

Town of Manlius

Planning Board Agenda

February 28, 2022

6:30PM

1. Zoom Meeting Instructions

Documents:

[ZOOM PLANNING BOARD MEETING INSTRUCTIONS FEBRUARY 28, 2022.PDF](#)

2. Pledge Of Allegiance

3. Approval Of Minutes February 14, 2022

4. A&E & SNY Center - Suite 38, 5781 Bridge Street, East Syracuse, NY 13057 - Discussion
- Zone Change Recommendation - Medical Center Drive - Behind Resort Lifestyles - Tax
Map # 086.-01-03.9

Documents:

[AE AND SNY CENTER ZONE CHANGE APPLICATION AMENDMENT 2022-02-17.PDF](#)

[AANDE AND SNY CENTER ZONE CHANGE APPLICATION.PDF](#)

[MANLIUS SUBDIVISION RECORDED MAP.PDF](#)

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

Documents:

[UPDATED - BRANDYWINE - 34 - LOT SUBDIVISION - SITE PLANS.PDF](#)

[UPDATED - BRANDYWINE 34 - LOT SUBDIVISION - REPLY LETTER TO
ENGINEER COMMENTS.PDF](#)

[UPDATED - BRANDYWINE 34 - LOT SUBDIVISION - SWPPP.PDF](#)

[BRANDYWINE - 34 - LOT SUBDIVISION - WELL REPORT MANLIUS PB
RESPONSE LETTER.PDF](#)

[BRANDYWINE - 34 - LOT SUBDIVISION - PB APPLICATION-SIGNED.PDF](#)
[OCPB REFERAL -HARRINGTON HOMES - BRANDYWINE - 34 LOT
SUBDIVISION.PDF](#)

[OCPB RESPONSE - HARRINGTON HOMES - BRANDYWINE - 34 - LOT
SUBDIVISION.PDF](#)

[OCPB RESPONSE - HARRINGTON HOMES - BRANDYWINE 34-LOT
SUBDIVISION.PDF](#)

6. Other Business

7. Adjournment



February 28, 2022

Virtual Planning Board Meeting

Instructions to attend the February 28, 2022 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/86201887119?>

Password to join when prompted:

Password: 216448

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: 862 0188 7119

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

Password: 216448

February 17, 2022

Mr. John Deer, Supervisor
Town of Manlius
301 Brooklea Drive
Fayetteville, NY 13066
Via email: jdeer@townofmanlius.org

Mr. Joseph Lupia, Chair
Town of Manlius Planning Board
301 Brooklea Drive
Fayetteville, NY 13066
Via email: lupia7@yahoo.com

Re: Zone Change Application
A&E & SNY Center
Medical Center Drive

Dear Supervisor Deer and Chairman Lupia,

On behalf of our client, A&E & SNY Center, we are submitting the enclosed amended zone change application for the parcel of land located on the northerly side of Medical Center Drive adjacent to the Towne Center Retirement Community (tax parcel 086.-01-03.9). Our client wishes to amend to the application and request that the parcel zoning be changed to **Neighborhood Shopping (NS)** from its current Restricted Agricultural (RA) zoning. The original application requested that the parcel zoning be changed to Commercial A (CA).

This amendment is in response to our initial meeting with the Planning Board on February 14, 2022 and a follow-up meeting with Chairman Lupia, Doug Miller, Michael Papa (applicant), and myself. As discussed in this meeting, the uses that A&E and SNY Center provide are allowable uses within the NS District. Amending the application allows the Town to restrict future uses if the Center ceases operations at the property; the NS District restricts the allowable uses to those that are compatible with the surrounding neighborhood while the CA District would allow uses that are not compatible with the neighborhood.

We look forward to working with the Town. If you should have any questions or comments, please feel free to contact us.



Respectfully,

NAPIERALA CONSULTING
Professional Engineer, P.C.

A handwritten signature in black ink, appearing to read 'Rod Ives' with a stylized flourish at the end.

Rod Ives, P.E.
Project Manager

Enclosure

cc: Michael Papa, A&E & SNY Center (papam42020@gmail.com)
Allison Weber, Town Clerk (aweber@townofmanlius.org)
Lisa Beeman, Deputy Town Clerk (lbeeman@townofmanlius.org)

**TOWN OF MANLIUS
ZONE CHANGE APPLICATION**

1. Name of Person applying for Zone Change A&E & SNY Center
Address of person applying Suite 38, 5781 Bridge Street, East Syracuse, NY 13057
Cell Number _____ Phone Number _____
2. Name: (owner of record) of land where Zone Change would occur Walnut Grove, LLC
Address (owner of record) 7101 82nd Street, Lincoln, NE 68516
Cell Number (owner of record) _____ Phone Number _____
3. Tax Map Number of property where Zone Change would occur 086.-01-03.9
4. Is this property located in a flood hazard area? No
If so, what flood area is the property in it in?

5. Present zoning classification of property Restricted Agricultural - RA
6. Desired zoning classification Neighborhood Shopping - NS
Reason for Change of Zone (use additional sheets if necessary) The proposed use (medical offices & personal services) is not an allowed use in the RA Zone

7. What is lot size? 4.03 Acres
8. If the Zone Change is granted, will the use of the property conform to the District regulations as stated in Chapter 155 Article III of the Town of Manlius Municipal Code? Yes
9. Is the property within the protectively zoned area of a housing project authorized under the public housing law? No
10. Is the property within five hundred (500) feet of the boundaries of any city, village, town, county, state park or parkway? No
If yes, please specify _____
11. Is the property within five hundred (500) feet from the boundary of any existing or proposed County or State park or other recreation area, or from the right-of-way of any existing or proposed county or state parkway, thruway, expressway, road or highway, or from the existing or proposed right-of-way of any stream or drainage channel owned by the county or for which the county has established channel lines, or from the existing or proposed boundary of any county or state owned land on which a public building or institution is situated? Yes

If yes, please specify Right-of-way of Burdick Street, a County Highway

12. List the uses of all abutting property Medical office building, retirement community,
single-family residential, vacant land

13. The following must be included with your 12 application packets unless otherwise specified and/or specifically waived by the Town Board:

- An environmental assessment form which can be obtained from the Town Clerk, or an environmental impact statement.
- Copy of a survey of the premises certified by a New York State licensed surveyor.
- Legal description of the premises.
- This application must be signed by both the owner of record of the property and the applicant.

The failure to answer any question on this application, the failure to submit any item as specified or the failure to execute this application will result in a delay in the processing of the application.

Date

2 17 22

Mike Pap
Applicant 1

Date

Applicant 2

Date

Applicant

A&E & SNY CENTER

MEDICAL CENTER DRIVE
TOWN OF MANLIUS
ONONDAGA COUNTY, NEW YORK

TOWN OF MANLIUS ZONE CHANGE APPLICATION



APPLICANT:

A&E & SNY CENTER
SUITE 38
5781 BRIDGE STREET
EAST SYRACUSE, NY 13057

PREPARED BY:

NAPIERALA CONSULTING
110 FAYETTE STREET
MANLIUS, NY 13104



JANUARY 14, 2022

January 14, 2022

Mr. John Deer, Supervisor
Town of Manlius
301 Brooklea Drive
Fayetteville, NY 13066

Re: Zone Change Application
A&E & SNY Center
Medical Center Drive

Dear Supervisor Deer,

On behalf of our client, A&E & SNY Center, we are submitting the enclosed zone change application with exhibits for the Town's consideration. The project is located on the parcel of land on the northerly side of Medical Center Drive adjacent to the Towne Center Retirement Community (tax parcel 086.-01-03.9). The proposed project will construct a two buildings, one a 14,242-square foot building (one-story with a "walk-out" type basement) and the other an 11,332-square foot building. The parcel is currently zone Restricted Agriculture (RA); the proposed use, medical offices with complimentary personal services, is not an allowable use in the RA zone. Therefore, the applicant is seeking a zone change to the Commercial A (CA) zone, which allows medical offices and personal services.

This application submittal includes the required exhibits specified on the permit application as well as additional preliminary information, notably preliminary site plans and a preliminary stormwater pollution prevention. The materials will continue to develop as the project progresses through the permitting processes. The included site plans are at a level of detail to provide the Town Board (and Planning Board) with the scope of the project. The site plans will be advanced towards a formal site plan submission after approval of the zone change. Similarly, the SWPPP and corresponding stormwater system design will be more detailed in future submissions as the project continues to progress towards site plan approval.

Based on our previous experience with the Town, it is our understanding that the project will be placed on the Town Board's agenda for an initial introductory meeting. We appreciate the opportunity to present the project and begin the zone change process.



We look forward to working with the Town. If you should have any questions or comments, please feel free to contact us.

Respectfully,

NAPIERALA CONSULTING
Professional Engineer, P.C.

A handwritten signature in black ink, appearing to read 'R. Ives' with a stylized flourish.

Rod Ives, P.E.
Project Manager

Enclosures

cc: Michael Papa, A&E & SNY Center

**TOWN OF MANLIUS
ZONE CHANGE APPLICATION**

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If so, what flood area is the property in it in?

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6. Desired zoning classification Commercial A - CA
Reason for Change of Zone (use additional sheets if necessary) The proposed use (medical offices & personal services) is not an allowed use in the RA Zone

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8. If the Zone Change is granted, will the use of the property conform to the District regulations as stated in Chapter 155 Article III of the Town of Manlius Municipal Code? Yes
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If yes, please specify _____
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- Legal description of the premises.
- This application must be signed by both the owner of record of the property and the applicant.

The failure to answer any question on this application, the failure to submit any item as specified or the failure to execute this application will result in a delay in the processing of the application.

Date 1.18.22

[Signature]
Applicant 1

Date _____

Applicant 2

Date _____

Applicant

Subscribed and Sworn to before me
this 18th day of JAN, 2022
[Signature]
Notary Public

NEDZADA KAPIC
01KA6176345
Notary Public, State of New York
Qualified in Onondaga County
My commission expires OCTOBER 29th, 2023

If yes, please specify Right-of-way of Burdick Street, a County Highway

12. List the uses of all abutting property Medical office building, retirement community,
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Date 01/18/2022

Bruce C. Callingsworth

Applicant 1

Date 01/18/2022

M. J. Pape

Applicant 2

Date _____

Applicant



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EXHIBIT C LEGAL DESCRIPTION

EXHIBIT DPRELIMINARY SWPPP

EXHIBIT E ENVIRONMENTAL ASSESSMENT FORM

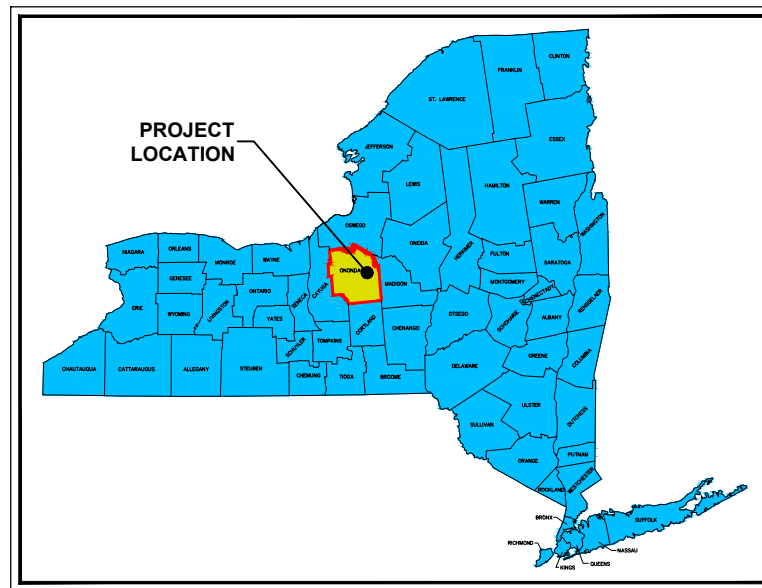
EXHIBIT F.....FRESHWATER WETLANDS LETTER

EXHIBIT G DISCLOSURE AFFIDAVIT



EXHIBIT A

SITE PLANS & ARCHITECTURALS (11"x17")



SITE LOCATION MAP
NOT TO SCALE



A&E & SNY CENTER

MEDICAL CENTER DRIVE

TAX PARCEL No. 086.-01-03.9

TOWN OF MANLIUS

ONONDAGA COUNTY

STATE OF NEW YORK

PREPARED BY:



SITE • DESIGN • ENGINEERING

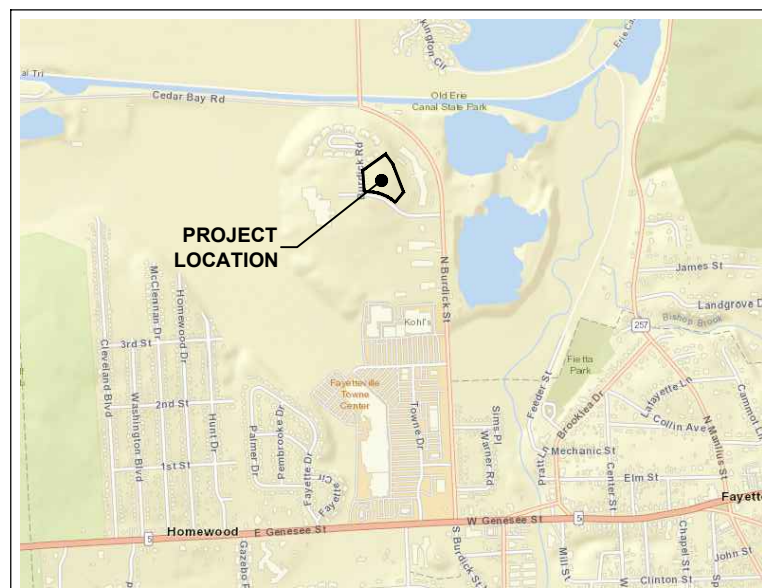
110 FAYETTE STREET
MANLIUS, NEW YORK 13104

email: MNAP@NAPCON.COM
PH: (315) 682-5580 FAX: (315) 682-5544

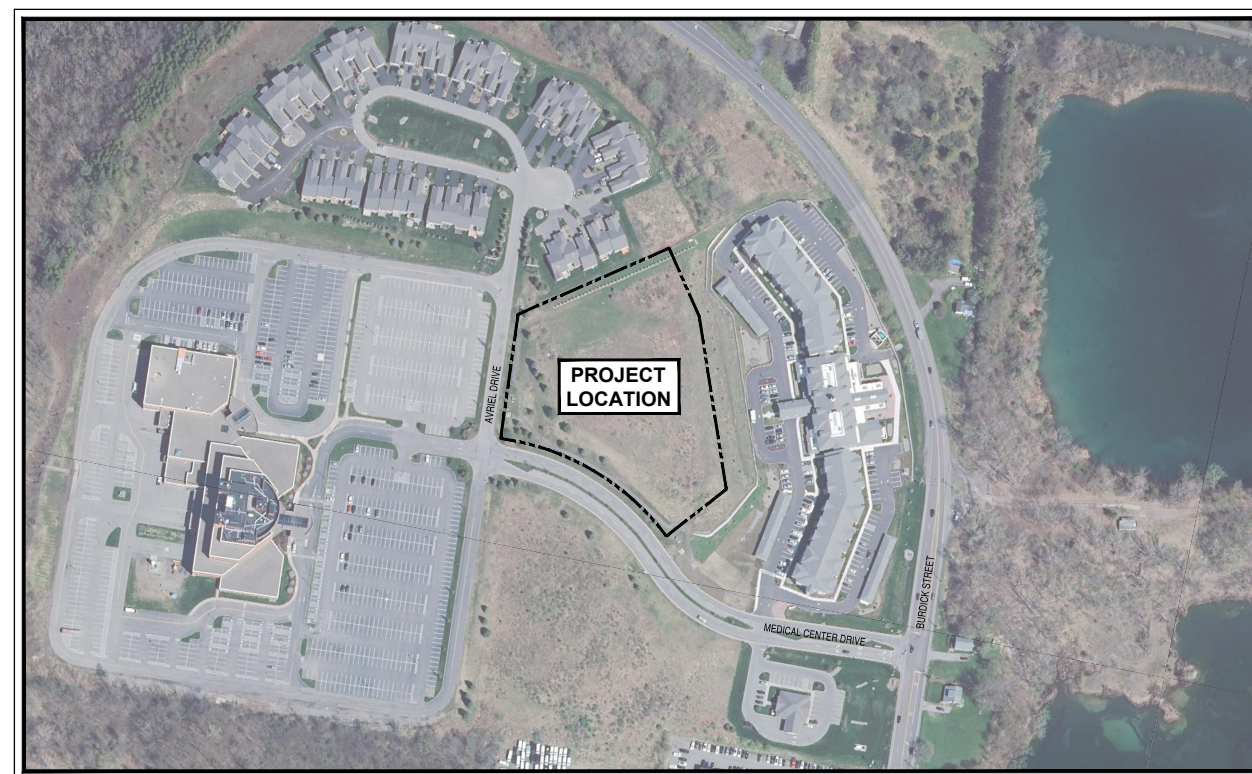
PREPARED FOR:

A&E & SNY CENTER

SUITE 38
5781 BRIDGE STREET
EAST SYRACUSE, NY 13057



PROJECT LOCATION MAP
NOT TO SCALE



AERIAL MAP
1"=200'



SHEET INDEX:

TITLE SHEET
NEIGHBORHOOD PLAN
PRELIMINARY SITE PLAN
PRELIMINARY GRADING PLAN
PRELIMINARY UTILITY PLAN

SP-1
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SP-3
SP-4
SP-5

SHEET

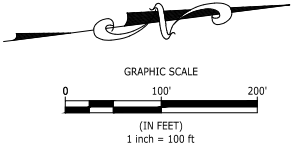
SP-1

PROJECT NO.

21-2022

DATE

01/14/2022



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PREPARED BY:
RODNEY C. IVES, JR., P.E.
NY'S REGISTRATION NO. 071642

PROJECT NO.
21-2022

DATE
01/14/2022

SCALE
1"=100'

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

NO.	REVISION/ISSUE	DATE

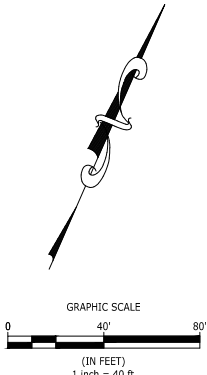
SHEET TITLE:
NEIGHBORHOOD PLAN

PROJECT TITLE:
**A&E & SNY CENTER
MEDICAL CENTER DRIVE**
TOWN OF MANLIUS ONONDAGA COUNTY, NEW YORK
PREPARED FOR:
A&E & SNY CENTER
SUITE 38
5781 BRIDGE STREET
EAST SYRACUSE, NY 13087

SHEET
SP-2



SITE CRITERIA CHECKLIST		
PROJECT SITE INFORMATION		
ADDRESS	MEDICAL CENTER DRIVE	
TAX MAP ID NO.	086-01-03.9	
BOUNDARY SURVEY	PROPERTY LINE INFORMATION TAKEN FROM SUBDIVISION MAP PREPARED BY CT MALE ASSOCIATES, PC DATED 05/10/2017	
TOTAL SITE AREA	4.038 ACRES	
LAND USE	EXISTING: VACANT	PROPOSED: PROFESSIONAL/MEDICAL SERVICES
	REQUIRED	PROVIDED
ZONING INFORMATION		
ZONING DISTRICT	CURRENT: RESTRICTED AGRICULTURAL (RA)	PROPOSED: COMMERCIAL A (CA)
LOT COVERAGE	75%	43%
FRONT YARD SETBACK	30 FT	40.4 FT
REAR YARD SETBACK	25 FT	25.4 FT
SIDE YARD SETBACK	15 FT	CORNER LOT; NON-FRONT YARDS CONSIDERED REAR YARDS
PARKING DIMENSIONS	10'x20'	10'x20'
PARKING AISLE WIDTH	24 FT	24 FT
PARKING SPACES		
PHASE 1: MEDICAL OFFICE SPACE (1 SPACE/300 SF)	11,000 SF 37 SPACES	
PERSONAL SERVICES SPACE (1 SPACE/200 SF)	17,484 SF 88 SPACES	
PHASE 2: MEDICAL OFFICE SPACE (1 SPACE/300 SF)	11,332 SF 38 SPACES	
TOTAL	163 SPACES	108 SPACES ONSITE 92 OFFSITE - LEASED 200 TOTAL SPACES PROVIDED



SP-3

21-2022

01/14/2022

1"=40'

DATE

SCALE

PROJECT NO.

21-2022

DATE

01/14/2022

SCALE

1"=40'

PREPARED BY:

RODNEY G. TYLES, JR., P.E.

NY'S REGISTRATION# 071942

PLAN SEAL BY:

RODNEY G. TYLES, JR., P.E.

NY'S REGISTRATION# 071942

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THEIR SIGNATURE TO THIS DOCUMENT

AND TO BE AVAILABLE FOR VERIFICATION

BY THE AUTHOR.

PROJECT TITLE:

A&E & SNY CENTER
MEDICAL CENTER DRIVE
TOWN OF MANLIUS ONONDAGA COUNTY, NEW YORK

SHEET TITLE:

PRLIMINARY
SITE PLAN

PREPARED FOR:

A&E & SNY CENTER
SUITE 38
5781 BRIDGE STREET
EAST SYRACUSE, NY 13087

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

DATE

01/14/2022

SCALE

1"=40'

PROJECT NO.

21-2022

DATE

01/14/2022

SCALE

1"=40'

SP-3

21-2022

01/14/2022

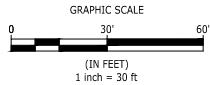
1"=40'



AVRIEL DRIVE
(FORMERLY ENED B' ROAD)

GRADING PLAN LEGEND

- 458 ——— EXISTING CONTOUR GRADES
- 459 ——— PROPOSED CONTOUR GRADES
- 459.8 ——— PROPOSED FINISHED SPOT ELEVATION
- TC= XXX.XX
BC= XXX.XX ——— PROPOSED TOP OF CURB AND BOTTOM OF CURB ELEVATIONS
- MEE ——— MATCH/MEET EXISTING ELEVATION



PROJECT NO. 21-2022
DATE 01/14/2022
SCALE 1"=30'

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CONSULTING, P.C.

DESIGNED BY:
RODNEY C. IVES, JR., P.E.
NYS REGISTRATION # 071942

PREPARED BY:
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110 FAYETTE STREET
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email: MNAP@NAPCON.COM
TEL: (315) 682-5580 FAX: (315) 682-5544

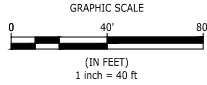
PROJECT NO. 21-2022
DATE 01/14/2022
SCALE 1"=30'

SHEET
SP-4

PRLIMINARY GRADING PLAN

NO.	REVISION/ISSUE	DATE

PROJECT TITLE:
**A&E & SNY CENTER
MEDICAL CENTER DRIVE**
TOWN OF MANLIUS ONONDAGA COUNTY, NEW YORK
PREPARED FOR:
A&E & SNY CENTER
SUITE 38
5781 BRIDGE STREET
EAST SYRACUSE, NY 13087



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TO THE FULL EXTENT OF THE LAW.

PLAN SEAL BY:
RODNEY C. IVES, JR., P.E.
NYS REGISTRATION # 071942

PROJECT NO.
21-2022

DATE
01/14/2022

SCALE
1"=40'

SHEET

SP-5

PREPARED BY:
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110 FAYETTE STREET
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email: MNAP@NAPCON.COM
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PROJECT NO.
21-2022

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01/14/2022

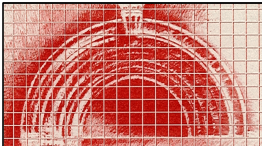
SCALE
1"=40'

NO.	REVISION/ISSUE	DATE

SHEET TITLE:
**PRLIMINARY
UTILITY PLAN**

PROJECT TITLE:
**A&E & SNY CENTER
MEDICAL CENTER DRIVE**
TOWN OF MANLIUS ONONDAGA COUNTY, NEW YORK

PREPARED FOR:
A&E & SNY CENTER
SUITE 38
5781 BRIDGE STREET
EAST SYRACUSE, NY 13057



CONCEPT
ELEVATION

2021.12.21
Revised:
2021.12.21

HOLMES-KING-KALLQUIST & ASSOCIATES, ARCHITECTS

575 North Salina Street - Syracuse, New York 13208 - 315.476.8371 - hkkarchitects.com

Avriel Drive
Fayetteville,
New York

A & E SPA





EXHIBIT B

SURVEY (11"x17")



EXHIBIT C

LEGAL DESCRIPTION

Lot 3A

ALL THAT CERTAIN PIECE OR PARCEL OF LAND situate in the Town of Manlius, County of Onondaga and State of New York, known and distinguished as part of Military Lot 64, also being part of Lot 3 of the Northeast Medical Center Subdivision recorded in the Onondaga County Clerk's Office as Map Number 8583 and being more particularly bounded and described as follows:

Beginning at a point in the easterly line of Avriel Drive at its intersection with the northerly line of Medical Center Drive; thence North 08 deg. 00 min. 20 sec. East along the said easterly line of Avriel Drive, a distance of 254.01 feet to a point on the division line of the lands now or formerly of DB Real Estate of Fayetteville as described in Book 5233 of Deeds at Page 385 on the south and the lands now or formerly of Star View Homeowners Association as described in Book 4882 of Deeds at Page 906 on the north; thence North 66 deg. 22 min. 43 sec. East along said division line, a distance of 343.87 to a point; thence through the said lands of DB Real Estate of Fayetteville, the following three (3) courses and distances: 1.) South 23 deg. 37 min. 17 sec. East a distance of 156.68 feet to a point; thence 2.) South 08 deg. 52 min. 11 sec. East a distance of 363.17 feet to a point; and 3.) South 51 deg. 59 min. 54 sec. West a distance of 158.24 feet to a point on the said northerly line of Medical Center Drive; thence northwesterly along said northerly line of Medical Center Drive, along a curve to the left having a radius of 517.00 feet, length of 411.42 feet and chord of North 59 deg. 30 min. 50 sec. West, 400.65 feet to the point of beginning. Containing 4.038 acres of lands, more or less.



EXHIBIT D

PRELIMINARY SWPPP

**A&E & SNY CENTER
Medical Center Drive
Town of Manlius, Onondaga County, NY**

PRELIMINARY STORMWATER POLLUTION PREVENTION PLAN

Prepared for the Town of Manlius Zone Change Application

January 14, 2022

Prepared By:



110 FAYETTE STREET
MANLIUS, NEW YORK 13104

**Telephone: (315) 682-5580
Fax: (315) 682-5544**



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Water Quality Treatment.....	5
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Appendices:

- Appendix A – NRCS Soil Map
- Appendix B – NYSDEC & GIS Environmental Resources Maps
- Appendix C – Drainage Area Maps
- Appendix D – HydroCAD Modelin



Introduction:

A&E & SNY Center proposes to construct medical office development located at the northeast corner of the intersection of Medical Center Drive and Avriel Drive in the Town of Manlius, New York. The project will develop approximately 2.9 acres of a predominantly brush-weed-grass field; the master plan includes two buildings, one a multi-story building with a footprint of 14,242 square feet and the other, future building having a footprint of 11,332 square feet. A 108-vehicle parking lot will be constructed. As the project will disturb greater than one acre of land, the project will require coverage under the New York State Pollution Discharge Elimination System General Permit for Stormwater Discharges from Construction Activity. To obtain coverage under the General Permit, the project must include post-construction stormwater management practices in order to mitigate the impacts to stormwater runoff quality and quantity that the project will create.

The purpose of this preliminary stormwater pollution prevention plan (SWPPP) is to supplement the zone change application to the Town of Manlius Town Board. It is provided as evidence that the site can properly manage stormwater runoff so as not to impact downstream areas. As the project details will continue develop as the application is reviewed, this preliminary plan will develop into a complete SWPPP including erosion and sediment control, operation and maintenance requirements, and other elements that the SPDES General Permit requires.

Background:

Site Location:

Tax Parcel 086.-01-03.9
Medical Center Drive
Town of Manlius, Onondaga County, NY

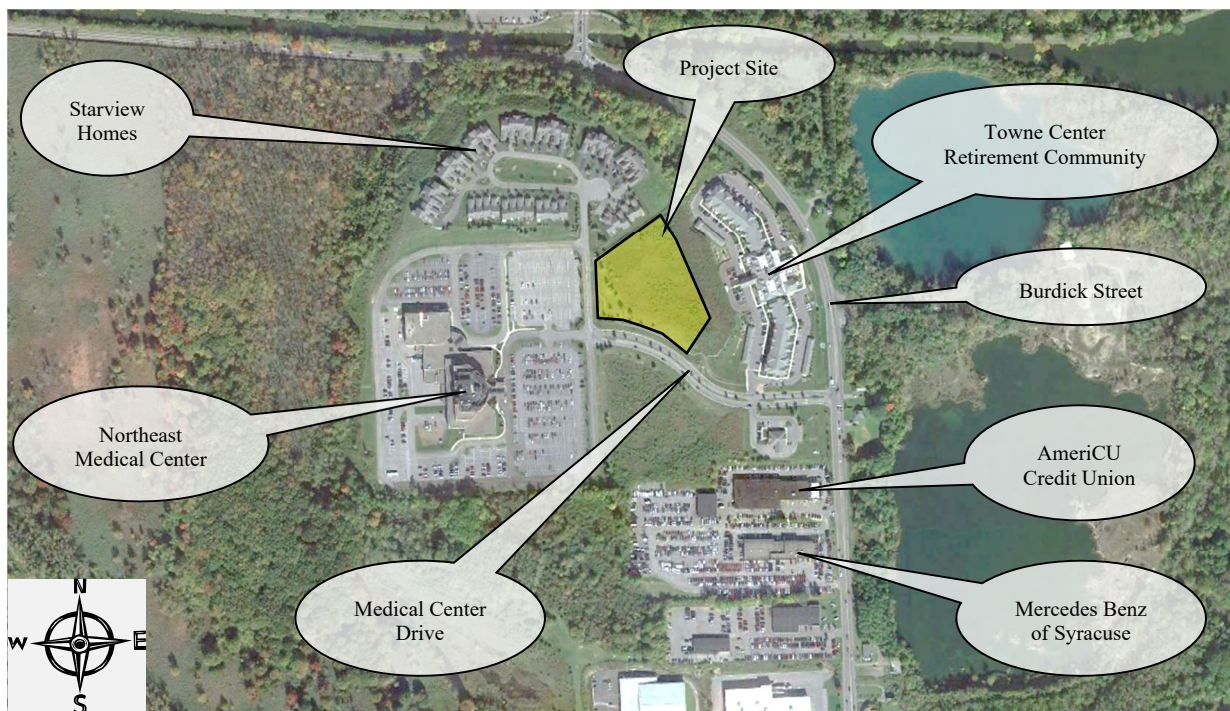


Figure 1: Site Location (source: Google Earth)



Project Description:

The existing parcel of land is approximately 4.038 acres located at the northeast corner of the intersection of Medical Center Drive and Avriel Drive in the Town of Manlius. The site is currently vacant and has a fairly consistent grass/brush cover throughout the lot. The property is the top of the hillside and generally drains in three directions: to the west and Avriel Drive, to the south and Medical Center Drive, and east towards the Towne Center Retirement Community.

The proposed development will occur in two phases. The first phase is the construction of a two-story building with a footprint of 14,242 square feet and the construction of a 108-vehicle parking lot. The second phase is the construction of a one-story, 17,484 square foot building. After completion of Phase 2, the total impervious area of the site will be approximately 1.74 acres.

Project Soils:

Soils information for the watershed was collected from the Natural Resource Conservation Service soils mapping database. The watershed consists of one distinct mapping unit, Ontario gravelly loam which belongs to hydrologic soil group B. Group B soils have a moderate infiltration rate and are moderately well-drained. See Appendix A for the NRCS soils map within the project area.

Environmental Resources:

The National Wetlands Inventory Mapper and the NYSDEC Environmental Resources Mapper (seen in Appendix B) show that no Federal or DEC regulated wetlands are within the vicinity of this project. Additionally, the project is not located within a floodplain. The NYSDEC Resource Mapper does show that the project is located within a check zone for having the potential to contain rare plants and animals or significant natural communities. The specific species in question on this site is the northern long-eared bat. However, given that flora on this site is predominantly brush without any groupings of trees, the presence of the bat on this site is not likely.

Hydrology:

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 user input. The input data was taken from soil maps, detailed topographic and utility survey information, rainfall distribution maps, and aerial images. Watershed areas were delineated using the contour data obtained from the site survey. The hydrologic conditions are used to assess the impacts to the runoff characteristics and to design appropriate measures to mitigate these impacts.

Preliminary Summary of Sizing Criteria:

A preliminary analysis has been performed to determine the potential stormwater mitigation practices to be implemented on-site in order to achieve the required water quality and water quantity standards as set forth in the NYSDEC SPDES General Permit for Stormwater Discharges from Construction Activity (GP-0-20-001). The stormwater runoff from the new impervious surfaces on site will be collected and routed through the mitigation system in order to improve water quality, reduce the volume of stormwater runoff, and reduce the peak runoff flow rate before discharging to an existing drainage channel at the southwest corner of the site.

Drainage Area Delineation:

Three drainage systems are located in the vicinity of the project site that can be used to collect stormwater runoff from the proposed project. At the intersection of Medical Center Drive and Avriel Drive, the southwest corner of the project site, is a 15" diameter culvert that collects runoff along the easterly shoulder of Avriel Drive and conveys it to an open ditch to the south along to perimeter roadway around Northeast Medical Center. Within Medical Center Drive, the southeast of the project site, is a storm drain inlet that collects stormwater runoff from the hillside and the inbound travel lane of Medical Center Drive; the inlet is part of a storm drainage system that conveys to Burdick Street. The third drainage system is the stormwater



management system that was constructed as part of the Towne Center Retirement Community project; Towne Center sits at the base of the hill and runoff from a portion of the proposed project site flows into the system.

In order to eliminate any impacts to the Medical Center Drive or Towne Center Retirement Community drainage systems, the stormwater management system for the proposed project will discharge to the 15" culvert at the intersection of Medical Center Drive and Avriel Drive. In order to properly design and manage the runoff, the existing drainage area tributary to the 15" culvert is mapped and compared to the proposed condition drainage area, which includes stormwater management practices that will attenuate the runoff. The following table summarizes the hydrologic characteristics of the existing condition drainage area tributary to the culvert.

Table 1: Existing Condition Drainage to the 15" Culvert

Area (ac)	CN	Description
0.451	65	Brush, Good, HSG C
0.107	61	>75% Grass cover, Good, HSG B
0.558	64	Weighted Average
0.558		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.0	100	0.0100	0.11		Sheet Flow, Grass: Short n= 0.150 P2= 2.38"
0.4	69	0.0277	2.68		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
0.2	70	0.2000	7.20		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
15.6	239	Total			

The post-construction drainage area mapping is based on preliminary grading of the site, the location of the stormwater management practices, and the preliminary stormwater conveyance system. The proposed condition drainage area to the 15" culvert is split between two sub-drainage areas, each tributary to separate stormwater management practices. As the soils are classified as HSG B soils and are a gravelly loam, each practice will be designed as an infiltration basin to allow a portion of the stormwater runoff to recharge the groundwater, reduce the volume of stormwater runoff that discharges to the surface, and attenuate the peak rates of runoff so as not to impact downstream areas. The following tables summarize the hydrologic characteristics of the proposed condition drainage areas as well as the preliminary hydraulics (stage-storage-discharge characteristics) of the stormwater management practices.

Table 2: Proposed Condition, East Drainage Area

Area (ac)	CN	Description
1.460	98	Unconnected roofs, HSG B
0.720	61	>75% Grass cover, Good, HSG B
2.180	86	Weighted Average
0.720		33.03% Pervious Area
1.460		66.97% Impervious Area
1.460		100.00% Unconnected

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



Table 3: East Infiltration Basin

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
500.00	0	0	0
501.00	3,605	1,803	1,803
502.00	6,059	4,832	6,635
503.00	7,835	6,947	13,582
504.00	8,851	8,343	21,925
505.00	9,892	9,372	31,296
506.00	10,958	10,425	41,721
507.00	12,050	11,504	53,225

Device	Routing	Invert	Outlet Devices
#1	Primary	501.80'	12.0" Round Culvert L= 365.0' Ke= 0.500 Inlet / Outlet Invert= 501.80' / 495.00' S= 0.0186 '/' Cc=0.900 n= 0.012,
#2	Device 1	501.80'	3.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads

Table 4: Proposed Condition, West Drainage Area

Area (ac)	CN	Description
0.274	98	Paved parking, HSG B
0.522	61	>75% Grass cover, Good, HSG B
0.796	74	Weighted Average
0.522		65.58% Pervious Area
0.274		34.42% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.0	26	0.1000	0.15		Sheet Flow, Grass: Dense n= 0.240 P2= 2.38"
3.8	28	0.0607	0.12		Sheet Flow, Grass: Dense n= 0.240 P2= 2.38"
0.1	38	0.2488	8.03		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
1.3	240		3.00		Direct Entry,
8.2	332	Total			

Table 5: West Infiltration Basin

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
496.00	0	0	0
497.00	490	245	245
498.00	1,097	794	1,039
499.00	1,848	1,473	2,511
500.00	2,759	2,304	4,815

Device	Routing	Invert	Outlet Devices
#1	Primary	498.20'	12.0" Round Culvert L= 100.0' Ke= 0.500 Inlet / Outlet Invert= 498.20' / 495.00' S= 0.0320 '/' Cc=0.900 n= 0.012,
#2	Device 1	498.20'	3.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads



Water Quality Treatment:

The infiltration basins will be designed in accordance with the NYS Stormwater Design Manual. The Design Manual specifies the volumes necessary to provide water quality treatment and runoff reduction. These calculations are provided below:

East Drainage Area/Infiltration Basin

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

Drainage Area Tributary to Practice (A) = 2.180 acres

Impervious Areas (A_I) = 1.460 acre

$$R_v = 0.05 + 0.9 \left(\frac{1.460 \text{ ac}}{2.180 \text{ ac}} \right)$$

$$R_v = 0.65$$

90th Percentile Rainstorm (P) = 1.0 inch

$$WQ_v = \frac{1.00 \cdot 0.65 \cdot 2.180 \text{ ac}}{12}$$

$$WQ_v = 0.119 \text{ ac} \cdot \text{ft}$$

$$RR_v = \frac{0.95 \cdot P \cdot S \cdot A_I}{12}$$

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

B Soils = 100% of area

$$RR_v = \frac{0.95 \cdot 1.00 \cdot 0.40 \cdot 1.460 \text{ ac}}{12}$$

$$RR_v = 0.046 \text{ ac} \cdot \text{ft}$$

The preliminary design for the infiltration basin sets the overflow outlet 1.8 feet above the bottom of the basin. At this depth, the basin will hold 0.130 ac·ft, allowing it to percolate into the groundwater.



West Drainage Area/Infiltration Basin

Drainage Area Tributary to Practice (A) = 0.796 acres

Impervious Areas (A_I) = 0.274 acre

$$R_v = 0.05 + 0.9 \left(\frac{0.274 \text{ ac}}{0.796 \text{ ac}} \right)$$

$$R_v = 0.36$$

$$WQ_v = \frac{1.00 \cdot 0.36 \cdot 0.796 \text{ ac}}{12}$$

$$WQ_v = 0.0.024 \text{ ac} \cdot \text{ft}$$

$$RR_v = \frac{0.95 \cdot P \cdot S \cdot A_I}{12}$$

$$RR_v = \frac{0.95 \cdot 1.00 \cdot 0.40 \cdot 0.274 \text{ ac}}{12}$$

$$RR_v = 0.009 \text{ ac} \cdot \text{ft}$$

The preliminary design for the infiltration basin sets the overflow outlet 2.2 feet above the bottom of the basin. At this depth, the basin will hold 0.030 ac·ft, allowing it to percolate into the groundwater.

Peak Flow Mitigation:

In accordance with the SPDES General Permit, the 1-year, 10-year, and 100-year frequency storms will be analyzed to ensure that post-development conditions will not adversely impact downstream areas.

The project site must provide sufficient storage of the 1-year, 24-hour runoff event such that the volume is released over a 24-hour period. The NYS Stormwater Design Manual methodology for determining the storage volume was used (Appendix B.1) and is discussed below.

Tributary Area = 2.976 acres

CN = 83

t_c = 8.2 mins

I_a = 0.410

P = 2.04"

$$\frac{I_a}{P} = 0.201$$

Using I_a/P and T_c , $q_u = 900 \text{ csm/in}$ (TR-55, Exhibit 4-II)

Using q_u and $T = 24 \text{ hr}$, $q_o/q_i = .020$ (Design Manual, Figure B.1)

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



$$\frac{V_s}{V_r} = 0.654$$

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

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

HydroCAD provides the volume of runoff ($Q_d A / 12$) = 0.162 ac · ft

$$V_s = 0.654 \cdot 0.162 \text{ ac} \cdot \text{ft}$$

$$V_s = 0.106 \text{ ac} \cdot \text{ft} \text{ Required}$$

The provided RR_v is subtracted from V_s to determine the required Cp_v .

$$Cp_v = 0.106 \text{ ac} \cdot \text{ft} - 0.143 \text{ ac} \cdot \text{ft}$$

As RR_v exceeds the storage volume required, the Cp_v requirement is met.

Additionally, the stormwater management system must provide sufficient storage and attenuation such that the peak rate of discharge to the 15" culvert during the 10- and 100-year, 24-hour design storms after construction is less than or equal to the existing condition peak flows. The table below summarizes the hydrologic and hydraulic calculations:

Table 6. Peak Flow Summary

Storm Event	Rainfall	Existing Condition Peak Runoff (cfs)	Post–Construction Peak Runoff (cfs)
10 year (Q_p)	3.43"	0.39	0.29
100 year (Q_f)	5.78"	1.45	0.63

Erosion & Sediment Control:

Erosion and sediment control is any temporary or permanent measure taken to reduce erosion, control siltation and sedimentation, and ensure that sediment-laden water or wind does not leave the site. All applicable standards for reduction of sediment and pollution leaving the construction site will be followed by the on-site contractor. Below is an outline of the temporary and permanent erosion and sediment control practices to be implemented on site.

1. Stabilization Practices (Permanent) 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) 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.
 - b. Mulching of exposed areas where construction activity has ceased.
 - c. Frequent watering to minimize wind erosion during construction.
3. Structural Practices (Permanent) for this site include:
 - a. 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.



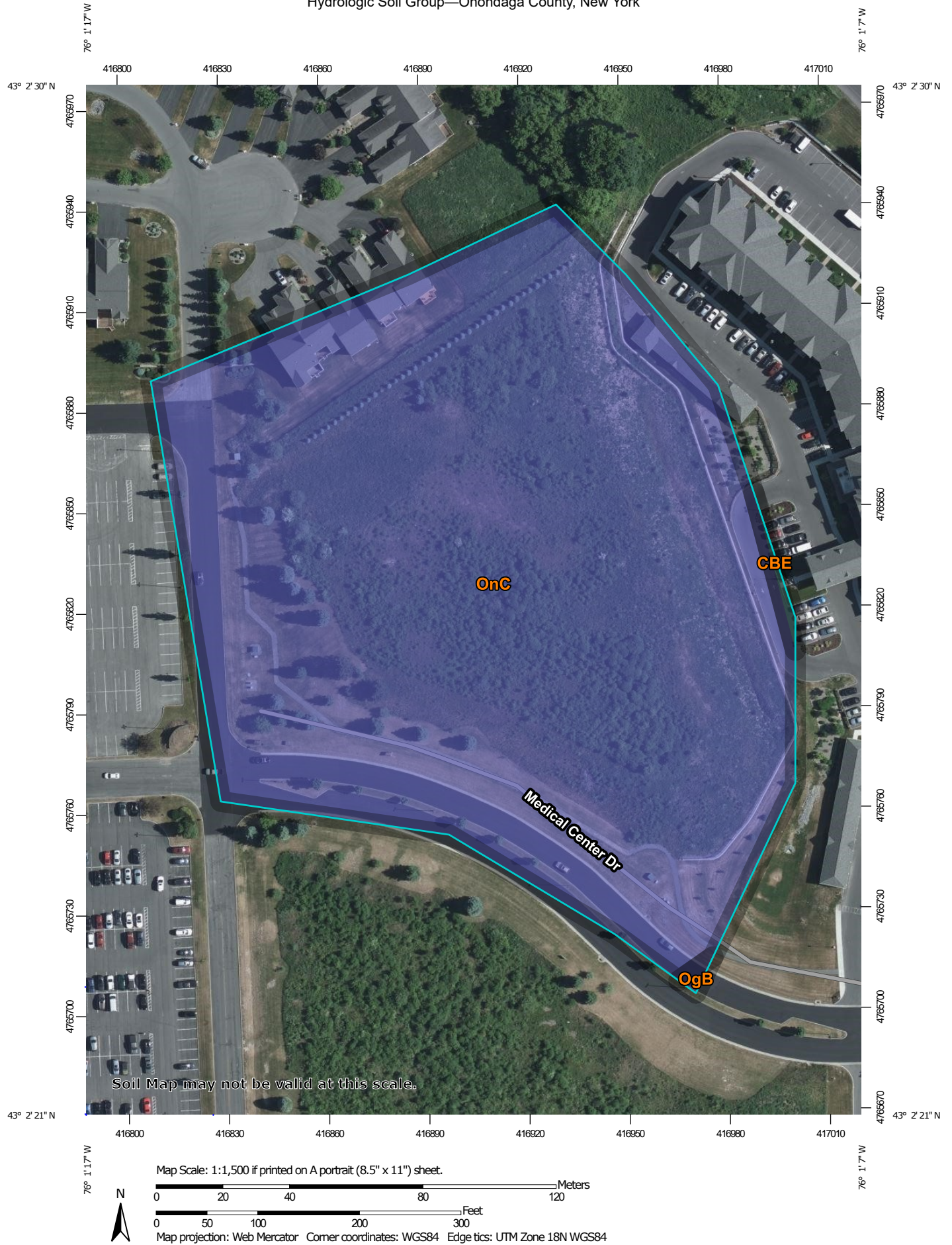
-
4. Structural Practices (Temporary) for this site include:
- a. Silt fence. Silt fence is a temporary barrier of geotextile fabric installed on the contours across from a slope used to intercept sediment laden runoff from small drainage areas of disturbed soil. The purpose of silt fence is to reduce 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.
 - c. 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.



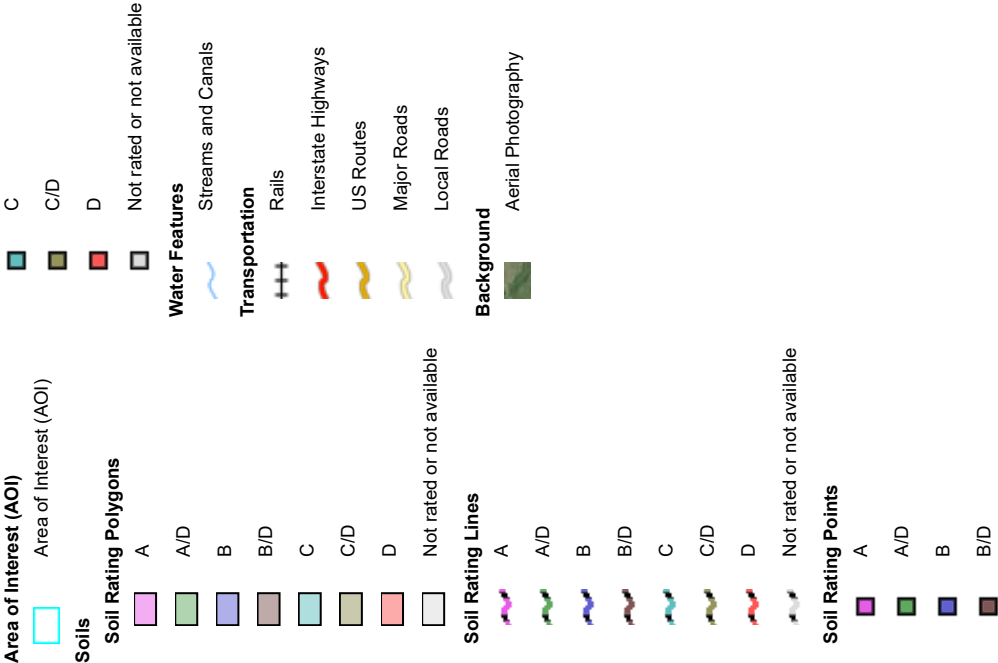
APPENDIX A

NRCS SOIL MAP

Hydrologic Soil Group—Onondaga County, New York



MAP LEGEND



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 16, Sep 1, 2021

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

Date(s) aerial images were photographed: May 21, 2020—Jun 17, 2020

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
CBE	Camillus and Lairdsville channery soils, steep	C	0.0	0.2%
OgB	Ontario loam, 3 to 8 percent slopes	B	0.0	0.1%
OnC	Ontario gravelly loam, 8 to 15 percent slopes	B	7.4	99.7%
Totals for Area of Interest			7.4	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

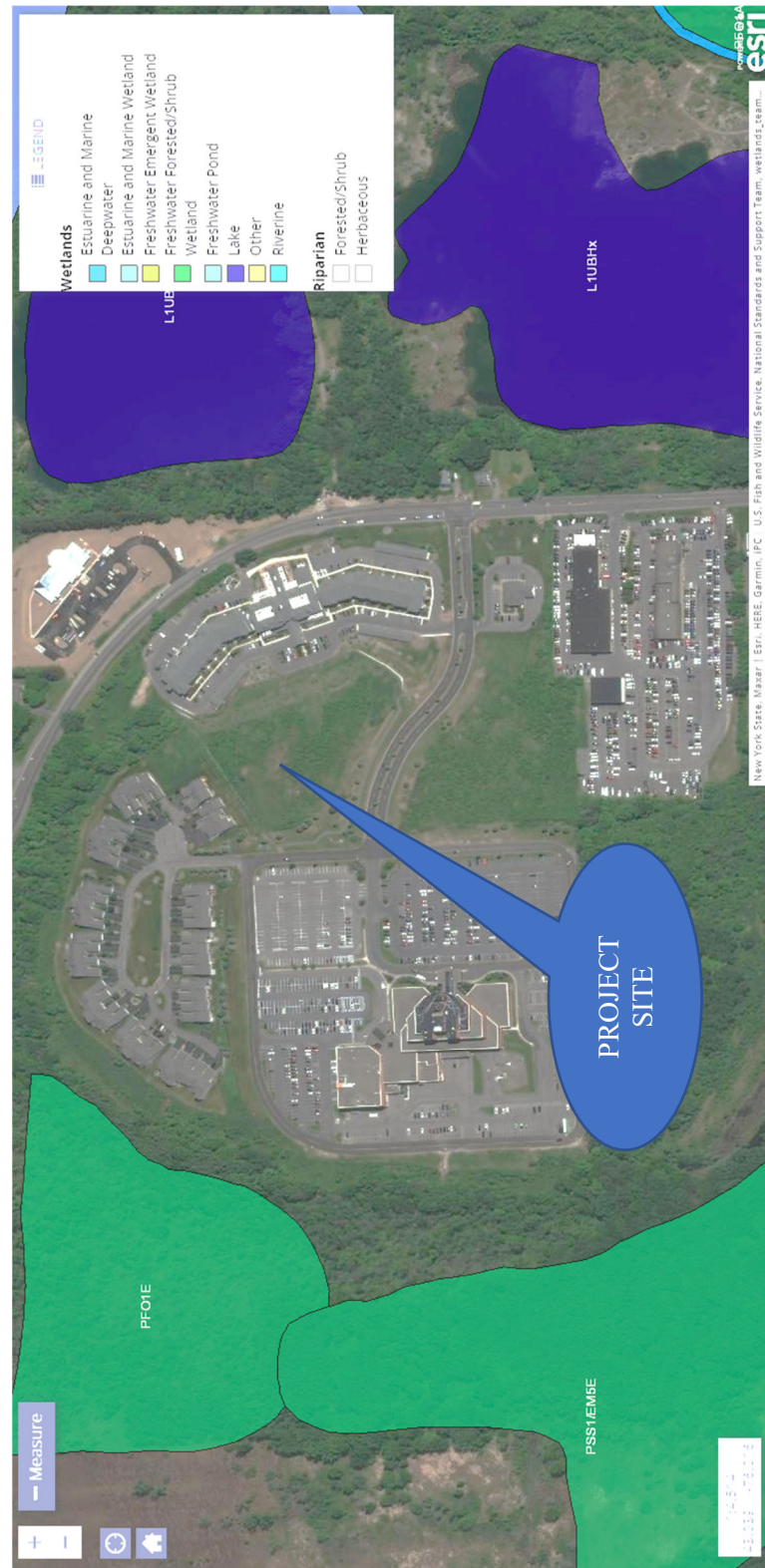
Component Percent Cutoff: None Specified

Tie-break Rule: Higher



APPENDIX B

NATIONAL & STATE WETLAND MAPPING



National Wetlands Inventory Mapping



NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

Environmental Resource Mapper

Base Map: [Satellite](#)

+

-

Home

Search

Tools

Layers and Legend

☐ All Layers

☐ Unique Geological Features

☐ Waterbody Classifications for Rivers/Streams

☒ Waterbody Classifications for Lakes

☒ State Regulated Freshwater Wetlands (Outside of the Adirondack Park)

☐ State Regulated Wetland Checkzone

☐ Imperiled Mussels

Other Wetland Layers

Reference Layers

Tell Me More...

Need A Permit?

Contacts

PROJECT SITE

Scale: 0 100 200 Feet

NYSDEC Wetlands Mapping



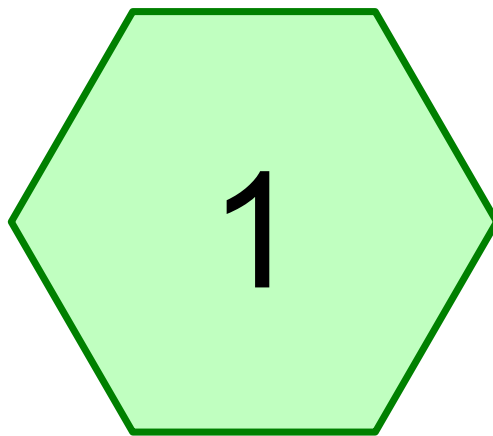
APPENDIX C

DRAINAGE AREA MAPS

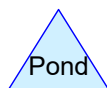
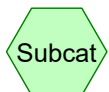


APPENDIX D

HydroCAD Modeling



15" CULVERT AT MED CENTER DR



Routing Diagram for EXISTING CONDITION

Prepared by Napierala Consulting

HydroCAD® 10.10-6a s/n 01332 © 2020 HydroCAD Software Solutions LLC

EXISTING CONDITION

Prepared by Napierala Consulting

HydroCAD® 10.10-6a s/n 01332 © 2020 HydroCAD Software Solutions LLC

Type II 24-hr 1-yr Rainfall=2.04"

Page 2

Summary for Subcatchment 1: 15" CULVERT AT MED CENTER DR

Runoff = 0.02 cfs @ 12.18 hrs, Volume= 0.006 af, Depth= 0.13"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 2.00-30.00 hrs, dt= 0.05 hrs

Type II 24-hr 1-yr Rainfall=2.04"

Area (ac)	CN	Description
0.451	65	Brush, Good, HSG C
0.107	61	>75% Grass cover, Good, HSG B
0.558	64	Weighted Average
0.558		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.0	100	0.0100	0.11		Sheet Flow, Grass: Short n= 0.150 P2= 2.38"
0.4	69	0.0277	2.68		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
0.2	70	0.2000	7.20		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
15.6	239	Total			

EXISTING CONDITION

Prepared by Napierala Consulting

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Type II 24-hr 10-yr Rainfall=3.43"

Page 3

Summary for Subcatchment 1: 15" CULVERT AT MED CENTER DR

Runoff = 0.39 cfs @ 12.11 hrs, Volume= 0.031 af, Depth= 0.67"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 2.00-30.00 hrs, dt= 0.05 hrs

Type II 24-hr 10-yr Rainfall=3.43"

Area (ac)	CN	Description
0.451	65	Brush, Good, HSG C
0.107	61	>75% Grass cover, Good, HSG B
0.558	64	Weighted Average
0.558		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.0	100	0.0100	0.11		Sheet Flow, Grass: Short n= 0.150 P2= 2.38"
0.4	69	0.0277	2.68		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
0.2	70	0.2000	7.20		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
15.6	239	Total			

EXISTING CONDITION

Prepared by Napierala Consulting

HydroCAD® 10.10-6a s/n 01332 © 2020 HydroCAD Software Solutions LLC

Type II 24-hr 100-yr Rainfall=5.78"

Page 4

Summary for Subcatchment 1: 15" CULVERT AT MED CENTER DR

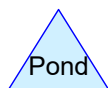
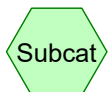
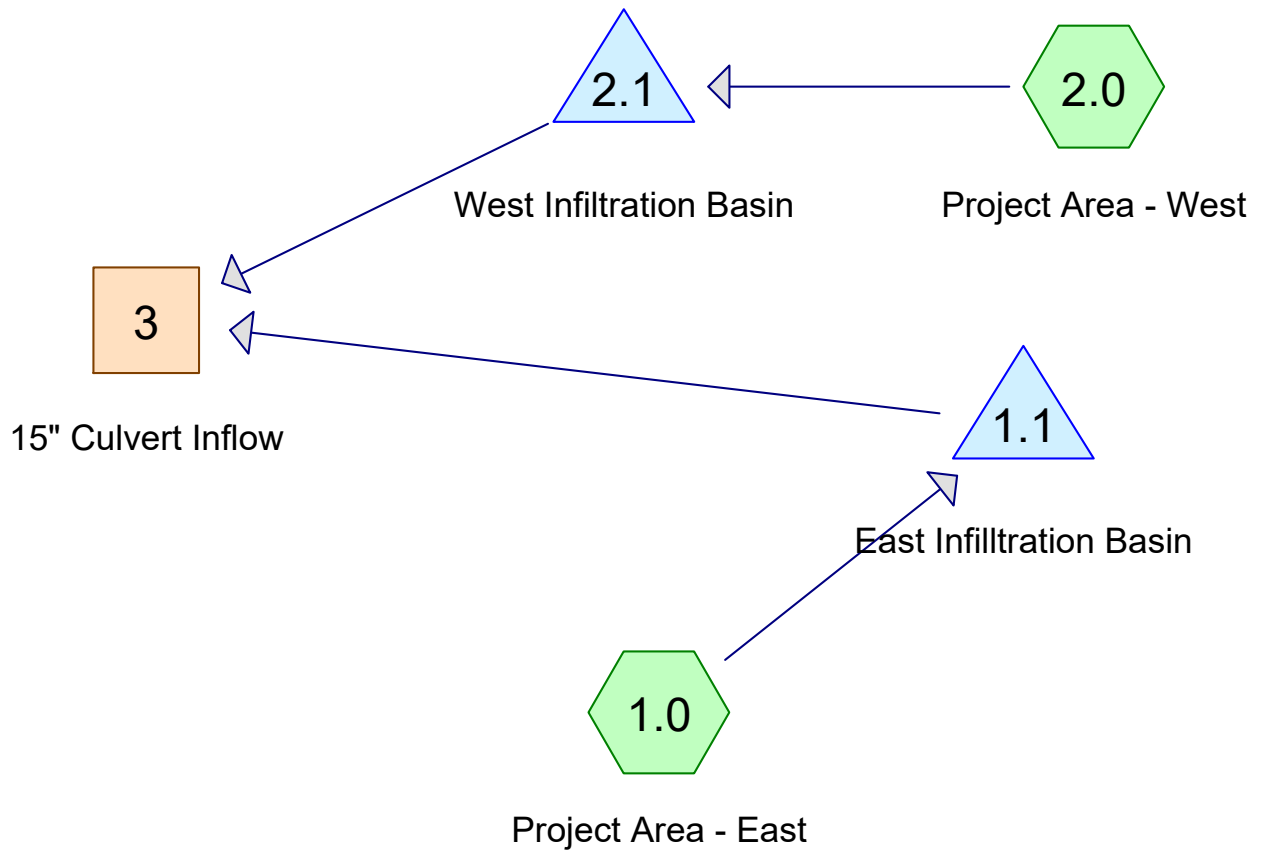
Runoff = 1.45 cfs @ 12.09 hrs, Volume= 0.098 af, Depth= 2.11"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 2.00-30.00 hrs, dt= 0.05 hrs

Type II 24-hr 100-yr Rainfall=5.78"

Area (ac)	CN	Description
0.451	65	Brush, Good, HSG C
0.107	61	>75% Grass cover, Good, HSG B
0.558	64	Weighted Average
0.558		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.0	100	0.0100	0.11		Sheet Flow, Grass: Short n= 0.150 P2= 2.38"
0.4	69	0.0277	2.68		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
0.2	70	0.2000	7.20		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
15.6	239	Total			



PROPOSED CONDITION

Prepared by Napierala Consulting

HydroCAD® 10.10-6a s/n 01332 © 2020 HydroCAD Software Solutions LLC

Type II 24-hr 1-yr Rainfall=2.04"

Page 2

Summary for Subcatchment 1.0: Project Area - East

Runoff = 3.34 cfs @ 11.98 hrs, Volume= 0.146 af, Depth> 0.80"
 Routed to Pond 1.1 : East Infiltration Basin

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
1.460	98	Unconnected roofs, HSG B
0.720	61	>75% Grass cover, Good, HSG B
2.180	86	Weighted Average
0.720		33.03% Pervious Area
1.460		66.97% Impervious Area
1.460		100.00% Unconnected

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

Summary for Pond 1.1: East Infiltration Basin

Inflow Area = 2.180 ac, 66.97% Impervious, Inflow Depth > 0.80" for 1-yr event
 Inflow = 3.34 cfs @ 11.98 hrs, Volume= 0.146 af
 Outflow = 0.03 cfs @ 20.00 hrs, Volume= 0.005 af, Atten= 99%, Lag= 481.5 min
 Primary = 0.03 cfs @ 20.00 hrs, Volume= 0.005 af
 Routed to Reach 3 : 15" Culvert Inflow

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 501.92' @ 20.00 hrs Surf.Area= 5,860 sf Storage= 6,151 cf

Plug-Flow detention time=464.1 min calculated for 0.005 af (3% of inflow)
 Center-of-Mass det. time=327.5 min (1,123.1 - 795.6)

Volume	Invert	Avail.Storage	Storage Description
#1	500.00'	53,225 cf	SURFACE STORAGE (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
500.00	0	0	0
501.00	3,605	1,803	1,803
502.00	6,059	4,832	6,635
503.00	7,835	6,947	13,582
504.00	8,851	8,343	21,925
505.00	9,892	9,372	31,296
506.00	10,958	10,425	41,721
507.00	12,050	11,504	53,225

Device	Routing	Invert	Outlet Devices
#1	Primary	501.80'	12.0" Round Culvert L= 365.0' Ke= 0.500 Inlet / Outlet Invert= 501.80' / 495.00' S= 0.0186 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf
#2	Device 1	501.80'	3.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.03 cfs @ 20.00 hrs HW=501.92' (Free Discharge)

1=Culvert (Passes 0.03 cfs of 0.06 cfs potential flow)

2=Orifice/Grate (Orifice Controls 0.03 cfs @ 1.17 fps)

PROPOSED CONDITION

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Type II 24-hr 1-yr Rainfall=2.04"

Page 3

Summary for Subcatchment 2.0: Project Area - West

Runoff = 0.41 cfs @ 12.02 hrs, Volume= 0.021 af, Depth> 0.32"
 Routed to Pond 2.1 : West Infiltration Basin

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
0.274	98	Paved parking, HSG B
0.522	61	>75% Grass cover, Good, HSG B
0.796	74	Weighted Average
0.522		65.58% Pervious Area
0.274		34.42% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.0	26	0.1000	0.15		Sheet Flow, Grass: Dense n= 0.240 P2= 2.38"
3.8	28	0.0607	0.12		Sheet Flow, Grass: Dense n= 0.240 P2= 2.38"
0.1	38	0.2488	8.03		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
1.3	240		3.00		Direct Entry,
8.2	332	Total			

Summary for Pond 2.1: West Infiltration Basin

Inflow Area = 0.796 ac, 34.42% Impervious, Inflow Depth > 0.32" for 1-yr event
 Inflow = 0.41 cfs @ 12.02 hrs, Volume= 0.021 af
 Outflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Atten= 100%, Lag= 0.0 min
 Primary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
 Routed to Reach 3 : 15" Culvert Inflow

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 497.90' @ 20.00 hrs Surf.Area= 1,035 sf Storage= 929 cf

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

Volume	Invert	Avail.Storage	Storage Description
#1	496.00'	4,815 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
496.00	0	0	0
497.00	490	245	245
498.00	1,097	794	1,039
499.00	1,848	1,473	2,511
500.00	2,759	2,304	4,815

Device	Routing	Invert	Outlet Devices
#1	Primary	498.20'	12.0" Round Culvert L= 100.0' Kc= 0.500 Inlet / Outlet Invert= 498.20' / 495.00' S= 0.0320 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf
#2	Device 1	498.20'	3.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=496.00' (Free Discharge)

1=Culvert (Controls 0.00 cfs)

2=Orifice/Grate (Controls 0.00 cfs)

PROPOSED CONDITION*Type II 24-hr 1-yr Rainfall=2.04"*

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Summary for Reach 3: 15" Culvert Inflow

Inflow Area = 2.976 ac, 58.27% Impervious, Inflow Depth > 0.02" for 1-yr event
Inflow = 0.03 cfs @ 20.00 hrs, Volume= 0.005 af
Outflow = 0.03 cfs @ 20.00 hrs, Volume= 0.005 af, Atten= 0%, Lag= 0.0 min

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

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Type II 24-hr 10-yr Rainfall=3.43"

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Summary for Subcatchment 1.0: Project Area - East

Runoff = 7.55 cfs @ 11.97 hrs, Volume= 0.343 af, Depth> 1.89"
 Routed to Pond 1.1 : East Infiltration Basin

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
1.460	98	Unconnected roofs, HSG B
0.720	61	>75% Grass cover, Good, HSG B
2.180	86	Weighted Average
0.720		33.03% Pervious Area
1.460		66.97% Impervious Area
1.460		100.00% Unconnected

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

Summary for Pond 1.1: East Infiltration Basin

Inflow Area = 2.180 ac, 66.97% Impervious, Inflow Depth > 1.89" for 10-yr event
 Inflow = 7.55 cfs @ 11.97 hrs, Volume= 0.343 af
 Outflow = 0.19 cfs @ 15.04 hrs, Volume= 0.123 af, Atten= 97%, Lag= 184.3 min
 Primary = 0.19 cfs @ 15.04 hrs, Volume= 0.123 af
 Routed to Reach 3 : 15" Culvert Inflow

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 502.61' @ 15.04 hrs Surf.Area= 7,134 sf Storage= 10,629 cf

Plug-Flow detention time=270.5 min calculated for 0.122 af (36% of inflow)
 Center-of-Mass det. time=184.3 min (961.5 - 777.2)

Volume	Invert	Avail.Storage	Storage Description
#1	500.00'	53,225 cf	SURFACE STORAGE (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
500.00	0	0	0
501.00	3,605	1,803	1,803
502.00	6,059	4,832	6,635
503.00	7,835	6,947	13,582
504.00	8,851	8,343	21,925
505.00	9,892	9,372	31,296
506.00	10,958	10,425	41,721
507.00	12,050	11,504	53,225

Device	Routing	Invert	Outlet Devices
#1	Primary	501.80'	12.0" Round Culvert L= 365.0' Ke= 0.500 Inlet / Outlet Invert= 501.80' / 495.00' S= 0.0186 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf
#2	Device 1	501.80'	3.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.19 cfs @ 15.04 hrs HW=502.61' (Free Discharge)

1=Culvert (Passes 0.19 cfs of 2.07 cfs potential flow)

2=Orifice/Grate (Orifice Controls 0.19 cfs @ 3.97 fps)

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Type II 24-hr 10-yr Rainfall=3.43"

Page 6

Summary for Subcatchment 2.0: Project Area - West

Runoff = 1.52 cfs @ 12.00 hrs, Volume= 0.071 af, Depth> 1.08"
 Routed to Pond 2.1 : West Infiltration Basin

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
0.274	98	Paved parking, HSG B
0.522	61	>75% Grass cover, Good, HSG B
0.796	74	Weighted Average
0.522		65.58% Pervious Area
0.274		34.42% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.0	26	0.1000	0.15		Sheet Flow, Grass: Dense n= 0.240 P2= 2.38"
3.8	28	0.0607	0.12		Sheet Flow, Grass: Dense n= 0.240 P2= 2.38"
0.1	38	0.2488	8.03		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
1.3	240		3.00		Direct Entry,
8.2	332	Total			

Summary for Pond 2.1: West Infiltration Basin

Inflow Area = 0.796 ac, 34.42% Impervious, Inflow Depth > 1.08" for 10-yr event
 Inflow = 1.52 cfs @ 12.00 hrs, Volume= 0.071 af
 Outflow = 0.10 cfs @ 13.08 hrs, Volume= 0.039 af, Atten= 93%, Lag= 64.9 min
 Primary = 0.10 cfs @ 13.08 hrs, Volume= 0.039 af
 Routed to Reach 3 : 15" Culvert Inflow

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 498.51' @ 13.08 hrs Surf.Area= 1,481 sf Storage= 1,698 cf

Plug-Flow detention time=191.7 min calculated for 0.039 af (54% of inflow)
 Center-of-Mass det. time=105.6 min (912.8 - 807.2)

Volume	Invert	Avail.Storage	Storage Description
#1	496.00'	4,815 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
496.00	0	0	0
497.00	490	245	245
498.00	1,097	794	1,039
499.00	1,848	1,473	2,511
500.00	2,759	2,304	4,815

Device	Routing	Invert	Outlet Devices
#1	Primary	498.20'	12.0" Round Culvert L= 100.0' Kc= 0.500 Inlet / Outlet Invert= 498.20' / 495.00' S= 0.0320 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf
#2	Device 1	498.20'	3.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.10 cfs @ 13.08 hrs HW=498.51' (Free Discharge)

1=Culvert (Passes 0.10 cfs of 0.40 cfs potential flow)

2=Orifice/Grate (Orifice Controls 0.10 cfs @ 2.08 fps)

PROPOSED CONDITION

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Type II 24-hr 10-yr Rainfall=3.43"

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Summary for Reach 3: 15" Culvert Inflow

Inflow Area = 2.976 ac, 58.27% Impervious, Inflow Depth > 0.65" for 10-yr event
Inflow = 0.29 cfs @ 13.44 hrs, Volume= 0.161 af
Outflow = 0.29 cfs @ 13.44 hrs, Volume= 0.161 af, Atten= 0%, Lag= 0.0 min

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

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Type II 24-hr 100-yr Rainfall=5.78"

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Summary for Subcatchment 1.0: Project Area - East

Runoff = 15.06 cfs @ 11.97 hrs, Volume= 0.715 af, Depth> 3.93"
 Routed to Pond 1.1 : East Infiltration Basin

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
1.460	98	Unconnected roofs, HSG B
0.720	61	>75% Grass cover, Good, HSG B
2.180	86	Weighted Average
0.720		33.03% Pervious Area
1.460		66.97% Impervious Area
1.460		100.00% Unconnected

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

Summary for Pond 1.1: East Infiltration Basin

Inflow Area = 2.180 ac, 66.97% Impervious, Inflow Depth > 3.93" for 100-yr event
 Inflow = 15.06 cfs @ 11.97 hrs, Volume= 0.715 af
 Outflow = 0.35 cfs @ 15.15 hrs, Volume= 0.230 af, Atten= 98%, Lag= 191.3 min
 Primary = 0.35 cfs @ 15.15 hrs, Volume= 0.230 af
 Routed to Reach 3 : 15" Culvert Inflow

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 504.12' @ 15.15 hrs Surf.Area= 8,977 sf Storage= 23,000 cf

Plug-Flow detention time=296.6 min calculated for 0.230 af (32% of inflow)
 Center-of-Mass det. time=197.1 min (957.4 - 760.4)

Volume	Invert	Avail.Storage	Storage Description
#1	500.00'	53,225 cf	SURFACE STORAGE (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
500.00	0	0	0
501.00	3,605	1,803	1,803
502.00	6,059	4,832	6,635
503.00	7,835	6,947	13,582
504.00	8,851	8,343	21,925
505.00	9,892	9,372	31,296
506.00	10,958	10,425	41,721
507.00	12,050	11,504	53,225

Device	Routing	Invert	Outlet Devices
#1	Primary	501.80'	12.0" Round Culvert L= 365.0' Ke= 0.500 Inlet / Outlet Invert= 501.80' / 495.00' S= 0.0186 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf
#2	Device 1	501.80'	3.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.35 cfs @ 15.15 hrs HW=504.12' (Free Discharge)

1=Culvert (Passes 0.35 cfs of 5.10 cfs potential flow)

2=Orifice/Grate (Orifice Controls 0.35 cfs @ 7.13 fps)

PROPOSED CONDITION

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Type II 24-hr 100-yr Rainfall=5.78"

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Summary for Subcatchment 2.0: Project Area - West

Runoff = 3.88 cfs @ 12.00 hrs, Volume= 0.183 af, Depth> 2.76"
 Routed to Pond 2.1 : West Infiltration Basin

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
0.274	98	Paved parking, HSG B
0.522	61	>75% Grass cover, Good, HSG B
0.796	74	Weighted Average
0.522		65.58% Pervious Area
0.274		34.42% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.0	26	0.1000	0.15		Sheet Flow, Grass: Dense n= 0.240 P2= 2.38"
3.8	28	0.0607	0.12		Sheet Flow, Grass: Dense n= 0.240 P2= 2.38"
0.1	38	0.2488	8.03		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
1.3	240		3.00		Direct Entry,
8.2	332	Total			

Summary for Pond 2.1: West Infiltration Basin

Inflow Area = 0.796 ac, 34.42% Impervious, Inflow Depth > 2.76" for 100-yr event
 Inflow = 3.88 cfs @ 12.00 hrs, Volume= 0.183 af
 Outflow = 0.29 cfs @ 12.71 hrs, Volume= 0.145 af, Atten= 92%, Lag= 42.8 min
 Primary = 0.29 cfs @ 12.71 hrs, Volume= 0.145 af
 Routed to Reach 3 : 15" Culvert Inflow

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 499.87' @ 12.71 hrs Surf.Area= 2,636 sf Storage= 4,451 cf

Plug-Flow detention time=189.5 min calculated for 0.145 af (79% of inflow)
 Center-of-Mass det. time=132.7 min (920.2 - 787.4)

Volume	Invert	Avail.Storage	Storage Description
#1	496.00'	4,815 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
496.00	0	0	0
497.00	490	245	245
498.00	1,097	794	1,039
499.00	1,848	1,473	2,511
500.00	2,759	2,304	4,815

Device	Routing	Invert	Outlet Devices
#1	Primary	498.20'	12.0" Round Culvert L= 100.0' Kc= 0.500 Inlet / Outlet Invert= 498.20' / 495.00' S= 0.0320 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf
#2	Device 1	498.20'	3.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.29 cfs @ 12.71 hrs HW=499.87' (Free Discharge)

1=Culvert (Passes 0.29 cfs of 4.08 cfs potential flow)

2=Orifice/Grate (Orifice Controls 0.29 cfs @ 5.98 fps)

PROPOSED CONDITION*Type II 24-hr 100-yr Rainfall=5.78"*

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Summary for Reach 3: 15" Culvert Inflow

Inflow Area = 2.976 ac, 58.27% Impervious, Inflow Depth > 1.51" for 100-yr event

Inflow = 0.63 cfs @ 13.22 hrs, Volume= 0.376 af

Outflow = 0.63 cfs @ 13.22 hrs, Volume= 0.376 af, Atten= 0%, Lag= 0.0 min

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



EXHIBIT E

ENVIRONMENTAL ASSESSMENT FORM

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: A&E & SNY Center			
Project Location (describe, and attach a location map): Medical Center Drive at Avriel Drive (Tax Parcel 086.-01-03.9), Town of Manlius, Onondaga County			
Brief Description of Proposed Action: A two-phase development of a medical office / personal services center. The first phase is the construction of a one-story building with a "walk-out" basement with a footprint of 14,242 sq ft (total 28,484 sq ft), a 108-vehicle parking lot and associated utilities (water, sewer, stormwater management, electric, natural gas, communications). Phase 2 is the construction of a second, one-story building with a footprint of 11,332 sq ft.			
Name of Applicant or Sponsor: A&E & SNY CENTER		Telephone: (315) 445-1177 E-Mail: papam42020@gmail.com	
Address: Suite 38, 5781 Bridge Street			
City/PO: East Syracuse		State: New York	Zip Code: 13057
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.		NO ☒	YES ☐
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: Manlius Planning Board - Site Plan Approval Manlius Town Board - Zone Change		NO ☐	YES ☒
3. a. Total acreage of the site of the proposed action?		4.038 acres	
b. Total acreage to be physically disturbed?		2.890 acres	
c. Total acreage (project site and any contiguous properties) owned or controlled by the applicant or project sponsor?		4.038 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): Undeveloped ☐ Parkland			

5. Is the proposed action,	NO	YES	N/A
a. A permitted use under the zoning regulations? <i>With an approved Zone Change</i>	☐	☒	☐
b. Consistent with the adopted comprehensive plan?	☐	☒	☐
6. Is the proposed action consistent with the predominant character of the existing built or natural landscape?	NO ☐	YES ☒	
7. Is the site of the proposed action located in, or does it adjoin, a state listed Critical Environmental Area? If Yes, identify: _____	NO ☒	YES ☐	
8. a. Will the proposed action result in a substantial increase in traffic above present levels?	NO ☒	YES ☐	
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: _____ _____	NO ☐	YES ☒	
10. Will the proposed action connect to an existing public/private water supply? If No, describe method for providing potable water: _____ _____	NO ☐	YES ☒	
11. Will the proposed action connect to existing wastewater utilities? If No, describe method for providing wastewater treatment: _____ _____	NO ☐	YES ☒	
12. a. Does the project site contain, or is it substantially contiguous to, a building, archaeological site, or district which is listed on the National or State Register of Historic Places, or that has been determined by the Commissioner of the NYS Office of Parks, Recreation and Historic Preservation to be eligible for listing on the State Register of Historic Places?	NO ☒	YES ☐	
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?	NO ☒	YES ☐	
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		
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? Northern Long-eared Bat	NO	YES
	☐	☒
16. Is the project site located in the 100-year flood plan?	NO	YES
	☒	☐
17. Will the proposed action create storm water discharge, either from point or non-point sources? If Yes,	NO	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:	☐	☒
Existing 15" culvert at the intersection of Medical Center Drive and Avriel Drive		
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:	NO	YES
Stormwater management practice to attenuate runoff so as not to adversely impact downstream properties.	☐	☒
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:	NO	YES
	☒	☐
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:	NO	YES
	☒	☐
I CERTIFY THAT THE INFORMATION PROVIDED ABOVE IS TRUE AND ACCURATE TO THE BEST OF MY KNOWLEDGE Applicant/sponsor/name: <u>RODNEY LUIS JR</u> Date: <u>01/14/2022</u> Signature: <u>[Signature]</u> Title: <u>AGENT FOR AFE & SNY CENTER</u> <u>Project Manager</u>		



EXHIBIT F

FRESHWATER WETLANDS LETTER

November 14, 2022

Mr. John Deer, Supervisor
Town of Manlius
301 Brooklea Drive
Fayetteville, NY 13066

Re: Zone Change Application – Freshwater Wetlands
A&E & SNY Center
Medical Center Drive

Dear Supervisor Deer,

This letter is in reference to the zone change application for the proposed A&E & SNY Center on Medical Center Drive. A preliminary review of the subject parcel has been performed to determine the potential presence of on-site freshwater wetlands. After site observation and evaluation of the National Wetlands Inventory and the NYSDEC Environmental Resources Mapper, it has been determined that the subject parcel and adjoining parcels within a 100 foot buffer do not contain any jurisdictional wetlands.

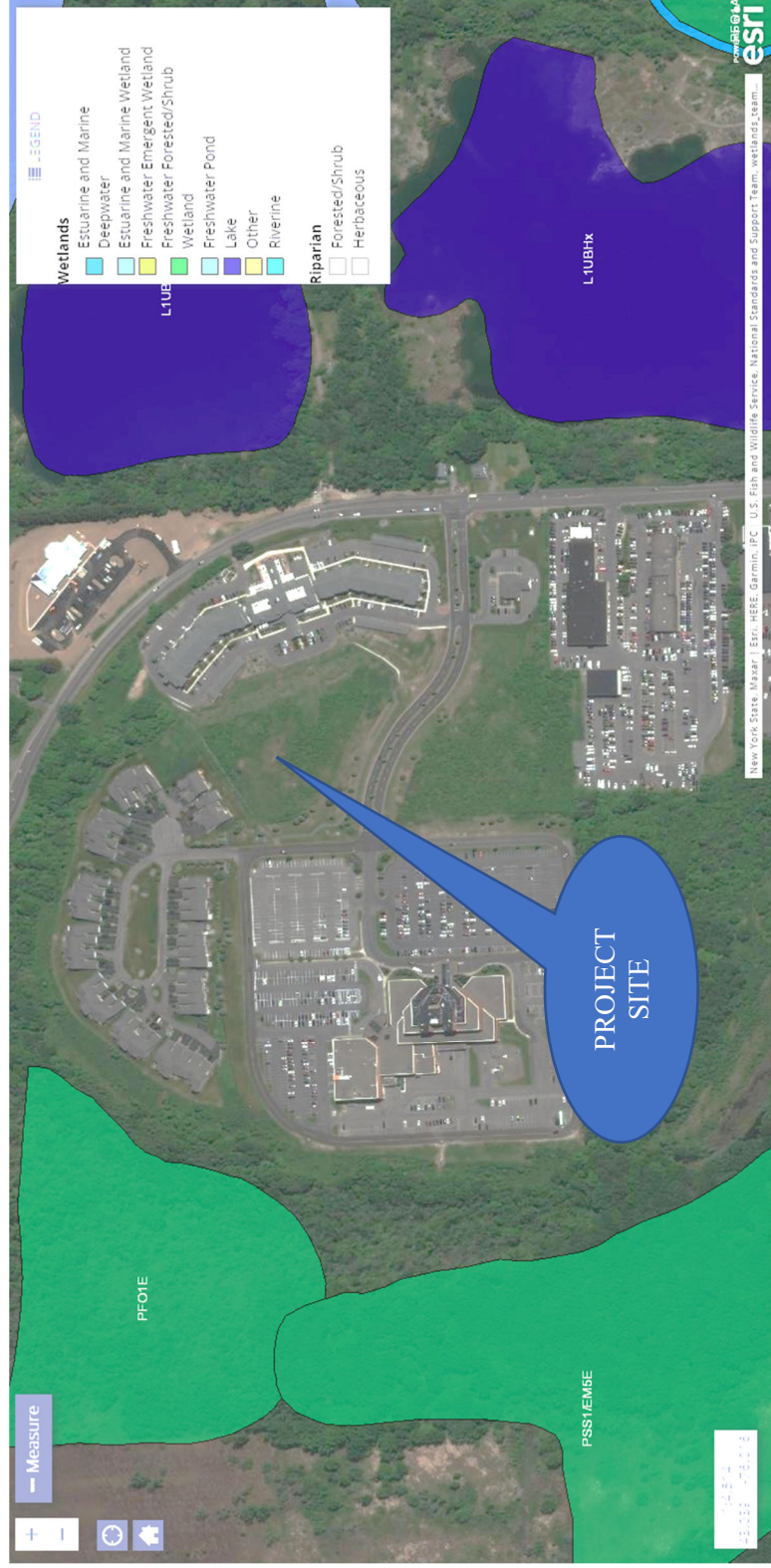
If you should have any questions or comments, please feel free to contact us.

Respectfully,

NAPIERALA CONSULTING
Professional Engineer, P.C.



Rodney Ives, Jr., PE
Project Manager



National Wetlands Inventory Mapping



NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

Environmental Resource Mapper

Base Map: [Satellite](#)

+

-

Search

Tools

Layers and Legend

☐ All Layers

☐ Unique Geological Features

☐ Waterbody Classifications for Rivers/Streams

☒ Waterbody Classifications for Lakes

☒ State Regulated Freshwater Wetlands (Outside of the Adirondack Park)

☐ State Regulated Wetland Checkzone

☐ Imperiled Mussels

Other Wetland Layers

Reference Layers

Tell Me More...

Need A Permit?

Contacts

PROJECT SITE

0 100 200 Feet

NYSDEC Wetlands Mapping



EXHIBIT G

DISCLOSURE AFFIDAVIT

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. Mike Dafa, being duly sworn, deposes and says that (s) he is:
applicant
(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.

CORPORATE ACKNOWLEDGEMENT

STATE OF NEW YORK)

) SS:

COUNTY OF ONONDAGA)

Mike Papc, being duly sworn, deposes and says the
s(he) is the owner of H+E 2020 Corp
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.

[Signature]
Applicant Signature

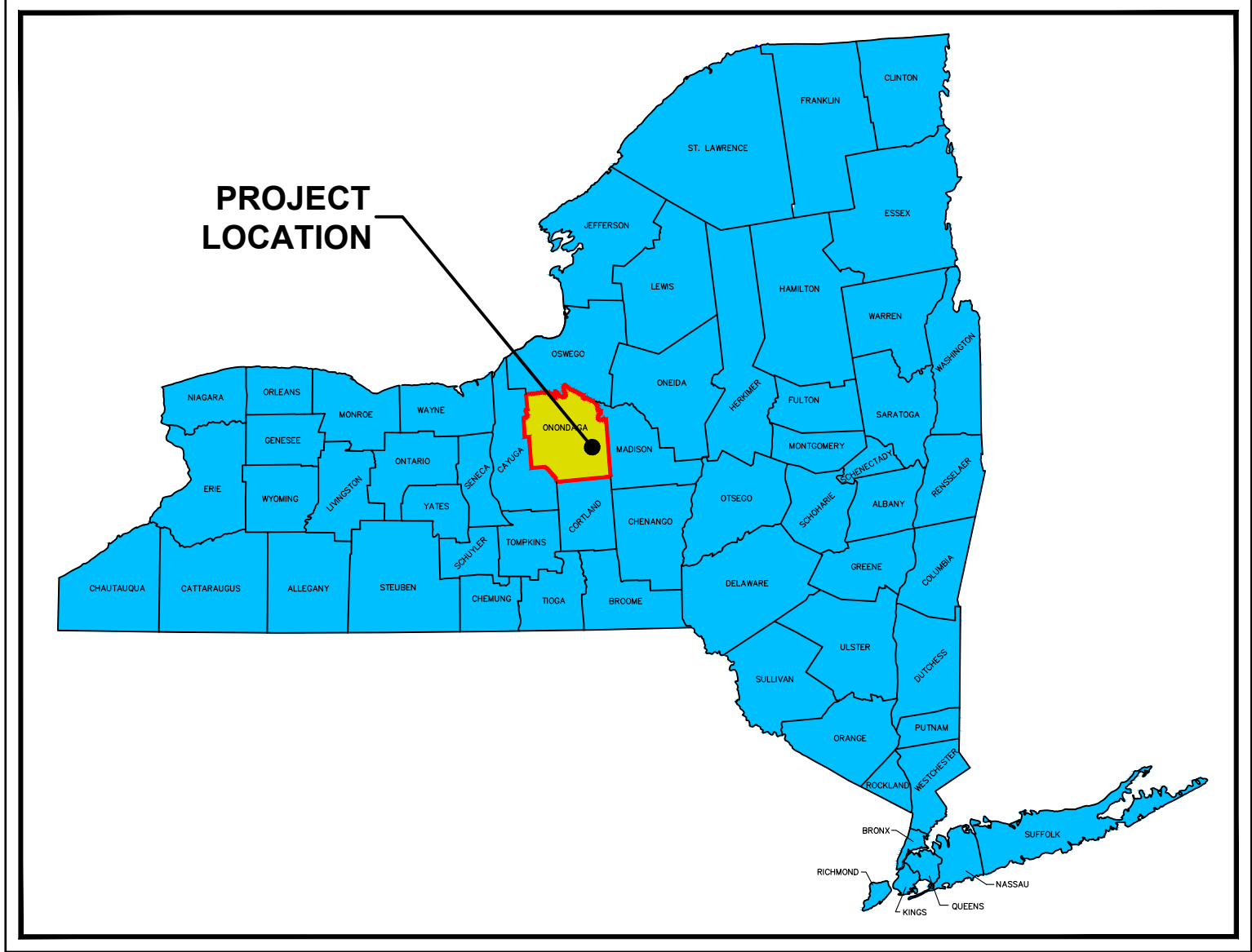
Subscribed to me before this day

Of JAN 18TH, 2022

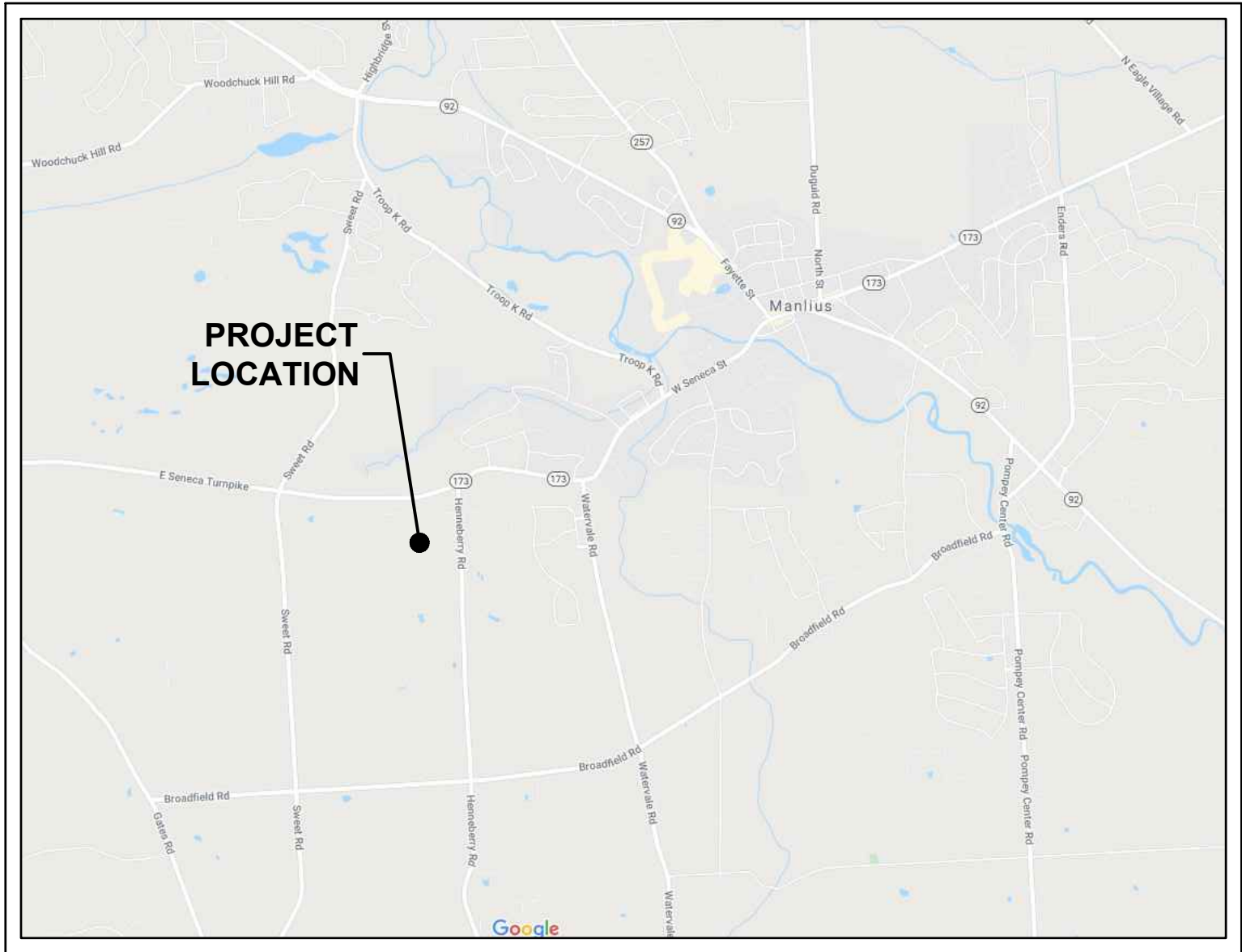
[Signature]
Notary Public

NEDZADA KAPIC
01KA6176345

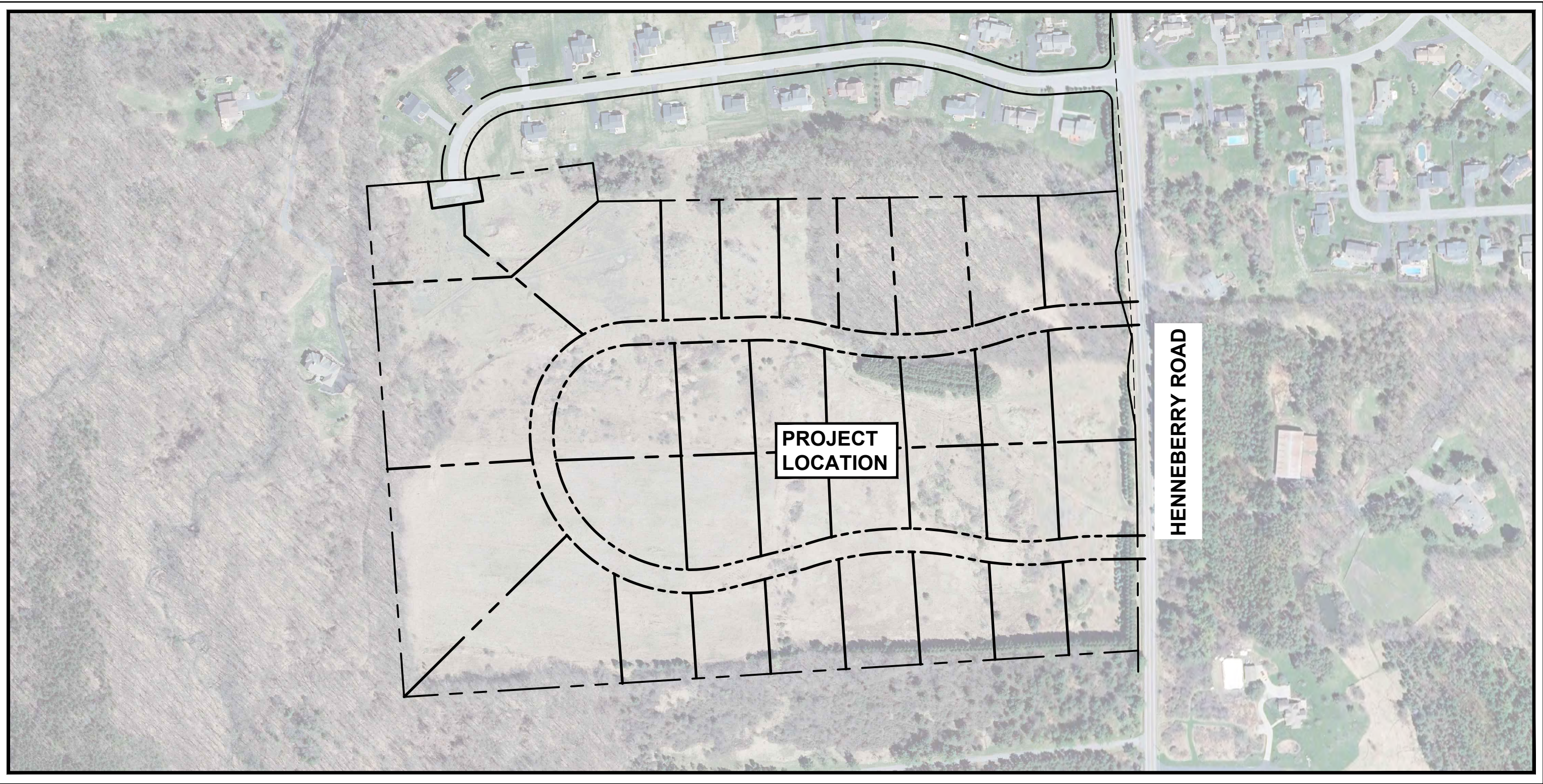
Notary Public, State of New York
Qualified in Onondaga County
My commission expires OCTOBER 29th, 2023



SITE LOCATION MAP
NOT TO SCALE



PROJECT LOCATION MAP
NOT TO SCALE



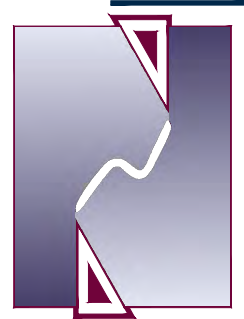
AERIAL MAP
1"=250'

PROPOSED BRANDYWINE ESTATES PHASE 2 - 34 LOT SUBDIVISION

HENNEBERRY ROAD
TAX ID: 109.-02-07.1

TOWN OF MANLIUS
ONONDAGA COUNTY
NEW YORK STATE

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
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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
PHASING PLAN	C-8

PRELIMINARY PLANS - FINAL APPROVAL
REQUIRED BY ALL JURISDICTIONS



APPROVED BY OWNER

SHEET TITLE:

TITLE SHEET

NAME DATE

3	REVISED AS PER TOWN ENGINEER'S COMMENTS	02/16/2022
2	GENERAL REVISIONS	02/09/2022
1	GENERAL REVISIONS	12/01/2021
NO.	REVISION/ISSUE	DATE

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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.

PRELIMINARY
NOT FOR CONSTRUCTION

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

PROJECT NO.

20-1906

DATE

17 SEP 2020

PROPOSED BRANDYWINE
ESTATES PHASE 2

HENNEBERRY ROAD
TOWN OF MANLIUS
ONONDAGA COUNTY, NY

SHEET

C-0

THE PLANS SHOW SURFACE 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.

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.

THE CONTRACTOR IS INSTRUCTED TO COOPERATE WITH ANY AND ALL OTHER CONTRACTORS PERFORMING WORK ON THIS JOB SITE DURING THE PERFORMANCE OF THIS CONTRACT.

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.

THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING AND INCURRING THE COST OF ALL REQUIRED PERMITS, INSPECTIONS, CERTIFICATES, ETC. AND SHALL COMPLY WITH ALL PERMITS.

ALL WORK SHALL BE DONE IN STRICT COMPLIANCE WITH ALL APPLICABLE NATIONAL, STATE, AND LOCAL CODES, STANDARDS, ORDINANCES, RULES, AND REGULATIONS.

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.

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.

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.

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.

IT IS THE CONTRACTOR'S RESPONSIBILITY TO EXAMINE ALL PLAN SHEETS AND COORDINATE WORK WITH ALL OTHER CONTRACTS FOR THE SITE.

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 THE RECOGNIZED GOOD STANDARD PRACTICE.
- D. HOLD THE OWNER HARMLESS AGAINST ANY AND ALL CLAIMS ARISING FROM WORK DONE BY THE CONTRACTOR ON THE SITE.

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 REQUIREMENTS FOR CONSTRUCTION. SHEET PILING SHALL BE DESIGNED AND SEALED BY A NEW YORK STATE PROFESSIONAL ENGINEER.

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.

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.

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.

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.

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.

MAINTAIN FLOW FOR ALL EXISTING UTILITIES.

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.

THE CONTRACTOR SHALL MAINTAIN ALL TRAFFIC IN ALL AREAS IN ACCORDANCE WITH THE NYSDOT MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES.

THE CONTRACTOR SHALL MAINTAIN ACCESS TO ALL COMMERCIAL, RESIDENTIAL, AND PUBLIC PROPERTIES OR AS DIRECTED BY THE ENGINEER.

ALL EXCAVATIONS SHALL BE BACKFILLED TO EXISTING GRADE AT THE END OF EACH WORKDAY.

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.

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.

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.

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.

	----- PROPOSED BUILDING
	----- PROPERTY LINE
	----- PROPOSED EASEMENT LINE
	----- PROPOSED STORM INLET
	----- PROPOSED MANHOLE (STORM OR S
	----- PROPOSED SANITARY PIPE
	----- PROPOSED STORM PIPE
	----- PROPOSED WATER PIPE
	----- PROPOSED GAS PIPE
	----- PROPOSED UNDERGROUND ELECTRIC

TEMPORARY SEEDING MIXTURES			PERMANENT SEEDING MIXTURES		
	LBS./ACRE	LBS./1000 SQ. FT	SEED MIXTURE NO. 1	LBS./ACRE	
FOR SPRING, SUMMER OR EARLY FALL SEEDINGS:					
A. ANNUAL RYEGRASS – OR –	30	0.70	CREeping RED FESCUE (var. ENSYLVA)	10	
B. PERENNIAL RYEGRASS	30	0.70	PERENNIAL RYE GRASS (var. PENNFINE)	10	
			SEED MIXTURE NO. 2		
FOR LATE FALL OR EARLY WINTER			SWITCHGRASS (var. SHELTER, PATHFINDER, TRAILBLAZER, OR BLACKWELL)	20	
A. WINTER RYE (AROSTOOK)	100	2.50	SEED MIXTURE NO. 3		
MULCH THE AREA WITH HAY OR STRAW AT 2 TONS/ACRE (APPROXIMATELY 2 LARGE ROLLED BALES/ACRE).			BIRDFOOT TREFOIL (var. EMPIRE, PARDEE)	10	
			REDTOP	2	
			TALL FESCUE (var. KY 31, REBEL)	20	
MULCH ANCHORING IS REQUIRED WHERE WIND OR AREAS OF CONCENTRATED WATER ARE OF CONCERN.			SEED MIXTURE NO. 4		
			CREeping RED FESCUE (var. ENSYLVA)	20	
			CHEWINGS FESCUE (COMMON)	20	
			PERENNIAL RYE GRASS (var. PENNFINE)	5	
			RED CLOVER (COMMON)	10	
PERMANENT SEEDINGS SHOULD TAKE PLACE IN EARLY SPRING. PROPER MULCHING AND ADEQUATE MOISTURE MUST BE PROVIDED FOR PERMANENT SEEDING. RESEEDING OF SPALLED AREAS SHALL TAKE PLACE DURING LATE SUMMER/EARLY FALL OR DURING THE FOLLOWING SPRING.			SEED MIXTURE 1 TO BE APPLIED TO SHADED AREAS.		
FERTILIZER:			SEED MIXTURE 2 IS IN PURE LIVE SEED. TO BE APPLIED TO AREAS OF UPLAND OF WETLANDS AND ALONG STORMWATER MITIGATION BASIN BANKS.		
5% NITROGEN					
0% PHOSPHORUS			SEED MIXTURE 3 TO BE APPLIED TO ALL SWALES AND WATERWAYS		
5% POTASH			WHITE CLOVER OR LADINO CLOVER MAY BE SUBSTITUTED FOR BIRDFOOT TREFOIL AND SEEDED AT THE SAME RATE		
HYDROMULCH			PERENNIAL RYEGRASS MAY BE SUBSTITUTED FOR REDTOP BUT INCREASE SEEDING RATE TO 5 LBS./ACRE (0.1 LBS./1000 SQ. FT)		
HYDROMULCH SHALL BE A WOOD-FIBER COMPOSITION (50% PAPER + 50% WOOD)			SEED MIXTURE 4 TO BE APPLIED TO ALL AREAS. (NOT FOR USE IN PLAYGROUNDS OR AS TURF)		
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.					

PROJECT TITLE: **BRANDYWINE ESTATES PHASE 2
HENNEBERRY ROAD**

TOWN OF MANLIUS **ONONDAGA COUNTY, NY**

HARRINGTON HOMES

3848 HENNEBERRY ROAD
JAMESVILLE, NY 13078

PREPARED FOR:

NO.	NO.	REVISION/ISSUE	DATE
1	1	GENERAL REVISIONS	12/01/2021
2	2	GENERAL REVISIONS	02/09/2022
3	3	REVISED AS PER TOWN ENGINEER'S COMMENTS	21/16/2022

PREPARED BY:

**NAPIERALA
CONSULTING**
PROFESSIONAL ENGINEER, P.C.
SITE • DESIGN • ENGINEERING
110 FAYETTE STREET
MANHATTAN, NEW YORK 1304

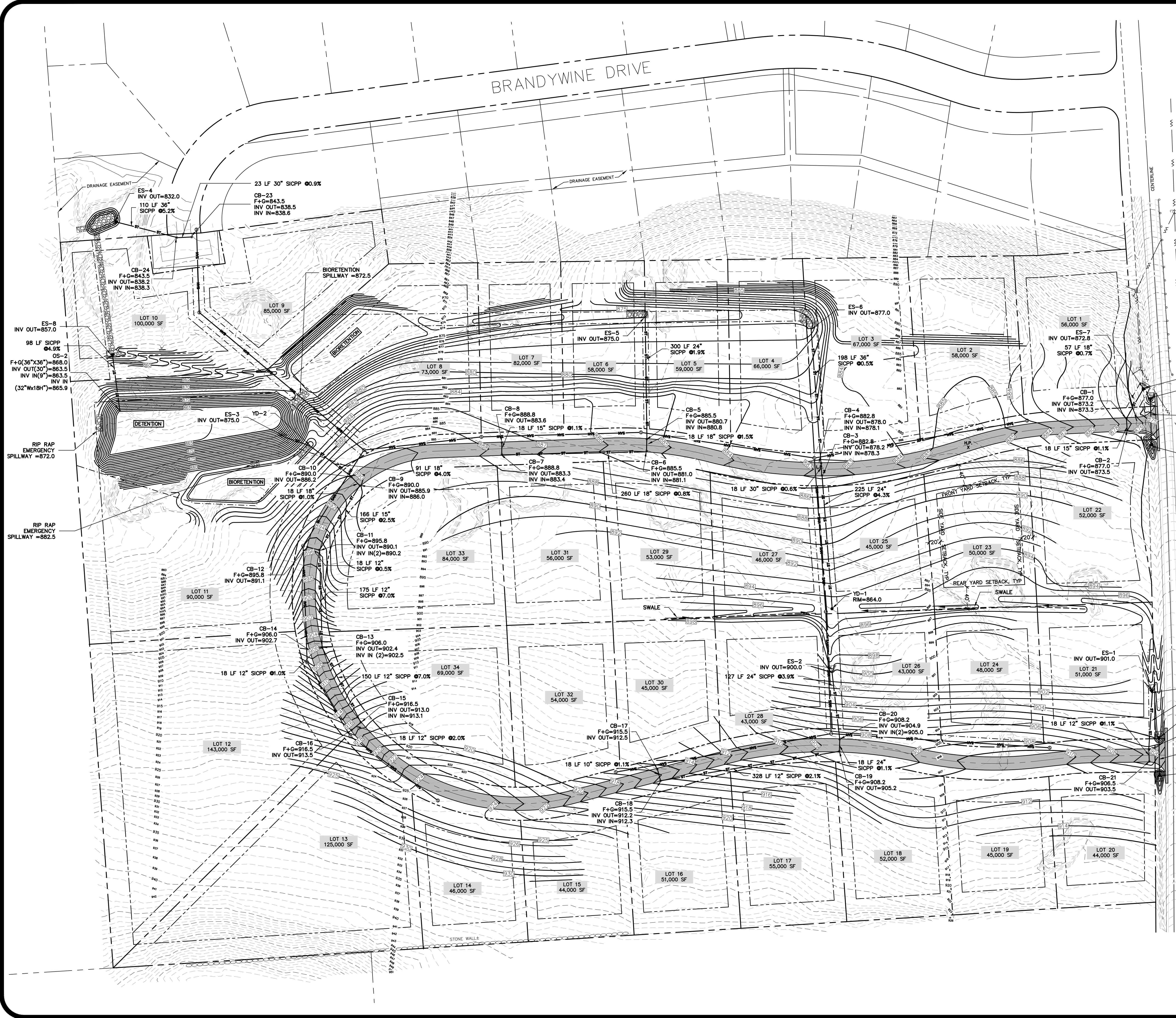
email: MNAP@NAPCON.COM
PH: (315) 682-5580 FAX: (315) 682-5544

PROJECT NO.	20-1906
DATE	17 SEP 2020
SCALE	NTS

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PRELIMINARY
NOT FOR CONSTRUCTION

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NAPERALEA CONSULTING
PROFESSIONAL ENGINEER, PC



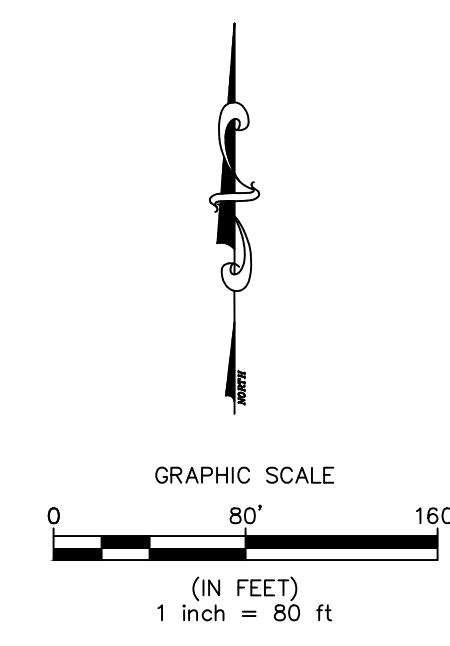
SITE CRITERIA CHECKLIST		
PROJECT SITE INFORMATION		
ADDRESS	HENNEBERRY ROAD (COUNTY ROUTE 182)	
TAX MAP ID NO.	109.-02.-07.1	
BOUNDARY SURVEY	PROPERTY LINE INFORMATION TAKEN FROM SURVEY BY IANUZI AND ROMANS	
TOTAL SITE AREA	54.746 ACRES	
LAND USE	SINGLE FAMILY RESIDENTIAL – 34 LOTS	
ZONING INFORMATION		
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

OVERALL GRADING PLAN

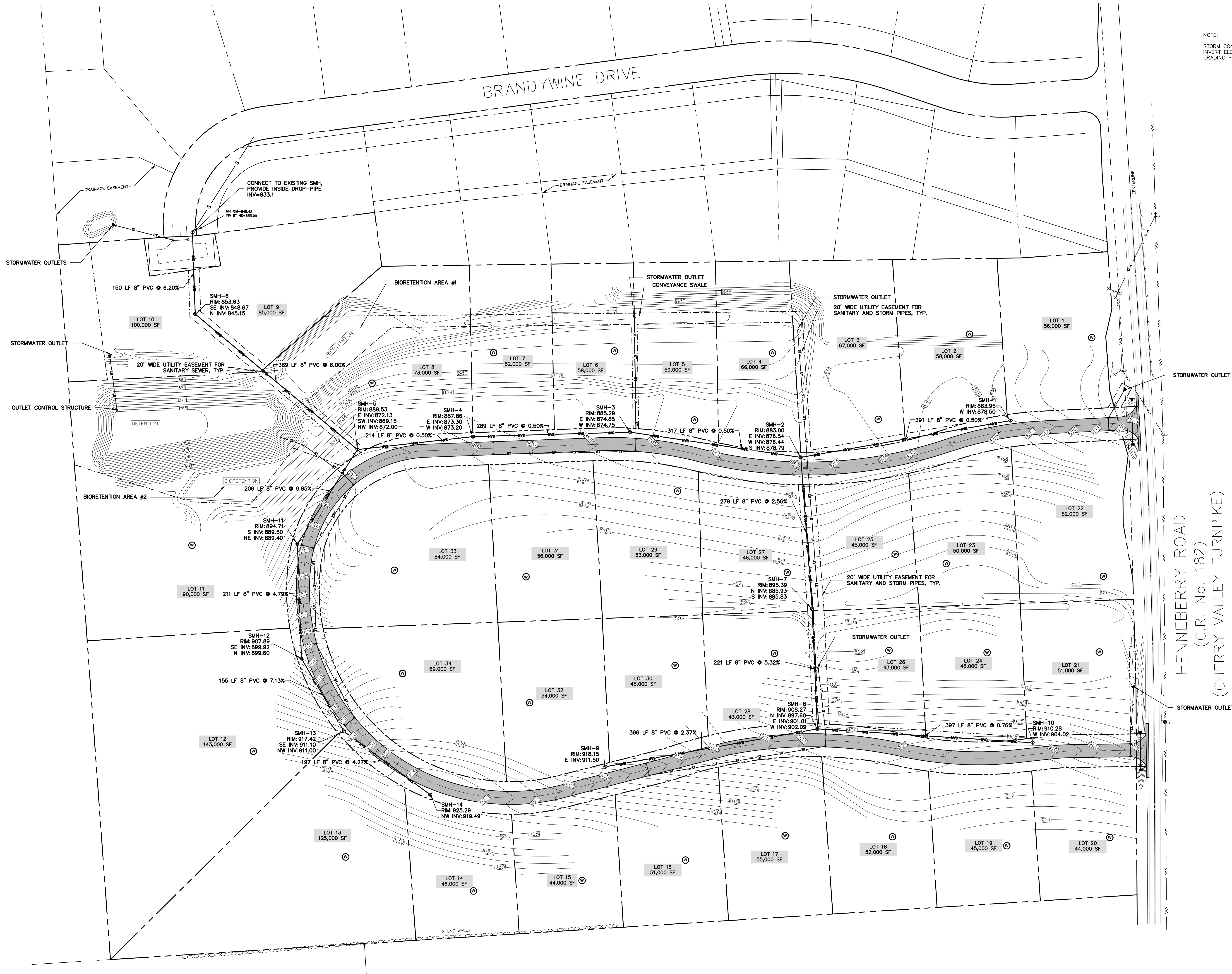
NO.	REVISION/ISSUE	DATE
3	REVISED AS PER TOWN ENGINEER'S COMMENTS	2/16/2022
2	GENERAL REVISIONS	02/09/2022
1	GENERAL REVISIONS	12/01/2021

PREPARED BY: **NAPIERALA CONSULTING**
 PROFESSIONAL ENGINEER, P.E.
 110 FAYETTE STREET
 MANLIUS, NEW YORK 13044
 email: MNAP@NAPCON.COM
 PH: (315) 682-5580 FAX: (315) 682-5544

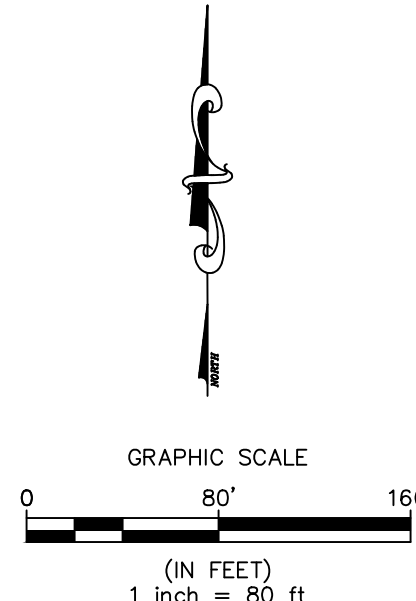


PRELIMINARY
 NOT FOR CONSTRUCTION

PROJECT NO. **20-1906**
 DATE **17 SEP 2020**
 SCALE **1" = 80'**
C-2



NOTE:
STORM CONVEYANCE SYSTEM PIPE SLOPE, RIM, AND
INVERT ELEVATIONS CAN BE SEEN ON THE OVERALL
GRADING PLAN, SHEET C-2.



PRELIMINARY
NOT FOR CONSTRUCTION

PLAN SEAL BY:
NYS REGISTRATION #02711

PROJECT TITLE:
**BRANDYWINE ESTATES PHASE 2
HENNEBERRY ROAD**

TOWN OF MANLIUS
ONONDAGA COUNTY, NY

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

OVERALL UTILITY PLAN

NO.	REVISION/ISSUE	DATE
3	REVISED AS PER TOWN ENGINEER'S COMMENTS	2/16/2022
2	GENERAL REVISIONS	02/09/2022
1	GENERAL REVISIONS	12/01/2021

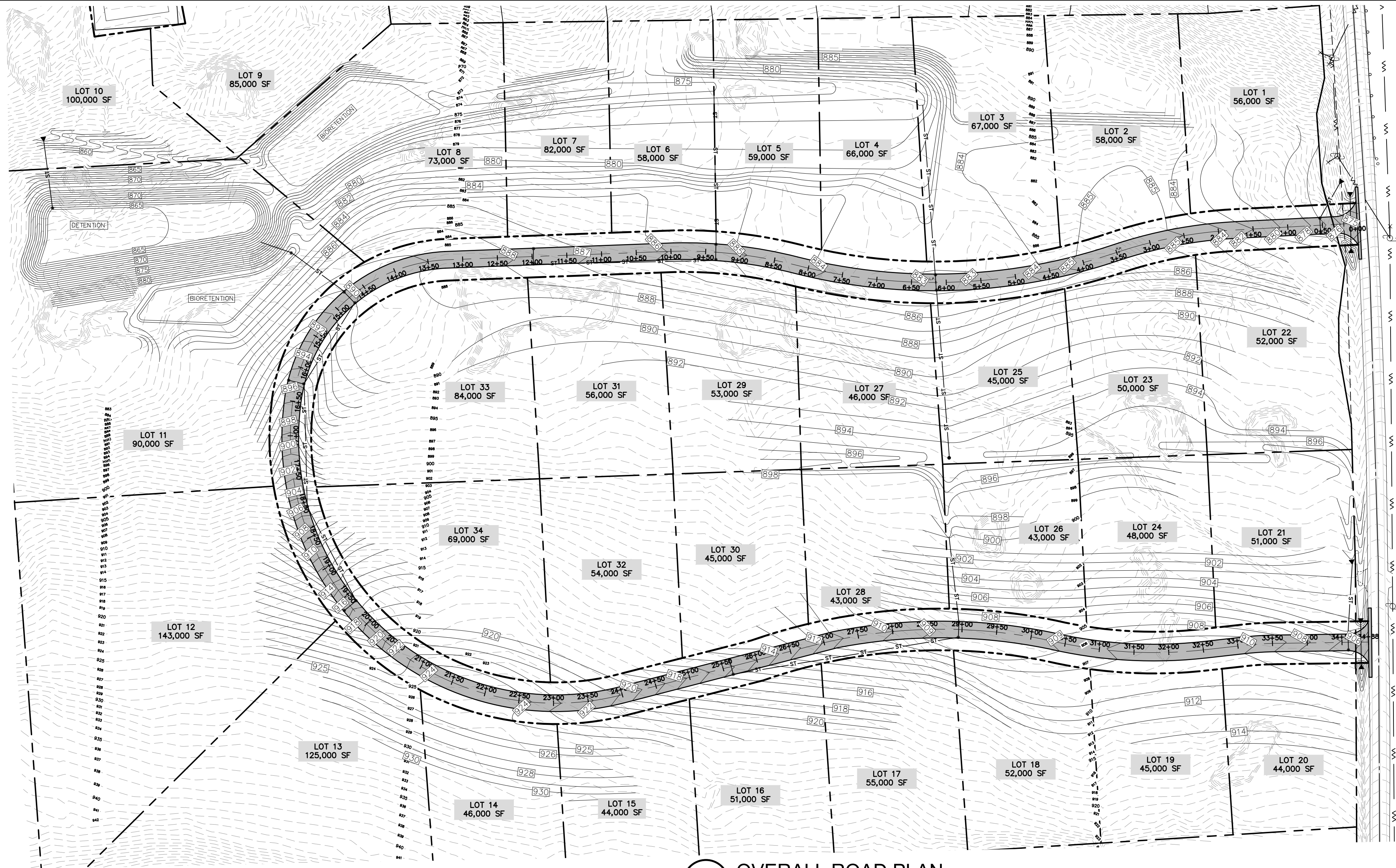
PREPARED BY:
NAPIERALA CONSULTING
PROFESSIONAL ENGINEER, P.E.
SPECIALTY: DESIGN • ENGINEERING
110 FAYETTE STREET
MANLIUS, NEW YORK 13104
email: MNAP@NAPCON.COM
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PROJECT NO.
20-1906

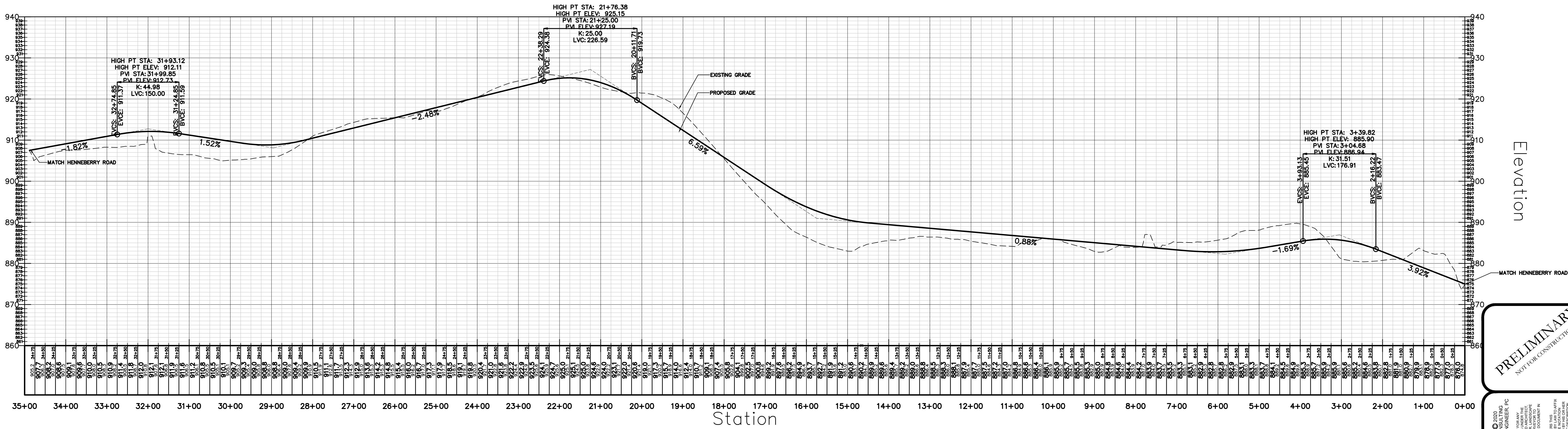
DATE
17 SEP 2020

SCALE
1" = 80'

SHEET
C-3



1 OVERALL ROAD PLAN
C-4 SCALE: 1"=100'



2 OVERALL ROAD PROFILE
C-4 SCALE: H: 1"=120' V: 1"=12'

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

PROJECT TITLE: BRANDYWINE ESTATES PHASE 2
HENNEBERRY ROAD
TOWN OF MANLIUS ONONDAGA COUNTY, NY
PREPARED FOR: HARRINGTON HOMES
3848 HENNEBERRY ROAD
JAMESVILLE, NY 13078

OVERALL ROAD PROFILE

NO.	REVISION/ISSUE	DATE
3	REVISED AS PER TOWN ENGINEER'S COMMENTS	2/16/2022
2	GENERAL REVISIONS	02/09/2022
1	GENERAL REVISIONS	12/01/2021

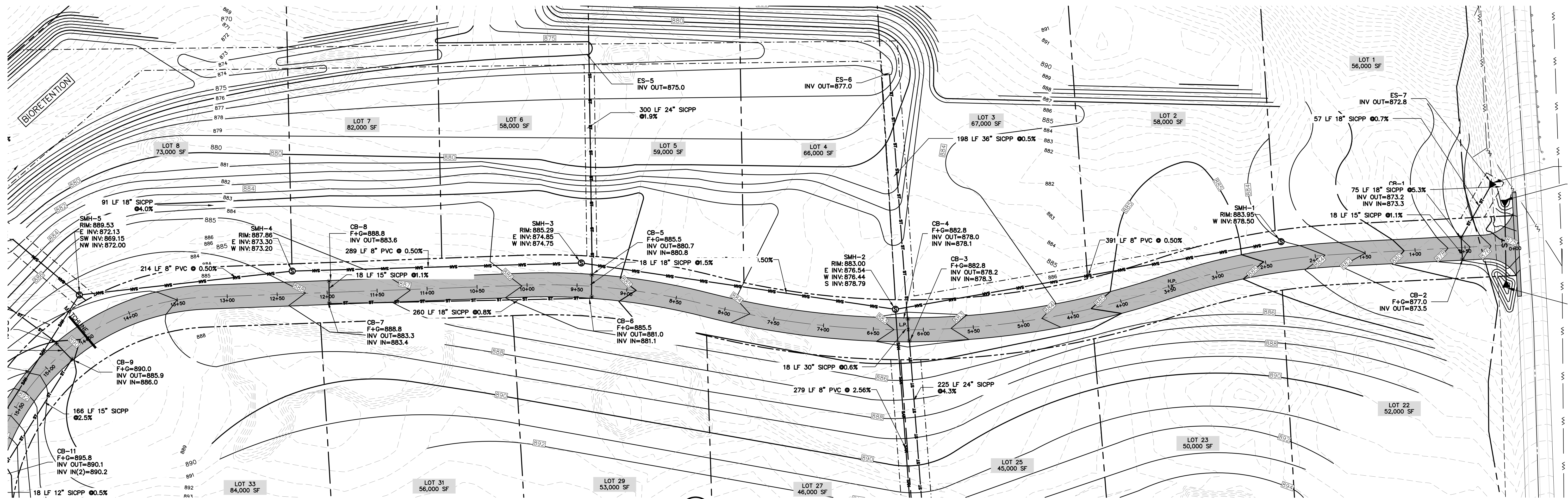
PREPARED BY: NAPIERALA CONSULTING
PROFESSIONAL ENGINEER P.E.
SITE: DESIGN • ENGINEERING
MANLIUS, NEW YORK 1304
email: MNAP@NAPCON.COM
PH: (315) 682-5560 FAX: (315) 682-5544

Elevation

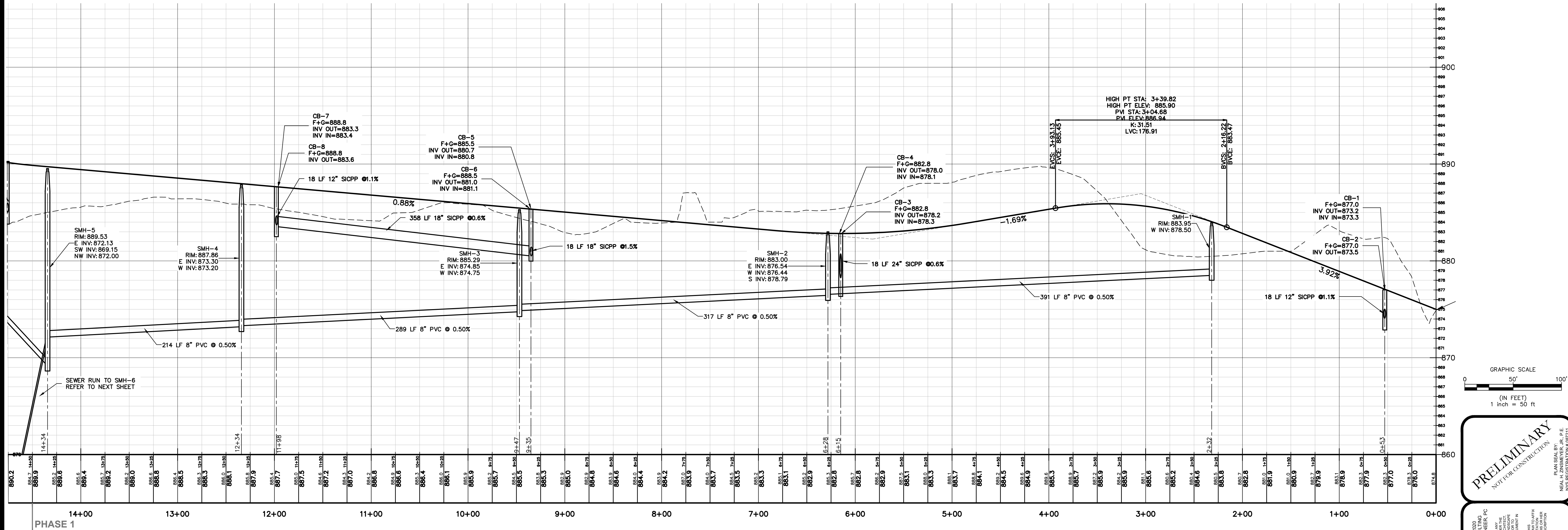
PRELIMINARY
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PLAN SEAL BY: P.E.
NYS REGISTRATION NO. 002711

PROJECT NO. 20-1906
DATE 17 SEP 2020
SCALE AS NOTED
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'

PROJECT TITLE: BRANDYWINE ESTATES PHASE 2
HENNEBERRY ROAD
TOWN OF MANLIUS ONONDAGA COUNTY, NY
PREPARED FOR: HARRINGTON HOMES
3848 HENNEBERRY ROAD
JAMESVILLE, NY 13078

ROAD PROFILE PLAN

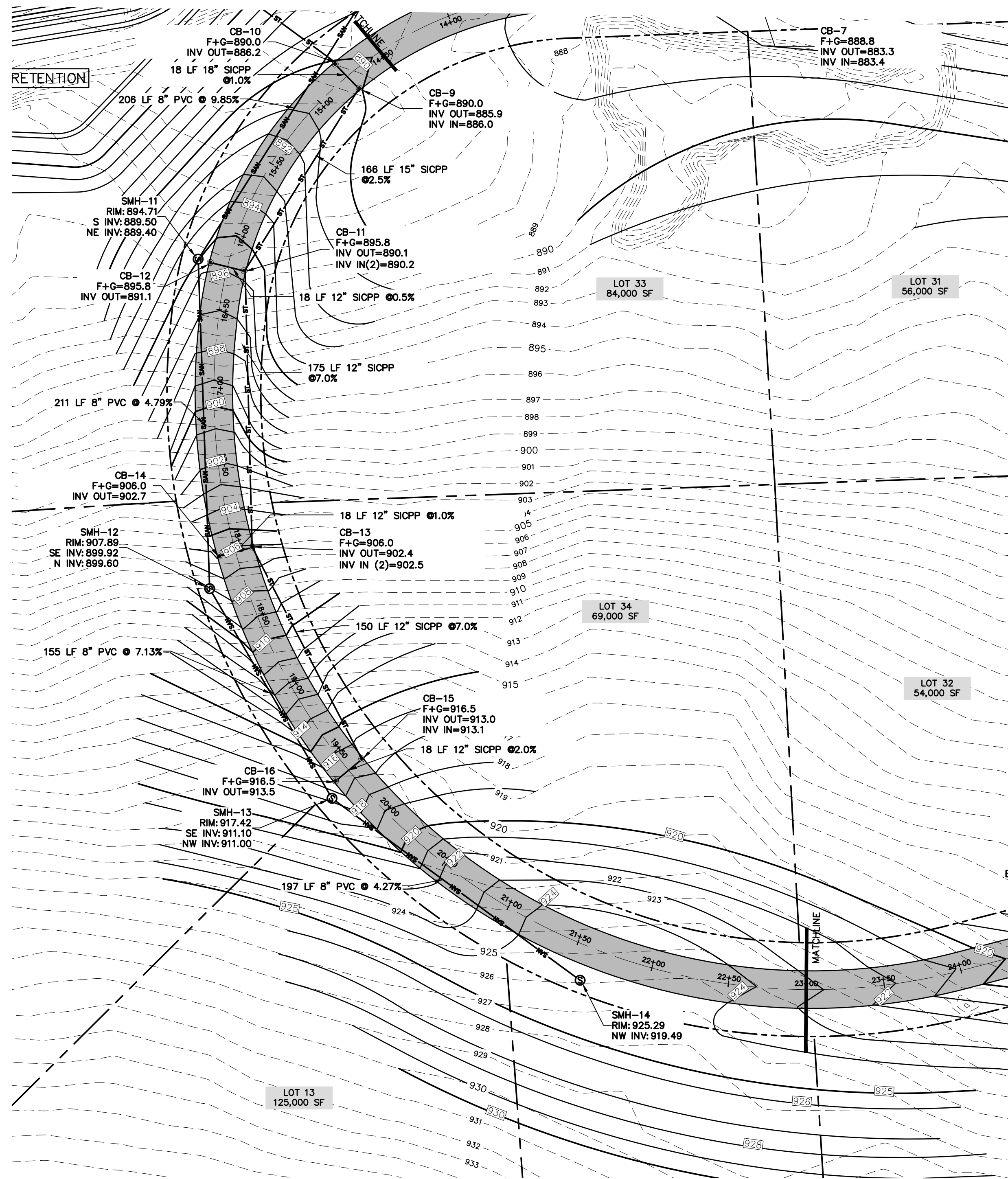
SHEET TITLE:	DATE
1 ROAD A	2/16/2022
2 ROAD A PROFILE - SUBDIVISION PHASE 1	02/09/2022
3 ROAD A PROFILE - SUBDIVISION PHASE 1	12/01/2021

REVISIONS
3 REVISED AS PER TOWN ENGINEER'S COMMENTS
2 GENERAL REVISIONS
1 GENERAL REVISIONS

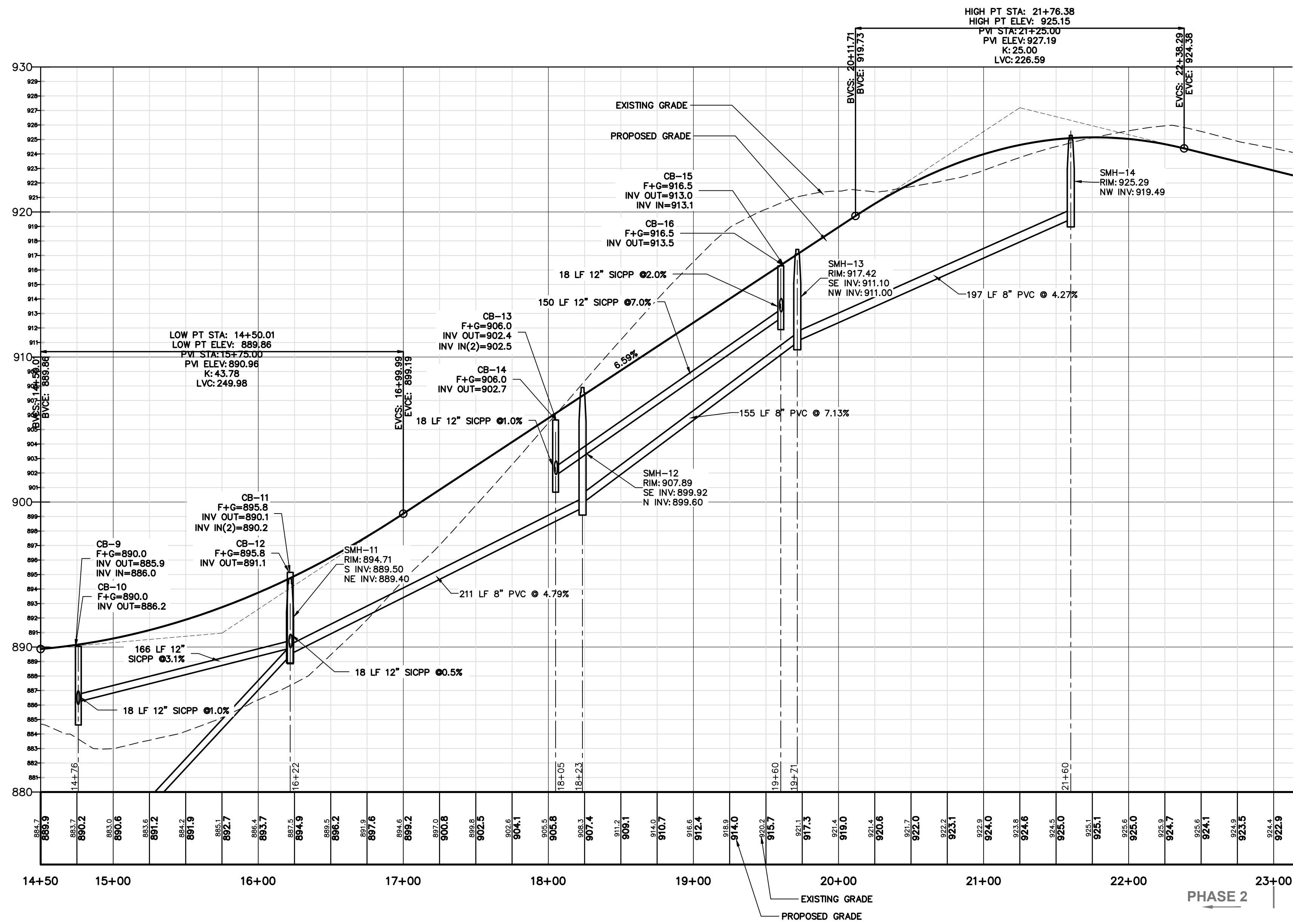
PREPARED BY: NAPIERALA CONSULTING PROFESSIONAL ENGINEERING PC
110 FAYETTE STREET
MANLIUS, NEW YORK 13104
email: MNAP@NAPCON.COM
PH: (315) 682-5560 FAX: (315) 682-5544

DATE: 17 SEP 2020
SCALE: 1" = 50'

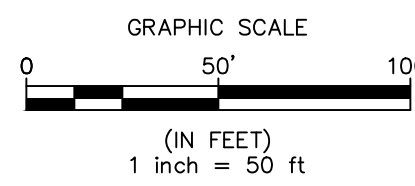
C-5.0



1 ROAD A PLAN
C-5.1 SCALE: 1"=50'



2 ROAD A PROFILE - SUBDIVISION PHASE 2
C-5.1 SCALE: H:1"=50' V:1"=5'



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PLAN SEAL BY:
NEW JERSEY
NYS REGISTRATION NO. 007211

PROJECT TITLE:
**BRANDYWINE ESTATES PHASE 2
HENNEBERRY ROAD**
TOWN OF MANLIUS ONONDAGA COUNTY, NY
PREPARED FOR:
HARRINGTON HOMES
3848 HENNEBERRY ROAD
JAMESVILLE, NY 13078

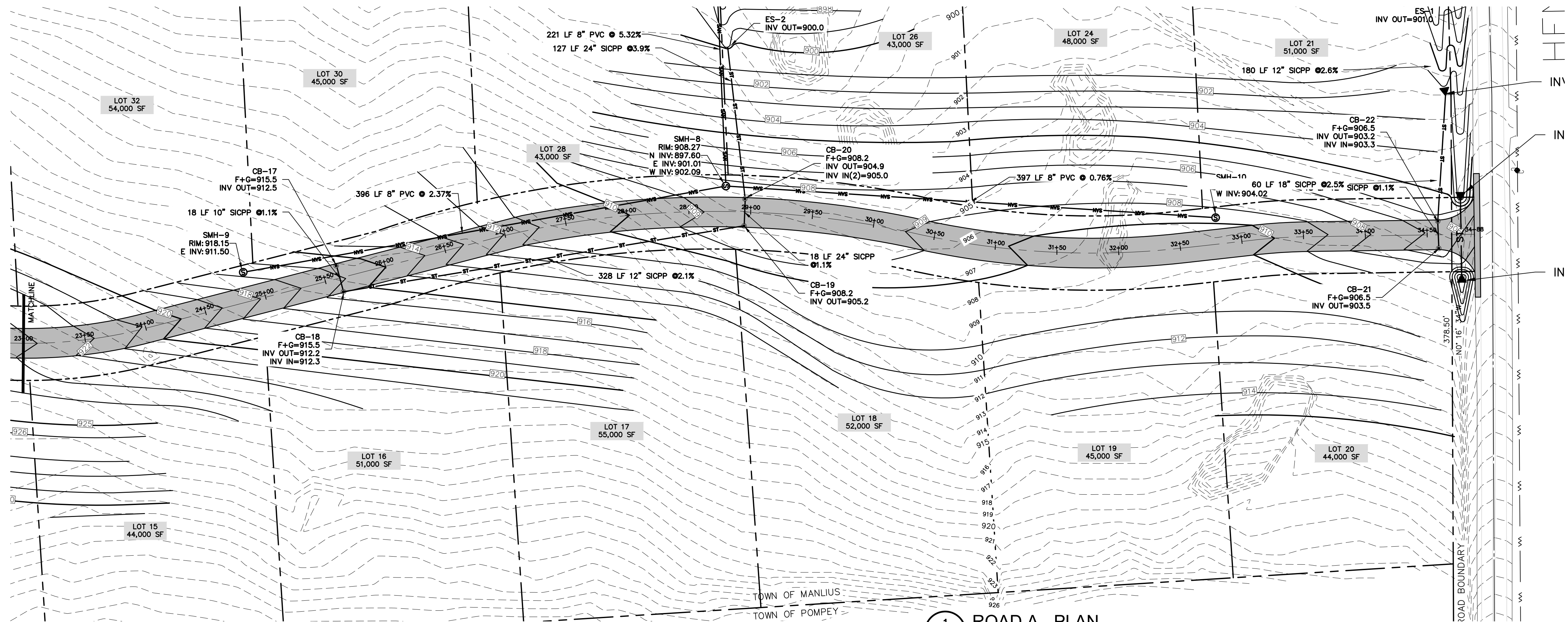
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ROAD PROFILE PLAN

NO.	REVISION/ISSUE	DATE
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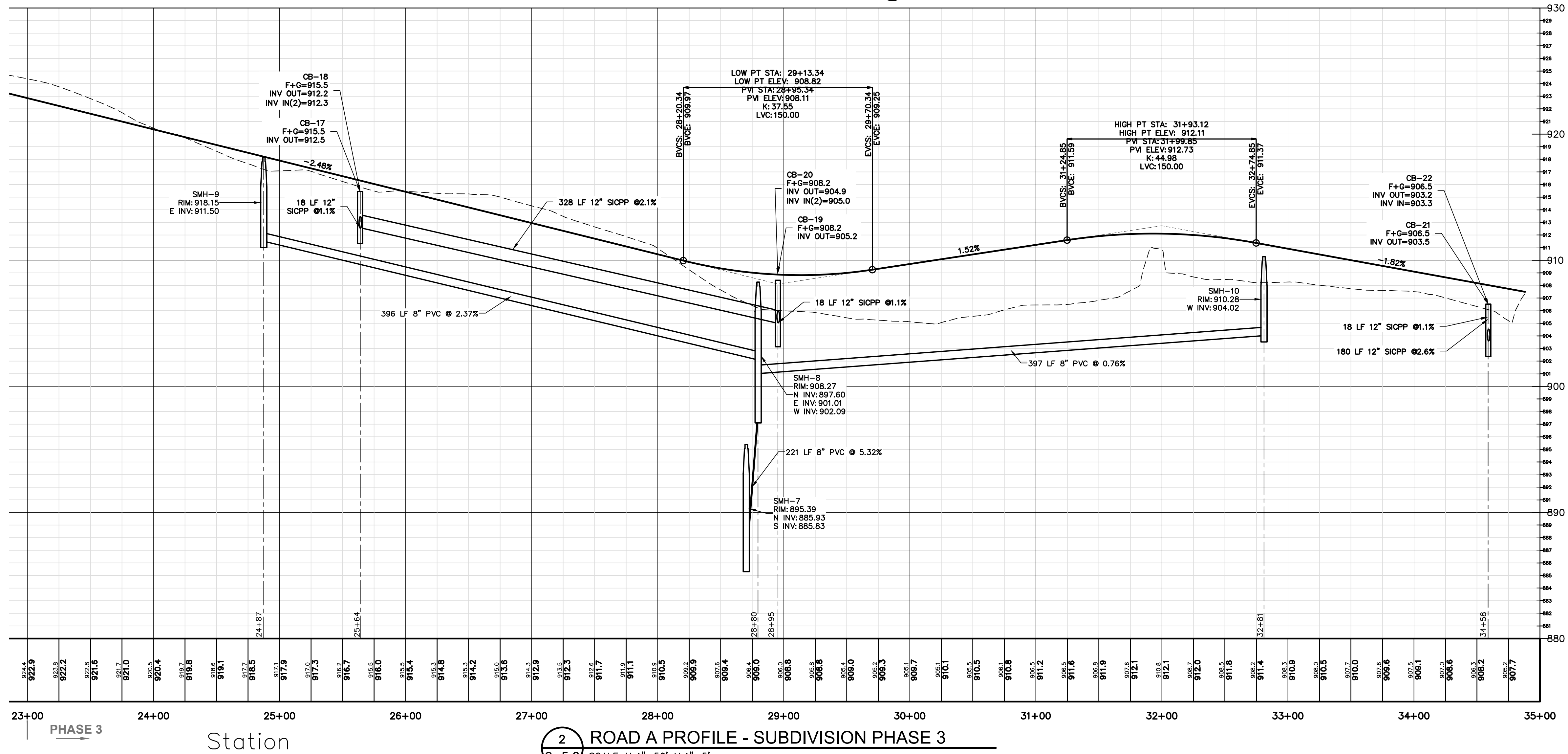
PREPARED BY:
NAPIERALA CONSULTING
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PH: (315) 682-5560 FAX: (315) 682-5544

PROJECT NO.
20-1906
DATE
17 SEP 2020
SCALE
1" = 50'

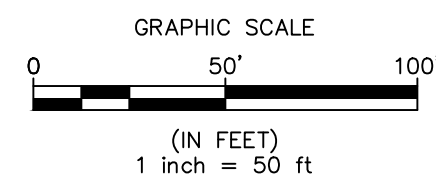
C-5.1



1 ROAD A - PLAN
C-5.2 SCALE: 1"=50'



2 ROAD A PROFILE - SUBDIVISION PHASE 3
C-5.2 SCALE: H: 1"=50' V: 1"=5'



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Professional Engineer P.C.
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PREPARED FOR:
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3848 HENNEBERRY ROAD
JAMESVILLE, NY 13078

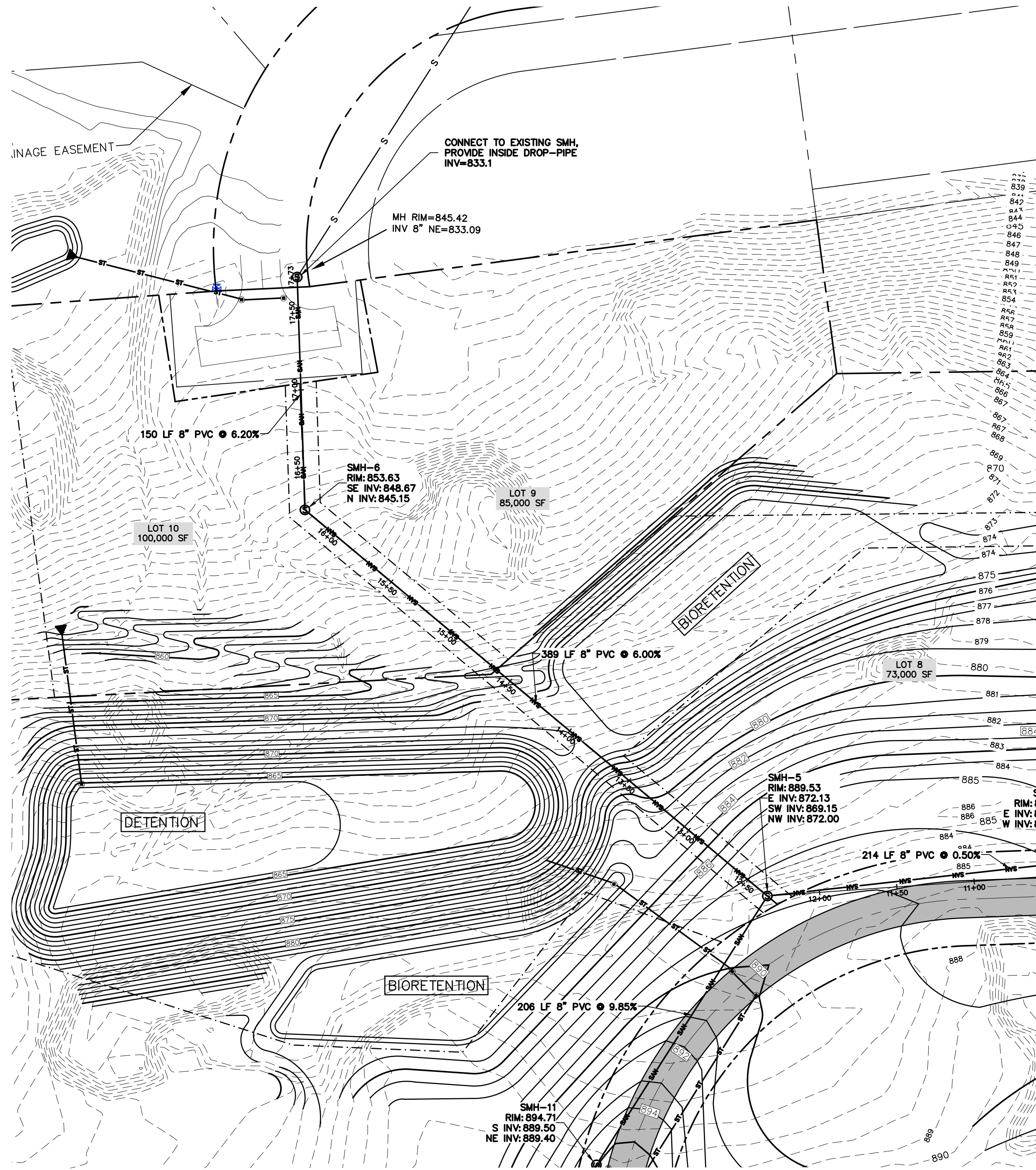
ROAD PROFILE PLAN

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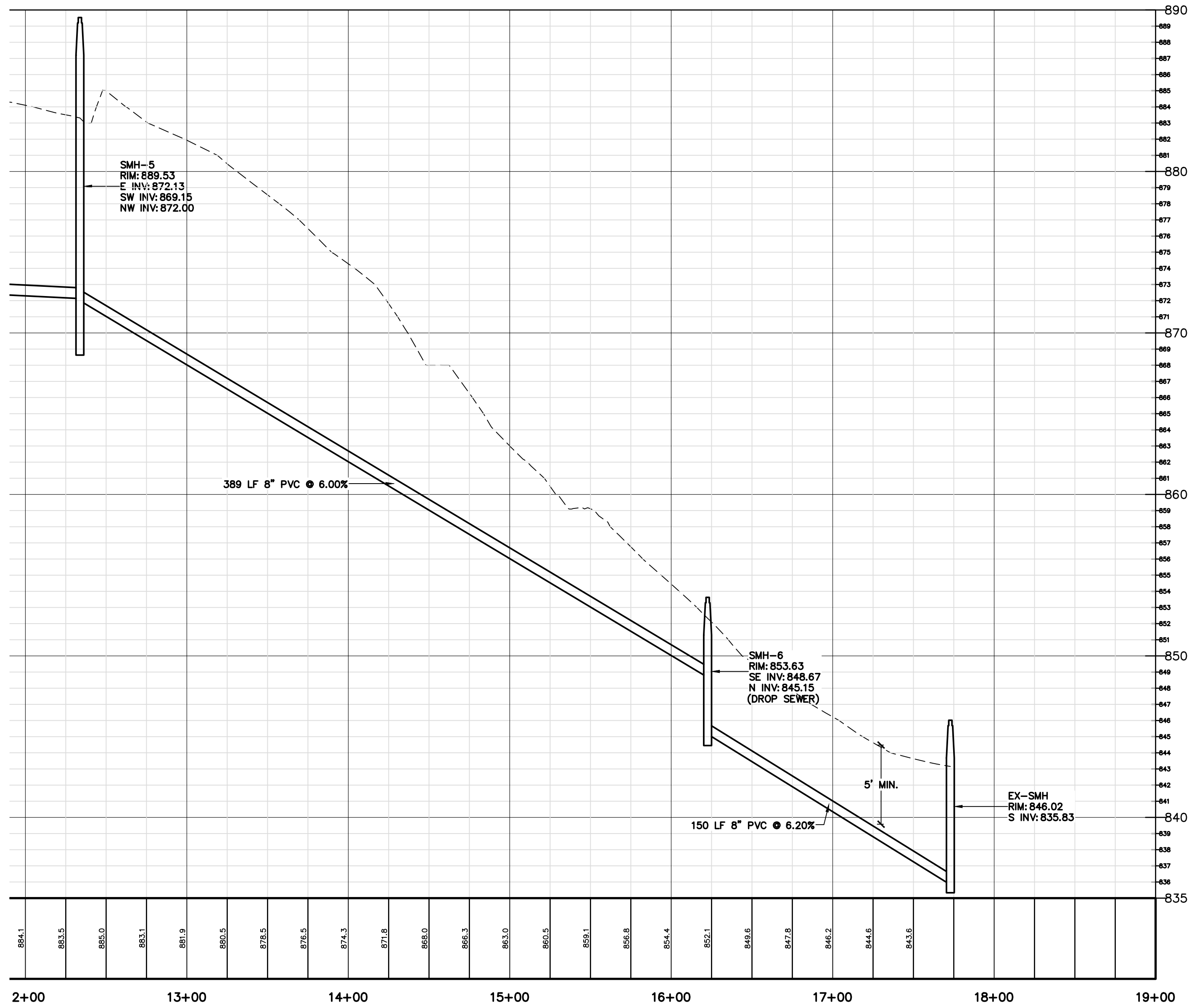
PREPARED BY:
NAPIERALA CONSULTING
PROFESSIONAL ENGINEER P.C.
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PH: (315) 682-5560 FAX: (315) 682-5544

PROJECT NO.
20-1906
DATE
17 SEP 2020
SCALE
1" = 50'

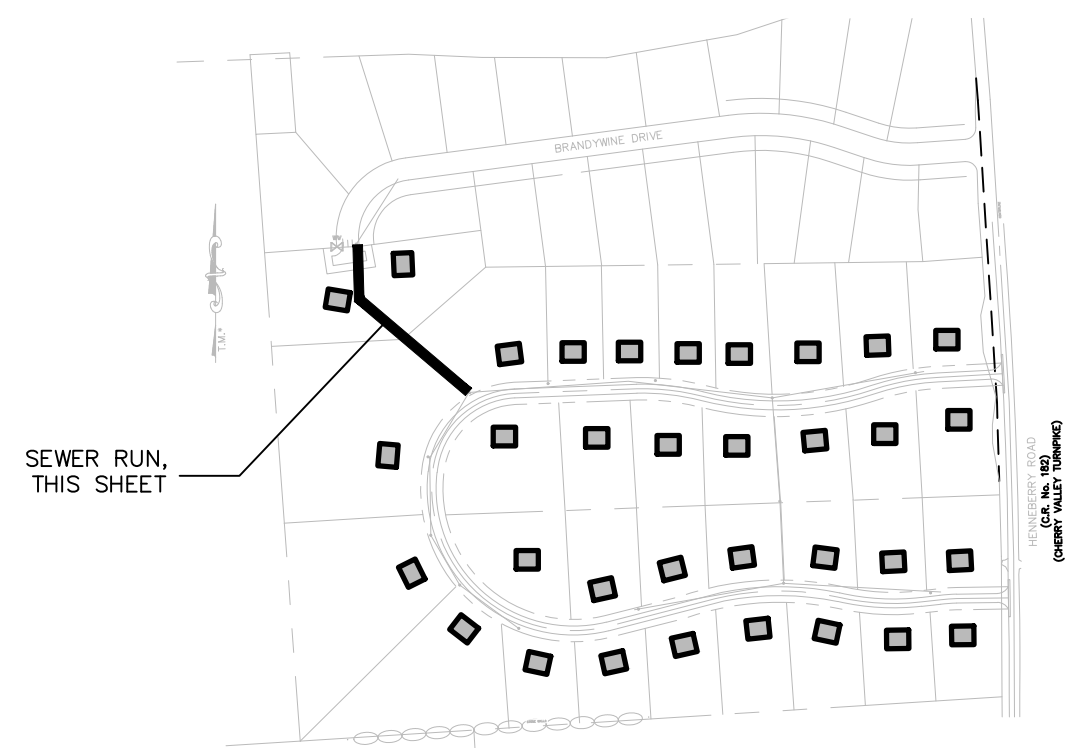
C-5.2



2 SEWER PLAN
C-6.0 SCALE: 1"=50'



3 SEWER PROFILE
C-6.0 SCALE: H:1"=50' V:1"=5'



1 OVERALL SEWER LAYOUT
C-6.0 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

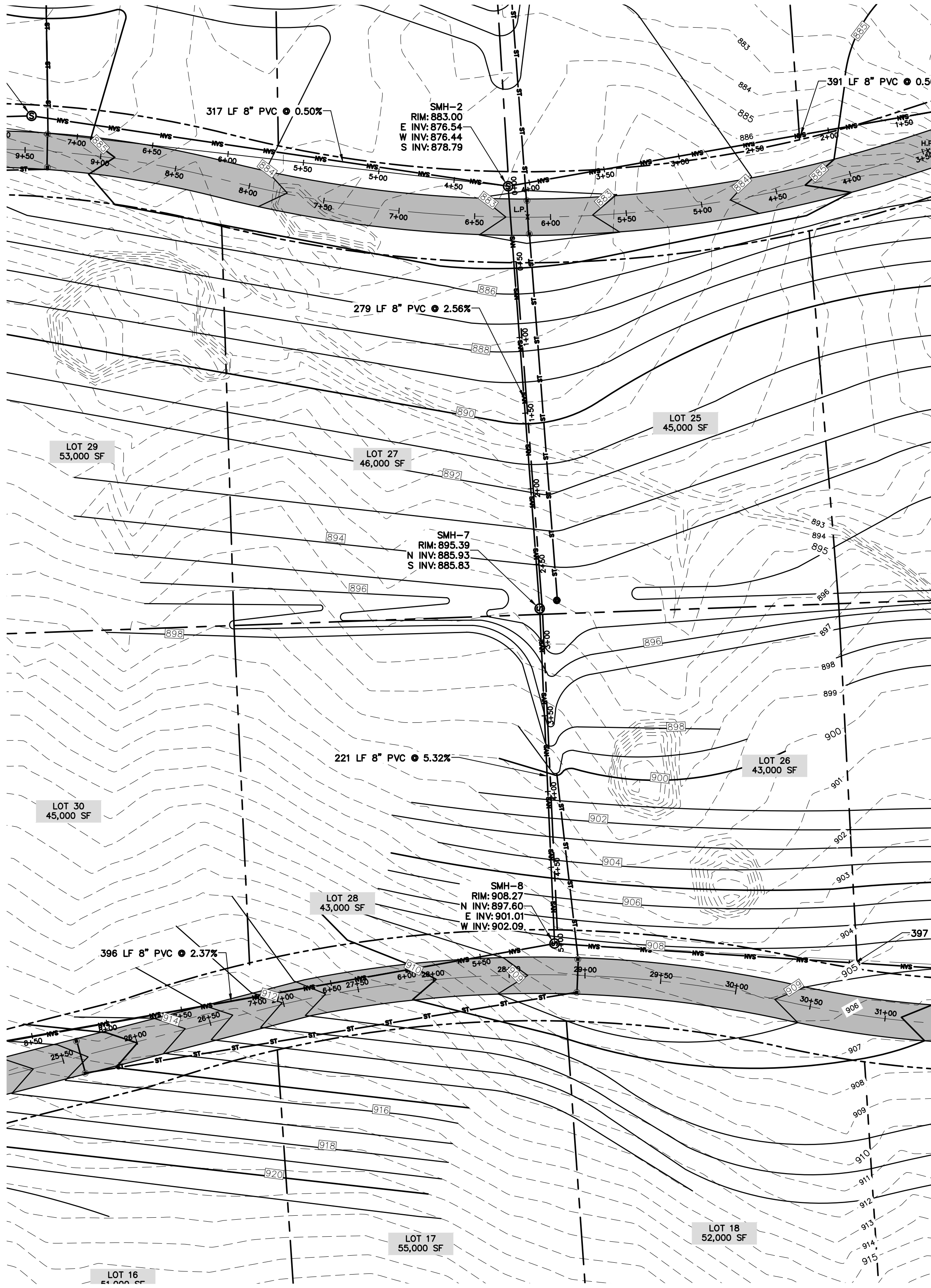
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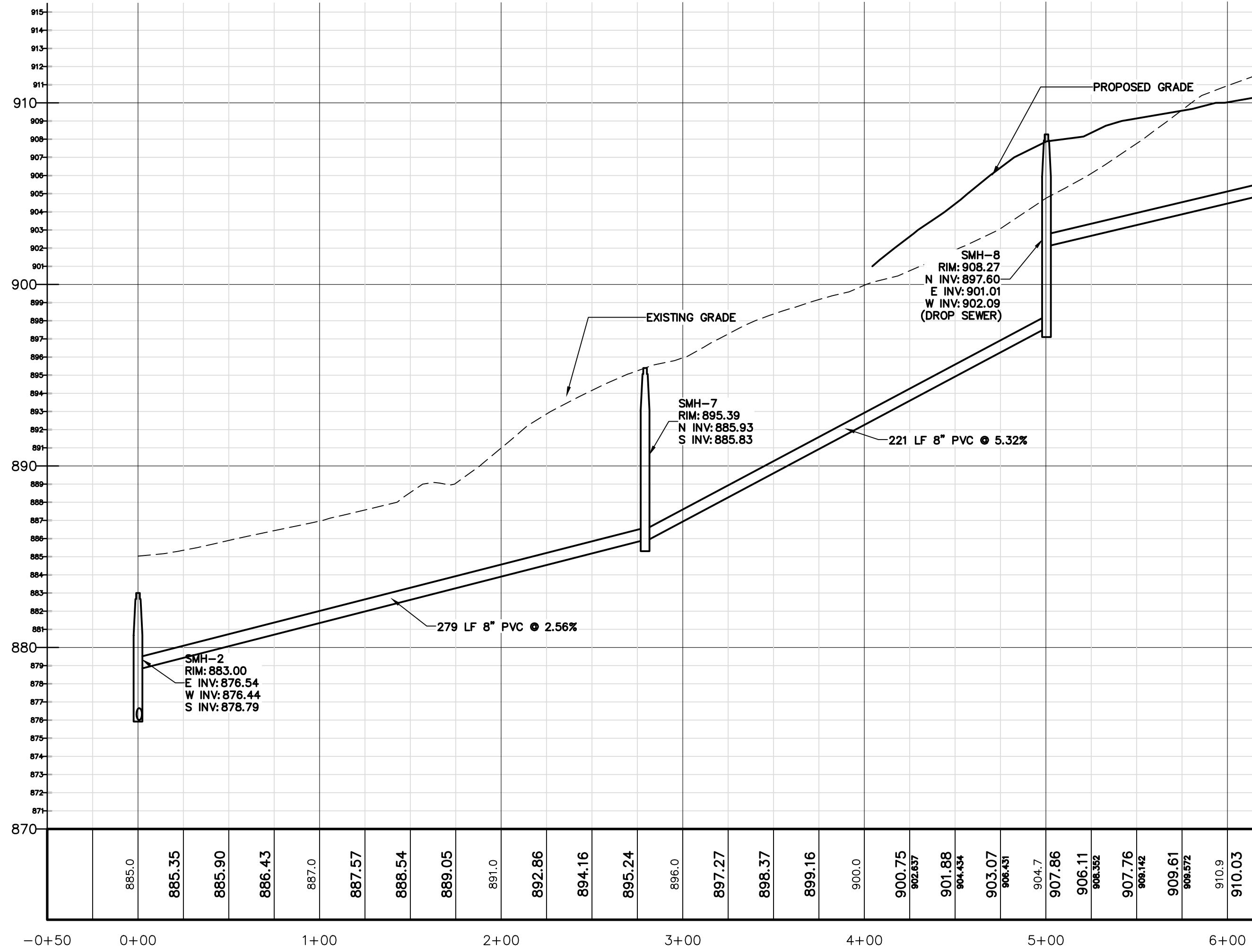
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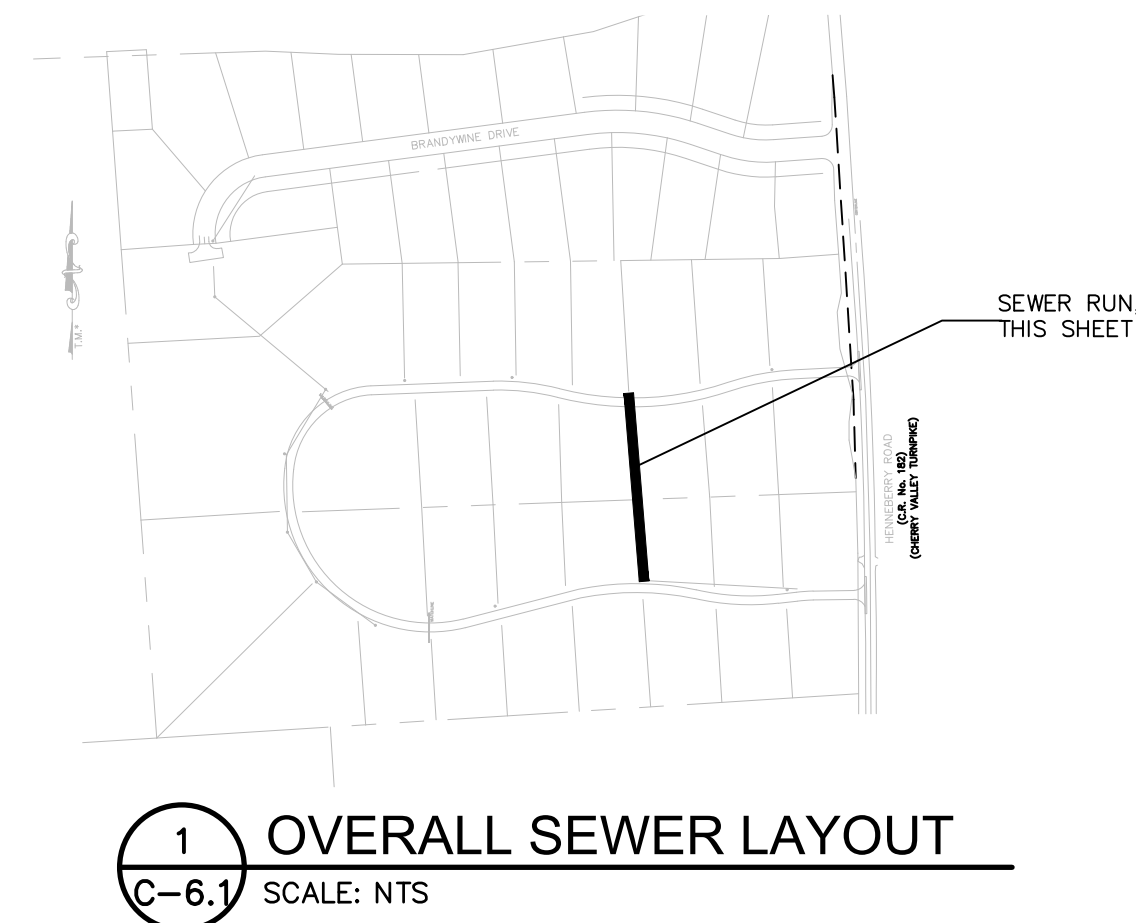
PROJECT NO. 20-1906
DATE 15 SEP 2020
SCALE 1" = 50'
SHEET C-6.0



2 SANITARY SEWER PLAN
C-6.1 SCALE: 1"=50'



3 SANITARY SEWER PROFILE
C-6.1 SCALE: H: 1"=50' V: 1"=5'



1 OVERALL SEWER LAYOUT
C-6.1 SCALE: NTS

PROJECT TITLE: BRANDYWINE ESTATES PHASE 2
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3848 HENNEBERRY ROAD
JAMESVILLE, NY 13078

SEWER PROFILE PLAN

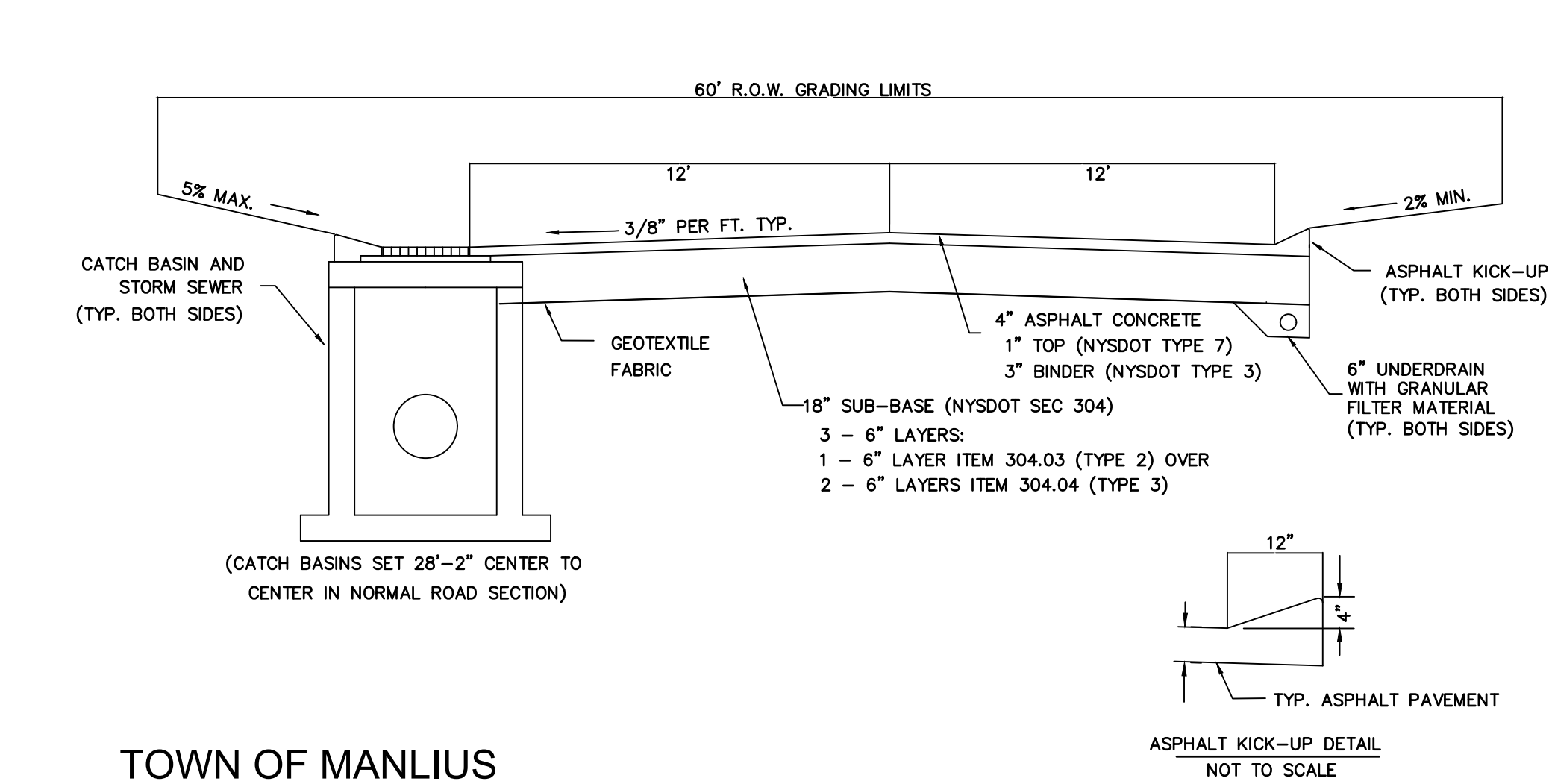
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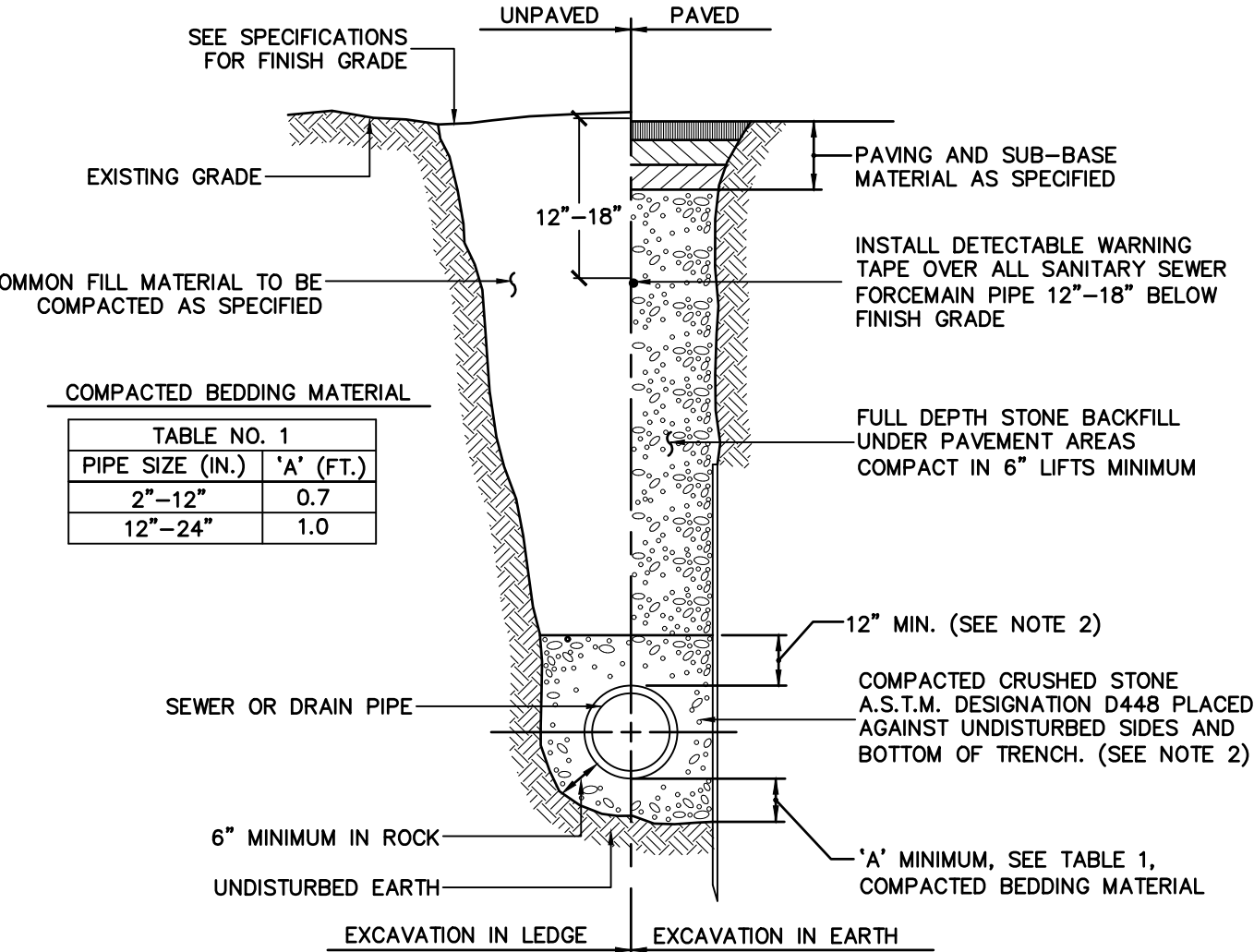
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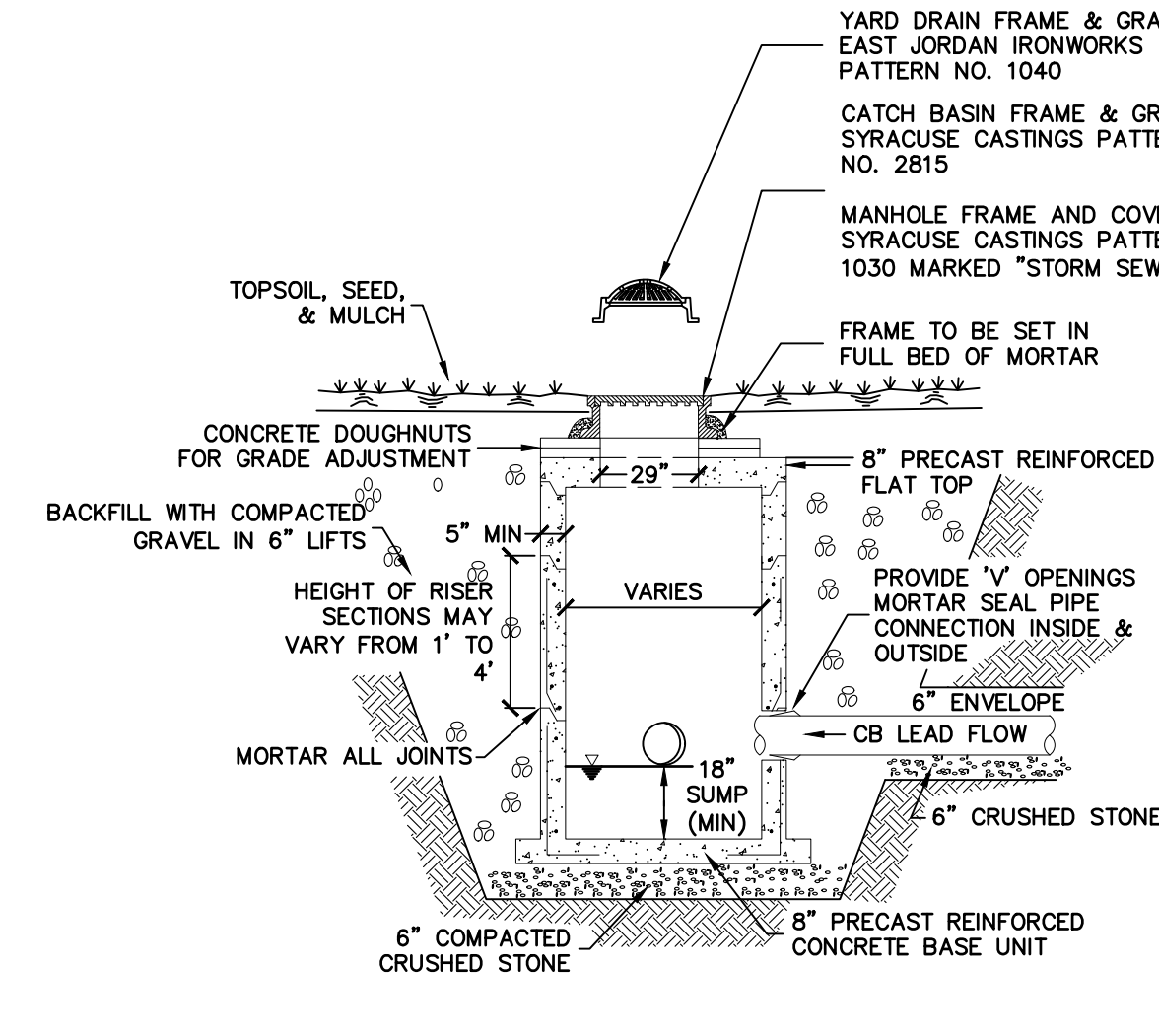
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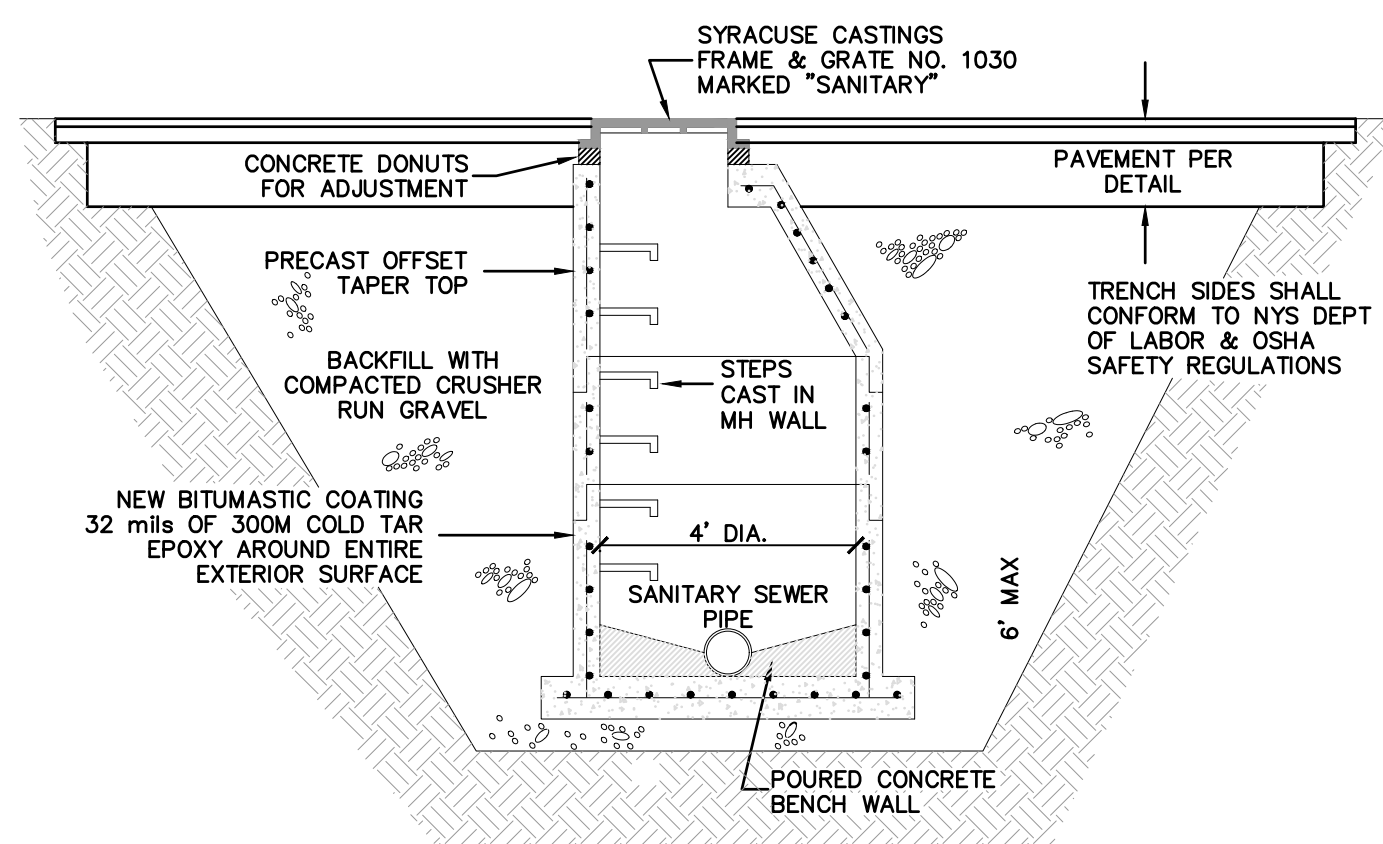
1 TOWN OF MANLIUS
RESIDENTIAL STREET CROSS SECTION
SCALE: NTS



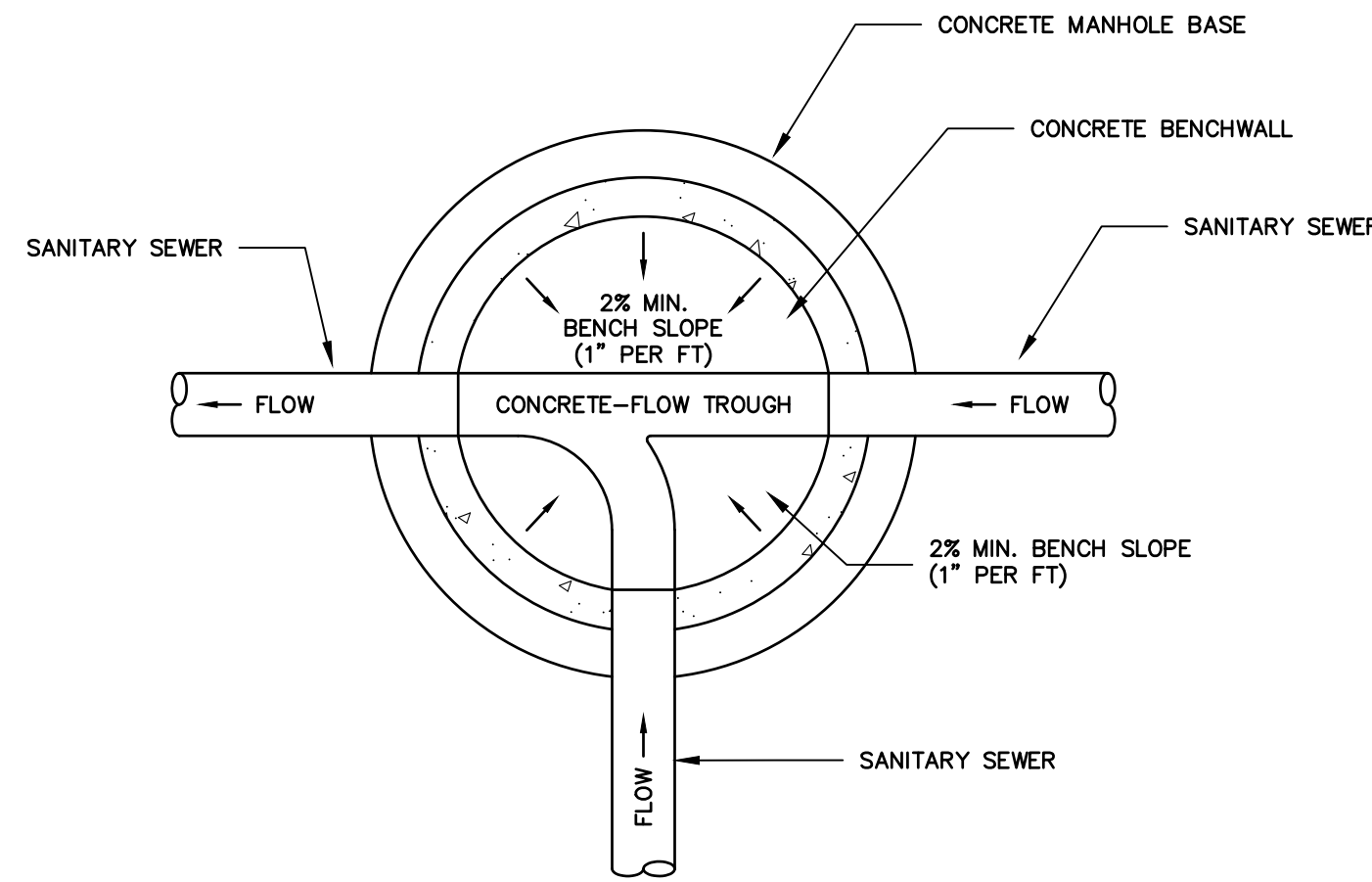
4 TYPICAL SEWER AND DRAIN TRENCH
SCALE: NTS



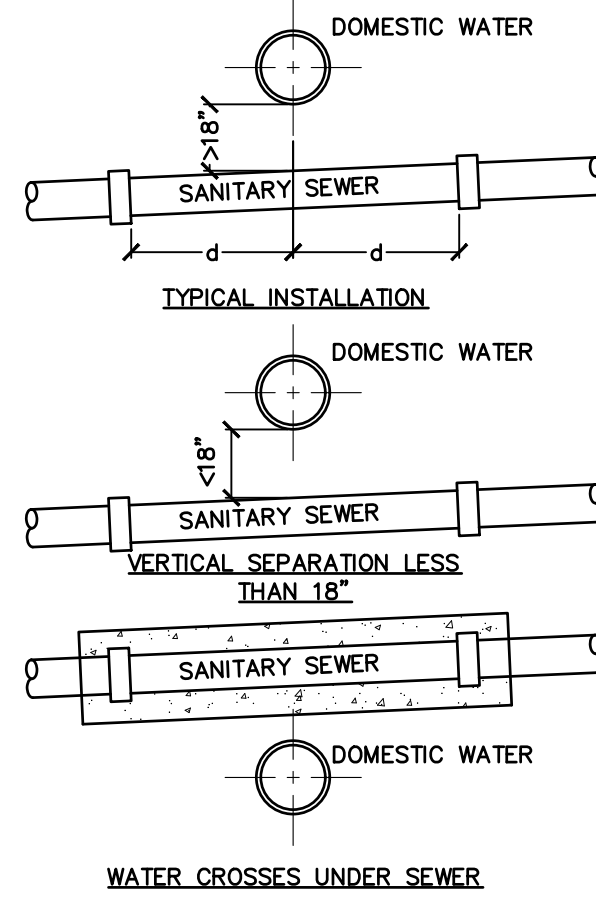
2 CATCH BASIN
SCALE: NTS



5 SANITARY MANHOLE STRUCTURE
SCALE: NTS



6 SANITARY SEWER MANHOLE BENCH
SCALE: NTS



3 WATER AND SEWER SEPARATION
SCALE: NTS

DRAINAGE STRUCTURE GENERAL NOTES

- ALL STRUCTURES SHALL BE RATED FOR H-20 LOADING
- 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.
- ALL REINFORCEMENT SHALL BE PLACED SO IT WILL HAVE A MINIMUM COVER OF 2" AND BE LOCATED APPROXIMATELY WITHIN THE CENTER OF THE SECTION.
- 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.
- 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.
- 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.
- TRENCH SIDES SHALL CONFORM TO NYS DEPT OF LABOR AND OSHA SAFETY REGULATIONS.
- 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.

TYPICAL INSTALLATION

- MINIMUM VERTICAL SEPARATION IS 18" FROM TOP OF PIPE TO BOTTOM OF PIPE.
- SEWER JOINTS ARE TO SPACED EQUIDISTANT AND AS FAR AS POSSIBLE FROM THE WATER MAIN JOINTS.

VERTICAL SEPARATION LESS THAN 18"

- 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.
- SEWER JOINTS ARE TO SPACED EQUIDISTANT AND AS FAR AS POSSIBLE FROM THE WATER MAIN JOINTS.

WATER CROSSES UNDER SEWER

- 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.
- SEWER JOINTS ARE TO SPACED EQUIDISTANT AND AS FAR AS POSSIBLE FROM THE WATER MAIN JOINTS.
- PROVIDE ADEQUATE STRUCTURAL SUPPORT FOR SEWER TO MAINTAIN LINE AND GRADE

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HARRINGTON HOMES

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JAMESVILLE, NY 13078

SITE DETAILS

SHEET TITLE:

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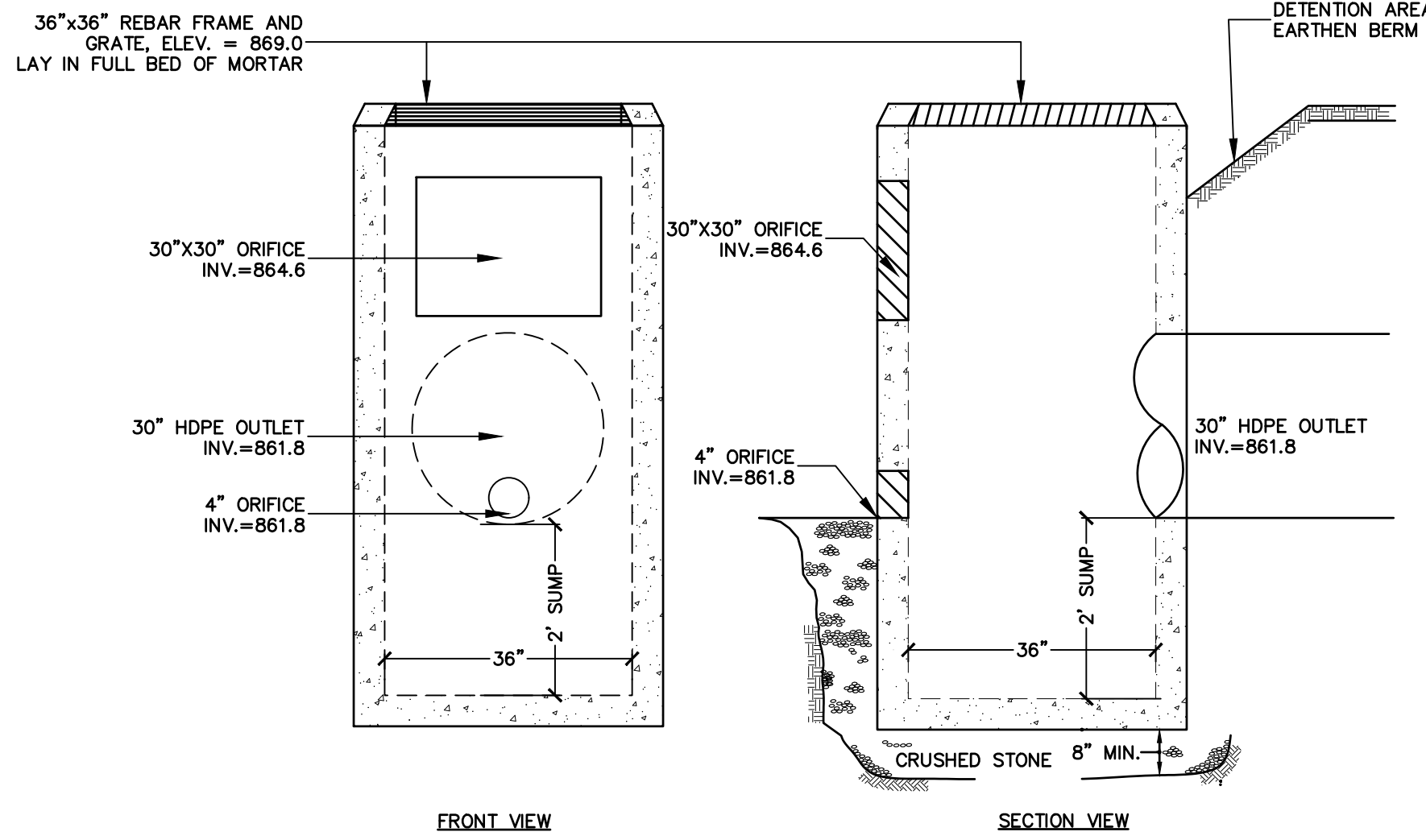
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PROJECT NO. 20-1906

DATE 17 SEP 2020

SCALE NTS

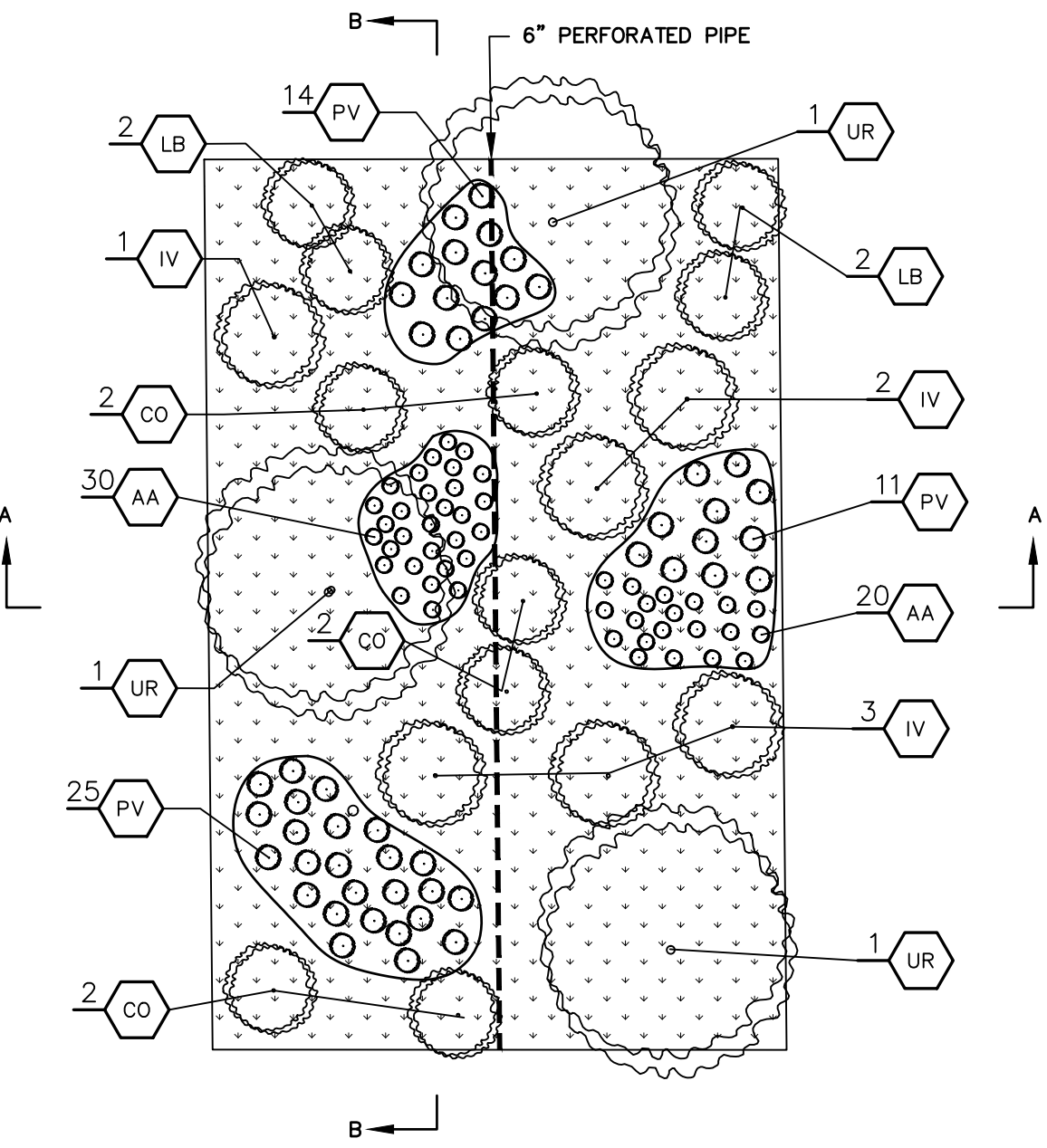
C-7.0



DETENTION BASIN #1

1 PRECAST CONCRETE OUTLET STRUCTURE

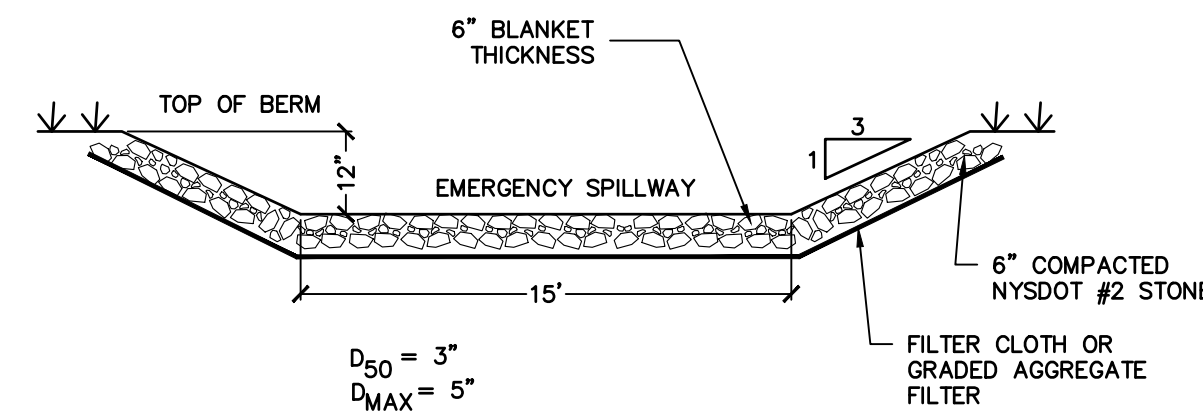
SCALE: NTS



*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.

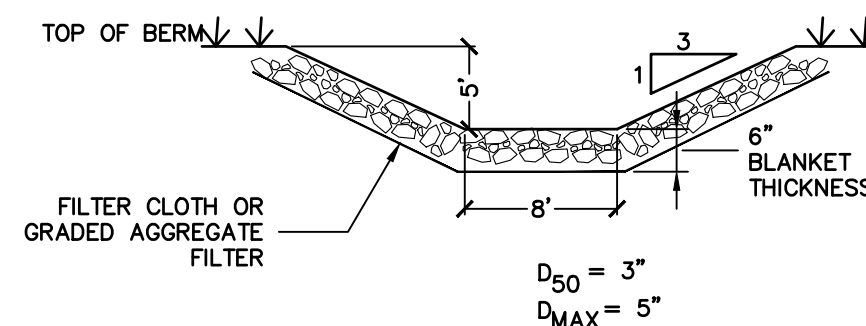
KEY	QUANTITY*	LATIN NAME	COMMON NAME	CALIPER	HEIGHT
TREES					
UR	16	ULMUS RUBRA	SLIPPERY ELM	6'-8'	B&B
SHRUBS					
LB	45	LINDERA BENZOIN	COMMON SPICE	18"-24"	B&B
IV	65	ILEX VERTICILLATA	WINTER BERRY	2'-3'	B&B
CO	65	CEPHALANTHUS OCCIDENTALIS	BUTTONBUSH	18"-24"	B&B
HERBACEOUS PLANTS					
PV	600	PANICUM VIRGATUM	SWITCH GRASS		
AA	600	AGROSTIS ALBA	REDTOP		

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		



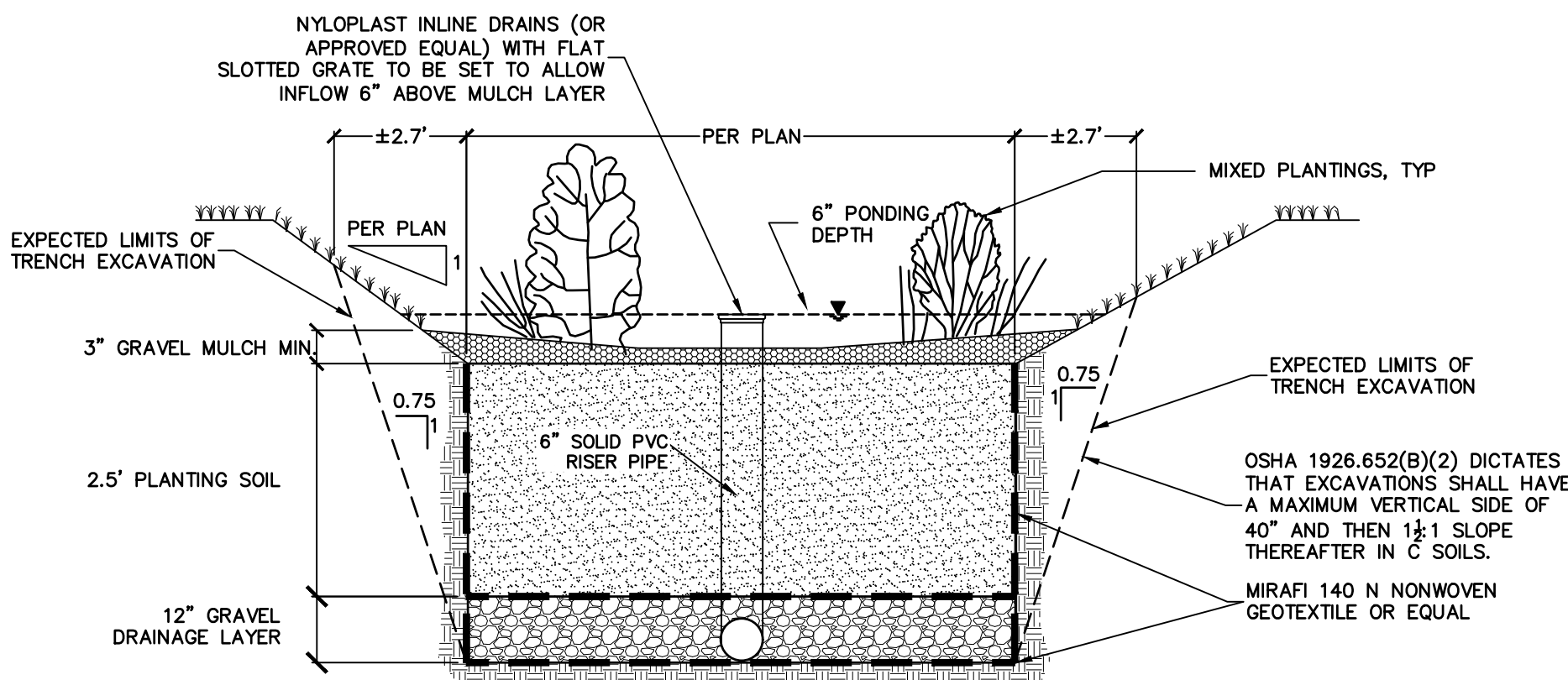
3 RIP RAP EMERGENCY SPILLWAY

SCALE: NTS

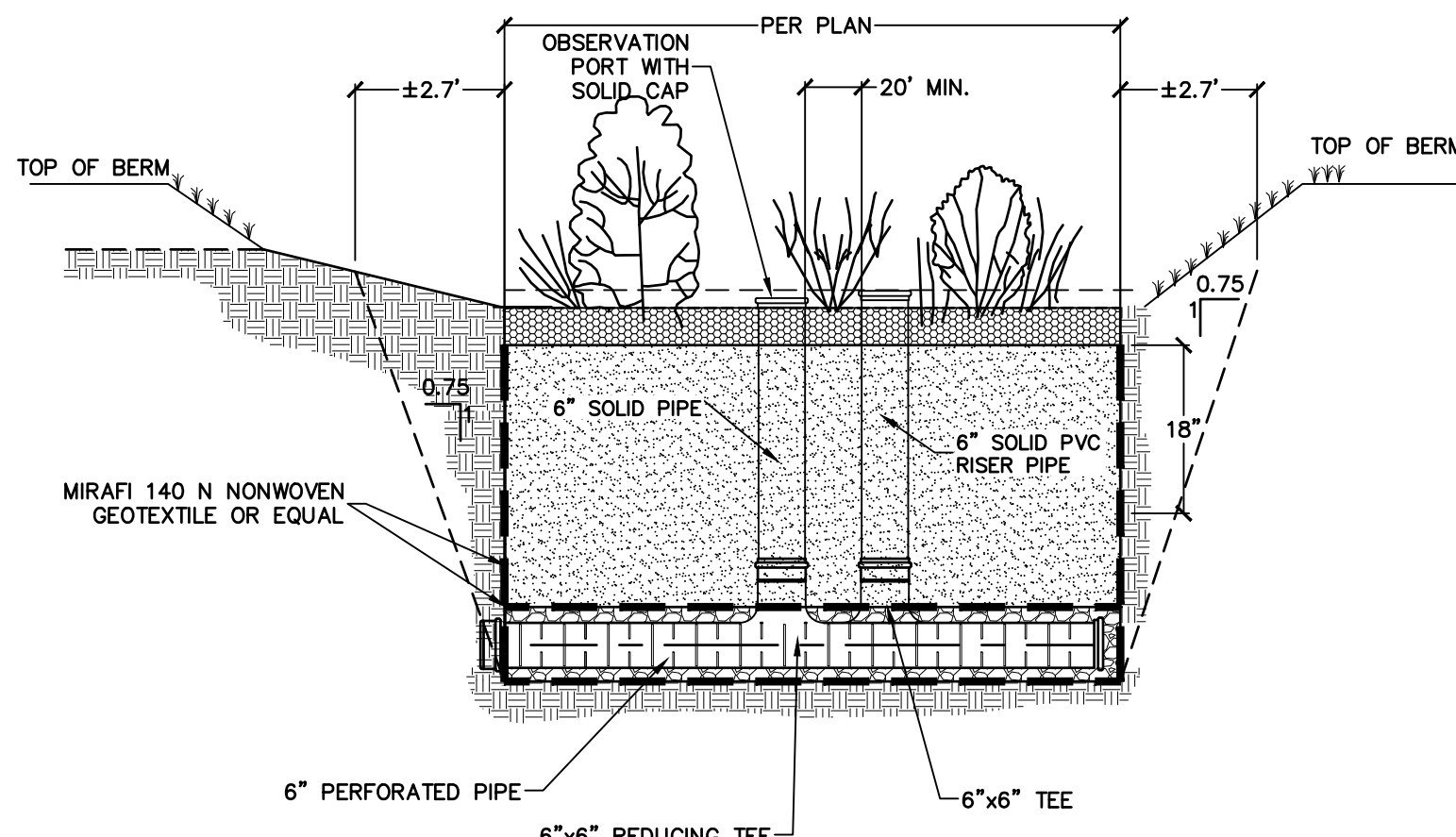


4 RIP RAP BIORETENTION SPILLWAY

SCALE: NTS



PROFILE VIEW SECTION A-A



PROFILE VIEW SECTION B-B

BIORETENTION NOTES:

- PLANTING SOIL MEDIA SHALL BE:
 - 85% TO 88% COARSE TO MEDIUM SAND
 - 12%-15% LEAF COMPOST OR TOPSOIL
- PEA GRAVEL MULCH CONFORMING TO ASTM D 448 No. 6.
- UNDERDRAIN GRAVEL TO BE AASHTO M-43 No. 67, 0.25" TO 0.75".
- 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
- COMPACT WITH WATER-FILLED HAND ROLLER. COMPACTION TO BE FIRM BUT EASY (UTILIZE PENCIL TEST).
- ENGINEER TO TEST IN PLACE COMPACTION AND INFILTRATION OF PLANTING SOIL.
- 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.

5 BIORETENTION FILTER CROSS SECTIONS

SCALE: NTS

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HARRINGTON HOMES

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SCALE
AS SHOWN

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.
-
- 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.
-
- NOTES:

1. CONCRETE WASHOUT 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 WASHOUT 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.
-
- 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.

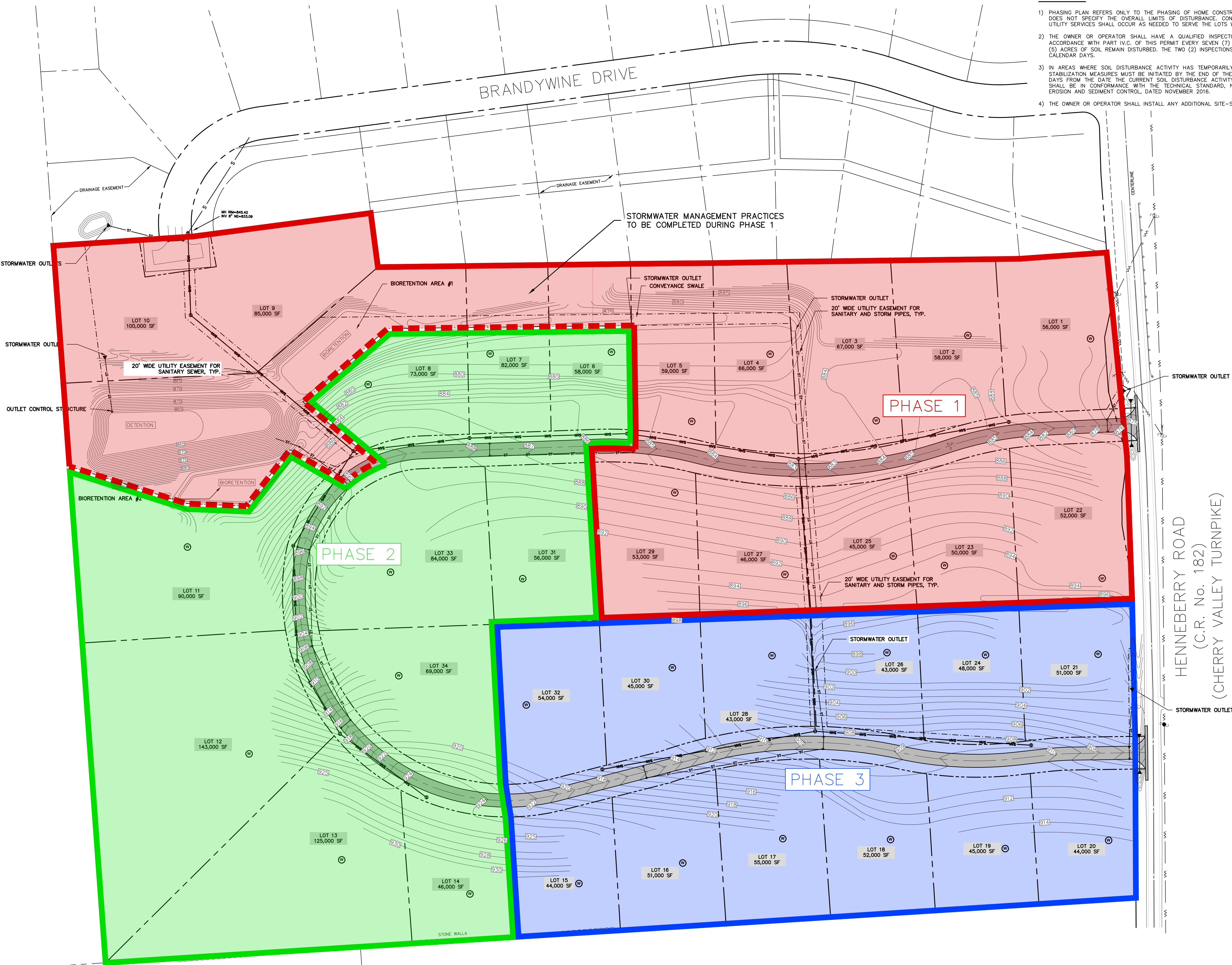
3. OVERLAP OR ABUT ROLL EDGES PER MANUFACTURER RECOMMENDATIONS. OVERLAP ROLL ENDS BY 6 INCHES (MINIMUM), WITH THE UPSLOPE MAT OVERLAPPING ON TOP OF THE DOWNSLOPE MAT.
- 1 CONSTRUCTION ENTRANCE
- C-7.2 SCALE: NTS
- 2 SILT FENCE
- C-7.2 SCALE: NTS
- 3 CONCRETE WASHOUT AREA
- C-7.2 SCALE: NTS
- 4 SLOPE STABILIZATION MATTING
- C-7.2 SCALE: NTS
-
- 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
-
- PROFILE
- DISCHARGE TO UNCONFINED SECTION (FLARED OUTLET) (MINIMUM TAILWATER CONDITION)
-
- NOTE: APRON AT ZERO GRADE SIDE SLOPE AT 2:1 (HORZ:VERT)
- GRADED AGGREGATE FILTER OR FILTER CLOTH
- SEE RIPRAP STANDARDS AND SPECIFICATIONS
- ROCK RIPRAP OUTLET PROTECTION
- UNCONFINED DOWNSTREAM SECTION
- C-7.2 SCALE: NTS
- 5 TYPICAL TOPSOIL STOCKPILE
- C-7.2 SCALE: NTS
- PROJECT TITLE
**BRANDYWINE ESTATES PHASE 2
HENNEBERRY ROAD**
- TOWN OF MANLIUS
ONONDAGA COUNTY, NY
- HARRINGTON HOMES
- 3848 HENNEBERRY ROAD
JAMESVILLE, NY 13078
- SITE DETAILS
- SHEET TITLE:
- | NO. | REVISIONS | DATE |
|-----|---|------------|
| 3 | REVISED AS PER TOWN ENGINEER'S COMMENTS | 2/16/2022 |
| 2 | GENERAL REVISIONS | 02/09/2022 |
| 1 | GENERAL REVISIONS | 12/01/2021 |
- PREPARED BY:
NAPIERALA CONSULTING
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110 FAYETTE STREET
MANLIUS, NEW YORK 13104
email: MNAVP@NAPCON.COM
PH: (315) 682-5560 FAX: (315) 682-5544
- PROJECT NO.
20-1906
DATE
17 SEP 2020
SCALE
AS SHOWN
SHEET
C-7.2

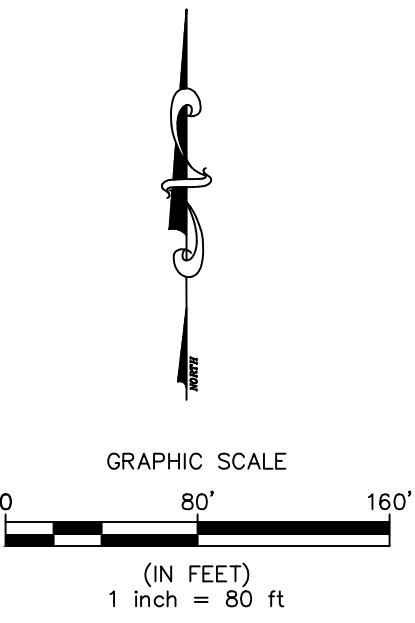


- NOTES:
- 1) PHASING PLAN REFERS ONLY TO THE PHASING OF HOME CONSTRUCTION WITHIN INDIVIDUAL LOTS TO BE SUBDIVIDED AND DOES NOT SPECIFY THE OVERALL LIMITS OF DISTURBANCE. CONSTRUCTION OF STORMWATER MITIGATION FACILITIES AND UTILITY SERVICES SHALL OCCUR AS NEEDED TO SERVE THE LOTS WITHIN THE PHASE UNDER CONSTRUCTION.
 - 2) THE OWNER OR OPERATOR SHALL HAVE A QUALIFIED INSPECTOR CONDUCT AT LEAST TWO (2) SITE INSPECTIONS IN ACCORDANCE WITH PART IV.C. OF THIS PERMIT EVERY SEVEN (7) CALENDAR DAYS, FOR AS LONG AS GREATER THAN FIVE (5) ACRES OF SOIL REMAIN DISTURBED. THE TWO (2) INSPECTIONS SHALL BE SEPARATED BY A MINIMUM OF TWO (2) FULL CALENDAR DAYS.
 - 3) IN AREAS WHERE SOIL DISTURBANCE ACTIVITY HAS TEMPORARILY OR PERMANENTLY CEASED, THE APPLICATION OF SOIL STABILIZATION MEASURES MUST BE INITIATED BY THE END OF THE NEXT BUSINESS DAY AND COMPLETED WITHIN SEVEN (7) DAYS FROM THE DATE THE CURRENT SOIL DISTURBANCE ACTIVITY CEASED. THE SOIL STABILIZATION MEASURES SELECTED SHALL BE IN CONFORMANCE WITH THE TECHNICAL STANDARD, NEW YORK STATE STANDARDS AND SPECIFICATIONS FOR EROSION AND SEDIMENT CONTROL, DATED NOVEMBER 2016.
 - 4) THE OWNER OR OPERATOR SHALL INSTALL ANY ADDITIONAL SITE-SPECIFIC PRACTICES NEEDED TO PROTECT WATER QUALITY.

PROJECT TITLE: **BRANDYWINE ESTATES PHASE 2**
HENNEBERRY ROAD
TOWN OF MANLIUS ONONDAGA COUNTY, NY
PREPARED FOR: **HARRINGTON HOMES**
3848 HENNEBERRY ROAD
JAMESVILLE, NY 13078

PHASING PLAN			
SHEET TITLE:			
REVISIONS			
NO.	REVISION/ISSUE	DATE	BY
3	REVISED AS PER TOWN ENGINEER'S COMMENTS	2/16/2022	
2	GENERAL REVISIONS	02/09/2022	
1	GENERAL REVISIONS	12/01/2021	

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PRELIMINARY
NOT FOR CONSTRUCTION
PLAN SEAL BY: **N.E.A. J.**
NYS REGISTRATION NO. 007211

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

C-8

February 17, 2022

Mr. Douglas A. Miller, P.E.
Miller Engineers
Seneca Turnpike; Suite B
Box 311
Manlius, NY 13104

**Re: Brandywine Estates Subdivision – Phase 2
Preliminary Stormwater Review
Henneberry Road, Town of Manlius, Onondaga County, NY**

Dear Mr. Miller,

Attached for your review is a revised site plan set and SWPPP for the proposed Brandywine Estates Subdivision Phase 2 project in the Town of Manlius, NY. Below are responses to the your comments from an email dated February 9th, 2022.

1. *Drainage boundaries require confirmation and detail limits from the applicant. It looks like there are quite a few cutoff ditches on the property, probably to redirect water away from the Phase 1 homes. You can see them on the aerial but not the topo very well. We are in the process of scheduling a site visit to better confirm plan details.*
Drainage boundaries were delineated using topography provided by the surveyor. Several diversion ditches are present on the property and are depicted within the drainage area maps.
2. *Existing runoff numbers seem high and proposed runoff numbers seem low. Just one point difference is a big issue. Suggest to add brush (good) for some of the existing land cover. For proposed would just use a CN for one acres lots which is 84 or two points higher than what has been calculated.*
The SWPPP has been revised to include brush area within DA-1 in the existing and proposed conditions. The average lot size within the subdivision is about 1.5 acres. The curve number value that was calculated for the development is based on the expected impervious cover for each individual lot. The impervious cover has been increased in the revised analysis to match the requested value more closely. These changes are reflected in the SWPPP.
3. *Main outfall to the west is on private property across a driveway and to a stream. Not sure if the facilities on the private property can handle the flows. No discussion in the report about this or the size of the culvert on Seneca Turnpike that has been noted as overtopping during recent storm events.*
The current drainage conditions of the property in exist in such a manner that a 56-acre portion of the subject property are tributary to the point of study, which is located upstream of the culvert on Seneca Turnpike. The NYSDEC stormwater regulations require that the development mitigate all peak runoff flow rates to the point of study so as to not adversely impact the downstream area. According to the prepared stormwater analysis, the provided detention basin and outlet control structure will reduce the peak flow during both the 10-year and 100-year precipitation events.



4. *More than 5 acres will be openly graded at one time. Need a phasing plan and Town signoff for this request. Phasing approach should be coordinated with overall phasing approach for entire project.*
A phasing plan has been included with this submittal on sheet C-8. Written authorization will be required from the MS4 in order to disturb more than 5-acres at any one time.
5. *House FF's do not accurately reflect contours. There will be significantly more grading than shown. Building first-floor elevations have been removed from the plan. The intent of the provided grading plan is to show an overall site grading plan for the project. Lot-specific grading plans have not been prepared.*
6. *Looks like cuts and fills in the road will exceed 5 feet at some locations.*
Noted. Earthwork is required to balance the site in preparation for construction of the stormwater mitigation basins, the proposed houses, and the road as per the town standards.
7. *Some runoff runs directly to Henneberry with no provision for stormwater management at all. Requires attention to address the situation.*
The stormwater mitigation facilities provided on site have been oversized to overcompensate for the stormwater runoff on the far east end of the development. The site plans and project SWPPP has been sent to Onondaga County DOT for their review; discharge to the right-of-way will be coordinated with OCDOT.
8. *Based upon spoil descriptions, bedrock is anywhere from 24 to 48 inches. Need a soils investigation and a report to confirm the entire proposed site activities. Rock was present along the Brandywine subdivision located immediately to the North.*
Additional soil investigations will be coordinated with the applicant in areas of proposed deep excavation to ensure that there will be minimal issues with bedrock.
9. *A NYSDEC Dam permit may be required for the proposed site plan. Hard to read the contours, but it will be close.*
The stage-storage for the proposed detention basin has been lowered to 8.5' from outlet to the emergency spillway. Therefore, a dam permit will not be required for a 10' impoundment of water.
10. *NOI is blank, but at this point it should be.*
Noted.
11. *Cadd files would be helpful as the drawings are too small to read accurately.*
Both hard copies and PDFs of full-size design drawings have been provided and are sufficient for review.
12. *Ownership of facilities and need for HOA may be required*
A draft of the stormwater maintenance agreement has been provided and will be coordinated with the Town prior to construction.

Any and all future comments will be addressed accordingly. If you have any questions or if you need any other additional information, please contact us.



Respectfully submitted,

NAPIERALA CONSULTING
Professional Engineer, P.C.

Christian Hill

Christian Hill
Design Engineer

STORMWATER POLLUTION PREVENTION PLAN

For the:

**Proposed Brandywine Estates – Phase 2
Henneberry Road
Town of Manlius**

Prepared for:



Your Builder for Life

**Harrington Homes, Inc
3848 Henneberry Road
Jamesville, NY 13078**

Prepared by:



110 FAYETTE STREET
MANLIUS, NEW YORK 13104

Telephone: (315) 682-5580

Fax: (315) 682-5544

Project No. 20-1906

Revised February 2022



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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)
0.498	0.498

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)
0.060	0.199



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	67.61	7.68	9.35	32.92	2.07	9.31
100-Year Storm	165.93	18.46	22.06	80.24	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

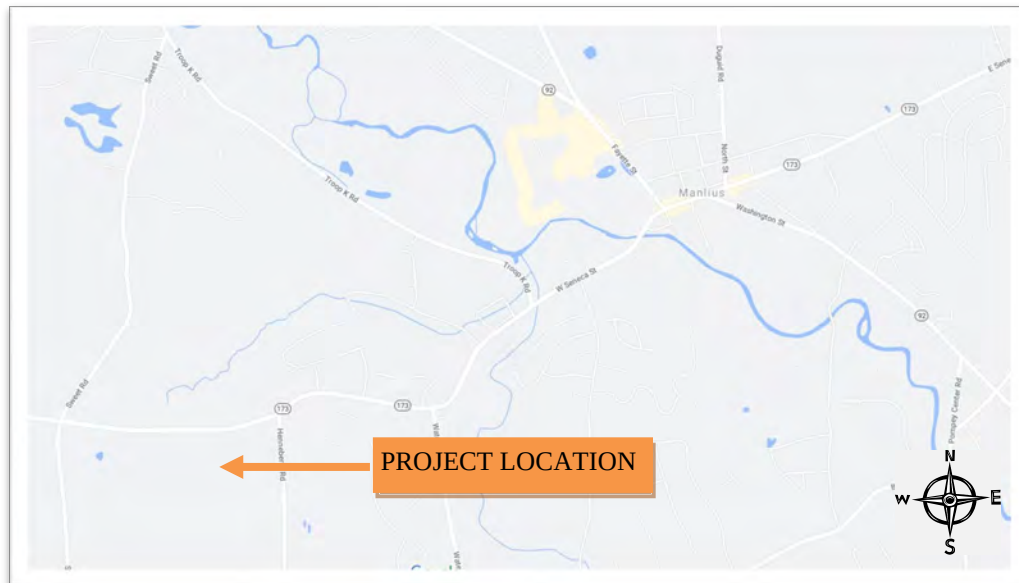


Figure 1: Site Location Map

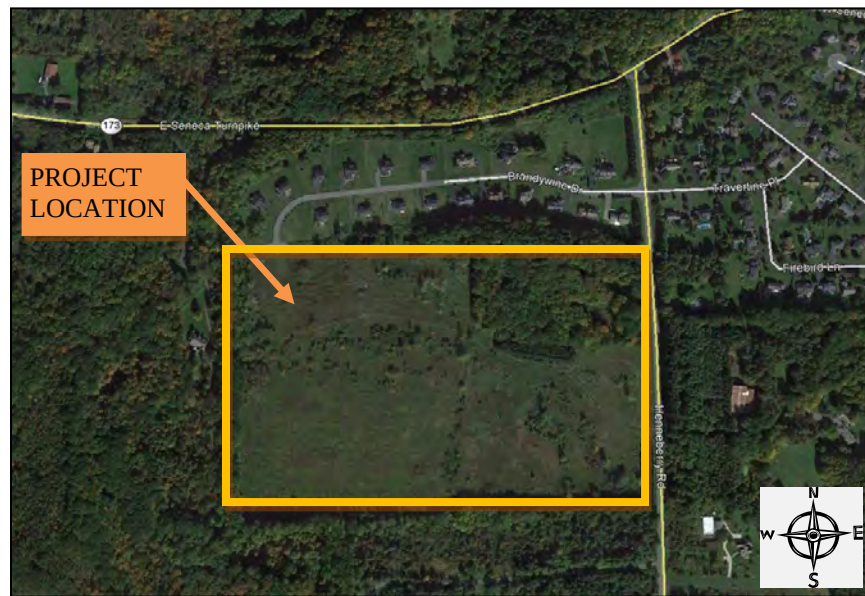


Figure 2: Proposed Site Aerial Image - Google Earth

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.

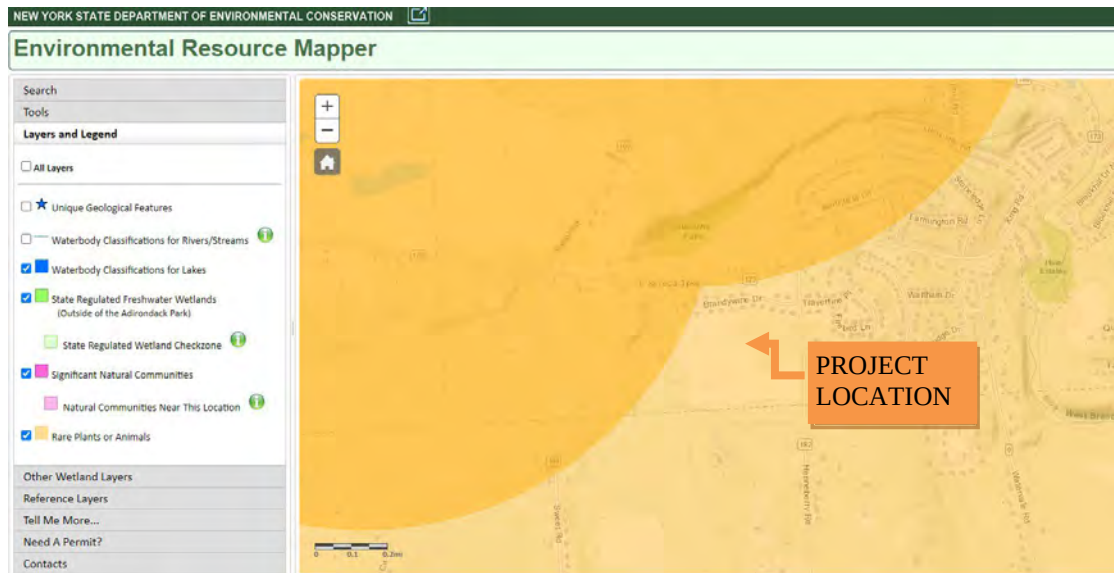


Figure 3: NYS DEC Environmental Resource Mapper

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.

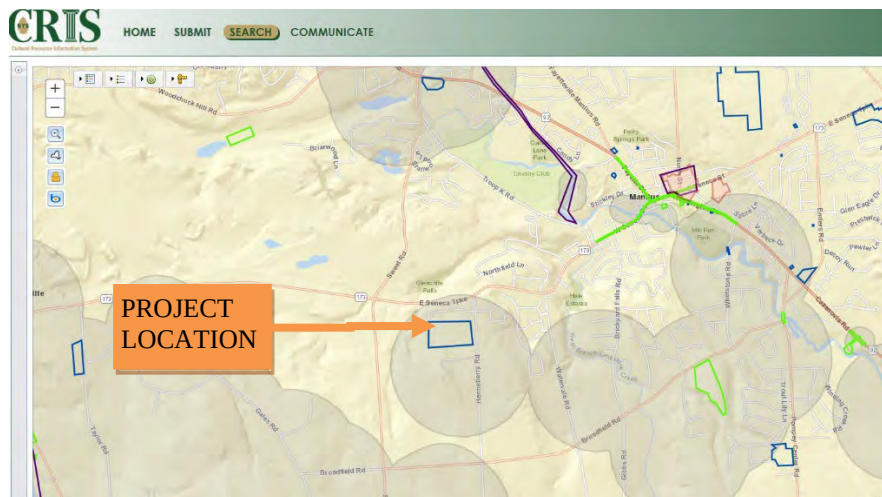


Figure 4: State Historic Preservation Office Map



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.

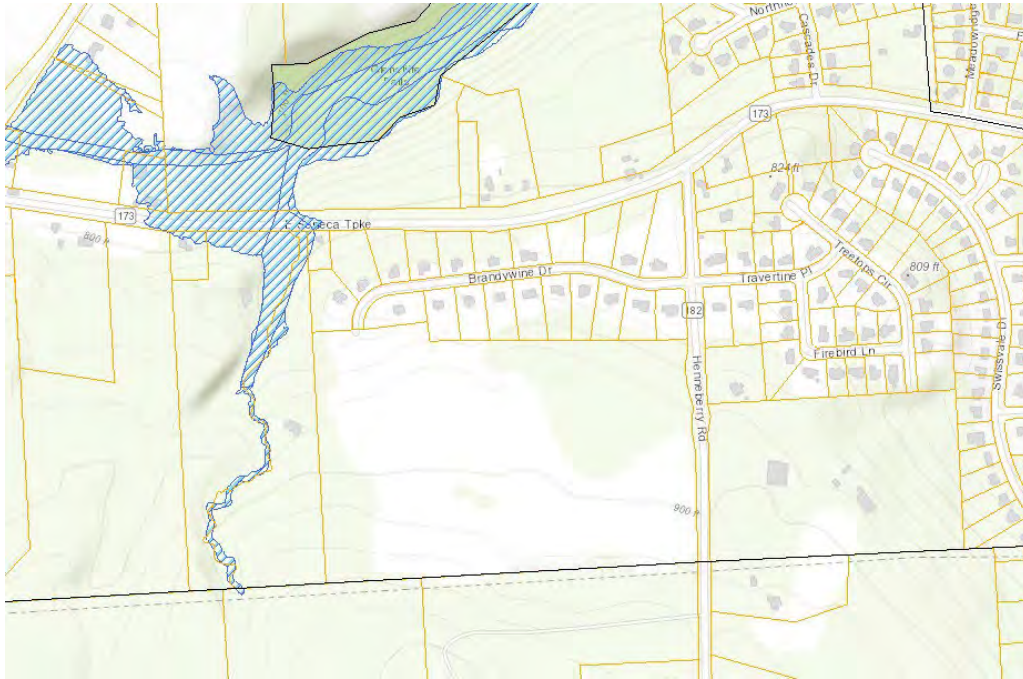


Figure 5: Onondaga County GIS Mapping



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_t)	5.78

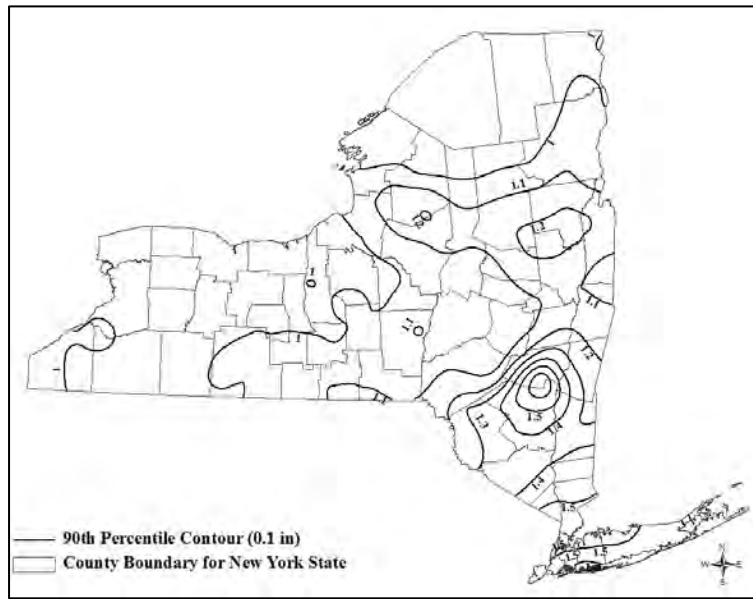


Figure 6: New York State 90% Rainfall Map

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 $\pm 3\%$ 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
17.420	80	>75% Grass cover, Good, HSG D
18.000	73	Brush, Good, HSG D
56.630	77	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.

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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
2.470	98	Paved parking, HSG D
1.870	98	Unconnected roofs, HSG D
24.080	80	>75% Grass cover, Good, HSG D
8.960	77	Woods, Good, HSG D
37.380	81	Weighted Average
33.040		88.39% Pervious Area
4.340		11.61% Impervious Area
1.870		43.09% 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	Adj	Description		
0.870	98		Paved parking, HSG D		
0.410	98		Unconnected roofs, HSG D		
4.000	80		>75% Grass cover, Good, HSG D		
2.040	77		Woods, Good, HSG D		
1.600	73		Brush, Good, HSG D		
8.920	81	80	Weighted Average, UI Adjusted		
7.640			85.65% Pervious Area		
1.280			14.35% Impervious Area		
0.410			32.03% 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
3.230	80	>75% Grass cover, Good, HSG D
8.910	77	Woods, Good, HSG D
0.200	98	Paved parking, HSG D
2.660	73	Brush, Good, HSG D
15.000	77	Weighted Average
14.800		98.67% Pervious Area
0.200		1.33% 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
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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.

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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:

	<u>Applicable</u>	<u>Not Applicable</u>
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:

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

$$WQ_v = \frac{PR_v A}{12}$$

90-th Percentile Rainfall (P) = 1.0 inch

Drainage Area (A) = 37.38 acres

Impervious Area (A_I) = 2.47 acres

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

$$R_v = 0.05 + 0.9(0.066)$$

$$R_v = 0.109$$

therefore:

$$WQ_v = \frac{1.0 \cdot 0.109 \cdot 37.38}{12}$$

$$\boxed{\text{Total WQ}_v \text{ Required} = 0.340 \text{ ac} \cdot \text{ft (14,800 cf)}}$$

2. Minimum RR_v requirements

Calculate minimum required Runoff Reduction Volume (RR_v) for DA-1A, 1B, & 1C using:

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

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

$$RR_v = \frac{1.0(0.95)(0.20)(2.47)}{12}$$

$$\boxed{\text{Total Minimum RR}_v \text{ required} = 0.039 \text{ ac} \cdot \text{ft (1,705 cf)}}$$

3. 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.

$$WQ_v = \frac{PR_v A}{12}$$

90-th Percentile Rainfall (P) = 1.0 inch

Drainage Area (A) = 13.72 acres

Impervious Area (A_I) = 1.34 acres (Total from DA-1B and DA-3)

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

$$R_v = 0.05 + 0.9(0.098)$$

$$R_v = 0.138$$

therefore:

$$WQ_v = \frac{1.0 \cdot 0.138 \cdot 13.72}{12}$$

$$\boxed{\text{Total WQ}_v \text{ Required} = 0.158 \text{ ac} \cdot \text{ft (6,870 cf)}}$$



4. Minimum RR_v requirements

Calculate minimum required Runoff Reduction Volume (RR_v) for DA-1A, 1B, & 1C using:

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

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

$$RR_v = \frac{1.0(0.95)(0.20)(1.34)}{12}$$

Total Minimum RR_v required = 0.021 ac·ft (925 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 (ft²)

WQ_v = Water Quality Volume (ft³)

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)

$$A_f = \frac{(14,800 \text{ ft}^3)(2.5 \text{ ft})}{\left(0.5 \frac{\text{ft}}{\text{day}}\right)(0.25 \text{ ft} + 2.5 \text{ ft})(2 \text{ days})}$$

Total A_f = 13,455 ft² *required*

Total A_f provided = 13,500 ft²

Therefore,

$WQ_v = 14,800 \text{ ft}^3$ (0.340 ac·ft) *Provided*

The RR_v provided is calculated as follows:

Bioretention areas in C and D soils have a RR_v factor of $0.4 \cdot WQ_v$.

$$RR_v = 0.4 \cdot 14,800 \text{ ft}^3$$

RR_v provided = 5,920 ft³ = 0.136 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 (ft²)
- WQ_v = Water Quality Volume (ft³)
- 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)

$$A_f = \frac{(6,870 \text{ ft}^3)(2.5 \text{ ft})}{\left(0.5 \frac{\text{ft}}{\text{day}}\right)(0.25 \text{ ft} + 2.5 \text{ ft})(2 \text{ days})}$$

Total A_f = 6,245 ft² *required*

Total A_f provided = 6,250 ft²

Therefore,

$WQ_v = 6,870 \text{ ft}^3$ (0.158 ac·ft) *Provided*

The RR_v provided is calculated as follows:

Bioretention areas in C and D soils have a RR_v factor of $0.4 \cdot WQ_v$.

$$RR_v = 0.4 \cdot 6,870 \text{ ft}^3$$

$$\mathbf{RR_v \text{ provided} = 2,750 \text{ ft}^3 = 0.063 \text{ ac} \cdot \text{ft}}$$

Diversion Structure Design

Peak Runoff Rate During WQ_v Event

Using the methodology outlined in Appendix D.10 of the Stormwater Manual :

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

Where,

- CN = the computed runoff curve number
- P = rainfall, in inches (P=1.0")
- Q = runoff volume (= P R_v), in inches

$$P = 1.00''$$

$$R_v = 0.114 \text{ (from above)}$$

$$CN = \frac{1000}{10 + (5 \cdot 1.00) + (10 \cdot 1.00 \cdot 0.114) - 10\sqrt{(0.114 \cdot 1.00)^2 + 1.25(0.114 \cdot 1.00 \cdot 1.00)}}$$

$$CN = 82$$



Time of Concentration, t_c , is 21.1 minutes

From Table 4-1 of the SCS TR-55, the initial abstraction, I_a , for a watershed with a curve number of 82 is 0.439.

$$\frac{I_a}{P} = \frac{0.439}{1.00}$$

$$\frac{I_a}{P} = 0.439$$

Using the I_a/P and the time of concentration, the unit peak discharge, q_u , is found to be 400 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 ($P \cdot R_v$)

$$Q_p = 400 \frac{\text{csm}}{\text{in}} \times \frac{8.92 \text{ acres}}{\frac{640 \text{ ac}}{\text{mi}^2}} \times (1.00 \cdot 0.109)$$

$$Q_p = 0.61 \text{ cfs}$$

Inverts of Structure

$$Q = C_d \cdot A \sqrt{2gH}$$

$$0.61 \text{ cfs} = 0.6 \cdot \frac{\pi \left(\frac{6}{12}\right)^2}{4} \sqrt{2 \left(32.2 \frac{\text{ft}}{\text{sec}^2}\right) H}$$

$$H = 0.42 \text{ ft}$$

G. CHANNEL PROTECTION VOLUME (CP_v)

The proposed project must provide sufficient storage of the channel protection volume (CP_v), 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 = 47.38 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

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

$$V_s = (0.59) 2.450 \text{ ac} \cdot \text{ft} \text{ (total tributary from HydroCAD)}$$

$$V_s = 1.44 \text{ ac} \cdot \text{ft} \text{ (62,725 cf)}$$

CPv required = CPv - RRv Provided

$$\text{CPv required} = 62,725 \text{ ft}^3 - 8,670 \text{ ft}^3 = \mathbf{54,055 \text{ ft}^3 \text{ required}}$$

CPv Provided in Bioretention #1 = 11,608 ft³

CPv Provided in Bioretention #2 = 4,491 ft³

CPv Provided in Detention #1 = 40,512 ft³

Total CPv = 56,610 ft³ 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

Point of Study	Existing Peak Runoff Rate (cfs)			Proposed Peak Runoff Rate (cfs)		
	Pt. 1	Pt. 2	Pt. 3	Pt. 1	Pt. 2	Pt. 3
10-Year Storm	67.61	7.68	9.35	32.92	2.07	9.31
100-Year Storm	165.93	18.46	22.06	80.24	4.70	21.06

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
863.50	1,285	0	0
864.00	11,100	3,096	3,096
865.00	18,820	14,960	18,056
866.00	21,020	19,920	37,976
867.00	23,280	22,150	60,126
868.00	25,590	24,435	84,561
869.00	27,960	26,775	111,336
870.00	30,390	29,175	140,511
871.00	32,875	31,633	172,144
872.00	35,415	34,145	206,289
873.00	38,010	36,713	243,001

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	863.50'	30.0" Round Culvert L= 98.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 863.50' / 857.00' S= 0.0663 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 4.91 sf
#3	Device 2	863.50'	7.0" Vert. Orifice1 C= 0.600 Limited to weir flow at low heads
#4	Device 2	866.00'	32.0" W x 18.0" H Vert. Orifice2 C= 0.600 Limited to weir flow at low heads
#5	Device 2	868.10'	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 request, 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.

- An effort will be made to store only enough products required to do the job.
- 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.
- Products will be kept in their original containers with the original manufacturer's label in legible condition.
- Substances will not be mixed with one another unless recommended by the manufacturer.
- Whenever possible, all of a product will be used up before disposing of the container.
- Manufacturer's recommendations for proper use and disposal will be followed.
- 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.

- Products will be kept in original containers with the original labels in legible condition.
- Original labels and material safety data sheets (MSDS's) will be procured and used for each material.
- 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

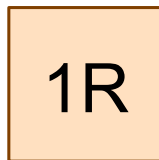
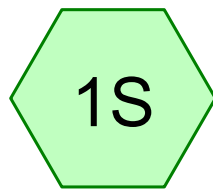
The New York State Department of Environmental Conservation requires that the operator and the contractor make certifications of knowledge of the contents of this SWPPP and agreement to follow the SWPPP. The terms of the General Permit also require that each contractor sign the SWPPP plan, thereby making 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.



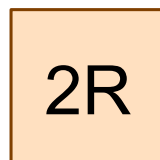
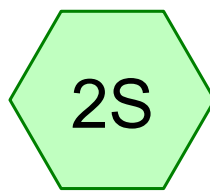
APPENDIX A: HYDRO CAD – EXISTING CONDITIONS



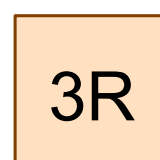
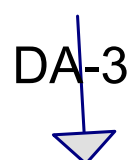
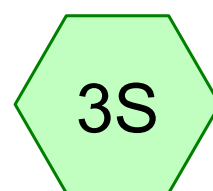
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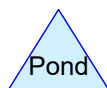
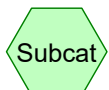
Pt of Study 1



Pt of Study 2



Pt of Study 3



Routing Diagram for Existing Drainage Areas

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Existing Drainage Areas

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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

Existing Drainage Areas

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Type II 24-hr 1-yr Rainfall=2.04"

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Summary for Subcatchment 1S: DA-1

Runoff = 19.91 cfs @ 12.27 hrs, Volume= 1.941 af, Depth> 0.41"
 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
17.420	80	>75% Grass cover, Good, HSG D
18.000	73	Brush, Good, HSG D
56.630	77	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			

Existing Drainage Areas

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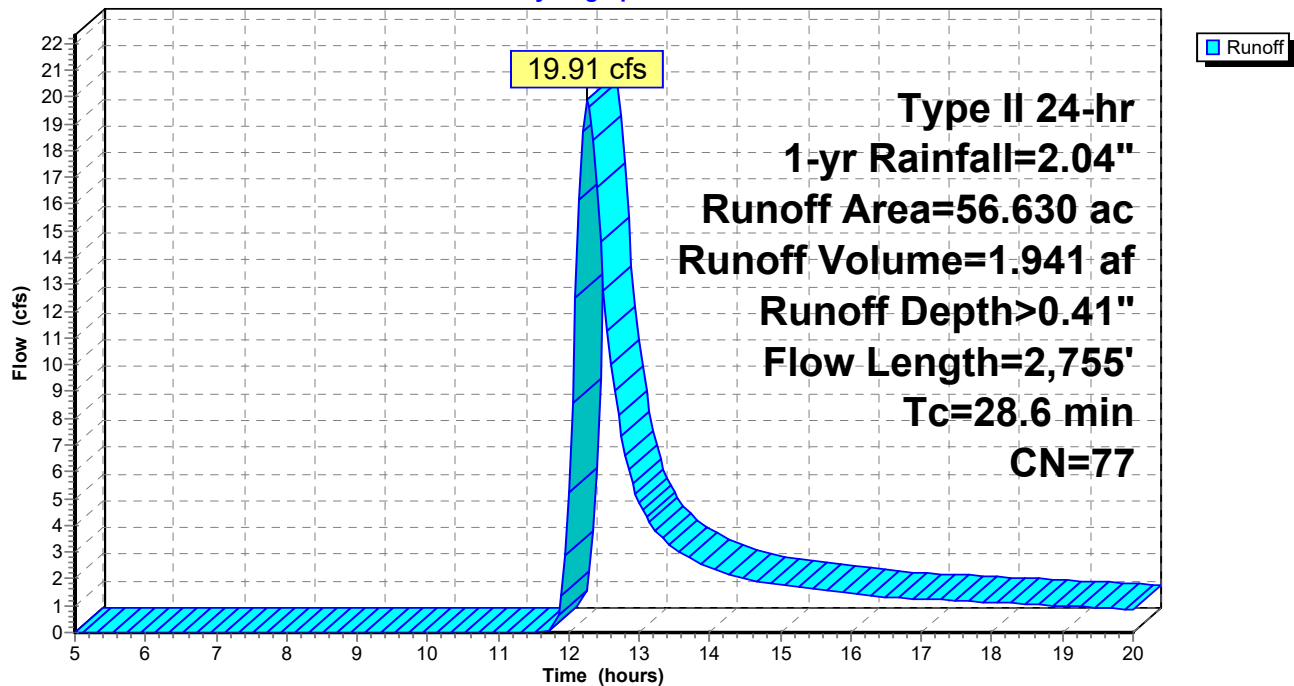
Type II 24-hr 1-yr Rainfall=2.04"

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Subcatchment 1S: DA-1

Hydrograph



Existing Drainage Areas

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Type II 24-hr 1-yr Rainfall=2.04"

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Summary for Subcatchment 2S: DA-2

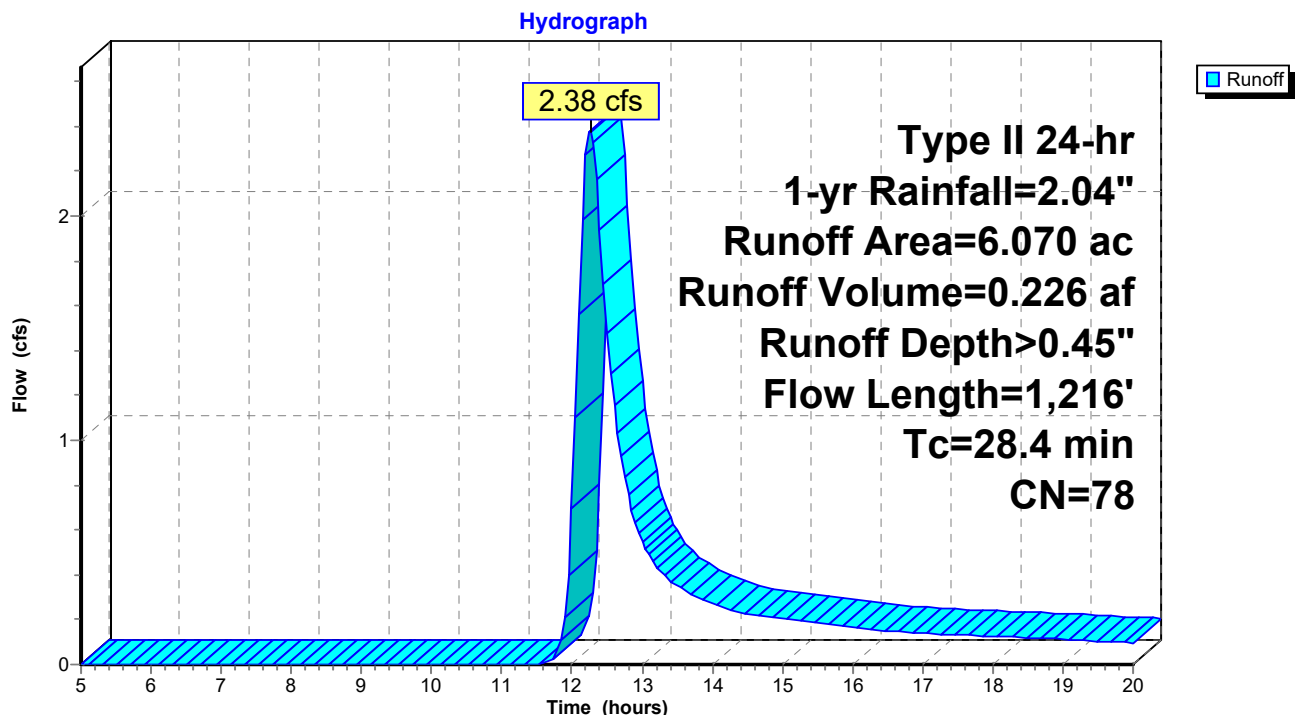
Runoff = 2.38 cfs @ 12.26 hrs, Volume= 0.226 af, Depth> 0.45"
Routed to Reach 2R : Pt of Study 2

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



Existing Drainage Areas

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Type II 24-hr 1-yr Rainfall=2.04"

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Summary for Subcatchment 3S: DA-3

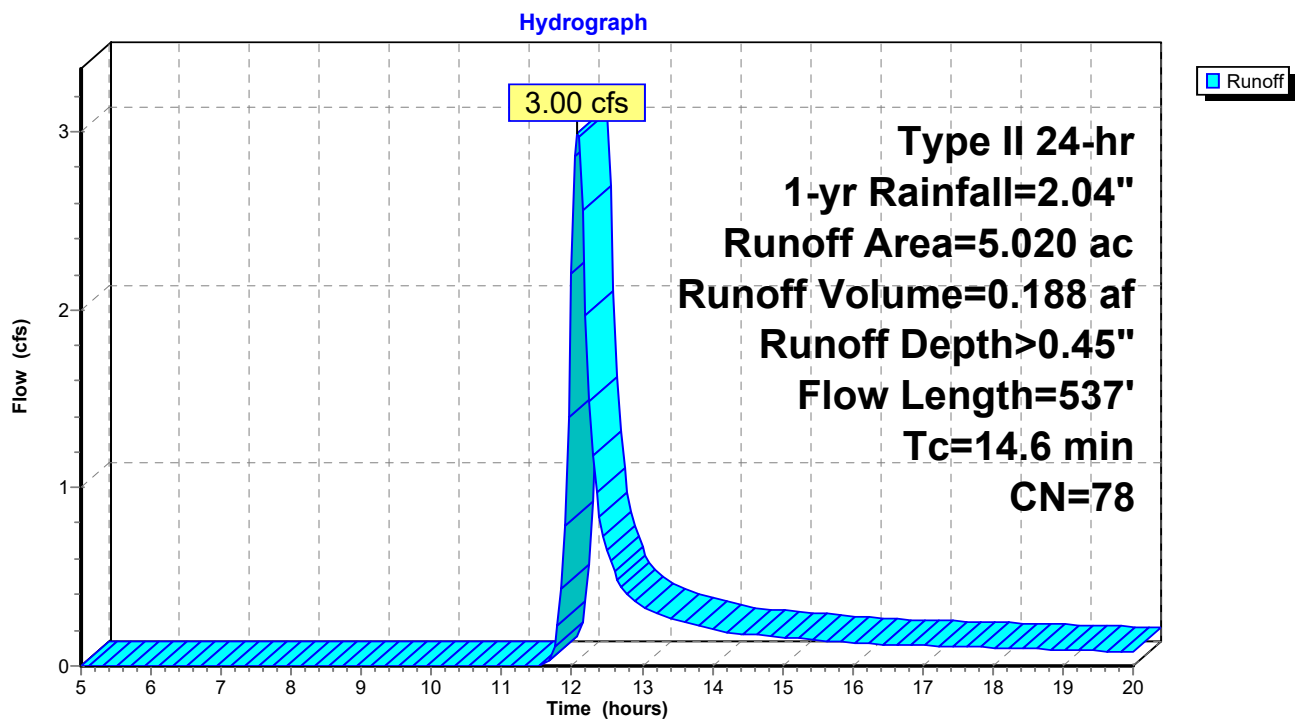
Runoff = 3.00 cfs @ 12.09 hrs, Volume= 0.188 af, Depth> 0.45"
Routed to Reach 3R : Pt of Study 3

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



Existing Drainage Areas

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Type II 24-hr 1-yr Rainfall=2.04"

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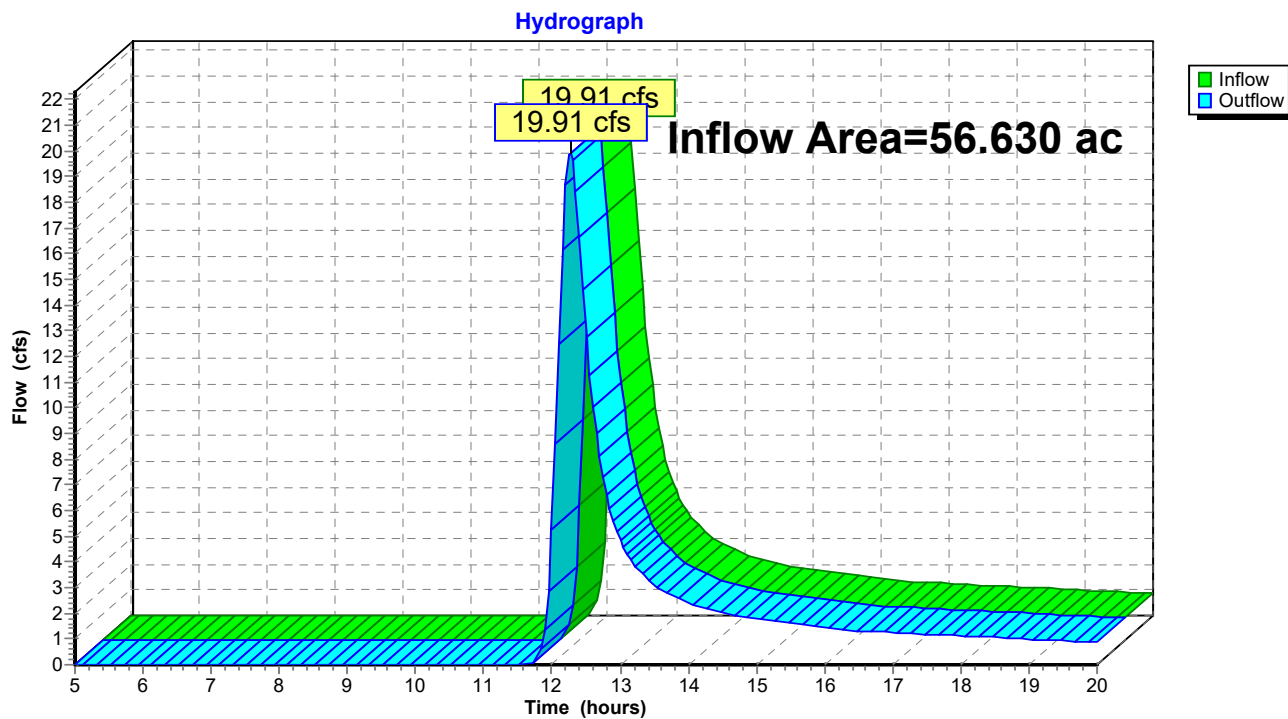
Page 7

Summary for Reach 1R: Pt of Study 1

Inflow Area = 56.630 ac, 0.00% Impervious, Inflow Depth > 0.41" for 1-yr event
Inflow = 19.91 cfs @ 12.27 hrs, Volume= 1.941 af
Outflow = 19.91 cfs @ 12.27 hrs, Volume= 1.941 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



Existing Drainage Areas

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Type II 24-hr 1-yr Rainfall=2.04"

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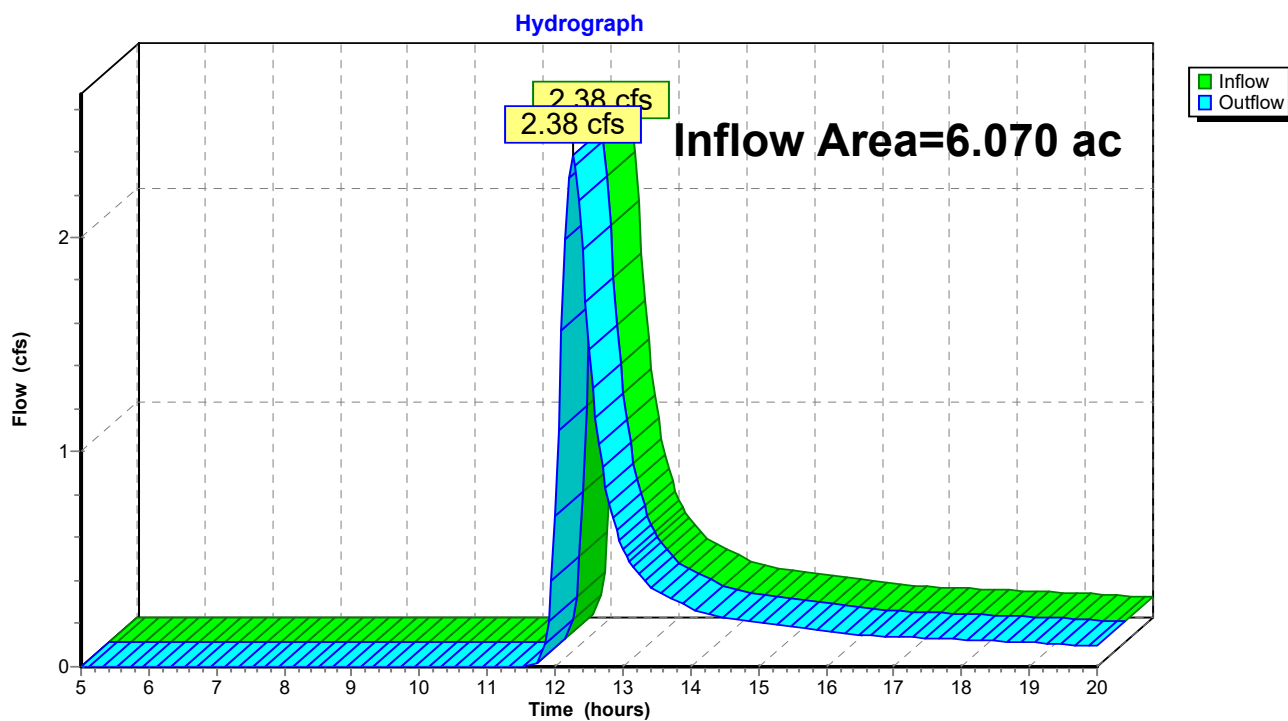
Page 8

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



Existing Drainage Areas

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Type II 24-hr 1-yr Rainfall=2.04"

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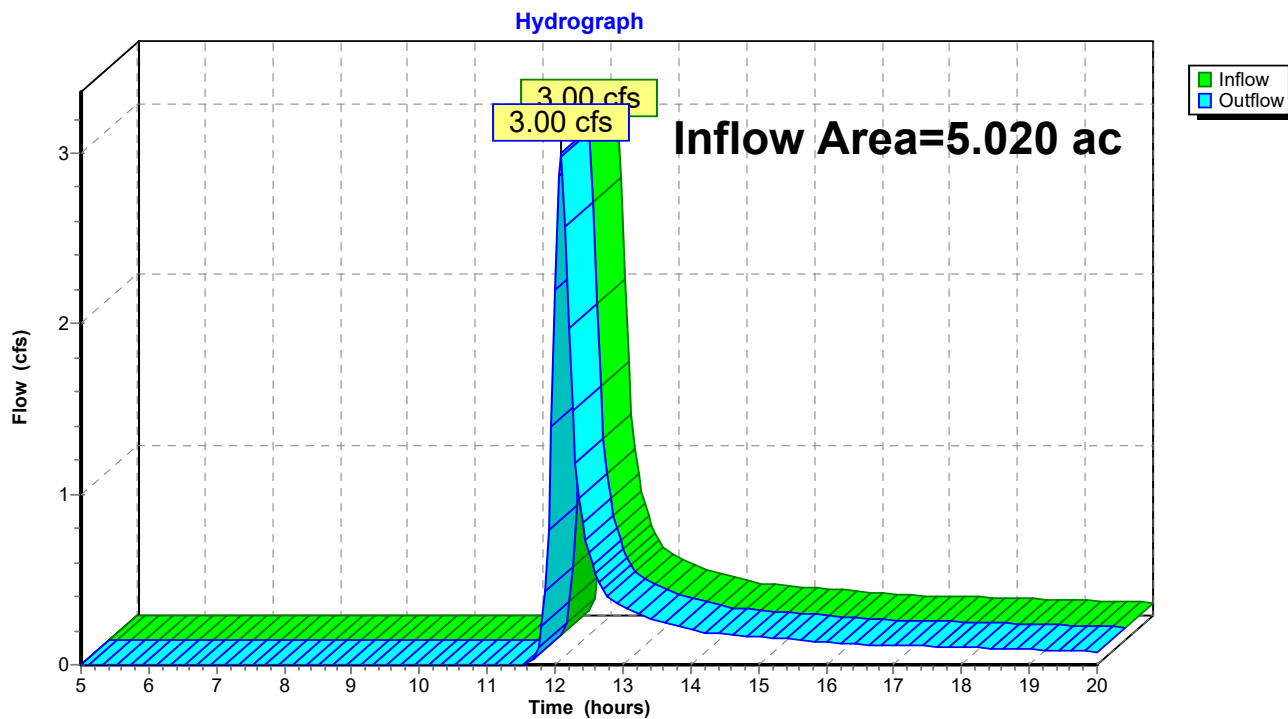
Page 9

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



Existing Drainage Areas

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Type II 24-hr 10-yr Rainfall=3.43"

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Summary for Subcatchment 1S: DA-1

Runoff = 67.61 cfs @ 12.24 hrs, Volume= 5.874 af, Depth> 1.24"
 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
17.420	80	>75% Grass cover, Good, HSG D
18.000	73	Brush, Good, HSG D
56.630	77	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			

Existing Drainage Areas

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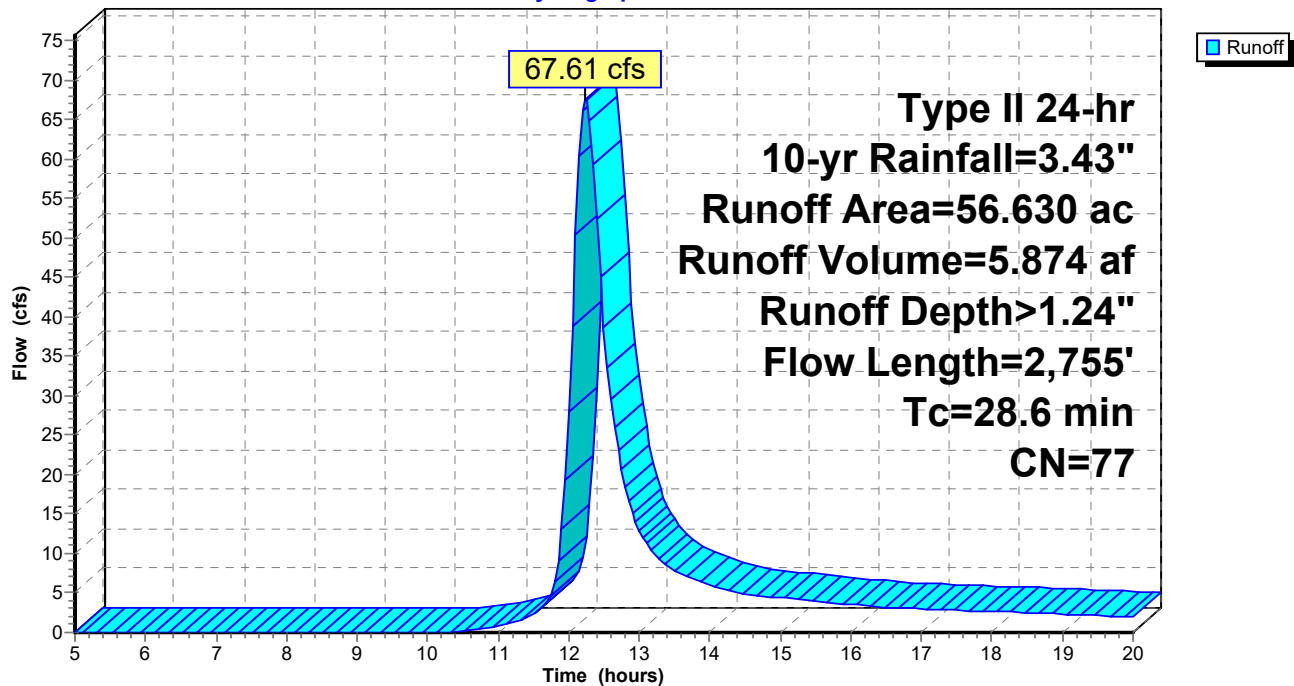
Type II 24-hr 10-yr Rainfall=3.43"

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Subcatchment 1S: DA-1

Hydrograph



Existing Drainage Areas

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Type II 24-hr 10-yr Rainfall=3.43"

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Summary for Subcatchment 2S: DA-2

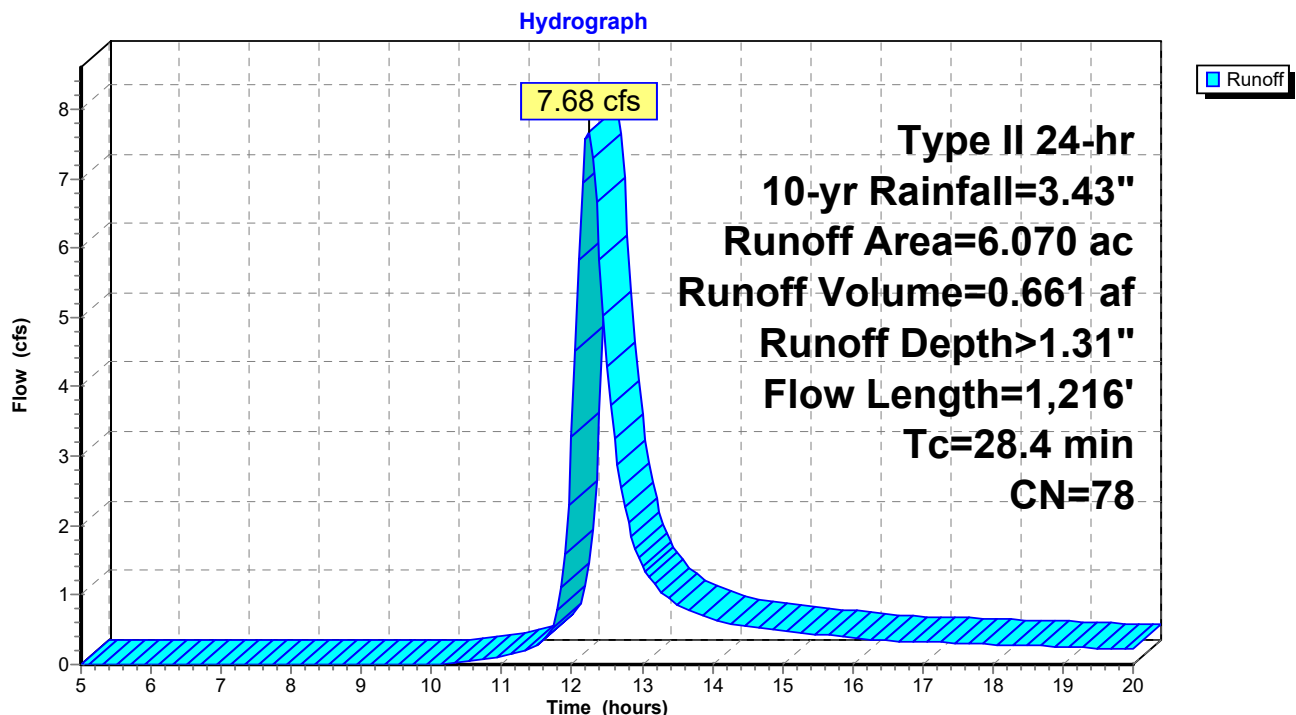
Runoff = 7.68 cfs @ 12.23 hrs, Volume= 0.661 af, Depth> 1.31"
Routed to Reach 2R : Pt of Study 2

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



Existing Drainage Areas

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Type II 24-hr 10-yr Rainfall=3.43"

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Summary for Subcatchment 3S: DA-3

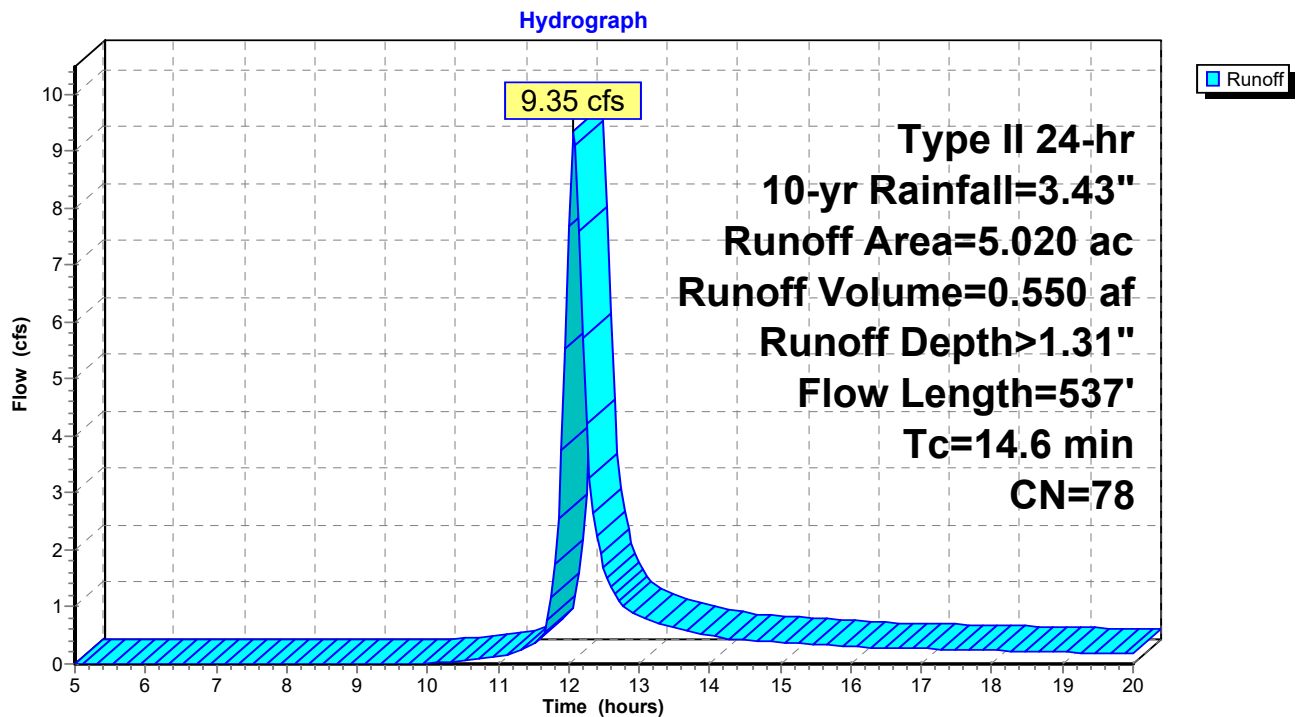
Runoff = 9.35 cfs @ 12.07 hrs, Volume= 0.550 af, Depth> 1.31"
Routed to Reach 3R : Pt of Study 3

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



Existing Drainage Areas

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Type II 24-hr 10-yr Rainfall=3.43"

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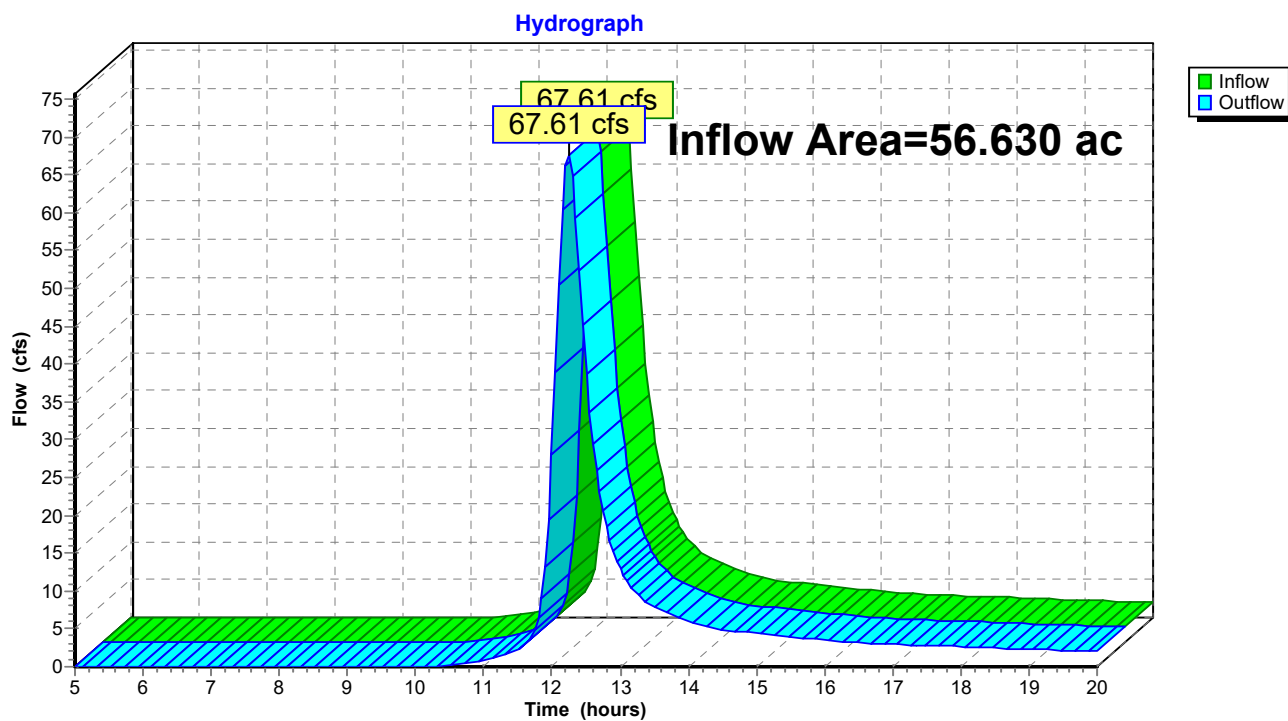
Page 14

Summary for Reach 1R: Pt of Study 1

Inflow Area = 56.630 ac, 0.00% Impervious, Inflow Depth > 1.24" for 10-yr event
Inflow = 67.61 cfs @ 12.24 hrs, Volume= 5.874 af
Outflow = 67.61 cfs @ 12.24 hrs, Volume= 5.874 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



Existing Drainage Areas

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Type II 24-hr 10-yr Rainfall=3.43"

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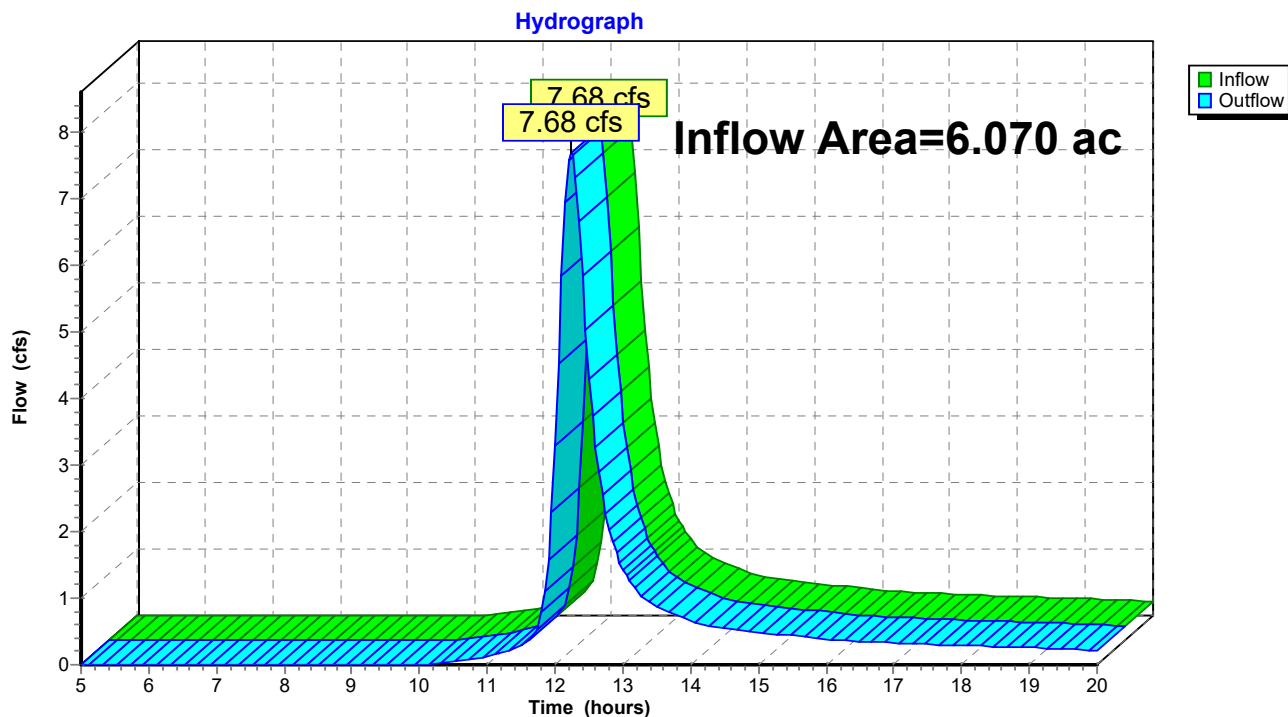
Page 15

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



Existing Drainage Areas

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Type II 24-hr 10-yr Rainfall=3.43"

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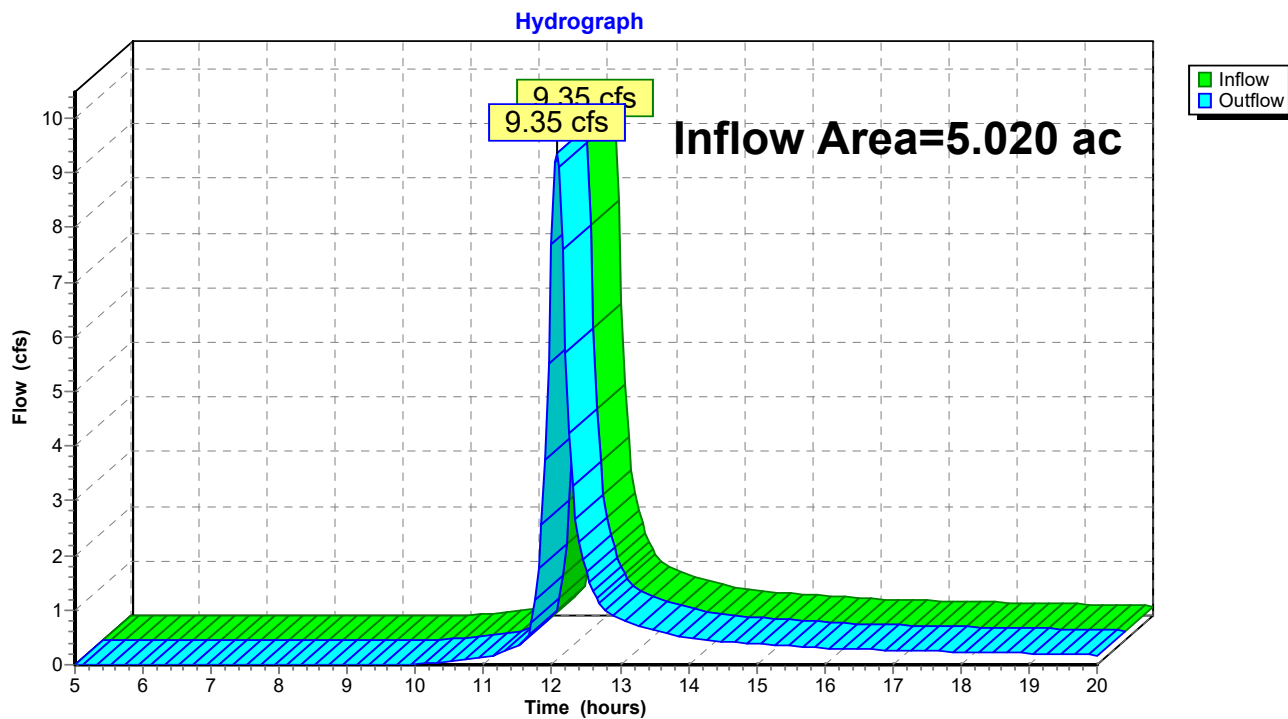
Page 16

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



Existing Drainage Areas

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Type II 24-hr 100-yr Rainfall=5.78"

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Summary for Subcatchment 1S: DA-1

Runoff = 165.93 cfs @ 12.23 hrs, Volume= 14.254 af, Depth> 3.02"
 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
17.420	80	>75% Grass cover, Good, HSG D
18.000	73	Brush, Good, HSG D
56.630	77	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			

Existing Drainage Areas

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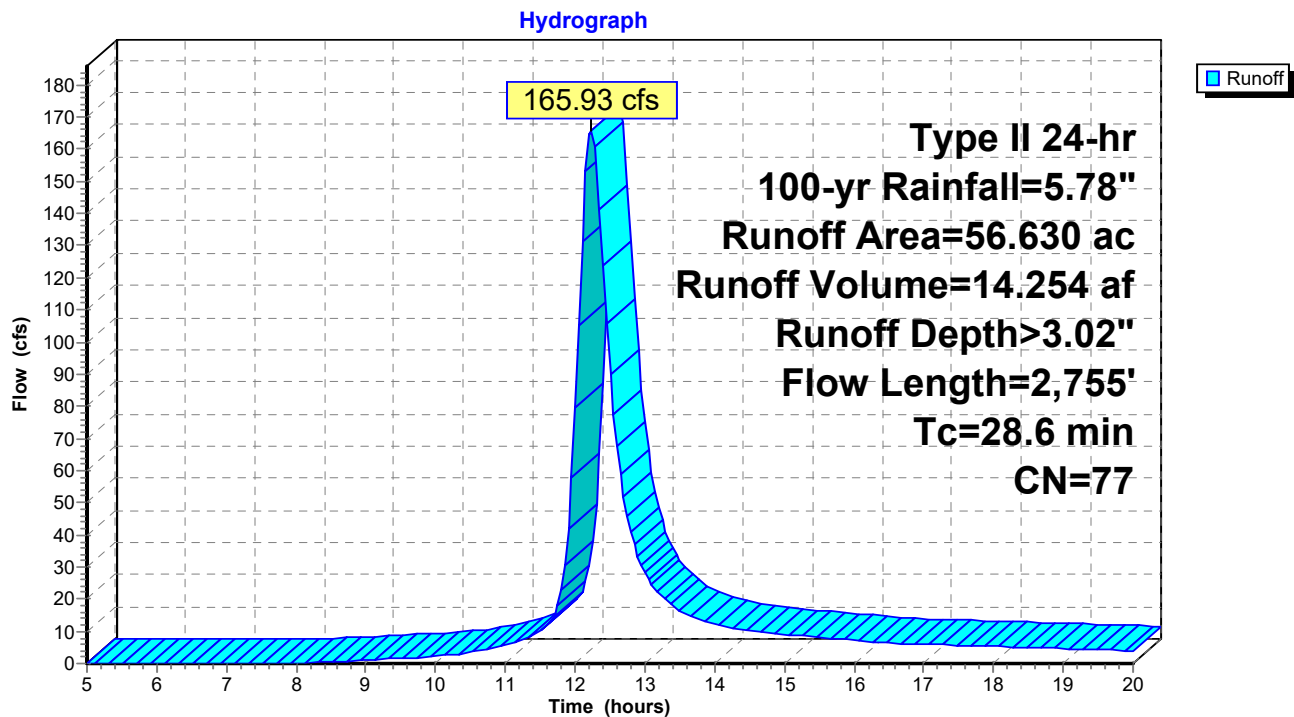
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Type II 24-hr 100-yr Rainfall=5.78"

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Subcatchment 1S: DA-1



Existing Drainage Areas

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Type II 24-hr 100-yr Rainfall=5.78"

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Summary for Subcatchment 2S: DA-2

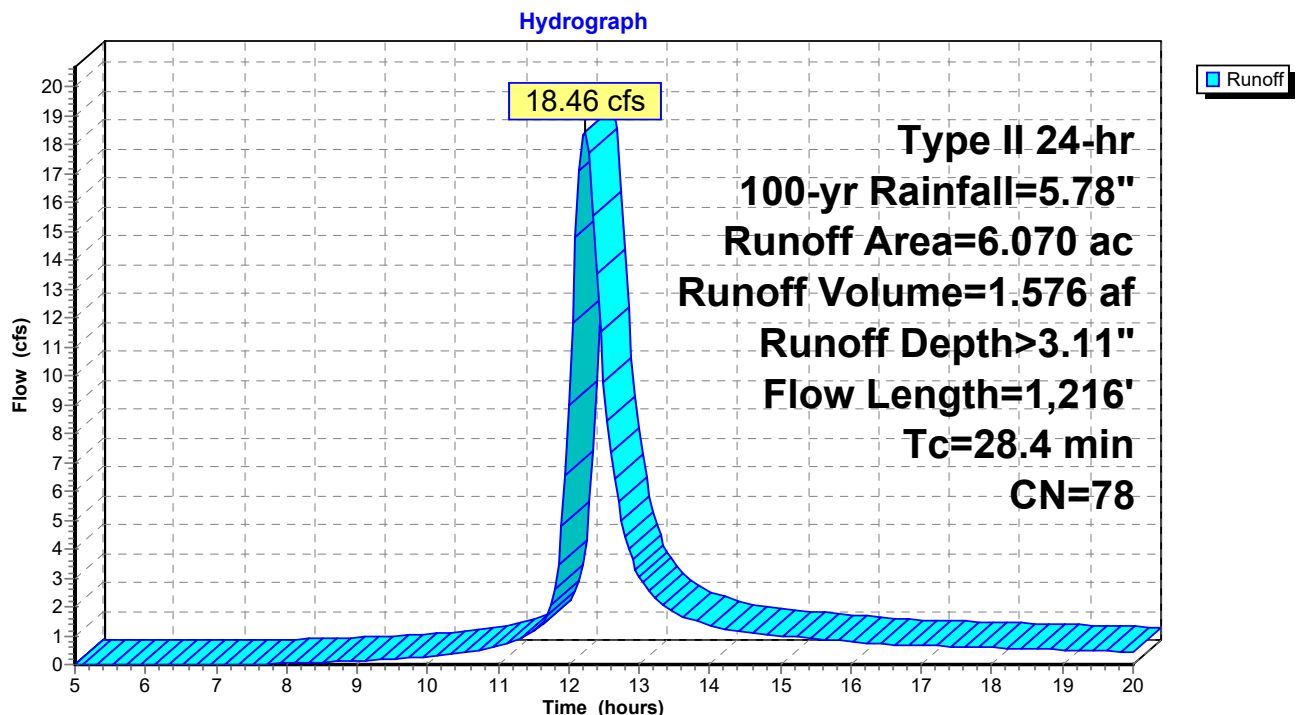
Runoff = 18.46 cfs @ 12.22 hrs, Volume= 1.576 af, Depth> 3.11"
Routed to Reach 2R : Pt of Study 2

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



Existing Drainage Areas

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Type II 24-hr 100-yr Rainfall=5.78"

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Summary for Subcatchment 3S: DA-3

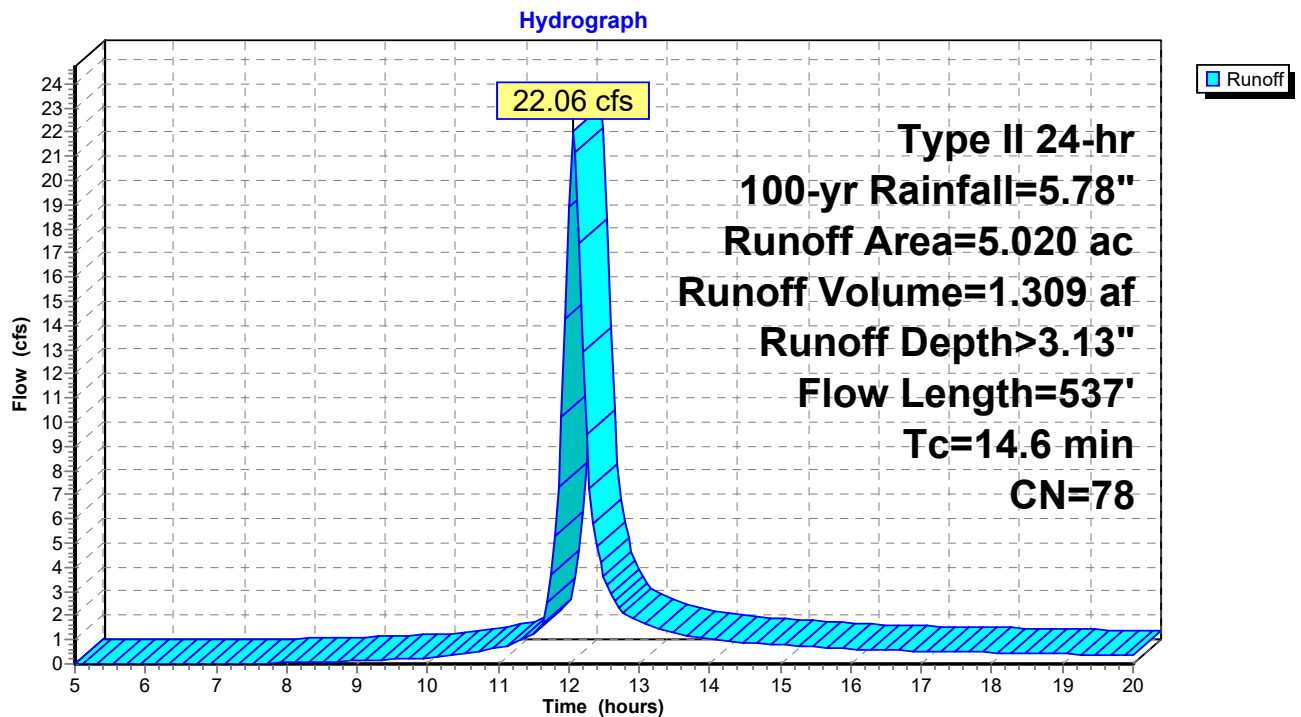
Runoff = 22.06 cfs @ 12.07 hrs, Volume= 1.309 af, Depth> 3.13"
Routed to Reach 3R : Pt of Study 3

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



Existing Drainage Areas

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Type II 24-hr 100-yr Rainfall=5.78"

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Summary for Reach 1R: Pt of Study 1

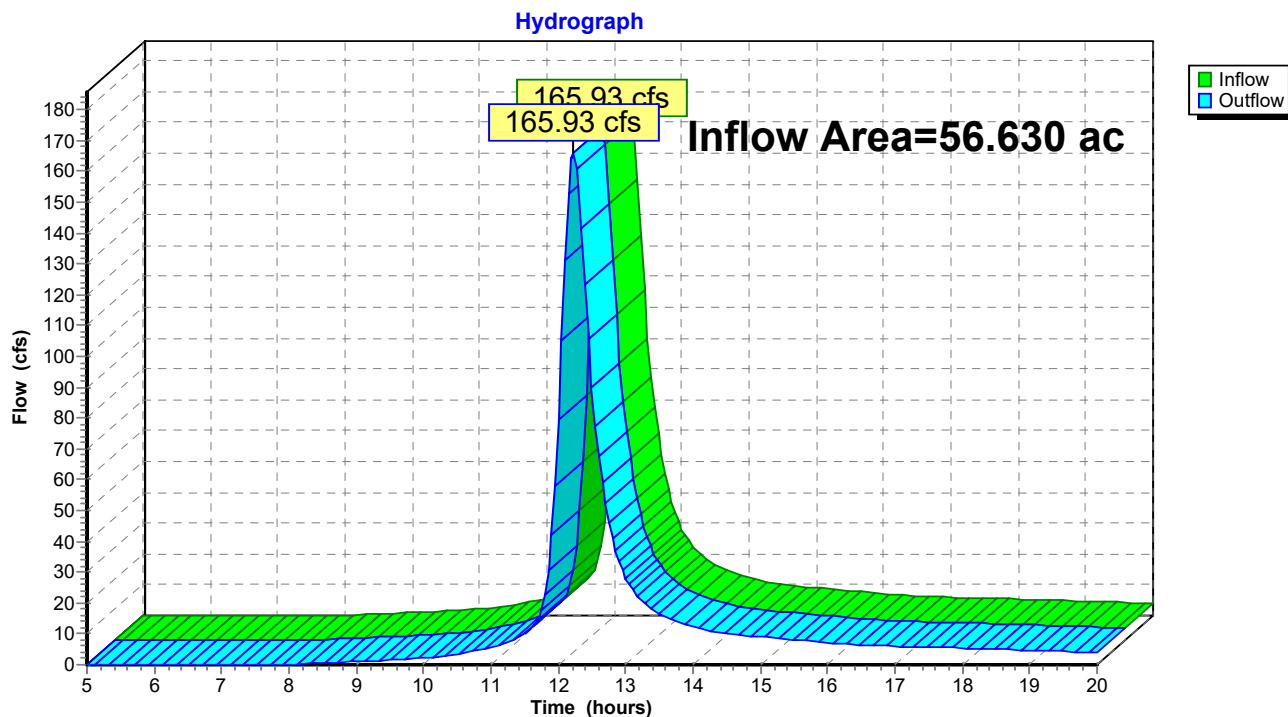
Inflow Area = 56.630 ac, 0.00% Impervious, Inflow Depth > 3.02" for 100-yr event

Inflow = 165.93 cfs @ 12.23 hrs, Volume= 14.254 af

Outflow = 165.93 cfs @ 12.23 hrs, Volume= 14.254 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



Existing Drainage Areas

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Type II 24-hr 100-yr Rainfall=5.78"

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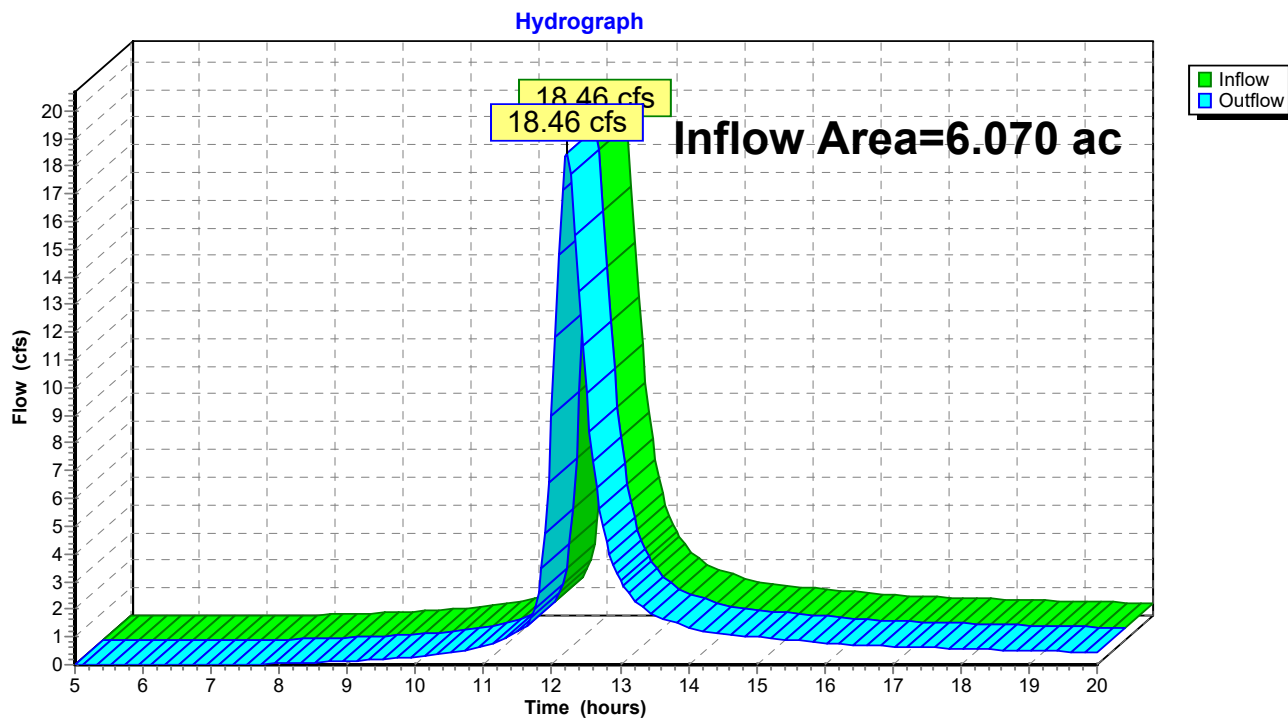
Page 22

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



Existing Drainage Areas

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Type II 24-hr 100-yr Rainfall=5.78"

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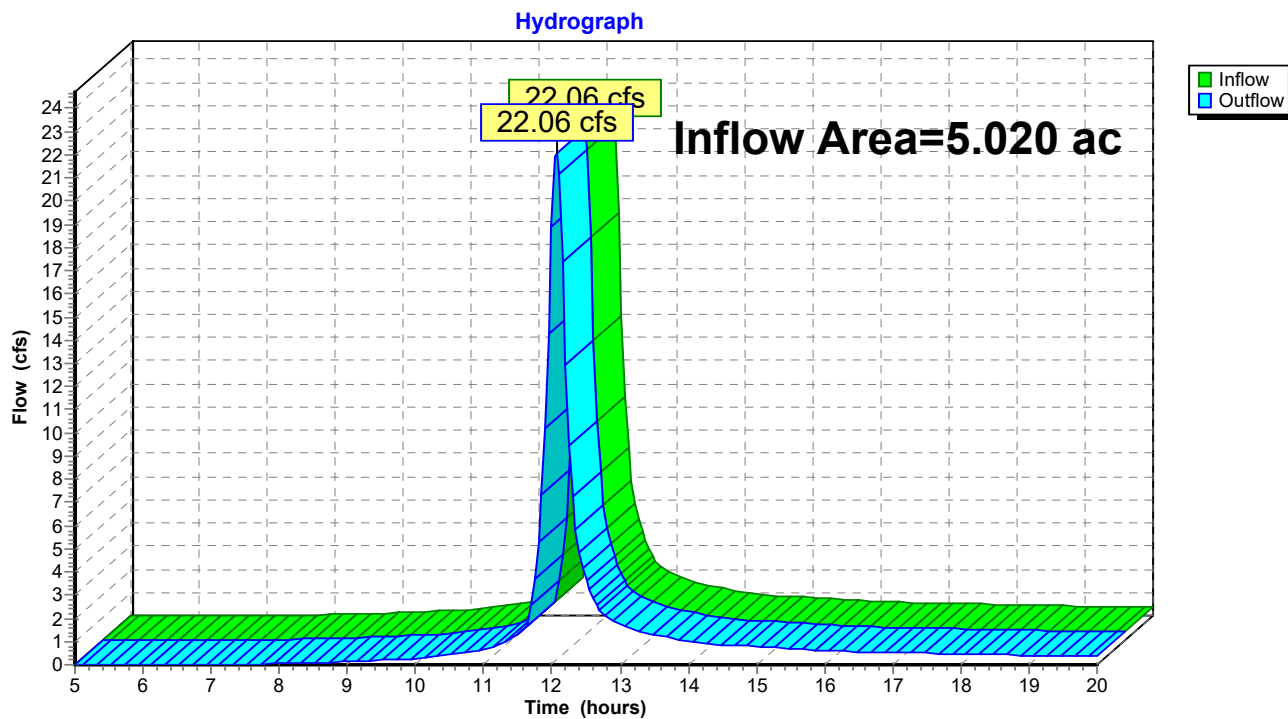
Page 23

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





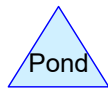
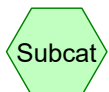
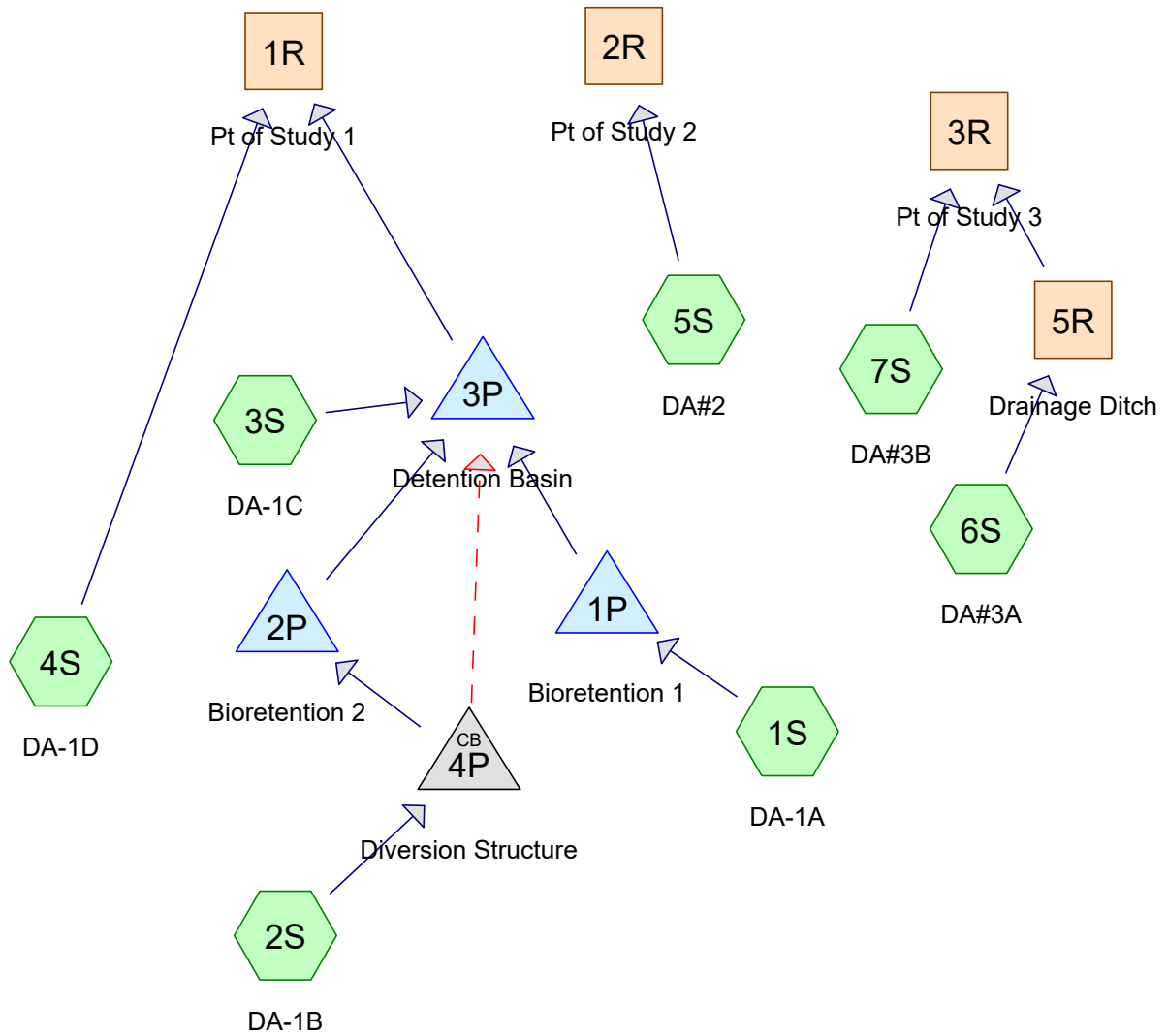
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APPENDIX B: HYDRO CAD – PROPOSED CONDITIONS



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Proposed Drainage Areas

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Page 2

Rainfall Events Listing (selected events)

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

Proposed Drainage Areas

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Type II 24-hr 1-yr Rainfall=2.04"

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Page 3

Summary for Subcatchment 1S: DA-1A

Runoff = 15.26 cfs @ 12.40 hrs, Volume= 1.963 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
2.470	98	Paved parking, HSG D
1.870	98	Unconnected roofs, HSG D
24.080	80	>75% Grass cover, Good, HSG D
8.960	77	Woods, Good, HSG D
37.380	81	Weighted Average
33.040		88.39% Pervious Area
4.340		11.61% Impervious Area
1.870		43.09% 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			

Proposed Drainage Areas

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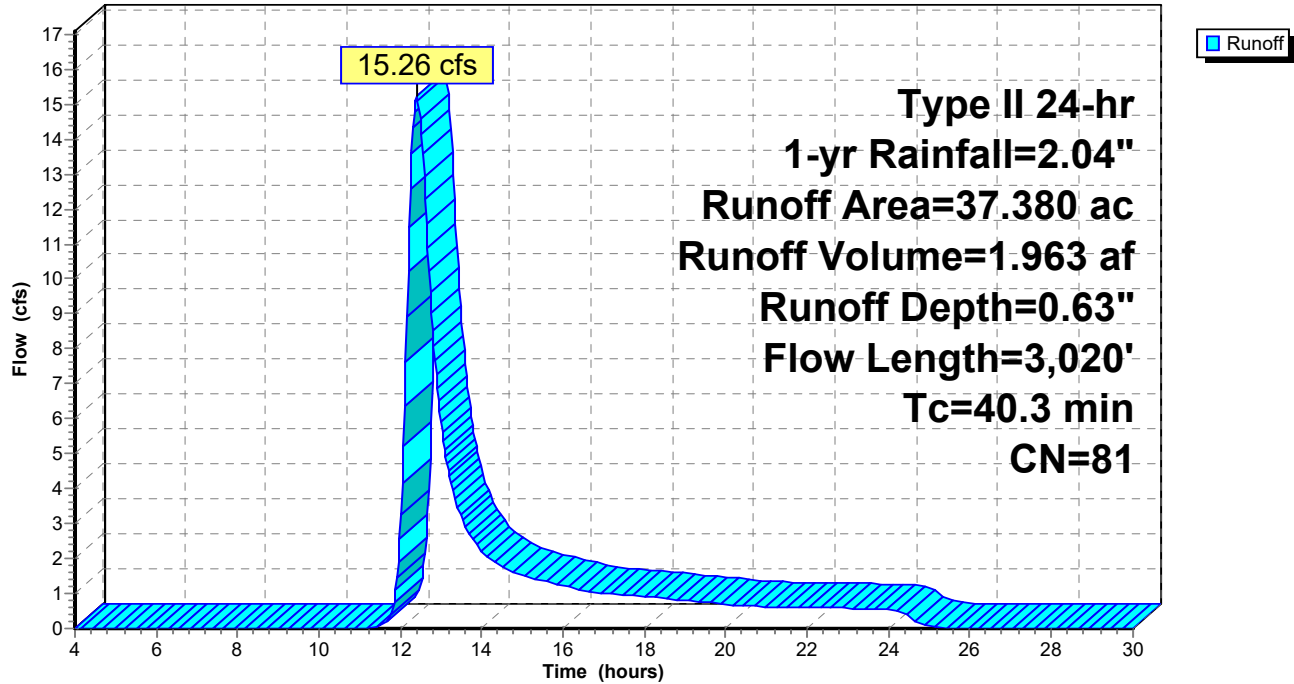
Type II 24-hr 1-yr Rainfall=2.04"

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Subcatchment 1S: DA-1A

Hydrograph



Proposed Drainage Areas

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Type II 24-hr 1-yr Rainfall=2.04"

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Page 5

Summary for Subcatchment 2S: DA-1B

Runoff = 5.19 cfs @ 12.16 hrs, Volume= 0.436 af, Depth= 0.59"
Routed to Pond 4P : Diversion Structure

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
0.870	98		Paved parking, HSG D
0.410	98		Unconnected roofs, HSG D
4.000	80		>75% Grass cover, Good, HSG D
2.040	77		Woods, Good, HSG D
1.600	73		Brush, Good, HSG D
8.920	81	80	Weighted Average, UI Adjusted
7.640			85.65% Pervious Area
1.280			14.35% Impervious Area
0.410			32.03% 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			

Proposed Drainage Areas

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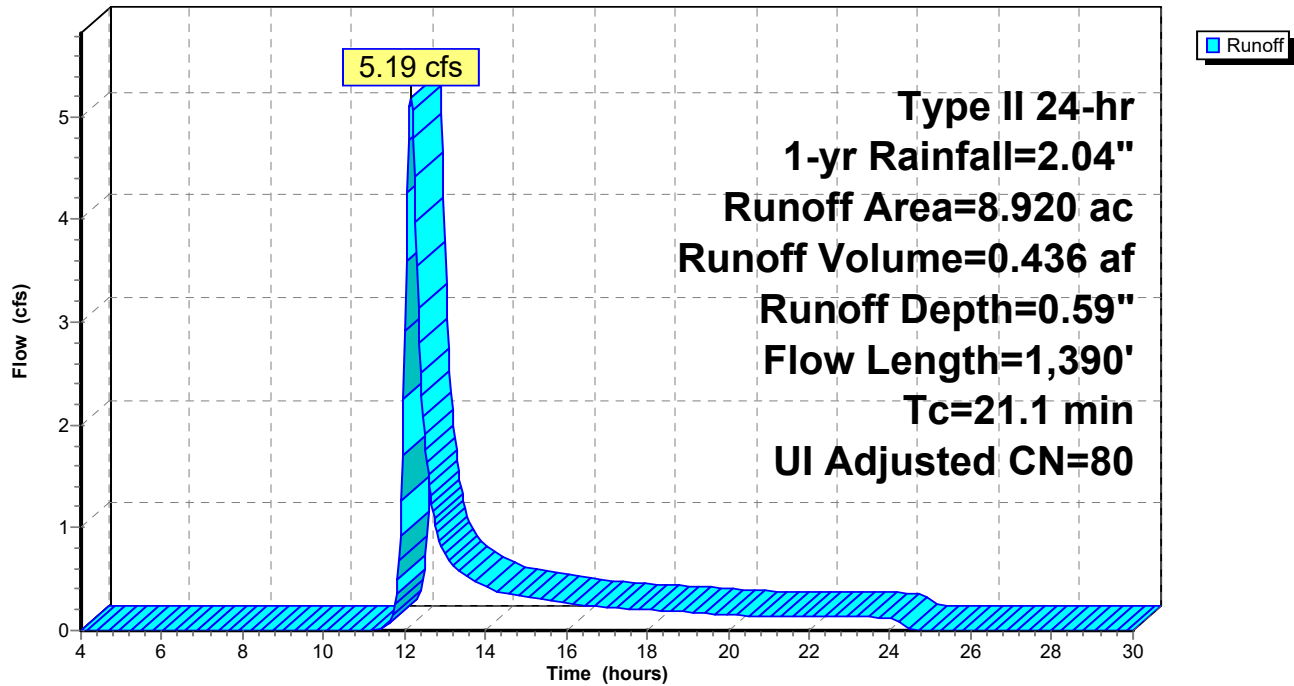
Type II 24-hr 1-yr Rainfall=2.04"

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Subcatchment 2S: DA-1B

Hydrograph



Proposed Drainage Areas

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Type II 24-hr 1-yr Rainfall=2.04"

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Summary for Subcatchment 3S: DA-1C

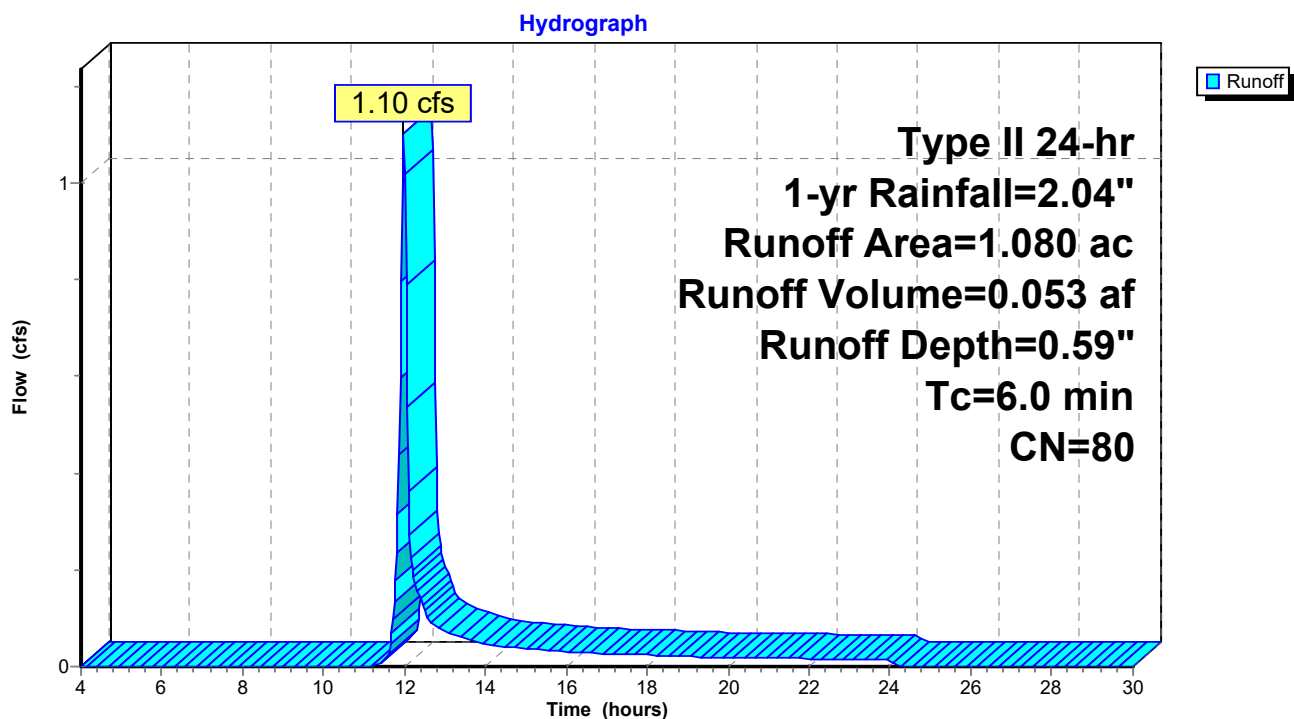
Runoff = 1.10 cfs @ 11.98 hrs, Volume= 0.053 af, Depth= 0.59"
Routed to Pond 3P : Detention Basin

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



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Type II 24-hr 1-yr Rainfall=2.04"

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Summary for Subcatchment 4S: DA-1D

Runoff = 4.26 cfs @ 12.40 hrs, Volume= 0.587 af, Depth= 0.47"
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
3.230	80	>75% Grass cover, Good, HSG D
8.910	77	Woods, Good, HSG D
0.200	98	Paved parking, HSG D
2.660	73	Brush, Good, HSG D
15.000	77	Weighted Average
14.800		98.67% Pervious Area
0.200		1.33% 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			

Proposed Drainage Areas

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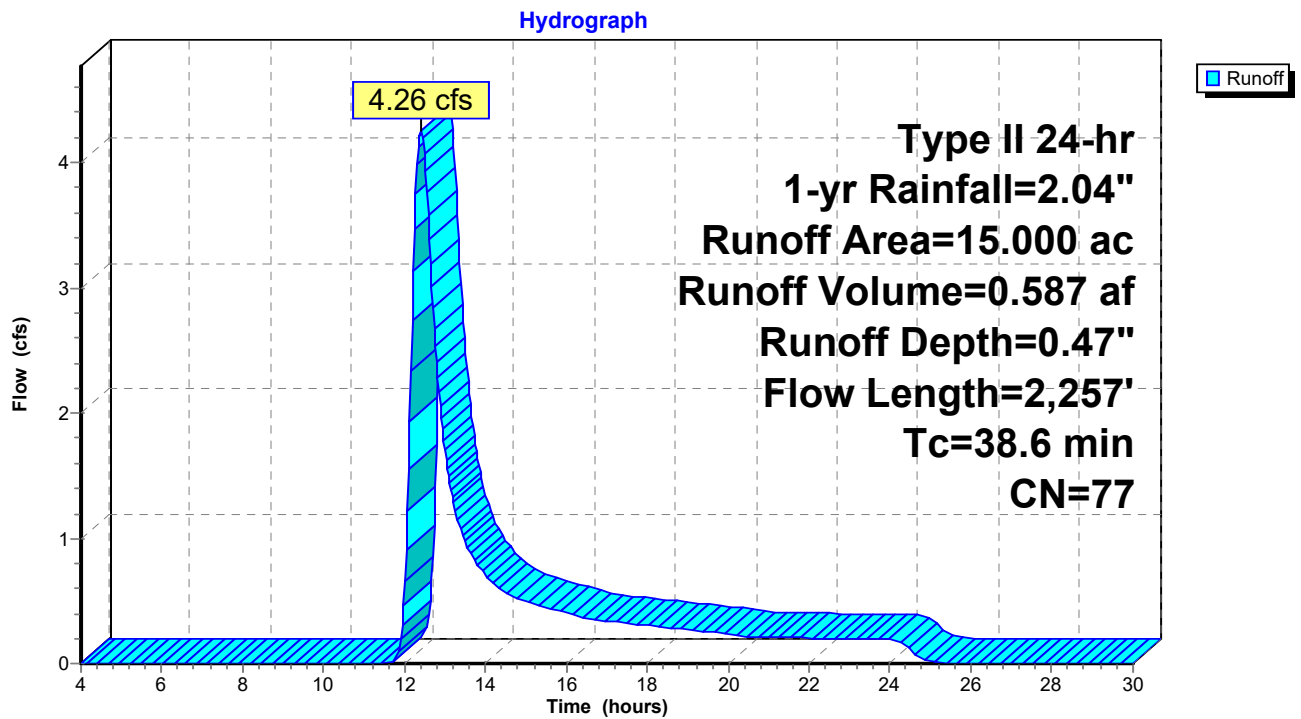
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Type II 24-hr 1-yr Rainfall=2.04"

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Subcatchment 4S: DA-1D



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Type II 24-hr 1-yr Rainfall=2.04"

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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

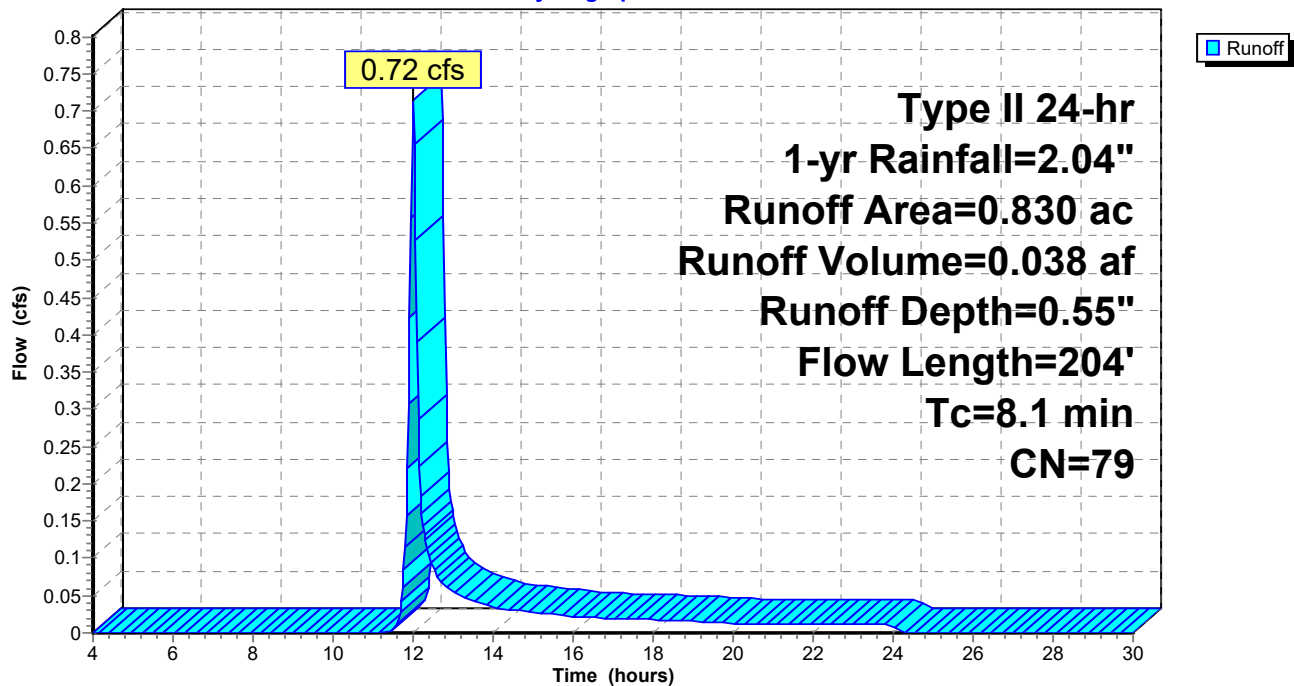
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 4.00-30.01 hrs, dt= 0.03 hrs
Type II 24-hr 1-yr Rainfall=2.04"

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

Hydrograph



Proposed Drainage Areas

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Type II 24-hr 1-yr Rainfall=2.04"

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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
0.900	80		>75% Grass cover, Good, HSG D
0.200	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
1.930			87.73% Pervious Area
0.270			12.27% Impervious Area
0.070			25.93% 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			

Proposed Drainage Areas

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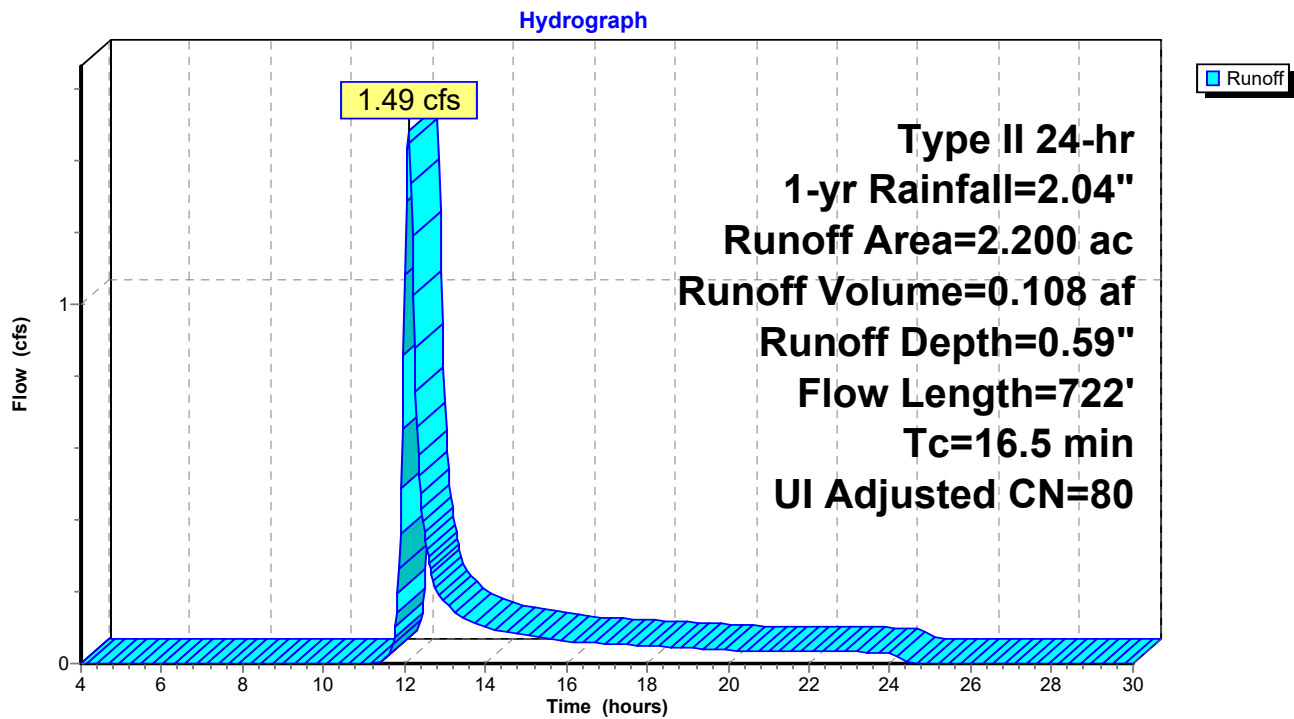
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Type II 24-hr 1-yr Rainfall=2.04"

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Subcatchment 6S: DA#3A



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Type II 24-hr 1-yr Rainfall=2.04"

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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
2.190	80		>75% Grass cover, Good, HSG D
0.270	98		Paved parking, HSG D
0.140	98		Unconnected roofs, HSG D
2.600	83	82	Weighted Average, UI Adjusted
2.190			84.23% Pervious Area
0.410			15.77% Impervious Area
0.140			34.15% 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			

Proposed Drainage Areas

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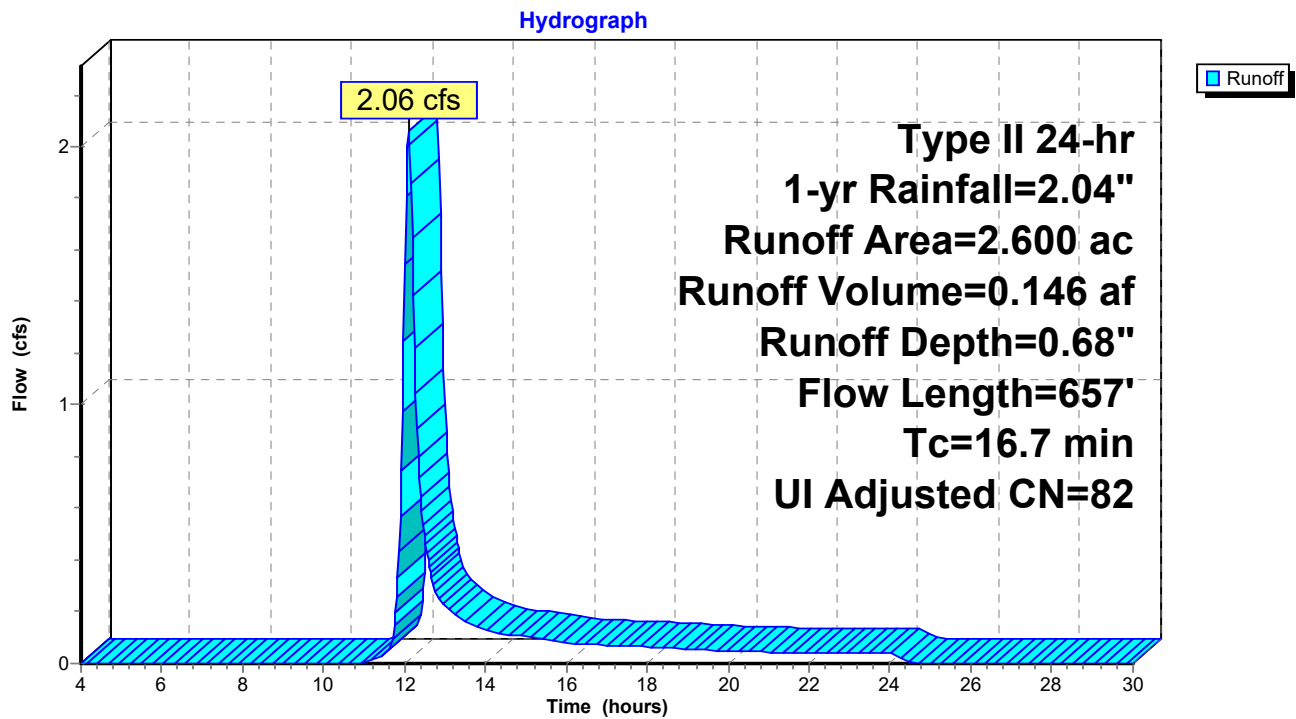
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Type II 24-hr 1-yr Rainfall=2.04"

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Subcatchment 7S: DA#3B



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Type II 24-hr 1-yr Rainfall=2.04"

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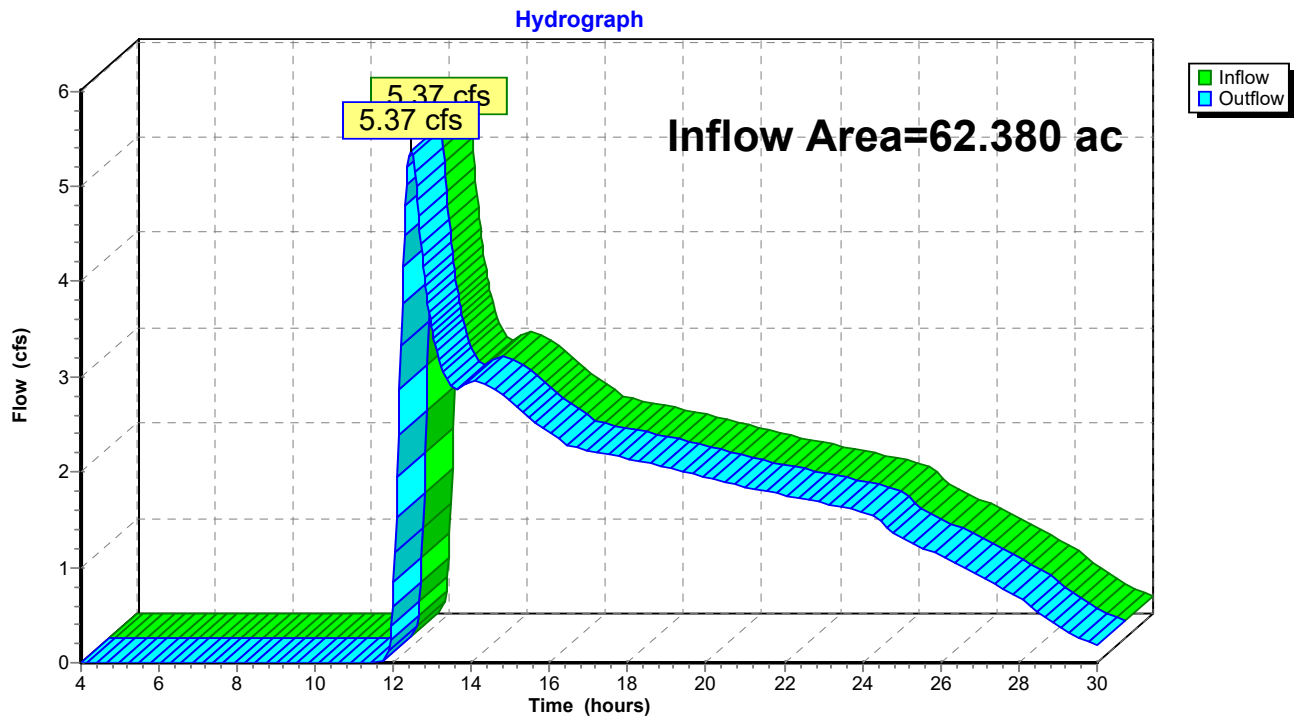
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Summary for Reach 1R: Pt of Study 1

Inflow Area = 62.380 ac, 9.33% Impervious, Inflow Depth > 0.53" for 1-yr event
Inflow = 5.37 cfs @ 12.45 hrs, Volume= 2.764 af
Outflow = 5.37 cfs @ 12.45 hrs, Volume= 2.764 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



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Type II 24-hr 1-yr Rainfall=2.04"

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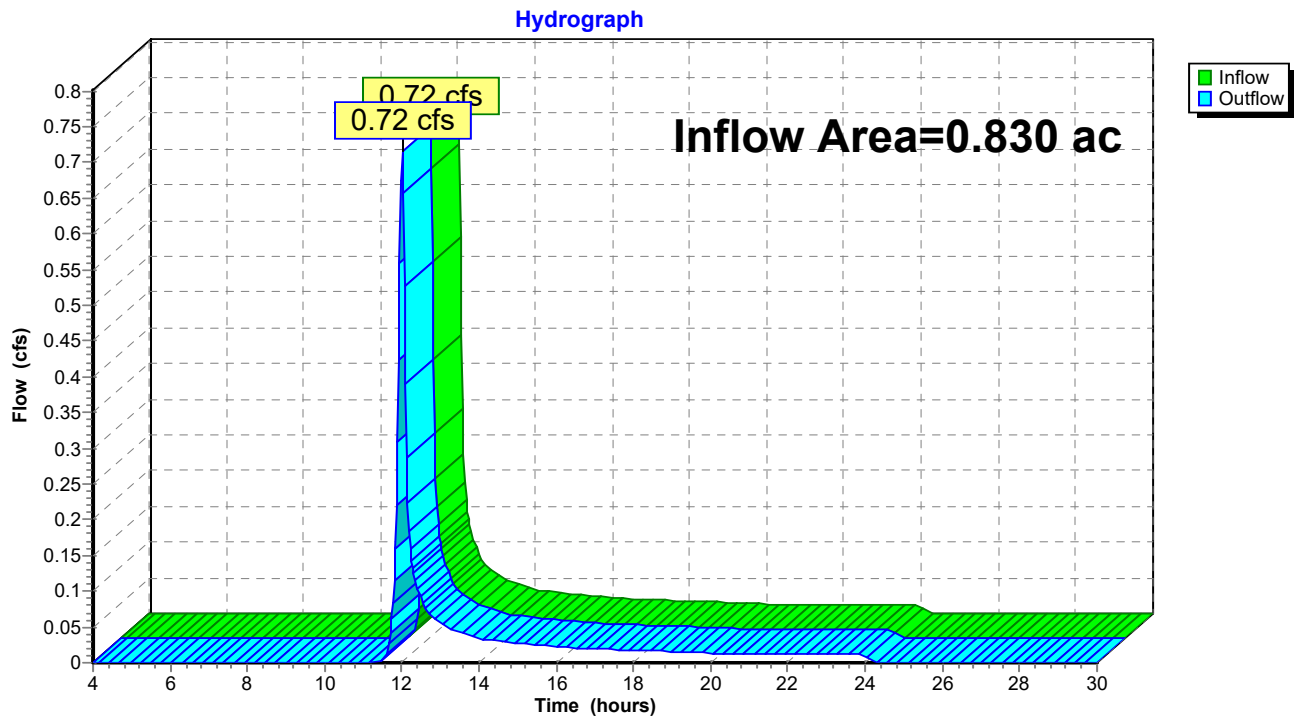
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Summary for Reach 2R: Pt of Study 2

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



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Type II 24-hr 1-yr Rainfall=2.04"

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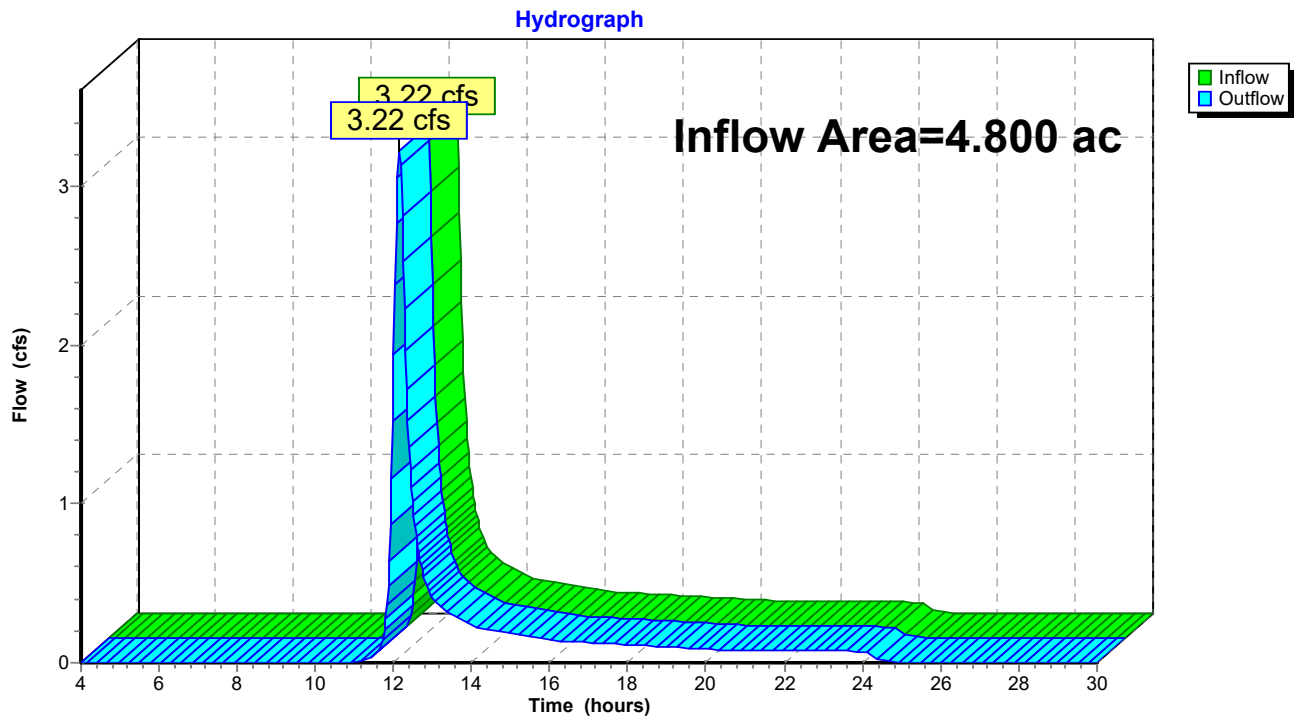
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Summary for Reach 3R: Pt of Study 3

Inflow Area = 4.800 ac, 14.17% 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



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Type II 24-hr 1-yr Rainfall=2.04"

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Summary for Reach 5R: Drainage Ditch

Inflow Area = 2.200 ac, 12.27% 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

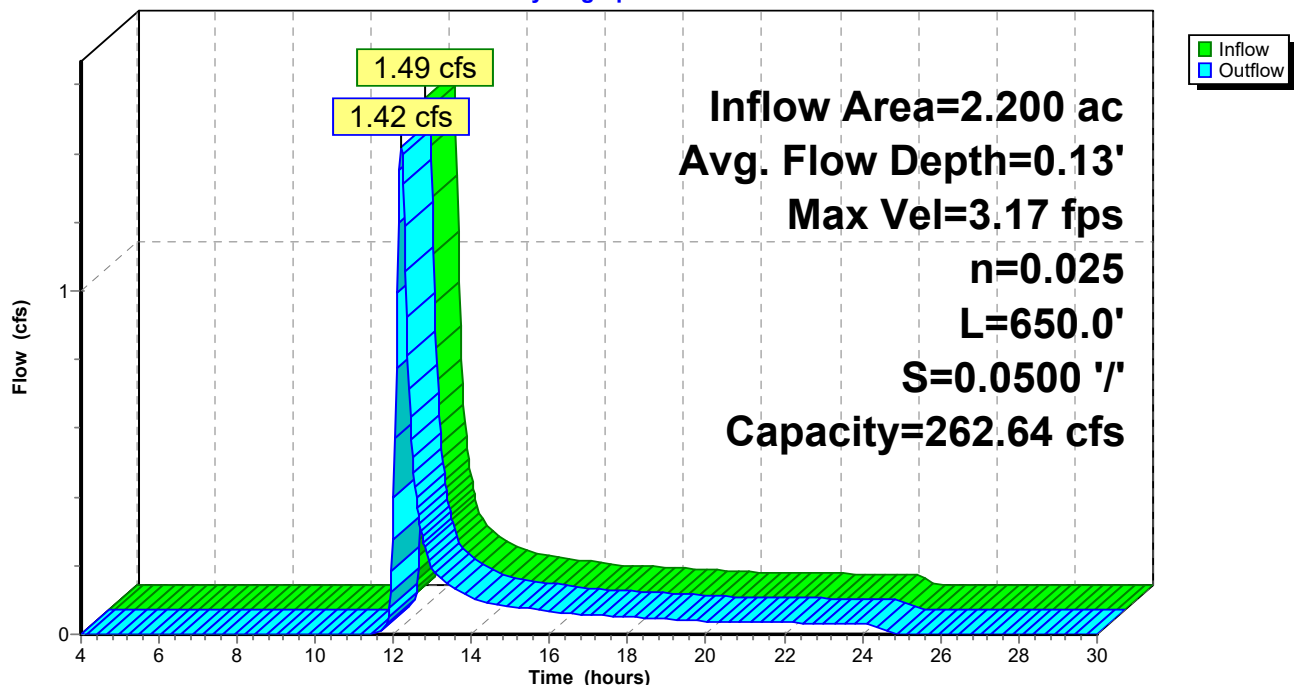
Peak Storage= 290 cf @ 12.14 hrs
Average Depth at Peak Storage= 0.13' , Surface Width= 3.79'
Bank-Full Depth= 2.00' Flow Area= 18.0 sf, Capacity= 262.64 cfs

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

Hydrograph



Proposed Drainage Areas

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Type II 24-hr 1-yr Rainfall=2.04"

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Summary for Pond 1P: Bioretention 1

Inflow Area = 37.380 ac, 11.61% Impervious, Inflow Depth = 0.63" for 1-yr event
Inflow = 15.26 cfs @ 12.40 hrs, Volume= 1.963 af
Outflow = 14.54 cfs @ 12.50 hrs, Volume= 1.803 af, Atten= 5%, Lag= 5.6 min
Primary = 14.54 cfs @ 12.50 hrs, Volume= 1.803 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= 872.81' @ 12.50 hrs Surf.Area= 15,794 sf Storage= 11,608 cf

Plug-Flow detention time= 66.9 min calculated for 1.801 af (92% of inflow)
Center-of-Mass det. time= 24.5 min (918.0 - 893.5)

Volume	Invert	Avail.Storage	Storage Description
#1	872.00'	14,715 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
872.00	13,500	0	0
872.50	14,330	6,958	6,958
873.00	16,700	7,758	14,715

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=14.52 cfs @ 12.50 hrs HW=872.81' (Free Discharge)
↑1=**Broad-Crested Rectangular Weir** (Weir Controls 14.52 cfs @ 1.48 fps)

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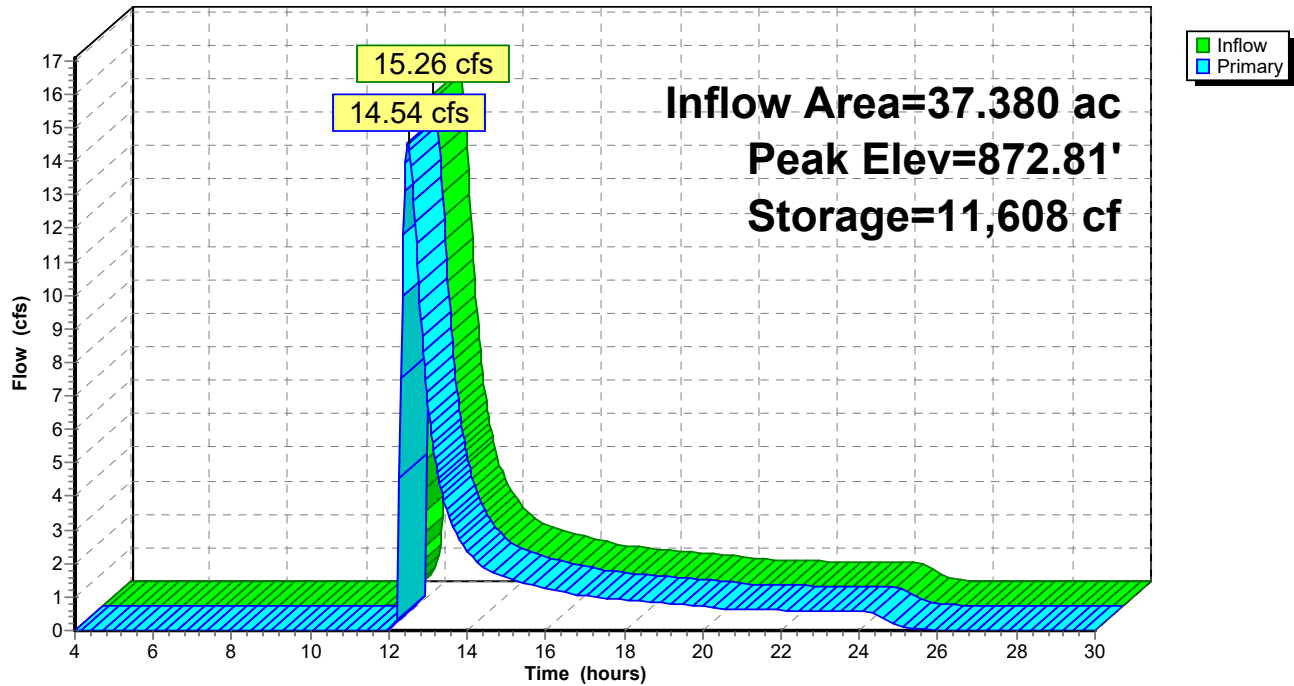
Type II 24-hr 1-yr Rainfall=2.04"

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Pond 1P: Bioretention 1

Hydrograph



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Type II 24-hr 1-yr Rainfall=2.04"

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Summary for Pond 2P: Bioretention 2

Inflow Area = 8.920 ac, 14.35% Impervious, Inflow Depth = 0.42" for 1-yr event
Inflow = 1.20 cfs @ 12.16 hrs, Volume= 0.316 af
Outflow = 0.61 cfs @ 13.26 hrs, Volume= 0.221 af, Atten= 49%, Lag= 66.0 min
Primary = 0.61 cfs @ 13.26 hrs, Volume= 0.221 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= 882.54' @ 13.26 hrs Surf.Area= 9,571 sf Storage= 4,491 cf

Plug-Flow detention time= 218.4 min calculated for 0.221 af (70% of inflow)
Center-of-Mass det. time= 97.6 min (1,033.8 - 936.2)

Volume	Invert	Avail.Storage	Storage Description
#1	882.00'	9,105 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
882.00	7,000	0	0
882.50	9,500	4,125	4,125
883.00	10,420	4,980	9,105

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=0.61 cfs @ 13.26 hrs HW=882.54' (Free Discharge)
↑1=**Broad-Crested Rectangular Weir** (Weir Controls 0.61 cfs @ 0.52 fps)

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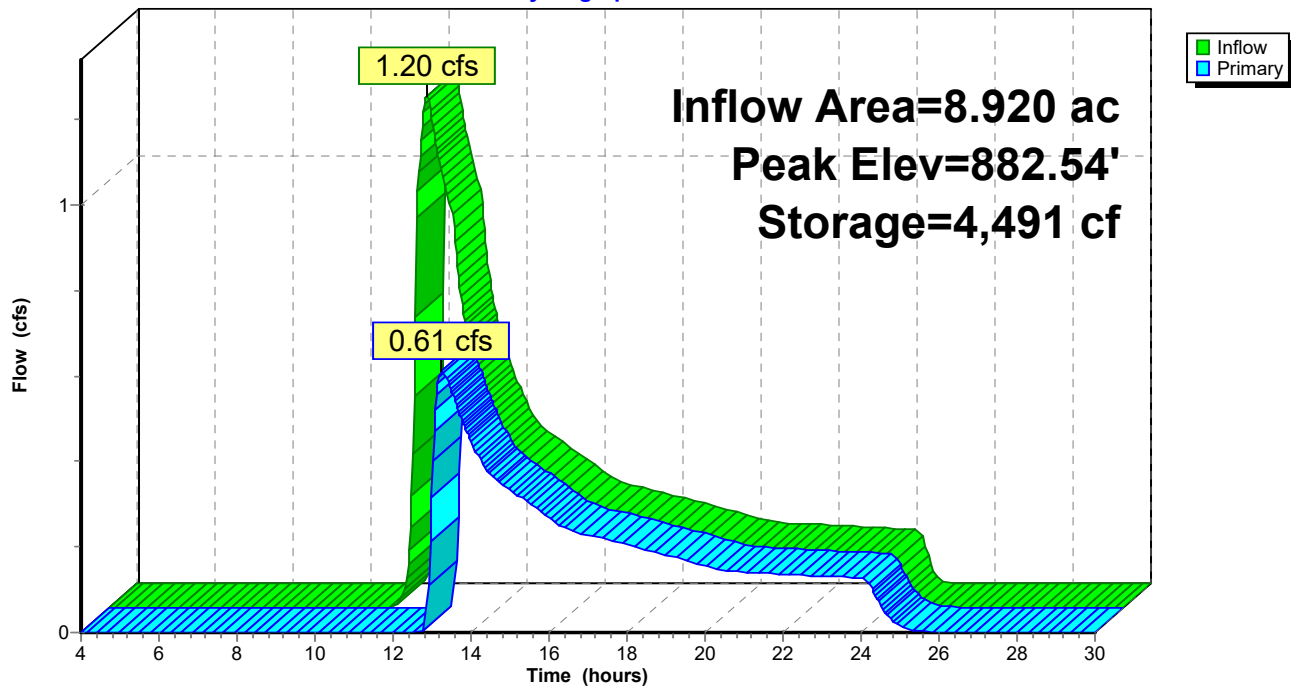
Type II 24-hr 1-yr Rainfall=2.04"

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Pond 2P: Bioretention 2

Hydrograph



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Type II 24-hr 1-yr Rainfall=2.04"

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Summary for Pond 3P: Detention Basin

Inflow Area = 47.380 ac, 11.86% Impervious, Inflow Depth = 0.56" for 1-yr event
Inflow = 15.57 cfs @ 12.47 hrs, Volume= 2.197 af
Outflow = 2.34 cfs @ 14.40 hrs, Volume= 2.176 af, Atten= 85%, Lag= 115.3 min
Primary = 2.34 cfs @ 14.40 hrs, Volume= 2.176 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= 866.12' @ 14.40 hrs Surf.Area= 21,291 sf Storage= 40,512 cf

Plug-Flow detention time= 255.4 min calculated for 2.176 af (99% of inflow)
Center-of-Mass det. time= 249.8 min (1,168.0 - 918.3)

Volume	Invert	Avail.Storage	Storage Description
#1	863.50'	243,001 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
863.50	1,285	0	0
864.00	11,100	3,096	3,096
865.00	18,820	14,960	18,056
866.00	21,020	19,920	37,976
867.00	23,280	22,150	60,126
868.00	25,590	24,435	84,561
869.00	27,960	26,775	111,336
870.00	30,390	29,175	140,511
871.00	32,875	31,633	172,144
872.00	35,415	34,145	206,289
873.00	38,010	36,713	243,001

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	863.50'	30.0" Round Culvert L= 98.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 863.50' / 857.00' S= 0.0663 '/ Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 4.91 sf
#3	Device 2	863.50'	7.0" Vert. Orifice1 C= 0.600 Limited to weir flow at low heads
#4	Device 2	866.00'	32.0" W x 18.0" H Vert. Orifice2 C= 0.600 Limited to weir flow at low heads
#5	Device 2	868.10'	36.0" x 36.0" Horiz. Grate C= 0.600 Limited to weir flow at low heads

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Type II 24-hr 1-yr Rainfall=2.04"

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Primary OutFlow Max=2.32 cfs @ 14.40 hrs HW=866.12' (Free Discharge)

↳ **2=Culvert** (Passes 2.32 cfs of 21.84 cfs potential flow)

↳ **3=Orifice1** (Orifice Controls 1.96 cfs @ 7.35 fps)

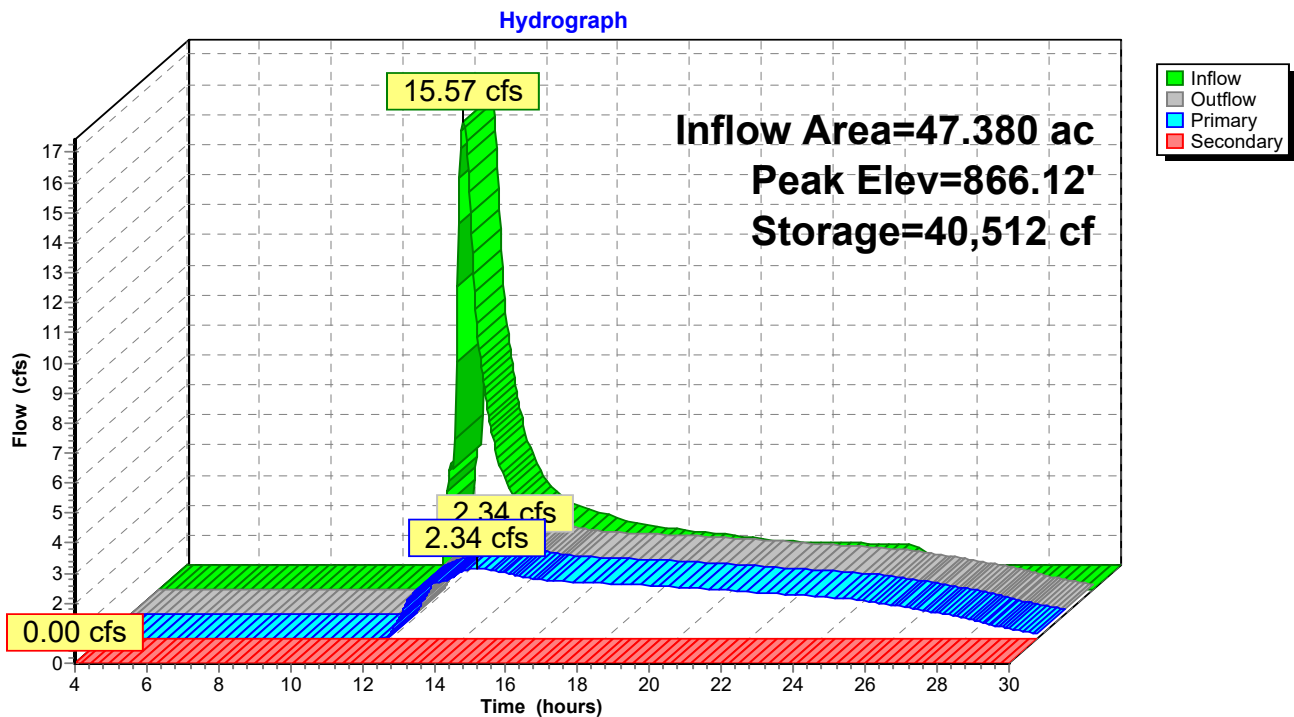
↳ **4=Orifice2** (Orifice Controls 0.36 cfs @ 1.11 fps)

↳ **5=Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 4.00 hrs HW=863.50' (Free Discharge)

↳ **1=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 3P: Detention Basin



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Type II 24-hr 1-yr Rainfall=2.04"

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Summary for Pond 4P: Diversion Structure

Inflow Area = 8.920 ac, 14.35% Impervious, Inflow Depth = 0.59" for 1-yr event
Inflow = 5.19 cfs @ 12.16 hrs, Volume= 0.436 af
Outflow = 5.19 cfs @ 12.16 hrs, Volume= 0.436 af, Atten= 0%, Lag= 0.0 min
Primary = 1.20 cfs @ 12.16 hrs, Volume= 0.316 af
Routed to Pond 2P : Bioretention 2
Secondary = 4.00 cfs @ 12.16 hrs, Volume= 0.121 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= 885.01' @ 12.16 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	882.20'	6.0" Round Bioretention Culvert L= 10.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 882.20' / 882.10' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.20 sf
#2	Secondary	883.90'	18.0" Round Detention Culvert L= 45.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 883.90' / 875.00' S= 0.1978 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf

Primary OutFlow Max=1.20 cfs @ 12.16 hrs HW=885.01' (Free Discharge)

↑**1=Bioretention Culvert** (Inlet Controls 1.20 cfs @ 6.09 fps)

Secondary OutFlow Max=3.99 cfs @ 12.16 hrs HW=885.01' (Free Discharge)

↑**2=Detention Culvert** (Inlet Controls 3.99 cfs @ 2.84 fps)

Proposed Drainage Areas

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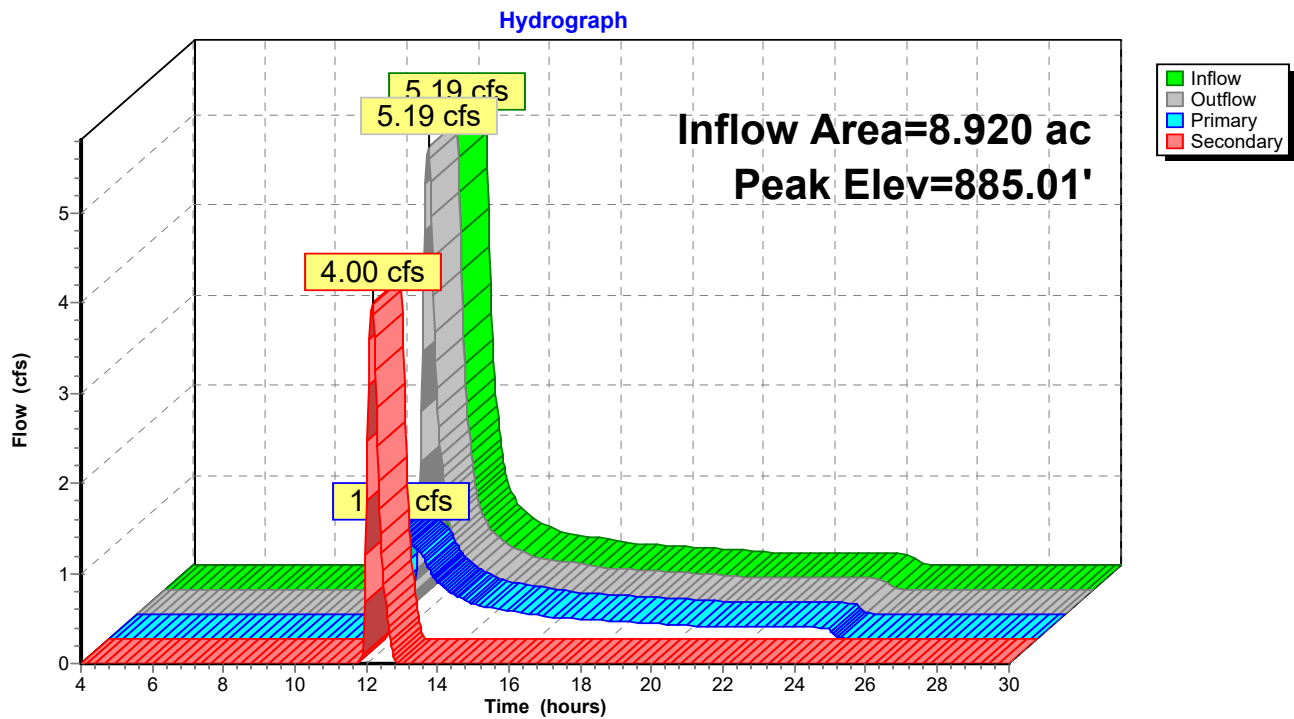
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Type II 24-hr 1-yr Rainfall=2.04"

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Pond 4P: Diversion Structure



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Type II 24-hr 10-yr Rainfall=3.43"

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Summary for Subcatchment 1S: DA-1A

Runoff = 43.33 cfs @ 12.38 hrs, Volume= 5.146 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
2.470	98	Paved parking, HSG D
1.870	98	Unconnected roofs, HSG D
24.080	80	>75% Grass cover, Good, HSG D
8.960	77	Woods, Good, HSG D
37.380	81	Weighted Average
33.040		88.39% Pervious Area
4.340		11.61% Impervious Area
1.870		43.09% 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			

Proposed Drainage Areas

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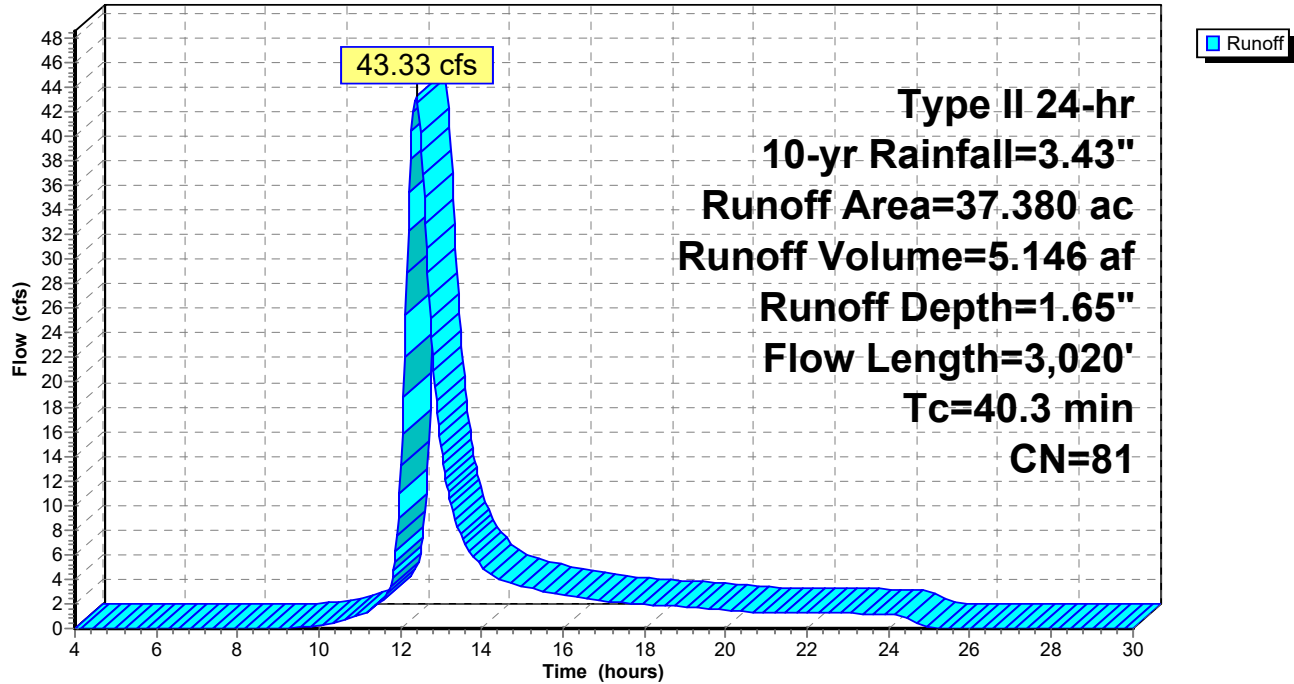
Type II 24-hr 10-yr Rainfall=3.43"

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Subcatchment 1S: DA-1A

Hydrograph



Proposed Drainage Areas

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Type II 24-hr 10-yr Rainfall=3.43"

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Summary for Subcatchment 2S: DA-1B

Runoff = 15.08 cfs @ 12.14 hrs, Volume= 1.175 af, Depth= 1.58"
Routed to Pond 4P : Diversion Structure

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
0.870	98		Paved parking, HSG D
0.410	98		Unconnected roofs, HSG D
4.000	80		>75% Grass cover, Good, HSG D
2.040	77		Woods, Good, HSG D
1.600	73		Brush, Good, HSG D
8.920	81	80	Weighted Average, UI Adjusted
7.640			85.65% Pervious Area
1.280			14.35% Impervious Area
0.410			32.03% 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			

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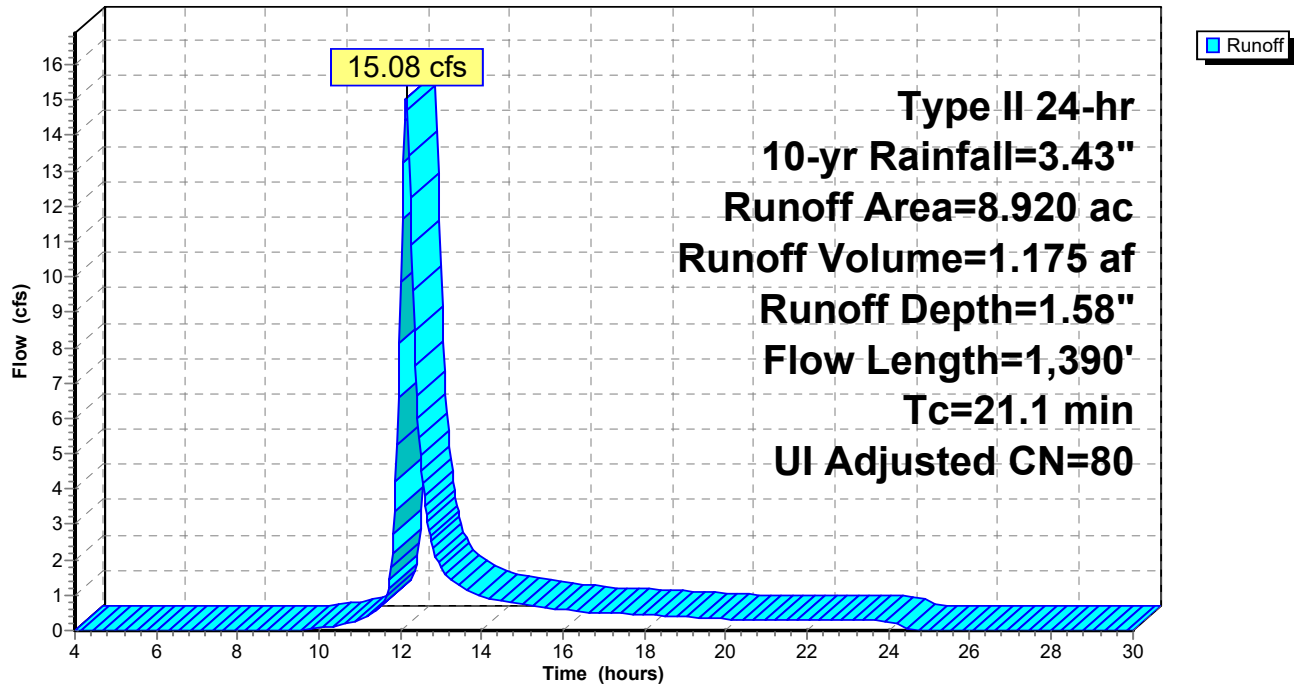
Type II 24-hr 10-yr Rainfall=3.43"

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Subcatchment 2S: DA-1B

Hydrograph



Proposed Drainage Areas

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Type II 24-hr 10-yr Rainfall=3.43"

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Summary for Subcatchment 3S: DA-1C

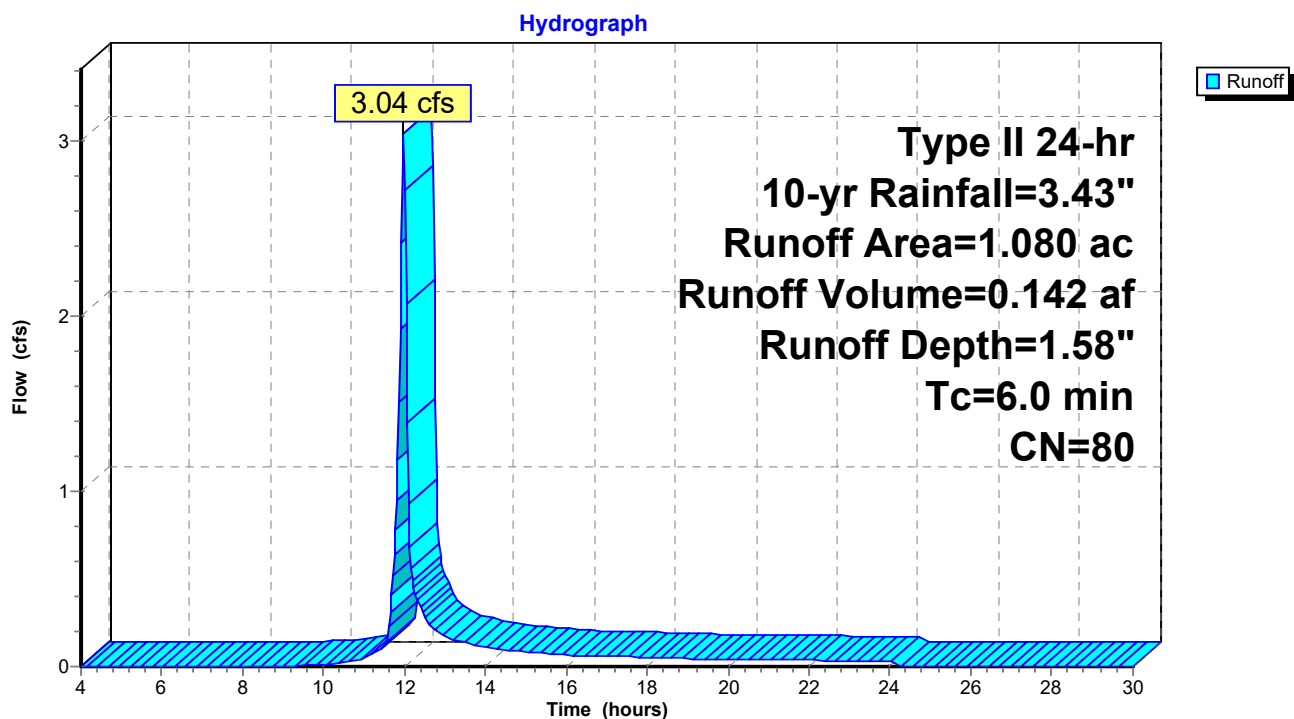
Runoff = 3.04 cfs @ 11.97 hrs, Volume= 0.142 af, Depth= 1.58"
Routed to Pond 3P : Detention Basin

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



Proposed Drainage Areas

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Type II 24-hr 10-yr Rainfall=3.43"

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Summary for Subcatchment 4S: DA-1D

Runoff = 14.59 cfs @ 12.37 hrs, Volume= 1.723 af, Depth= 1.38"
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
3.230	80	>75% Grass cover, Good, HSG D
8.910	77	Woods, Good, HSG D
0.200	98	Paved parking, HSG D
2.660	73	Brush, Good, HSG D
15.000	77	Weighted Average
14.800		98.67% Pervious Area
0.200		1.33% 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			

Proposed Drainage Areas

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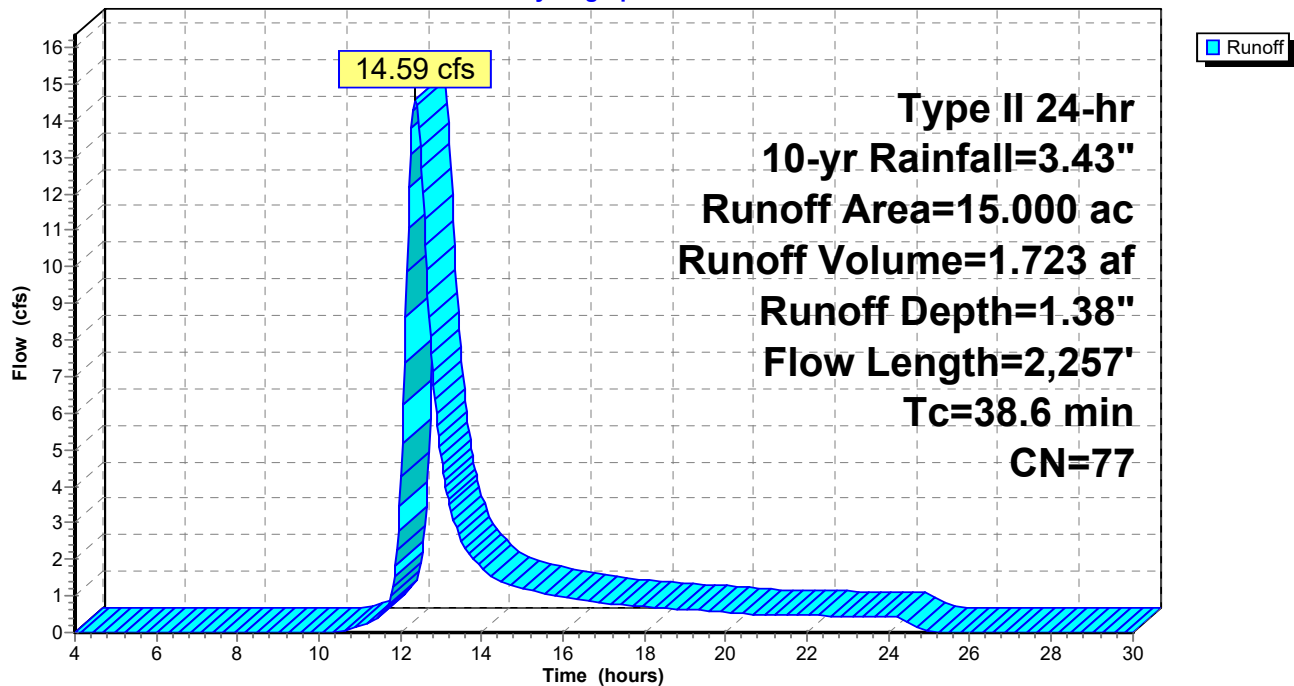
Type II 24-hr 10-yr Rainfall=3.43"

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Subcatchment 4S: DA-1D

Hydrograph



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Type II 24-hr 10-yr Rainfall=3.43"

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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

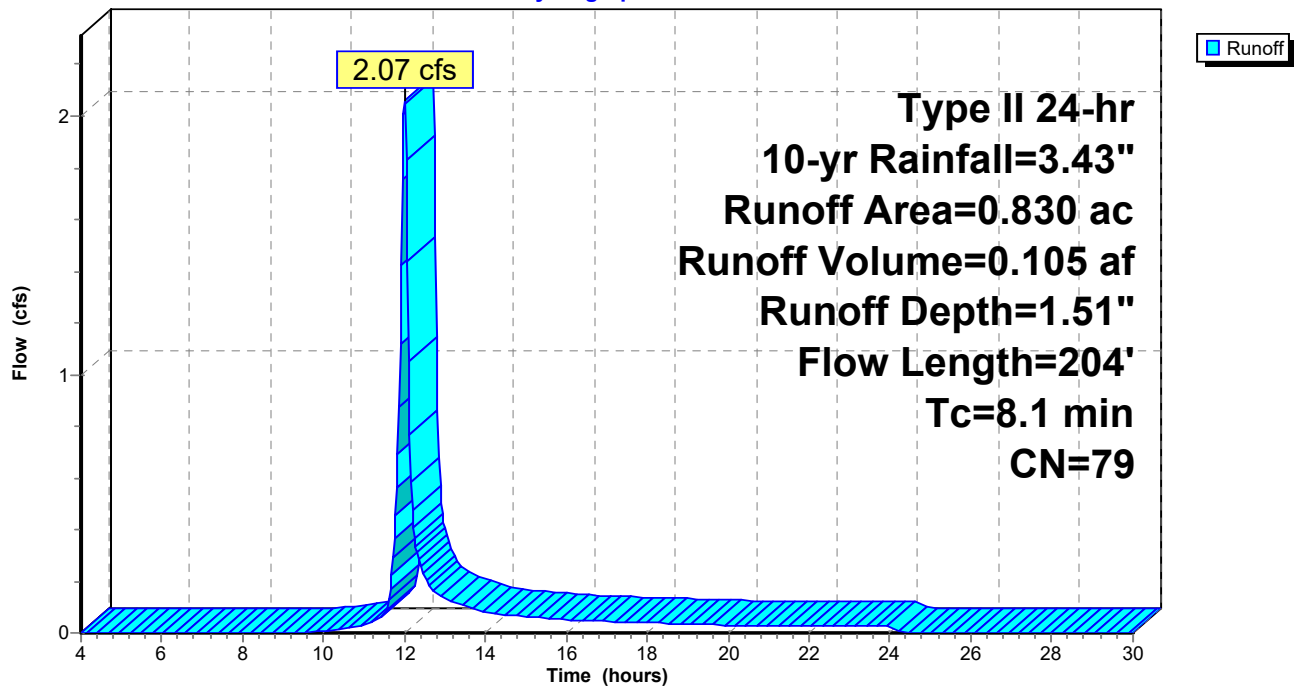
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 4.00-30.01 hrs, dt= 0.03 hrs
Type II 24-hr 10-yr Rainfall=3.43"

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

Hydrograph



Proposed Drainage Areas

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Type II 24-hr 10-yr Rainfall=3.43"

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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
0.900	80		>75% Grass cover, Good, HSG D
0.200	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
1.930			87.73% Pervious Area
0.270			12.27% Impervious Area
0.070			25.93% 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			

Proposed Drainage Areas

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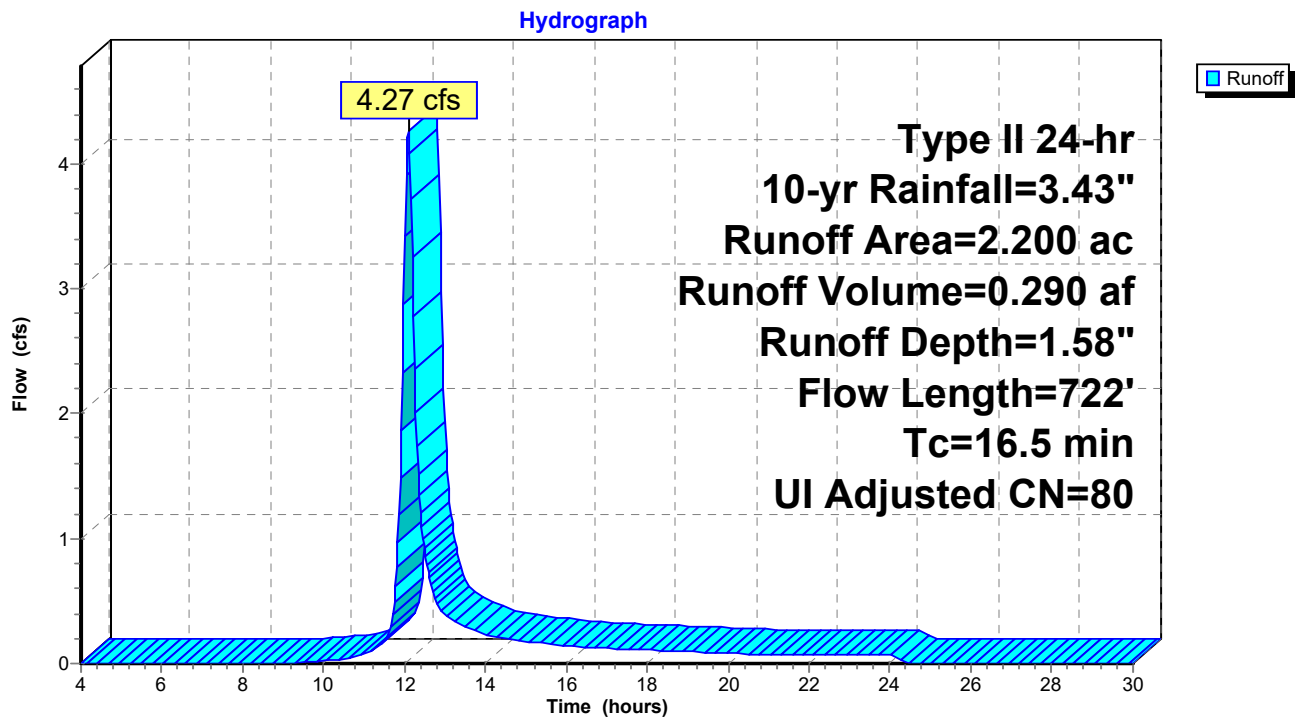
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Type II 24-hr 10-yr Rainfall=3.43"

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Subcatchment 6S: DA#3A



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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		
2.190	80		>75% Grass cover, Good, HSG D		
0.270	98		Paved parking, HSG D		
0.140	98		Unconnected roofs, HSG D		
2.600	83	82	Weighted Average, UI Adjusted		
2.190			84.23% Pervious Area		
0.410			15.77% Impervious Area		
0.140			34.15% 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			

Proposed Drainage Areas

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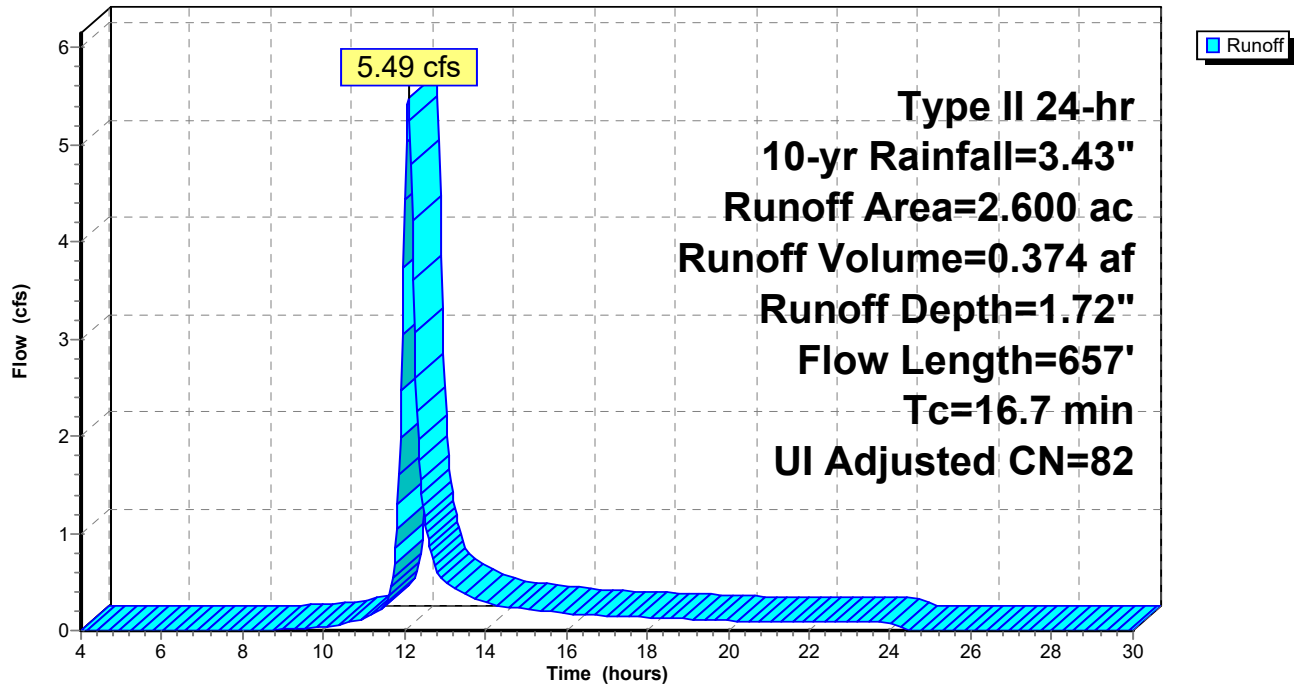
Type II 24-hr 10-yr Rainfall=3.43"

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Subcatchment 7S: DA#3B

Hydrograph



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Type II 24-hr 10-yr Rainfall=3.43"

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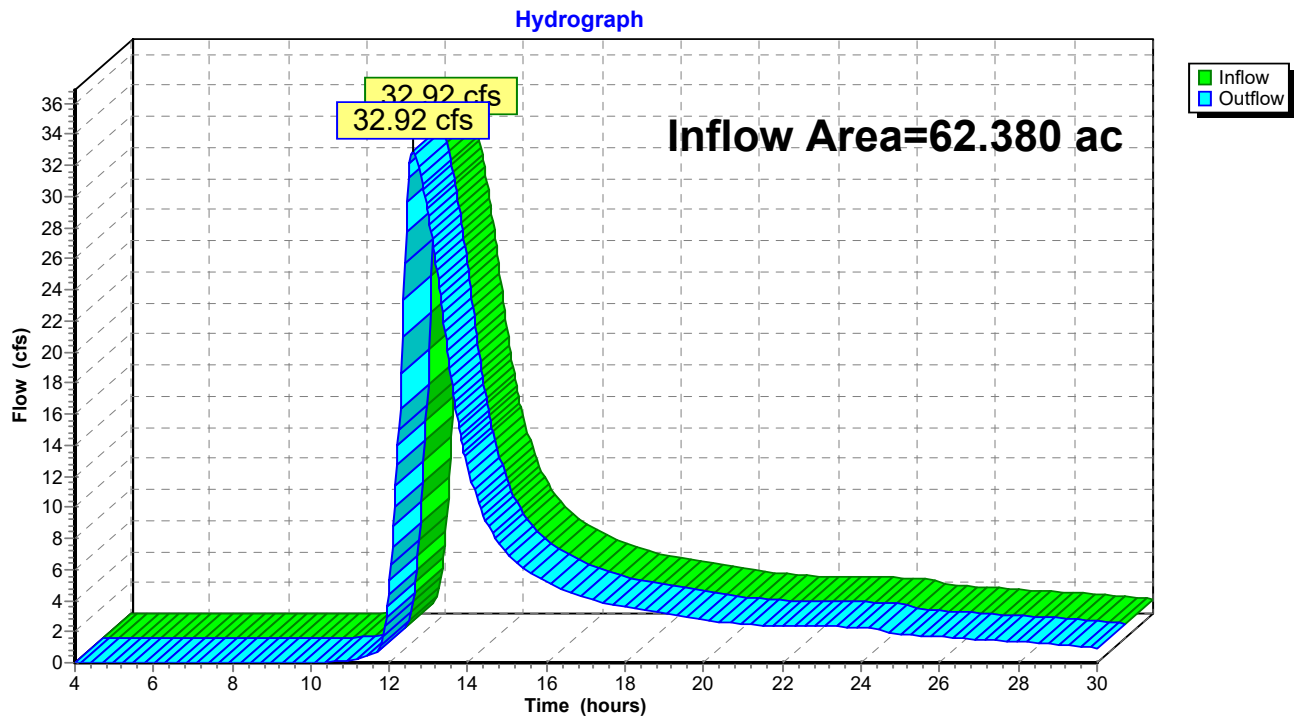
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Summary for Reach 1R: Pt of Study 1

Inflow Area = 62.380 ac, 9.33% Impervious, Inflow Depth > 1.49" for 10-yr event
Inflow = 32.92 cfs @ 12.59 hrs, Volume= 7.765 af
Outflow = 32.92 cfs @ 12.59 hrs, Volume= 7.765 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



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Type II 24-hr 10-yr Rainfall=3.43"

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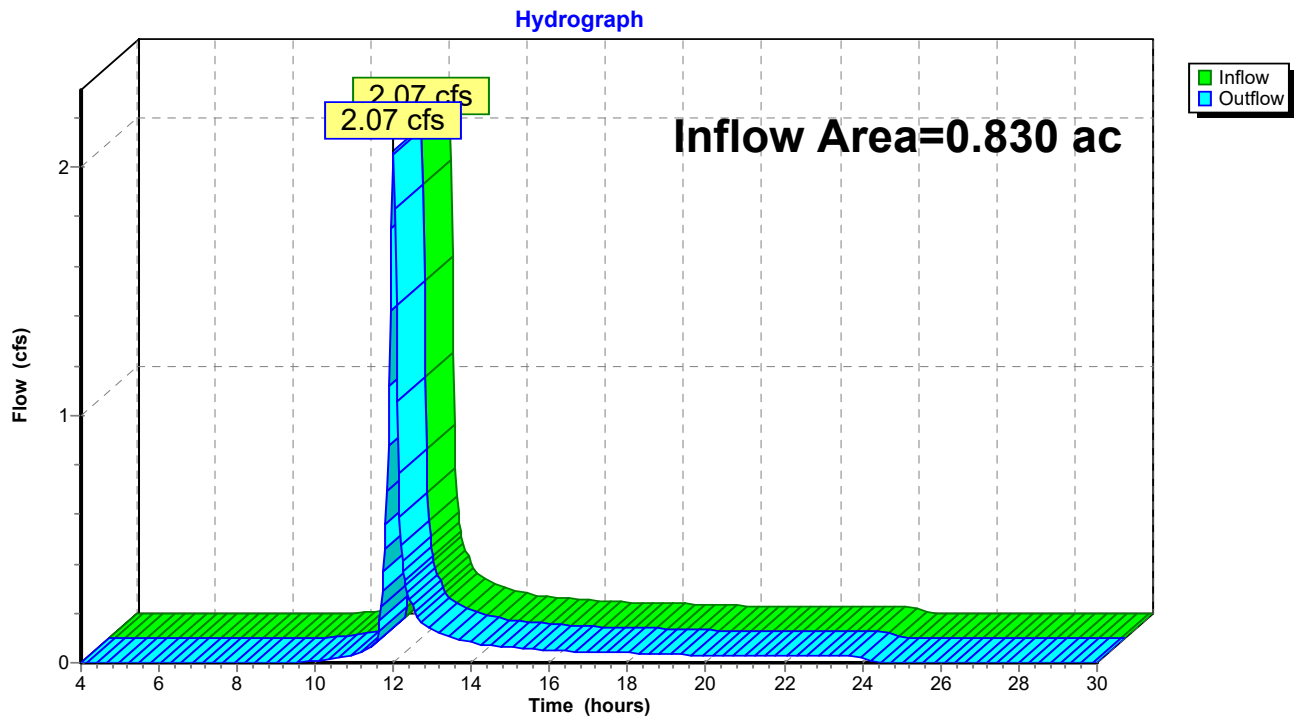
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Summary for Reach 2R: Pt of Study 2

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



Proposed Drainage Areas

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Type II 24-hr 10-yr Rainfall=3.43"

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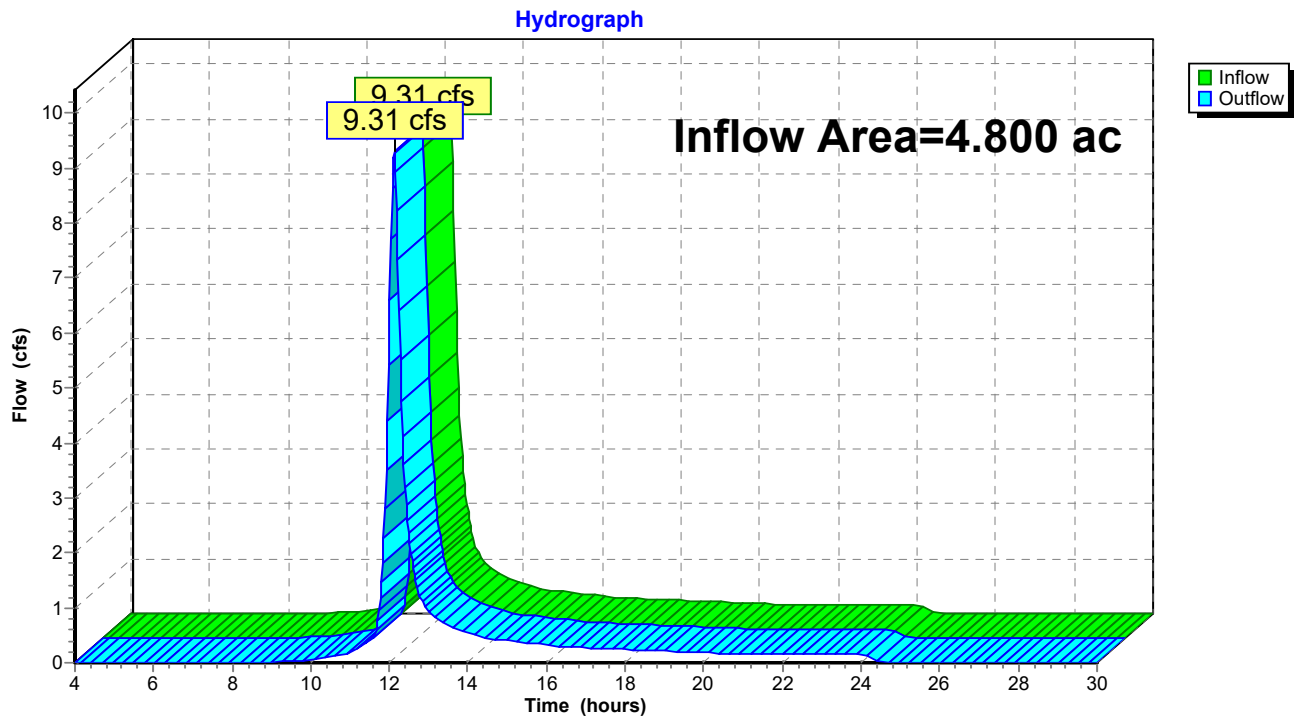
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Summary for Reach 3R: Pt of Study 3

Inflow Area = 4.800 ac, 14.17% 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



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Type II 24-hr 10-yr Rainfall=3.43"

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Summary for Reach 5R: Drainage Ditch

Inflow Area = 2.200 ac, 12.27% 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

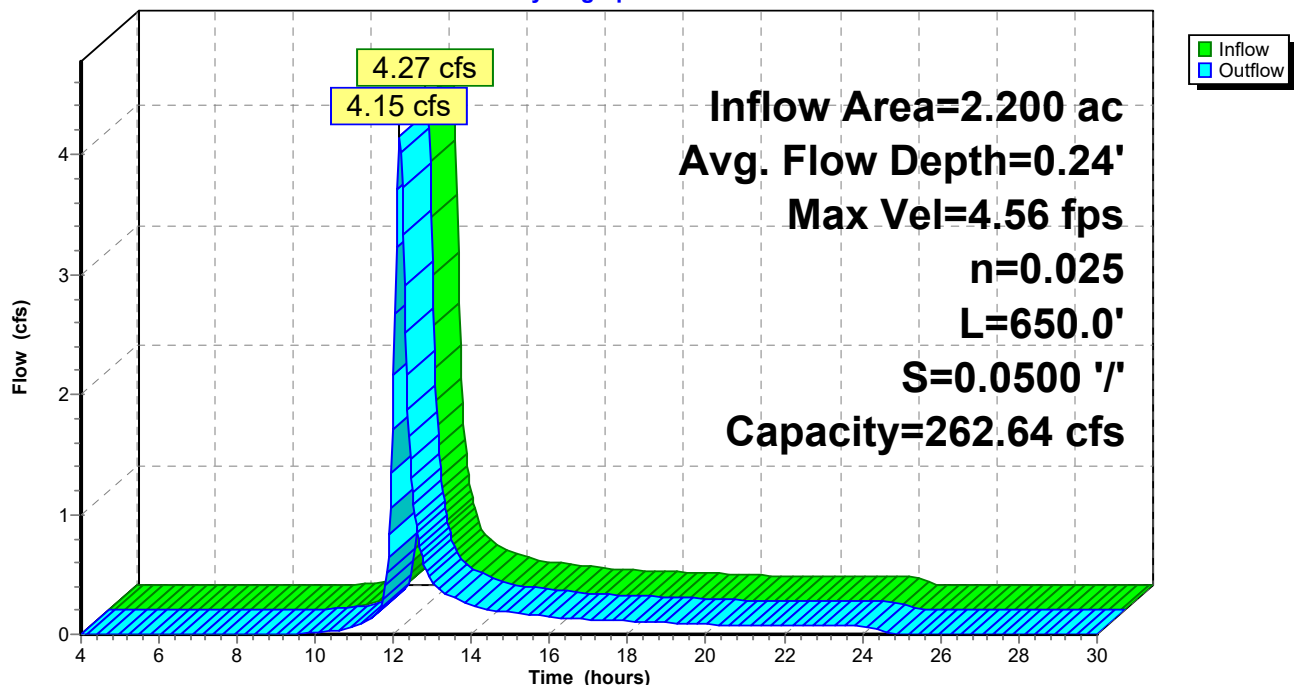
Peak Storage= 594 cf @ 12.12 hrs
Average Depth at Peak Storage= 0.24' , Surface Width= 4.47'
Bank-Full Depth= 2.00' Flow Area= 18.0 sf, Capacity= 262.64 cfs

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

Hydrograph



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Type II 24-hr 10-yr Rainfall=3.43"

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Summary for Pond 1P: Bioretention 1

Inflow Area = 37.380 ac, 11.61% Impervious, Inflow Depth = 1.65" for 10-yr event
Inflow = 43.33 cfs @ 12.38 hrs, Volume= 5.146 af
Outflow = 45.49 cfs @ 12.37 hrs, Volume= 4.986 af, Atten= 0%, Lag= 0.0 min
Primary = 45.49 cfs @ 12.37 hrs, Volume= 4.986 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= 873.14' @ 12.37 hrs Surf.Area= 16,700 sf Storage= 14,715 cf

Plug-Flow detention time= 30.8 min calculated for 4.981 af (97% of inflow)
Center-of-Mass det. time= 12.9 min (877.6 - 864.7)

Volume	Invert	Avail.Storage	Storage Description
#1	872.00'	14,715 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
872.00	13,500	0	0
872.50	14,330	6,958	6,958
873.00	16,700	7,758	14,715

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=45.39 cfs @ 12.37 hrs HW=873.14' (Free Discharge)
↑1=**Broad-Crested Rectangular Weir** (Weir Controls 45.39 cfs @ 2.10 fps)

Proposed Drainage Areas

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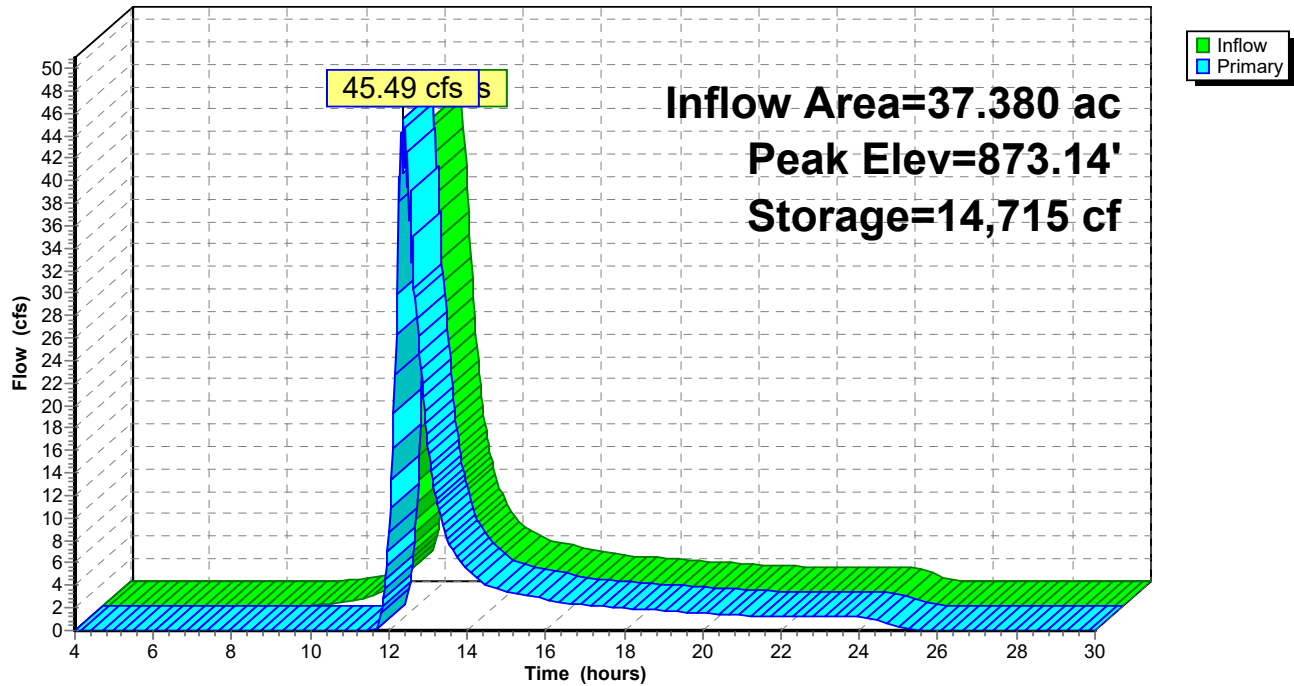
Type II 24-hr 10-yr Rainfall=3.43"

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Pond 1P: Bioretention 1

Hydrograph



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Type II 24-hr 10-yr Rainfall=3.43"

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Summary for Pond 2P: Bioretention 2

Inflow Area = 8.920 ac, 14.35% Impervious, Inflow Depth = 0.86" for 10-yr event
Inflow = 1.84 cfs @ 12.14 hrs, Volume= 0.637 af
Outflow = 1.29 cfs @ 12.38 hrs, Volume= 0.542 af, Atten= 30%, Lag= 14.1 min
Primary = 1.29 cfs @ 12.38 hrs, Volume= 0.542 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= 882.56' @ 12.38 hrs Surf.Area= 9,616 sf Storage= 4,729 cf

Plug-Flow detention time= 122.7 min calculated for 0.541 af (85% of inflow)
Center-of-Mass det. time= 54.4 min (999.7 - 945.3)

Volume	Invert	Avail.Storage	Storage Description
#1	882.00'	9,105 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
882.00	7,000	0	0
882.50	9,500	4,125	4,125
883.00	10,420	4,980	9,105

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=1.29 cfs @ 12.38 hrs HW=882.56' (Free Discharge)
↑1=**Broad-Crested Rectangular Weir** (Weir Controls 1.29 cfs @ 0.67 fps)

Proposed Drainage Areas

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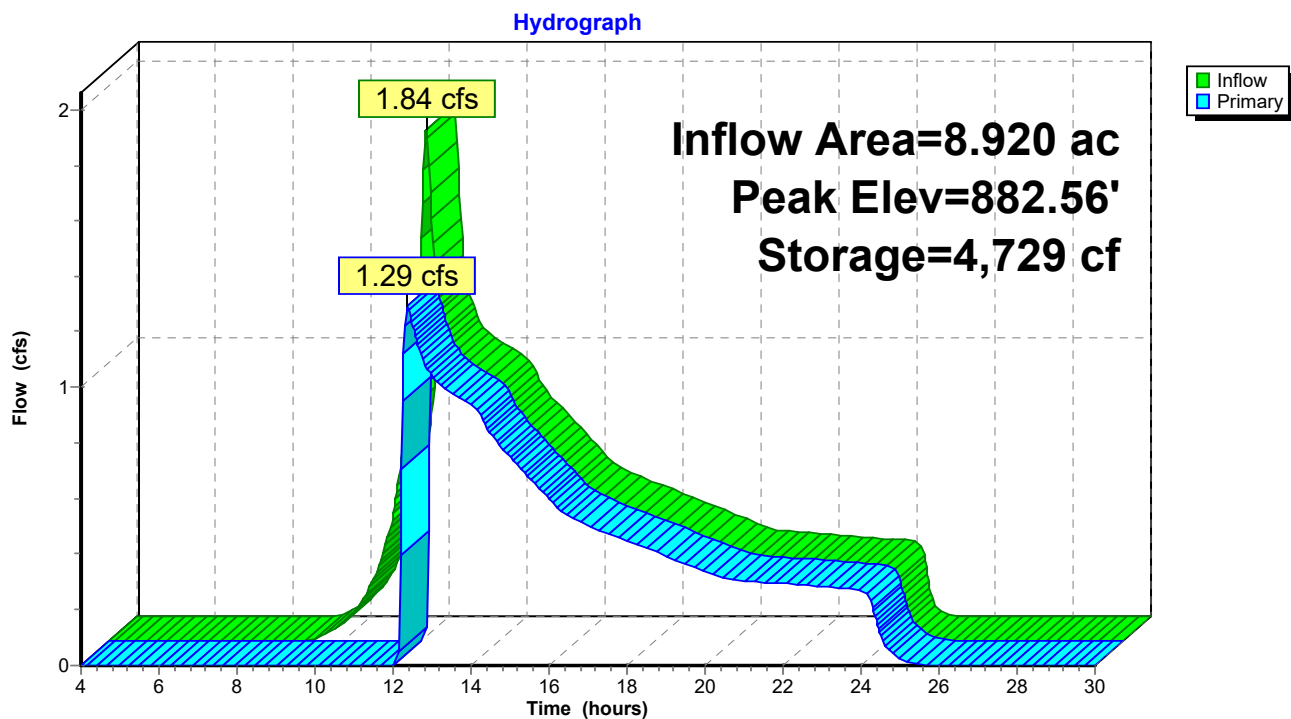
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Pond 2P: Bioretention 2



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Type II 24-hr 10-yr Rainfall=3.43"

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Summary for Pond 3P: Detention Basin

Inflow Area = 47.380 ac, 11.86% Impervious, Inflow Depth = 1.57" for 10-yr event
Inflow = 54.02 cfs @ 12.31 hrs, Volume= 6.209 af
Outflow = 24.46 cfs @ 12.85 hrs, Volume= 6.041 af, Atten= 55%, Lag= 32.2 min
Primary = 24.46 cfs @ 12.85 hrs, Volume= 6.041 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= 868.07' @ 12.85 hrs Surf.Area= 25,753 sf Storage= 86,322 cf

Plug-Flow detention time= 146.4 min calculated for 6.041 af (97% of inflow)
Center-of-Mass det. time= 130.5 min (1,005.7 - 875.2)

Volume	Invert	Avail.Storage	Storage Description
#1	863.50'	243,001 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
863.50	1,285	0	0
864.00	11,100	3,096	3,096
865.00	18,820	14,960	18,056
866.00	21,020	19,920	37,976
867.00	23,280	22,150	60,126
868.00	25,590	24,435	84,561
869.00	27,960	26,775	111,336
870.00	30,390	29,175	140,511
871.00	32,875	31,633	172,144
872.00	35,415	34,145	206,289
873.00	38,010	36,713	243,001

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	863.50'	30.0" Round Culvert L= 98.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 863.50' / 857.00' S= 0.0663 '/ Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 4.91 sf
#3	Device 2	863.50'	7.0" Vert. Orifice1 C= 0.600 Limited to weir flow at low heads
#4	Device 2	866.00'	32.0" W x 18.0" H Vert. Orifice2 C= 0.600 Limited to weir flow at low heads
#5	Device 2	868.10'	36.0" x 36.0" Horiz. Grate C= 0.600 Limited to weir flow at low heads

Proposed Drainage Areas

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Type II 24-hr 10-yr Rainfall=3.43"

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Primary OutFlow Max=24.46 cfs @ 12.85 hrs HW=868.07' (Free Discharge)

2=Culvert (Passes 24.46 cfs of 33.99 cfs potential flow)

3=Orifice1 (Orifice Controls 2.66 cfs @ 9.96 fps)

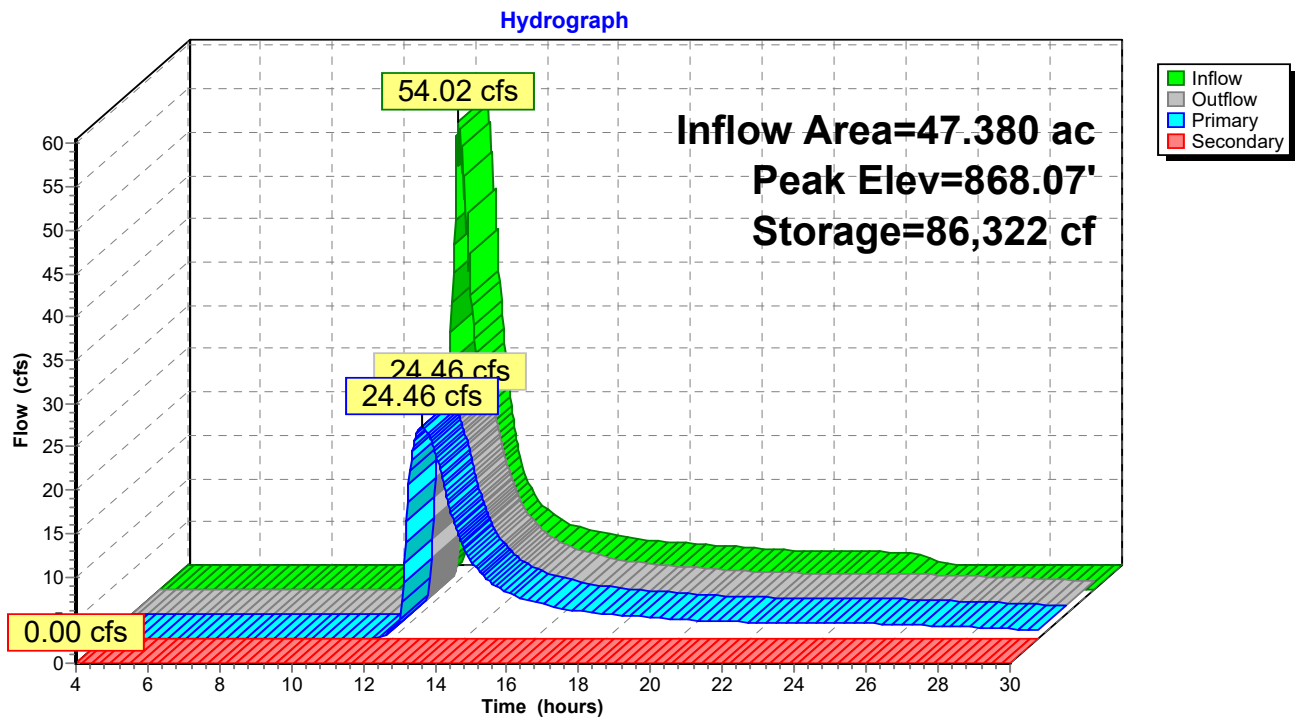
4=Orifice2 (Orifice Controls 21.79 cfs @ 5.45 fps)

5=Grate (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 4.00 hrs HW=863.50' (Free Discharge)

1=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Pond 3P: Detention Basin



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Type II 24-hr 10-yr Rainfall=3.43"

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Summary for Pond 4P: Diversion Structure

Inflow Area = 8.920 ac, 14.35% Impervious, Inflow Depth = 1.58" for 10-yr event
Inflow = 15.08 cfs @ 12.14 hrs, Volume= 1.175 af
Outflow = 15.08 cfs @ 12.14 hrs, Volume= 1.175 af, Atten= 0%, Lag= 0.0 min
Primary = 1.84 cfs @ 12.14 hrs, Volume= 0.637 af
Routed to Pond 2P : Bioretention 2
Secondary = 13.24 cfs @ 12.14 hrs, Volume= 0.538 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= 888.54' @ 12.14 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	882.20'	6.0" Round Bioretention Culvert L= 10.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 882.20' / 882.10' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.20 sf
#2	Secondary	883.90'	18.0" Round Detention Culvert L= 45.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 883.90' / 875.00' S= 0.1978 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf

Primary OutFlow Max=1.84 cfs @ 12.14 hrs HW=888.49' (Free Discharge)

↑1=Bioretention Culvert (Inlet Controls 1.84 cfs @ 9.35 fps)

Secondary OutFlow Max=13.17 cfs @ 12.14 hrs HW=888.49' (Free Discharge)

↑2=Detention Culvert (Inlet Controls 13.17 cfs @ 7.45 fps)

Proposed Drainage Areas

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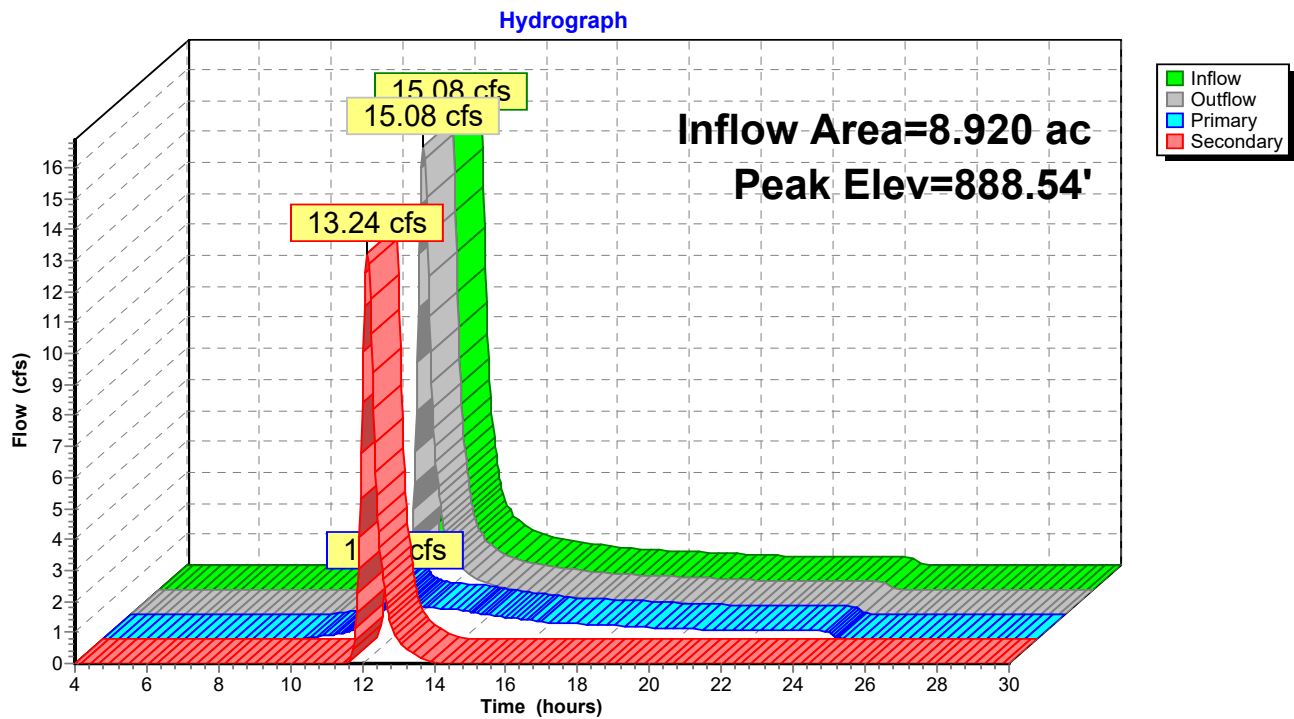
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Type II 24-hr 10-yr Rainfall=3.43"

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Pond 4P: Diversion Structure



Proposed Drainage Areas

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Type II 24-hr 100-yr Rainfall=5.78"

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Summary for Subcatchment 1S: DA-1A

Runoff = 97.78 cfs @ 12.37 hrs, Volume= 11.475 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
2.470	98	Paved parking, HSG D
1.870	98	Unconnected roofs, HSG D
24.080	80	>75% Grass cover, Good, HSG D
8.960	77	Woods, Good, HSG D
37.380	81	Weighted Average
33.040		88.39% Pervious Area
4.340		11.61% Impervious Area
1.870		43.09% 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			

Proposed Drainage Areas

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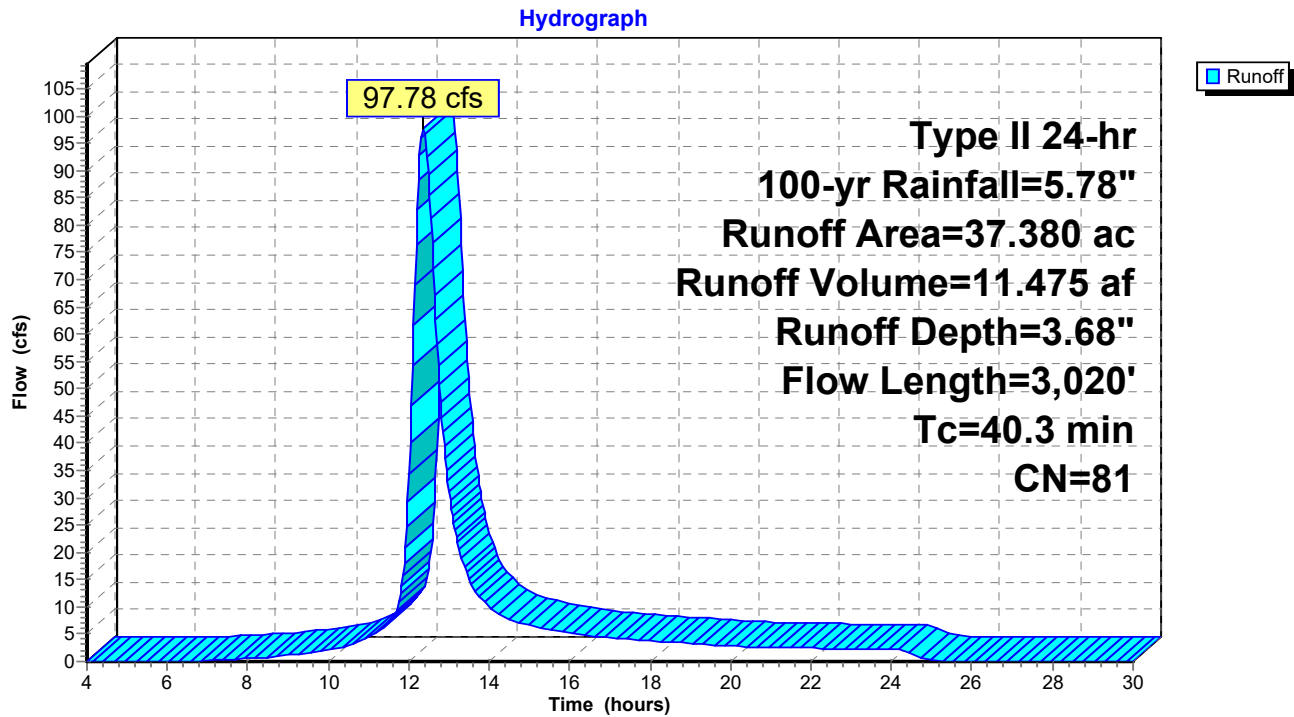
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Type II 24-hr 100-yr Rainfall=5.78"

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Subcatchment 1S: DA-1A



Proposed Drainage Areas

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Type II 24-hr 100-yr Rainfall=5.78"

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Summary for Subcatchment 2S: DA-1B

Runoff = 34.39 cfs @ 12.14 hrs, Volume= 2.664 af, Depth= 3.58"
Routed to Pond 4P : Diversion Structure

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
0.870	98		Paved parking, HSG D
0.410	98		Unconnected roofs, HSG D
4.000	80		>75% Grass cover, Good, HSG D
2.040	77		Woods, Good, HSG D
1.600	73		Brush, Good, HSG D
8.920	81	80	Weighted Average, UI Adjusted
7.640			85.65% Pervious Area
1.280			14.35% Impervious Area
0.410			32.03% 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			

Proposed Drainage Areas

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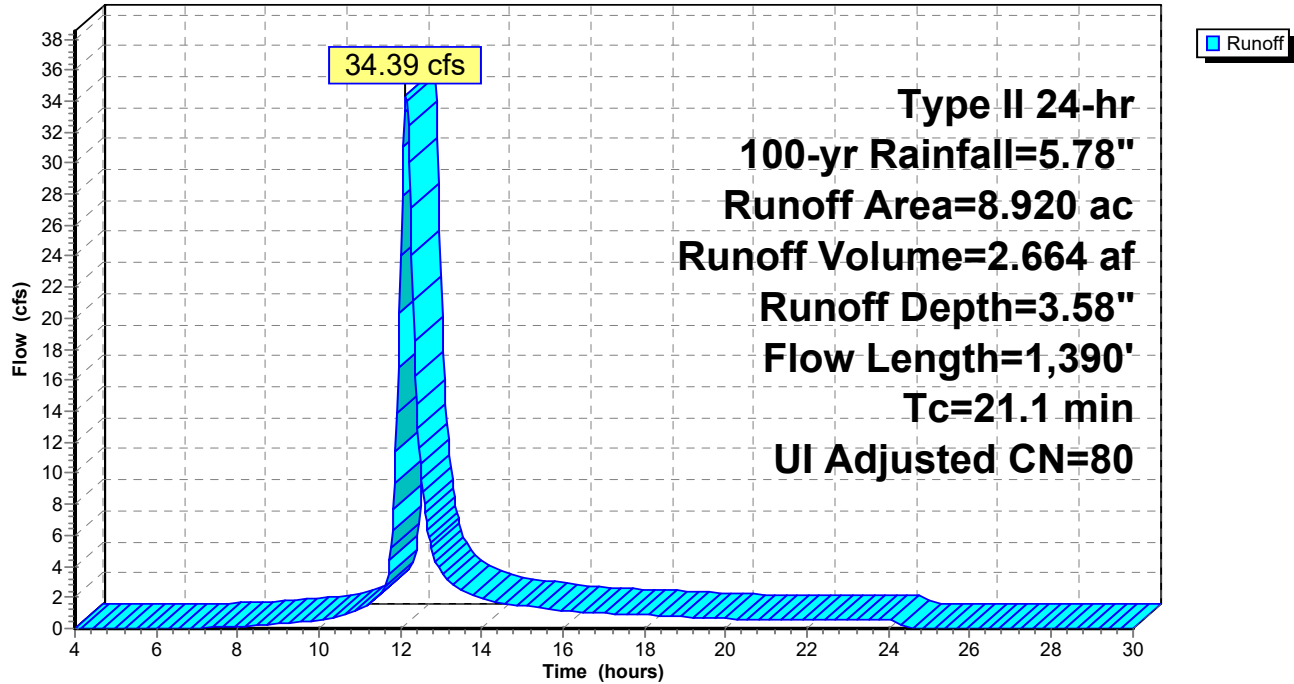
Type II 24-hr 100-yr Rainfall=5.78"

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Subcatchment 2S: DA-1B

Hydrograph



Proposed Drainage Areas

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Type II 24-hr 100-yr Rainfall=5.78"

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Summary for Subcatchment 3S: DA-1C

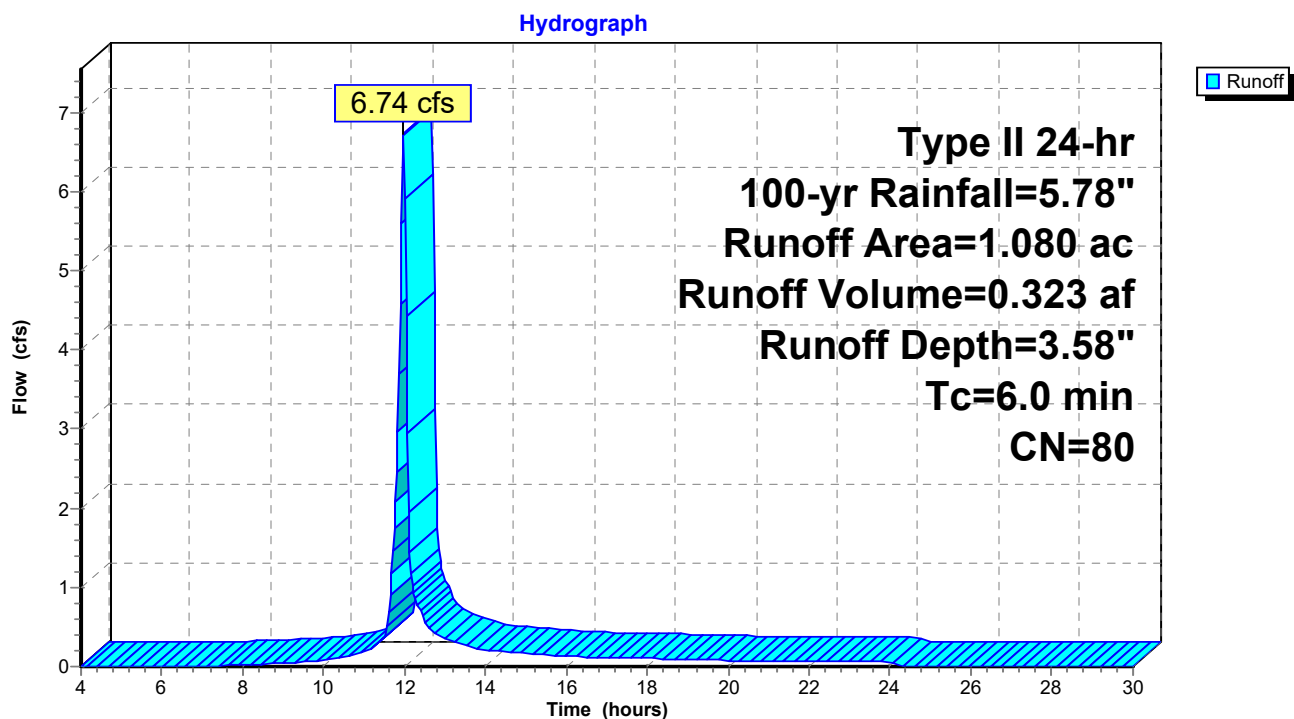
Runoff = 6.74 cfs @ 11.97 hrs, Volume= 0.323 af, Depth= 3.58"
Routed to Pond 3P : Detention Basin

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



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Type II 24-hr 100-yr Rainfall=5.78"

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Summary for Subcatchment 4S: DA-1D

Runoff = 36.02 cfs @ 12.35 hrs, Volume= 4.110 af, Depth= 3.29"
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
3.230	80	>75% Grass cover, Good, HSG D
8.910	77	Woods, Good, HSG D
0.200	98	Paved parking, HSG D
2.660	73	Brush, Good, HSG D
15.000	77	Weighted Average
14.800		98.67% Pervious Area
0.200		1.33% 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			

Proposed Drainage Areas

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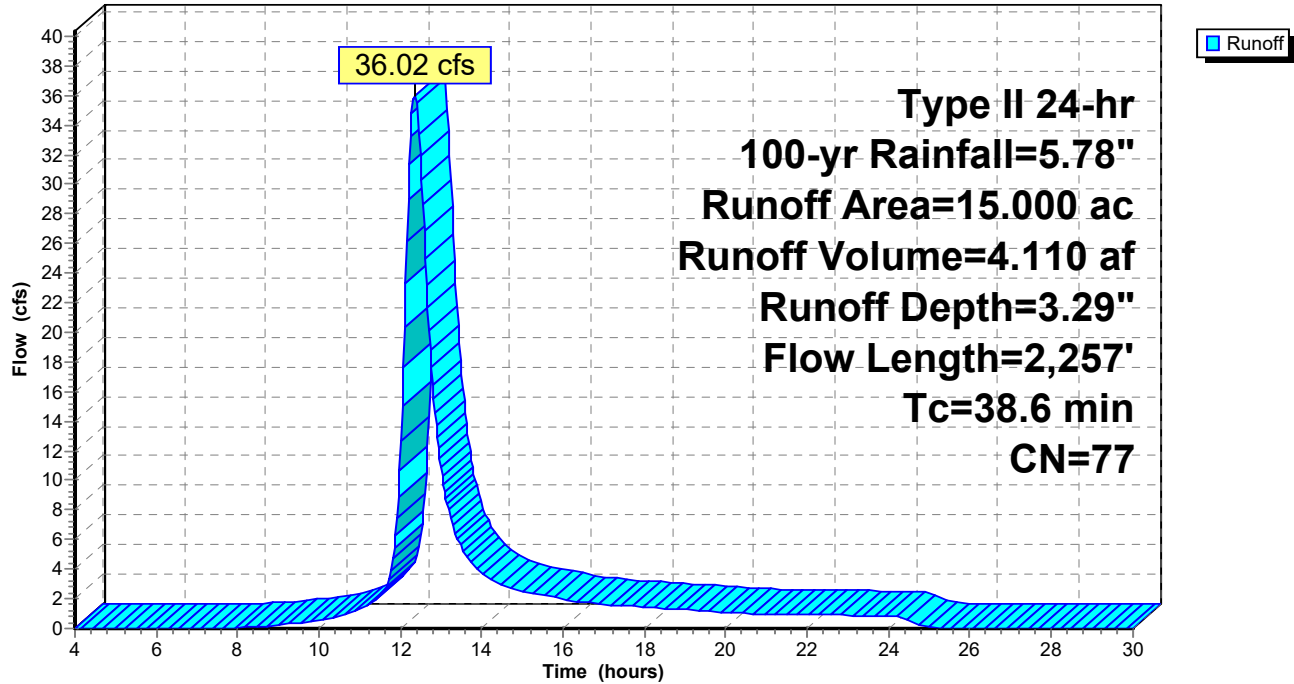
Type II 24-hr 100-yr Rainfall=5.78"

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Subcatchment 4S: DA-1D

Hydrograph



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Type II 24-hr 100-yr Rainfall=5.78"

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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

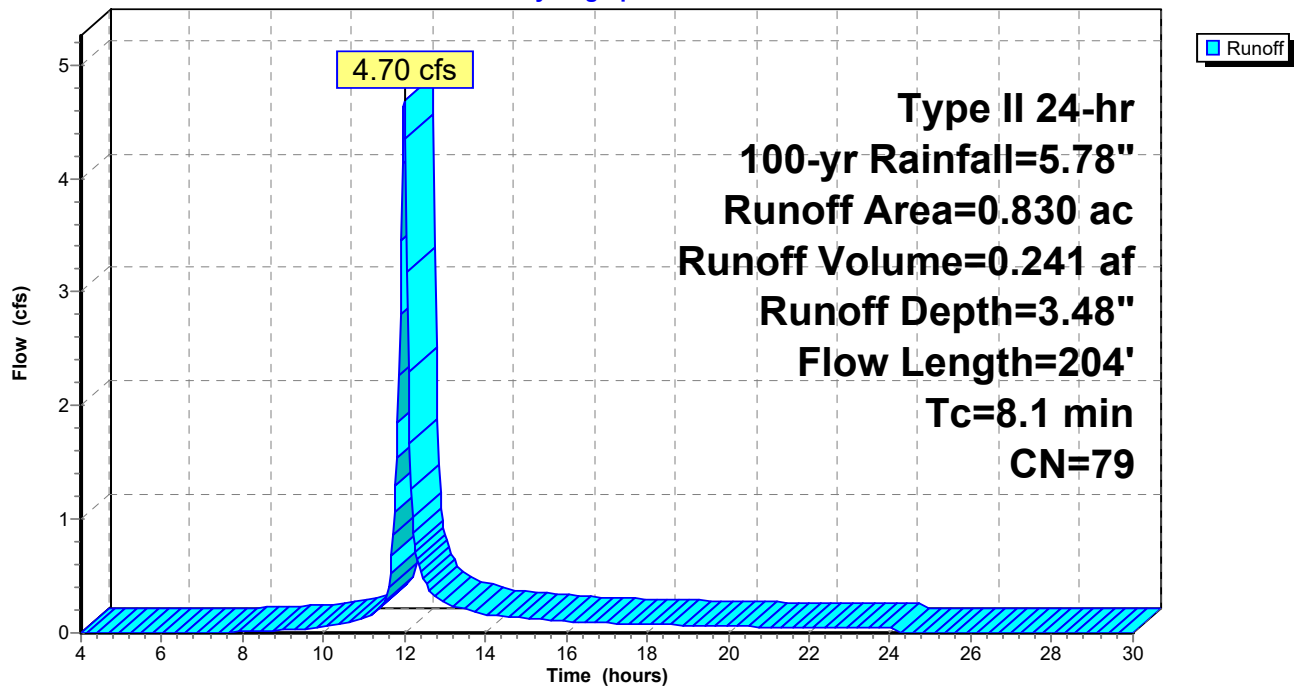
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 4.00-30.01 hrs, dt= 0.03 hrs
Type II 24-hr 100-yr Rainfall=5.78"

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

Hydrograph



Proposed Drainage Areas

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Type II 24-hr 100-yr Rainfall=5.78"

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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
0.900	80		>75% Grass cover, Good, HSG D
0.200	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
1.930			87.73% Pervious Area
0.270			12.27% Impervious Area
0.070			25.93% 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			

Proposed Drainage Areas

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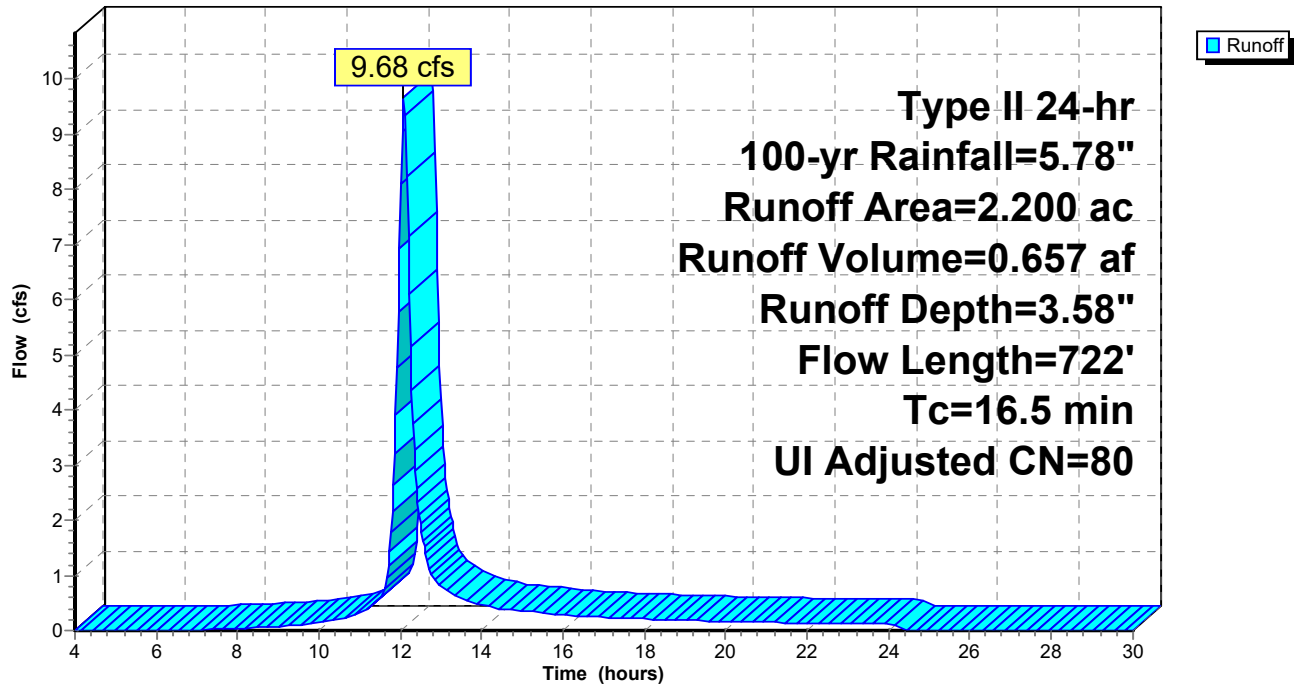
Type II 24-hr 100-yr Rainfall=5.78"

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Subcatchment 6S: DA#3A

Hydrograph



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Type II 24-hr 100-yr Rainfall=5.78"

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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		
2.190	80		>75% Grass cover, Good, HSG D		
0.270	98		Paved parking, HSG D		
0.140	98		Unconnected roofs, HSG D		
2.600	83	82	Weighted Average, UI Adjusted		
2.190			84.23% Pervious Area		
0.410			15.77% Impervious Area		
0.140			34.15% 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			

Proposed Drainage Areas

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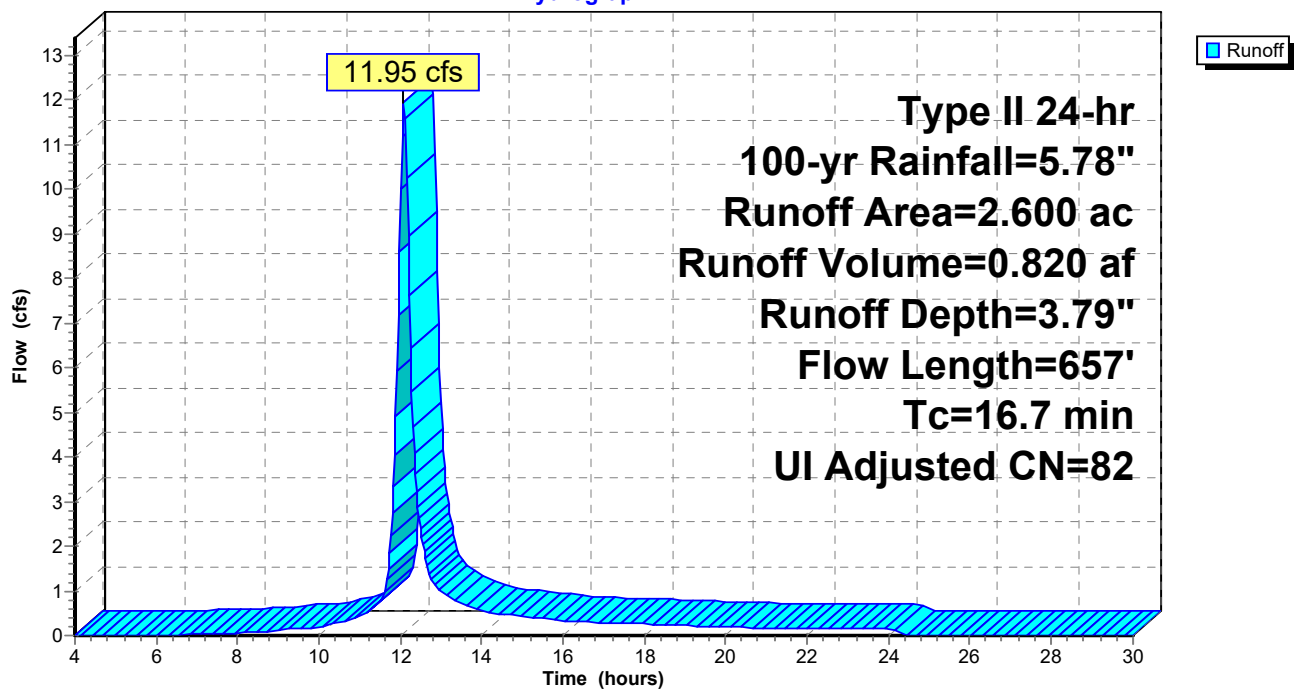
Type II 24-hr 100-yr Rainfall=5.78"

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Subcatchment 7S: DA#3B

Hydrograph



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Type II 24-hr 100-yr Rainfall=5.78"

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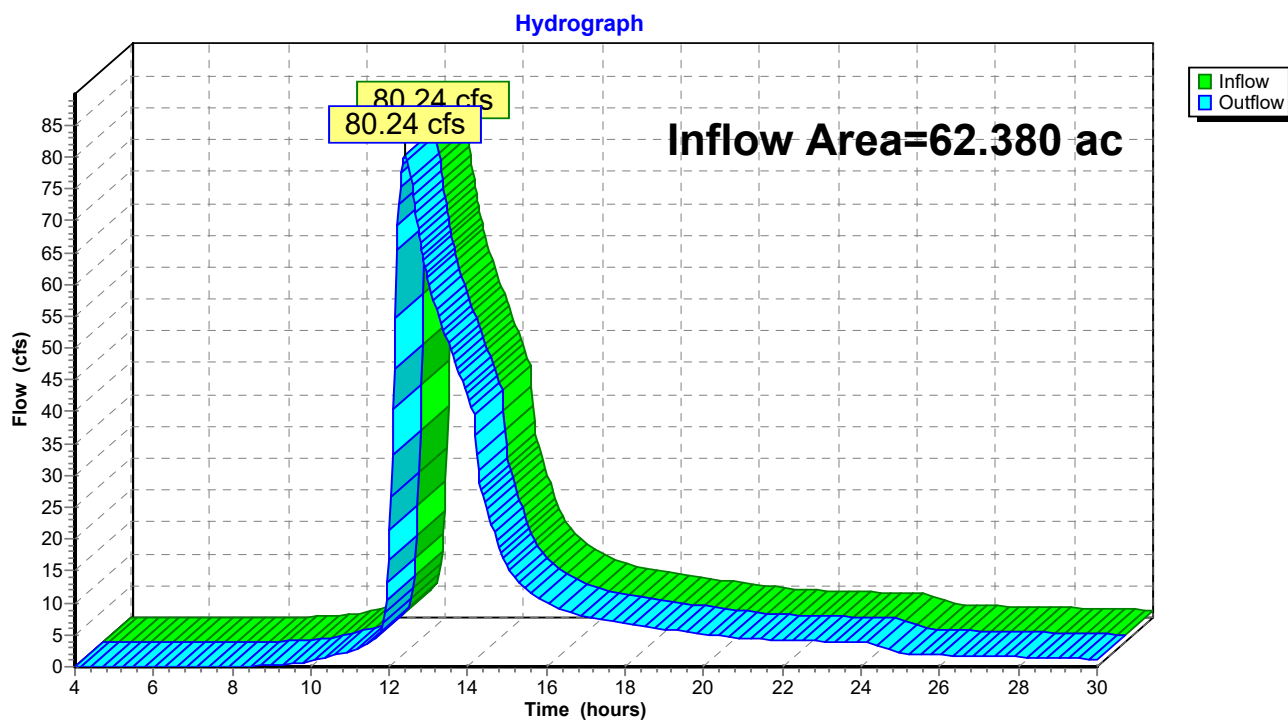
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Summary for Reach 1R: Pt of Study 1

Inflow Area = 62.380 ac, 9.33% Impervious, Inflow Depth > 3.47" for 100-yr event
Inflow = 80.24 cfs @ 12.41 hrs, Volume= 18.049 af
Outflow = 80.24 cfs @ 12.41 hrs, Volume= 18.049 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



Proposed Drainage Areas

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Type II 24-hr 100-yr Rainfall=5.78"

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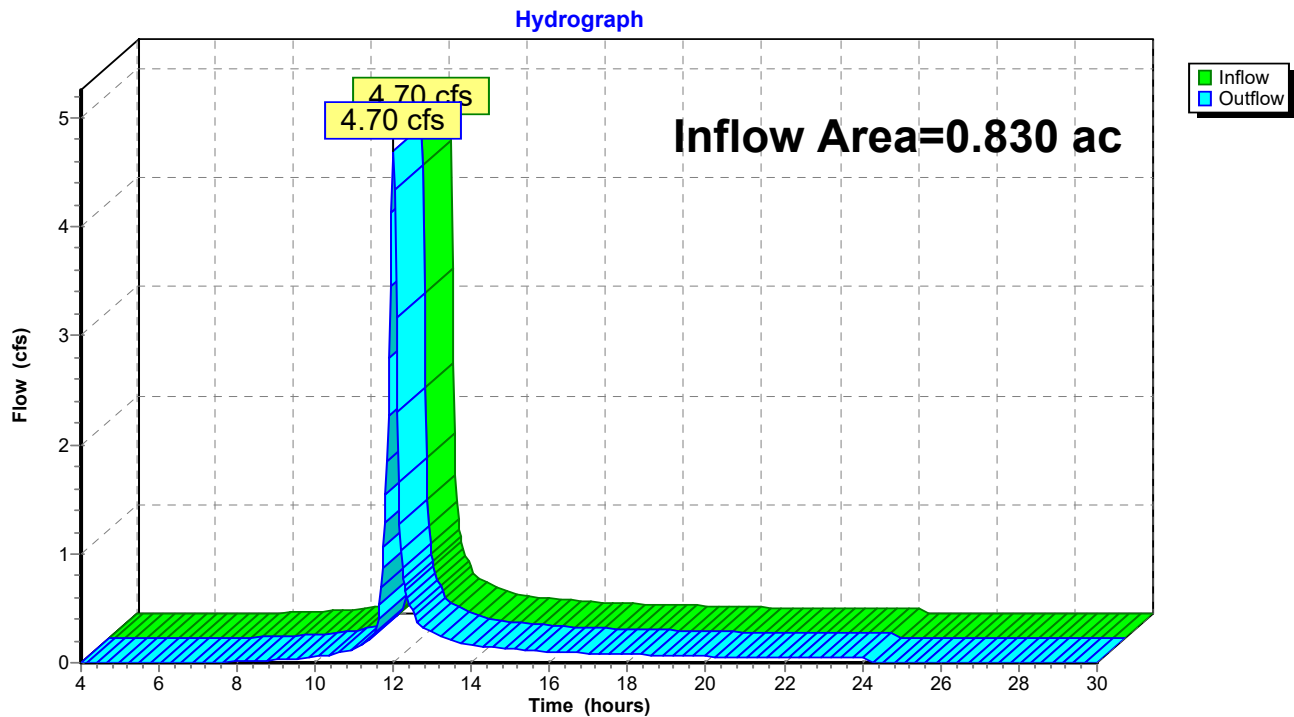
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Summary for Reach 2R: Pt of Study 2

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



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Type II 24-hr 100-yr Rainfall=5.78"

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Summary for Reach 3R: Pt of Study 3

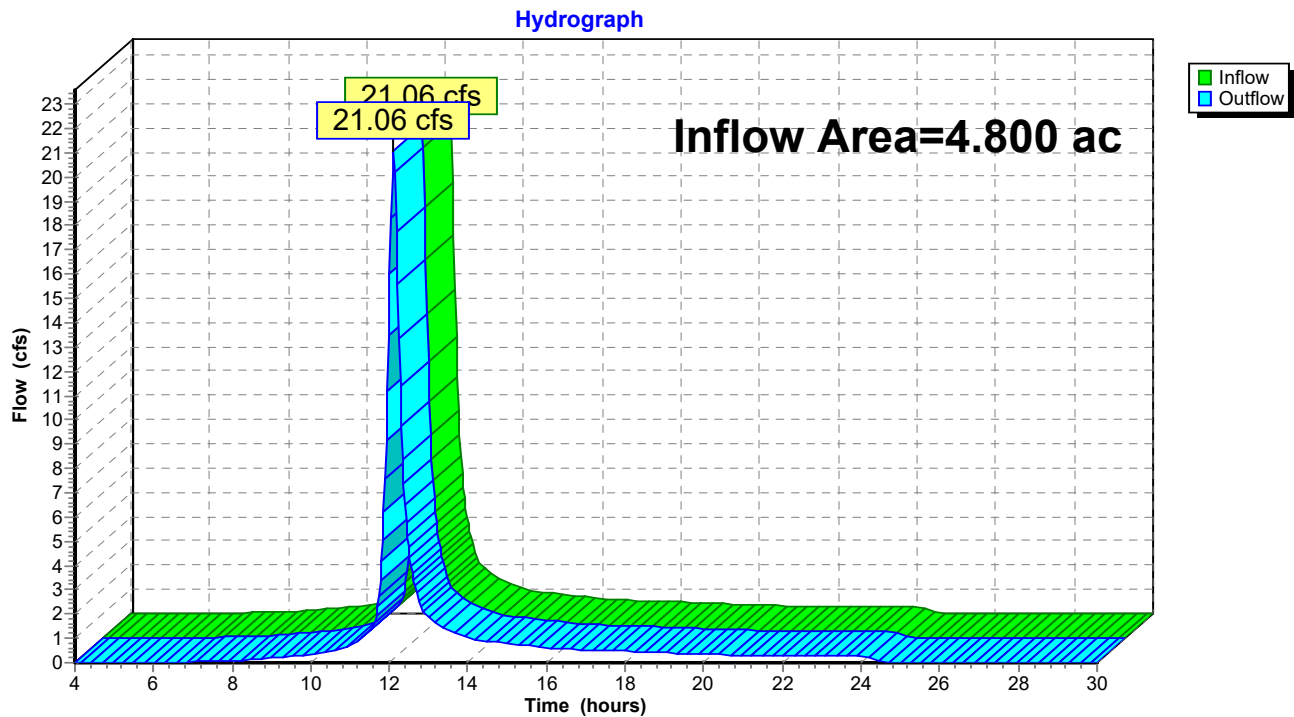
Inflow Area = 4.800 ac, 14.17% Impervious, Inflow Depth = 3.69" for 100-yr event

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



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Type II 24-hr 100-yr Rainfall=5.78"

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Summary for Reach 5R: Drainage Ditch

Inflow Area = 2.200 ac, 12.27% 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

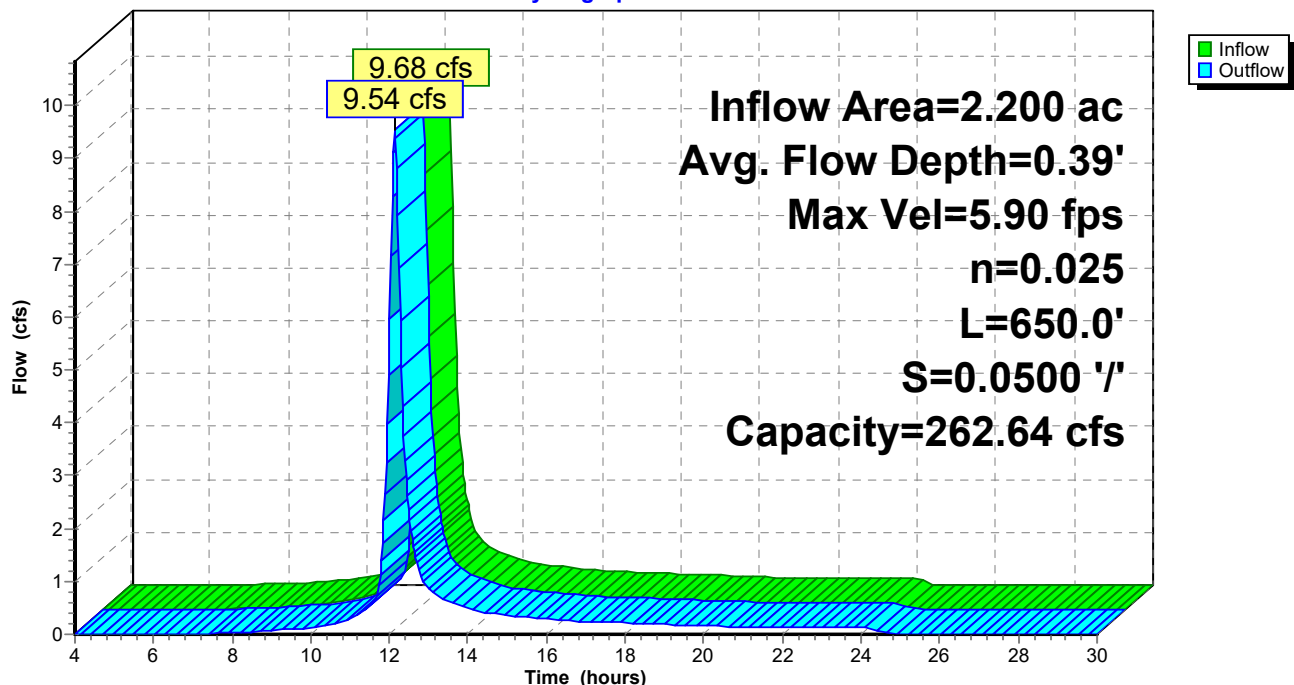
Peak Storage= 1,050 cf @ 12.11 hrs
Average Depth at Peak Storage= 0.39' , Surface Width= 5.33'
Bank-Full Depth= 2.00' Flow Area= 18.0 sf, Capacity= 262.64 cfs

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

Hydrograph



Proposed Drainage Areas

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Type II 24-hr 100-yr Rainfall=5.78"

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Summary for Pond 1P: Bioretention 1

Inflow Area = 37.380 ac, 11.61% Impervious, Inflow Depth = 3.68" for 100-yr event
Inflow = 97.78 cfs @ 12.37 hrs, Volume= 11.475 af
Outflow = 103.86 cfs @ 12.37 hrs, Volume= 11.315 af, Atten= 0%, Lag= 0.2 min
Primary = 103.86 cfs @ 12.37 hrs, Volume= 11.315 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= 873.58' @ 12.37 hrs Surf.Area= 16,700 sf Storage= 14,715 cf

Plug-Flow detention time= 17.6 min calculated for 11.302 af (98% of inflow)
Center-of-Mass det. time= 9.2 min (851.0 - 841.8)

Volume	Invert	Avail.Storage	Storage Description
#1	872.00'	14,715 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
872.00	13,500	0	0
872.50	14,330	6,958	6,958
873.00	16,700	7,758	14,715

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=103.82 cfs @ 12.37 hrs HW=873.58' (Free Discharge)

↑1=**Broad-Crested Rectangular Weir** (Weir Controls 103.82 cfs @ 2.64 fps)

Proposed Drainage Areas

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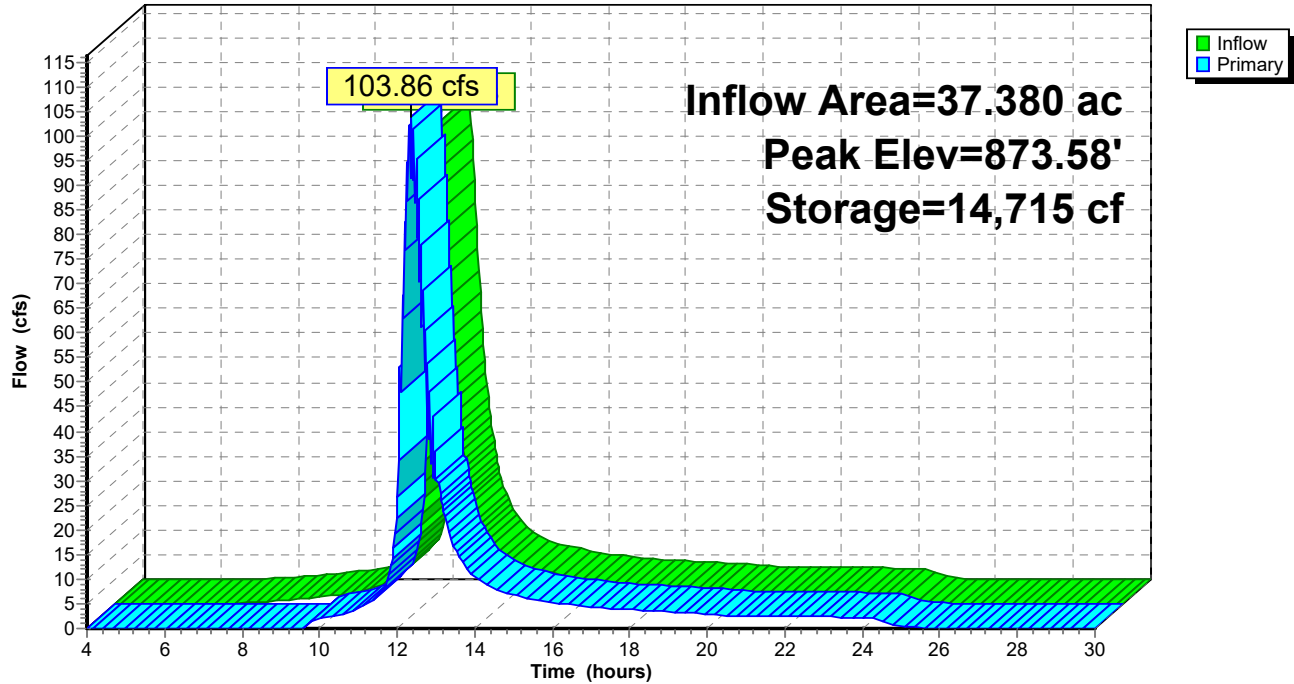
Type II 24-hr 100-yr Rainfall=5.78"

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Pond 1P: Bioretention 1

Hydrograph



Proposed Drainage Areas

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Summary for Pond 2P: Bioretention 2

Inflow Area = 8.920 ac, 14.35% Impervious, Inflow Depth = 1.49" for 100-yr event
Inflow = 3.60 cfs @ 12.14 hrs, Volume= 1.110 af
Outflow = 3.37 cfs @ 12.20 hrs, Volume= 1.015 af, Atten= 6%, Lag= 3.6 min
Primary = 3.37 cfs @ 12.20 hrs, Volume= 1.015 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= 882.62' @ 12.20 hrs Surf.Area= 9,719 sf Storage= 5,269 cf

Plug-Flow detention time= 85.0 min calculated for 1.014 af (91% of inflow)
Center-of-Mass det. time= 42.7 min (980.6 - 937.9)

Volume	Invert	Avail.Storage	Storage Description
#1	882.00'	9,105 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
882.00	7,000	0	0
882.50	9,500	4,125	4,125
883.00	10,420	4,980	9,105

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=3.36 cfs @ 12.20 hrs HW=882.62' (Free Discharge)
↑1=**Broad-Crested Rectangular Weir** (Weir Controls 3.36 cfs @ 0.92 fps)

Proposed Drainage Areas

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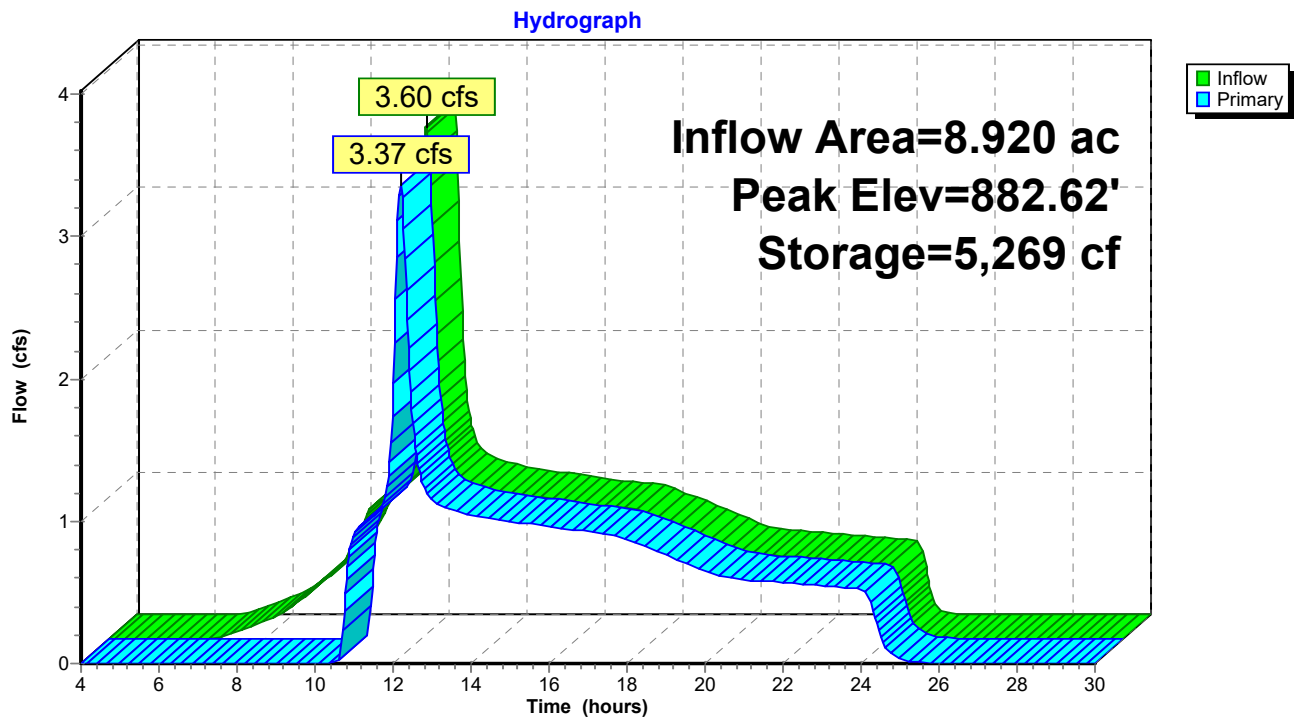
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Pond 2P: Bioretention 2



Proposed Drainage Areas

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Type II 24-hr 100-yr Rainfall=5.78"

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Summary for Pond 3P: Detention Basin

Inflow Area = 47.380 ac, 11.86% Impervious, Inflow Depth = 3.60" for 100-yr event
Inflow = 124.54 cfs @ 12.31 hrs, Volume= 14.207 af
Outflow = 50.05 cfs @ 12.82 hrs, Volume= 13.939 af, Atten= 60%, Lag= 30.5 min
Primary = 50.05 cfs @ 12.82 hrs, Volume= 13.939 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= 871.95' @ 12.82 hrs Surf.Area= 35,277 sf Storage= 204,367 cf

Plug-Flow detention time= 94.7 min calculated for 13.939 af (98% of inflow)
Center-of-Mass det. time= 83.1 min (931.1 - 848.0)

Volume	Invert	Avail.Storage	Storage Description
#1	863.50'	243,001 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
863.50	1,285	0	0
864.00	11,100	3,096	3,096
865.00	18,820	14,960	18,056
866.00	21,020	19,920	37,976
867.00	23,280	22,150	60,126
868.00	25,590	24,435	84,561
869.00	27,960	26,775	111,336
870.00	30,390	29,175	140,511
871.00	32,875	31,633	172,144
872.00	35,415	34,145	206,289
873.00	38,010	36,713	243,001

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	863.50'	30.0" Round Culvert L= 98.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 863.50' / 857.00' S= 0.0663 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 4.91 sf
#3	Device 2	863.50'	7.0" Vert. Orifice1 C= 0.600 Limited to weir flow at low heads
#4	Device 2	866.00'	32.0" W x 18.0" H Vert. Orifice2 C= 0.600 Limited to weir flow at low heads
#5	Device 2	868.10'	36.0" x 36.0" Horiz. Grate C= 0.600 Limited to weir flow at low heads

Proposed Drainage Areas

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Primary OutFlow Max=50.05 cfs @ 12.82 hrs HW=871.95' (Free Discharge)

↳ **2=Culvert** (Inlet Controls 50.05 cfs @ 10.20 fps)

↳ **3=Orifice1** (Passes < 3.67 cfs potential flow)

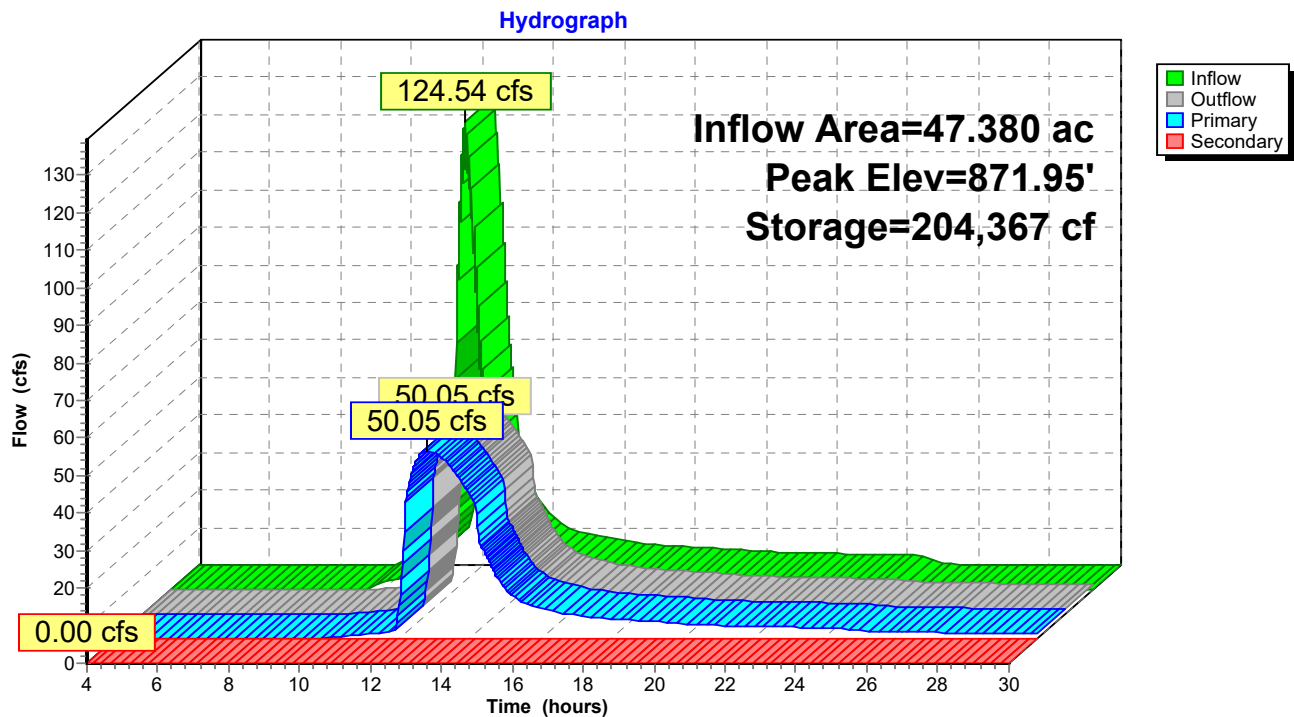
↳ **4=Orifice2** (Passes < 43.86 cfs potential flow)

↳ **5=Grate** (Passes < 84.98 cfs potential flow)

Secondary OutFlow Max=0.00 cfs @ 4.00 hrs HW=863.50' (Free Discharge)

↳ **1=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 3P: Detention Basin



Proposed Drainage Areas

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Type II 24-hr 100-yr Rainfall=5.78"

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Summary for Pond 4P: Diversion Structure

Inflow Area = 8.920 ac, 14.35% Impervious, Inflow Depth = 3.58" for 100-yr event
Inflow = 34.39 cfs @ 12.14 hrs, Volume= 2.664 af
Outflow = 34.39 cfs @ 12.14 hrs, Volume= 2.664 af, Atten= 0%, Lag= 0.0 min
Primary = 3.60 cfs @ 12.14 hrs, Volume= 1.110 af
Routed to Pond 2P : Bioretention 2
Secondary = 30.79 cfs @ 12.14 hrs, Volume= 1.553 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= 905.66' @ 12.14 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	882.20'	6.0" Round Bioretention Culvert L= 10.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 882.20' / 882.10' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.20 sf
#2	Secondary	883.90'	18.0" Round Detention Culvert L= 45.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 883.90' / 875.00' S= 0.1978 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf

Primary OutFlow Max=3.58 cfs @ 12.14 hrs HW=905.51' (Free Discharge)

↑**1=Bioretention Culvert** (Inlet Controls 3.58 cfs @ 18.26 fps)

Secondary OutFlow Max=30.68 cfs @ 12.14 hrs HW=905.51' (Free Discharge)

↑**2=Detention Culvert** (Inlet Controls 30.68 cfs @ 17.36 fps)

Proposed Drainage Areas

Prepared by Napierala Consulting, P.C.

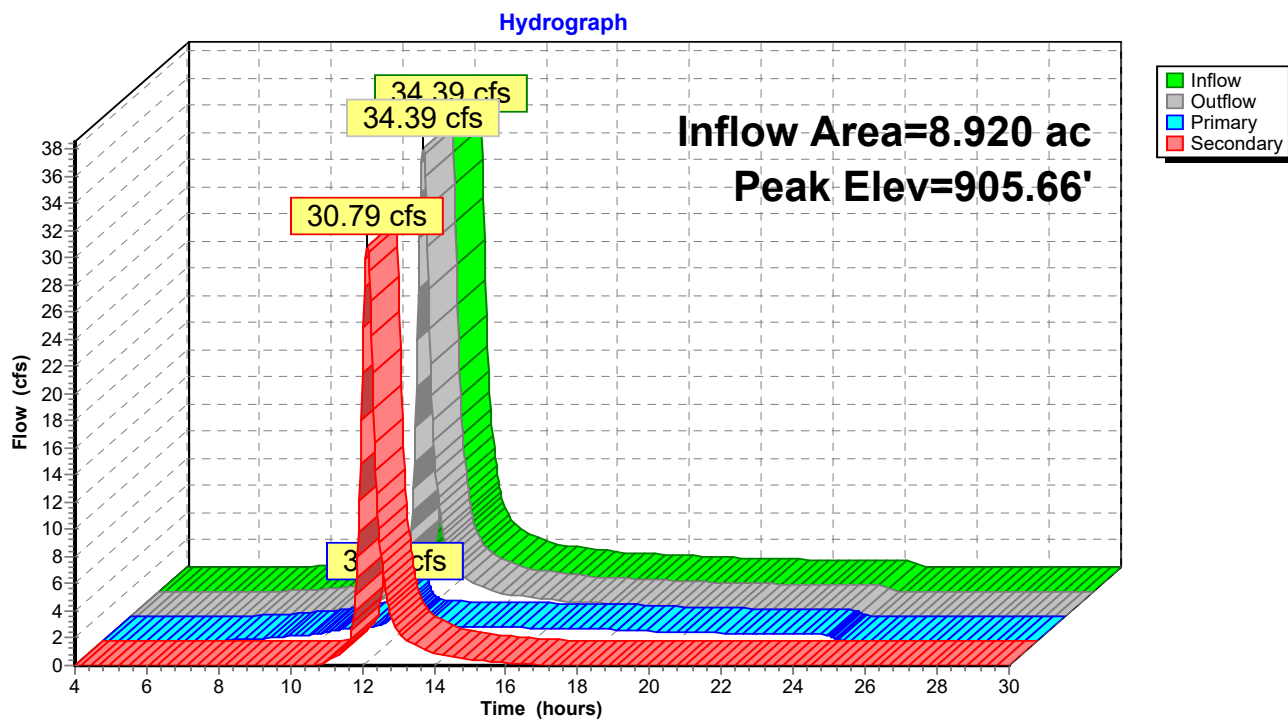
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Pond 4P: Diversion Structure



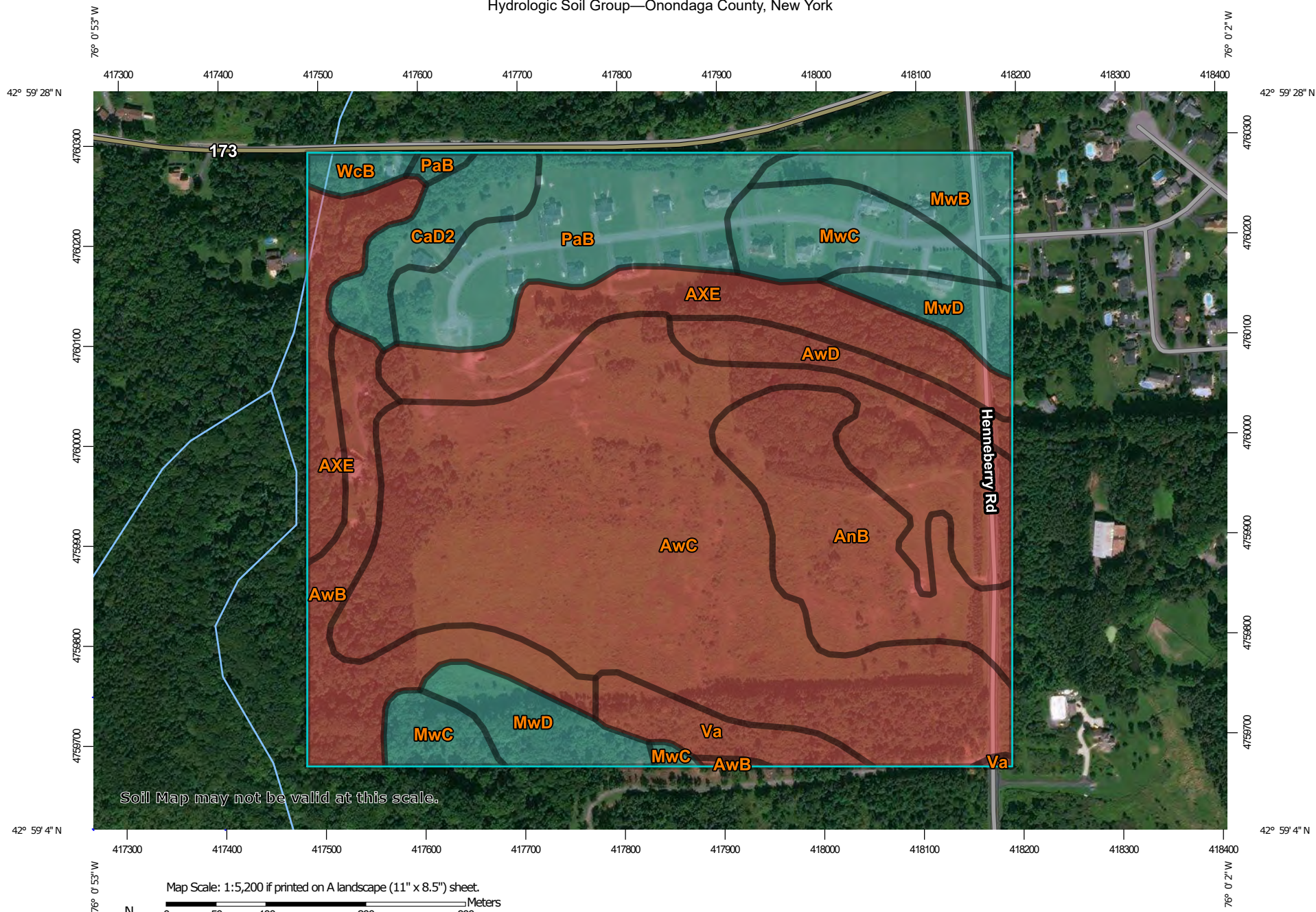


APPENDIX C: SOIL DESCRIPTIONS



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Hydrologic Soil Group—Onondaga County, New York



**Natural Resources
Conservation Service**

Web Soil Survey
National Cooperative Soil Survey

8/3/2020
Page 1 of 4

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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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)



- ☐ Mulch (if used) needs to be replaced or replenished. The mulch layer had decomposed or is less than 1-inch thick.

Follow-Up Actions

- ☐ 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: _____

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: _____

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:
	☐ 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: _____

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: _____

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: _____

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:
☐ Vegetation is too thin, is not healthy, and there are many spots that are not well vegetated.	☐ 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.
	☐ 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: _____

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:

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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

[illegible]

Street Address (NOT P.O. BOX)

[illegible]

Side of Street

☐ North ☐ South ☐ East ☐ West

City/Town/Village (THAT ISSUES BUILDING PERMIT)

[illegible]

State

Zip

County

DEC Region

N	Y
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—

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[illegible]

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Name of Nearest Cross Street

[illegible]

Distance to Nearest Cross Street (Feet)

--	--	--	--	--

Project In Relation to Cross Street

☐ North ☐ South ☐ East ☐ West

Tax Map Numbers Section-Block-Parcel

[illegible]

Tax Map Numbers

[illegible]

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
☐ 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

Number of Lots

--	--	--	--

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***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

--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Name

[illegible]

☐ 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

[illegible]

- ☐ Regulatory Map
- ☐ Delineated by Consultant
- ☐ Delineated by Army Corps of Engineers
- ☐ Other (identify)

[illegible]

☐ Yes ☐ No

☐ Yes ☐ No

☐ Yes ☐ No

☐ Yes ☐ No

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☐ Yes ☐ No

15. Does the site runoff enter a separate storm sewer system (including roadside drains, swales, ditches, culverts, etc)? ☐ Yes ☐ No ☐ Unknown

- [illegible]

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

[illegible]

SWPPP Preparer

[illegible]

Contact Name (Last, Space, First)

[illegible]

Mailing Address

[illegible]

City

[illegible]

State Zip

						-				
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Phone

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Fax

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Email

[illegible][illegible]

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

[illegible]

MI

7

Last Name

[illegible]

Signature

Date _____

	/		/	
--	---	--	---	--

25. Has a construction sequence schedule for the planned management practices been prepared? ☐ Yes ☐ No

☐ 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**

Other

[illegible]

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

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)**

<u>RR Techniques (Area Reduction)</u>	<u>Total Contributing Area (acres)</u>	<u>Total Contributing Impervious Area(acres)</u>
○ Conservation of Natural Areas (RR-1) ...	<table border="1" style="display: inline-table; width: 60px; height: 20px;"></table> · <table border="1" style="display: inline-table; width: 60px; height: 20px;"></table>	and/or <table border="1" style="display: inline-table; width: 60px; height: 20px;"></table> · <table border="1" style="display: inline-table; width: 60px; height: 20px;"></table>
○ Sheetflow to Riparian Buffers/Filters Strips (RR-2)	<table border="1" style="display: inline-table; width: 60px; height: 20px;"></table> · <table border="1" style="display: inline-table; width: 60px; height: 20px;"></table>	and/or <table border="1" style="display: inline-table; width: 60px; height: 20px;"></table> · <table border="1" style="display: inline-table; width: 60px; height: 20px;"></table>
○ Tree Planting/Tree Pit (RR-3)	<table border="1" style="display: inline-table; width: 60px; height: 20px;"></table> · <table border="1" style="display: inline-table; width: 60px; height: 20px;"></table>	and/or <table border="1" style="display: inline-table; width: 60px; height: 20px;"></table> · <table border="1" style="display: inline-table; width: 60px; height: 20px;"></table>
○ Disconnection of Rooftop Runoff (RR-4) ..	<table border="1" style="display: inline-table; width: 60px; height: 20px;"></table> · <table border="1" style="display: inline-table; width: 60px; height: 20px;"></table>	and/or <table border="1" style="display: inline-table; width: 60px; height: 20px;"></table> · <table border="1" style="display: inline-table; width: 60px; height: 20px;"></table>
<u>RR Techniques (Volume Reduction)</u>		
○ Vegetated Swale (RR-5)		<table border="1" style="display: inline-table; width: 60px; height: 20px;"></table> · <table border="1" style="display: inline-table; width: 60px; height: 20px;"></table>
○ Rain Garden (RR-6)		<table border="1" style="display: inline-table; width: 60px; height: 20px;"></table> · <table border="1" style="display: inline-table; width: 60px; height: 20px;"></table>
○ Stormwater Planter (RR-7)		<table border="1" style="display: inline-table; width: 60px; height: 20px;"></table> · <table border="1" style="display: inline-table; width: 60px; height: 20px;"></table>
○ Rain Barrel/Cistern (RR-8)		<table border="1" style="display: inline-table; width: 60px; height: 20px;"></table> · <table border="1" style="display: inline-table; width: 60px; height: 20px;"></table>
○ Porous Pavement (RR-9)		<table border="1" style="display: inline-table; width: 60px; height: 20px;"></table> · <table border="1" style="display: inline-table; width: 60px; height: 20px;"></table>
○ Green Roof (RR-10)		<table border="1" style="display: inline-table; width: 60px; height: 20px;"></table> · <table border="1" style="display: inline-table; width: 60px; height: 20px;"></table>
<u>Standard SMPs with RRv Capacity</u>		
○ Infiltration Trench (I-1)		<table border="1" style="display: inline-table; width: 60px; height: 20px;"></table> · <table border="1" style="display: inline-table; width: 60px; height: 20px;"></table>
○ Infiltration Basin (I-2)		<table border="1" style="display: inline-table; width: 60px; height: 20px;"></table> · <table border="1" style="display: inline-table; width: 60px; height: 20px;"></table>
○ Dry Well (I-3)		<table border="1" style="display: inline-table; width: 60px; height: 20px;"></table> · <table border="1" style="display: inline-table; width: 60px; height: 20px;"></table>
○ Underground Infiltration System (I-4)		<table border="1" style="display: inline-table; width: 60px; height: 20px;"></table> · <table border="1" style="display: inline-table; width: 60px; height: 20px;"></table>
○ Bioretention (F-5)		<table border="1" style="display: inline-table; width: 60px; height: 20px;"></table> · <table border="1" style="display: inline-table; width: 60px; height: 20px;"></table>
○ Dry Swale (O-1)		<table border="1" style="display: inline-table; width: 60px; height: 20px;"></table> · <table border="1" style="display: inline-table; width: 60px; height: 20px;"></table>
<u>Standard SMPs</u>		
○ Micropool Extended Detention (P-1)		<table border="1" style="display: inline-table; width: 60px; height: 20px;"></table> · <table border="1" style="display: inline-table; width: 60px; height: 20px;"></table>
○ Wet Pond (P-2)		<table border="1" style="display: inline-table; width: 60px; height: 20px;"></table> · <table border="1" style="display: inline-table; width: 60px; height: 20px;"></table>
○ Wet Extended Detention (P-3)		<table border="1" style="display: inline-table; width: 60px; height: 20px;"></table> · <table border="1" style="display: inline-table; width: 60px; height: 20px;"></table>
○ Multiple Pond System (P-4)		<table border="1" style="display: inline-table; width: 60px; height: 20px;"></table> · <table border="1" style="display: inline-table; width: 60px; height: 20px;"></table>
○ Pocket Pond (P-5)		<table border="1" style="display: inline-table; width: 60px; height: 20px;"></table> · <table border="1" style="display: inline-table; width: 60px; height: 20px;"></table>
○ Surface Sand Filter (F-1)		<table border="1" style="display: inline-table; width: 60px; height: 20px;"></table> · <table border="1" style="display: inline-table; width: 60px; height: 20px;"></table>
○ Underground Sand Filter (F-2)		<table border="1" style="display: inline-table; width: 60px; height: 20px;"></table> · <table border="1" style="display: inline-table; width: 60px; height: 20px;"></table>
○ Perimeter Sand Filter (F-3)		<table border="1" style="display: inline-table; width: 60px; height: 20px;"></table> · <table border="1" style="display: inline-table; width: 60px; height: 20px;"></table>
○ Organic Filter (F-4)		<table border="1" style="display: inline-table; width: 60px; height: 20px;"></table> · <table border="1" style="display: inline-table; width: 60px; height: 20px;"></table>
○ Shallow Wetland (W-1)		<table border="1" style="display: inline-table; width: 60px; height: 20px;"></table> · <table border="1" style="display: inline-table; width: 60px; height: 20px;"></table>
○ Extended Detention Wetland (W-2)		<table border="1" style="display: inline-table; width: 60px; height: 20px;"></table> · <table border="1" style="display: inline-table; width: 60px; height: 20px;"></table>
○ Pond/Wetland System (W-3)		<table border="1" style="display: inline-table; width: 60px; height: 20px;"></table> · <table border="1" style="display: inline-table; width: 60px; height: 20px;"></table>
○ Pocket Wetland (W-4)		<table border="1" style="display: inline-table; width: 60px; height: 20px;"></table> · <table border="1" style="display: inline-table; width: 60px; height: 20px;"></table>
○ Wet Swale (O-2)		<table border="1" style="display: inline-table; width: 60px; height: 20px;"></table> · <table border="1" style="display: inline-table; width: 60px; height: 20px;"></table>

**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.

[illegible][illegible]

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

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 .

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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

- 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

☐ Yes ☐ No

If Yes, Identify the entity responsible for the long term
Operation and Maintenance

[illegible]

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					
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☐ Other

☐ None

41. Does this project require a US Army Corps of Engineers Wetland Permit? ☐ ☐ ☐ ☐ ☐ ☐

☐ Yes ☐ No

Wetland Permit:					
If Yes, Indicate Size of Impact.					.
1. Wetland Use:					
2. Wetland Use:					
3. Wetland Use:					
4. Wetland Use:					
5. Wetland Use:					
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89. Wetland Use:					
90. Wetland Use:					
91. Wetland Use:					

42. Is this project subject to the requirements of a regulated, traditional land use control MS4?
(If No, skip question 43)

☐ Yes ☐ No

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	P							
---	---	---	--	--	--	--	--	--	--

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

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Print Last Name

--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Owner/Operator Signature

--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Date

				/				/				
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**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

**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. K All disturbed areas have achieved final stabilization in accordance with the general permit and SWPPP. ***Date final stabilization completed** (month/year): _____

9b. K 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. K 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? K yes K no (If no, go to question 10f.)

10b. Have all post-construction stormwater management practices included in the final SWPPP been constructed? K yes K 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? K yes K no

10e. Indicate the method used to ensure long-term operation and maintenance of the post-construction stormwater management practice(s):

 K Post-construction stormwater management practice(s) and any right-of-way(s) needed to maintain practice(s) have been deeded to the municipality.

 K Executed maintenance agreement is in place with the municipality that will maintain the post-construction stormwater management practice(s).

 K 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.

 K 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? K 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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STORMWATER MANAGEMENT SYSTEM MAINTENANCE AGREEMENT

THIS AGREEMENT is dated as of the _____ day of _____, 2022 (the “Agreement”) and is by and between the **Town of Manlius** (the “Municipality”), having offices at 301 Brooklea Drive, Fayetteville, NY, and **Harrington Homes, Inc.** (the “Owner”), with offices at 3848 Henneberry Road, Jamesville, NY.

WHEREAS, Owner is the record owner of the property located on Henneberry Road, Manlius, New York (the “Property”) (tax parcel ID # 109.-02-07.1); and

WHEREAS, Owner intends to construct a stormwater management system (the “SMS”) on the Property, consisting of those items depicted on Schedule A annexed hereto and made a part hereof; and

WHEREAS, the agreement is to provide for the long term maintenance and continuation of stormwater management system approved by the Municipality for the below named project; and

WHEREAS, the Municipality and the Owner desire that the SMS be built in accordance with the approved project plans and thereafter be maintained, cleaned, repaired, replaced and continued in perpetuity in order to ensure optimum performance of the SMS components within the easements as identified in Schedule A; and

NOW, THEREFORE, in consideration of the mutual covenants and agreements of the parties hereto, it is hereby agreed as follows:

1. This agreement binds the Owner, its successors and assigns, to the maintenance provisions depicted in the approved project plans which are attached as Schedule A of this agreement.
2. The Owner shall maintain, clean, repair, replace and continue the SMS depicted in Schedule A as necessary to ensure optimum performance of the measures to design specifications. The SMS shall include, but shall not be limited to, the following: drainage ditches, swales, dry wells, infiltrators, drop inlets, pipes, culverts, soil absorption devices, bioretention areas, and detention/retention ponds.
3. The Owner shall be responsible for all expenses related to the maintenance of the SMS and shall establish a means for the collection and distribution of expenses among parties for any commonly owned facilities.
4. The Owner shall provide for the periodic inspection of the SMS, not less than once in every five-year period, to determine the condition and integrity of the measures. Such inspection shall be performed by a Professional Engineer licensed by the State of New York. The inspecting engineer shall prepare and submit to the Municipality within 30 days of the inspection, a written report of the findings including recommendations for those actions necessary for the continuation of the SMS.
5. The Owner shall not authorize, undertake or permit alteration, abandonment, modification or discontinuation of the SMS except in accordance with written approval of the Municipality.



6. The Owner shall undertake necessary repairs and replacement of the SMS at the direction of the Municipality or in accordance with the recommendations of the inspecting engineer.
7. The Owner shall provide to the Municipality within 30 days of the date of this agreement, a security for the maintenance and continuation of the SMS in the form of (a Bond, letter of credit or escrow account).
8. This agreement shall be recorded in the Office of the County Clerk, County of Onondaga together with the deed for the common property and shall be included in the offering plan and/or prospectus.
9. If ever the Municipality determines that the Owner has failed to construct or maintain the SMS in accordance with the project plan or has failed to undertake corrective action specified by the Municipality or by the inspecting engineer, the Municipality is authorized to undertake such steps as reasonably necessary for the preservation, continuation or maintenance of the SMS and to affix the expenses thereof as a lien against the property.

IN WITNESS WHEREOF, the parties hereto have executed this Agreement as of the day and date first set forth above.

TOWN OF MANLIUS

Name: _____

Title: _____

Signature: _____

HARRINGTON HOMES, INC.

Name: _____

Title: _____

Signature: _____



Schedule A

Stormwater Management System Plans

Site Plan Sheets C-2, C-3, and SMP (Overall Grading Plan, Overall Utility Plan, and Stormwater Management Plan)



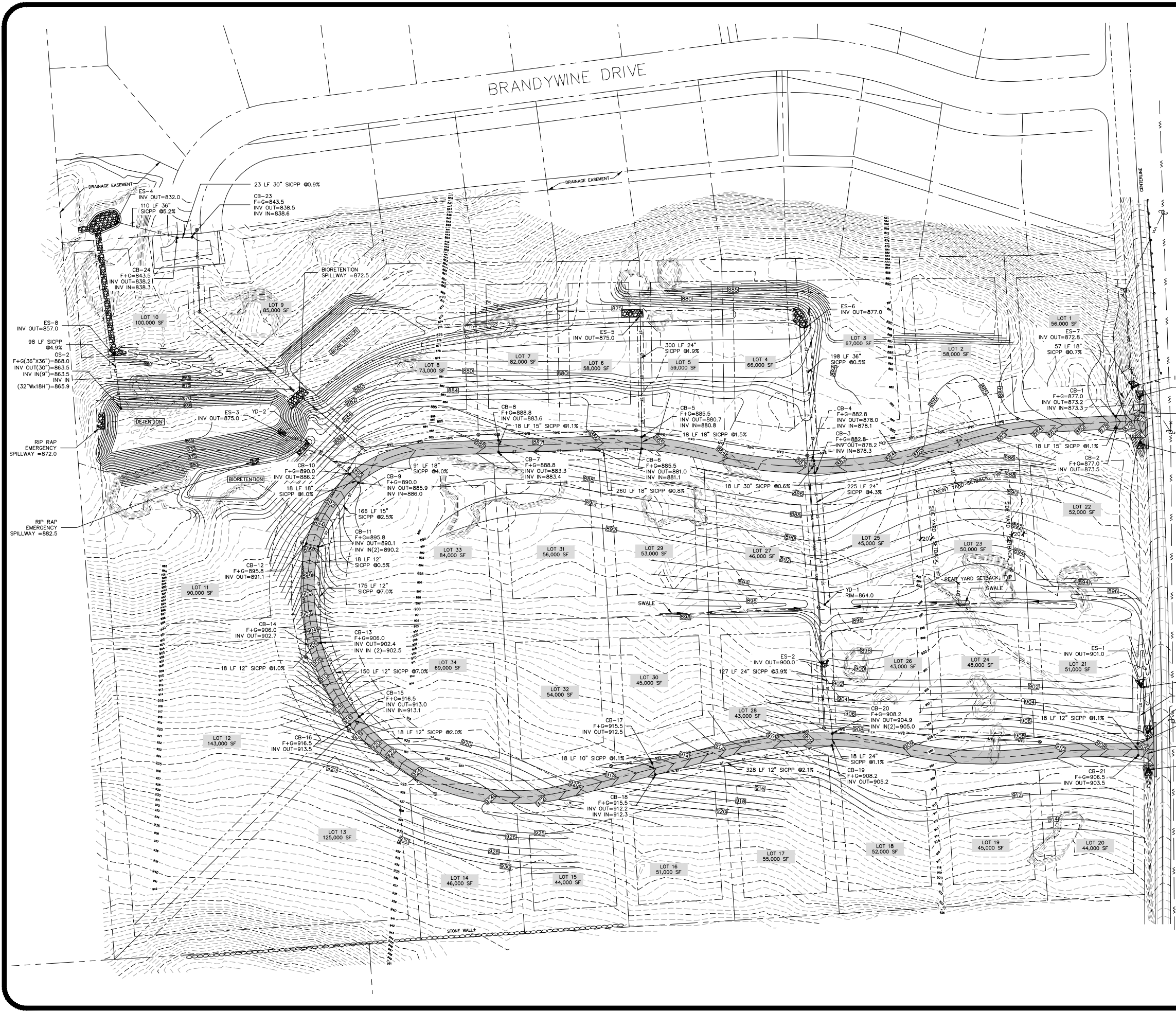
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APPENDIX F: EROSION & SEDIMENT CONTROL DETAILS AND STORMWATER MANAGEMENT PLAN



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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

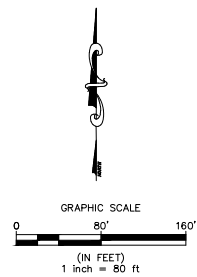
PREPARED FOR:
 HARRINGTON HOMES
 3848 HENNEBERRY ROAD
 JAMESVILLE, NY 13078

OVERALL GRADING PLAN

SHEET TITLE:

NO.	REVISION/ISSUE	DATE
3	REVISED AS PER TOWN ENGINEER'S COMMENTS	2/16/2022
2	GENERAL REVISIONS	2/29/2022
1	GENERAL REVISIONS	12/01/2021

PREPARED BY:
NAPIERALA CONSULTING
 PROFESSIONAL ENGINEERING, P.C.
 1100 N. MANLIUS ROAD
 MANLIUS, NEW YORK 13114
 email: MNAP@NAPCON.COM
 PH: (315) 682-5580 FAX: (315) 682-5544



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 NOT FOR CONSTRUCTION

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 PROFESSIONAL ENGINEER, P.C.
 IF A VIOLATION OF ANY LAW OR
 ORDER OF THE STATE OF NEW YORK
 IS FOUND, THE ENGINEER SHALL
 BE RESPONSIBLE FOR THE VIOLATION
 AND SHALL BE SUBJECT TO THE
 PENALTIES OF THE LAW.

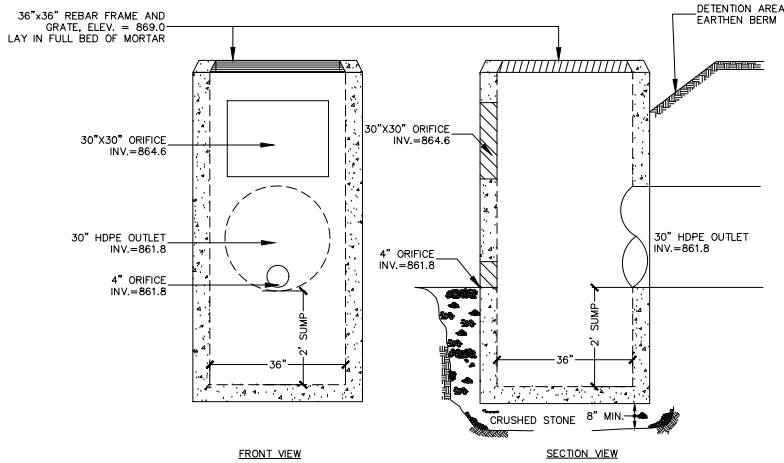
PROJECT NO. **20-1906**

DATE **17 SEP 2020**

SCALE **1" = 80'**

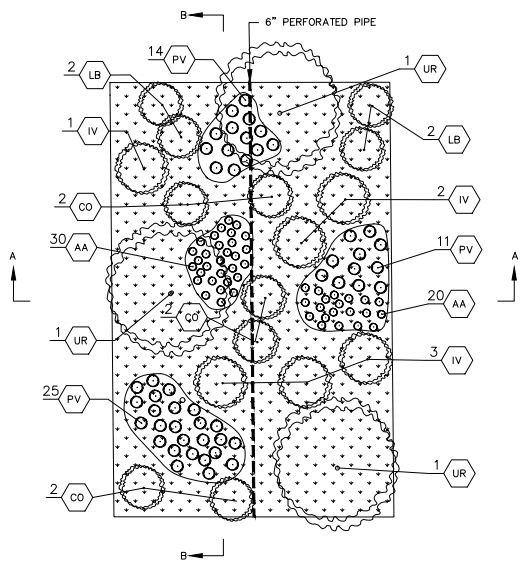
C-2

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DETENTION BASIN #1 PRECAST CONCRETE OUTLET STRUCTURE

1
C-7.1
SCALE: NTS



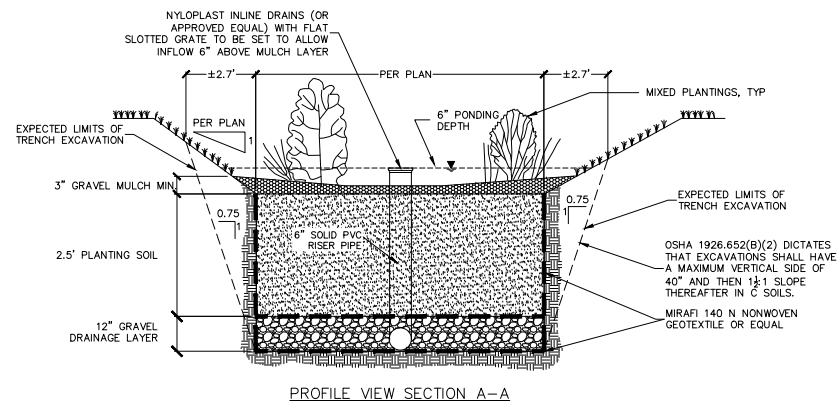
KEY	QUANTITY*	LATIN NAME	COMMON NAME	CALIPER	HEIGHT
TREES					
UR	16	ULMUS RUBRA	SLIPPERY ELM	6'-8'	B&B
SHRUBS					
LB	45	LINDERA BENZOIN	COMMON SPICE	18"-24"	B&B
IV	65	ILEX VERTICILLATA	WINTER BERRY	2'-3'	B&B
CO	65	CEPHALANTHUS OCCIDENTALIS	BUTTONBUSH	18"-24"	B&B
HERBACEOUS PLANTS					
PV	600	PANICUM VIRGATUM	SWITCH GRASS		
AA	600	AGROSTIS ALBA	REDFOP		

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	REDFOP		

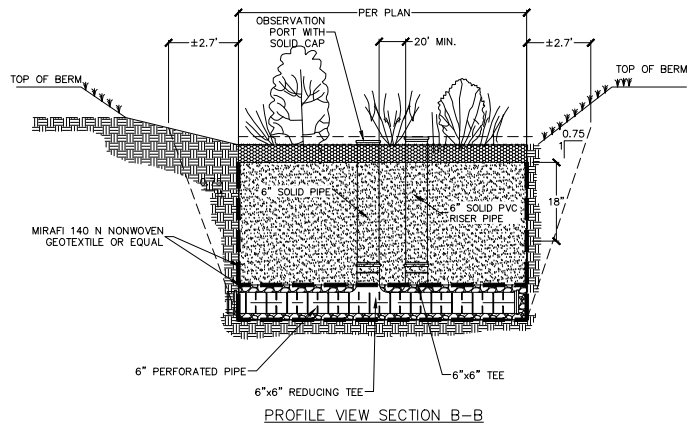
*PLANTING QUANTITIES SHOWN IN THE GRAPHIC ABOVE ARE FOR A TYPICAL 1,000 SF BIORETENTION AREA. SPECIFIC QUANTITIES FOR THE BIORETENTION AREA ARE PROVIDED IN THE CORRESPONDING LANDSCAPING TABLE.

2 BIORETENTION FILTER SPECIES

C-7.1
SCALE: NTS

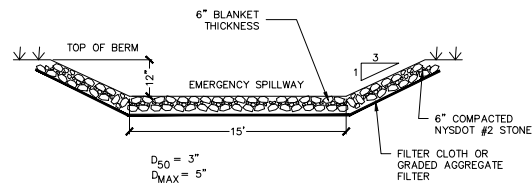


PROFILE VIEW SECTION A-A



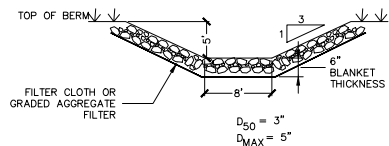
PROFILE VIEW SECTION B-B

- BIORETENTION NOTES:**
- PLANTING SOIL MEDIA SHALL BE:
 - 85% TO 88% COARSE TO MEDIUM SAND
 - 12%-15% LEAF COMPOST OR TOPSOIL
 - PEA GRAVEL MULCH CONFORMING TO ASTM D 448 No. 6.
 - UNDERDRAIN GRAVEL TO BE AASHTO M-43 No. 67, 0.25" TO 0.75".
 - 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
 - COMPACT WITH WATER-FILLED HAND ROLLER. COMPACTION TO BE FIRM BUT EASY (UTILIZE PENCIL TEST).
 - ENGINEER TO TEST IN PLACE COMPACTION AND INFILTRATION OF PLANTING SOIL.
 - 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.



3 RIP RAP EMERGENCY SPILLWAY

C-7.1
SCALE: NTS



4 RIP RAP BIORETENTION SPILLWAY

C-7.1
SCALE: NTS

5 BIORETENTION FILTER CROSS SECTIONS

C-7.1
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

SITE DETAILS

SHEET TITLE:

NO.	REVISIONS	DATE
3	REVISED AS PER TOWN ENGINEER'S COMMENTS	2/16/2022
2	GENERAL REVISIONS	2/29/2022
1	GENERAL REVISIONS	12/01/2021

PREPARED BY:
NAPIERALA CONSULTING
PROFESSIONAL ENGINEER, P.E.
SITING • DESIGN • ENGINEERING
MANLIUS, NEW YORK 13104
email: MNAPI@NAPCON.COM
PH: (315) 682-5580 FAX: (315) 682-5544

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CONSENT OF NAPIERALA
CONSULTING

PROJECT NO.
20-1906

DATE
17 SEP 2020

SCALE
AS SHOWN

C-7.1

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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
- a) 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 REOCCURRENCE 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

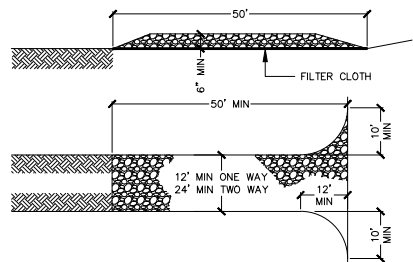
THE CONTRACTOR SHALL KEEP THE FOLLOWING RECORDS RELATED TO CONSTRUCTION ACTIVITIES AT THE SITE:

- 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

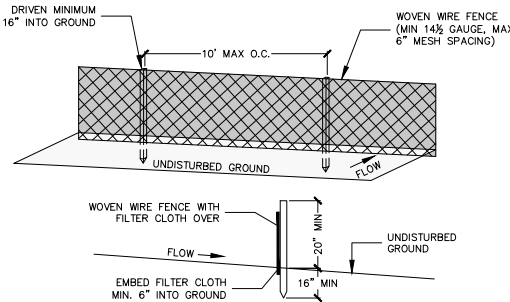
1. LAND DISTURBING ACTIVITIES SHALL NOT COMMENCE UNTIL APPROVAL TO DO SO HAS BEEN RECEIVED BY GOVERNING AUTHORITIES. THE GENERAL CONTRACTOR SHALL STRICTLY ADHERE TO THE APPROVED SWPPP DRAWINGS DURING CONSTRUCTION OPERATIONS.
2. NO LAND CLEARING OR GRADING SHALL BEGIN UNTIL THE APPROPRIATE EROSION CONTROL 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

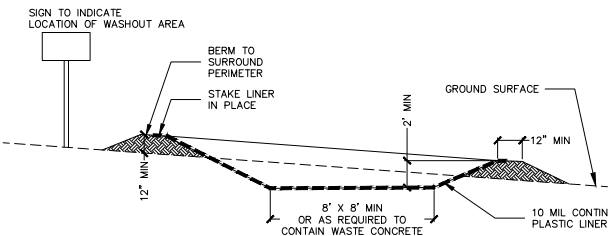
C-7.2 SCALE: NTS



- POSTS: STEEL, EITHER "I" OR "U" TYPE OR 2" HARDWOOD
- FENCE: WOVEN WIRE, 1 1/2 GAUGE, 6" MAX. MESH OPENING
- FILTER CLOTH: FILTER X, MIRAFI 100X, STABILINKA T140N OR APPROVED EQUAL
- PREFABRICATED UNIT: GEOTAB, 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

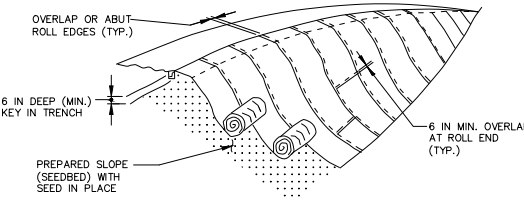
C-7.2 SCALE: NTS



- NOTES:
1. CONCRETE WASHOUT AREA SHALL BE INSTALLED PRIOR TO ANY CONCRETE PLACEMENT ON SITE.
 2. CONCRETE WASHOUT 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 WASHOUT 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

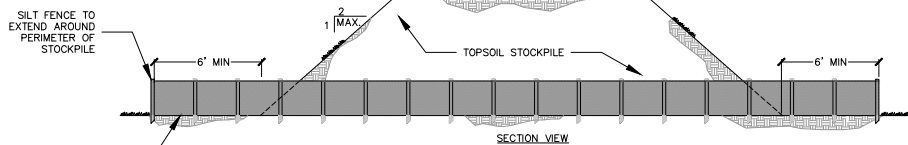


CONSTRUCTION SPECIFICATIONS

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

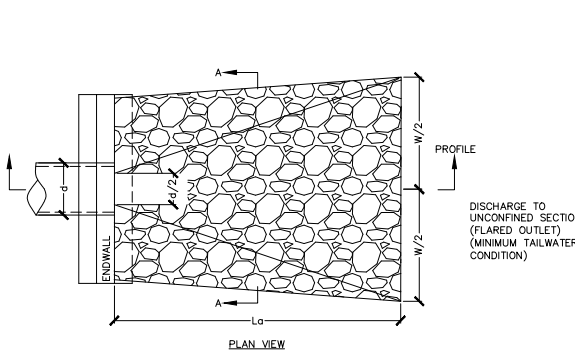
C-7.2 SCALE: NTS



- 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

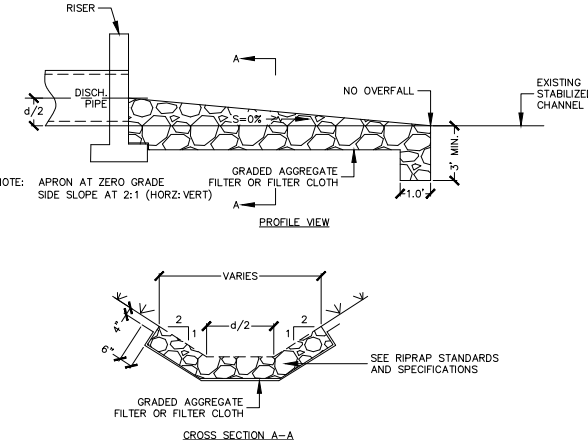
5 TYPICAL TOPSOIL STOCKPILE

C-7.2 SCALE: NTS



ROCK RIPRAP OUTLET PROTECTION UNCONFINED DOWNSTREAM SECTION

C-7.2 SCALE: NTS



SHEET TITLE:

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

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

SITE DETAILS

NO.	REVISION/ISSUE	DATE
3	REVISED AS PER TOWN ENGINEER'S COMMENTS	2/16/2022
2	GENERAL REVISIONS	2/09/2022
1	GENERAL REVISIONS	12/01/2021

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

PRELIMINARY NOT FOR CONSTRUCTION

PROJECT NO. 20-1906
DATE 17 SEP 2020
SCALE AS SHOWN

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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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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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.



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. 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.***

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

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

Planning Board - Initial

TOWN OF MANLIUS
PLANNING DEPARTMENT
INITIAL APPEARANCE APPLICATION
(continued)

Property Owner/s: MARK HARRINGTON Phone: 315 682 8851
Address: 3848 HENNEBERRY RD SANESVILLE NY Zip: 13078
Tax Map#(s): _____ Owner's Signature: [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)

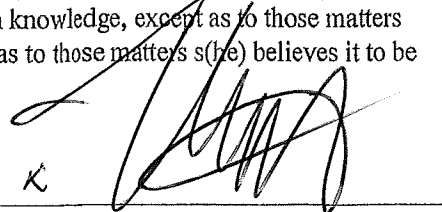
MARK HARRINGTON

s(he) is the OFFICER

, being duly sworn, deposes and says the

of HARRINGTON HONES OF SHAMESVILLE 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

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, 20 20.

Date: _____, 20 ____.

MARK HARRINGTON

(Print Name)

(Print Name)

(Signature)

(Signature)

HARRINGTON HOMES OF SADLERVILLE
INC

(Entity Name)

(Entity Name)

By (Officer) (Title)

By (Officer) (Title)

3848 HENNEBERRY RD. SADLERVILLE
NY 13078

(Mailing Address of Applicant)

(Mailing Address of Applicant)

315-682-8851

(Telephone Number)

(Telephone Number)

ACKNOWLEDGEMENTS

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

On this 14th day of SEPTEMBER in the year 20 20, 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.

Patel

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.



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

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

Provider: _____

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

Wastewater Service

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

Provider: _____

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

Notes: _____

10. ☒ OCPB Jurisdiction (check 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

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.

A handwritten signature in black ink, appearing to read 'Daniel Cupoli', with a stylized flourish at the end.

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.



Joanne M. Mahoney
County Executive

Onondaga County Planning Board

RESOLUTION OF THE ONONDAGA COUNTY PLANNING BOARD

Meeting Date: January 19, 2022

OCPB Case # S-22-1

- 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 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 Henneberry Road (Route 182), a county highway, East Seneca Turnpike (Route 173), a state 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 new residential parcels in a Residential (R-1) zoning district; and
- WHEREAS, in 2020, the Board recommended modification of a preliminary subdivision (S-20-51) for a previous iteration of the proposed subdivision; the plan currently under review appears to have minimal changes from the 2020 iteration; 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 2021 shows the vacant site has additional frontage on Henneberry 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 submitted Overall Grading Plan dated September 17, 2020 shows the subdivision for Harrington Homes at Brandywine will include 34 proposed lots ranging in size from 43,000 SF (0.99 acres) to 143,000 SF (3.28 acres); the plan shows 3,000 sf building footprints on all lots; proposed Lots 9 and 10 will have frontage on the hammerhead at the end of Brandywine Drive; 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 revised Stormwater Pollution Prevention Plan (SWPPP) was included with the referral materials; the plans show a proposed storm sewer network with outlet to a proposed detention basin on Lot 11; the detention basin will have two adjacent

bioretention areas, one on Lot 11 and one on Lot 8; the storm sewer lines appear to occur within a utility easement or the road right-of-way; the detention basin and bioretention areas appear to also occur within 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 EAF, drinking water services for each proposed lot will be provided by an individual well; 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; a letter to the Town of Manlius, dated August 31, 2021, indicates concerns were raised by the Town Planning Board regarding water availability and sustainability on-site for the proposed subdivision; a Well Report dated August 31, 2021 was subsequently completed by DW Stoner & Associates, LLC and provided to the Town;

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 submitted project is located in the Meadowbrook Limestone Waste Water Treatment Plant service area, an area designated as flow constrained and impacted by excessive wet weather flow; 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; the revised SWPPP includes a letter from the NYS Department of Environmental Conservation (DEC) indicating the project site is within 2.5 miles of a documented winter hibernaculum of both bat species and that further information from on-site surveys or other resources may be required to fully assess impacts on biological resources; 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); the revised SWPPP includes a letter from the State historic Preservation Office/Office of Parks, Recreation and Historic Preservation noting that a Phase IA/IB archaeological survey is recommended for components of the project that will involve ground disturbance, unless substantial prior ground disturbance can be documented; 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:

1. Per the Onondaga County Department of Transportation, all access to the proposed lots must come from Brandywine Drive or the proposed subdivision road. No driveways on Henneberry Road will be permitted for individual lots. The applicant must coordinate plans for the new subdivision 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.
2. Any extension of the public wastewater infrastructure must be approved by the Onondaga County Health Department and Onondaga County Department of Water Environment Protection prior to, or as a condition of, municipal approval.

The Board also offers the following comments:

1. Prior to approval of infrastructure plans for this development, the Town is strongly advised to coordinate this proposal with the adjacent Town of Pompey, to ensure that development is well-considered, efficient and orderly. Decisions on individual well service and a closed loop road to serve this development may impact the ability to efficiently allow for continued development on Henneberry Road in future years. In conducting this coordination, the towns should consider whether the infrastructure as planned is appropriate for the area if any future development is anticipated, even in the long term. Conversely, the towns should consider if there are any existing protections in place that will minimize urban development in this area, or if any protections should be established.
2. 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.
3. 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.
4. 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.
5. 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.

A handwritten signature in black ink, appearing to read 'Martin E. Voss', with a stylized flourish at the end.

Martin E. Voss, Chairman
Onondaga County Planning Board

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 off Henneberry Road
Referral Type: PRELIMINARY SUBDIVISION
OCPB Date: January 19, 2022
OCPB Action: Modification
OCPB Case #: S-22-1

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.
