300	2.52		**Shallow Concentrated Flow, SCF** Short Grass Pasture Kv= 7.0 fps
8.1	204	Total			

Subcatchment 5S: DA#2



Summary for Subcatchment 6S: DA#3A

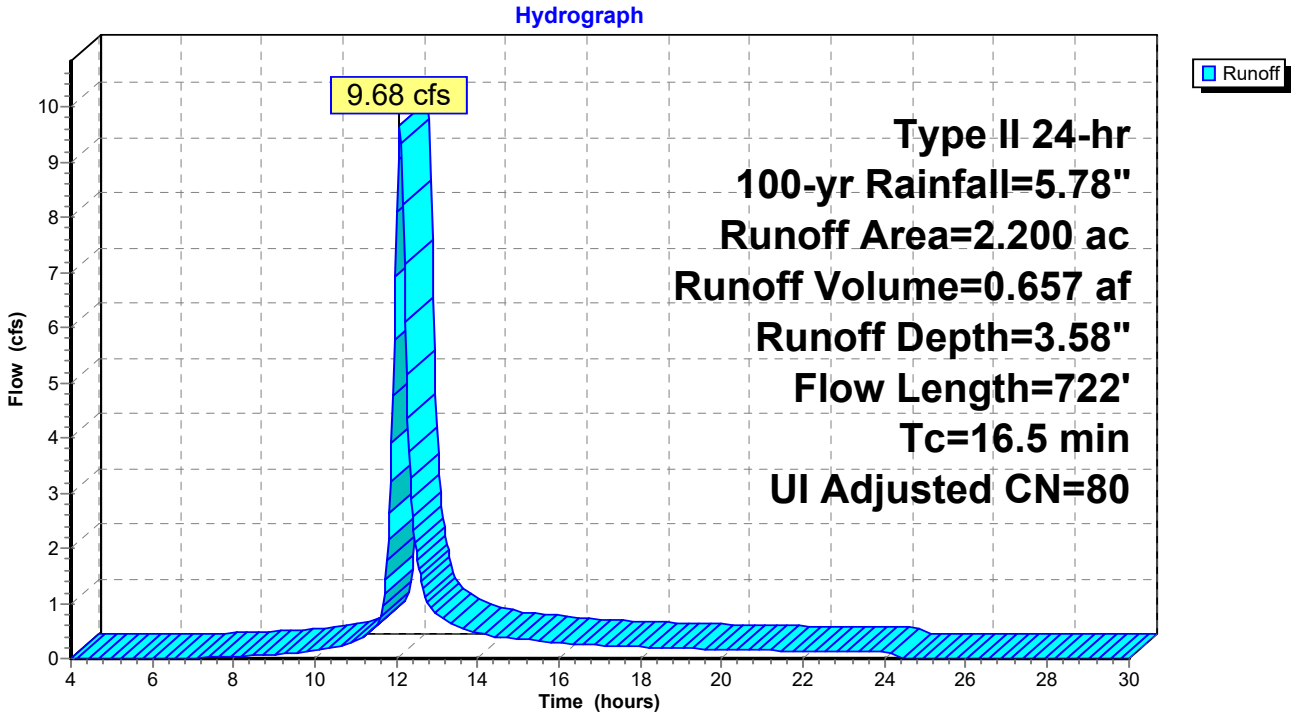
Runoff = 9.68 cfs @ 12.08 hrs, Volume= 0.657 af, Depth= 3.58"
Routed to Reach 5R : Drainage Ditch

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 4.00-30.01 hrs, dt= 0.03 hrs
Type II 24-hr 100-yr Rainfall=5.78"

Area (ac)	CN	Adj	Description
0.920	80		>75% Grass cover, Good, HSG D
0.180	98		Paved parking, HSG D
0.070	98		Unconnected roofs, HSG D
1.030	77		Woods, Good, HSG D
2.200	81	80	Weighted Average, UI Adjusted
1.950			88.64% Pervious Area
0.250			11.36% Impervious Area
0.070			28.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.9	100	0.0450	0.14		**Sheet Flow, SHEET FLOW** Grass: Dense n= 0.240 P2= 2.39"
2.5	188	0.0650	1.27		**Shallow Concentrated Flow, SCF** Woodland Kv= 5.0 fps
1.9	202	0.0650	1.78		**Shallow Concentrated Flow, SCF** Short Grass Pasture Kv= 7.0 fps
0.2	232	0.0220	16.95	50.86	**Channel Flow, curb flow** Area= 3.0 sf Perim= 3.0' r= 1.00' n= 0.013 Asphalt, smooth
16.5	722	Total			

Subcatchment 6S: DA#3A



Summary for Subcatchment 7S: DA#3B

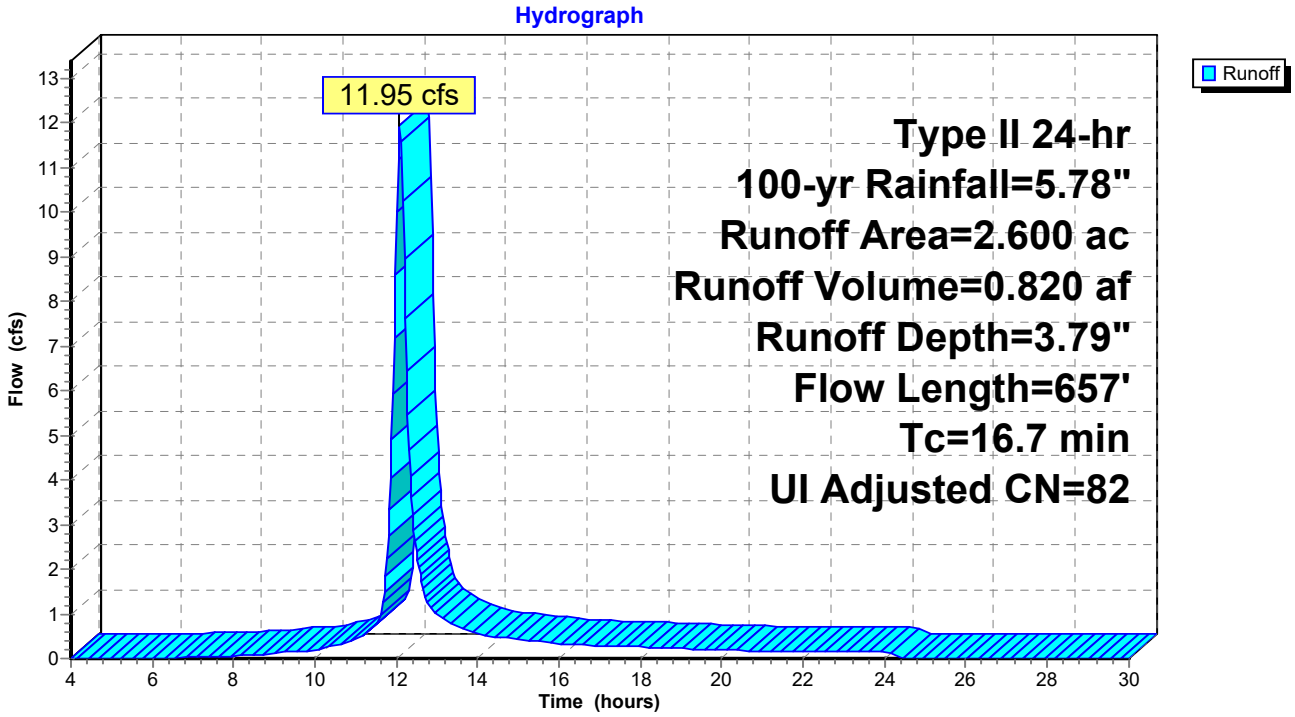
Runoff = 11.95 cfs @ 12.09 hrs, Volume= 0.820 af, Depth= 3.79"
Routed to Reach 3R : Pt of Study 3

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 4.00-30.01 hrs, dt= 0.03 hrs
Type II 24-hr 100-yr Rainfall=5.78"

Area (ac)	CN	Adj	Description
2.230	80		>75% Grass cover, Good, HSG D
0.230	98		Paved parking, HSG D
0.140	98		Unconnected roofs, HSG D
2.600	83	82	Weighted Average, UI Adjusted
2.230			85.77% Pervious Area
0.370			14.23% Impervious Area
0.140			37.84% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.4	100	0.0500	0.15		**Sheet Flow, SHEET FLOW** Grass: Dense n= 0.240 P2= 2.39"
5.1	475	0.0500	1.57		**Shallow Concentrated Flow, SCF** Short Grass Pasture Kv= 7.0 fps
0.2	82	0.0200	6.42	5.04	**Pipe Channel, pipe flow** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013 Corrugated PE, smooth interior
16.7	657	Total			

Subcatchment 7S: DA#3B

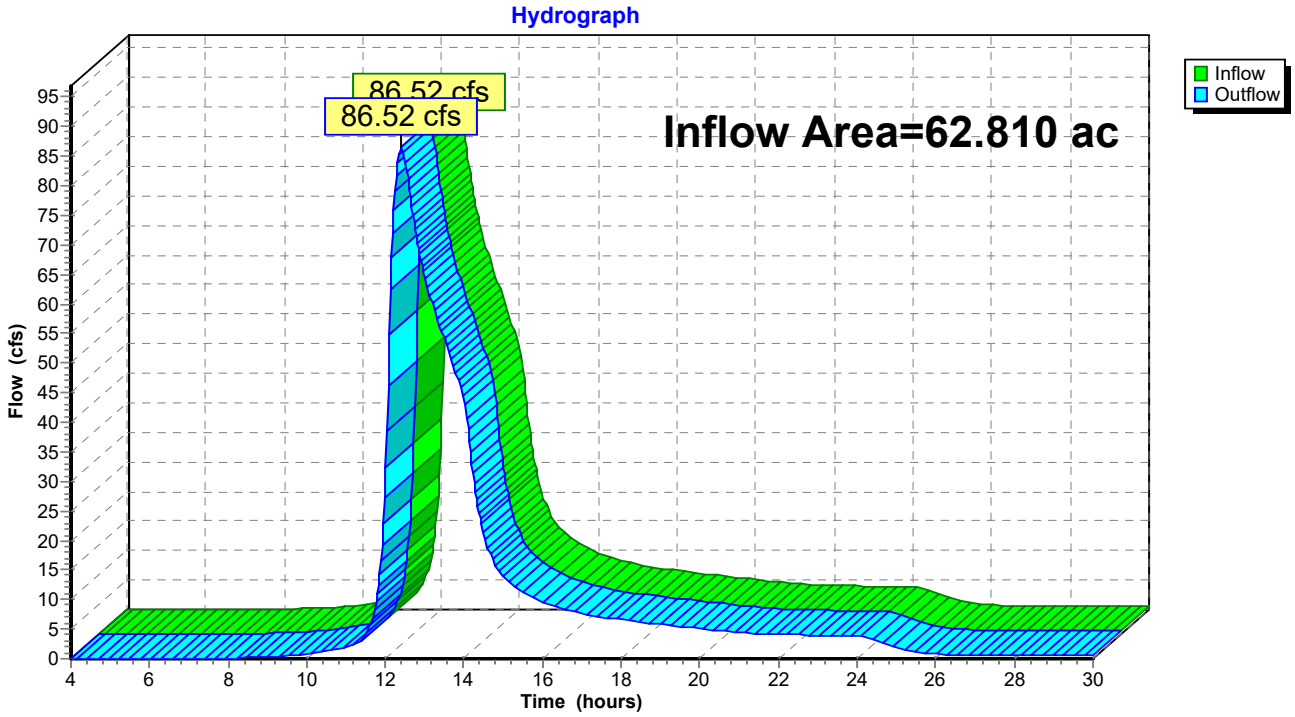


Summary for Reach 1R: Pt of Study 1

Inflow Area = 62.810 ac, 8.28% Impervious, Inflow Depth > 3.51" for 100-yr event
Inflow = 86.52 cfs @ 12.40 hrs, Volume= 18.359 af
Outflow = 86.52 cfs @ 12.40 hrs, Volume= 18.359 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 4.00-30.01 hrs, dt= 0.03 hrs

Reach 1R: Pt of Study 1

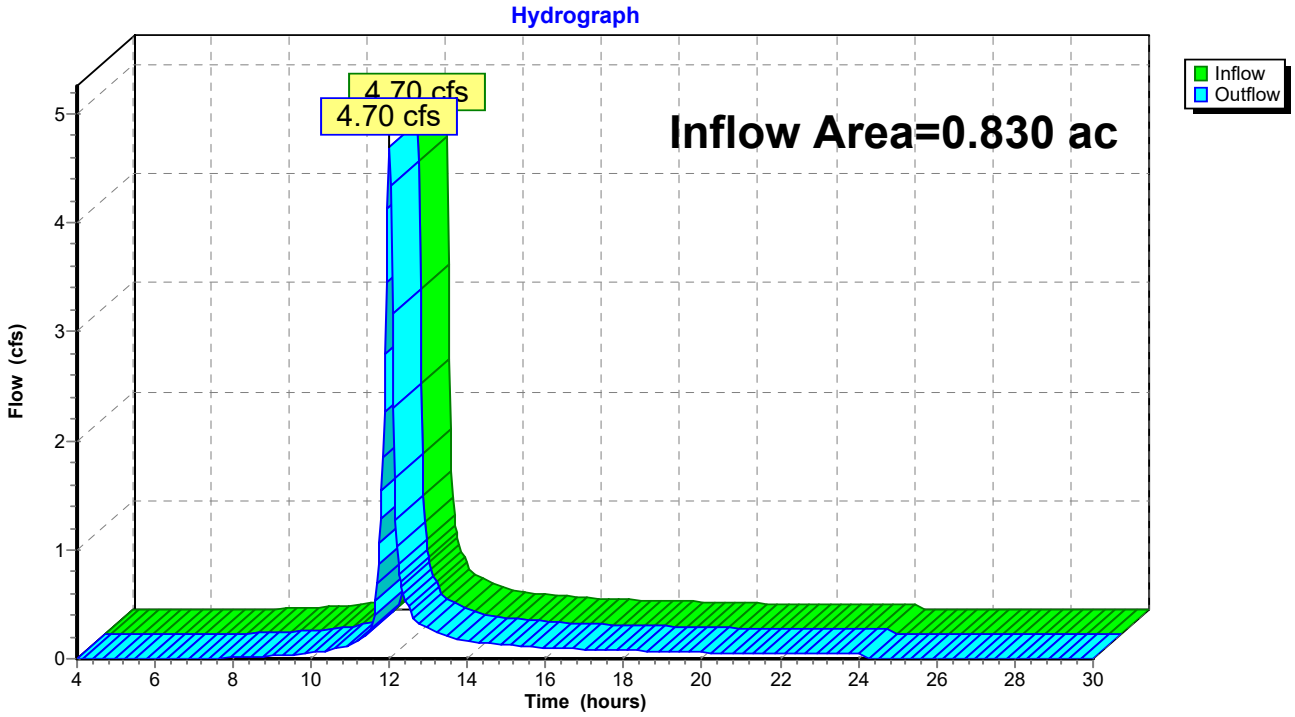


Summary for Reach 2R: Pt of Study 2

Inflow Area = 0.830 ac, 0.00% Impervious, Inflow Depth = 3.48" for 100-yr event
Inflow = 4.70 cfs @ 12.00 hrs, Volume= 0.241 af
Outflow = 4.70 cfs @ 12.00 hrs, Volume= 0.241 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 4.00-30.01 hrs, dt= 0.03 hrs

Reach 2R: Pt of Study 2

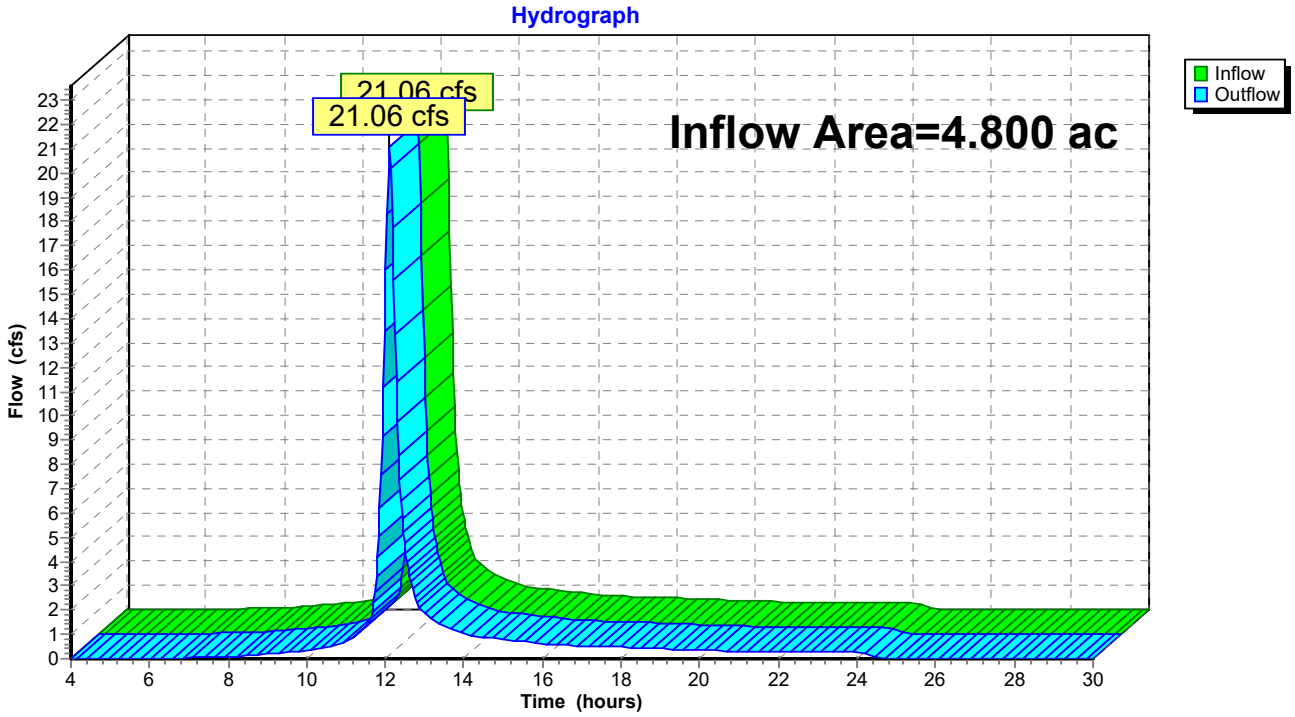


Summary for Reach 3R: Pt of Study 3

Inflow Area = 4.800 ac, 12.92% Impervious, Inflow Depth = 3.69" for 100-yr event
Inflow = 21.06 cfs @ 12.11 hrs, Volume= 1.477 af
Outflow = 21.06 cfs @ 12.11 hrs, Volume= 1.477 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 4.00-30.01 hrs, dt= 0.03 hrs

Reach 3R: Pt of Study 3



Summary for Reach 5R: Drainage Ditch

Inflow Area = 2.200 ac, 11.36% Impervious, Inflow Depth = 3.58" for 100-yr event
Inflow = 9.68 cfs @ 12.08 hrs, Volume= 0.657 af
Outflow = 9.54 cfs @ 12.14 hrs, Volume= 0.657 af, Atten= 1%, Lag= 3.2 min
Routed to Reach 3R : Pt of Study 3

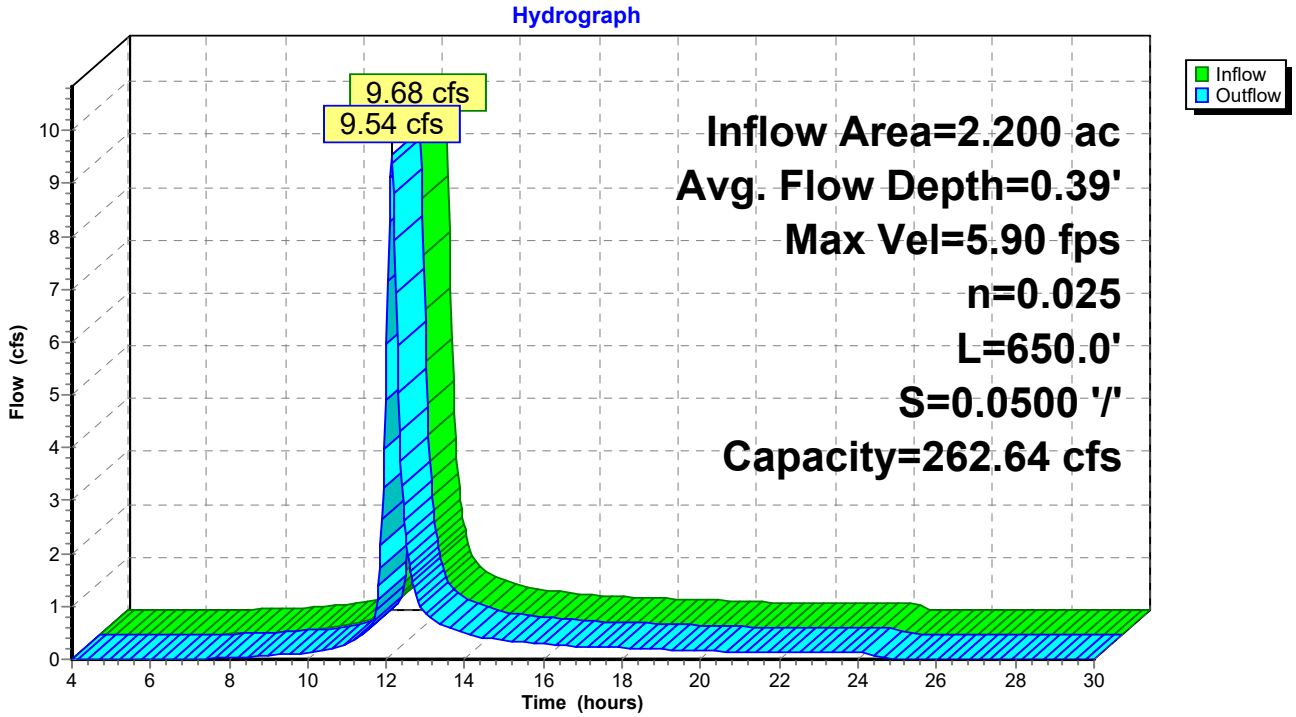
Routing by Stor-Ind+Trans method, Time Span= 4.00-30.01 hrs, dt= 0.03 hrs
Max. Velocity= 5.90 fps, Min. Travel Time= 1.8 min
Avg. Velocity = 1.66 fps, Avg. Travel Time= 6.5 min

Peak Storage= 1,050 cf @ 12.11 hrs
Average Depth at Peak Storage= 0.39' , Surface Width= 5.33'
Bank-Full Depth= 2.00' Flow Area= 18.0 sf, Capacity= 262.64 cfs

3.00' x 2.00' deep channel, n= 0.025 Earth, clean & straight
Side Slope Z-value= 3.0 '/' Top Width= 15.00'
Length= 650.0' Slope= 0.0500 '/'
Inlet Invert= 0.00', Outlet Invert= -32.50'

‡

Reach 5R: Drainage Ditch



Summary for Pond 1P: Bioretention 1

Inflow Area = 35.820 ac, 11.14% Impervious, Inflow Depth = 3.68" for 100-yr event
Inflow = 93.70 cfs @ 12.37 hrs, Volume= 10.996 af
Outflow = 100.01 cfs @ 12.37 hrs, Volume= 10.840 af, Atten= 0%, Lag= 0.2 min
Primary = 100.01 cfs @ 12.37 hrs, Volume= 10.840 af
Routed to Pond 3P : Detention Basin

Routing by Stor-Ind method, Time Span= 4.00-30.01 hrs, dt= 0.03 hrs
Peak Elev= 873.55' @ 12.37 hrs Surf.Area= 16,700 sf Storage= 14,540 cf

Plug-Flow detention time= 17.9 min calculated for 10.828 af (98% of inflow)
Center-of-Mass det. time= 9.4 min (851.1 - 841.8)

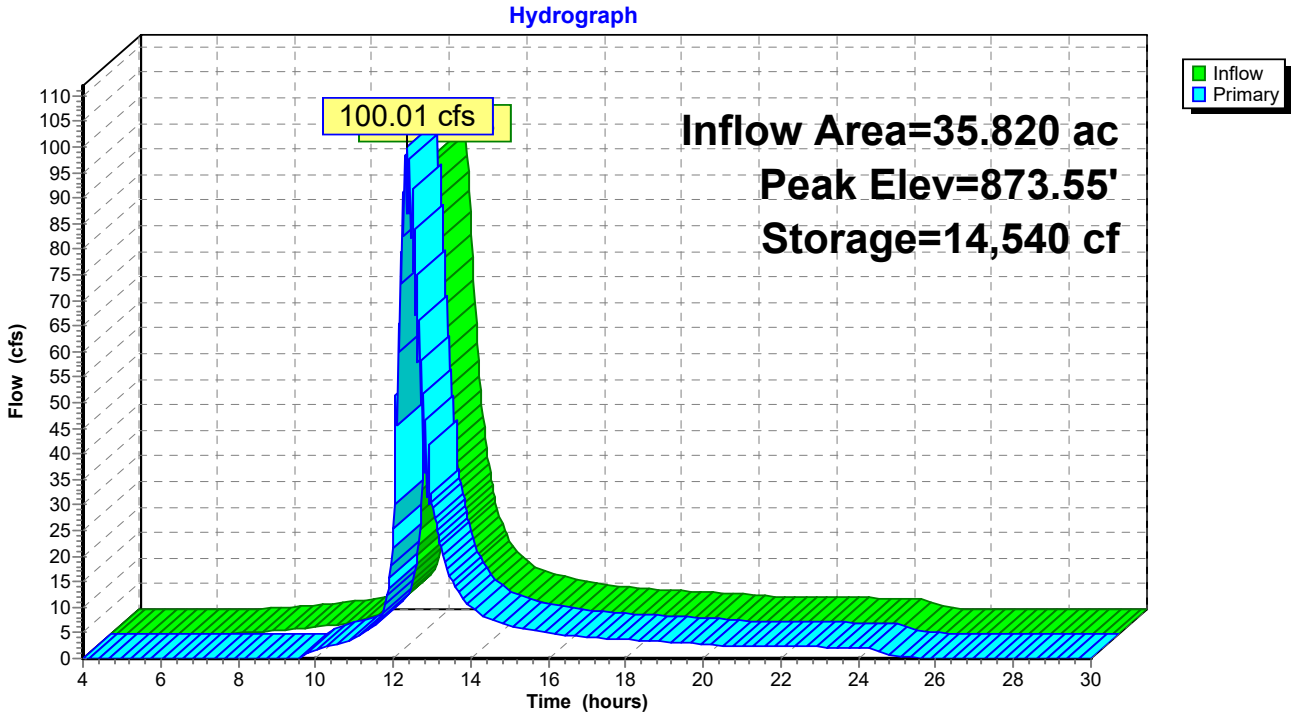
Volume	Invert	Avail.Storage	Storage Description
#1	872.00'	14,540 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
872.00	12,800	0	0
872.50	14,330	6,783	6,783
873.00	16,700	7,758	14,540

Device	Routing	Invert	Outlet Devices
#1	Primary	872.50'	**15.0' long + 3.0 '/' SideZ x 15.0' breadth Broad-Crested Rectangular Weir X 2**
			Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60
			Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=99.97 cfs @ 12.37 hrs HW=873.55' (Free Discharge)
└**1=Broad-Crested Rectangular Weir** (Weir Controls 99.97 cfs @ 2.61 fps)

Pond 1P: Bioretention 1



Summary for Pond 2P: Bioretention 2

Inflow Area = 10.910 ac, 9.62% Impervious, Inflow Depth = 3.68" for 100-yr event
Inflow = 43.17 cfs @ 12.14 hrs, Volume= 3.349 af
Outflow = 46.72 cfs @ 12.13 hrs, Volume= 3.263 af, Atten= 0%, Lag= 0.0 min
Primary = 46.72 cfs @ 12.13 hrs, Volume= 3.263 af
Routed to Pond 3P : Detention Basin

Routing by Stor-Ind method, Time Span= 4.00-30.01 hrs, dt= 0.03 hrs
Peak Elev= 883.15' @ 12.13 hrs Surf.Area= 10,300 sf Storage= 8,493 cf

Plug-Flow detention time= 27.3 min calculated for 3.260 af (97% of inflow)
Center-of-Mass det. time= 12.1 min (836.1 - 824.0)

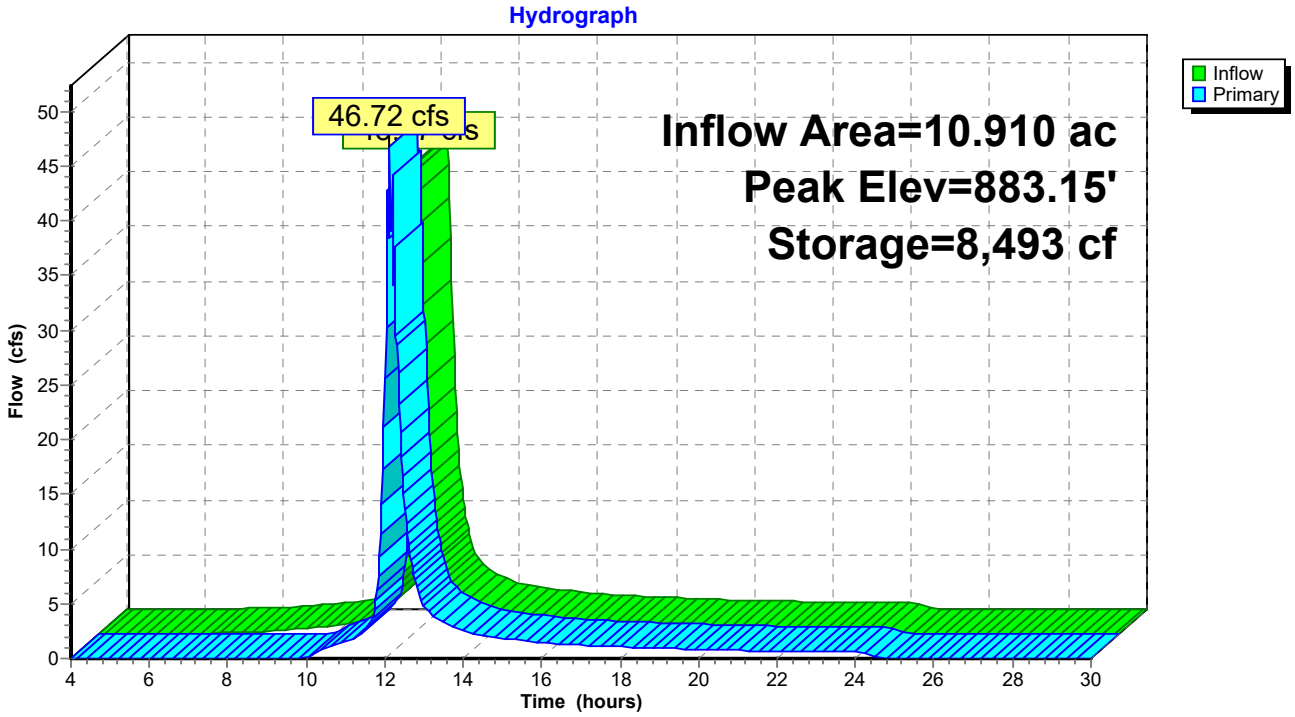
Volume	Invert	Avail.Storage	Storage Description
#1	882.00'	8,493 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
882.00	6,200	0	0
882.50	8,735	3,734	3,734
883.00	10,300	4,759	8,493

Device	Routing	Invert	Outlet Devices
#1	Primary	882.50'	**15.0' long + 3.0 '/' SideZ x 15.0' breadth Broad-Crested Rectangular Weir X 2**
			Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60
			Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=46.55 cfs @ 12.13 hrs HW=883.15' (Free Discharge)
└**1=Broad-Crested Rectangular Weir** (Weir Controls 46.55 cfs @ 2.11 fps)

Pond 2P: Bioretention 2



Summary for Pond 3P: Detention Basin

Inflow Area = 47.810 ac, 10.54% Impervious, Inflow Depth = 3.62" for 100-yr event
Inflow = 129.58 cfs @ 12.25 hrs, Volume= 14.426 af
Outflow = 54.55 cfs @ 12.77 hrs, Volume= 14.128 af, Atten= 58%, Lag= 31.3 min
Primary = 54.55 cfs @ 12.77 hrs, Volume= 14.128 af
Routed to Reach 1R : Pt of Study 1
Secondary = 0.00 cfs @ 4.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 4.00-30.01 hrs, dt= 0.03 hrs
Peak Elev= 871.60' @ 12.77 hrs Surf.Area= 32,177 sf Storage= 187,465 cf

Plug-Flow detention time= 67.5 min calculated for 14.111 af (98% of inflow)
Center-of-Mass det. time= 55.2 min (902.1 - 846.9)

Volume	Invert	Avail.Storage	Storage Description
#1	861.80'	235,158 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

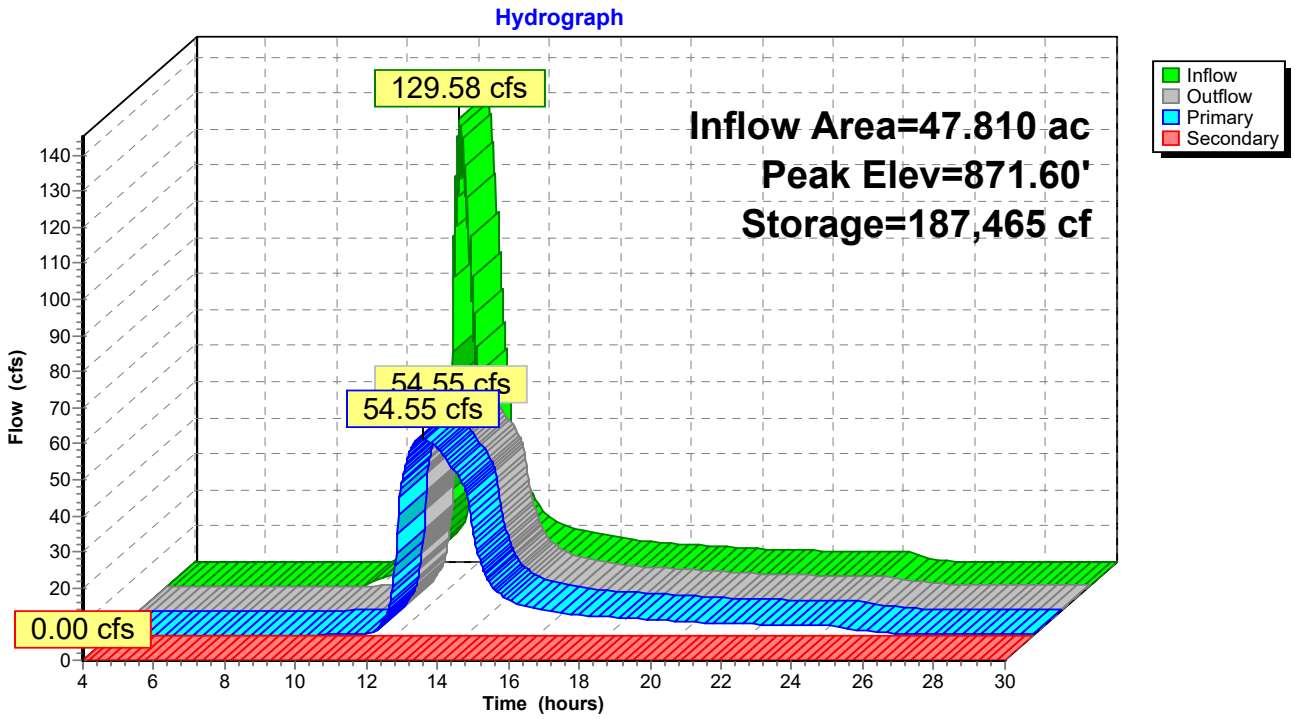
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
861.80	1,260	0	0
862.00	2,891	415	415
863.00	6,366	4,629	5,044
864.00	11,515	8,941	13,984
865.00	16,570	14,043	28,027
866.00	18,777	17,674	45,700
867.00	21,040	19,909	65,609
868.00	23,360	22,200	87,809
869.00	25,736	24,548	112,357
870.00	28,169	26,953	139,309
871.00	30,658	29,414	168,723
872.00	33,204	31,931	200,654
873.00	35,805	34,505	235,158

Device	Routing	Invert	Outlet Devices
#1	Secondary	872.00'	**30.0' long x 12.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.57 2.62 2.70 2.67 2.66 2.67 2.66 2.64
#2	Primary	861.80'	**30.0" Round Culvert** L= 98.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 861.80' / 857.00' S= 0.0490 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 4.91 sf
#3	Device 2	861.80'	**4.0" Vert. Orifice1** C= 0.600 Limited to weir flow at low heads
#4	Device 2	864.60'	**30.0" W x 30.0" H Vert. Orifice2** C= 0.600 Limited to weir flow at low heads
#5	Device 2	869.00'	**36.0" x 36.0" Horiz. Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=54.55 cfs @ 12.77 hrs HW=871.59' (Free Discharge)
└─**2=Culvert** (Inlet Controls 54.55 cfs @ 11.11 fps)
  ├─**3=Orifice1** (Passes < 1.30 cfs potential flow)
  ├─**4=Orifice2** (Passes < 71.99 cfs potential flow)
  └─**5=Grate** (Passes < 69.81 cfs potential flow)

Secondary OutFlow Max=0.00 cfs @ 4.00 hrs HW=861.80' (Free Discharge)
└─**1=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 3P: Detention Basin



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APPENDIX C: SOIL DESCRIPTIONS

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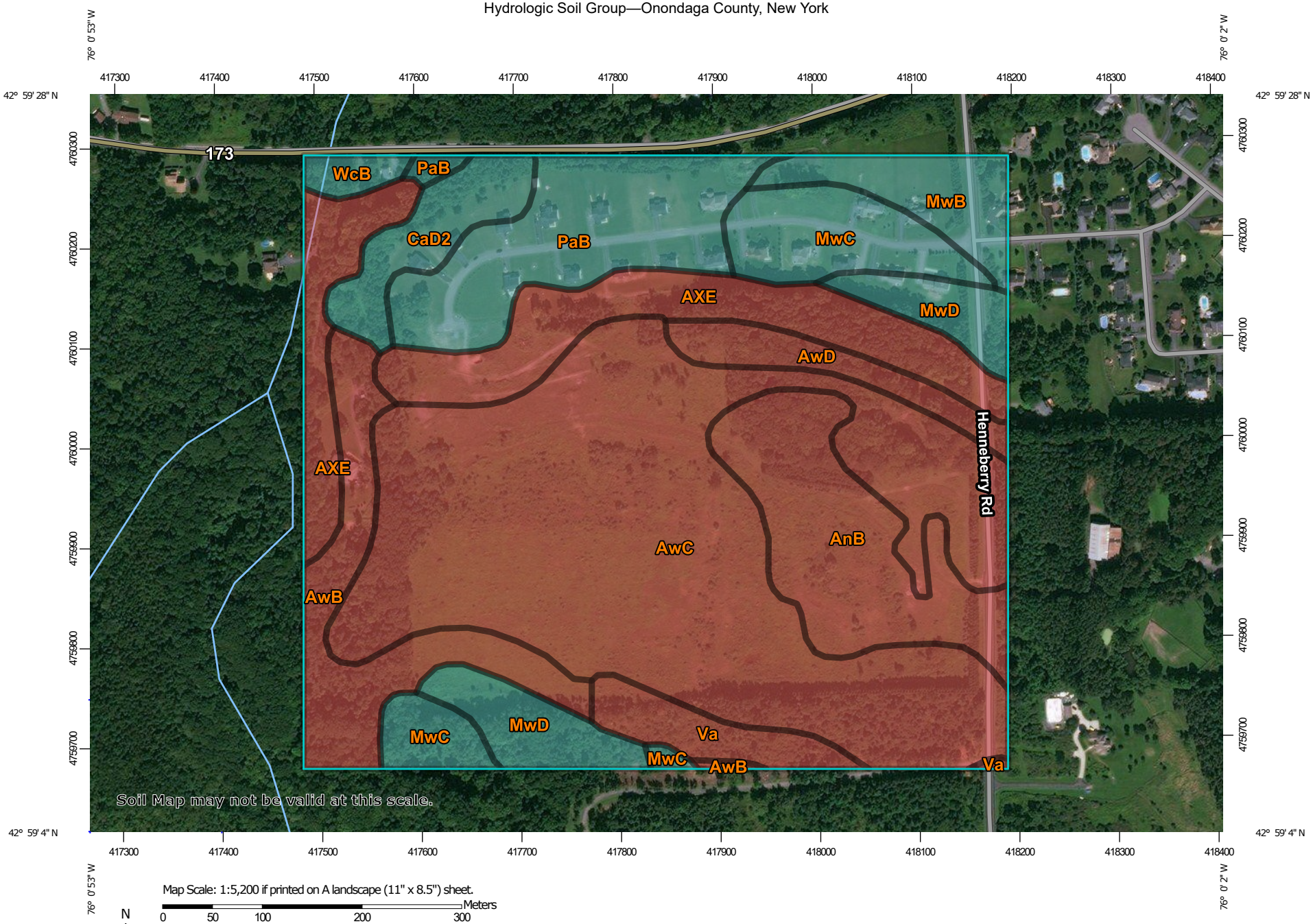
Hydrologic Soil Group—Onondaga County, New York



Map Scale: 1:5,200 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0 50 100 200 300

Feet: 0 250 500 1000 1500

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

MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Rating Polygons

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Lines

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Points

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Water Features

Streams and Canals

Transportation

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

Background

Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

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

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

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

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

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

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

Soil Survey Area: Onondaga County, New York
Survey Area Data: Version 15, Jun 11, 2020

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

Date(s) aerial images were photographed: Jun 18, 2011—Oct 10, 2016

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

Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
AnB	Angola-Darien silt loams, 0 to 6 percent slopes	D	10.0	9.3%
AwB	Aurora silt loam, 0 to 6 percent slopes	D	7.7	7.1%
AwC	Aurora silt loam, 6 to 12 percent slopes	D	41.7	38.7%
AwD	Aurora silt loam, 12 to 18 percent slopes	D	2.9	2.7%
AXE	Aurora-Farmington-Rock outcrop association, steep	D	12.5	11.6%
CaD2	Camillus silt loam, 12 to 18 percent slopes eroded	C	3.7	3.4%
MwB	Mohawk silt loam, 2 to 8 percent slopes	C	3.7	3.4%
MwC	Mohawk silt loam, 8 to 15 percent slopes	C	6.6	6.1%
MwD	Mohawk silt loam, 15 to 25 percent slopes	C	5.3	4.9%
PaB	Palatine shaly silt loam, 2 to 6 percent slopes	C	9.9	9.2%
Va	Varick silt loam	D	2.9	2.6%
WcB	Wassaic silt loam, 0 to 8 percent slopes	C	0.9	0.9%
Totals for Area of Interest			**107.8**	**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.

Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

APPENDIX D: BIORETENTION BASIN CONSTRUCTION AND MAINTENANCE

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NEW YORK STATE OF OPPORTUNITY | Department of Environmental Conservation

Bioretention Stormwater Management Practices
Level 1 Inspection Checklist

SMP ID #		**SMP Owner**		☐ Private ☐ Public
SMP Location (Address; Latitude & Longitude)				
	Latitude		**Longitude**	

Party Responsible for Maintenance	**System Type**		**Type of Site**
☐ Same as SMP Owner ☐ Other _____	☐ Seasonal ☐ Continuous Use ☐ Other	☐ Above Ground ☐ Below Ground	☐ Commercial ☐ Industrial ☐ Residential ☐ State

Inspection Date		**Inspection Time**	
Inspector			
Date of Last Inspection			

BR Drainage Area

Look for areas that are uphill from the Bioretention cell.

Problem (Check if Present)	**Follow-Up Actions**
 ☐ Bare soil, erosion of the ground (rills washing out the dirt)	☐ Seed and mulch areas of bare soil to establish vegetation. ☐ Fill in erosion areas with soil, compact, and seed and straw to establish vegetation. ☐ If a rill or small channel is forming, try to redirect water flowing to this area by creating a small berm or adding topsoil to areas that are heavily compacted. ☐ Other:

BR Drainage Area

Look for areas that are uphill from the Bioretention cell.

Problem (Check if Present)	Follow-Up Actions
	☐ Kick-Out to Level 2 Inspection: Large areas of soil have been eroded, or larger channels are forming. May require rerouting of flow paths.
☐ Piles of grass clippings, mulch, dirt, salt, or other materials	☐ Remove or cover piles of grass clippings, mulch, dirt, etc. ☐ Other:
☐ Open containers of oil, grease, paint, or other substances	☐ Cover or properly dispose of materials; consult your local solid waste authority for guidance on materials that may be toxic or hazardous. ☐ Other:

BR Inlets

Stand in the Bioretention cell itself and look for all the places where water flows in. Often there will be multiple points of inflow to the practice.

Problem (Check if Present)	Follow-Up Actions
 ☐ Inlets collect grit and debris or grass/weeds. Some water may not be getting into the Bioretention cell. The objective is to have a clear pathway for water to flow into the cell.	☐ Use a flat shovel to remove grit and debris (especially at curb inlets or openings). Parking lots generate fine grit that will accumulate at these spots. ☐ Pull out clumps of growing grass or weeds and scoop out the soil or grit that the plants are growing in. ☐ Remove any grass clippings, leaves, sticks, and other debris that is collecting at inlets. ☐ For pipes and ditches, remove sediment and debris that is partially blocking the pipe or ditch opening where it enters the Bioretention cell. ☐ Dispose of all material properly where it will not re-enter the Bioretention cell. ☐ Other: ☐ Kick-Out to Level 2 Inspection: Inlets are blocked to the extent that most of the water does not seem to be entering the Bioretention cell.
 ☐ Some or all of the inlets are eroding so that rills, gullies, and other erosion is present, or there is bare dirt that is washing into the Bioretention cell.	☐ For small areas of erosion, smooth out the eroded part and apply rock or stone (e.g., river cobble) to prevent further erosion. Usually, filter fabric is placed under the rock or stone. ☐ In some cases, reseeding and applying erosion-control matting can be used to prevent further erosion. Some of these materials may be available at a garden center, but it may be best to consult a landscape contractor. ☐ Other: ☐ Kick-Out to Level 2 Inspection: Erosion is occurring at most of the inlets, and it looks like there is too much water that is concentrating at these points. The inlet design may have to be modified.

BR Ponding Area

Examine the entire Bioretention surface and side slopes

Problem (Check if Present)	Follow-Up Actions
 ☐ Mulch (if used) needs to be replaced or replenished. The mulch layer had decomposed or is less than 1-inch thick.	☐ Add new mulch to a total depth (including any existing mulch that is left) of 2 to 3 inches. The mulch should be shredded hardwood mulch that is less likely to float away during rainstorms. ☐ Avoid adding too much mulch so that inlets are obstructed or certain areas become higher than the rest of the Bioretention surface. ☐ Other:
 ☐ Minor areas of sediment, grit, trash, or other debris are accumulating on the bottom.	☐ Use a shovel to scoop out minor areas of sediment or grit, especially in the spring after winter sanding materials may wash in and accumulate. Dispose of the material where it cannot re-enter the Bioretention cell . ☐ If removing the material creates a hole or low area, fill with soil mix that matches original mix and cover with mulch so that the Bioretention surface area is as flat as possible. ☐ Remove trash, vegetative debris, and other undesirable materials. ☐ Other:
	☐ Kick-Out to Level 2 Inspection: Sediment has accumulated more than 2-inches deep and covers 25% or more of the Bioretention surface. ☐ Kick-Out to Level 2 Inspection: The Bioretention cell is too densely vegetated to assess sediment accumulation or ponding; see BR-4, Vegetation.

BR Ponding Area

Examine the entire Bioretention surface and side slopes

Problem (Check if Present)	Follow-Up Actions
 ☐ There is erosion in the bottom or on the side slopes. Water seems to be carving out rills as it flows across the Bioretention surface or on the slopes, or sinkholes are forming in certain areas. ☐ Source: Stormwater Maintenance, LLC.	☐ Try filling the eroded areas with clean topsoil or sand, and cover with mulch. ☐ If the problem recurs, you may have to use stone (e.g., river cobble) to fill in problem areas. ☐ If the erosion is on a side slope, fill with clay that can be compacted and seed and mulch the area. ☐ Other: ☐ Kick-Out to Level 2 Inspection: The problem persists or the erosion is more than 3-inches deep and seems to be an issue with how water enters and moves through the Bioretention cell. ☐ Kick-Out to Level 2 Inspection: The problem does not seem to be caused by flowing water, but a collapse or sinking of the surface (e.g., “sinkhole”) due to some underground problem.
 ☐ The bottom of the Bioretention cell is not flat, and the water pools at one end, along an edge, or in certain pockets. The whole bottom is not uniformly covered with water. See design plan to verify that bioretention surface is intended to be flat. Check during or immediately after a rainstorm.	☐ If the problem is minor (just small, isolated areas are not covered with water), try raking the surface OR adding mulch to low spots to create a more level surface. You may need to remove and replace plantings in order to properly even off the surface. ☐ Check the surface with a string and bubble level to get the surface as flat as possible. ☐ Other: ☐ Kick-Out to Level 2 Inspection: Ponding water is isolated to less than half of the Bioretention surface area, and there seem to be elevation differences of more than a couple of inches across the surface.

BR Ponding Area

Examine the entire Bioretention surface and side slopes

Problem (Check if Present)	Follow-Up Actions
 ☐ Water stands on the surface more than 72 hours after a rainstorm and /or wetland-type vegetation is present. The Bioretention cell does not appear to be draining properly.	☐ Kick-Out to Level 2 Inspection: This is generally a serious problem, and it will be necessary to activate a Level 2 Inspection.

BR Vegetation

Examine all Bioretention cell vegetation.

Problem (Check if Present)	Follow-Up Actions
 ☐ Vegetation requires regular maintenance—pulling weeds, removing dead and diseased plants, replacing mulch around plants, adding plants to fill in areas that are not well vegetated, etc.	☐ If you can identify which plants are weeds or not intended to be part of the planting plan, eliminate these, preferably by hand pulling. ☐ If weeds are widespread, check with the local stormwater authority and/or Extension Office about proper use of herbicides for areas connected with the flow of water. ☐ Even vegetation that is intended to be present can become large, overgrown, and/or crowd out surrounding plants. Prune and thin accordingly. ☐ If weeds or invasive plants have overtaken the whole Bioretention cell , bush-hog the entire area before seedheads form in the spring. It will be necessary to remove the root mat manually or with appropriate herbicides, as noted above. ☐ Re-plant with species that are aesthetically pleasing and seem to be doing well in the Bioretention cell. ☐ Other: ☐ Kick-Out to Level 2 Inspection: You are unsure of the original planting design, or the vegetation maintenance task is beyond your capabilities of time, expertise, or resources. If you are unsure of the health of the vegetation (e.g. salt damage, invasives, which plants are undesirable) or the appropriate season to conduct vegetation management, consult a landscape professional before undertaking any cutting, pruning, mowing, or brush hogging.

BR Vegetation

Examine all Bioretention cell vegetation.

Problem (Check if Present)	Follow-Up Actions
 ☐ Vegetation is too thin, is not healthy, and there are many spots that are not well vegetated.	☐ The original plants are likely not suited for the actual conditions within the Bioretention cell . If you are knowledgeable about plants, select and plant more appropriate vegetation (preferably native plants) so that almost the entire surface area will be covered by the end of the second growing season. ☐ Other:
	☐ Kick-Out to Level 2 Inspection: For all but small practices (e.g., rain gardens), this task will likely require a landscape design professional or horticulturalist.

BR Outlets

Examine outlets that release water out of the Bioretention cell.

Problem (Check if Present)	Follow-Up Actions
☐ Erosion at outlet	☐ Add stone to reduce the impact from the water flowing out of the outlet pipe or weir during storms. ☐ Other:
	☐ Kick-Out to Level 2 Inspection: Rills have formed and erosion problem becomes more severe.
 ☐ Outlet obstructed with mulch, sediment, debris, trash, etc.	☐ Remove the debris and dispose of it where it cannot re-enter the Bioretention cell . ☐ Other:
	☐ Kick-Out to Level 2 Inspection: Outlet is completely clogged or obstructed; there is too much material to remove by hand or with simple hand tools.

Additional Notes:

Inspector:_____ Date: _____

Complete the following if follow-up/corrective actions were identified during this inspection:

Certified Completion of Follow-Up Actions:

"I hereby certify that the follow-up/corrective actions identified in the inspection performed on _____ (DATE) have been completed and any required maintenance deficiencies have been adequately corrected."

Inspector/Operator: _____ Date: _____

NEW YORK STATE OF OPPORTUNITY | Department of Environmental Conservation

Bioretention Stormwater Management Practices
Level 2 Inspection Checklist

SMP ID #		**SMP Owner**		☐ Private ☐ Public
SMP Location (Address; Latitude & Longitude)				
	Latitude		**Longitude**	

Party Responsible for Maintenance	**System Type**		**Type of Site**
☐ Same as SMP Owner ☐ Other _____	☐ Seasonal ☐ Continuous Use ☐ Other	☐ Above Ground ☐ Below Ground	☐ Commercial ☐ Industrial ☐ Residential ☐ State

Inspection Date		**Inspection Time**	
Inspector			
Date of Last Inspection			

Level 2 Inspection: BIORETENTION
NOTE: Key Source for this Information *(CSN, 2013)*

Recommended Repairs	Triggers for Level 3 Inspection
Observed Condition: Water Stands on Surface for More than 72 Hours after Storm	
☐ Condition 1: Small pockets of standing water Use a soil probe or auger to examine the soil profile. If isolated areas have accumulated grit, fines, or vegetative debris or have bad soil media, try scraping off top 3 inches of media and replacing with clean material. Also check to see that surface is level and water is not ponding selectively in certain areas. ☐ Condition 2: Standing water is widespread or covers entire surface Requires diagnosis and resolution of problem: • Clogged underdrain? • Filter fabric between soil media and underdrain stone? • Need to install underdrain if not present? • Too much sediment/grit washing in from drainage area? • Too much ponding depth? • Improper soil media?	• Soil media is clogged and problem is not evident from Level 2 inspection. • Level 2 inspection identifies problem, but it cannot be resolved easily or is associated with the original design of the practice. ☐ Level 3 inspection necessary
Observed Condition: Vegetation is sparse or out of control	
☐ Condition 1: Original design planting plan seems good but has not been maintained, so there are many invasives and/or dead plants Will require some horticultural experience to restore vegetation to intended condition by weeding, pruning, removing plants, and adding new plants. ☐ Condition 2: Original design planting plan is unknown or cannot be actualized A landscape architect or horticulturalist will be needed to redo the planting plan. Will likely require analysis of soil pH, moisture, organic content, sun/shade, and other conditions to make sure plants match conditions. Plan should include invasive plant management and maintenance plan to include mulching, watering, disease intervention, periodic thinning/pruning, etc.	• Vegetation deviates significantly from original planting plan; Bioretention has been neglected and suffered from deferred maintenance. • Owner/responsible party does not know how to maintain the practice. ☐ Level 3 inspection necessary
Observed Condition: Bioretention does not conform to original design plan in surface area or storage	
☐ Condition 1: Level 2 Inspection reveals that practice is too small based on design dimension, does not have adequate storage (e.g., ponding depth) based on the plan, and/or does not treat the drainage area runoff as indicated on the plan Small areas of deviation can be corrected by the property owner or responsible party, but it is likely that a Qualified Professional will have to revisit the design and attempt a redesign that meets original objectives or that can be resubmitted to the municipality for approval.	• More than a 25% departure from the approved plan in surface area, storage, or drainage area; sometimes less than this threshold at the discretion of the Level 2 inspector. ☐ Level 3 inspection necessary

Level 2 Inspection: BIORETENTION
NOTE: Key Source for this Information *(CSN, 2013)*

Recommended Repairs	Triggers for Level 3 Inspection
Observed Condition: Severe erosion of filter bed, inlets, or around outlets	
☐ Condition 1: Erosion at inlets The lining (e.g., grass, matting, stone, rock) may not be adequate for the actual flow velocities coming through the inlets. First line of defense is to try a more non-erosive lining and/or to extend the lining further down to where inlet slopes meet the Bioretention surface. If problem persists, analysis by a Qualified Professional is warranted. ☐ Condition 2: Erosion of Bioretention filter bed This is often caused by "preferential flow paths" through and along the Bioretention surface. The source of flow should be analyzed and methods employed to dissipate energy and disperse the flow (e.g., check dams, rock splash pads). ☐ Condition 3: Erosion on side slopes Again, the issue is likely linked with unanticipated flow paths down the side slopes (probably overland flow that concentrates as it hits the edge of the slope). For small or isolated areas, try filling, compacting, and re-establishing healthy ground cover vegetation. If the problem is more widespread, further analysis is required to determine how to redirect the flow.	• Erosion (rills, gullies) is more than 12 inches deep at inlets or the filter bed or more than 3 inches deep on side slopes. • If the issue is not caused by moving water but some sort of subsurface defect. This may manifest as a sinkhole or linear depression and be associated with problems with the underdrain stone or pipe or underlying soil. ☐ Level 3 inspection necessary
Observed Condition: Significant sediment accumulation, indicating an uncontrolled source of sediment	
☐ Condition 1: Isolated areas of sediment accumulation, generally less than 3-inches deep Sediment source may be from a one-time or isolated event. Remove accumulated sediment and top 2 to 3 inches of Bioretention soil media; replace with clean material. Check drainage area for any ongoing sources of sediment. ☐ Condition 2: Majority of the surface is caked with "hard pan" (thin layer of clogging material) or accumulated sediment that is 3-inches deep or more This can be caused by an improper construction sequence (drainage area not fully stabilized prior to installation of Bioretention soil media) or another chronic source of sediment in the drainage area. Augering several holes down through the media can indicate how severe the problem is; often the damage is confined to the first several inches of soil media. Removing and replacing this top layer (or to the depth where sediment incursion is seen in auger holes) can be adequate, as long as the problem does not recur.	• More than 2 inches of accumulated sediment cover 25% or more of the Bioretention surface area. • "Hard pan" of thin, crusty layer covers majority of Bioretention surface area and seems to be impeding flow of water down through the soil media. • New sources of sediment seem to be accumulating with each significant rainfall event. ☐ Level 3 inspection necessary

Notes:

Inspector:_____ Date: _____

Complete the following if follow-up/corrective actions were identified during this inspection:

Certified Completion of Follow-Up Actions:

"I hereby certify that the follow-up/corrective actions identified in the inspection performed on _____ (DATE) have been completed and any required maintenance deficiencies have been adequately corrected."

Inspector/Operator: _____ Date: _____

NEW YORK STATE OF OPPORTUNITY | Department of Environmental Conservation

Pond and Wetland Stormwater Management Practices Level 1 Inspection Checklist

SMP ID #		**SMP Owner**		☐ Private ☐ Public
SMP Location (Address; Latitude & Longitude)				
	Latitude		**Longitude**	

Party Responsible for Maintenance	**System Type**		**Type of Site**
☐ Same as SMP Owner ☐ Other _____	☐ Seasonal ☐ Continuous Use ☐ Other	☐ Above Ground ☐ Below Ground	☐ Commercial ☐ Industrial ☐ Residential ☐ State

Inspection Date		**Inspection Time**	
Inspector			
Date of Last Inspection			

PW Drainage Area

Look for areas that are uphill from the pond.

Problem (Check if Present)	**Follow-Up Actions**
☐ Bare soil, erosion of the ground (rills washing out the dirt)	☐ Seed and straw areas of bare soil to establish vegetation. ☐ Fill in eroded areas with soil, compact, seed and mulch with straw to establish vegetation. ☐ Other:

☐ Bare soil, erosion of the ground (rills washing out the dirt)	☐ Kick-Out to Level 2 Inspection: If a rill or small channel is forming, try to redirect water flowing to this area by creating a small berm or adding topsoil to areas that are heavily compacted. ☐ If large areas of soil have been eroded or larger channels are forming, this may require rerouting of flow paths or use of an erosion-control seed mat or blanket to reestablish acceptable ground cover or anchor sod where it is practical.
☐ Piles of grass clippings, mulch, dirt, salt, or other materials	☐ Remove or cover piles of grass clippings, mulch, dirt, etc. ☐ Remove excessive vegetation or woody debris that can block drainage systems. ☐ Other:
☐ Open containers of oil, grease, paint, or other substances exposed to rain in the drainage area	☐ Cover or properly dispose of materials; consult your local solid waste authority for guidance on materials that may be toxic or hazardous. ☐ Other:

Pond Inlets

Look for all areas where water flows into the pond during storms. Note that there may be multiple points of inflow and types of structures (e.g., pipes, open ditches, etc.).

Problem (Check if Present)	Follow-Up Actions
☐ Inlets are buried, covered or filled with silt, debris, or trash, or blocked by excessive vegetation.	☐ If the problem can be remedied with hand tools and done in a safe manner, remove vegetation, trash, woody debris, etc. from blocking inlet structures. ☐ Other:
	☐ Kick-Out to Level 2 or 3 Inspection: If the amount of material is too large to handle OR there are ANY safety concerns about working in standing water, soft sediment, etc., the work will likely have to be performed by a qualified contractor.

Pond Inlets

Look for all areas where water flows into the pond during storms. Note that there may be multiple points of inflow and types of structures (e.g., pipes, open ditches, etc.).

Problem (Check if Present)		Follow-Up Actions
	☐ Inlets are buried, covered or filled with silt, debris, or trash, or blocked by excessive vegetation.	☐ Kick-Out to Level 2 or 3 Inspection: If the amount of material is too large to handle OR there are ANY safety concerns about working in standing water, soft sediment, etc., the work will likely have to be performed by a qualified contractor.
	☐ Inlets are broken, and, with pieces of pipe or concrete falling into the pond, there is erosion around the inlet, there is open space under the pipe, or there is erosion where the inlet meets the pond	☐ Kick-Out to Level 2 Inspection: These types of structural or erosion problems are more serious and will require a qualified contractor to repair.

PW Pond Area and Embankments

Examine both interior and exterior pond banks as well as the pond body. Observe from the inlet pipes to the outfall structure and emergency overflow.

Problem (Check if Present)		Follow-Up Actions
	☐ The pretreatment area(s) or forebay(s) are filled with sediment, trash, vegetation, or other debris.	☐ If the problem can be remedied with hand tools and done in a safe manner, use a flat shovel or other equipment to remove small amounts of sediment. ☐ Remove trash and excessive vegetation from forebays if this can be done in a safe manner. ☐ Other:

PW Pond Area and Embankments

Examine both interior and exterior pond banks as well as the pond body. Observe from the inlet pipes to the outfall structure and emergency overflow.

Problem (Check if Present)		Follow-Up Actions
	☐ The pretreatment area(s) or forebay(s) are filled with sediment, trash, vegetation, or other debris.	☐ Kick-Out to Level 2 Inspection: Large amounts of sediment or debris will have to be removed by a qualified contractor. ANY condition that poses a safety concern for working in standing water or soft sediments should be referred to a Level 2 Inspection or qualified contractor.
	☐ The pond area itself has accumulated sediment, trash, debris, or excessive vegetation that is choking the flow of the water, OR the pond area is covered with algae or aquatic plants.	☐ Level 1 includes handling only small amounts of material that can be removed by hand, or with rakes or other hand tools. Do not attempt any repair that poses a safety issue. ☐ Other: ☐ Kick-Out to Level 2 Inspection: Most cases will call for a Level 2 Inspection and/or a qualified contractor. ☐ You are not sure what type and amount of vegetation is supposed to be in the pond. ☐ The algae or aquatic plants should be identified so that proper control techniques can be applied.
	☐ The side slopes of the pond are unstable, eroding, and have areas of bare dirt.	☐ If there are only minor areas, try filling in small rills or gullies with topsoil, compacting, and seeding and mulching all bare dirt areas with an appropriate seed. Alternatively, try using herbaceous plugs to get vegetation established in tricky areas, such as steep slopes. ☐ Other: ☐ Kick-Out to Level 2 Inspection: Erosion and many bare dirt areas on steep side slopes will require a Level 2 Inspection and repair by a qualified contractor.

PW Pond Area and Embankments

Examine both interior and exterior pond banks as well as the pond body. Observe from the inlet pipes to the outfall structure and emergency overflow.

Problem (Check if Present)		Follow-Up Actions
	☐ The riser structure is clogged with trash, debris, sediment, vegetation, etc., OR is open, unlocked, or has a steep drop and poses a safety concern. The pond level may have dropped below its "normal" level.	☐ If you can safely access the riser on foot or with a small boat, clear minor amounts of debris and remove it from the pond area for safe disposal. ☐ Other: ☐ Kick-Out to Level 2 Inspection: The riser cannot be accessed safely, the amount of debris is substantial, or the riser seems to be completely clogged and the water level has risen too high. ☐ There are safety issues with the riser and concern about access to pipes, drops, or any other life safety concern. ☐ The riser is leaning, broken, settling or slumping, corroded, eroded or any other structural problem.
	☐ The dam/embankment is slumping, sinking, settling, eroding, or has medium or large trees growing on it.	☐ If there are small isolated areas, try to fix them by adding clean material (clay and topsoil) and seeding and mulching. ☐ Periodically mow embankments to enable inspection of the banks and to minimize establishment of woody vegetation. ☐ Remove any woody vegetation that has already established on embankments. ☐ Other: ☐ Kick-Out to Level 2 Inspection: Most of these situations will require a Level 2 Inspection or evaluation and repair by a qualified contractor. Seepage through the dam or problems with the pipe through the dam can be a serious issue that should be addressed to avoid possible dam failure.

PW Pond Area and Embankments

Examine both interior and exterior pond banks as well as the pond body. Observe from the inlet pipes to the outfall structure and emergency overflow.

Problem (Check if Present)		Follow-Up Actions
	☐ The emergency spillway or outfall (if it exists) has ☐ Erosion, settlement, or loss of material. Rock-lined spillways have excessive debris or vegetation.	☐ Clear light debris and vegetation. ☐ Other: ☐ Kick-Out to Level 2 Inspection: Displacement of rock lining, excessive vegetation and erosion/settlement may warrant review and decision by Level 2 Inspector to check against original plan. ☐ Any uncertainty about the integrity of the emergency spillway should be referred to a Level 2 Inspector. ☐ Erosion or settlement such that design has been compromised should be reviewed by an engineer.

PW Pond Outlet

Examine the outlet of the pipe on the downstream side of the dam/embankment where it empties into a stream, channel, or drainage system.

Problem (Check if Present)	Follow-Up Actions
 ☐ The pond outlet is clogged with sediment, trash, debris, vegetation, or is eroding, caving in, slumping, or falling apart.	☐ If there is a minor blockage, remove the debris or vegetation to allow free flow of water. ☐ Remove any accumulated trash at the outlet. ☐ Outlet: ☐ Kick-Out to Level 2 Inspection: ☐ If the area at the outlet cannot be easily accessed or if the blockage is substantial, a Level 2 Inspection is warranted. ☐ Erosion at and downstream of the outfall should be evaluated by a qualified professional. ☐ Any structural problems, such as broken pipes, structures falling into the stream, or holes or tunnels around the outfall pipe, should be evaluated by a Level 2 Inspector and will require repair by a qualified contractor. ☐ The pool of water at the outlet pipe is discolored, has an odor, or has excessive algae or vegetative growth.

Additional Notes:

Inspector:_____ Date: _____

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Inspector/Operator: _____ Date: _____

NEW YORK STATE OF OPPORTUNITY | Department of Environmental Conservation

Pond and Wetland Stormwater Management Practices Level 2 Inspection Checklist

SMP ID #		**SMP Owner**		☐ Private ☐ Public
SMP Location (Address; Latitude & Longitude)				
	Latitude		**Longitude**	

Party Responsible for Maintenance	**System Type**		**Type of Site**
☐ Same as SMP Owner ☐ Other _____	☐ Seasonal ☐ Continuous Use ☐ Other	☐ Above Ground ☐ Below Ground	☐ Commercial ☐ Industrial ☐ Residential ☐ State

Inspection Date		**Inspection Time**	
Inspector			
Date of Last Inspection			

Level 2 Inspection: PONDS and WETLANDS

Recommended Repairs and Required Skills	Triggers for Level 3 Inspection
Observed Condition: Bare Soil or Erosion in the Drainage Area	
☐ Condition 1: Extensive problem spots, but no channels or rills forming Reseed problem areas. If problem persists or grass does not take, consider hiring a landscape contractor. ☐ Condition 2: Problem is extensive, and rills/channels are beginning to form May be necessary to divert or redirect water that is causing the erosion problem. If it appears that simple regrading—such as installing a berm or leveling a low spot–will fix the problem, make repairs and ensure that the problem is repaired after the next storm.	• Large rills or gullies are forming in the drainage area. • An attempt to regrade the drainage area has been unsuccessful. • Fixing the problem would require major regrading (i.e., redirecting more than a 100-square-foot area. • It is not clear why the problem is occurring. ☐ Level 3 inspection necessary
Observed Condition: Manholes or Inlet Pipe Buried or Covered with Vegetation	
☐ Condition 1: Nearest manhole and inlet pipe not found Consult as-built drawings to get to closest suspected location and use metal detector to search for metal manhole cover. If unsuccessful, identify nearest drain inlets and approximate pipe direction to locate next manhole. ☐ Condition 2: Manhole located and inspected Never enter a manhole, except by following confined-space entry protocols. If outlet pipe is not visible or greater than 25% full of sediment/debris or trash, it will typically require a qualified contractor to flush, clean and clear blockages. ☐ Condition 3: Inlet pipe not found at pond Clear vegetation and brush that may be covering the inlet pipe. Buried inlet pipes may be found through use of a metal probe. ☐ Condition 4: Inlet pipe buried in sediment or blocked by vegetation Once located, the pipe path can be cleared of vegetation with brush hook or other brush tools. Light digging may clear sediment from the end of the pipe.	• To locate buried manholes and lost storm lines, it is sometimes necessary to hire a pipeline inspection contractor with televising equipment or ground-penetrating radar and enter at the closest upstream access point. • Locating a buried inlet pipe may require wading in the edge of the pond and using a metal probe and brush axe to find and expose the pipe. • If other than light digging is necessary to remove accumulated sediment, a contractor with heavy equipment may be required. ☐ Level 3 inspection necessary

Level 2 Inspection: PONDS and WETLANDS	
Recommended Repairs and Required Skills	**Triggers for Level 3 Inspection**
Observed Condition: Pipe or Headwall Settlement, Erosion, Corrosion or Failure	
☐ Condition 1: Pipe or headwall settlement or failure Severe sinkholes, settlement or corrosion should be kicked out to Level 3 Inspection. ☐ Condition 2: Flow not confined to pipe and visible outside pipe wall With flashlight, observe the inside of the pipe and note its condition. Take photographs. Look for sinkholes developing that indicate pipe failure beneath the surface. Kick out to Level 3 inspection.	• Where blockages are visible, a decision is needed on whether to clear them or leave in place. If a third of the pipe is full of sediment, it should be removed by a contractor with pipe-cleaning equipment. • Corrosion of inlet pipes that allows flow around the pipe exterior is a structural concern because it can lead to settlement, sinkholes and undermining pond embankment. Evidence of this type of failure may require specialized pipe-inspection equipment and investigation by an engineer. ☐ Level 3 inspection necessary
Observed Condition: Pond Conditions	
☐ Condition 1: Pond pre-treatment zone is full of sediment or not constructed as shown on as-built drawings. ☐ Condition 2: Excessive buildup of sediment or overgrowth If the pre-treatment area or pond pool is overgrown or filled with sediment so that the original design is compromised, corrective measures are required. If plants have died, then replanting is necessary. If none of the original design exists due to alteration or sediment, kick out to Level 3 inspection.	• It may require inspection by an engineer to determine next steps for clearing, replanting or reconstruction. • Erosion or settlement such that design has been compromised should be reviewed by an engineer. Recurring erosion may require redesign and/or regrading to direct flow away from eroding area. • If sediment has filled more than 50% of the pond's capacity, dredging is likely needed and should be evaluated by a qualified contractor. • Removal or control of excessive algae or aquatic plants can be assessed by a qualified pond maintenance company. ☐ Level 3 inspection necessary

Notes:

Inspector:_____ Date: _____

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Inspector/Operator: _____ Date: _____

NEW YORK STATE OF OPPORTUNITY | Department of Environmental Conservation

Swale Stormwater Management Practices
Level 1 Inspection Checklist

SMP ID #		**SMP Owner**		☐ Private ☐ Public
SMP Location (Address; Latitude & Longitude)				
	Latitude		**Longitude**	

Party Responsible for Maintenance	**System Type**		**Type of Site**
☐ Same as SMP Owner ☐ Other _____	☐ Seasonal ☐ Continuous Use ☐ Other	☐ Above Ground ☐ Below Ground	☐ Commercial ☐ Industrial ☐ Residential ☐ State

Inspection Date		**Inspection Time**	
Inspector			
Date of Last Inspection			

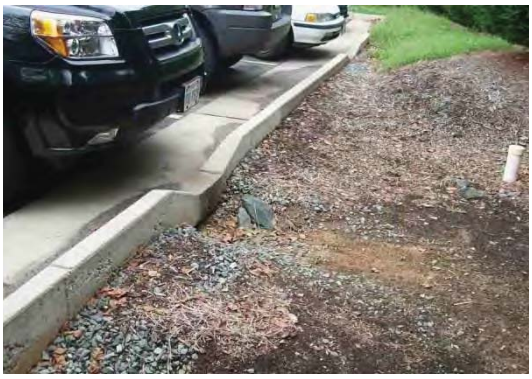
SW Drainage Area

Look at areas that are uphill from the swale.

Problem (Check if Present)	Follow-Up Actions
☐ Bare soil, erosion of the ground (rills washing out the dirt)	☐ Seed and mulch or sod areas of bare soil to establish vegetation. ☐ Fill in erosion areas with soil, compact, and add seed and straw to establish vegetation. ☐ If a rill or small channel is forming, try to redirect water flowing to this area by creating a small berm or adding topsoil to areas that are heavily compacted. ☐ Other: ☐ Kick-Out to Level 2 Inspection: Large areas of soil have been eroded, or larger channels are forming. May require rerouting of flow paths
☐ Piles of grass clippings, mulch, dirt, salt, or other materials	☐ Remove or cover piles of grass clippings, mulch, dirt, etc. ☐ Other:
☐ Open containers of oil, grease, paint, or other substances	☐ Cover or properly dispose of materials; consult your local solid waste authority for guidance on materials that may be toxic or hazardous.
☐ Grass dying at edge of road	☐ Seed and mulch; add topsoil or compost if needed. ☐ Other: ☐ Kick-Out to Level 2 Inspection: Grass on edge of pavement continues to die off for unknown reasons. Swale edge may need to be replaced with other materials (e.g., stone diaphragm).

SW Inlets

Stand in the swale and look for all the places where water flows in.

Problem (Check if Present)	Follow-Up Actions
☐ Inlets or the swale edge are collecting grit, grass clippings, or debris or have grass/weeds growing. Some water may not be getting into the swale. The objective is to have a clear pathway for water to flow into the swale.	☐ Use a flat shovel to remove grit and debris (especially at curb inlets or opening). Parking lots will generate fine grit that will accumulate at these spots. ☐ Pull out clumps of growing grass or weeds, and scoop out the soil or grit that the plants are growing in. ☐ Remove any grass clippings, leaves, sticks, and other debris that is collecting at inlets or along the edge of the swale where water is supposed to enter. ☐ For pipes and ditches, remove sediment and debris that is partially blocking the pipe or ditch opening where it enters the swale. ☐ Dispose of all material properly in an area where it will not re-enter the swale. ☐ Other:
	☐ Kick-Out to Level 2 Inspection: Inlets are blocked to the extent that most of the water does not seem to be entering the swale.
 ☐ Some or all of the inlets are eroding so that rills, gullies, and other erosion are present, or there is bare dirt that is washing into the swale.	☐ For small areas of erosion, smooth out the eroded part and apply rock or stone (e.g., river cobble) to prevent further erosion. Usually, filter fabric is placed under the rock or stone. ☐ In some cases, reseeding and applying an erosion control matting can be used to prevent further erosion. Some of these materials may be available at a garden center, but it may be best to consult a landscape contractor. ☐ Other:
	☐ Level 2 Inspection: Erosion is occurring at most of the inlets or along much of the swale edge. The inlet design may have to be modified.

SW Surface Area

Examine the entire swale surface and side slopes.

Problem (Check if Present)	Follow-Up Actions
☐ Minor areas of sediment, grit, trash, or other debris are accumulating in the swale.	☐ Use a shovel to scoop out minor areas of sediment or grit, especially in the spring after winter sanding materials may wash in and accumulate. Dispose of the material where it cannot re-enter the swale. ☐ If removing the material creates a hole or low area, fill with good topsoil and add seed and straw to re-vegetate. ☐ Remove trash, vegetative debris, and other undesirable materials. ☐ If the swale is densely vegetated, it may be difficult to do the maintenance; check for excessive ponding or other issues described in this section to see if the accumulated material is causing a problem. ☐ Other:
	☐ Kick-Out to Level 2 Inspection: Sediment has accumulated more than 3 inches deep and covers 25% or more of the swale surface. ☐ The source of sediment is unknown or cannot be controlled with simple measures.
 ☐ There is erosion in the bottom or on the side slopes. Water seems to be carving out rills as it flows through the swale or on the slopes.	☐ Try filling the eroded areas with clean topsoil, and then seed and mulch to establish vegetation. ☐ If the problem recurs, you may have to use some type of matting, stone (e.g., river cobble), or other material to fill in eroded areas. ☐ If the erosion is on a side slope, fill with soil and cover with erosion-control matting or at least straw mulch after re-seeding.
	☐ Kick-Out to Level 2 Inspection: The problem persists or the erosion is more than 3 inches deep and seems to be an issue with how water enters and moves through the swale. ☐ Kick-Out to Level 2 Inspection: The problem does not seem to be caused by flowing water, but a collapse or sinking of the surface (e.g., “sinkhole”) due to some underground problem.
☐ Water does not flow evenly down the length of the swale, but ponds in certain areas for long periods of time (e.g., 72 hours after a storm). The swale does not seem to have “positive drainage.” Check during or immediately after a rain storm.	☐ If the problem is minor (just small, isolated areas), try using a metal rake or other tools to create a more even flow path; remove excessive vegetative growth, sediment, or other debris that may be blocking the flow. ☐ Other:
	☐ Kick-Out to Level 2 Inspection: Water ponds in more than 25% of the swale for three days or more after a storm. The issue may be with the underlying soil or the grade of the swale. ☐ Water ponds behind check dams for three days or more after a storm. Check dams may be clogged or not functioning properly.

SW Surface Area

Examine the entire swale surface and side slopes.

Problem (Check if Present)	Follow-Up Actions
 ☐ Check dams (if present): water is flowing around the edges of check dams, creating erosion or sinkholes on the uphill or downhill side, or the check dams are breaking apart or breaching .	☐ If the problem is isolated to just a few check dams, try simple repairs. ☐ It is very important for the center of each check dam (where most of the water flows) to be lower (by at least several inches) than the edges of the check dams where they meet the side slopes. Also, the check dams should be keyed into side slopes so water does not flow between the check dam and side slope. ☐ Use a level to check the right check-dam configuration, as noted above. Repair by moving around stone, filling and compacting soil, or adding new material so that water will be directed to the center of the check dam instead of the edges. ☐ Other: ☐ Kick-Out to Level 2 Inspection: Many check dams are impacted and/or the problem seems to be a design issue with height, spacing, shape, or materials used to construct them.

SW Vegetation

Assess the swale vegetation.

Problem (Check if Present)	Follow-Up Actions
 ☐ Vegetation is too overgrown to access swale for maintenance activities	☐ Mow or bush-hog the path. ☐ Other:

SW Vegetation

Assess the swale vegetation.

Problem (Check if Present)	Follow-Up Actions
 ☐ Vegetation requires regular maintenance: pulling weeds, removing dead and diseased plants, adding plants to fill in areas that are not well vegetated, etc.	☐ If you can identify which plants are weeds or not intended to be part of the planting plan, eliminate these, preferably by hand pulling. ☐ If weeds are widespread, check with the local stormwater authority and/or Extension Office about proper use of herbicides for areas connected with the flow of water. ☐ Even vegetation that is intended to be present can become large, overgrown, block flow, and/or crowd out surrounding plants. Prune and thin accordingly. ☐ If weeds or invasive plants have overtaken the whole swale, bush-hog the entire area before seed heads form in the spring. It will be necessary to remove the root mat manually or with appropriate herbicides, as noted above. ☐ Replant with species that are aesthetically pleasing and seem to be doing well in the swale. ☐ Other:
	☐ Kick-Out to Level 2 Inspection: You are unsure of the original planting design or the vegetation maintenance task is beyond your capabilities of time, expertise, or resources. If you are unsure of the health of the vegetation (e.g. salt damage, invasives, which plants are undesirable) or the appropriate season to conduct vegetation management, consult a landscape professional before undertaking any cutting, pruning, mowing, or brush hogging.
☐ Vegetation is too thin, is not healthy, and there are many spots that are not well vegetated.	☐ The original plants are likely not suited for the actual conditions within the swale. If you are knowledgeable about plants, select and plant more appropriate vegetation (preferably native plants) so that almost the entire surface area will be covered by the end of the second growing season. ☐ Other:
	☐ Kick-Out to Level 2 Inspection: For all but small practices (e.g., in residential yards), this task will likely require a landscape design professional or horticulturalist.

SW Outlets

Examine outlets that release water out of the swale.

Problem (Check if Present)	Follow-Up Actions
☐ Outlet is obstructed with mulch, sediment, debris, trash, etc.	☐ Remove the debris and dispose of it where it cannot re-enter the swale. ☐ Other:
	☐ Kick-Out to Level 2 Inspection: Outlet is completely clogged or obstructed; there is too much material to remove by hand or with simple hand tools.

Additional Notes:

Inspector:_____ Date: _____

Complete the following if follow-up/corrective actions were identified during this inspection:

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Inspector/Operator: _____ Date: _____

NEW YORK STATE OF OPPORTUNITY | Department of Environmental Conservation

Swale Stormwater Management Practices
Level 2 Inspection Checklist

SMP ID #		**SMP Owner**		☐ Private ☐ Public
SMP Location (Address; Latitude & Longitude)				
	Latitude		**Longitude**	

Party Responsible for Maintenance	**System Type**		**Type of Site**
☐ Same as SMP Owner ☐ Other _____	☐ Seasonal ☐ Continuous Use ☐ Other	☐ Above Ground ☐ Below Ground	☐ Commercial ☐ Industrial ☐ Residential ☐ State

Inspection Date		**Inspection Time**	
Inspector			
Date of Last Inspection			

Level 2 Inspection: SWALE	
Recommended Repairs	**Triggers for Level 3 Inspection**
Observed Condition: Water Stands on Surface for More than 72 Hours after Storm	
☐ Condition 1: Small pockets of standing water Use a soil probe or auger to examine the soil profile. If isolated areas have accumulated grit, fines, or vegetative debris or have compacted soil, try scraping off top 3 to 6 inches of soil and replacing with clean material. Also check to see that surface is level and water is not ponding selectively in certain areas. ☐ Condition 2: Standing water is widespread or covers entire surface Requires diagnosis and resolution of problem: • Bad or compacted soil • Filter fabric on the swale bottom • Too much sediment/grit washing in from drainage area? • Too much ponding depth? • Longitudinal slope is too flat?	• Soil is overly compacted or clogged and problem is not evident from Level 2 inspection. • Level 2 inspection identifies problem, but it cannot be resolved easily or is associated with the original design of the practice (e.g., not enough slope down through the swale). ☐ Level 3 inspection necessary
Observed Condition: Vegetation is predominantly weeds and invasive species	
For a small area, weed and dig up invasive plants. Replant with natives or plants from original planting plan. If longer than 100 feet, develop a new planting plan and have it professionally reviewed.	• Vegetation deviates significantly from original planting plan; swale has been neglected and suffered from deferred maintenance. • Owner/responsible party does not know how to maintain the practice. • For large area, hire a professional to develop a grading plan and develop a planting plan. ☐ Level 3 inspection necessary

Notes:

Inspector:_____ Date: _____

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Inspector/Operator: _____ Date: _____

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APPENDIX E: SWPPP FORMS

Notice of Intent

Notice of Termination

Contractor Forms

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NOTICE OF INTENT

New York State Department of Environmental Conservation
Division of Water
625 Broadway, 4th Floor
Albany, New York 12233-3505

NYR ☐☐☐☐☐☐
(for DEC use only)

Stormwater Discharges Associated with Construction Activity Under State Pollutant Discharge Elimination System (SPDES) General Permit # GP-0-20-001

All sections must be completed unless otherwise noted. Failure to complete all items may result in this form being returned to you, thereby delaying your coverage under this General Permit. Applicants must read and understand the conditions of the permit and prepare a Stormwater Pollution Prevention Plan prior to submitting this NOI. Applicants are responsible for identifying and obtaining other DEC permits that may be required.

-IMPORTANT-

RETURN THIS FORM TO THE ADDRESS ABOVE

OWNER/OPERATOR MUST SIGN FORM

Owner/Operator Information

Owner/Operator (Company Name/Private Owner Name/Municipality Name)

Owner/Operator Contact Person Last Name (NOT CONSULTANT)

Owner/Operator Contact Person First Name

Owner/Operator Mailing Address

City

State

Zip -

Phone (Owner/Operator) - -

Fax (Owner/Operator) - -

Email (Owner/Operator)

FED TAX ID - (not required for individuals)

Project Site Information

Project/Site Name

Street Address (NOT P.O. BOX)

Side of Street

○ **North** ○ **South** ○ **East** ○ **West**

City/Town/Village (THAT ISSUES BUILDING PERMIT)

State N Y

Zip -

County

DEC Region

Name of Nearest Cross Street

Distance to Nearest Cross Street (Feet)

Project In Relation to Cross Street

○ **North** ○ **South** ○ **East** ○ **West**

Tax Map Numbers
Section-Block-Parcel

Tax Map Numbers

1. Provide the Geographic Coordinates for the project site in NYTM Units. To do this you **must** go to the NYSDEC Stormwater Interactive Map on the DEC website at:

www.dec.ny.gov/imsmaps/stormwater/viewer.htm

Zoom into your Project Location such that you can accurately click on the centroid of your site. Once you have located your project site, go to the tool boxes on the top and choose "i"(identify). Then click on the center of your site and a new window containing the X, Y coordinates in UTM will pop up. Transcribe these coordinates into the boxes below. For problems with the interactive map use the help function.

X Coordinates (Easting)

Y Coordinates (Northing)

4

2. What is the nature of this construction project?

○ **New Construction**

○ **Redevelopment with increase in impervious area**

○ **Redevelopment with no increase in impervious area**

3. Select the predominant land use for both pre and post development conditions.
SELECT ONLY ONE CHOICE FOR EACH

Pre-Development Existing Land Use

- ○ FOREST
- ○ PASTURE/OPEN LAND
- ○ CULTIVATED LAND
- ○ SINGLE FAMILY HOME
- ○ SINGLE FAMILY SUBDIVISION
- ○ TOWN HOME RESIDENTIAL
- ○ MULTIFAMILY RESIDENTIAL
- ○ INSTITUTIONAL/SCHOOL
- ○ INDUSTRIAL
- ○ COMMERCIAL
- ○ ROAD/HIGHWAY
- ○ RECREATIONAL/SPORTS FIELD
- ○ BIKE PATH/TRAIL
- ○ LINEAR UTILITY
- ○ PARKING LOT
- ○ OTHER

Post-Development Future Land Use

- ○ SINGLE FAMILY HOME
- ○ SINGLE FAMILY SUBDIVISION — Number of Lots
- ○ TOWN HOME RESIDENTIAL
- ○ MULTIFAMILY RESIDENTIAL
- ○ INSTITUTIONAL/SCHOOL
- ○ INDUSTRIAL
- ○ COMMERCIAL
- ○ MUNICIPAL
- ○ ROAD/HIGHWAY
- ○ RECREATIONAL/SPORTS FIELD
- ○ BIKE PATH/TRAIL
- ○ LINEAR UTILITY (water, sewer, gas, etc.)
- ○ PARKING LOT
- ○ CLEARING/GRADING ONLY
- ○ DEMOLITION, NO REDEVELOPMENT
- ○ WELL DRILLING ACTIVITY *(Oil, Gas, etc.)
- ○ OTHER

***Note**: for gas well drilling, non-high volume hydraulic fractured wells only

4. In accordance with the larger common plan of development or sale, enter the total project site area; the total area to be disturbed; existing impervious area to be disturbed (for redevelopment activities); and the future impervious area constructed within the disturbed area. (Round to the nearest tenth of an acre.)

Total Site Area	Total Area To Be Disturbed	Existing Impervious Area To Be Disturbed	Future Impervious Area Within Disturbed Area
____.__	____.__	____.__	____.__

5. Do you plan to disturb more than 5 acres of soil at any one time? ○ **Yes** ○ **No**

6. Indicate the percentage of each Hydrologic Soil Group(HSG) at the site.

A	B	C	D
___ %	___ %	___ %	___ %

7. Is this a phased project? ○ **Yes** ○ **No**

8. Enter the planned start and end dates of the disturbance activities.

Start Date __ / __ / ____ – **End Date** __ / __ / ____

9. Identify the nearest surface waterbody(ies) to which construction site runoff will discharge.

Name

9a. Type of waterbody identified in Question 9?

- ○ Wetland / State Jurisdiction On Site (Answer 9b)
- ○ Wetland / State Jurisdiction Off Site
- ○ Wetland / Federal Jurisdiction On Site (Answer 9b)
- ○ Wetland / Federal Jurisdiction Off Site
- ○ Stream / Creek On Site
- ○ Stream / Creek Off Site
- ○ River On Site
- ○ River Off Site
- ○ Lake On Site
- ○ Lake Off Site
- ○ Other Type On Site
- ○ Other Type Off Site

9b. How was the wetland identified?

- ○ Regulatory Map
- ○ Delineated by Consultant
- ○ Delineated by Army Corps of Engineers
- ○ Other (identify)

10. Has the surface waterbody(ies) in question 9 been identified as a 303(d) segment in Appendix E of GP-0-20-001? ○ **Yes** ○ **No**

11. Is this project located in one of the Watersheds identified in Appendix C of GP-0-20-001? ○ **Yes** ○ **No**

12. Is the project located in one of the watershed areas associated with AA and AA-S classified waters? ○ **Yes** ○ **No**
If no, skip question 13.

13. Does this construction activity disturb land with no existing impervious cover and where the Soil Slope Phase is identified as an E or F on the USDA Soil Survey? ○ **Yes** ○ **No**
If Yes, what is the acreage to be disturbed?

.

14. Will the project disturb soils within a State regulated wetland or the protected 100 foot adjacent area? ○ **Yes** ○ **No**

15. Does the site runoff enter a separate storm sewer system (including roadside drains, swales, ditches, culverts, etc)? ○ **Yes** ○ **No** ○ **Unknown**

16. What is the name of the municipality/entity that owns the separate storm sewer system?

17. Does any runoff from the site enter a sewer classified as a Combined Sewer? ○ **Yes** ○ **No** ○ **Unknown**

18. Will future use of this site be an agricultural property as defined by the NYS Agriculture and Markets Law? ○ **Yes** ○ **No**

19. Is this property owned by a state authority, state agency, federal government or local government? ○ **Yes** ○ **No**

20. Is this a remediation project being done under a Department approved work plan? (i.e. CERCLA, RCRA, Voluntary Cleanup Agreement, etc.) ○ **Yes** ○ **No**

21. 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** ○ **No**

22. Does this construction activity require the development of a SWPPP that includes the post-construction stormwater management practice component (i.e. Runoff Reduction, Water Quality and Quantity Control practices/techniques)? ○ **Yes** ○ **No**
If No, skip questions 23 and 27-39.

23. Has the post-construction stormwater management practice component of the SWPPP been developed in conformance with the current NYS Stormwater Management Design Manual? ○ **Yes** ○ **No**

24. The Stormwater Pollution Prevention Plan (SWPPP) was prepared by:

- ○ **Professional Engineer (P.E.)**
- ○ **Soil and Water Conservation District (SWCD)**
- ○ **Registered Landscape Architect (R.L.A)**
- ○ **Certified Professional in Erosion and Sediment Control (CPESC)**
- ○ **Owner/Operator**
- ○ **Other**

SWPPP Preparer

Contact Name (Last, Space, First)

Mailing Address

City

State Zip -

Phone - -

Fax - -

Email

SWPPP Preparer Certification

I hereby certify that the Stormwater Pollution Prevention Plan (SWPPP) for this project has been prepared in accordance with the terms and conditions of the GP-0-20-001. Furthermore, I understand that certifying false, incorrect or inaccurate information is a violation of this permit and the laws of the State of New York and could subject me to criminal, civil and/or administrative proceedings.

First Name **MI**

Last Name

Signature

Date / /

25. Has a construction sequence schedule for the planned management practices been prepared? ○ **Yes** ○ **No**

26. Select **all** of the erosion and sediment control practices that will be employed on the project site:

Temporary Structural

- ○ **Check Dams**
- ○ **Construction Road Stabilization**
- ○ **Dust Control**
- ○ **Earth Dike**
- ○ **Level Spreader**
- ○ **Perimeter Dike/Swale**
- ○ **Pipe Slope Drain**
- ○ **Portable Sediment Tank**
- ○ **Rock Dam**
- ○ **Sediment Basin**
- ○ **Sediment Traps**
- ○ **Silt Fence**
- ○ **Stabilized Construction Entrance**
- ○ **Storm Drain Inlet Protection**
- ○ **Straw/Hay Bale Dike**
- ○ **Temporary Access Waterway Crossing**
- ○ **Temporary Stormdrain Diversion**
- ○ **Temporary Swale**
- ○ **Turbidity Curtain**
- ○ **Water bars**

Biotechnical

- ○ **Brush Matting**
- ○ **Wattling**

Vegetative Measures

- ○ **Brush Matting**
- ○ **Dune Stabilization**
- ○ **Grassed Waterway**
- ○ **Mulching**
- ○ **Protecting Vegetation**
- ○ **Recreation Area Improvement**
- ○ **Seeding**
- ○ **Sodding**
- ○ **Straw/Hay Bale Dike**
- ○ **Streambank Protection**
- ○ **Temporary Swale**
- ○ **Topsoiling**
- ○ **Vegetating Waterways**

Permanent Structural

- ○ **Debris Basin**
- ○ **Diversion**
- ○ **Grade Stabilization Structure**
- ○ **Land Grading**
- ○ **Lined Waterway (Rock)**
- ○ **Paved Channel (Concrete)**
- ○ **Paved Flume**
- ○ **Retaining Wall**
- ○ **Riprap Slope Protection**
- ○ **Rock Outlet Protection**
- ○ **Streambank Protection**

Other

Post-construction Stormwater Management Practice (SMP) Requirements

Important: Completion of Questions 27-39 is not required if response to Question 22 is No.

27. Identify all site planning practices that were used to prepare the final site plan/layout for the project.

- ○ **Preservation of Undisturbed Areas**
- ○ **Preservation of Buffers**
- ○ **Reduction of Clearing and Grading**
- ○ **Locating Development in Less Sensitive Areas**
- ○ **Roadway Reduction**
- ○ **Sidewalk Reduction**
- ○ **Driveway Reduction**
- ○ **Cul-de-sac Reduction**
- ○ **Building Footprint Reduction**
- ○ **Parking Reduction**

27a. 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 (2010 version).

- ○ 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).
- ○ Compacted areas were considered as impervious cover when calculating the **WQv Required**, and the compacted areas were assigned a post-construction Hydrologic Soil Group (HSG) designation that is one level less permeable than existing conditions for the hydrology analysis.

28. Provide the total Water Quality Volume (WQv) required for this project (based on final site plan/layout).

Total WQv Required

☐☐☐.☐☐☐ **acre-feet**

29. Identify the RR techniques (Area Reduction), RR techniques(Volume Reduction) and Standard SMPs with RRv Capacity in Table 1 (See Page 9) that were used to reduce the Total WQv Required(#28).

Also, provide in Table 1 the total impervious area that contributes runoff to each technique/practice selected. For the Area Reduction Techniques, provide the total contributing area (includes pervious area) and, if applicable, the total impervious area that contributes runoff to the technique/practice.

Note: Redevelopment projects shall use Tables 1 and 2 to identify the SMPs used to treat and/or reduce the WQv required. If runoff reduction techniques will not be used to reduce the required WQv, skip to question 33a after identifying the SMPs.

Table 1 - Runoff Reduction (RR) Techniques and Standard Stormwater Management Practices (SMPs)

	Total Contributing Area (acres)		Total Contributing Impervious Area (acres)
RR Techniques (Area Reduction)			
○ Conservation of Natural Areas (RR-1) ...	___.___	and/or	___.___
○ Sheetflow to Riparian Buffers/Filters Strips (RR-2)	___.___	and/or	___.___
○ Tree Planting/Tree Pit (RR-3)	___.___	and/or	___.___
○ Disconnection of Rooftop Runoff (RR-4) ..	___.___	and/or	___.___
RR Techniques (Volume Reduction)			
○ Vegetated Swale (RR-5)			___.___
○ Rain Garden (RR-6)			___.___
○ Stormwater Planter (RR-7)			___.___
○ Rain Barrel/Cistern (RR-8)			___.___
○ Porous Pavement (RR-9)			___.___
○ Green Roof (RR-10)			___.___
Standard SMPs with RRv Capacity			
○ Infiltration Trench (I-1)			___.___
○ Infiltration Basin (I-2)			___.___
○ Dry Well (I-3)			___.___
○ Underground Infiltration System (I-4)			___.___
○ Bioretention (F-5)			___.___
○ Dry Swale (O-1)			___.___
Standard SMPs			
○ Micropool Extended Detention (P-1)			___.___
○ Wet Pond (P-2)			___.___
○ Wet Extended Detention (P-3)			___.___
○ Multiple Pond System (P-4)			___.___
○ Pocket Pond (P-5)			___.___
○ Surface Sand Filter (F-1)			___.___
○ Underground Sand Filter (F-2)			___.___
○ Perimeter Sand Filter (F-3)			___.___
○ Organic Filter (F-4)			___.___
○ Shallow Wetland (W-1)			___.___
○ Extended Detention Wetland (W-2)			___.___
○ Pond/Wetland System (W-3)			___.___
○ Pocket Wetland (W-4)			___.___
○ Wet Swale (O-2)			___.___

Table 2 - Alternative SMPs (DO NOT INCLUDE PRACTICES BEING USED FOR PRETREATMENT ONLY)

Alternative SMP	Total Contributing Impervious Area (acres)
○ **Hydrodynamic**	___ . ___
○ **Wet Vault**	___ . ___
○ **Media Filter**	___ . ___
○ **Other** _____	___ . ___

Provide the name and manufacturer of the Alternative SMPs (i.e. proprietary practice(s)) being used for WQv treatment.

Name _____

Manufacturer _____

Note: Redevelopment projects which do not use RR techniques, shall use questions 28, 29, 33 and 33a to provide SMPs used, total WQv required and total WQv provided for the project.

30. Indicate the Total RRv provided by the RR techniques (Area/Volume Reduction) and Standard SMPs with RRv capacity identified in question 29.

Total RRv provided

___ . ___ **acre-feet**

31. Is the Total RRv provided (#30) greater than or equal to the total WQv required (#28).

○ **Yes** ○ **No**

If Yes, go to question 36.
If No, go to question 32.

32. Provide the Minimum RRv required based on HSG.
[Minimum RRv Required = (P)(0.95)(Ai)/12, Ai=(S)(Aic)]

Minimum RRv Required

___ . ___ **acre-feet**

32a. Is the Total RRv provided (#30) greater than or equal to the Minimum RRv Required (#32)?

○ **Yes** ○ **No**

If Yes, go to question 33.
Note: Use the space provided in question #39 to summarize the specific site limitations and justification for not reducing 100% of WQv required (#28). A detailed evaluation of the specific site limitations and justification for not reducing 100% of the WQv required (#28) must also be included in the SWPPP.
If No, sizing criteria has not been met, so NOI can not be processed. SWPPP preparer must modify design to meet sizing criteria.

33. Identify the Standard SMPs in Table 1 and, if applicable, the Alternative SMPs in Table 2 that were used to treat the remaining total WQv(=Total WQv Required in 28 - Total RRv Provided in 30).

Also, provide in Table 1 and 2 the total impervious area that contributes runoff to each practice selected.

Note: Use Tables 1 and 2 to identify the SMPs used on Redevelopment projects.

33a. Indicate the Total WQv provided (i.e. WQv treated) by the SMPs identified in question #33 and Standard SMPs with RRv Capacity identified in question 29.

WQv Provided

☐☐☐.☐☐☐ **acre-feet**

Note: For the standard SMPs with RRv capacity, the WQv provided by each practice = the WQv calculated using the contributing drainage area to the practice - RRv provided by the practice. (See Table 3.5 in Design Manual)

34. Provide the sum of the Total RRv provided (#30) and the WQv provided (#33a). ☐☐☐.☐☐☐

35. Is the sum of the RRv provided (#30) and the WQv provided (#33a) greater than or equal to the total WQv required (#28)? ○ **Yes** ○ **No**

If Yes, go to question 36.
If No, sizing criteria has not been met, so NOI can not be processed. SWPPP preparer must modify design to meet sizing criteria.

36. Provide the total Channel Protection Storage Volume (CPv) required and provided or select waiver (36a), if applicable.

CPv Required

☐☐☐.☐☐☐ **acre-feet**

CPv Provided

☐☐☐.☐☐☐ **acre-feet**

36a. The need to provide channel protection has been waived because:

○ Site discharges directly to tidal waters or a fifth order or larger stream.

○ Reduction of the total CPv is achieved on site through runoff reduction techniques or infiltration systems.

37. Provide the Overbank Flood (Qp) and Extreme Flood (Qf) control criteria or select waiver (37a), if applicable.

Total Overbank Flood Control Criteria (Qp)

Pre-Development

☐☐☐.☐☐☐ **CFS**

Post-development

☐☐☐.☐☐☐ **CFS**

Total Extreme Flood Control Criteria (Qf)

Pre-Development

☐☐☐.☐☐☐ **CFS**

Post-development

☐☐☐.☐☐☐ **CFS**

37a. The need to meet the Qp and Qf criteria has been waived because:

- ○ Site discharges directly to tidal waters or a fifth order or larger stream.
- ○ Downstream analysis reveals that the Qp and Qf controls are not required

38. Has a long term Operation and Maintenance Plan for the post-construction stormwater management practice(s) been developed? ○ **Yes** ○ **No**

If Yes, Identify the entity responsible for the long term Operation and Maintenance

39. Use this space to summarize the specific site limitations and justification for not reducing 100% of WQv required(#28). (See question 32a) This space can also be used for other pertinent project information.

40. Identify other DEC permits, existing and new, that are required for this project/facility.

- ○ Air Pollution Control
- ○ Coastal Erosion
- ○ Hazardous Waste
- ○ Long Island Wells
- ○ Mined Land Reclamation
- ○ Solid Waste
- ○ Navigable Waters Protection / Article 15
- ○ Water Quality Certificate
- ○ Dam Safety
- ○ Water Supply
- ○ Freshwater Wetlands/Article 24
- ○ Tidal Wetlands
- ○ Wild, Scenic and Recreational Rivers
- ○ Stream Bed or Bank Protection / Article 15
- ○ Endangered or Threatened Species(Incidental Take Permit)
- ○ Individual SPDES
- ○ SPDES Multi-Sector GP N Y R
- ○ Other
- ○ None

41. Does this project require a US Army Corps of Engineers Wetland Permit? ○ **Yes** ○ **No**
If Yes, Indicate Size of Impact. .

42. Is this project subject to the requirements of a regulated, traditional land use control MS4? ○ **Yes** ○ **No**
(If No, skip question 43)

43. Has the "MS4 SWPPP Acceptance" form been signed by the principal executive officer or ranking elected official and submitted along with this NOI? ○ **Yes** ○ **No**

44. If this NOI is being submitted for the purpose of continuing or transferring coverage under a general permit for stormwater runoff from construction activities, please indicate the former SPDES number assigned. N Y R

Owner/Operator Certification

I have read or been advised of the permit conditions and believe that I understand them. I also understand that, under the terms of the permit, there may be reporting requirements. I hereby certify that this document and the corresponding documents were prepared under my direction or supervision. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations. I further understand that coverage under the general permit will be identified in the acknowledgment that I will receive as a result of submitting this NOI and can be as long as sixty (60) business days as provided for in the general permit. I also understand that, by submitting this NOI, I am acknowledging that the SWPPP has been developed and will be implemented as the first element of construction, and agreeing to comply with all the terms and conditions of the general permit for which this NOI is being submitted.

Print First Name

MI

Print Last Name

Owner/Operator Signature

Date

/ /

NYS Department of Environmental Conservation
Division of Water
625 Broadway, 4th Floor
Albany, New York 12233-3505

MS4 Stormwater Pollution Prevention Plan (SWPPP) Acceptance Form

for

Construction Activities Seeking Authorization Under SPDES General Permit

*(NOTE: Attach Completed Form to Notice Of Intent and Submit to Address Above)

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:
12. MS4 SPDES Permit Identification Number: NYR20A
13. Contact Person:
14. Street Address:
15. City/State/Zip:
16. 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 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. Additional Information

(NYS DEC - MS4 SWPPP Acceptance Form - January 2015)

New York State Department of Environmental Conservation
Division of Water
625 Broadway, 4th Floor
Albany, New York 12233-3505
(NOTE: Submit completed form to address above)

NOTICE OF TERMINATION for Storm Water Discharges Authorized under the SPDES General Permit for Construction Activity

Please indicate your permit identification number: NYR ___ ___ ___ ___ ___ ___

I. Owner or Operator Information

1. Owner/Operator Name:

2. Street Address:

3. City/State/Zip:

4. Contact Person:	4a.Telephone:

4b. Contact Person E-Mail:

II. Project Site Information

5. Project/Site Name:

6. Street Address:

7. City/Zip:

8. County:

III. Reason for Termination

9a. □ All disturbed areas have achieved final stabilization in accordance with the general permit and SWPPP. ***Date final stabilization completed** (month/year): _____

9b. □ Permit coverage has been transferred to new owner/operator. Indicate new owner/operator's permit identification number: NYR ___ ___ ___ ___ ___ ___
(Note: Permit coverage can not be terminated by owner identified in I.1. above until new owner/operator obtains coverage under the general permit)

9c. □ Other (Explain on Page 2)

IV. Final Site Information:

10a. Did this construction activity require the development of a SWPPP that includes post-construction stormwater management practices? □ yes □ no (If no, go to question 10f.)

10b. Have all post-construction stormwater management practices included in the final SWPPP been constructed? □ yes □ no (If no, explain on Page 2)

10c. Identify the entity responsible for long-term operation and maintenance of practice(s)?

_____

NOTICE OF TERMINATION for Storm Water Discharges Authorized under the SPDES General Permit for Construction Activity - continued

10d. Has the entity responsible for long-term operation and maintenance been given a copy of the operation and maintenance plan required by the general permit? □ yes □ no

10e. Indicate the method used to ensure long-term operation and maintenance of the post-construction stormwater management practice(s):

□ Post-construction stormwater management practice(s) and any right-of-way(s) needed to maintain practice(s) have been deeded to the municipality.

□ Executed maintenance agreement is in place with the municipality that will maintain the post-construction stormwater management practice(s).

□ For post-construction stormwater management practices that are privately owned, a mechanism is 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.

□ For post-construction stormwater management practices that are owned by a public or private institution (e.g. school, university or hospital), government agency or authority, or public utility; policy and procedures are in place that ensures operation and maintenance of the practice(s) in accordance with the operation and maintenance plan.

10f. Provide the total area of impervious surface (i.e. roof, pavement, concrete, gravel, etc.) constructed within the disturbance area? _____ (acres)

11. Is this project subject to the requirements of a regulated, traditional land use control MS4? □ yes □ no

(If Yes, complete section VI - "MS4 Acceptance" statement

V. Additional Information/Explanation:

(Use this section to answer questions 9c. and 10b., if applicable)

VI. MS4 Acceptance - MS4 Official (principal executive officer or ranking elected official) or Duly Authorized Representative (Note: Not required when 9b. is checked -transfer of coverage)

I have determined that it is acceptable for the owner or operator of the construction project identified in question 5 to submit the Notice of Termination at this time.

Printed Name:

Title/Position:

Signature:	Date:

NOTICE OF TERMINATION for Storm Water Discharges Authorized under the SPDES General Permit for Construction Activity - continued	
VII. Qualified Inspector Certification - Final Stabilization:	
I hereby certify that all disturbed areas have achieved final stabilization as defined in the current version of the general permit, and that all temporary, structural erosion and sediment control measures have been removed. 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.	
Printed Name:	
Title/Position:	
Signature:	Date:
VIII. Qualified Inspector Certification - Post-construction Stormwater Management Practice(s):	
I hereby certify that all post-construction stormwater management practices have been constructed in conformance with the SWPPP. 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.	
Printed Name:	
Title/Position:	
Signature:	Date:
IX. Owner or Operator Certification	
I hereby certify that this document was prepared by me or under my direction or supervision. My determination, based upon my inquiry of the person(s) who managed the construction activity, or those persons directly responsible for gathering the information, is that the information provided in this document is true, accurate and complete. 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.	
Printed Name:	
Title/Position:	
Signature:	Date:

(NYS DEC Notice of Termination - January 2015)

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APPENDIX F: EROSION & SEDIMENT CONTROL DETAILS AND STORMWATER MANAGEMENT PLAN

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SITE CRITERIA CHECKLIST		
PROJECT SITE INFORMATION		
ADDRESS	HENNEBERRY ROAD (COUNTY ROUTE 182)	
TAX MAP ID NO.	109.-02-07.1	
BOUNDARY SURVEY	PROPERTY LINE INFORMATION TAKEN FROM SURVEY BY IANUZI AND ROMANS	
TOTAL SITE AREA	54.746 ACRES	
LAND USE	SINGLE FAMILY RESIDENTIAL – 34 LOTS	
ZONING INFORMATION		
ZONING DISTRICT	R-1, RESIDENTIAL DISTRICT	
	REQUIRED	PROVIDED
MIN. LOT FRONTAGE	150'	150' MIN.
MIN. LOT AREA	40,000 SF	40,000 SF MIN.
MINIMUM FRONT YARD	40'	40' MIN.
MINIMUM REAR YARD	40'	40' MIN.
MINIMUM SIDE YARD	20'	20' MIN.

PROJECT TITLE:
BRANDYWINE ESTATES PHASE 2
HENNEBERRY ROAD
TOWN OF MANLIUS — ONONDAGA COUNTY, NY

PREPARED FOR:
HARRINGTON HOMES
3848 HENNEBERRY ROAD
JAMESVILLE, NY 13078

SHEET TITLE:
OVERALL GRADING PLAN

NO.	REVISION/ISSUE	DATE
1	GENERAL REVISIONS	12/01/2021

GRAPHIC SCALE
0 80' 160'
(IN FEET)
1 inch = 80 ft

PREPARED BY:
NAPIERALA CONSULTING
PROFESSIONAL ENGINEER, P.C.
SITE • DESIGN • ENGINEERING
110 FAYETTE STREET
MANLIUS, NEW YORK 13104
email: NNAPIERALA@CNY.COM
PH: (315) 682-5500 FAX: (315) 682-5544

PRELIMINARY
NOT FOR CONSTRUCTION

PREPARED BY:
NEAL H. JENNETTER, JR., P.E.
NYS REGISTRATION # 087211

PROJECT NO. 20-1906
DATE 17 SEP 2020
SCALE 1" = 80'

SHEET C-2

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PROFESSIONAL ENGINEER, PC
IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, ARCHITECT, LANDSCAPE ARCHITECT OR LAND SURVEYOR, TO ALTER ANY ITEM ON THIS DOCUMENT IN ANY WAY.
ANY LICENSED SPECIALISTS THAT ALTER THIS DOCUMENT SHALL ADD TO IT THEIR SEAL AND THE DESIGNATION OF THE SPECIALIST WHO MADE THE ALTERATION.

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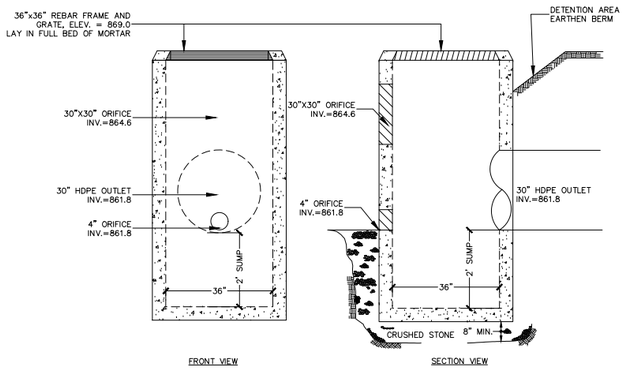
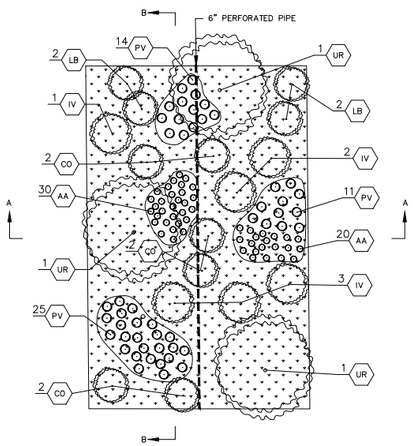


DETENTION BASIN #1 PRECAST CONCRETE OUTLET STRUCTURE

1 / C-7.1 SCALE: NTS



*PLANTING QUANTITIES SHOWN IN THE GRAPHIC ABOVE ARE FOR A TYPICAL 1,000 SF BIORETENTION AREA. SPECIFIC QUANTITIES FOR THE BIORETENTION AREA ARE PROVIDED IN THE CORRESPONDING LANDSCAPING TABLE.

BIORETENTION AREA #1 (±12,800 SF) – LANDSCAPE TABLE

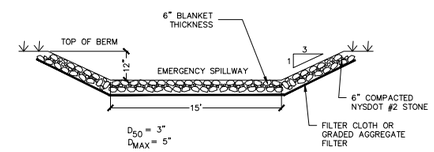
KEY	QUANTITY*	LATIN NAME	COMMON NAME	CALIPER	HEIGHT
TREES					
UR	16	ULMUS RUBRA	SLIPPERY ELM	6'–8'	B&B
SHRUBS					
LB	45	LINDERA BENZOIN	COMMON SPICE	18"–24"	B&B
IV	65	ILEX VERTICILLATA	WINTER BERRY	2'–3'	B&B
CO	65	CEPHALANTHUS OCCIDENTALIS	BUTTONBUSH	18"–24"	B&B
HERBACEOUS PLANTS					
PV	600	PANICUM VIRGATUM	SWITCH GRASS		
AA	600	AGROSTIS ALBA	REDTOP		

BIORETENTION AREA #2 (±6,200 SF) – LANDSCAPE TABLE

KEY	QUANTITY*	LATIN NAME	COMMON NAME	CALIPER	HEIGHT
TREES					
UR	8	ULMUS RUBRA	SLIPPERY ELM	6'–8'	B&B
SHRUBS					
LB	25	LINDERA BENZOIN	COMMON SPICE	18"–24"	B&B
IV	35	ILEX VERTICILLATA	WINTER BERRY	2'–3'	B&B
CO	30	CEPHALANTHUS OCCIDENTALIS	BUTTONBUSH	18"–24"	B&B
HERBACEOUS PLANTS					
PV	300	PANICUM VIRGATUM	SWITCH GRASS		
AA	300	AGROSTIS ALBA	REDTOP		

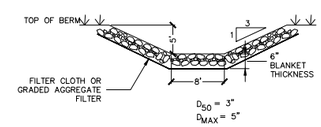
BIORETENTION FILTER SPECIES

2 / C-7.1 SCALE: NTS



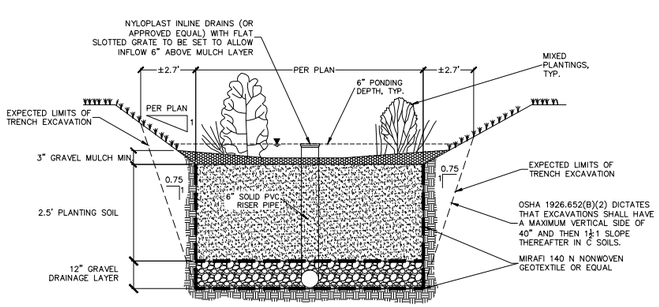
RIP RAP EMERGENCY SPILLWAY

3 / C-7.1 SCALE: NTS

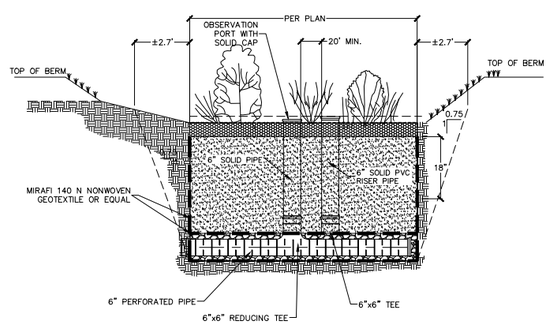


RIP RAP BIORETENTION SPILLWAY

4 / C-7.1 SCALE: NTS



PROFILE VIEW SECTION A–A



PROFILE VIEW SECTION B–B

BIORETENTION FILTER CROSS SECTIONS

5 / C-7.1 SCALE: NTS

BIORETENTION NOTES:

1. PLANTING SOIL MEDIA SHALL BE:
   A.) 85% TO 88% COARSE TO MEDIUM SAND
   B.) 12%–15% LEAF COMPOST OR TOPSOIL
2. PEA GRAVEL MULCH CONFORMING TO ASTM D 448 No. 6.
3. UNDERDRAIN GRAVEL TO BE AASHTO M–43 No. 67, 0.25" TO 0.75".
4. GEOTEXTILE FILTER FABRIC (SEPARATION LAYER):
   ASTM D–751 (PUNCTURE STRENGTH – 125 LB)
   ASTM D–1117 (MULLEN BURST STRENGTH – 400 PSI)
   ASTM D–1682 (TENSILE STRENGTH – 300 LB)
   SIZE – 0.08" THICK; EQUIVALENT OPENING SIZE OF #80 SIEVE
5. COMPACT WITH WATER–FILLED HAND ROLLER. COMPACTION TO BE FIRM BUT EASY (UTILIZE PENCIL TEST).
6. ENGINEER TO TEST IN PLACE COMPACTION AND INFILTRATION OF PLANTING SOIL.
7. ENGINEER TO PERFORM INSPECTION OF BIORETENTION PLANTING SOIL IMMEDIATELY FOLLOWING PLACEMENT AND PERFORM AN IN PLACE PERCOLATION TEST TO CONFIRM THAT THE IN PLACE MATERIAL PERCOLATES AT A RATE FASTER THAN 10 MIN/INCH.

PROJECT TITLE:
BRANDYWINE ESTATES PHASE 2
HENNEBERRY ROAD
TOWN OF MANLIUS ONONDAGA COUNTY, NY

PREPARED FOR:
HARRINGTON HOMES
3848 HENNEBERRY ROAD
JAMESVILLE, NY 13078

SHEET TITLE:
SITE DETAILS

NO.	REVISION/ISSUE	DATE
1	GENERAL REVISIONS	12/01/2021

PREPARED BY:
NAPIERALA CONSULTING
PROFESSIONAL ENGINEER, P.C.
SITE • DESIGN • ENGINEERING
110 FAYETTE STREET
MANLIUS, New York 13104
email: MNAPIER@NPCONS.COM
PH.: (315) 682-5580 FAX: (315) 682-5544

PRELIMINARY
NOT FOR CONSTRUCTION

PE-SEAL BY:
NEAL F. ZIMMERMYER, JR. P.E.
NYS REGISTRATION # 087211

PROJECT NO. 20-1906
DATE 17 SEP 2020
SCALE AS SHOWN

SHEET C-7.1

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PROFESSIONAL ENGINEER, PC
IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS THEY ARE ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, ARCHITECT, LANDSCAPE ARCHITECT OR LAND SURVEYOR, TO ALTER AN ITEM IN ANY WAY. IF AN ITEM BEARING THE STAMP OF A LICENSED PROFESSIONAL IS ALTERED, THE ALTERING ENGINEER, ARCHITECT, LANDSCAPE ARCHITECT OR LAND SURVEYOR SHALL AFFIX TO THE ITEM THE STAMP OF THE ALTERING ENGINEER, ARCHITECT, LANDSCAPE ARCHITECT OR LAND SURVEYOR AND A DESCRIPTION OF THE ALTERATION.

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EROSION CONTROL NOTES

EROSION AND SEDIMENT CONTROLS

1. STABILIZATION PRACTICES (TEMPORARY)
   a) TEMPORARY SEEDING AND PLANTING OF ALL UNPAVED AREAS WHEN CONSTRUCTION ACTIVITY HAS CEASED, OR WILL CEASE, IN AN AREA FOR 14 DAYS. SEEDING MIXTURES AND APPLICATION RATES ARE LISTED ON SHEET C-2.
   b) MULCHING EXPOSED AREAS.
   c) FREQUENT WATERING TO MINIMIZE WIND EROSION DURING CONSTRUCTION.

2. STABILIZATION PRACTICES (PERMANENT)
   a) LAND CLEARING ACTIVITIES SHALL BE DONE ONLY IN AREAS WHERE EARTHWORK WILL BE PERFORMED AND SHALL PROGRESS AS EARTHWORK IS NEEDED.
   b) PERMANENT SEEDING AND PLANTING OF ALL UNPAVED AREAS.

3. STRUCTURAL MEASURES TEMPORARY
   a. STABILIZED CONSTRUCTION ENTRANCE: AT THE ENTRANCE TO THE ALL DISTURBED AREAS FROM AN EXISTING ROADWAY A STABILIZED CONSTRUCTION ENTRANCE SHALL BE PROVIDED. THE PURPOSE OF THE STABILIZED CONSTRUCTION ENTRANCE IS TO REDUCE OR ELIMINATE THE TRACKING OF SEDIMENT ONTO THE PUBLIC RIGHT-OF-WAY.
   b. SILT FENCE: SILT FENCE SHALL BE INSTALLED AS SHOWN ON THE EROSION CONTROL PLAN . THE FABRIC SHALL MEET THE SPECIFICATIONS NOTED ON THE DETAILS UNLESS OTHERWISE APPROVED BY THE APPROPRIATE EROSION AND SEDIMENT CONTROL PLAN APPROVAL AUTHORITY. SUCH APPROVAL SHALL NOT CONSTITUTE STATEWIDE ACCEPTANCE.
   c. DUST CONTROL: DUST CONTROL IS THE CONTROL OF DUST RESULTING FROM LAND-DISTURBING ACTIVITIES. THE PURPOSE IS TO PREVENT SURFACE AND AIR MOVEMENT OF DUST FROM DISTURBED SOIL SURFACES THAT MAY CAUSE OFF-SITE DAMAGE, HEALTH HAZARDS, AND TRAFFIC SAFETY PROBLEMS.
   d. SEDIMENT TRAP: SEDIMENT TRAP TO BE INSTALLED IN DETENTION BASIN AREA FOR USE DURING CONSTRUCTION. STONE OUTLET SEDIMENT TRAP TO BE INSTALLED AS PER DETAIL TO ELIMINATE SEDIMENT DISCHARGE TO DOWNSTREAM AREAS DURING CONSTRUCTION PHASE.

4. STRUCTURAL PRACTICES (PERMANENT)
   a. ROCK OUTLET PROTECTION: ROCK OUTLET PROTECTION IS A SECTION OF ROCK PROTECTION PLACED AT THE OUTLET END OF CULVERTS, CONDUITS, OR CHANNELS. THE PURPOSE OF THE ROCK OUTLET PROTECTION IS TO REDUCE THE DEPTH, VELOCITY, AND ENERGY OF WATER, SUCH THAT THE FLOW WILL NOT ERODE THE RECEIVING DOWNSTREAM REACH.
   b. REINFORCED SLOPE PROTECTION: A TEMPORARY PROTECTIVE COVERING PLACED ON A PREPARED PLANTING AREA THAT IS ANCHORED IN PLACE BY STAPLES OR OTHER MEANS TO AID IN CONTROLLING EROSION BY ABSORBING RAIN SPLASH ENERGY AND WITHSTAND OVERLAND FLOW AS WELL AS PROVIDE A MICROCLIMATE TO PROTECT AND PROMOTE SEED ESTABLISHMENT.
   c. LAND GRADING: PERMANENT RESHAPING OF THE EXISTING LAND SURFACE BY GRADING IN ACCORDANCE WITH AN ENGINEERING TOPOGRAPHIC PLAN AND SPECIFICATION TO PROVIDE EROSION CONTROL AND VEGETATIVE ESTABLISHMENT ON DISTURBED, RESHAPED AREAS.

5. SEQUENCE OF MAJOR ACTIVITIES
   THE CONTRACTOR SHALL BE RESPONSIBLE FOR IMPLEMENTING THE ABOVE LISTED EROSION AND SEDIMENT CONTROL PRACTICES. THE CONTRACTOR MAY DESIGNATE THESE TASKS TO CERTAIN SUBCONTRACTORS AS IS SEEN FIT, BUT THE ULTIMATE RESPONSIBILITY FOR IMPLEMENTING THESE CONTROLS AND ENSURING THEIR PROPER FUNCTION REMAINS WITH THE CONTRACTOR. THE ORDER OF ACTIVITIES WILL BE AS FOLLOWS:
   a) CONDUCT PRECONSTRUCTION MEETING
   b) CONSTRUCT TEMPORARY CONSTRUCTION ENTRANCE/EXIT AT THE LOCATION SHOWN ON THE PLAN.
   c) INSTALL PERIMETER SILT FENCE AND SECURITY CONSTRUCTION FENCE IN THE LOCATIONS SHOWN ON THE PLAN.
   d) ESTABLISH STAGING AREA ON PROJECT SITE
   e) CONSTRUCT TEMPORARY SEDIMENT TRAP
   f) REMOVE TOPSOIL, STOCKPILE AND STABILIZE
   g) SITE GRADING. IMPORT OF FILL MATERIAL TO RAISE SITE TO PROPOSED GRADE (OR SUB-GRADE, AS APPROPRIATE).
   h) BUILDING FOUNDATION EXCAVATION (BUILDING CONSTRUCTION TO CONTINUE CONCURRENTLY WITH REMAINING SITE WORK).
   i) DISTURBED AREAS OF THE SITE WHERE CONSTRUCTION ACTIVITY HAS CEASED FOR MORE THAN 14 DAYS SHALL BE TEMPORARILY SEEDED AND WATERED.
   j) UNDERGROUND UTILITY INSTALLATIONS.
   k) INSTALL FILTER FABRIC DROP INLET PROTECTION AT ALL STORM INLETS.
   l) COMPACT GRAVEL ALONG ALL DRIVE AISLES AND PARKING AREAS
   m) SITE CONCRETE CONSTRUCTION.
   n) FINALIZE PAVEMENT SUBGRADE PREPARATION.
   o) REMOVE INLET PROTECTION NO MORE THAN 24 HOURS PRIOR TO PLACING ASPHALT PAVEMENT.
   p) PAVE AREAS NOTED ON PLAN.
   q) DEEP RIPPING OF NON-PAVED AREAS AS REQUIRED (NON-PAVED AREAS THAT HAVE BEEN COMPACTED DURING CONSTRUCTION VIA CONSTRUCTION TRAFFIC).
   r) FINAL GRADING, SEEDING, AND PLANTING.
   s) CONSTRUCT BIORETENTION BASINS AND OUTLET CONTROLS UPON UPSTREAM STABILIZATION OF SITE
   t) REMOVE SEDIMENT TRAP AND FINALIZE GRADING OF DETENTION BASIN
   u) REMOVE SILT FENCE ONLY AFTER ALL PAVING IS COMPLETE AND EXPOSED SURFACES ARE STABILIZED.

MAINTENANCE/INSPECTION PROCEDURES

THE FOLLOWING INSPECTION AND MAINTENANCE PRACTICES WILL BE USED TO MAINTAIN EROSION AND SEDIMENT CONTROLS AND STABILIZATION MEASURES.

1. ALL CONTROL MEASURES WILL BE INSPECTED AT LEAST TWICE EVERY SEVEN (7) CALENDAR DAYS
2. ALL MEASURES WILL BE MAINTAINED IN GOOD WORKING ORDER; IF REPAIRS OR OTHER EROSION CONTROL MEASURES ARE FOUND TO BE NECESSARY, THEY WILL BE INITIATED WITHIN 24 HOURS OF REPORT.
3. BUILT UP SEDIMENT WILL BE REMOVED FROM SILT FENCE WHEN IT HAS REACHED ONE-THIRD THE HEIGHT OF THE FENCE.
4. SILT FENCES WILL BE INSPECTED FOR DEPTH OF SEDIMENT, TEARS, ETC., TO SEE IF THE FABRIC IS SECURELY ATTACHED TO THE FENCE POSTS, AND TO SEE THAT THE FENCE POSTS ARE SECURELY IN THE GROUND.
5. TEMPORARY AND PERMANENT SEEDING AND ALL OTHER STABILIZATION MEASURES WILL BE INSPECTED FOR BARE SPOTS, WASHOUTS, AND HEALTHY GROWTH.
6. A MAINTENANCE INSPECTION REPORT WILL BE MADE AFTER EACH INSPECTION. COPIES OF THE REPORT FORMS TO BE COMPLETED BY THE INSPECTOR ARE INCLUDED IN THIS SWPPP.
7. THE OPERATOR SHALL HAVE A "QUALIFIED PROFESSIONAL" CONDUCT SITE INSPECTIONS FOLLOWING THE COMMENCEMENT OF CONSTRUCTION. A "QUALIFIED PROFESSIONAL" IS A PERSON KNOWLEDGEABLE IN THE PRINCIPLES AND PRACTICE OF EROSION AND SEDIMENT CONTROLS, SUCH AS A LICENSED PROFESSIONAL ENGINEER, CERTIFIED PROFESSIONAL IN EROSION AND SEDIMENT CONTROL (CPESC), OR SOIL SCIENTIST.
8. DISTURBED AREAS AND MATERIALS STORAGE AREAS WILL BE INSPECTED FOR EVIDENCE OF OR POTENTIAL FOR POLLUTANTS ENTERING STORMWATER SYSTEMS.
9. REPORT TO NYS DEC WITHIN 24 HOURS ANY NONCOMPLIANCE WITH THE SWPPP THAT WILL ENDANGER PUBLIC HEALTH OR THE ENVIRONMENT. FOLLOW UP WITH A WRITTEN REPORT WITHIN 5 DAYS OF THE NONCOMPLIANCE EVENT. THE FOLLOWING EVENTS REQUIRE 24 HOUR REPORTING: A) ANY UNANTICIPATED BYPASS WHICH EXCEEDS ANY EFFLUENT LIMITATION IN THE PERMIT, B) ANY UPSET WHICH EXCEEDS ANY EFFLUENT LIMITATION IN THE PERMIT, AND C) A VIOLATION OF A MAXIMUM DAILY DISCHARGE LIMITATION FOR ANY OF THE POLLUTANTS LISTED BY THE EPA IN THE PERMIT TO BE REPORTED WITHIN 24 HOURS. THE WRITTEN SUBMISSION MUST CONTAIN A DESCRIPTION OF THE NON-COMPLIANCE AND ITS CAUSE; THE PERIOD OF NON-COMPLIANCE, INCLUDING EXACT DATES AND TIMES, AND IF THE NON-COMPLIANCE HAS NOT BEEN CORRECTED, THE ANTICIPATED TIME IT IS EXPECTED TO CONTINUE; AND STEPS TAKEN OR PLANNED TO REDUCE, ELIMINATE, AND PREVENT RECURRENCE OF THE NON-COMPLIANCE.
10. RELEASES OF HAZARDOUS SUBSTANCES OR OIL IN EXCESS OF REPORTABLE QUANTITIES (AS ESTABLISHED UNDER 40 CFR 110, 40 CFR 117 OR 40 CFR 302) MUST BE REPORTED. FORM G-1 PROVIDES FURTHER DETAILS ON THE NOTIFICATION AND REPORTING PROCESS.

INSPECTION AND MAINTENANCE REPORT FORMS

ONCE INSTALLATION OF ANY REQUIRED OR OPTIONAL EROSION CONTROL DEVICE OR MEASURE HAS BEEN IMPLEMENTED, AT LEAST ONCE EVERY SEVEN (7) CALENDAR DAYS AND SHALL BE PERFORMED BY A QUALIFIED PROFESSIONAL. THE FORMS FOUND IN THIS SWPPP SHALL BE USED BY THE INSPECTORS TO INVENTORY AND REPORT THE CONDITION OF EACH MEASURE TO ASSIST IN MAINTAINING THE EROSION AND SEDIMENT CONTROL MEASURES IN GOOD WORKING ORDER.

THESE REPORT FORMS SHALL BECOME AN INTEGRAL PART OF THE SWPPP AND SHALL BE MADE READILY ACCESSIBLE TO GOVERNMENTAL INSPECTION OFFICIALS, THE OPERATOR'S ENGINEER, AND THE OPERATOR FOR REVIEW UPON REQUEST DURING VISITS TO THE PROJECT SITE. IN ADDITION, COPIES OF THE REPORTS SHALL BE PROVIDED TO ANY OF THESE PERSONS, UPON REQUEST, VIA MAIL OR FACSIMILE TRANSMISSION. INSPECTION AND MAINTENANCE REPORT FORMS ARE TO BE MAINTAINED BY THE PERMITTEE FOR FIVE YEARS FOLLOWING THE FINAL STABILIZATION OF THE SITE.

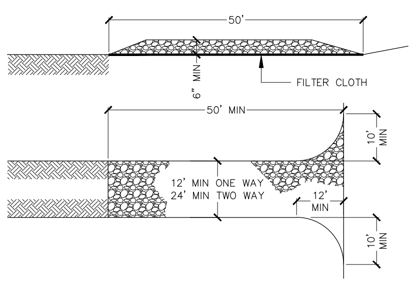
OTHER RECORD-KEEPING REQUIREMENTS

THE CONTRACTOR SHALL KEEP THE FOLLOWING RECORDS RELATED TO CONSTRUCTION ACTIVITIES AT THE SITE:

- DATES WHEN MAJOR GRADING ACTIVITIES OCCUR AND THE AREAS WHICH WERE GRADED
- DATES AND DETAILS CONCERNING THE INSTALLATION OF STRUCTURAL CONTROLS
- DATES WHEN CONSTRUCTION ACTIVITIES CEASE IN AN AREA
- DATES WHEN AN AREAS IS STABILIZED, EITHER TEMPORARILY OR PERMANENTLY
- DATES OF RAINFALL AND THE AMOUNT OF RAINFALL
- DATES AND DESCRIPTIONS OF THE CHARACTER AND AMOUNT OF ANY SPILLS OF HAZARDOUS MATERIALS
- RECORDS OF REPORTS FILED WITH REGULATORY AGENCIES IF REPORTABLE QUANTITIES OF HAZARDOUS MATERIALS SPILLED

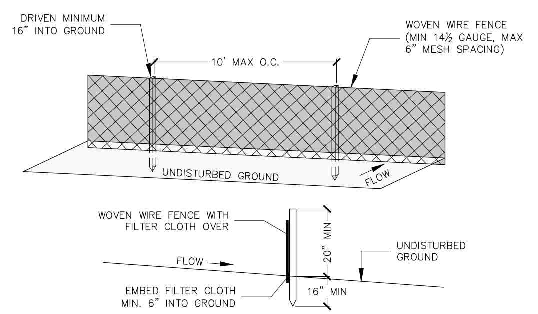
EROSION CONTROL NOTES

1. LAND DISTURBING ACTIVITIES SHALL NOT COMMENCE UNTIL APPROVAL TO DO SO HAS BEEN RECEIVED BY GOVERNING AUTHORITIES. THE GENERAL CONTRACTOR SHALL STRICTLY ADHERE TO THE APPROVED SWPPP DRAWINGS DURING CONSTRUCTION OPERATIONS.
2. NO LAND CLEARING OR GRADING SHALL BEGIN UNTIL THE APPROPRIATE EROSION CONTROL MEASURES HAVE BEEN INSTALLED.
3. ALL EXPOSED AREAS SHALL BE SEEDED AS SPECIFIED WITHIN 7 DAYS OF FINAL GRADING.
4. SHOULD CONSTRUCTION STOP FOR LONGER THAN 14 DAYS, THE SITE SHALL BE SEEDED AS SPECIFIED.
5. MAINTAIN EROSION CONTROL MEASURES AFTER EACH RAIN AND AT LEAST ONCE A WEEK.
6. THIS PLAN SHALL NOT BE CONSIDERED ALL INCLUSIVE AS THE GENERAL CONTRACTOR SHALL TAKE ALL NECESSARY PRECAUTIONS TO PREVENT SEDIMENT FROM LEAVING THE SITE.
7. GENERAL CONTRACTOR SHALL COMPLY WITH ALL STATE AND LOCAL ORDINANCES THAT APPLY.
8. ADDITIONAL EROSION AND SEDIMENT CONTROL MEASURES WILL BE INSTALLED IF DEEMED NECESSARY BY ON SITE INSPECTION.
9. IF INSTALLATION OF STORM DRAINAGE SYSTEM SHOULD BE INTERRUPTED BY WEATHER OR NIGHTFALL, THE PIPE ENDS SHALL BE COVERED WITH FILTER FABRIC.
10. GENERAL CONTRACTOR SHALL BE RESPONSIBLE TO TAKE WHATEVER MEANS NECESSARY TO ESTABLISH PERMANENT SOIL STABILIZATION.
11. ALL WORK TO BE DONE IN STRICT ACCORDANCE WITH THE NEW YORK STANDARDS AND SPECIFICATIONS FOR EROSION AND SEDIMENT CONTROL.



1. STONE SIZE - USE 2" STONE, OR RECLAIMED OR RECYCLED CONCRETE EQUIVALENT.
2. LENGTH - NOT LESS THAN 50 FEET.
3. THICKNESS - NOT LESS THAN SIX (6) INCHES.
4. WIDTH - 24 FEET MINIMUM.
5. FILTER CLOTH - WILL BE PLACED OVER THE ENTIRE AREA PRIOR TO PLACING OF STONE.
6. SURFACE WATER - ALL SURFACE WATER FLOWING OR DIVERTED TOWARD CONSTRUCTION ENTRANCES SHALL BE PIPED ACROSS THE ENTRANCE. IF PIPING IS IMPRACTICAL, A MOUNTABLE BERM WITH 5:1 SLOPES WILL BE PERMITTED.
7. MAINTENANCE - THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION WHICH WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHTS-OF-WAY. ALL SEDIMENT SPILLED, DROPPED, WASHED, OR TRACKED ONTO PUBLIC RIGHTS-OF-WAY MUST BE REMOVED IMMEDIATELY.
8. WHEN WASHING IS REQUIRED, IT SHALL BE DONE ON AN AREA STABILIZED WITH STONE AND WHICH DRAINS INTO AN APPROVED SEDIMENT TRAPPING DEVICE.
9. PERIODIC INSPECTION AND NEEDED MAINTENANCE SHALL BE PROVIDED AFTER EACH RAIN.

1 CONSTRUCTION ENTRANCE
C-7.2 SCALE: NTS



POSTS: STEEL, EITHER "T" OR "U" TYPE OR 2" HARDWOOD

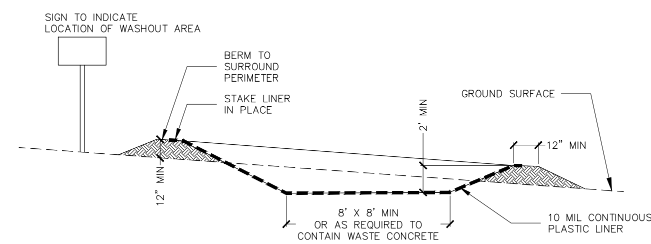
FENCE: WOVEN WIRE, 14 1/2 GAUGE, 6" MAX. MESH OPENING

FILTER CLOTH: FILTER X., MIRAFI 100X, STABILINKA T140N OR APPROVED EQUAL

PREFABRICATED UNIT: GEOFAB, ENVIROFENCE, OR APPROVED EQUAL

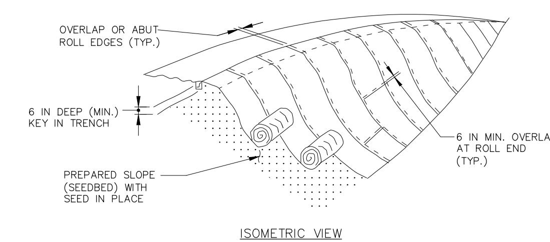
1. WOVEN WIRE FENCE TO BE FASTENED SECURELY TO FENCE POSTS WITH WIRE TIES OR STAPLES.
2. FILTER CLOTH IS TO BE FASTENED SECURELY TO WOVEN WIRE FENCE WITH TIES SPACED EVERY 24" AT TOP AND MID SECTION.
3. WHEN TWO SECTIONS OF FILTER CLOTH ADJOIN EACH OTHER, THEY SHALL BE OVERLAPPED BY SIX INCHES AND FOLDED.
4. MAINTENANCE SHALL BE PERFORMED AS NEEDED AND MATERIAL REMOVED WHEN "BULGES" DEVELOP IN THE SILT FENCE.

2 SILT FENCE
C-7.2 SCALE: NTS



NOTES:
1. CONCRETE WAHSOUT AREA SHALL BE INSTALLED PRIOR TO ANY CONCRETE PLACEMENT ON SITE.
2. CONCRETE WASHOUT OUT AREA SHALL BE LINED WITH A 10 MIL IMPERMEABLE LINER AND STAKED IN PLACE.
3. SIGNS SHALL BE PLACED AT THE CONSTRUCTION ENTRANCE, AT THE WASHOUT AREA, AND ELSEWHERE AS NECESSARY TO CLEARLY INDICATE LOCATION OF CONCRETE WASHOUT AREA TO OPERATORS OF CONCRETE TRUCKS AND PUMP RIGS.
4. THE CONCRETE WAHSOUT AREA SHALL BE REPAIRED AND ENLARGED OR CLEANED OUT AS NECESSARY TO MAINTAIN CAPACITY FOR WASTED CONCRETE.
5. AT THE END OF CONSTRUCTION, ALL CONCRETE SHALL BE REMOVED FROM SITE AND DISPOSED OF AT AN ACCEPTED WASTE SITE.
6. WHEN THE CONCRETE WASHOUT AREA IS REMOVED, THE DISTURBED AREA SHALL BE SEEDED AND MULCHED OR OTHERWISE STABILIZED.

3 CONCRETE WASHOUT AREA
C-7.2 SCALE: NTS

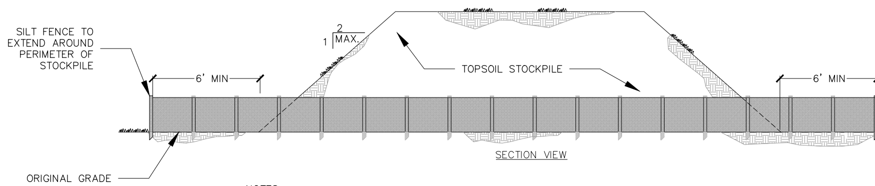


ISOMETRIC VIEW

CONSTRUCTION SPECIFICATIONS

1. USE TEMPORARY SOIL STABILIZATION MATTING MADE OF DEGRADABLE (LASTS 6 MONTHS MINIMUM) NATURAL OR MAN-MADE FIBERS (MOSTLY ORGANIC).
2. PERFORM FINAL GRADING, TOPSOIL APPLICATION, SEEDBED PREPARATION, AND PERMANENT SEEDING IN ACCORDANCE WITH SPECIFICATIONS. PLACE MATTING WITHIN 48 HOURS OF COMPLETING SEEDING OPERATIONS UNLESS END OF WORKDAY STABILIZATION IS SPECIFIED ON THE APPROVED EROSION & SEDIMENT CONTROL PLAN.
3. OVERLAP OR ABUT ROLL EDGES PER MANUFACTURER RECOMMENDATIONS. OVERLAP ROLL ENDS BY 6 INCHES (MINIMUM), WITH THE UPSLOPE MAT OVERLAPPING ON TOP OF THE DOWNSLOPE MAT.

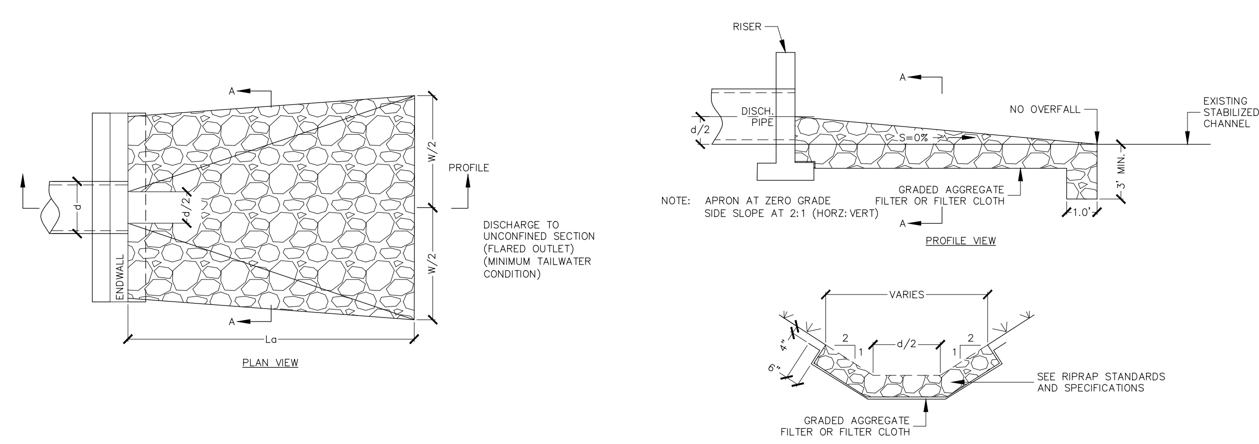
4 SLOPE STABILIZATION MATTING
C-7.2 SCALE: NTS



SECTION VIEW

NOTES:
1. SEE EROSION CONTROL PLAN FOR LOCATION OF STOCKPILE
2. REFER TO SILT FENCE DETAIL FOR INSTALLATION OF SILT FENCE
3. IF THE STOCKPILE IS TO REMAIN FOR MORE THAN 14 DAYS IT SHALL BE TEMPORARILY SEEDED FOR STABILIZATION
4. SILT FENCES TO BE MAINTAINED IN PLACE UNTIL TOPSOIL STOCKPILE HAS BEEN REMOVED

5 TYPICAL TOPSOIL STOCKPILE
C-7.2 SCALE: NTS



6 ROCK RIPRAP OUTLET PROTECTION UNCONFINED DOWNSTREAM SECTION
C-7.2 SCALE: NTS

PROJECT TITLE:
BRANDYWINE ESTATES PHASE 2
HENNEBERRY ROAD
TOWN OF MANLIUS ONONDAGA COUNTY, NY

PREPARED FOR:
HARRINGTON HOMES
3848 HENNEBERRY ROAD
JAMESVILLE, NY 13078

SHEET TITLE:
SITE DETAILS

NO.	REVISION/ISSUE	DATE
1	GENERAL REVISIONS	12/01/2021

PREPARED BY:
NAPIERALA CONSULTING
PROFESSIONAL ENGINEER, P.C.
SITE • DESIGN • ENGINEERING
110 FAYETTE STREET
MANLIUS, NEW YORK 13104
email: MNAP@NAPCON.COM
PH: (315) 682-5580 FAX: (315) 682-5544

PRELIMINARY
NOT FOR CONSTRUCTION

PLAN SEAL BY:
NEAL H. ZINSMEYER, JR., P.E.
NYS REGISTRATION # 087211

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NAPIERALA CONSULTING
PROFESSIONAL ENGINEER, PC

IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS ACTING UNDER THE DIRECTION OF A LICENSED ARCHITECT, PROFESSIONAL ENGINEER, LANDSCAPE ARCHITECT, OR LAND SURVEYOR TO ALTER ANY ITEM ON THIS DOCUMENT IN ANY WAY.

ANY LICENSEE WHO ALTERS THIS DOCUMENT IS REQUIRED BY LAW TO AFFIX HIS OR HER SEAL AND THE NOTATION "ALTERED BY" FOLLOWED BY HIS OR HER SIGNATURE AND SPECIFIC DESCRIPTION OF THE ALTERATIONS.

PROJECT NO. 20-1906
DATE 17 SEP 2020
SCALE AS SHOWN
SHEET C-7.2

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APPENDIX G: SHPO AND NYSDEC LETTERS

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NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

Division of Fish and Wildlife, New York Natural Heritage Program
625 Broadway, Fifth Floor, Albany, NY 12233-4757
P: (518) 402-8935 | F: (518) 402-8925
www.dec.ny.gov

September 1, 2020

Neal Zinsmeyer
Napierala Consulting
110 Fayette Street
Manlius, NY 13104

Re: Brandywine Phase 2
County: Onondaga Town/City: Manlius

Dear Mr. Zinsmeyer:

In response to your recent request, we have reviewed the New York Natural Heritage Program database with respect to the above project.

We have no records of rare or state-listed animals or plants, or significant natural communities at the project site.

Within 2.5 miles of the project site is a documented winter hibernaculum of **Indiana Bat** (*Myotis sodalis*, state and federally listed as Endangered) and **Northern long-eared Bat** (*Myotis septentrionalis*, state and federally listed as Threatened). These bat species may travel 2.5 miles or more from documented locations. The main impact of concern for bats is the removal of potential roost trees. For information about any permit considerations for your project, please contact the Permits staff at the NYSDEC Region 7 Office, Division of Environmental Permits, at dep.r7@dec.ny.gov, 315-426-7438.

For most sites, comprehensive field surveys have not been conducted. We cannot provide a definitive statement on the presence or absence of all rare or state-listed species or significant natural communities. Depending on the nature of the project and the conditions at the project site, further information from on-site surveys or other resources may be required to fully assess impacts on biological resources.

For information regarding other permits that may be required under state law for regulated areas or activities (e.g., regulated wetlands), please contact the Permits staff at the NYSDEC Region 7 Office as described above.

Sincerely,

Nicholas Conrad
Information Resources Coordinator
New York Natural Heritage Program

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NEW YORK STATE OF OPPORTUNITY | Department of Environmental Conservation

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NEW YORK STATE OF OPPORTUNITY. | Parks, Recreation and Historic Preservation

ANDREW M. CUOMO
Governor

ERIK KULLESEID
Commissioner

ARCHAEOLOGY COMMENTS

Phase IA/IB Archaeological Survey Recommendation
Project: Harrington Homes Residential Subdivision
PR#: 20PR05587
Date: 9/18/2020

Your project is in an archaeologically sensitive location. Therefore, the State Historic Preservation Office/Office of Parks, Recreation and Historic Preservation (SHPO/OPRHP) recommends a Phase IA/IB archaeological survey for components of the project that will involve ground disturbance, unless substantial prior ground disturbance can be documented. A Phase IA/IB survey is designed to determine the presence or absence of archaeological sites or other cultural resources in the project's Area of Potential Effects (APE).

If you consider the entire project area to be disturbed, documentation of the disturbance will need to be reviewed by SHPO/OPRHP. Examples of disturbance include mining activities and multiple episodes of building construction and demolition. Documentation of ground disturbance typically consists of soil bore logs, photos, or previous project plans. Agricultural activity is not considered to be substantial ground disturbance.

Please note that in areas with alluvial soils or fill archaeological deposits may exist below the depth of superficial disturbances such as pavement or even deeper disturbances, depending on the thickness of the alluvium or fill. Evaluation of the possible impact of prior disturbance on archaeological sites must consider the depth of potentially culture-bearing deposits and the depth of planned disturbance by the proposed project.

Our office does not conduct archaeological surveys. A 36 CFR 61 qualified archaeologist should be retained to conduct the Phase IA/IB survey.

Please also be aware that a Section 233 permit from the New York State Education Department (SED) may be necessary before archaeological fieldwork is conducted on State-owned land. If any portion of the project includes the lands of New York State, you should contact the SED before initiating survey activities. The SED contact is Christina Rieth and she can be reached at (518) 402-5975 or christina.rieth@nysed.gov. Section 233 permits are not required for projects on private land.

If you have any questions concerning archaeology, please contact Tim Lloyd at Timothy.Lloyd@parks.ny.gov

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Planning Board -Full Application.pdf

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Pages:	9
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E-Signature Summary

E-Signature 1: Matt Flansburg (MGF)
October 27, 2021 14:10:53 -8:00 [2A84B683FBF8] [66.41.43.162]
matthew.flansburg@target.com (Principal) (Personally Known)

E-Signature Notary: Lisa M Hill (LMH)
October 27, 2021 14:10:53 -8:00 [6F2D8A851A05] [208.127.242.42]
lisa.hill@kimley-horn.com
I, Lisa M Hill, did witness the participants named above electronically sign this document.

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Expected Fee: _____

TOWN OF MANLIUS
PLANNING DEPARTMENT
INITIAL APPEARANCE APPLICATION

DATE: 10/27/2021

Name of Project: Target Drive Up Expansion

Applicant must submit 12 copies of all site plans, surveys, and supporting data with the final application before a planning board meeting can be scheduled.

Location of Project: 5351 Burdick St N, Fayetteville, NY 13066

Type of Project:

○ Division of Land ○ Subdivision ○ Accessory Use ○ Zone Change ⊗ Site Review ○ Other _____

Developer: Kimley-Horn Phone: 619-744-0619

Address: 401 B Street, Suite 600 Zip: 92101

Tax Map Number(#)/s: 087.-01-20.0

Present Zoning: RS- Regional Shopping District Desired Zoning: RS- Regional Shopping District

Total Acreage: 9.76 Total Number of Lots: 1

Property Owner/s: Target Corporation Phone: 612.761.6788

Address: 50 S 10th Street, Suite 400, Minneapolis, MN Zip: 55403-2054

Tax Map#(s): 087.-01-20.0 Owner's Signature: _____

Printed Name: Matthew Flansburg

Property Owner/s: _____ Phone: _____

Address: _____ Zip: _____

Tax Map#(s): _____ Owner's Signature: _____

Printed Name: _____

Use next page for additional known property owners' information

---

Planning Board Meeting Date Assignment: _____

Fee: _____ Paid: _____ Per: ○ Credit/Debit Card ○ Check ○ Cash

Planning Board - Initial

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TOWN OF MANLIUS
PLANNING DEPARTMENT
INITIAL APPEARANCE APPLICATION
(continued)

Property Owner/s: _____ Phone: _____

Address: _____ Zip: _____

Tax Map#(s): _____ Owner's Signature: _____

_____ Printed Name: _____

Property Owner/s: _____ Phone: _____

Address: _____ Zip: _____

Tax Map#(s): _____ Owner's Signature: _____

_____ Printed Name: _____

Property Owner/s: _____ Phone: _____

Address: _____ Zip: _____

Tax Map#(s): _____ Owner's Signature: _____

_____ Printed Name: _____

Property Owner/s: _____ Phone: _____

Address: _____ Zip: _____

Tax Map#(s): _____ Owner's Signature: _____

_____ Printed Name: _____

Property Owner/s: _____ Phone: _____

Address: _____ Zip: _____

Tax Map#(s): _____ Owner's Signature: _____

_____ Printed Name: _____

Property Owner/s: _____ Phone: _____

Address: _____ Zip: _____

Tax Map#(s): _____ Owner's Signature: _____

_____ Printed Name: _____

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Appendix B
Short Environmental Assessment Form

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 which 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:
Target Drive Up Expansion

Project Location (describe, and attach a location map):
5351 Burdick St N, Fayetteville, NY 13066; West side of N Burdick Street

Brief Description of Proposed Action:
Removal of existing parking stalls on site and installation of "Drive Up" designated parking stall striping, crosswalk and two (2) "Drive Up" beacons.

Name of Applicant or Sponsor:	Telephone: 612.761.6788
Target Corporation	E-Mail: matthew.flansburg@target.com

Address:
50 S 10th Street, Suite 400, Minneapolis, MN

City/PO:	State:	Zip Code:
Minneapolis	MN	55403-2054

	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 governmental Agency? If Yes, list agency(s) name and permit or approval:	☒	☐

3.a. Total acreage of the site of the proposed action? 9.76 acres
b. Total acreage to be physically disturbed? 0.05 acres
c. Total acreage (project site and any contiguous properties) owned or controlled by the applicant or project sponsor? 9.76 acres

4. Check all land uses that occur on, adjoining and near the proposed action.
☐ Urban ☐ Rural (non-agriculture) ☐ Industrial ☒ Commercial ☒ Residential (suburban)
☐ Forest ☐ Agriculture ☐ Aquatic ☐ Other (specify): _____
☐ Parkland

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	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?	☐	☒
7. Is the site of the proposed action located in, or does it adjoin, a state listed Critical Environmental Area? If Yes, identify: _____	☒	☐
8. a. Will the proposed action result in a substantial increase in traffic above present levels?	☒	☐
b. Are public transportation service(s) available at or near the site of the proposed action?	☐	☒
c. Are any pedestrian accommodations or bicycle routes available on or near site of the proposed action?	☒	☐
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: _____	☐	☒
10. Will the proposed action connect to an existing public/private water supply? If No, describe method for providing potable water: N/A	☒	☐
11. Will the proposed action connect to existing wastewater utilities? If No, describe method for providing wastewater treatment: N/A	☒	☐
12. a. Does the site contain a structure that is listed on either the State or National Register of Historic Places?	☐	☒
b. Is the proposed action located in an archeological sensitive area?	☒	☐
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-eared Bat	☐	☒
16. Is the project site located in the 100 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? ☐ NO ☐ YES	☒	☐
b. Will storm water discharges be directed to established conveyance systems (runoff and storm drains)? If Yes, briefly describe: ☐ NO ☐ YES		

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	NO	YES
18. Does the proposed action include construction or other activities that result in the impoundment of water or other liquids (e.g. retention pond, waste lagoon, dam)? If Yes, explain purpose and size:	X	
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:	X	
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: Site is labeled as a subject of remediation by NYS DEC EAF Mapper.		X

I AFFIRM THAT THE INFORMATION PROVIDED ABOVE IS TRUE AND ACCURATE TO THE BEST OF MY KNOWLEDGE

Applicant/sponsor name: Matthew Flansburg Date: 10-27-2021

Signature:

STOP

Part 2 - Impact Assessment. The Lead Agency is responsible for the completion of Part 2. Answer all of the following questions in Part 2 using the information contained in Part 1 and other materials submitted by the project sponsor or otherwise available to the reviewer. When answering the questions the reviewer should be guided by the concept "Have my responses been reasonable considering the scale and context of the proposed action?"

	No, or small impact may occur	Moderate to large impact may occur
1. Will the proposed action create a material conflict with an adopted land use plan or zoning regulations?		
2. Will the proposed action result in a change in the use or intensity of use of land?		
3. Will the proposed action impair the character or quality of the existing community?		
4. Will the proposed action have an impact on the environmental characteristics that caused the establishment of a Critical Environmental Area (CEA)?		
5. Will the proposed action result in an adverse change in the existing level of traffic or affect existing infrastructure for mass transit, biking or walkway?		
6. Will the proposed action cause an increase in the use of energy and it fails to incorporate reasonably available energy conservation or renewable energy opportunities?		
7. Will the proposed action impact existing: a. public / private water supplies?		
b. public / private wastewater treatment utilities?		
8. Will the proposed action impair the character or quality of important historic, archaeological, architectural or aesthetic resources?		
9. Will the proposed action result in an adverse change to natural resources (e.g., wetlands, waterbodies, groundwater, air quality, flora and fauna)?		

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	No, or small impact may occur	Moderate to large impact may occur
10. Will the proposed action result in an increase in the potential for erosion, flooding or drainage problems?	☐	☐
11. Will the proposed action create a hazard to environmental resources or human health?	☐	☐

Part 3 - Determination of significance. The Lead Agency is responsible for the completion of Part 3. For every question in Part 2 that was answered "moderate to large impact may occur", or if there is a need to explain why a particular element of the proposed action may or will not result in a significant adverse environmental impact, please complete Part 3. Part 3 should, in sufficient detail, identify the impact, including any measures or design elements that have been included by the project sponsor to avoid or reduce impacts. Part 3 should also explain how the lead agency determined that the impact may or will not be significant. Each potential impact should be assessed considering its setting, probability of occurring, duration, irreversibility, geographic scope and magnitude. Also consider the potential for short-term, long-term and cumulative impacts.

☐ Check this box if you have determined, based on the information and analysis above, and any supporting documentation, that the proposed action may result in one or more potentially large or significant adverse impacts and an environmental impact statement is required.

☐ Check this box if you have determined, based on the information and analysis above, and any supporting documentation, that the proposed action will not result in any significant adverse environmental impacts.

Name of Lead Agency	Date
Print or Type Name of Responsible Officer in Lead Agency	Title of Responsible Officer
Signature of Responsible Officer in Lead Agency	Signature of Preparer (if different from Responsible Officer)

PRINT

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TOWN OF MANLIUS

DISCLOSURE AFFIDAVIT

This affidavit is a part of and must be completed and attached to every application, petition, request submitted for a *site plan, variance, amendment, change of zoning, approval of a plat, exemption from a plat or official map, license* or *permit.*

STATE OF NEW YORK)
) SS:
COUNTY OF ONONDAGA)

I. _____, being duly sworn, deposes and says that (s) he is:

_____
(applicant, petitioner, corporation officer, property owner, ***etc.)***

II. That deponent has read and is familiar with the provisions of the General Municipal Law, Section 809 which states:

A. Every application, petition or request submitted for a site plan, variance, amendment, change of zoning, approval of a plat, exemption from a plat or official map, license or permit, pursuant to the provisions or any ordinance, local law, rule or regulation constituting the zoning and planning regulations of a municipality shall state the name, residence and the nature and extent of the interest of any state officer or any officer or employee of such municipality is a part, in the person, partnership or association making such application, petition or request (hereinafter called the applicant) to the extent known to such applicant.

B. For the purpose of this action an officer or employee shall be deemed to have an interest in the applicant when (s)he, his/her spouse, or their brothers, sisters, parents, children, grandchildren, or the spouse of any of them:

1) is the applicant, or
2) is an officer, director, partner or employee of the applicant, or
3) legally or beneficially owns or controls stock of a corporate applicant or is a member of a partnership or association applicant, or
4) is a party to an agreement with such an applicant, express or implied, whereby (s) he may receive any payment or other benefit, whether or not for services rendered, or contingent upon the favorable approval of such application, petition or request.

C. Ownership of less than five percent (5%) of the stock of a corporation whose stock is listed on the New York or American Stock Exchanges shall not constitute an interest for the purposes of this section.

D. A person who knowingly and intentionally violates this section shall be guilty of a misdemeanor.

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III. That no Town of Manlius officer, employee or a relative of either, as defined in Section 809 General Municipal Law has any interest in this application.

-OR-

If a Town of Manlius officer, employee or relative of either as defined in Section 809 General Municipal law has any interest in this application, the full particulars are provided on an attached sheet.

Date: _____, 20_____.

_____
(Print Name)

_____
(Signature)

_____
(Entity Name)

_____
By (Officer) (Title)

_____
(Mailing Address of Applicant)

_____
(Telephone Number)

Date: _____, 20_____.

_____
(Print Name)

_____
(Signature)

_____
(Entity Name)

_____
By (Officer) (Title)

_____
(Mailing Address of Applicant)

_____
(Telephone Number)

ACKNOWLEDGEMENTS

STATE OF NEW YORK)
) SS:
COUNTY OF ONONDAGA)

On this _____ day of _____ in the year 20_____, before me, the undersigned, a notary public in and for said state, personally appeared _____, _____, and _____ personally known to me or proved to me on the basis of satisfactory evidence to be the individual whose name is subscribed to the within Petition and acknowledged to me the he/she/they executed the same in his/her/their capacity, and that by his/her/their signature(s) on the Petition, the individual or the persons upon behalf of which the individual acted executed the instrument.

_____
Notary Public

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CORPORATE ACKNOWLEDGEMENT

STATE OF ~~NEW YORK~~)FLORIDA
) SS:
COUNTY OF ~~ONONDAGA~~) PALM BEACH

Matthew Flansburg, being duly sworn, deposes and says the s(he) is the Project Manager of Target corporation named in the within Application/Petition, that s(he) has read the foregoing affidavit and knows the contents thereof; that the same is true of s(he) own knowledge, except as to those matters therein stated to be alleged upon information and belief, and as to those matters s(he) believes it to be true.

Matt Flansburg
Signed on 2021/10/27 14:10:53 -8:00

Applicant Signature

Subscribed to me before this day
Of October 27, 2021

Signed on 2021/10/27 14:10:53 -8:00

Notary Public

Lisa M. Hill
Commission # GG 310574
Notary Public - State of Florida
My Commission Expires May 18, 2023

Notary Stamp 2021/10/27 14:10:53 PST 6F2D8A851A05

Notarial act performed by audio-visual communication

06/29/16 LB

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TARGET®

DRIVE UP EXPANSION
T-1476 FAYETTEVILLE
340 TOWNE DR
FAYETTEVILLE, NY 13066

SCOPE OF WORK

PARKING LOT RE-STRIPING, STALL PARKING SIGNAGE AND WAYFINDING DRIVE UP BEACONS WHERE SHOWN ON THE PLAN.

ZONING

B-5

OFF-STREET PARKING LOT CODE REQUIREMENTS

- DRIVE AISLE = 24' MIN. WIDTH
- STANDARD PARKING STALL = 10' X 20' MIN.
-

OWNER

TARGET CORP.
CONTACT: MATTHEW FLANSBURG
50 SOUTH 10TH ST, SUITE 400
MINNEAPOLIS, MN, 55403
MATTHEW.FLANSBURG@TARGET.COM

CIVIL ENGINEER

KIMLEY-HORN
CONTACT: JUSTIN BECKER P.E.
401 B ST, SUITE 600
SAN DIEGO, CA, 92101
619-744-0619
JUSTIN.BECKER@KIMLEY-HORN.COM

VICINITY MAP
NTS

NORTH

SHEET INDEX

COVER SHEET.....C0.0
OVERALL SITE PLAN.....C0.1
IMPROVEMENT PLAN.....C1.0
DETAILS.....C2.0 - C2.1

811 Know what's **below.** **Call** before you dig.

TARGET
1000 NICOLLET MALL
MINNEAPOLIS, MN 55403

Kimley»Horn

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300 BAKER AVENUE, SUITE 300
CONCORD, MA 01742
PHONE: 781-328-0676
WWW.KIMLEY-HORN.COM

Date	No	Description

STATE OF NEW YORK · TRACY J. LETERRIS · LICENSED PROFESSIONAL ENGINEER

DATE: 09/23/2021

TARGET
T-1476 FAYETTEVILLE
340 TOWNE DR
FAYETTEVILLE, NY 13066

Project Number	T-1476
Config:	
Drawn By	AS
Checked By	KR

COVER SHEET

C0.0

Plotted By:Saavedra, Angela Sheet Set:Kha Layout:C0.0 October 01, 2021 02:25:44pm C:\Users\angela.saavedra\OneDrive - Kit\Documents - Target DU Expansions_T-Stores\1476 Fayetteville NY\T1476 DriveUp Expansion.dwg
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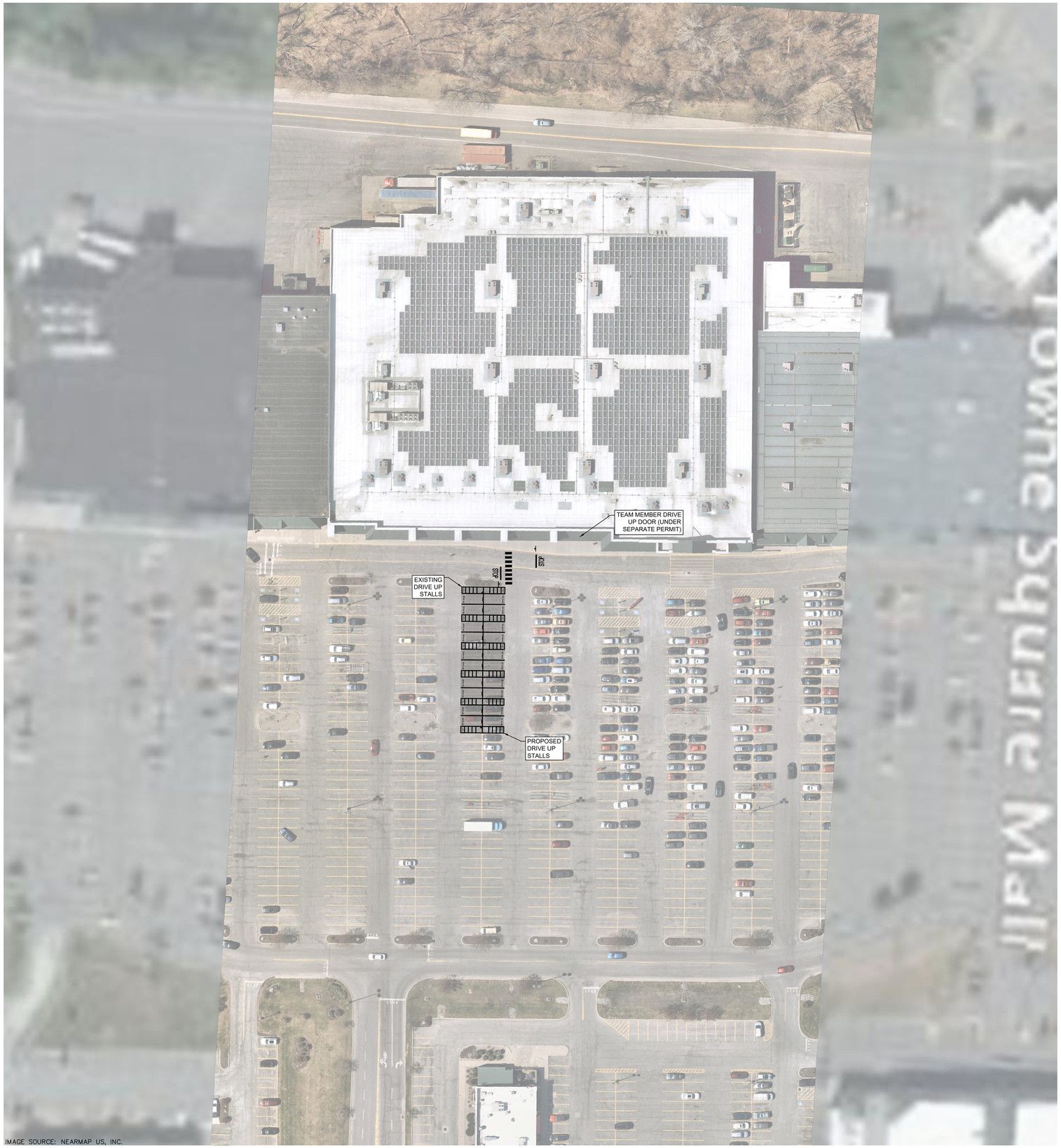

IMAGE SOURCE: NEARMAP US, INC.

OVERALL SITE PLAN
1" = 40'

NORTH

GRAPHIC SCALE IN FEET
0 20 40 80

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340 TOWNE DR
FAYETTEVILLE, NY 13066

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Drawn By	AS
Checked By	KR

OVERALL SITE PLAN

C0.1

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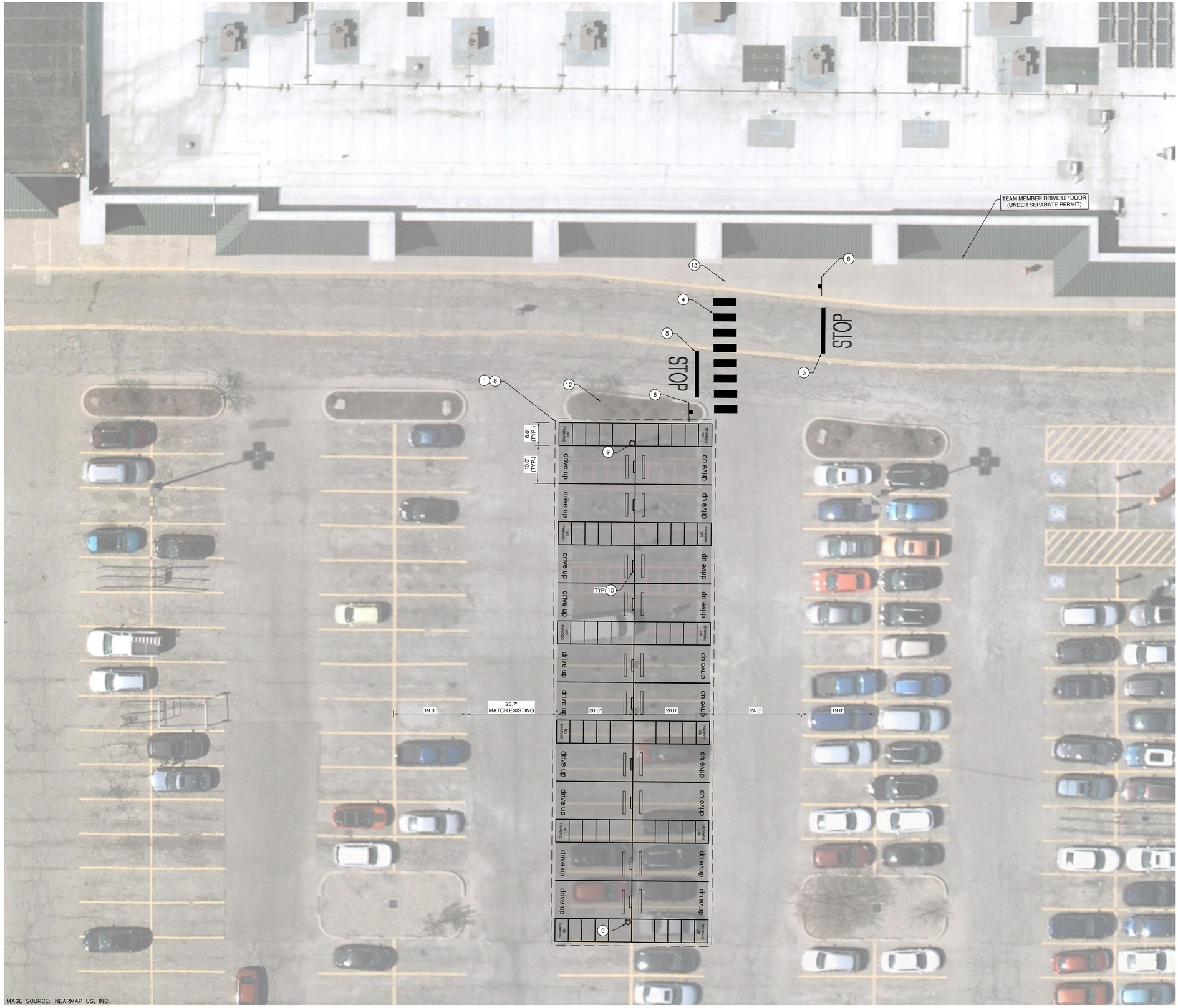

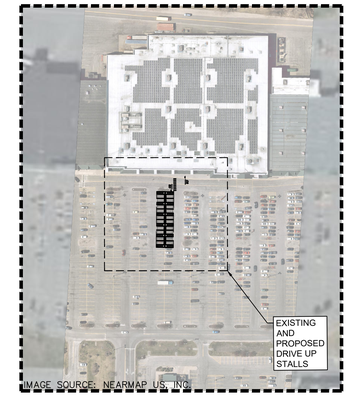

KEY MAP
1" = 150'

CONSTRUCTION NOTES

1. SANDBLAST AND REMOVE EXISTING STRIPING AND DRIVE UP SIGNAGE.
4. INSTALL CROSSWALK PER DETAILS SHEET.
5. INSTALL STOP BAR AND MARKING PER DETAILS SHEET.
6. INSTALL STOP SIGN PER DETAILS SHEET.
8. INSTALL DRIVE UP STRIPING AND SIGNAGE PER DETAILS SHEET.
9. INSTALL DRIVE UP BEACON PER DETAILS SHEET.
10. INSTALL STANCHION SIGN AND BASE PER DETAILS SHEET.
12. PROTECT IN PLACE EXISTING LANDSCAPE ISLANDS.
13. PROTECT IN PLACE EXISTING ADA INFRASTRUCTURE.

Know what's **below.**
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EXISTING AND PROPOSED
DRIVE UP STALLS
1" = 10'

NORTH

GRAPHIC SCALE IN FEET
0 5 10 20

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TARGET
T-1476 FAYETTEVILLE
340 TOWNE DR
FAYETTEVILLE, NY 13066

Project Number	T-1476
Config:	
Drawn By	AS
Checked By	KR

IMPROVEMENT PLAN

C1.0

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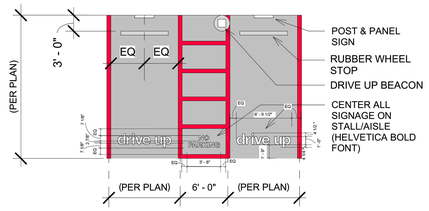
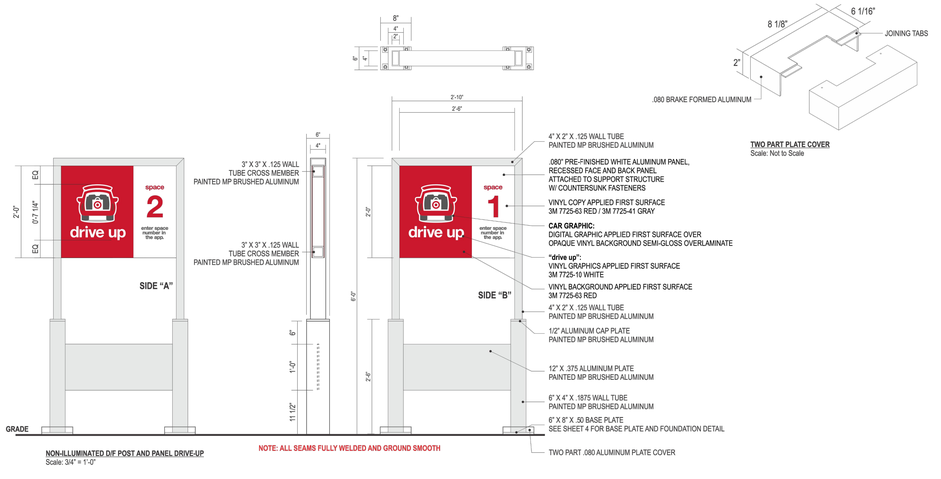


NOTES:

1. ALL RED STRIPING IS 6" WIDE
2. TARGET TO PROVIDE GC WITH "drive up" AND "NO PARKING" TEMPLATES
3. SEE PLAN VIEW DIMENSIONS FOR EXACT LAYOUT OF SITE
4. REFER TO C1.0 FOR EXACT DIMENSIONS

DRIVE UP STRIPING
N.T.S.



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CAR LOGO COLORS

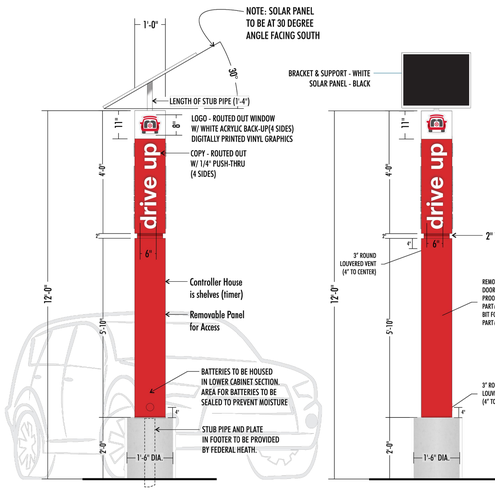
Target Red PMS 186	DARK RED PMS 188	DARK GRAY PMS 425	LIGHT GRAY PMS 421

STANCHION SIGN POST AND BASE - DOUBLE SIDE
N.T.S.

NOTE:
-FOR SOUTHERN SOLAR ZONES SIGNS TO HAVE 70 WATT SOLAR PANEL (DIMENSIONS 2'3" X 2'6").
-FOR NORTHERN SOLAR ZONES SIGNS TO HAVE 100 WATT SOLAR PANEL (DIMENSIONS 2'3" X 3'6").

MATERIAL FINISH COLORS

Target Red 0 #139423 AZCO (FULL GLOSS)	AZCO 100% WHITE (FULL GLOSS)	7328 WHITE Acrylic	CLEAR Acrylic W/ DIFFUSER
Cabinets	Header/Supports	Logo Face	Push-Thru Copy



12'(FT) DRIVE-UP BEACON | FOUR(4) SIDED | SOLAR POWERED
scale 1/4" = 1'-0"

12'(FT) DRIVE-UP BEACON | FOUR(4) SIDED | SOLAR POWERED
scale 1/4" = 1'-0"

NOTE
SOLAR PANEL, MOUNTING BRACKET AND BATTERIES TO SHIP DIRECT TO INSTALLER AND BE INSTALLED IN THE FIELD.

NOTE
SIGNS TO BE DESIGNED FOR TWO WIND LOAD ZONES. (120MPH) & (180 MPH) (APPROPRIATE STRUCTURAL DESIGN TO BE USED FOR LOCATION AS REQUIRED)

DESCRIPTION OF WORK
MANUFACTURE AND INSTALL BEACON SIGN AS SHOWN AND NOTED
.125" ALUM.SKIN & FRAME . COPY TO BE ROUT-OUT WITH 1/4" PUSH THRU.
PUSH THRU IS 1/2" SHOULDER-CUT CLEAR ACRYLIC W/ FIRST SURFACE WHITE VINYL AND DIFFUSER 2ND SURFACE.
TOP (LOGO) IS 7328 WHITE ACRYLIC VINYL GRAPHICS FIRST SURFACE.
SERVICE DOORS AS REQUIRED. ALL FASTENERS TO BE COUNTER-SUNK SCREWS.
FACES AND POLE COVER TO BE PAINTED RED (SEE CHART)
WHITE LED ILLUMINATION WITH SOLAR PANELS.
BATTERIES SELF CONTAINED AS NOTED.

12'(FT) DRIVE-UP BEACON w/ SOLAR PANEL

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SOLAR DRIVE UP BEACON
N.T.S.

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PHONE: 781-328-0676
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Date	No	Description

STATE OF NEW YORK · TRACY J. LETERRIS · LICENSED PROFESSIONAL ENGINEER

DATE: 09/23/2021

TARGET
T-1476 FAYETTEVILLE
340 TOWNE DR
FAYETTEVILLE, NY 13066

Project Number	T-1476
Config:	
Drawn By	AS
Checked By	KR

DETAILS

C2.0

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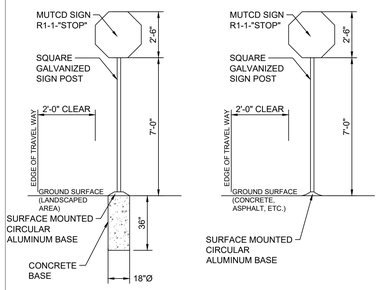
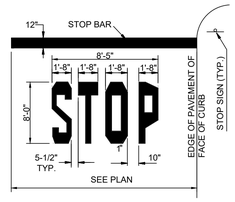


CASE 1: LANDSCAPED AREA

CASE 2: HARDSCAPE AREA

STOP SIGN DETAIL

N.T.S.

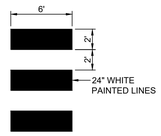


NOTES:

1. WORDS AND ARROWS FOR DRIVEWAYS SHALL BE APPLIED ACCORDING TO REQUIREMENTS AS OUTLINED IN SECTION 3B OF THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES FOR STREETS AND HIGHWAYS
2. THESE WORDS AND BAR ARE TO BE PAINTED WHITE.

STOP BAR

N.T.S.



6' WIDE CROSSWALK DETAIL

N.T.S.

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Date	No	Description

STATE OF NEW YORK · TRACY J. LETZRING · 090791 · LICENSED PROFESSIONAL ENGINEER

DATE: 09/23/2021

TARGET
T-1476 FAYETTEVILLE
340 TOWNE DR
FAYETTEVILLE, NY 13066

Project Number	T-1476
Config:	
Drawn By	AS
Checked By	KR

DETAILS

C2.1

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Planning Board -Full Application.pdf

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E-Signature Summary

E-Signature 1: Matt Flansburg (MGF)
October 27, 2021 14:10:53 -8:00 [2A84B683FBF8] [66.41.43.162]
matthew.flansburg@target.com (Principal) (Personally Known)

E-Signature Notary: Lisa M Hill (LMH)
October 27, 2021 14:10:53 -8:00 [6F2D8A851A05] [208.127.242.42]
lisa.hill@kimley-horn.com
I, Lisa M Hill, did witness the participants named above electronically sign this document.

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Expected Fee: _____

TOWN OF MANLIUS
PLANNING DEPARTMENT
INITIAL APPEARANCE APPLICATION

DATE: 10/27/2021

Name of Project: Target Drive Up Expansion

Applicant must submit 12 copies of all site plans, surveys, and supporting data with the final application before a planning board meeting can be scheduled.

Location of Project: 5351 Burdick St N, Fayetteville, NY 13066

Type of Project:

○ Division of Land ○ Subdivision ○ Accessory Use ○ Zone Change ⊗ Site Review ○ Other _____

Developer: Kimley-Horn Phone: 619-744-0619

Address: 401 B Street, Suite 600 Zip: 92101

Tax Map Number(#)/s: 087.-01-20.0

Present Zoning: RS- Regional Shopping District Desired Zoning: RS- Regional Shopping District

Total Acreage: 9.76 Total Number of Lots: 1

Property Owner/s: Target Corporation Phone: 612.761.6788

Address: 50 S 10th Street, Suite 400, Minneapolis, MN Zip: 55403-2054

Tax Map#(s): 087.-01-20.0 Owner's Signature: _____

Printed Name: Matthew Flansburg

Property Owner/s: _____ Phone: _____

Address: _____ Zip: _____

Tax Map#(s): _____ Owner's Signature: _____

Printed Name: _____

Use next page for additional known property owners' information

---

Planning Board Meeting Date Assignment: _____

Fee: _____ Paid: _____ Per: ○ Credit/Debit Card ○ Check ○ Cash

Planning Board - Initial

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TOWN OF MANLIUS
PLANNING DEPARTMENT
INITIAL APPEARANCE APPLICATION
(continued)

Property Owner/s: _____ Phone: _____

Address: _____ Zip: _____

Tax Map#(s): _____ Owner's Signature: _____

_____ Printed Name: _____

Property Owner/s: _____ Phone: _____

Address: _____ Zip: _____

Tax Map#(s): _____ Owner's Signature: _____

_____ Printed Name: _____

Property Owner/s: _____ Phone: _____

Address: _____ Zip: _____

Tax Map#(s): _____ Owner's Signature: _____

_____ Printed Name: _____

Property Owner/s: _____ Phone: _____

Address: _____ Zip: _____

Tax Map#(s): _____ Owner's Signature: _____

_____ Printed Name: _____

Property Owner/s: _____ Phone: _____

Address: _____ Zip: _____

Tax Map#(s): _____ Owner's Signature: _____

_____ Printed Name: _____

Property Owner/s: _____ Phone: _____

Address: _____ Zip: _____

Tax Map#(s): _____ Owner's Signature: _____

_____ Printed Name: _____

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617.20
Appendix B
Short Environmental Assessment Form

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 which 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:
Target Drive Up Expansion

Project Location (describe, and attach a location map):
5351 Burdick St N, Fayetteville, NY 13066; West side of N Burdick Street

Brief Description of Proposed Action:
Removal of existing parking stalls on site and installation of "Drive Up" designated parking stall striping, crosswalk and two (2) "Drive Up" beacons.

Name of Applicant or Sponsor:	Telephone: 612.761.6788
Target Corporation	E-Mail: matthew.flansburg@target.com

Address:
50 S 10th Street, Suite 400, Minneapolis, MN

City/PO:	State:	Zip Code:
Minneapolis	MN	55403-2054

	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 governmental Agency? If Yes, list agency(s) name and permit or approval:	☒	☐

3.a. Total acreage of the site of the proposed action? 9.76 acres
b. Total acreage to be physically disturbed? 0.05 acres
c. Total acreage (project site and any contiguous properties) owned or controlled by the applicant or project sponsor? 9.76 acres

4. Check all land uses that occur on, adjoining and near the proposed action.
☐ Urban ☐ Rural (non-agriculture) ☐ Industrial ☒ Commercial ☒ Residential (suburban)
☐ Forest ☐ Agriculture ☐ Aquatic ☐ Other (specify): _____
☐ Parkland

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	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?	☐	☒
7. Is the site of the proposed action located in, or does it adjoin, a state listed Critical Environmental Area? If Yes, identify: _____	☒	☐
8. a. Will the proposed action result in a substantial increase in traffic above present levels?	☒	☐
b. Are public transportation service(s) available at or near the site of the proposed action?	☐	☒
c. Are any pedestrian accommodations or bicycle routes available on or near site of the proposed action?	☒	☐
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: _____	☐	☒
10. Will the proposed action connect to an existing public/private water supply? If No, describe method for providing potable water: N/A	☒	☐
11. Will the proposed action connect to existing wastewater utilities? If No, describe method for providing wastewater treatment: N/A	☒	☐
12. a. Does the site contain a structure that is listed on either the State or National Register of Historic Places?	☐	☒
b. Is the proposed action located in an archeological sensitive area?	☒	☐
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-eared Bat	☐	☒
16. Is the project site located in the 100 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? ☐ NO ☐ YES	☒	☐
b. Will storm water discharges be directed to established conveyance systems (runoff and storm drains)? If Yes, briefly describe: ☐ NO ☐ YES		

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	NO	YES
18. Does the proposed action include construction or other activities that result in the impoundment of water or other liquids (e.g. retention pond, waste lagoon, dam)? If Yes, explain purpose and size:	X	
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:	X	
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: Site is labeled as a subject of remediation by NYS DEC EAF Mapper.		X

I AFFIRM THAT THE INFORMATION PROVIDED ABOVE IS TRUE AND ACCURATE TO THE BEST OF MY KNOWLEDGE

Applicant/sponsor name: Matthew Flansburg Date: 10-27-2021

Signature:

STOP

Part 2 - Impact Assessment. The Lead Agency is responsible for the completion of Part 2. Answer all of the following questions in Part 2 using the information contained in Part 1 and other materials submitted by the project sponsor or otherwise available to the reviewer. When answering the questions the reviewer should be guided by the concept "Have my responses been reasonable considering the scale and context of the proposed action?"

	No, or small impact may occur	Moderate to large impact may occur
1. Will the proposed action create a material conflict with an adopted land use plan or zoning regulations?		
2. Will the proposed action result in a change in the use or intensity of use of land?		
3. Will the proposed action impair the character or quality of the existing community?		
4. Will the proposed action have an impact on the environmental characteristics that caused the establishment of a Critical Environmental Area (CEA)?		
5. Will the proposed action result in an adverse change in the existing level of traffic or affect existing infrastructure for mass transit, biking or walkway?		
6. Will the proposed action cause an increase in the use of energy and it fails to incorporate reasonably available energy conservation or renewable energy opportunities?		
7. Will the proposed action impact existing: a. public / private water supplies?		
b. public / private wastewater treatment utilities?		
8. Will the proposed action impair the character or quality of important historic, archaeological, architectural or aesthetic resources?		
9. Will the proposed action result in an adverse change to natural resources (e.g., wetlands, waterbodies, groundwater, air quality, flora and fauna)?		

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Page 5 of 9 536DF10E8C015

	No, or small impact may occur	Moderate to large impact may occur
10. Will the proposed action result in an increase in the potential for erosion, flooding or drainage problems?	☐	☐
11. Will the proposed action create a hazard to environmental resources or human health?	☐	☐

Part 3 - Determination of significance. The Lead Agency is responsible for the completion of Part 3. For every question in Part 2 that was answered "moderate to large impact may occur", or if there is a need to explain why a particular element of the proposed action may or will not result in a significant adverse environmental impact, please complete Part 3. Part 3 should, in sufficient detail, identify the impact, including any measures or design elements that have been included by the project sponsor to avoid or reduce impacts. Part 3 should also explain how the lead agency determined that the impact may or will not be significant. Each potential impact should be assessed considering its setting, probability of occurring, duration, irreversibility, geographic scope and magnitude. Also consider the potential for short-term, long-term and cumulative impacts.

☐ Check this box if you have determined, based on the information and analysis above, and any supporting documentation, that the proposed action may result in one or more potentially large or significant adverse impacts and an environmental impact statement is required.

☐ Check this box if you have determined, based on the information and analysis above, and any supporting documentation, that the proposed action will not result in any significant adverse environmental impacts.

Name of Lead Agency	Date
Print or Type Name of Responsible Officer in Lead Agency	Title of Responsible Officer
Signature of Responsible Officer in Lead Agency	Signature of Preparer (if different from Responsible Officer)

PRINT

0C6C680D-D297-424A-A1C0-36DF10E8C015 --- 2021/10/27 14:07:07 -8:00 --- Remote Notary

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www.docverify.com
Page 6 of 9 | 636DF10E8C015

TOWN OF MANLIUS

DISCLOSURE AFFIDAVIT

This affidavit is a part of and must be completed and attached to every application, petition, request submitted for a *site plan, variance, amendment, change of zoning, approval of a plat, exemption from a plat or official map, license* or *permit.*

STATE OF NEW YORK)
) SS:
COUNTY OF ONONDAGA)

I. _____, being duly sworn, deposes and says that (s) he is:

_____
(applicant, petitioner, corporation officer, property owner, ***etc.)***

II. That deponent has read and is familiar with the provisions of the General Municipal Law, Section 809 which states:

A. Every application, petition or request submitted for a site plan, variance, amendment, change of zoning, approval of a plat, exemption from a plat or official map, license or permit, pursuant to the provisions or any ordinance, local law, rule or regulation constituting the zoning and planning regulations of a municipality shall state the name, residence and the nature and extent of the interest of any state officer or any officer or employee of such municipality is a part, in the person, partnership or association making such application, petition or request (hereinafter called the applicant) to the extent known to such applicant.

B. For the purpose of this action an officer or employee shall be deemed to have an interest in the applicant when (s)he, his/her spouse, or their brothers, sisters, parents, children, grandchildren, or the spouse of any of them:

1) is the applicant, or
2) is an officer, director, partner or employee of the applicant, or
3) legally or beneficially owns or controls stock of a corporate applicant or is a member of a partnership or association applicant, or
4) is a party to an agreement with such an applicant, express or implied, whereby (s) he may receive any payment or other benefit, whether or not for services rendered, or contingent upon the favorable approval of such application, petition or request.

C. Ownership of less than five percent (5%) of the stock of a corporation whose stock is listed on the New York or American Stock Exchanges shall not constitute an interest for the purposes of this section.

D. A person who knowingly and intentionally violates this section shall be guilty of a misdemeanor.

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III. That no Town of Manlius officer, employee or a relative of either, as defined in Section 809 General Municipal Law has any interest in this application.

-OR-

If a Town of Manlius officer, employee or relative of either as defined in Section 809 General Municipal law has any interest in this application, the full particulars are provided on an attached sheet.

Date: _____, 20_____.

_____
(Print Name)

_____
(Signature)

_____
(Entity Name)

_____
By (Officer) (Title)

_____
(Mailing Address of Applicant)

_____
(Telephone Number)

Date: _____, 20_____.

_____
(Print Name)

_____
(Signature)

_____
(Entity Name)

_____
By (Officer) (Title)

_____
(Mailing Address of Applicant)

_____
(Telephone Number)

ACKNOWLEDGEMENTS

STATE OF NEW YORK)
) SS:
COUNTY OF ONONDAGA)

On this _____ day of _____ in the year 20_____, before me, the undersigned, a notary public in and for said state, personally appeared _____, _____, and _____ personally known to me or proved to me on the basis of satisfactory evidence to be the individual whose name is subscribed to the within Petition and acknowledged to me the he/she/they executed the same in his/her/their capacity, and that by his/her/their signature(s) on the Petition, the individual or the persons upon behalf of which the individual acted executed the instrument.

_____
Notary Public

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CORPORATE ACKNOWLEDGEMENT

STATE OF ~~NEW YORK~~)FLORIDA
) SS:
COUNTY OF ~~ONONDAGA~~) PALM BEACH

Matthew Flansburg, being duly sworn, deposes and says the s(he) is the Project Manager of Target corporation named in the within Application/Petition, that s(he) has read the foregoing affidavit and knows the contents thereof; that the same is true of s(he) own knowledge, except as to those matters therein stated to be alleged upon information and belief, and as to those matters s(he) believes it to be true.

Matt Flansburg
Signed on 2021/10/27 14:10:53 -8:00

Applicant Signature

Subscribed to me before this day
Of October 27, 2021

Signed on 2021/10/27 14:10:53 -8:00

Notary Public

Lisa M. Hill
Commission # GG 310574
Notary Public - State of Florida
My Commission Expires May 18, 2023

Notary Stamp 2021/10/27 14:10:53 PST 6F2D8A851A05

Notarial act performed by audio-visual communication

06/29/16 LB

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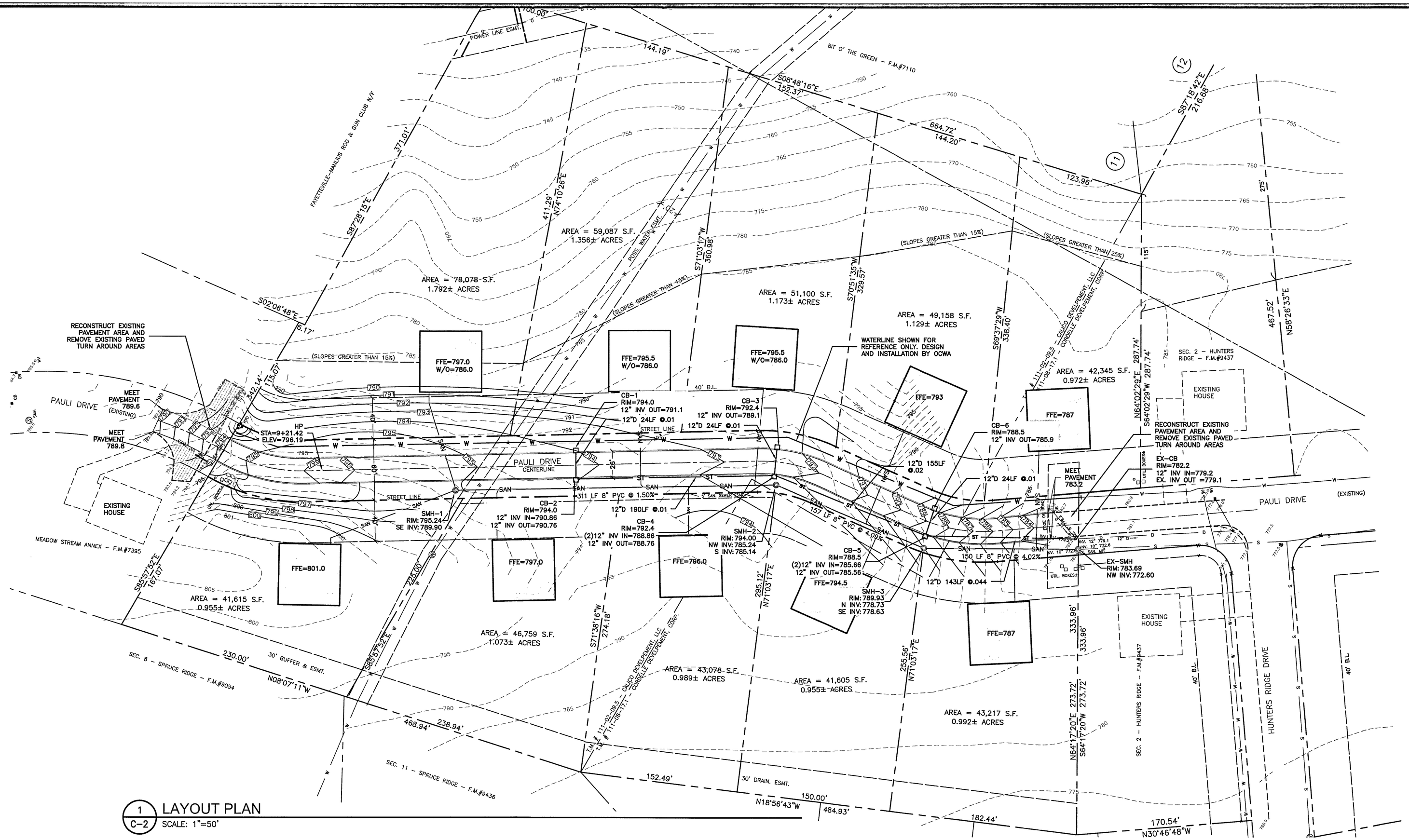
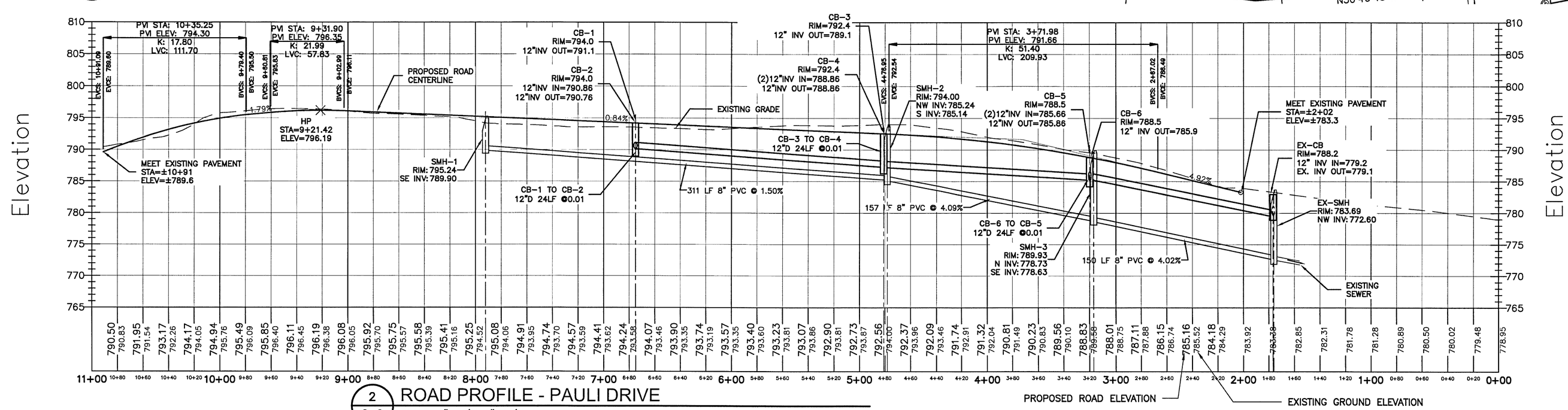


1 C-2 LAYOUT PLAN
SCALE: 1"=50'



2 C-2 ROAD PROFILE - PAULI DRIVE
SCALE: 1"=50'H 1"=10'V

PROJECT TITLE: HUNTER'S RIDGE (PAULI DRIVE EXTENSION)
TOWN OF MANLIUS ONONDAGA CO., NY

PREPARED FOR: ROBERT CARON HOMES
7990 BLARNEY STONE WAY MANLIUS, NY 13104

SHEET TITLE: LAYOUT, GRADING AND ROAD PROFILE

NO.	REVISION/ISSUE	DATE

RECEIVED NOV 05 2021 By

PREPARED BY: NAPIERALA CONSULTING
PROFESSIONAL ENGINEER, P.C.
SITE • DESIGN • ENGINEERING
110 FAYETTE STREET
MANLIUS, NEW YORK 13104
email: MNAP@NAPCON.COM
PH: (315) 682-5580 FAX: (315) 682-5544

PRELIMINARY NOT FOR CONSTRUCTION

PLAN SEAL BY: NEAL H. ZINSMEYER, JR. P.E.
REGISTERED PROFESSIONAL ENGINEER

PROJECT NO. 21-1973
DATE 30 JUNE 2021
SCALE 1"=50'
SHEET C-2

COPYRIGHT © 2021
NAPIERALA CONSULTING
IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS ACTING UNDER THE DIRECTION OF A LICENSED ARCHITECT, PROFESSIONAL ENGINEER, OR LANDSCAPE ARCHITECT, OR LAND SURVEYOR, TO ALTER IN ANY WAY THIS DOCUMENT IN ANY WAY.
ANY LICENSEE WHO ALTERS THIS DOCUMENT IS REQUIRED BY LAW TO AFFIX HIS OR HER SEAL AND THE NOTATION "ALTERED BY" FOLLOWED BY HIS OR HER SIGNATURE AND SPECIFIC DESCRIPTION OF THE ALTERATIONS.

Expected Fee: _____

TOWN OF MANLIUS
PLANNING DEPARTMENT
INITIAL APPEARANCE APPLICATION

RECEIVED NOV 05 2021 By _____

DATE: November 3, 2021

Name of Project: Hunters Ridge

Applicant must submit 12 copies of all site plans, surveys, and supporting data with the final application before a planning board meeting can be scheduled.

Location of Project: Hunters Ridge / Pauli Drive

Type of Project:

○ Division of Land ☒ Subdivision ○ Accessory Use ○ Zone Change ○ Site Review ○ Other _____

Developer: Robert Caron Homes Inc Phone: 315-682-2525

Address: 7990 Blarney Stone Way Manlius Zip: 13104

Tax Map Number(#)/s: 111-000-0008-017-001 & 111-000-002-009-005-

Present Zoning: _____ Desired Zoning: _____

Total Acreage: 12.4 Total Number of Lots: 10

Property Owner/s: Calico Development LLC Phone: 315-682-2525

Address: 7990 Blarney Stone Way Manlius Zip: 13104

Tax Map#(s): 111-000-002-009-005 Owner's Signature: [signature] Pres

Printed Name: Robert Caron Pres

Property Owner/s: Cordelle Development CORPORATION Phone: 315-682-5151

Address: 206 E Seneca St Manlius NY Zip: 13104

Tax Map#(s): 111-000-0008-017-001 Owner's Signature: R. F. DeForest

Printed Name: Robert DeForest III PRESIDENT

Use next page for additional known property owners' information

---

Planning Board Meeting Date Assignment: _____

Fee: _____ Paid: _____ Per: ○ Credit/Debit Card ○ Check ○ Cash

Planning Board - Initial

617.20
Appendix B
Short Environmental Assessment Form

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 which 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: Hunters Ridge / Pauli Drive

Project Location (describe, and attach a location map):

Brief Description of Proposed Action: Seeking Final Approval

Name of Applicant or Sponsor:	Telephone: 315-682-2525
Sharon Caron	E-Mail: scaron@twcny.rr.com

Address: 7990 Blarney Stone Way

City/PO:	State:	Zip Code:
Manlius	NY	13104

	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 governmental Agency? If Yes, list agency(s) name and permit or approval:	☒	☐

3.a. Total acreage of the site of the proposed action? 12.4 acres
b. Total acreage to be physically disturbed? 4-5 acres
c. Total acreage (project site and any contiguous properties) owned or controlled by the applicant or project sponsor? 12.4 acres

4. Check all land uses that occur on, adjoining and 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?	☐	☒
7. Is the site of the proposed action located in, or does it adjoin, a state listed Critical Environmental Area? If Yes, identify: _____	☒	☐
8. a. Will the proposed action result in a substantial increase in traffic above present levels?	☒	☐
b. Are public transportation service(s) available at or near the site of the proposed action?	☒	☐
c. Are any pedestrian accommodations or bicycle routes available on or near site of the proposed action?	☒	☐
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: _____	☐	☒
10. Will the proposed action connect to an existing public/private water supply? If No, describe method for providing potable water: _____	☐	☒
11. Will the proposed action connect to existing wastewater utilities? If No, describe method for providing wastewater treatment: _____	☐	☒
12. a. Does the site contain a structure that is listed on either the State or National Register of Historic Places?	☒	☐
b. Is the proposed action located in an archeological sensitive area?	☒	☐
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?	☒	☐
16. Is the project site located in the 100 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? ☐ NO ☒ YES	☐	☒
b. Will storm water discharges be directed to established conveyance systems (runoff and storm drains)? ☐ NO ☒ YES If Yes, briefly describe: Goes to existing detention ponds		

	NO	YES
18. Does the proposed action include construction or other activities that result in the impoundment of water or other liquids (e.g. retention pond, waste lagoon, dam)? If Yes, explain purpose and size:	☒	☐
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:	☒	☐

I AFFIRM THAT THE INFORMATION PROVIDED ABOVE IS TRUE AND ACCURATE TO THE BEST OF MY KNOWLEDGE

Applicant/sponsor name: Sharon Caron Date:

Signature: Sharon Caron

STOP

Part 2 - Impact Assessment. The Lead Agency is responsible for the completion of Part 2. Answer all of the following questions in Part 2 using the information contained in Part 1 and other materials submitted by the project sponsor or otherwise available to the reviewer. When answering the questions the reviewer should be guided by the concept "Have my responses been reasonable considering the scale and context of the proposed action?"

	No, or small impact may occur	Moderate to large impact may occur
1. Will the proposed action create a material conflict with an adopted land use plan or zoning regulations?	☐	☐
2. Will the proposed action result in a change in the use or intensity of use of land?	☐	☐
3. Will the proposed action impair the character or quality of the existing community?	☐	☐
4. Will the proposed action have an impact on the environmental characteristics that caused the establishment of a Critical Environmental Area (CEA)?	☐	☐
5. Will the proposed action result in an adverse change in the existing level of traffic or affect existing infrastructure for mass transit, biking or walkway?	☐	☐
6. Will the proposed action cause an increase in the use of energy and it fails to incorporate reasonably available energy conservation or renewable energy opportunities?	☐	☐
7. Will the proposed action impact existing: a. public / private water supplies?	☐	☐
b. public / private wastewater treatment utilities?	☐	☐
8. Will the proposed action impair the character or quality of important historic, archaeological, architectural or aesthetic resources?	☐	☐
9. Will the proposed action result in an adverse change to natural resources (e.g., wetlands, waterbodies, groundwater, air quality, flora and fauna)?	☐	☐

	No, or small impact may occur	Moderate to large impact may occur
10. Will the proposed action result in an increase in the potential for erosion, flooding or drainage problems?	☒	☐
11. Will the proposed action create a hazard to environmental resources or human health?	☒	☐

Part 3 - Determination of significance. The Lead Agency is responsible for the completion of Part 3. For every question in Part 2 that was answered "moderate to large impact may occur", or if there is a need to explain why a particular element of the proposed action may or will not result in a significant adverse environmental impact, please complete Part 3. Part 3 should, in sufficient detail, identify the impact, including any measures or design elements that have been included by the project sponsor to avoid or reduce impacts. Part 3 should also explain how the lead agency determined that the impact may or will not be significant. Each potential impact should be assessed considering its setting, probability of occurring, duration, irreversibility, geographic scope and magnitude. Also consider the potential for short-term, long-term and cumulative impacts.

☐ Check this box if you have determined, based on the information and analysis above, and any supporting documentation, that the proposed action may result in one or more potentially large or significant adverse impacts and an environmental impact statement is required.

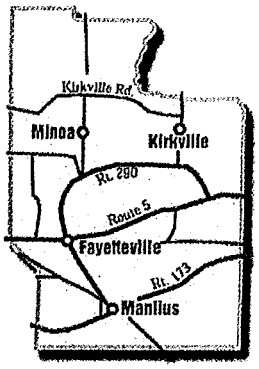
☐ Check this box if you have determined, based on the information and analysis above, and any supporting documentation, that the proposed action will not result in any significant adverse environmental impacts.

Name of Lead Agency	Date
Print or Type Name of Responsible Officer in Lead Agency	Title of Responsible Officer
Signature of Responsible Officer in Lead Agency	Signature of Preparer (if different from Responsible Officer)

PRINT

Town of Manlius

Planning and Development



DATE: December 1, 2021

TO: Town of Manlius Planning Board

FROM: Department of Planning and Development

RE: Special Use Permit Renewal Applications

1. Charter Communications, Cell Tower, 5428 N. Burdick St. - Tax Map # 086.-02-05.2
2. MCI Communications, Cell Tower, 6953 Collamer Road - Tax Map # 036.-01-03.0/1

The Planning and Development Office has reviewed the attached applications and find them to be in order.

There have not been any complaints or violations from the neighboring property owners. There have also been no changes from the original Special Use Permit approvals, and we recommend that each renewal be approved for a period of seven years (7) for 5428 North Burdick Street to expire October 23, 2027 and seven (7) years for 6953 Collamer Road to expire September 14, 2027.

Edmond J. Theobald, Supervisor

Town Board – Karen Green, Sara Bollinger, Elaine Denton, Heather Waters, Kaitlyn Kriesel, John Deer

301 Brooklea Drive • Fayetteville, NY 13066 • Telephone: (315) 637-8619 • Fax: (315) 637-0713
www.townofmanlius.org

TOWN OF MANLIUS
Special Permit Renewal Application

DATE: 11/15/2021 Tax Map # 086.-02-05.2

I CHARTER COMMUNICATION as applicant relative to property located
Applicant's Name

at 5428 N. BURDICK ST

hereby request renewal of a Special Permit from the Town of Manlius, Town Board as required by the Town of Manlius Code, submit the following application and information. I further acknowledge that should any information be later determined as false or not credible in any material respect, any special permit renewed based thereon may be determined by the Town Board as void from the start or revocable.

There are no changes of information or exhibits to the existing special permit originally issued on 10/23/1996 Yes ____ No X
Date

If you answered yes to above question, please state in detail the changes you are requesting. Please attach a letter if more space is needed.

Update Contact Information:

Name JEREMY BELLINGER

Address 6005 FAIR LAKES RD E. SYRACUSE 13057

Phone 315-634-6100 E-mail

Applicant's Signature 11/15/2021 *Date*

JEREMY BELLINGER
Applicant Print Name

Town Code Officers Comments:

RECEIVED
NOV 16 2021
By

Sprint Spectrum

086.-02-05.2
5428 N. Burdick St.
10/23/96 for 25yrs

COPY

IN THE MATTER

of

The Application of TIME WARNER ENTERTAINMENT-ADVANCE/NEWHOUSE PARTNERSHIP for a Special Permit Pursuant to Chapter 30, Article IV, Section 30.460 of the Code of the Town of Manlius

RESOLUTION GRANTING A SPECIAL PERMIT

10/23/2021

The **TOWN BOARD OF THE TOWN OF MANLIUS**, in the County of Onondaga, State of New York, met in regular session at the Town Hall in the Town of Manlius, located at 301 Brooklea Drive in the Village of Fayetteville, County of Onondaga, State of New York, on the 23rd day of October, 1996, at 7:30 p.m.

The meeting was called to order by Richard L. Lowenberg, Supervisor, and the following were present, namely:

Richard L. Lowenberg	Supervisor
Campbell J. Tellman	Councilman
Frank Purpura	Councilman
Robert A. Bird	Councilman
John S. Curtis	Councilman
William S. Tanner	Councilman
John R. Loeffler	Councilman

Absent: None

The following resolution was moved, seconded and unanimously adopted:

WHEREAS, application has been made to the Town Board of the Town of Manlius for a Special Permit to allow the applicant to replace an existing 106' tower with a 103' wireless telecommunications tower with 3' antenna and ground support equipment on certain premises located in a Restricted Agricultural District which premises are described as follows:

> **ALL THAT TRACT OR PARCEL OF LAND, situate in the Town of Manlius, County of Onondaga and State of New York, being part of Lot 65 in said Town, and more particularly bounded and described as follows: BEGINNING at an iron pipe standing in the easterly line of North Burdick Street at the north line of property conveyed to Maurice H. Alderman and Frances S. Alderman by Deed recorded in the Office of the Clerk of Onondaga County in Book of Deeds 1131 at Page 411; running thence easterly along the north line of Alderman and at right angles to North Burdick Street a distance of 175.00 feet to an iron pipe; thence southerly, parallel North Burdick Street 50.00 feet to an iron pipe; thence westerly, parallel Alderman's north line a distance of 50.00 feet to an iron pipe; thence northerly and parallel North Burdick a distance of 30.00 feet to an iron pipe in the south line of a 20 foot Access Road; thence westerly along said southerly Access Road line and parallel Alderman's north line a distance of 125.00 feet to an iron pipe in the easterly line of North Burdick Street; thence northerly along the easterly line of North Burdick Street a distance of 20.00 feet to the north line of said Alderman, and the place of beginning.**

and

WHEREAS, the Planning Board of the Town of Manlius has reviewed the application and recommends to the Town Board the granting of the requested Special Permit for the parcel of land hereinbefore described, and further makes the following recommendations:

1. That the existing vegetation or equivalent be maintained to provide screening to the base of the tower.

2. That if the tower is no longer in use it be removed.

3. That the applicant designate on the site map a 103' radius around the tower.

4. That the applicant provide power output and safety monitoring information to the Town Board.

5. That the applicant provide wind load information to the Town Board.

6. That the tower be a non-reflective gray color.

; and

WHEREAS, the Town Board of the Town of Manlius held a Public Hearing on the 23rd day of October, 1996, at 8:00 p.m., at which all persons in interest and citizens desiring to be heard had an opportunity to be heard; and

WHEREAS, all requirements of the State Environmental Quality Review Act have been complied with; and

WHEREAS, pursuant to the Federal Telecommunications Act of 1996, no state or local government may regulate the placement, construction and modification of personal wireless service facilities on the basis of the environmental effects of radio frequency emissions to the extent such facilities comply with the Federal Communications Commission regulations concerning such emissions; and

WHEREAS, in the opinion of the members of the Town Board, the granting of the Special Permit requested by the applicant herein will not adversely affect the health, safety, morals, and/or the general welfare of the public; and the Town Board members may impose additional standards for the Special Permit to preserve the general character of the neighborhood in which such special use is to be placed;

NOW, THEREFORE, be it

RESOLVED, that it is the finding of the Town Board of the Town of Manlius that:

1. The tower, once replaced, will generate only one or two vehicle trips per month to the site for maintenance purposes.

2. The base of the tower is well screened from view by surrounding trees and foliage.

3. Access to the site will be minimized by a chain link fence encircling the tower and a gate preventing access to the fenced area.

4. The information submitted by the applicant indicates there are no harmful effects resulting from the tower emissions.

5. The tower will not create any noise.

6. The co-location of two servers on the tower reduces the need for additional towers in the area.

7. The use possesses characteristics that will blend desirably with the neighboring properties and will secure the objectives of the Zoning Ordinance of the Town of Manlius.

8. The location, size of the use and structure, nature and intensity of the operations involved, size of the site in relation to it, and the location of the site with respect to the streets giving access to it are such that it will be in harmony with the orderly development of the district.

9. The location, nature, and height of the buildings, walls and fences will not discourage the appropriate development and use of adjacent land and buildings or impair their value.

10. The use does not conflict with any master plan or part thereof.

11. The proposal will not significantly impair the safety of the general public nor unreasonably increase traffic congestion.

12. The proposal will not significantly increase the possibility of nuisance or noise from the site.

13. The proposal provides for adequate parking in accordance with the Zoning Ordinance of the Town of Manlius.

; and be it further

RESOLVED, that the applicant be, and it hereby is, granted a Special Permit pursuant to the provisions of Chapter 30, Article IV, Section 30.460, of the Town of Manlius Municipal Code for the purpose of replacing an existing 106' tower with a 103' wireless telecommunications tower with 3' antenna and ground support equipment on the premises located in the Town of Manlius heretofore described; and be it further

RESOLVED, that the Special Permit shall be issued by the Town Clerk upon the agreement in writing by the applicant to the conditions imposed by the Special Permit.

SPECIAL PERMIT

Pursuant to a Resolution of the Town Board of the Town of Manlius on the Application of Time Warner Entertainment - Advance/Newhouse Partnership, which Resolution was passed at a regular meeting of the Town Board of the Town of Manlius, held on the 23rd day of October, 1996, permission is hereby granted to applicant, effective upon the mutual execution of this Permit, to replace an existing 106' tower with a 103' wireless telecommunications tower with 3' antenna and ground support equipment to be located on certain premises in the Town of Manlius, owned by applicant, which premises are more particularly described as follows:

> **ALL THAT TRACT OR PARCEL OF LAND, situate in the Town of Manlius, County of Onondaga and State of New York, being part of Lot 65 in said Town, and more particularly bounded and described as follows: BEGINNING at an iron pipe standing in the easterly line of North Burdick Street at the north line of property conveyed to Maurice H. Alderman and Frances S. Alderman by Deed recorded in the Office of the Clerk of Onondaga County in Book of Deeds 1131 at Page 411; running thence easterly along the north line of Alderman and at right angles to North Burdick Street a distance of 175.00 feet to an iron pipe; thence southerly, parallel North Burdick Street 50.00 feet to an iron pipe; thence westerly, parallel Alderman's north line a distance of 50.00 feet to an iron pipe; thence northerly and parallel North Burdick Street a distance of 30.00 feet to an iron pipe in the south line of a 20 foot Access Road; thence westerly along said southerly Access Road line and parallel Alderman's north line a distance of 125.00 feet to an iron pipe in the easterly line of North Burdick Street; thence northerly along the easterly line of North Burdick Street a distance of 20.00 feet to the north line of said Alderman, and the place of beginning.**

This Permit will continue in force until terminated by the Town Board for breach of one or more of the conditions pursuant to which it is granted, and the implementation thereof will be in accordance with the following conditions:

1. This Special Permit and the uses allowed pursuant thereto shall expire 25 ( ) years from the date of the mutual execution of the Permit.

2. If the special use ceases for more than six (6) months for any reason, the Permit shall expire, and the tower and support equipment shall be removed from the premises and the site shall be restored to its original condition.

3. The tower shall be painted a gray non-reflective color.

4. The existing vegetation or the equivalent shall be maintained to provide screening to the base of the tower.

5. This permit shall not obviate the need for the applicant to comply with all applicable federal, state and local laws, rules and regulations.

The applicant, by the acceptance of this Special Permit, agree to all of the above terms and conditions; and in the event it shall fail for any reason to perform any of the said terms and conditions on its part to be performed, said permit shall be revoked.

Gloria C. Miller

GLORIA C. MILLER
Town Clerk of the Town of Manlius
Onondaga County, New York

The undersigned, Time Warner Entertainment - Advance/Newhouse Partnership, does hereby accept the foregoing Special Permit and agrees to perform all of the terms and conditions thereof.

Time Warner Entertainment -
Advance/Newhouse Partnership

By: [illegible] Esq, Atty & Agent

I, GLORIA C. MILLER, Town Clerk of the Town of Manlius, **DO HEREBY CERTIFY** that the preceding Resolution was duly adopted by the Town Board of the Town of Manlius at a regular meeting the Board duly called and held on the 23rd day of October, 1996; that said Resolution was entered in the minutes of said meeting; that I have compared the foregoing copy with the original thereof now on file in my office; and that the same is a true and correct transcript of said Resolution and of the whole thereof.

I FURTHER CERTIFY that all members of said Board had due notice of said meeting.

IN WITNESS THEREOF, I have hereunto set my hand and affixed the seal of the Town of Manlius, this 23rd day of October 1996.

DATED: **October 23, 1996**
Fayetteville, New York

Gloria C. Miller

GLORIA C. MILLER
Town Clerk of the Town of Manlius
Onondaga County, New York

[SEAL]

TOWN OF MANLIUS
Special Permit Renewal Application

DATE: November 23, 2021 Tax Map # 036.-01-03.0/1

I Jennifer Sheetz, Right of Way Specialist as applicant relative to property located
Applicant's Name

at 6953 Collamer Road - MCI communication regen site

hereby request renewal of a Special Permit from the Town of Manlius, Town Board as required by the Town of Manlius Code, submit the following application and information. I further acknowledge that should any information be later determined as false or not credible in any material respect, any special permit renewed based thereon may be determined by the Town Board as void from the start or revocable.

There are no changes of information or exhibits to the existing special permit originally issued on September 14, 1988 Yes X No ____
Date

If you answered yes to above question, please state in detail the changes you are requesting. Please attach a letter if more space is needed.

Yes - correct - there are no changes other than to the change of MCI entity name, which is now MCI Communication Services LLC. (please see the attached documentation)

Update Contact Information:

Name Manager - Right of Way; MCI Communications Services, LLC.

Address 600 Hidden Ridge Drive; Irving, Texas 75038

Phone _____ E-mail VzB-ROWContractNotices@verizon.com

DocuSigned by:
Jennifer Sheetz
468811E3002B4E0...
Applicant's Signature

11/23/2021
Date

Jennifer Sheetz
Applicant Print Name

Town Code Officers Comments:

Delaware

The First State

I, JEFFREY W. BULLOCK, SECRETARY OF STATE OF THE STATE OF DELAWARE, DO HEREBY CERTIFY THAT THE ATTACHED IS A TRUE AND CORRECT COPY OF THE CERTIFICATE OF CONVERSION OF A DELAWARE CORPORATION UNDER THE NAME OF "MCI COMMUNICATIONS SERVICES, INC." TO A DELAWARE LIMITED LIABILITY COMPANY, CHANGING ITS NAME FROM "MCI COMMUNICATIONS SERVICES, INC." TO "MCI COMMUNICATIONS SERVICES LLC", FILED IN THIS OFFICE ON THE TWENTY-SECOND DAY OF JUNE, A.D. 2020, AT 2:05 O`CLOCK P.M.

AND I DO HEREBY FURTHER CERTIFY THAT THE EFFECTIVE DATE OF THE AFORESAID CERTIFICATE OF CONVERSION IS THE THIRTIETH DAY OF JUNE, A.D. 2020 AT 11:59 O'CLOCK P.M.

Jeffrey W. Bullock, Secretary of State

2283958 8100V
SR# 20205823394

Authentication: 203157556
Date: 06-23-20

You may verify this certificate online at corp.delaware.gov/authver.shtml

Delaware

The First State

I, JEFFREY W. BULLOCK, SECRETARY OF STATE OF THE STATE OF DELAWARE DO HEREBY CERTIFY THAT THE ATTACHED IS A TRUE AND CORRECT COPY OF THE CERTIFICATE OF FORMATION OF "MCI COMMUNICATIONS SERVICES LLC" FILED IN THIS OFFICE ON THE TWENTY-SECOND DAY OF JUNE, A.D. 2020, AT 2:05 O`CLOCK P.M.

AND I DO HEREBY FURTHER CERTIFY THAT THE EFFECTIVE DATE OF THE AFORESAID CERTIFICATE OF FORMATION IS THE THIRTIETH DAY OF JUNE, A.D. 2020 AT 11:59 O'CLOCK P.M.

Jeffrey W. Bullock, Secretary of State

2283958 8100V
SR# 20205823394

Authentication: 203157556
Date: 06-23-20

You may verify this certificate online at corp.delaware.gov/authver.shtml

State of Delaware
Secretary of State
Division of Corporations
Delivered 01:17 PM 06/22/2020
FILED 02:05 PM 06/22/2020
SR 20205823394 - File Number 2283958

CERTIFICATE OF CONVERSION TO LIMITED LIABILITY COMPANY

OF

MCI COMMUNICATIONS SERVICES, INC.

TO

MCI COMMUNICATIONS SERVICES LLC

This Certificate of Conversion to Limited Liability Company has been duly executed and is being filed by MCI Communications Services, Inc., a Delaware corporation (the "Corporation"), and Christy K. Reyes, Assistant Secretary of the Corporation and as an authorized person, to convert the Corporation to a Delaware limited liability company pursuant to Section 18-214 of the Delaware Limited Liability Company Act.

1. The name of the Corporation is MCI Communications Services, Inc.
2. The date of filing of the original certificate of incorporation of the Corporation with the Secretary of State of the State of Delaware is January 3, 1992
3. The name of the limited liability company into which the Corporation is being converted is MCI Communications Services LLC.
4. The conversion of the Corporation into a limited liability company has been approved in accordance with the provisions of Section 266 of the Delaware General Corporation Law.
5. The conversion of the Corporation to a limited liability company shall become effective as of June 30, 2020 at 11:59 PM.

IN WITNESS WHEREOF, the undersigned has executed this Certificate of Conversion to Limited Liability Company on the 22nd day of June, 2020.

Name: Christy K. Reyes
Title: Assistant Secretary and
Authorized Person

State of Delaware
Secretary of State
Division of Corporations
Delivered 01:17 PM 06/22/2020
FILED 02:05 PM 06/22/2020
SR 20205823394 - File Number 2283958

CERTIFICATE OF FORMATION

OF

MCI COMMUNICATIONS SERVICES LLC

The undersigned, as an authorized person, in order to form a limited liability company under the provisions of the Delaware Limited Liability Company Act (6 Del.C. § 18-101, et seq.), does hereby certify as follows:

FIRST: The name of the limited liability company formed hereby is:

MCI Communications Services LLC

SECOND: The address of the limited liability company's registered office in the State of Delaware is: Corporation Trust Center, 1209 Orange Street, City of Wilmington, Delaware 19801, and the name of the registered agent is The Corporation Trust Company.

THIRD: The Certificate of Formation shall be effective as of June 30, 2020 at 11:59 PM.

IN WITNESS WHEREOF, the undersigned has executed this Certificate of Formation as of the 22nd day of June, 2020.

Name: Christy K. Reyes
Authorized Person

MCI

036.-01-03.0/1
6953 Collamer Rd
approved 9.14.1988
for 33 years

COPY

RECEIVED AND FILED TOWN CLERK
2009 NOV 30 PM 2:32
TOWN OF MANLIUS
301 BROOKLEA DRIVE
FAYETTEVILLE

IN THE MATTER

of

The Application of MCI Telecommunications Corporation for a Special Permit Pursuant to Chapter 30, Article IV, Section 30.460 of the Town of Manlius Code.

RESOLUTION GRANTING A SPECIAL PERMIT

Renews 9/14/2021

The **TOWN BOARD OF THE TOWN OF MANLIUS**, in the County of Onondaga, State of New York, met in Regular session at the Town Hall in the Town of Manlius, located at 301 Brooklea Drive in the Village of Fayetteville, County of Onondaga, State of New York, on the 14th day of September, 1988, at 7:30 p.m.

The meeting was called to order by Richard L. Lowenberg, Supervisor, and the following were present, namely:

Richard L. Lowenberg	Supervisor
Fay T. Piquet, Jr.	Councilman
Campbell J. Tellman	Councilman
Frank Purpura	Councilman
Robert A. Bird	Councilman
John S. Curtis	Councilman
William S. Tanner	Councilman

Absent: None

The following resolution was moved, seconded and unanimously adopted:

WHEREAS, application has been made to the Town Board of the

Town of Manlius for a Special Permit in a "Restricted Agricultural Zone" for the purpose of allowing the applicant to operate and maintain a fiber optics facility on certain premises described as follows:

> **ALL THAT TRACT OR PARCEL OF LAND, situate in the Town of Manlius, County of Onondaga and State of New York, being part of Lot No. 13 in said town and more particularly bounded and described as follows: Beginning in the center of State Highway No. 298 leading from Syracuse to Bridgeport at a point N. 63 degrees 24′ 50″ E., 326.5 feet as measured along said center line from the intersection of the latter with the westerly line of Lot No. 13; thence N. 63 degrees 24′ 50″ E. along the center line of the highway 145.5 feet to an angle therein; thence S. 83 degrees 33′ 40″ E. still along said center line 179.2 feet to a point which is 263.9 feet westerly as measured along the center line of the highway from the southeasterly corner of land now or formerly owned by James A. Scott and Anna M. Scott; his wife; thence N. 7 degrees 15′ E., on a line parallel to the easterly line of said land of Scott 710.0 feet; thence N. 83 degrees 33′ 40″ W. 300.00 feet; thence South 7 degrees 15′ W. parallel with the easterly line of the said land of Scott 789.3 feet to the point of beginning, containing 5.000 acres of land, all bearings herein are referred to a magnetic origin of June 28, 1947 and the above described premises are part of 50 acres conveyed to James A. Scott and Anna M. Scott, his wife, by Albert Simon and Genevieve M. Simon, his wife, by warranty deed dated October 1, 1943 and recorded in the Onondaga County Clerk's Office December 3, 1943, in Book 1079 of Deeds at page 443, etc.; and**

WHEREAS, the Planning Board of the Town of Manlius has reviewed the application and recommends to the Town Board the granting of the requested Special Permit for the parcel of land hereinbefore described; and

"**WHEREAS,** the Syracuse-Onondaga City-County Planning Agency has not yet issued its recommendation on this proposal, but the

applicant has been advised that anything other than a favorable or neutral recommendation will require further proceedings; and

WHEREAS, the Town Board of the Town of Manlius held a Public Hearing on the 10th day of August, 1988, at 7:45 p.m., at which all persons in interest and citizens desiring to be heard had an opportunity to be heard; and

WHEREAS, all other requirements of the State Environmental Quality Review Act have been complied with;

WHEREAS, in the opinion of the members of the Town Board, the granting of said Special Permit requested by the applicant herein will not adversely affect the health, safety, morals, and/or the general welfare of the public; and the Town Board members may impose additional standards for the Special Permit to preserve the general character of the neighborhood in which such supposed special use is to be placed;

WHEREAS, this resolution is a corrective resolution intended to accommodate the applicant's financing arrangements by extending the permit term and setting forth in more detail the terms and conditions governing the assignment of applicant's rights and interest in the permit;

NOW, THEREFORE, be it

RESOLVED, that it is the finding of the Town Board of the Town of Manlius that:

1. The use possesses characteristics that will blend desirably with the neighboring properties and will secure the objectives of the Zoning Ordinance of the Town of Manlius.

2. The location, size of the use and structure, nature and intensity of the operations involved, size of the site in relation to it, and the location of the site with respect to the streets giving access to it are such that it will be in harmony with the orderly development of the district.

3. The location, nature, and height of the buildings, walls and fences will not discourage the appropriate development and use of adjacent land and buildings or impair their value.

4. The use does not conflict with any master plan or part thereof.

5. The proposal will not significantly impair the safety of the general public nor unreasonably increase traffic congestion.

6. The proposal will not significantly increase the possibility of nuisance or noise from the site.

7. The proposal provides for adequate parking in accordance with the Zoning Ordinance of the Town of Manlius.

and be it further

RESOLVED, that the applicant be, and hereby is, granted a Special Permit pursuant to the provisions of Chapter 30, Article

IV, Section 30.460, of the Town of Manlius Municipal Code for the purpose of operating and maintaining a fiber optics repeater facility on the premises located in the Town of Manlius heretofore described, and be it further

RESOLVED, that the Special Permit shall be issued by the Town Clerk upon the agreement in writing by the applicant to the conditions imposed by Special Permit.

SPECIAL PERMIT

Pursuant to a Resolution of the Town Board of the Town of Manlius on the Application of MCI Telecommunications, which Resolution was passed at a Regular meeting of the Town Board of the Town of Manlius, held on the 14th day of September, 1988, permission is hereby granted to applicant, effective upon the mutual execution of this Permit, to operate and maintain a fiber optics repeater facility to be located on certain premises in the Town of Manlius, owned by applicants, which premises are more particularly described as follows:

> **ALL THAT TRACT OR PARCEL OF LAND, situate in the Town of Manlius, County of Onondaga and State of New York, being part of Lot No. 13 in said town and more particularly bounded and described as follows: Beginning in the center of State Highway No. 298 leading from Syracuse to Bridgeport at a point N. 63 degrees 24′ 50″ E., 326.5 feet as measured along said center line from the intersection of the latter with the westerly line of Lot No. 13; thence N. 63 degrees 24′ 50″ E. along the center line of the highway 145.5 feet to an angle therein; thence S. 83 degrees 33′ 40″ E. still along said center line 179.2 feet to a point which is 263.9 feet westerly as measured along the center line of the highway from the southeasterly corner of land now or formerly owned by James A. Scott and Anna M. Scott; his wife; thence N. 7 degrees 15′ E., on a line parallel to the easterly line of said land of Scott 710.0 feet; thence N. 83 degrees 33′ 40″ W. 300.00 feet; thence South 7 degrees 15′ W. parallel with the easterly line of the said land of Scott 789.3 feet to the point of beginning, containing 5.000 acres of land, all bearings herein are referred to a magnetic origin of June 28, 1947 and the above described premises are part of 50 acres conveyed to James A. Scott and Anna M. Scott, his wife, by Albert Simon and Genevieve M. Simon, his wife, by warranty deed dated October 1, 1943 and recorded in the Onondaga County Clerk's Office December 3, 1943, in Book 1079 of Deeds at page 443, etc. and**

This Permit will continue in force until terminated by the Town Board for breach of one or more of the conditions pursuant to which it is granted, and the implementation thereof will be in accordance with the following conditions:

1. This Special Permit and the uses allowed pursuant thereto shall expire thirty-three (33) years from the date of the mutual execution of the Permit.

2. (a) MCI, its successors and assigns, shall have the right, at any time and from time to time, to assign, sublease, license, relinquish possession or control of or otherwise transfer or apportion, in whole or in part, its rights and/or interests under this Permit, or any part thereof, with the consent of the Town, which consent shall not be unreasonably withheld or delayed.

(b) In the event that MCI assigns its interest pursuant to a sale-leaseback or other financing transaction, the Town agrees that, upon written notice to it specifying (i) name(s) and address(es) of the assignee(s) of such interest (the "Transferee(s)") and (ii) the name and address of the representative or agent of the Transferee(s) (the "Agent"), the Town will simultaneously give to the Agent any notices required to be given to MCI under this Permit. The Town shall accept payment or performance by Agent of any obligation of MCI as though paid or performed by MCI, provided such payment and/or performance shall be made within the applicable cure periods allowed by this Permit. The Agent shall have the right to cure any default by

MCI within the applicable cure periods allowed by this Permit; if such default is not susceptible of being cured by such Agent and this Permit would be terminated as a result, the Town will grant to such Transferee the right to a new Permit upon the identical terms and conditions as are set forth in this Permit. If any Transferee shall become a party to such a new Permit, such Transferee's liability shall be limited to its interest in the affected portion and to such period of time as the Transferee shall retain such interest. The Transferee(s) may further assign or transfer any rights or interests they may have under this Permit from time to time, in whole or in part, with the consent of the Town, which consent shall not be unreasonably withheld or delayed; and if the special use ceases for more than six (6) months for any reason, the Permit shall expire.

(c) If any such Transferee(s) shall obtain possession and use of all or any part of the Communication System or System Segments (the "Affected Portion"), then, so long as all of the obligations of MCI under this Permit with respect to the Affected Portion are being performed, (i) such Transferee(s) shall agree to be bound by and to observe and perform the obligations of MCI under this Permit with respect to the Affected Portion and (ii) the Town shall not disturb the possession or use of the Affected Portion by such Transferee(s) and shall recognize such Transferee(s) right to possession and use thereof, subject, nevertheless, to the terms of this Permit and the respective rights of the parties herein.

(d) Except as set forth in paragraph 2(c) above, no assignment under this section shall be deemed to be an assumption by the Transferee(s) of the obligations of MCI under this Permit and MCI shall not in any event be released, relieved or discharged of or from any of the obligations assumed by MCI under this Permit unless specifically agreed to by the Town.

The applicant, by the acceptance of this Special Permit, agrees to all of the above terms and conditions; and in the event it shall fail for any reason to perform any of the said terms and conditions on its part to be performed, said Permit shall be revoked.

Gloria C. Miller

Gloria C. Miller
Town Clerk of the Town of Manlius
Onondaga County, New York

The undersigned, MCI Telecommunications Corporation, does hereby accept the foregoing Special Permit and agree to perform all of the terms and conditions thereof.

MCI Telecommunications Corporation

By: H.P. Scott

H.P. Scott
Vice President
Transmission Systems Construction

ACKNOWLEDGEMENT

STATE OF TEXAS)
: .SS.:
COUNTY OF DALLAS)

On the 28th day of November, 1988, before me personally came H. P. Scott, to me known, who, being by me duly sworn, did depose and say that he resides at 400 International Parkway, Richardson, Texas 75081; that he is the Vice President of MCI Telecommunications Corporation, the corporation described in and which executed the above instrument; that he knows the seal of said corporation; that the seal affixed to said instrument is such corporate seal; that it was so affixed by order of the Board of Directors of said corporation, and that he signed his name thereto by like order.

[Notarial Seal]

Charlene A. Gossett
Notary Public

My Commission Expires:

CHARLENE A. GOSSETT
Notary Public
STATE OF TEXAS
My Comm. Exp. 2-17-92

I, Gloria C. Miller, Clerk of the Town of Manlius, **DO HEREBY CERTIFY** that the preceding Resolution was duly adopted by the Town Board of the Town of Manlius at a meeting the Board duly called and held on the 14th day of September, 1988; that said Resolution was entered in the minutes of said meeting; that I have compared the foregoing copy with the original thereof now on file in my office; and that the same is a true and correct transcript of said Resolution and of the whole thereof.

I FURTHER CERTIFY that all members of said Board had due notice of said meeting.

IN WITNESS THEREOF, I have hereunto set my hand and affixed the seal of the Town of Manlius, this 14th day of September, 1988.

DATED: September 14, 1988
Fayetteville, New York

Gloria C. Miller

GLORIA C. MILLER
Town Clerk of the Town of Manlius
Onondaga County, New York

[SEAL]