CARMINA WOOD
DESIGN

ENGINEER'S REPORT

for

Holland Heights

Single Family Subdivision
1789 Dodge Road
Town of Amherst, Erie County, New York State

Prepared for

Joesph Rubino

5500 Main Street, Suite 343
Williamsville, New York, 14221

Prepared by

Carmina Wood Design

80 Silo City Row, Suite 100
Buffalo, NY 14203

Telephone: (716) 842-3165
Fax: (716) 842-0263

Revised July 2025

Table of Contents

Attachments

Section 1 - Location & Description

This project is a development of a 6.71 acre site located on the east side of Dodge Road in the Town of Amherst for a single family subdivision. Construction will consist of a proposed public roadway, public storm sewer, sanitary sewer and water mains, lighting and landscaping improvements. Seventeen (17) lots are proposed for the roadway extension, fourteen (14) of which will be building lots for single-family homes. One lot will be used for stormwater management areas and two lots will be permeant open space areas. Currently the site consists of one existing single-family house, but the majority of the site is undeveloped woodlands, wetlands and open grass areas. Approximately 0.12 acres of the site are designated as Federal wetlands. The proposed site development area to be disturbed for this project is approximately 5.61 acres when construction is completed.

Section 2 - Water Service

An existing 8" public PVC water main is located along the west side of Dodge Road that will be the source of water for this project. Approximately 637 LF of new 8" AWWA C-900 PVC water main will be installed along the public road. New ¾" Type 'k" copper services will tap the new 8" main and be installed for building each lot. Two (2) new public fire hydrants will be installed with maximum spacing not to exceed 400 feet.

Pipe material for the new main, hydrant installation and all fittings, valves, etc. will be in accordance with Erie County Water Authority (ECWA) standards. Per hydrant flow test provided by ECWA, the existing static pressure in the 8" PVC water main on Dodge Road Road was approximately 96 psi and the residual pressure was 84 psi. The proposed main, hydrant branches and hydrants will be installed and tested in accordance with ECWA Standard Specifications. Inspection and certification of the installation and testing of the water samples will be done by the ECWA. There are no conflicts with existing utilities in the area, the land is currently vacant. The proposed water main will maintain physical separation from other utilities as specified per Ten States Standards.

Domestic Summary:

Peak Operating Demand:	51 gpm
Water Main:	8" PVC on Dodge Road
Static Pressure:	96 psi (per ECWA)

See attached water demand calculations in Appendix A for additional information.

Section 3 - Sanitary Sewer Service

Proposed is 557 lf of 8" SDR-35 PVC public sanitary sewer, connected to the existing 8" sanitary sewer main along the east side of Dodge Road. The proposed sewer extension will run along the south side of the proposed roadway extension. Each proposed building lot will wye connect to the proposed 8" sanitary sewer via a 6" SDR-35 PVC sanitary lateral at 2.0% minimum slope.

Design Parameters

4-bedroom house: 440 gal/day/house x 14 houses = 6,160 gpd

6,160 gpd * 4.30 = 26.460 gpd *use peaking factor of 4.30

The hydraulic loading rate is per "Design Standards for Intermediate Sized Wastewater Treatment Systems" 2014, NYSDEC.

Downstream sewer capacity analysis is included within the Appendix of this report.

Section 4 - Storm Sewer Service

The site drains from the west to the east and south. A portion of the site drains to Dodge Road on the west side of the property. The rest of the site drains to the south side of the property or to an existing federal wetland on the east side of the property.

The proposed onsite storm sewer system for this development project consists of smooth interior and perforated HDPE pipes connected by a series of catch basins. The storm water management system for this project consists of one bioretention areas and one pond that has an outlet control structure prior to discharge. The ponds drain to the existing wetland. The bioretention areas proposed on site are designed to provide 100% of the required Runoff Reduction volume (RRv) for the site and most of the water quality treatment (WQv) based on the contributing area of 3.49 acres. The remainder of water quality treatment will be provided by the micropool extended detention pond for the additional 0.79 tributary area (see below). The purpose of the micropool extended detention pond (Noted as 'P-1' I the Stormwater Design Manual) is to provide additional WQv for controlled storm flows that surpass the bioretention area and instead are received directly by the detention pond.

The soils in the vicinity of the bioretention area are mainly USDA hydrologic group 'D' and therefore the system will be installed with underdrains per NYSDEC requirements. The bioretention areas will consist of 8" perforated HDPE underdrains in 12" of drainage gravel, followed by filter fabric and then finally 30" minimum of planting soil. Overflow catch basins will be installed to allow 6" maximum temporary ponding for RRv treatment. The proposed detention pond outlet control pipe is designed to accommodate the 1-year through 100-year storm events controlling the offsite runoff rate to less than the existing runoff rates for pre-development drainage area which drains to the existing stream.

Runoff reduction volume (RRv), water quality volume (WQv) and stormwater volume attenuation for the site is designed in accordance with Chapter 4 of the NYSDEC Stormwater design manual. The bioretention areas are provided as a "green infrastructure" practice to provide runoff reduction and a portion of water quality treatment, and the remainder of WQv will be provided in the micropool extended detention basin to meet the Chapter 4 requirements for the currently undeveloped areas. Runoff from the site was looked at as a whole for the calculation of volume attenuation requirements. The amount of impervious cover post-development is 1.57 acres. The proposed detention ponds are designed to accommodate the 1-year through 100-year storm events controlling the offsite runoff rate to less than the existing runoff rates.

<u>Town of Amherst Requirement:</u>
The Town of Amherst requires that the 25-year proposed storm event be attenuated with detention and that the outlet be restricted to the 10-year existing storm event. This volume of 16,041 cf is accommodated in the detention basin at elevation 583.35. At this elevation, the outlet discharge will be restricted to 6.29 cfs from the pond, which is less than the existing 10-year peak runoff outflow of 7.47 cfs of the overall site.

Detention Pond Summary:

Top of basin elevation = 585.00
Bottom of basin elevation = 578.50
Max. pond storage volume = 20,698 cf @ 583.86

Water Quality Summary:
WQv req'd = 7,594 cf (0.174 ac-ft)
RRv min. req'd = 4,182 cf (0.096 ac-ft)
RRv provided - bioretention area = 4,765 cf (0.109 ac-ft)
WQv provided – bioretention area = 2,303 cf (0.053 ac-ft)
WQv provided – micropool extended detention pond area = 526 cf (0.012 ac-ft)

Total RRv + WQv provided + WQv provided (micropool) = 4,765 cf + 2,303 cf + 526 cf = 7,594 cf (0.174 ac-ft)

Bioretention: 100% of minimum post-development Runoff Reduction volume (RRv)
Area: 4,400 sf
Bottom Elevation: 582.50

Detention: Comparison of the existing 1-year vs. the proposed 1-year runoff
Comparison of the existing 10-year vs. the proposed 10-year runoff
Comparison of the existing 10-year vs. the proposed 25-year runoff
Comparison of the existing 100-year vs. the proposed 100-year runoff

Runoff Summary
Drainage Area

Event	Ex. Runoff (cfs)	Pro. Runoff (cfs)*	Result (cfs)
1-year	2.32	2.29	-0.03
10-year	7.47	3.99	-3.48
25-year	10.75	6.29	-4.46
100-year	17.66	13.15	-4.51

*See attached storm drainage calculations and drainage report in Appendix B for additional information.

Appendix A

Sanitary Sewer and Water Demand Calculations

CARMINA WOOD DESIGN
80 Silo City Row, Suite 100
BUFFALO, NEW YORK, 14203
(716) 842-3165
FAX (716) 842-0263

Project No.: 20.247 Date: 4/21/2021
Project Name: Dodge Road Subdivision Revised 5/22/25
Project Address: Amherst, New York
Subject: Sanitary Sewage Demand Calcs
Sheet: 1 of 1

Sanitary Sewage Demand Calculations:

Proposed Subdivision:

14 Lots 4 bdrm @ 440 gpd = 6,160 gpd

Total Average Daily Demand = 6,160 gpd

Find Peak Sanitary Demand:

Total demand: 6,160 gpd / 100 gpcd = 62 per capita

Population (P) = 62 people

Peaking Factor : $(18 + \sqrt{P}) / (4 + \sqrt{P})$ where P is in thousands

Peaking Factor = 4.30

Peak Sanitary Demand = 6,160 x 4.30 = 26,460 gpd
= 0.026 MGD
= 0.041 cfs

Required Infiltration and Inflow Mitigation:

Peak Sanitary Flow = 26,460 gpd = 18.4 gpm

4:1 offset flow per NYSDEC requirements = 18.4 x 4 = 73.5 gpm req'd

Mitigation Credit = 250 /gpm

Mitigation Agreement Amount = **$18,375.27**

Downstream Sewer Capacity Analysis

CARMINA WOOD
DESIGN

DOWNSTREAM SANITARY SEWER CAPACITY ANALYSIS REPORT

for

Single Family Subdivision

1789 Dodge Road
Town of Amherst, Erie County, New York

Prepared for

Joesph Rubino

5500 Main Street, Suite 343
Williamsville, New York 14221

Prepared by

Carmina Wood Design

Silo City Row, Suite 100
Buffalo, NY 14203

Telephone: (716) 842-3165
Fax: (716) 842-0263

Revised May 2025

Project Description

This project is a development of a 6.7 acre +/- site located at 1789 Dodge Road in the Town of Amherst. Construction will consist of extension and completion of a proposed local street. The property will be subdivided to accommodate for 14 single family home lots to be built at a later date. The site will also include the construction of on-site utilities including water service, lighting and landscaping improvements.

The proposed sewer for this project will tie into the existing 8" sewer main along Dodge Road. Sewage will then be conveyed northeast and then west through the 24" and 36" French Trunk Sewer. Flows are then ultimately conveyed north through the 48" Trunk Sewer to the Town of Amherst Wastewater Treatment Facility #16.

Node 1 – 1875 Dodge Road (8"):

Existing Peak Flow measured (wet weather event)	=	0.013 cfs (.007 mgd)*
Proposed 1789 Dodge Rd Subdivision Peak Flow	=	0.041 cfs **
Proposed Peak Flow	=	0.054 cfs
Existing Peak Flow measured (dry weather event)	=	0.253 cfs (.007 mgd)*
Proposed 1789 Dodge Rd Peak Flow	=	0.041 cfs **
Proposed Peak Flow	=	0.294 cfs

Theoretical capacity of existing 8" VTP pipe @ 0.3% = 0.614 cfs

Conclusion: The proposed peak flow is less than the capacity of the 8" VTP pipe, therefore there is sufficient capacity. At no time during the monitoring did the flow depth exceed the pipe diameter at Node 1 of the downstream monitoring points during the rain events monitored.

Node 2 – North French Rd (24")

Existing Peak Flow measured (wet weather event)	=	9.582 cfs (5.155 mgd)*
Proposed 1789 Dodge Rd Subdivision Peak Flow	=	0.041 cfs **
Proposed Peak Flow	=	9.623 cfs

Theoretical capacity of existing 24" RCP pipe = 7.714 cfs (4.15 mgd)

Conclusion: Current flows the day following the 1.11" rainfall event exceeded the capacity of the existing 24" sewer pipe, but at no time during the monitoring period did the flow at any point slow or stall which would have caused a backup or flooding at the manhole. In addition, Sanitary Sewer Overflow (SSD) did not occur. I/I mitigation shall be required for the contribution proposed for this project.

Node 3 – North French near Millersport (24")

Existing Peak Flow measured (wet weather event)	=	9.439 cfs (5.078 mgd)*
Proposed 1789 Dodge Rd Subdivision Peak Flow	=	0.041 cfs **
Proposed Peak Flow	=	9.480 cfs

Theoretical capacity of existing 24" RCP pipe = 7.714 cfs (4.15 mgd)

Conclusion: Current flows the day following the 0.7" rainfall event exceeded the capacity of the existing 24" sewer pipe, but at no time during the monitoring period did the flow at any point slow or stall which would have caused a backup or flooding at the manhole. In addition, Sanitary Sewer Overflow (SSD) did not occur. I/I mitigation shall be required for the contribution proposed for this project.

Foot Notes:

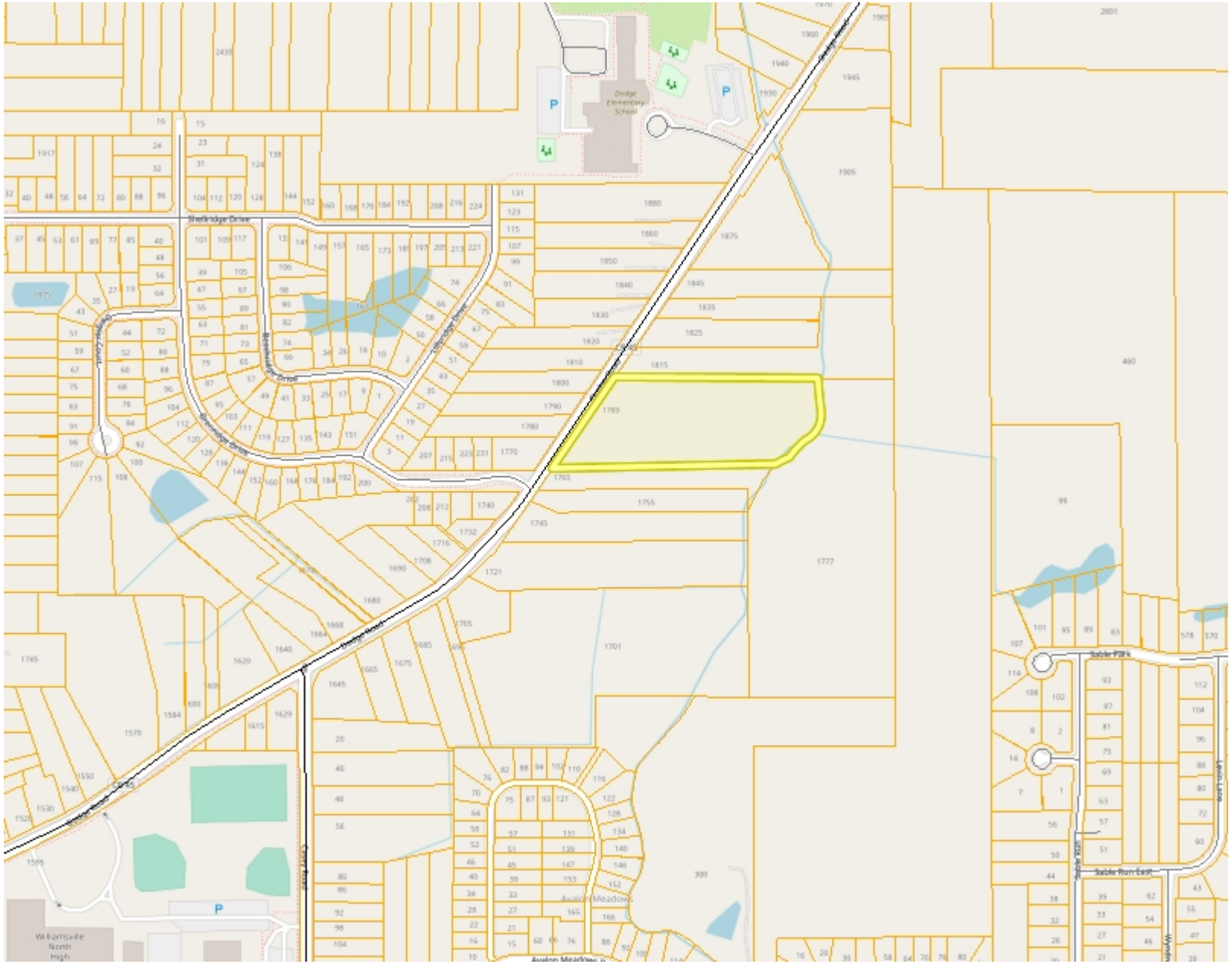
Pipe slopes, sizes and materials provided by Town of Amherst Engineering Department Sewer Maintenance Division

*Converted from measurements in TECSmith report dated 4/20/21

**See Sanitary Sewage Demand Calculations

Location Map

Erie County On-Line Mapping Application



Legend

- Parcels
- Streets and Highways
  - Interstate
  - Primary State Road
  - Secondary State Road
  - County Road
  - Local Road

0 0.14 0.3 Miles

WGS_1984_Web_Mercator_Auxiliary_Sphere
THIS MAP IS NOT TO BE USED FOR NAVIGATION

ERIE COUNTY
DEPARTMENT OF ENVIRONMENT & PLANNING
OFFICE OF GIS

This map is a user generated static output from an Internet mapping site and is for reference only. Data layers that appear on this map may or may not be accurate, current, or otherwise reliable.

1: 9,028

Sanitary Demand Calculations

CARMINA WOOD DESIGN
80 Silo City Row, Suite 100
BUFFALO, NEW YORK, 14203
(716) 842-3165
FAX (716) 842-0263

Project No.: 20.247 Date: 4/21/2021
Project Name: Dodge Road Subdivision Revised 5/22/25
Project Address: Amherst, New York
Subject: Sanitary Sewage Demand Calcs
Sheet: 1 of 1

Sanitary Sewage Demand Calculations:

Proposed Subdivision:

14 Lots 4 bdrm @ 440 gpd = 6,160 gpd

Total Average Daily Demand = 6,160 gpd

Find Peak Sanitary Demand:

Total demand: 6,160 gpd / 100 gpcd = 62 per capita

Population (P) = 62 people

Peaking Factor : $(18 + \sqrt{P}) / (4 + \sqrt{P})$ where P is in thousands

Peaking Factor = 4.30

Peak Sanitary Demand = 6,160 x 4.30 = 26,460 gpd
= 0.026 MGD
= 0.041 cfs

Required Infiltration and Inflow Mitigation:

Peak Sanitary Flow = 26,460 gpd = 18.4 gpm

4:1 offset flow per NYSDEC requirements = 18.4 x 4 = 73.5 gpm req'd

Mitigation Credit = 250 /gpm

Mitigation Agreement Amount = **$18,375.27**

CARMINAWOOD
DESIGN

May 26, 2025

Mr. Jeffrey Burroughs, PE
Town Engineer
Town of Amherst Engineering Department
1100 North French Road
Williamsville, NY 14221

Re: 1789 Dodge Road - Single Family Subdivision
Compliance Letter - Inflow and Infiltration Reduction Program

Dear Mr. Burroughs:

This compliance letter is being submitted by Joseph Rubino, project sponsor for the proposed Single-Family Subdivision at 1789 Dodge Road

The Project Sponsor agrees to comply with the Town of Amherst's I/I mitigation-offset requirements for the wastewater flow from the proposed development.

Wastewater flow from the proposed development was generated as follows:

6,160 gpd x 4.30 = 26,460 gpd or 18.4 gpm Peak Flow. Thus, the I/I mitigation requirements are 18.4 gpm x 4 = 73.5 gpm

Based on the Town's requirement of $250 /gpm x 73.5 gpm = **$18,375.27**, the Project Sponsor's financial contribution of the Town's "Trust in Agency" fund.

The Project Sponsor also agrees to make this contribution prior to acceptance of the PIP's.

Agreed and Accepted:

Joseph Rubino Date: 5/29/25

Joseph Rubino

TECSmith Monitoring Report

Date	Node 1			Node 2			Node 3			Rain₂
	1875 Dodge Rd (8")			North French 24" (24")			N French EO Millersport (25")			
	FLOW (GAL x 1,000)	PEAK FLOW (MGD)	PEAK LEVEL (IN)	FLOW (GAL x 1,000)	PEAK FLOW (MDG)	PEAK LEVEL (IN)	FLOW (GAL x 1,000)	PEAK FLOW (MDG)	PEAK LEVEL (IN)	(inches)
3/15/2021	1.558	0.007	1.021	901.924	2.509	13.017	2451.565	3.138	16.050	***0***
3/16/2021	5.814	0.136	1.429	1851.456	2.431	12.927	2362.168	2.987	15.828	***0***
3/17/2021	3.897	0.117	1.276	1833.935	2.354	12.793	2359.427	3.078	15.946	***0***
3/18/2021	3.526	0.007	0.965	1810.464	2.378	12.837	2259.529	3.071	15.681	***0***
3/19/2021	2.127	0.006	0.722	1777.378	2.272	12.485	2186.568	2.873	15.229	***0***
3/20/2021	2.908	0.006	0.733	1835.479	2.712	13.695	2278.543	3.111	16.386	***0***
3/21/2021	1.471	0.005	0.891	1782.700	2.522	13.292	2306.858	3.161	16.261	***0***
3/22/2021	2.153	0.010	0.804	1756.434	2.338	12.610	2220.316	3.332	15.590	***0***
3/23/2021	1.794	0.012	0.909	1750.216	2.354	12.508	2165.263	2.942	15.598	***0***
3/24/2021	1.334	0.010	0.803	1800.258	2.322	12.720	2209.647	2.930	15.544	***0.04***
3/25/2021	2.060	0.006	0.854	1818.708	2.327	12.425	2191.851	2.903	15.835	***0.1***
3/26/2021	3.490	0.007	0.854	3394.673	5.155	32.200	3430.052	4.993	21.358	***1.11***
3/27/2021	2.520	0.008	0.748	2789.517	3.572	15.870	3247.935	4.098	19.565	***0.01***
3/28/2021	2.553	0.008	0.911	3084.039	4.855	24.342	3297.641	4.788	20.613	***0.38***
3/29/2021	1.726	0.006	0.907	1755.045	3.449	16.146	3240.507	4.662	19.849	***0***
3/30/2021	2.827	0.008	0.856	---	---	---	2916.616	3.723	17.876	***0***
3/31/2021	2.680	0.005	0.742	---	---	---	2702.193	3.508	17.153	***0.15***
4/1/2021	2.651	0.005	0.843	---	---	---	2714.987	3.372	16.766	***0.01***
4/2/2021	2.859	0.005	0.796	---	---	---	2505.293	3.203	16.568	***0***
4/3/2021	2.990	0.007	0.938	---	---	---	2525.733	3.514	16.884	***0***
4/4/2021	2.417	0.009	1.135	---	---	---	2373.848	3.533	16.405	***0***
4/5/2021	2.483	0.007	0.912	---	---	---	2266.588	3.080	15.777	***0.03***
4/6/2021	2.944	0.006	0.910	825.215	2.343	12.291	2252.135	2.939	15.594	***0***
4/7/2021	2.503	0.007	0.950	1846.587	2.402	12.565	2309.849	3.101	15.697	***0.02***
4/8/2021	2.082	0.008	1.024	1828.950	2.483	12.622	2261.713	3.460	15.656	***0***
4/9/2021	2.374	0.010	1.239	1831.352	2.368	12.721	2193.455	3.117	15.464	***0.08***
4/10/2021	2.260	0.008	1.127	1858.770	2.612	13.316	2316.192	3.504	16.334	***0***
4/11/2021	2.859	0.007	1.008	3042.992	5.147	30.730	3249.342	5.078	22.008	***0.7***
4/12/2021	2.895	0.015	0.889	2708.829	3.298	15.235	3106.551	4.305	19.509	***0.05***
4/13/2021	2.801	0.012	0.802	2463.126	3.020	14.069	2867.249	4.024	17.279	***0***
4/14/2021	2.756	0.008	0.821	2271.773	2.756	13.315	2145.403	3.626	16.706	***0***
4/15/2021	3.060	0.013	1.094	2356.976	2.957	14.016	2774.988	3.769	17.125	***0.26***
4/16/2021	3.263	0.008	1.131	2855.766	3.437	15.096	3174.564	3.761	17.887	***0.11***
4/17/2021	2.860	0.007	1.015	2575.069	3.305	14.893	3010.105	3.907	17.949	***0***
4/18/2021	3.009	0.009	0.913	2359.773	3.104	14.318	2819.097	3.644	17.325	***0***
4/19/2021	2.925	0.008	0.910	2144.199	2.646	12.962	2572.211	3.217	16.430	***0.05***
4/20/2021	1.089	0.007	0.914	928.283	2.885	13.472	1081.133	3.048	15.628	***0.2***
---	---	---	---	---	---	---	---	---	---	***3.3***

Yellow Highlights are Wet Weather Days

	MGD	CFS
Wet	0.007	0.013
Dry	0.136	0.253

MGD	CFS
5.155	9.582

MGD	CFS
5.078	9.439

TECsmith

TECSMITH, Inc.
PO Box 383
Elma, New York 14059-0383
Tel: 716-462-0382
Fax: 716-687-1418

Date: April 20, 2021

SANITARY SEWER FLOW CAPACITY STUDY – Summary Review

Prepared For: 1789 Dodge Road Capacity Analysis

Christopher Wood
487 Main Street, Suite 600
Buffalo, New York 14203

Project Name: 1789 Dodge Road Capacity Analysis

Flow Monitoring Period: March 1, 2021 to April 13, 2021

Rain Events (> 0.5-inches) Monitored: March 26, (1.11”), and April 11 (0.70”)

Number of Monitoring Nodes: Three (3) downstream manholes

Node Locations and Descriptions:

- Node 1 1875 Dodge Rd (8")
- Node 2 North French 24" (24")
- Node 3 N French EO Millersport (25")

Summary Conclusion:

Based on the data presented in this report, specifically the flow depth measurements recorded (see graphs below)

- At no time did the flow depth exceed pipe diameter at Nodes 1 and 3 of the downstream monitoring points during the wet weather vents monitored.
- Three times the flow depth exceed pipe diameter at Node 2 of the downstream monitoring points during the wet weather vents monitored.

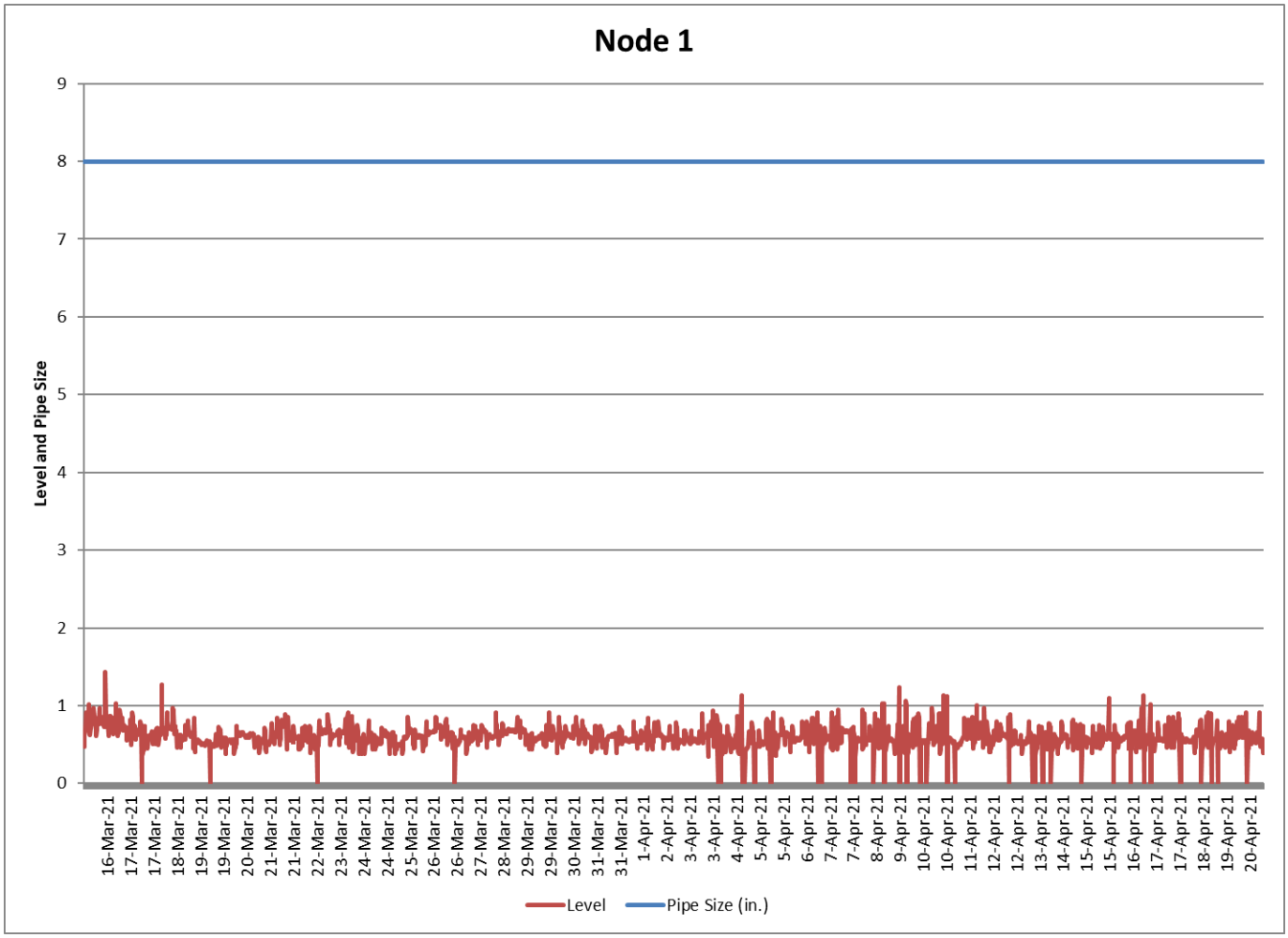
.

TECSMITH, Inc.
PO Box 383
Elma, New York 14059-0383
Tel: 716-462-0382
Fax: 716-687-1418

Depth of Flow Capacity Summary:

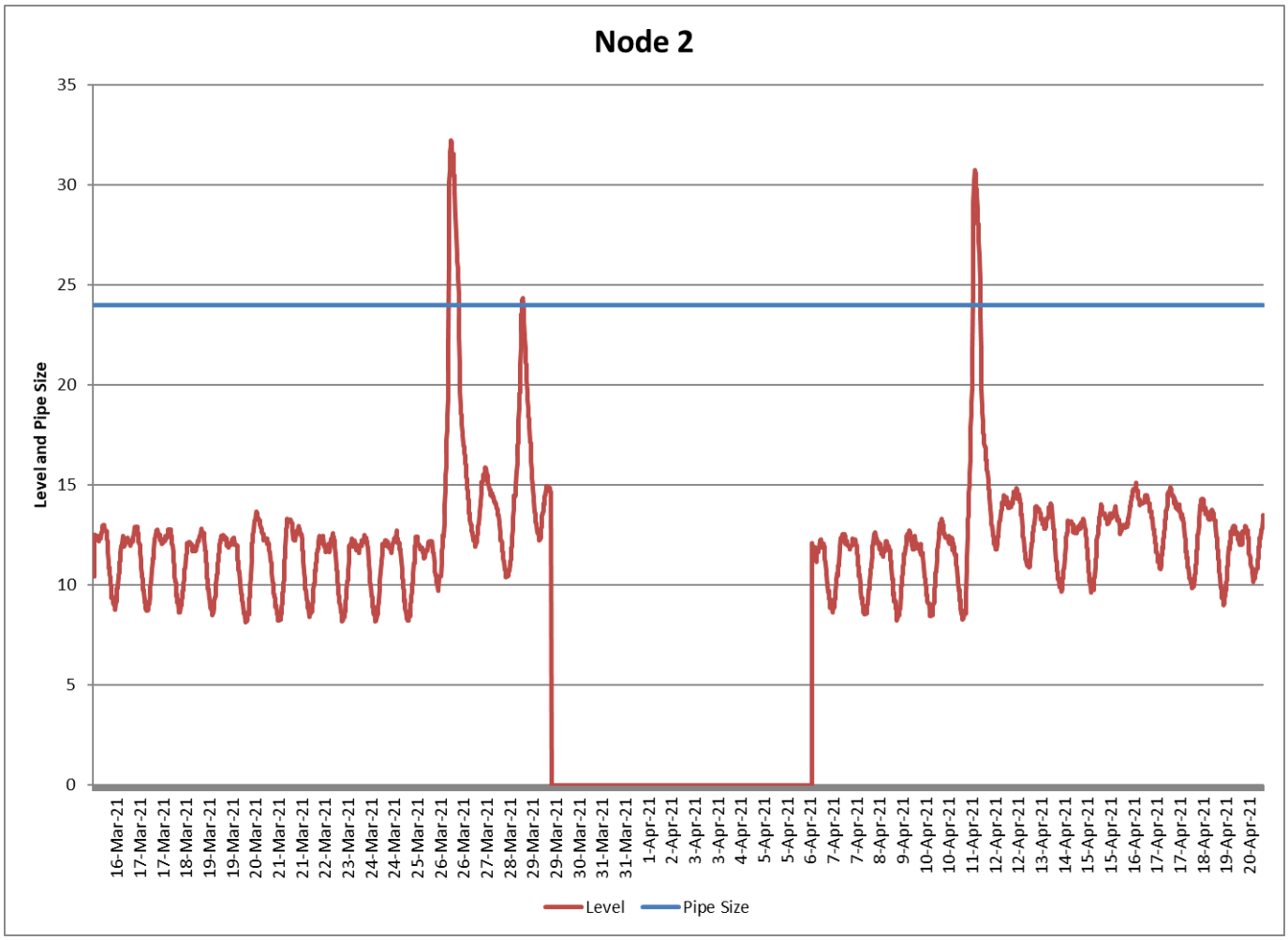
Depth of flow capacity is based on diameter of pipe. See graphs below.

- At no time during the monitoring period did depth of flow exceed pipe diameter at Node 1.



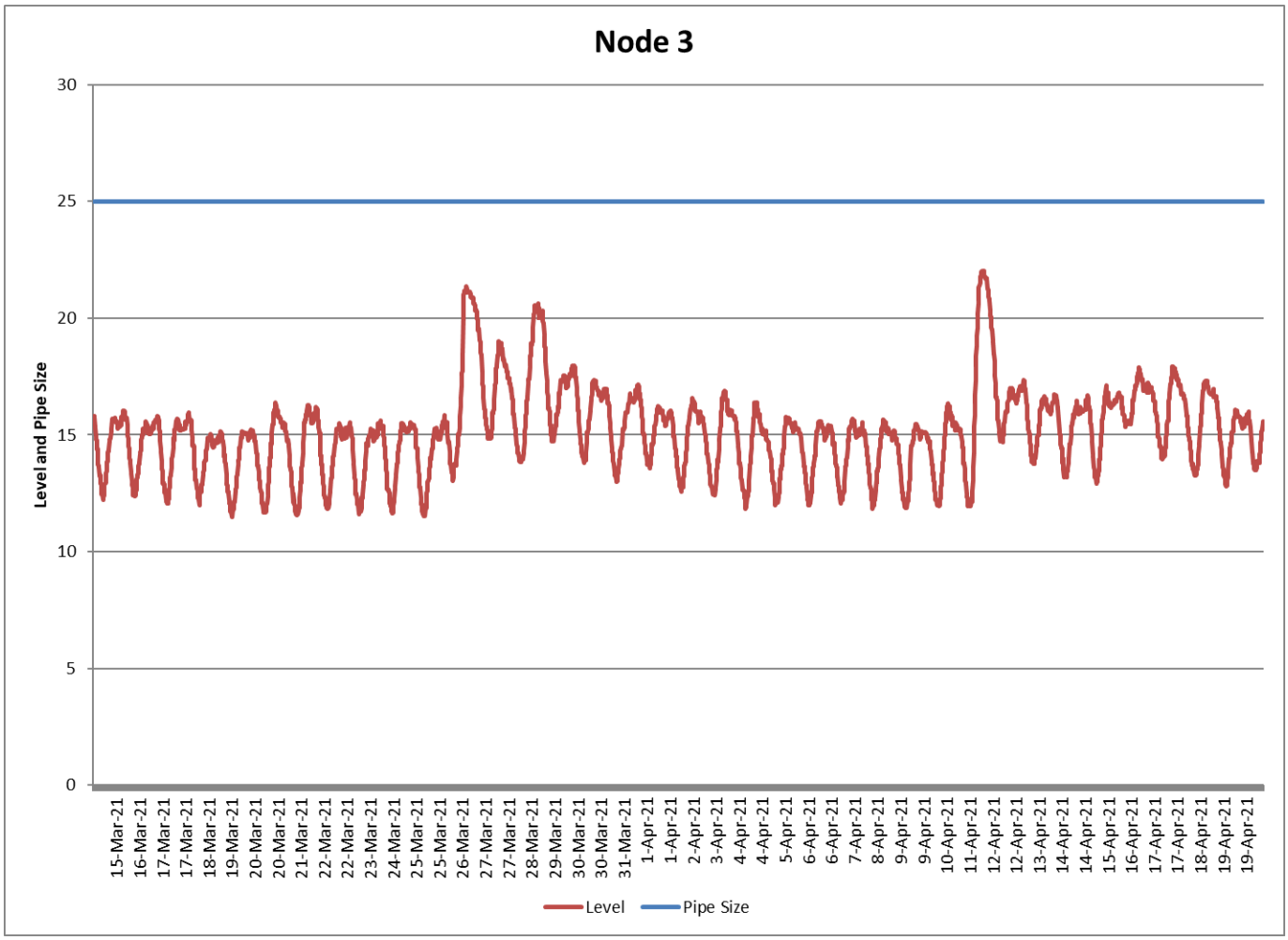
TECSMITH, Inc.
PO Box 383
Elma, New York 14059-0383
Tel: 716-462-0382
Fax: 716-687-1418

- Three times during the monitoring period did depth of flow exceed pipe diameter at Node 2.



TECSMITH, Inc.
PO Box 383
Elma, New York 14059-0383
Tel: 716-462-0382
Fax: 716-687-1418

- At no time during the monitoring period did depth of flow exceed pipe diameter at Node 3.



(T) Amherst Engineering Department Sewer Maintenance Division Downstream Routing Map and Node Maps

Town of Amherst Engineering Department
Sewer Maintenance Division

Main Sanitary Sewer Interceptors

DOWNSTREAM SEWER
FRENCH/DODGE TRUNK SEWER

TRANSIT ROAD TO PLANT #16

JANUARY 2021

* INCLUDES KLEIN RD DIVERSION & WOODLAND HILLS DEVELOPMENT JANUARY 2010

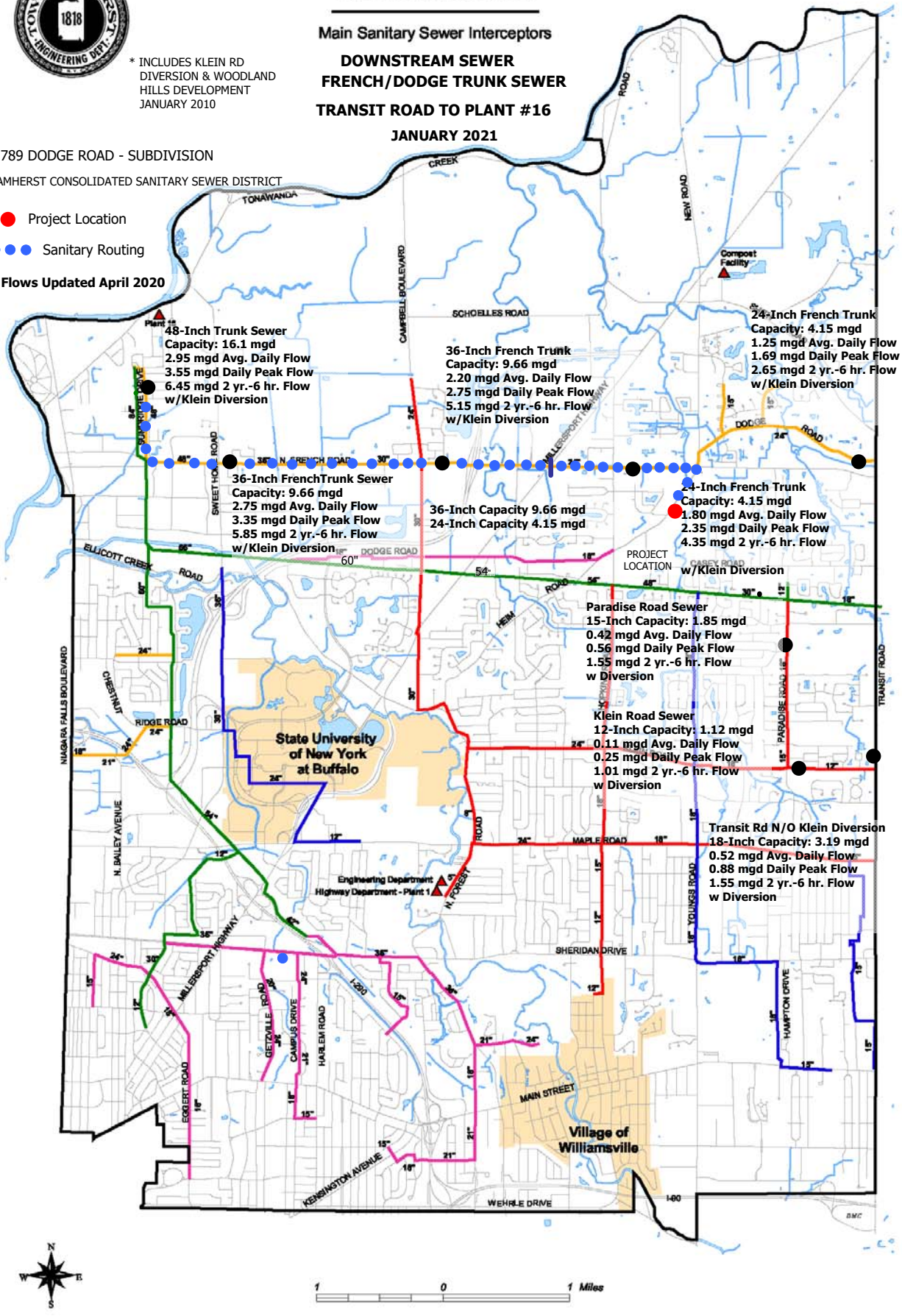
1789 DODGE ROAD - SUBDIVISION

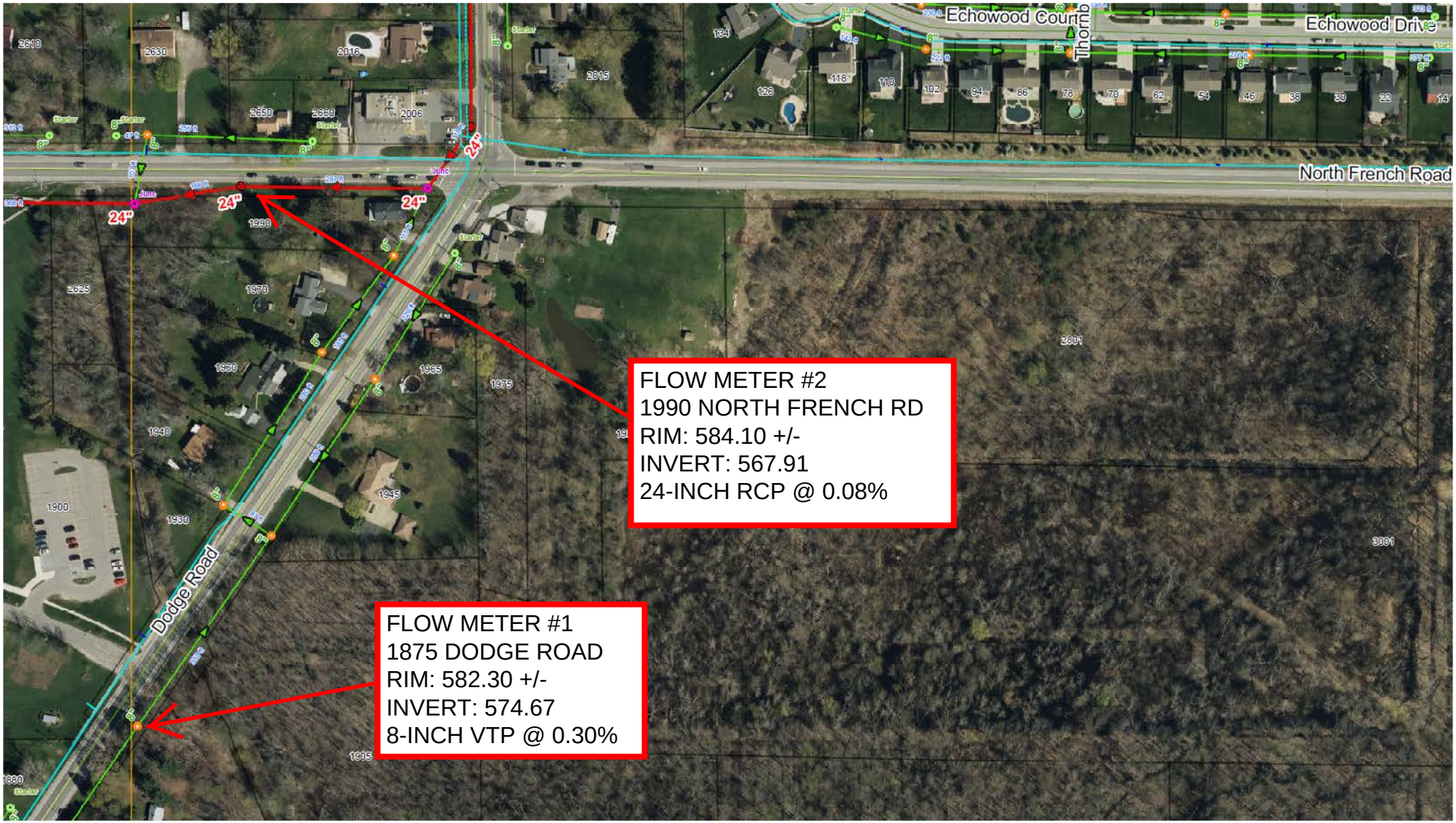
AMHERST CONSOLIDATED SANITARY SEWER DISTRICT

Project Location

Sanitary Routing

Flows Updated April 2020




Echowood Court
Echowood Drive
North French Road
Dodge Road
24"
24"
24"
24"
FLOW METER #2
1990 NORTH FRENCH RD
RIM: 584.10 +/-
INVERT: 567.91
24-INCH RCP @ 0.08%
FLOW METER #1
1875 DODGE ROAD
RIM: 582.30 +/-
INVERT: 574.67
8-INCH VTP @ 0.30%


North French Road
Millersport Highway
Daven Drive
Jackson Square Apts
2050
3400
2100
2130
2140
2158
2162
2168
2182
2198
2200
3375
3325
3355
2171-2235
8" PVC
42" PVC
12" PVC
24" PVC
24" RCP
8" VTP
6"
FLOW METER # 3
3325 NORTH FRENCH RD
RIM: 581.50 +/-
INVERT: 563.61
24-INCH RCP @ 0.08%
TOA TEMP. FLOW METER

Water Demand Calculations

CARMINA WOOD DESIGN
80 Silo City Row, Suite 100
BUFFALO, NEW YORK, 14203
(716) 842-3165
FAX (716) 842-0263

Project No.: 20.247 Date: 4/21/2021
Project Name: Dodge Road Subdivision Revised 5/22/25
Project Address: Amherst, New York
Subject: Sanitary Sewage Demand Calcs
Sheet: 1 of 1

Sanitary Sewage Demand Calculations:

Proposed Subdivision:

14 Lots 4 bdrm @ 440 gpd = 6,160 gpd

Total Average Daily Demand = 6,160 gpd

Find Peak Sanitary Demand:

Total demand: 6,160 gpd / 100 gpcd = 62 per capita

Population (P) = 62 people

Peaking Factor : $(18 + \sqrt{P}) / (4 + \sqrt{P})$ where P is in thousands

Peaking Factor = 4.30

Peak Sanitary Demand = 6,160 x 4.30 = 26,460 gpd
= 0.026 MGD
= 0.041 cfs

Required Infiltration and Inflow Mitigation:

Peak Sanitary Flow = 26,460 gpd = 18.4 gpm

4:1 offset flow per NYSDEC requirements = 18.4 x 4 = 73.5 gpm req'd

Mitigation Credit = 250 /gpm

Mitigation Agreement Amount = **$18,375.27**

CARMINA WOOD DESIGN
80 Silo City Row, Suite 100
BUFFALO, NEW YORK, 14203
(716) 842-3165
FAX (716) 842-0263

Project No.: 20.247 Date: 2/10/2025
Project Name: Dodge Road Subdivision Revised 5/9/25
Project Address: Amherst, New York
Subject: Domestic Water Demand Calculations
Sheet: 1 of 1

Domestic Water Demand Calculations:

Dodge Road Subdivision Typical Demand:

Q = 6,160 gpd * use 100% of Total Sanitary Average Daily Demand

Q = 4.28 gpm * assume 24 hour day

Dodge Road Subdivision Peak Demand:

Q_{peak} = 14 Units @ 3 gpm = 42 gpm Peak Demand

* use 3 gpm per unit (per ECDOH peak flow)

Headlosses:

Q_{peak} = 42 gpm

Pipe = 8 inch C-900 PVC C = 140

Length = 637 LF (approx. distance from HDY M04-G45 on Goodrich Rd to last prop. hydrant)

$$H_L = \frac{10.44\ L\ Q^{1.85}}{C^{1.85}\ D^{4.866}} = \frac{10.44(637)(51)^{1.85}}{(140)^{1.85}\ (8)^{4.866}} = 0.03 \text{ ft} = 0.01 \text{ psi}$$

Δ elev = -3 ft = -1.30 psi *approximate 6' elev. drop to north unit @ building 11

Total Losses = -1.3 psi

Static Pressure = 96 psi *per ECWA

Residual Pressure in main @ last prop. Hydrant = 84 - 3.2 = 97.3 psi

CARMINA WOOD DESIGN
80 Silo City Row, Suite 100
BUFFALO, NEW YORK, 14203
(716) 842-3165
FAX (716) 842-0263

Project No.: 20.247 Date: 2/10/2025
Project Name: Dodge Road Subdivision
Project Address: Amherst, New York
Subject: Fire Flow Demand Calculations
Sheet: 1 of 1

Peak Domestic Demand:

Dodge Road Subdivision

14	Units	@	3 gpm	=	42 gpm	Peak Domestic Demand

* use 3 gpm per unit (per ECDOH peak flow)

Water Demand Calculations (fire):

Fire Flow, Q	=	1000	gpm	* per ISO Guidelines	
Elev. @ ex. residual hyd. K04G12	=	590	ft		
Static pressure @ ex. hyd. K04G12	=	96	psi	* per ECWA	
Elev. @ connection:	=	589.00	ft		
Δ elev ex. hyd. K04G12 to connection	=	-1.00	= -0.43 psi	(positive is decrease in pressure from static)	
				(negative is increase in pressure from static)	
Static pressure @ connection	=	96.4	psi		
Elev. @ furthest pro. hydrant	=	586	ft		
Δ elev connection point to furthest hydrant	=	-3	= -1.3 psi	(positive is decrease in pressure from static)	
				(negative is increase in pressure from static)	

Find residual at furthest hydrant using fire flow:

Headlosses:

Q_{peak} = 1000 gpm
Pipe = 8 inch C-900 PVC C = 140
Length = 637 LF (approx. distance from connection to furthest pro. hydrant)

$$H_L = \frac{10.44\ L\ Q^{1.85}}{C^{1.85}\ D^{4.866}} = \frac{10.44(637)(1000)^{1.85}}{(140)^{1.85}\ (8)^{4.866}} = 10.19 \text{ ft} = 4.4 \text{ psi}$$

Residual pressure at furthest pro. Hydrant = Static pressure at connection - headloss - Δ elev
= 96.4 - 4.4 - -1.3
= 93.3 psi

Find residual at furthest hydrant using total flow:

Total flow = Fire Flow + Peak Domestic Flow = 1042 gpm

Headlosses:

Q_{peak} = 1042 gpm
Pipe = 8 inch C-900 PVC C = 140
Length = 637 LF (approx. distance from connection to furthest pro. hydrant)

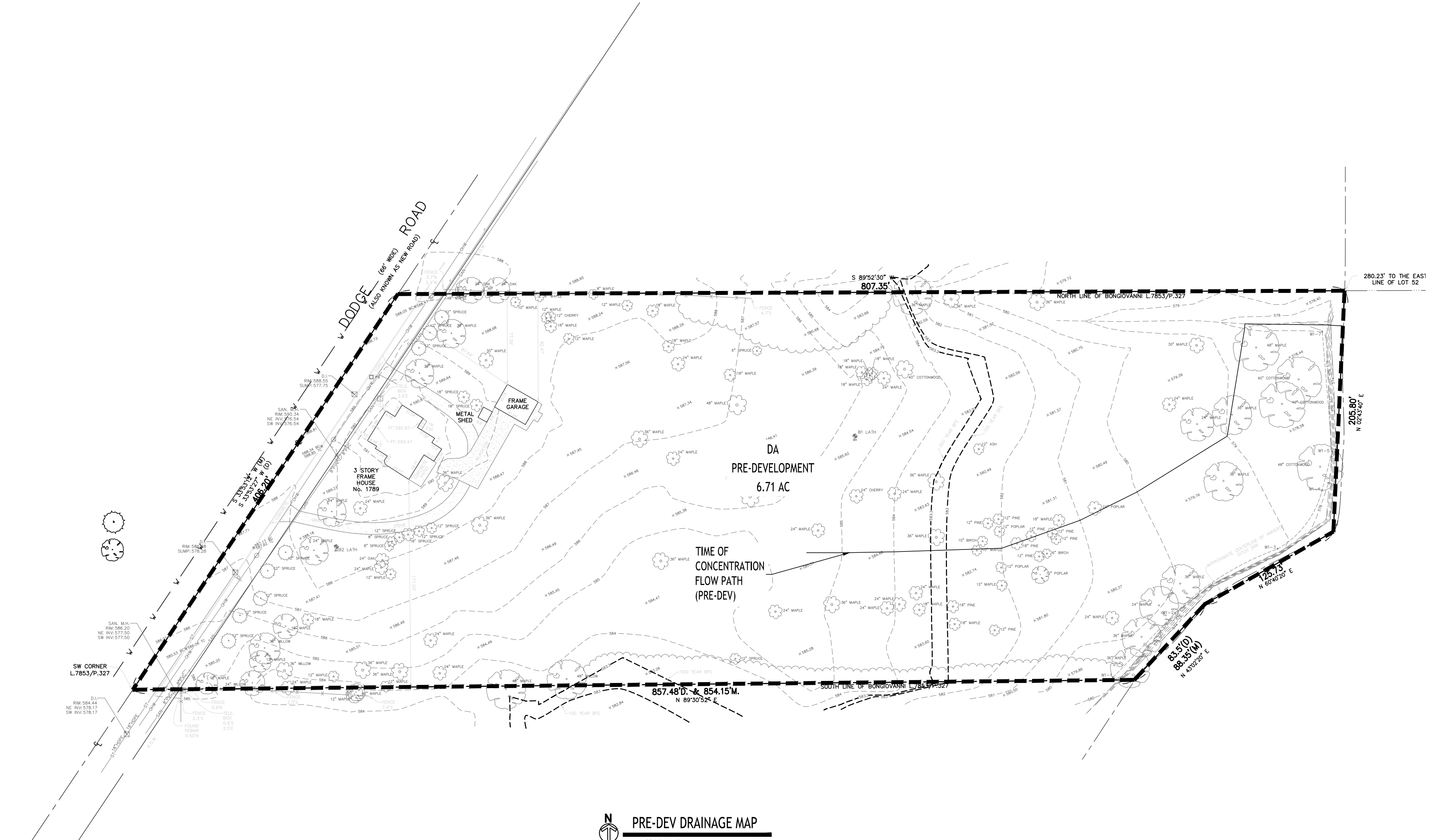
$$H_L = \frac{10.44\ L\ Q^{1.85}}{C^{1.85}\ D^{4.866}} = \frac{10.44(1465)(1084)^{1.85}}{(140)^{1.85}\ (8)^{4.866}} = 10.99 \text{ ft} = 4.8 \text{ psi}$$

Residual pressure at furthest pro. Hydrant = Static pressure at connection - headloss - Δ elev
= 96.4 - 4.8 - -1.3
= 93.0 psi

Appendix B

Storm System Drainage Calculations

Existing Runoff



PRE-DEV DRAINAGE MAP
SCALE: 1"=40'

TOWN OF AMHERST APPROVAL BOX:

NOTE: BOUNDARY AND TOPOGRAPHIC INFORMATION PROVIDED BY OTHERS, CARMINA WOOD DESIGN ASSUMES NO RESPONSIBILITY FOR ITS ACCURACY.

40' 40 0 40 80Ft.

CARMINA WOOD DESIGN
Buffalo | Utica | Greensboro

Single Family Subdivision
1789 Dodge Road
Amherst, New York

REVISIONS:

No.	Description	Date
5	Rev. Per Town Comments	4/16/2025
6	Rev. Permanent Open Space	5/13/2025
7	Rev. Per Town Comments	5/23/2025
8	Rev. Per Town Comments	6/10/2025
9	Rev. Per Town Comments	7/01/2025
10	Rev. Per Town Comments	7/25/2025

PRELIMINARY
NOT FOR CONSTRUCTION

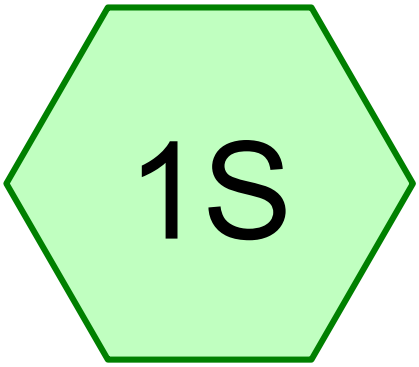
DRAWING NAME:
Pre-Dev
Drainage Map

Date: [illegible]
Drawn By: C. Wood
Scale: As Noted

DRAWING NO.
C-1

Project No: 20.247

PRE-DEVELOPMENT



DA PRE DEV

Subcat Reach Pond Link

Routing Diagram for 20.247 - Dodge Road Hydrology
Prepared by Carmina Wood Morris, PC, Printed 2/11/2025

Project Notes

Rainfall events imported from "NRCS-Rain.txt" for 7041 NY Erie

Rainfall Events Listing (selected events)

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	1-Year	NRCC 24-hr	A	Default	24.00	1	1.87	2
2	10-Year	NRCC 24-hr	A	Default	24.00	1	3.14	2
3	25-Year	NRCC 24-hr	A	Default	24.00	1	3.84	2
4	100-Year	NRCC 24-hr	A	Default	24.00	1	5.23	2

Area Listing (selected nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.060	96	Gravel surface, HSG D (1S)
0.050	98	Paved parking, HSG D (1S)
0.070	98	Roofs, HSG D (1S)
6.530	79	Woods/grass comb., Good, HSG D (1S)
6.710	**79**	**TOTAL AREA**

Ground Covers (selected nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.000	0.000	0.000	0.060	0.000	0.060	Gravel surface	1S
0.000	0.000	0.000	0.050	0.000	0.050	Paved parking	1S
0.000	0.000	0.000	0.070	0.000	0.070	Roofs	1S
0.000	0.000	0.000	6.530	0.000	6.530	Woods/grass comb., Good	1S
0.000	**0.000**	**0.000**	**6.710**	**0.000**	**6.710**	**TOTAL AREA**	

Summary for Subcatchment 1S: DA PRE DEV

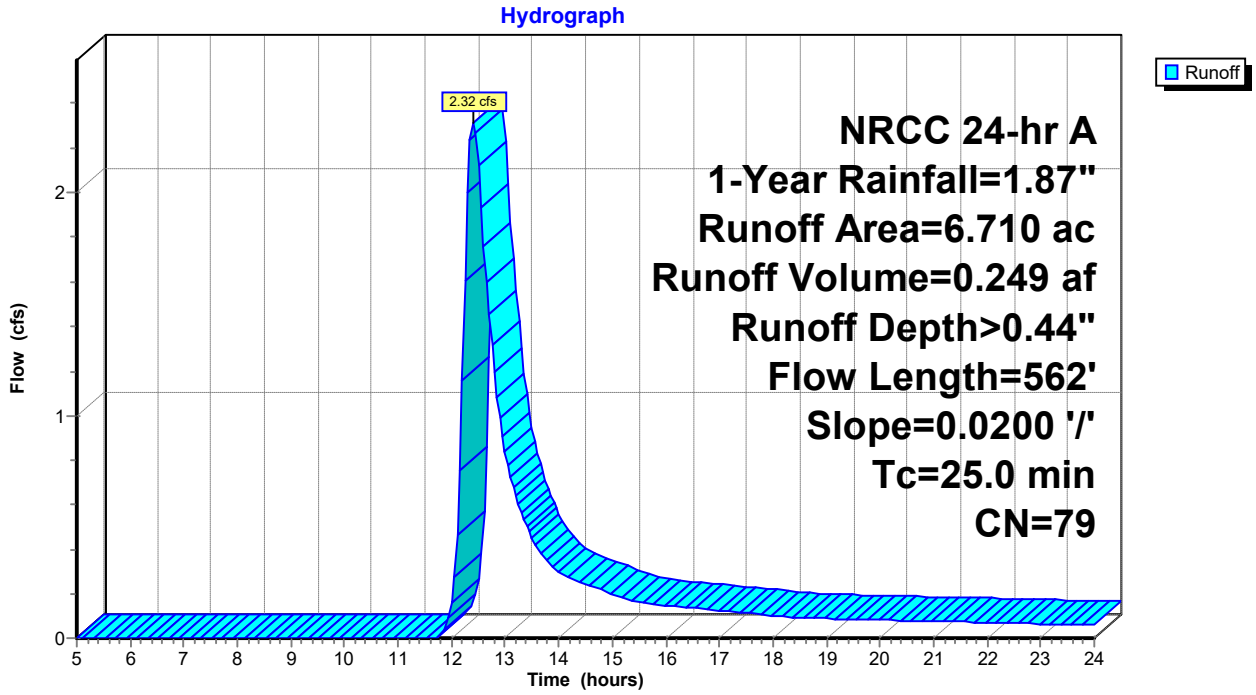
Runoff = 2.32 cfs @ 12.41 hrs, Volume= 0.249 af, Depth> 0.44"
Routed to nonexistent node 11L

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-24.00 hrs, dt= 0.05 hrs
NRCC 24-hr A 1-Year Rainfall=1.87"

Area (ac)	CN	Description
6.530	79	Woods/grass comb., Good, HSG D
0.050	98	Paved parking, HSG D
0.060	96	Gravel surface, HSG D
0.070	98	Roofs, HSG D
6.710	79	Weighted Average
6.590		98.21% Pervious Area
0.120		1.79% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
17.2	100	0.0200	0.10		**Sheet Flow, WOODS** Grass: Dense n= 0.240 P2= 2.20"
7.8	462	0.0200	0.99		**Shallow Concentrated Flow, WOODS** Short Grass Pasture Kv= 7.0 fps
25.0	562	Total			

Subcatchment 1S: DA PRE DEV



Hydrograph for Subcatchment 1S: DA PRE DEV

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
5.00	0.10	0.00	0.00
5.25	0.10	0.00	0.00
5.50	0.11	0.00	0.00
5.75	0.11	0.00	0.00
6.00	0.12	0.00	0.00
6.25	0.13	0.00	0.00
6.50	0.13	0.00	0.00
6.75	0.14	0.00	0.00
7.00	0.15	0.00	0.00
7.25	0.16	0.00	0.00
7.50	0.17	0.00	0.00
7.75	0.18	0.00	0.00
8.00	0.19	0.00	0.00
8.25	0.20	0.00	0.00
8.50	0.21	0.00	0.00
8.75	0.22	0.00	0.00
9.00	0.23	0.00	0.00
9.25	0.24	0.00	0.00
9.50	0.26	0.00	0.00
9.75	0.27	0.00	0.00
10.00	0.29	0.00	0.00
10.25	0.31	0.00	0.00
10.50	0.33	0.00	0.00
10.75	0.36	0.00	0.00
11.00	0.39	0.00	0.00
11.25	0.44	0.00	0.00
11.50	0.50	0.00	0.00
11.75	0.62	0.00	0.00
12.00	0.88	0.04	0.16
12.25	1.25	0.15	**1.61**
12.50	1.37	0.20	**2.12**
12.75	1.43	0.23	1.32
13.00	1.48	0.25	0.83
13.25	1.51	0.26	0.60
13.50	1.54	0.28	0.45
13.75	1.56	0.29	0.36
14.00	1.58	0.30	0.30
14.25	1.60	0.30	0.27
14.50	1.61	0.31	0.24
14.75	1.63	0.32	0.22
15.00	1.64	0.33	0.20
15.25	1.65	0.33	0.18
15.50	1.66	0.34	0.16
15.75	1.67	0.34	0.15
16.00	1.68	0.35	0.15
16.25	1.69	0.35	0.14
16.50	1.70	0.36	0.14
16.75	1.71	0.36	0.13
17.00	1.72	0.37	0.12
17.25	1.73	0.37	0.12
17.50	1.74	0.38	0.11
17.75	1.74	0.38	0.11
18.00	1.75	0.38	0.10
18.25	1.76	0.39	0.09
18.50	1.76	0.39	0.09
18.75	1.77	0.39	0.09
19.00	1.77	0.40	0.09
19.25	1.78	0.40	0.09
19.50	1.79	0.40	0.08
19.75	1.79	0.41	0.08
20.00	1.80	0.41	0.08
20.25	1.80	0.41	0.08
20.50	1.81	0.41	0.08
20.75	1.81	0.42	0.08
21.00	1.82	0.42	0.08
21.25	1.82	0.42	0.07
21.50	1.83	0.42	0.07
21.75	1.83	0.43	0.07
22.00	1.84	0.43	0.07
22.25	1.84	0.43	0.07
22.50	1.85	0.43	0.07
22.75	1.85	0.44	0.07
23.00	1.85	0.44	0.06
23.25	1.86	0.44	0.06
23.50	1.86	0.44	0.06
23.75	1.87	0.45	0.06
24.00	**1.87**	**0.45**	0.06

Summary for Subcatchment 1S: DA PRE DEV

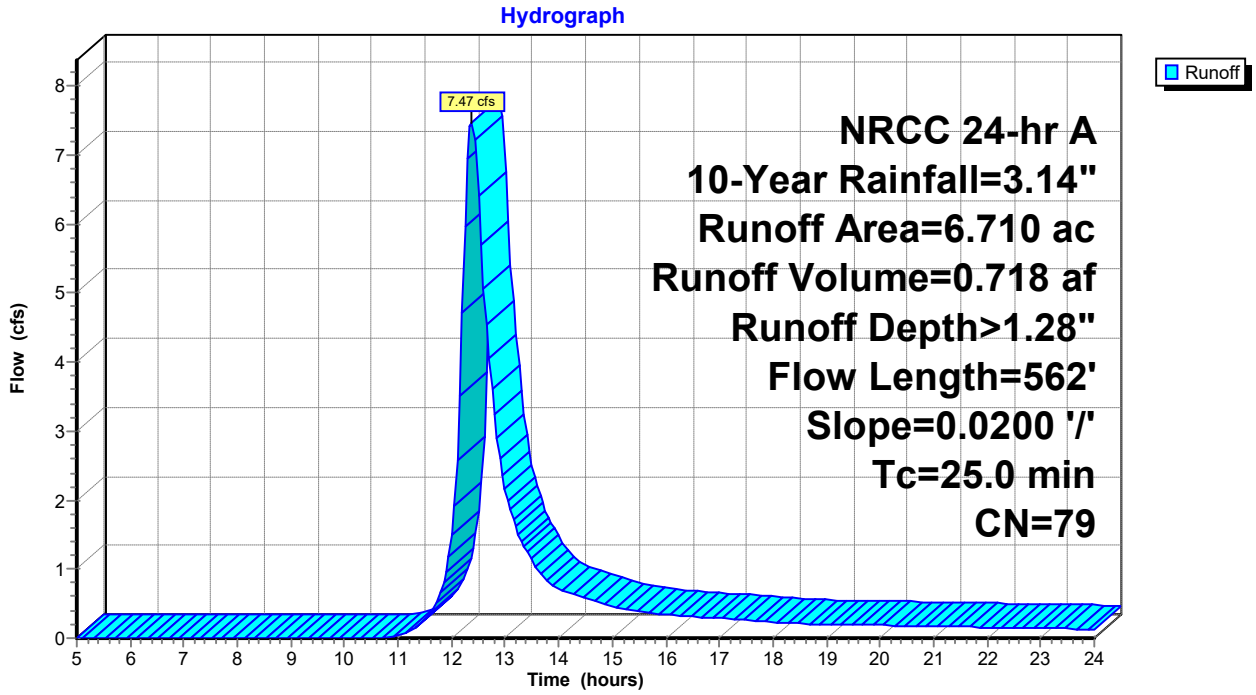
Runoff = 7.47 cfs @ 12.37 hrs, Volume= 0.718 af, Depth> 1.28"
Routed to nonexistent node 11L

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-24.00 hrs, dt= 0.05 hrs
NRCC 24-hr A 10-Year Rainfall=3.14"

Area (ac)	CN	Description
6.530	79	Woods/grass comb., Good, HSG D
0.050	98	Paved parking, HSG D
0.060	96	Gravel surface, HSG D
0.070	98	Roofs, HSG D
6.710	79	Weighted Average
6.590		98.21% Pervious Area
0.120		1.79% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
17.2	100	0.0200	0.10		**Sheet Flow, WOODS** Grass: Dense n= 0.240 P2= 2.20"
7.8	462	0.0200	0.99		**Shallow Concentrated Flow, WOODS** Short Grass Pasture Kv= 7.0 fps
25.0	562	Total			

Subcatchment 1S: DA PRE DEV



Hydrograph for Subcatchment 1S: DA PRE DEV

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
5.00	0.16	0.00	0.00
5.25	0.17	0.00	0.00
5.50	0.18	0.00	0.00
5.75	0.19	0.00	0.00
6.00	0.20	0.00	0.00
6.25	0.21	0.00	0.00
6.50	0.22	0.00	0.00
6.75	0.24	0.00	0.00
7.00	0.25	0.00	0.00
7.25	0.26	0.00	0.00
7.50	0.28	0.00	0.00
7.75	0.29	0.00	0.00
8.00	0.31	0.00	0.00
8.25	0.33	0.00	0.00
8.50	0.35	0.00	0.00
8.75	0.36	0.00	0.00
9.00	0.38	0.00	0.00
9.25	0.41	0.00	0.00
9.50	0.43	0.00	0.00
9.75	0.46	0.00	0.00
10.00	0.49	0.00	0.00
10.25	0.52	0.00	0.00
10.50	0.56	0.00	0.00
10.75	0.61	0.00	0.01
11.00	0.66	0.01	0.05
11.25	0.74	0.02	0.12
11.50	0.84	0.03	0.26
11.75	1.03	0.08	0.56
12.00	1.48	0.25	1.49
12.25	2.11	0.59	**5.96**
12.50	2.30	0.70	**6.40**
12.75	2.40	0.77	3.62
13.00	2.48	0.82	2.16
13.25	2.53	0.86	1.50
13.50	2.58	0.89	1.11
13.75	2.62	0.92	0.87
14.00	2.65	0.94	0.71
14.25	2.68	0.96	0.64
14.50	2.71	0.98	0.58
14.75	2.73	1.00	0.52
15.00	2.76	1.01	0.47
15.25	2.78	1.03	0.42
15.50	2.79	1.04	0.38
15.75	2.81	1.05	0.36
16.00	2.83	1.07	0.34
16.25	2.85	1.08	0.33
16.50	2.86	1.09	0.32
16.75	2.88	1.10	0.30
17.00	2.89	1.11	0.29
17.25	2.90	1.12	0.27
17.50	2.92	1.13	0.26
17.75	2.93	1.14	0.25
18.00	2.94	1.14	0.23
18.25	2.95	1.15	0.22
18.50	2.96	1.16	0.21
18.75	2.97	1.17	0.20
19.00	2.98	1.17	0.20
19.25	2.99	1.18	0.20
19.50	3.00	1.19	0.19
19.75	3.01	1.19	0.19
20.00	3.02	1.20	0.19
20.25	3.03	1.21	0.18
20.50	3.04	1.21	0.18
20.75	3.04	1.22	0.18
21.00	3.05	1.23	0.17
21.25	3.06	1.23	0.17
21.50	3.07	1.24	0.16
21.75	3.08	1.24	0.16
22.00	3.08	1.25	0.16
22.25	3.09	1.26	0.15
22.50	3.10	1.26	0.15
22.75	3.11	1.27	0.15
23.00	3.11	1.27	0.14
23.25	3.12	1.28	0.14
23.50	3.13	1.28	0.14
23.75	3.13	1.29	0.13
24.00	**3.14**	**1.29**	0.13

Summary for Subcatchment 1S: DA PRE DEV

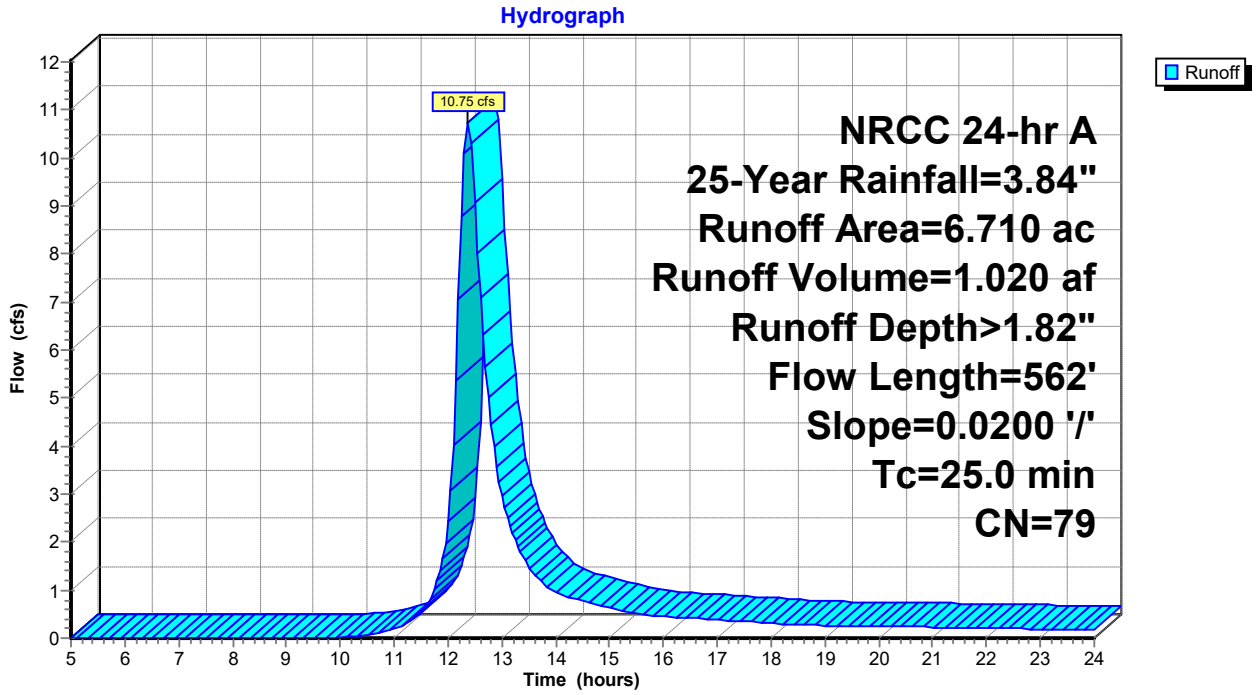
Runoff = 10.75 cfs @ 12.37 hrs, Volume= 1.020 af, Depth> 1.82"
Routed to nonexistent node 11L

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-24.00 hrs, dt= 0.05 hrs
NRCC 24-hr A 25-Year Rainfall=3.84"

Area (ac)	CN	Description
6.530	79	Woods/grass comb., Good, HSG D
0.050	98	Paved parking, HSG D
0.060	96	Gravel surface, HSG D
0.070	98	Roofs, HSG D
6.710	79	Weighted Average
6.590		98.21% Pervious Area
0.120		1.79% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
17.2	100	0.0200	0.10		**Sheet Flow, WOODS** Grass: Dense n= 0.240 P2= 2.20"
7.8	462	0.0200	0.99		**Shallow Concentrated Flow, WOODS** Short Grass Pasture Kv= 7.0 fps
25.0	562	Total			

Subcatchment 1S: DA PRE DEV



Hydrograph for Subcatchment 1S: DA PRE DEV

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
5.00	0.20	0.00	0.00
5.25	0.21	0.00	0.00
5.50	0.22	0.00	0.00
5.75	0.23	0.00	0.00
6.00	0.25	0.00	0.00
6.25	0.26	0.00	0.00
6.50	0.27	0.00	0.00
6.75	0.29	0.00	0.00
7.00	0.31	0.00	0.00
7.25	0.32	0.00	0.00
7.50	0.34	0.00	0.00
7.75	0.36	0.00	0.00
8.00	0.38	0.00	0.00
8.25	0.40	0.00	0.00
8.50	0.42	0.00	0.00
8.75	0.45	0.00	0.00
9.00	0.47	0.00	0.00
9.25	0.50	0.00	0.00
9.50	0.53	0.00	0.00
9.75	0.56	0.00	0.00
10.00	0.60	0.00	0.01
10.25	0.64	0.00	0.04
10.50	0.68	0.01	0.07
10.75	0.74	0.02	0.11
11.00	0.81	0.03	0.19
11.25	0.91	0.05	0.32
11.50	1.03	0.08	0.55
11.75	1.26	0.16	1.02
12.00	1.81	0.41	2.45
12.25	2.58	0.89	**8.77**
12.50	2.81	1.05	**9.06**
12.75	2.93	1.14	5.01
13.00	3.03	1.21	2.96
13.25	3.10	1.26	2.04
13.50	3.16	1.30	1.50
13.75	3.20	1.34	1.16
14.00	3.24	1.37	0.96
14.25	3.28	1.40	0.85
14.50	3.31	1.42	0.77
14.75	3.34	1.45	0.70
15.00	3.37	1.47	0.63
15.25	3.39	1.48	0.55
15.50	3.42	1.50	0.50
15.75	3.44	1.52	0.48
16.00	3.46	1.53	0.46
16.25	3.48	1.55	0.44
16.50	3.50	1.57	0.42
16.75	3.52	1.58	0.40
17.00	3.53	1.59	0.38
17.25	3.55	1.61	0.36
17.50	3.57	1.62	0.35
17.75	3.58	1.63	0.33
18.00	3.59	1.64	0.31
18.25	3.61	1.65	0.29
18.50	3.62	1.66	0.28
18.75	3.63	1.67	0.27
19.00	3.64	1.68	0.26
19.25	3.66	1.69	0.26
19.50	3.67	1.70	0.25
19.75	3.68	1.71	0.25
20.00	3.69	1.72	0.25
20.25	3.70	1.72	0.24
20.50	3.71	1.73	0.24
20.75	3.72	1.74	0.23
21.00	3.73	1.75	0.23
21.25	3.74	1.76	0.22
21.50	3.75	1.77	0.22
21.75	3.76	1.77	0.21
22.00	3.77	1.78	0.21
22.25	3.78	1.79	0.20
22.50	3.79	1.79	0.20
22.75	3.80	1.80	0.19
23.00	3.81	1.81	0.19
23.25	3.82	1.82	0.18
23.50	3.82	1.82	0.18
23.75	3.83	1.83	0.17
24.00	**3.84**	**1.83**	0.17

Summary for Subcatchment 1S: DA PRE DEV

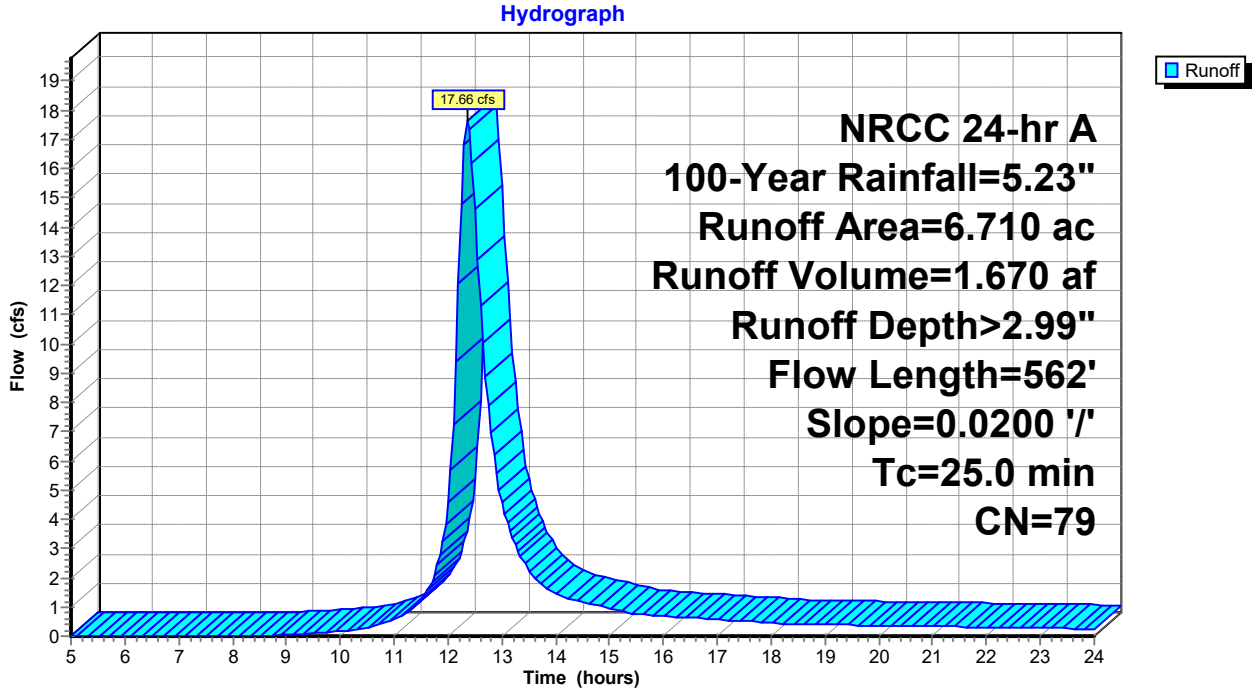
Runoff = 17.66 cfs @ 12.36 hrs, Volume= 1.670 af, Depth> 2.99"
Routed to nonexistent node 11L

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-24.00 hrs, dt= 0.05 hrs
NRCC 24-hr A 100-Year Rainfall=5.23"

Area (ac)	CN	Description
6.530	79	Woods/grass comb., Good, HSG D
0.050	98	Paved parking, HSG D
0.060	96	Gravel surface, HSG D
0.070	98	Roofs, HSG D
6.710	79	Weighted Average
6.590		98.21% Pervious Area
0.120		1.79% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
17.2	100	0.0200	0.10		**Sheet Flow, WOODS** Grass: Dense n= 0.240 P2= 2.20"
7.8	462	0.0200	0.99		**Shallow Concentrated Flow, WOODS** Short Grass Pasture Kv= 7.0 fps
25.0	562	Total			

Subcatchment 1S: DA PRE DEV

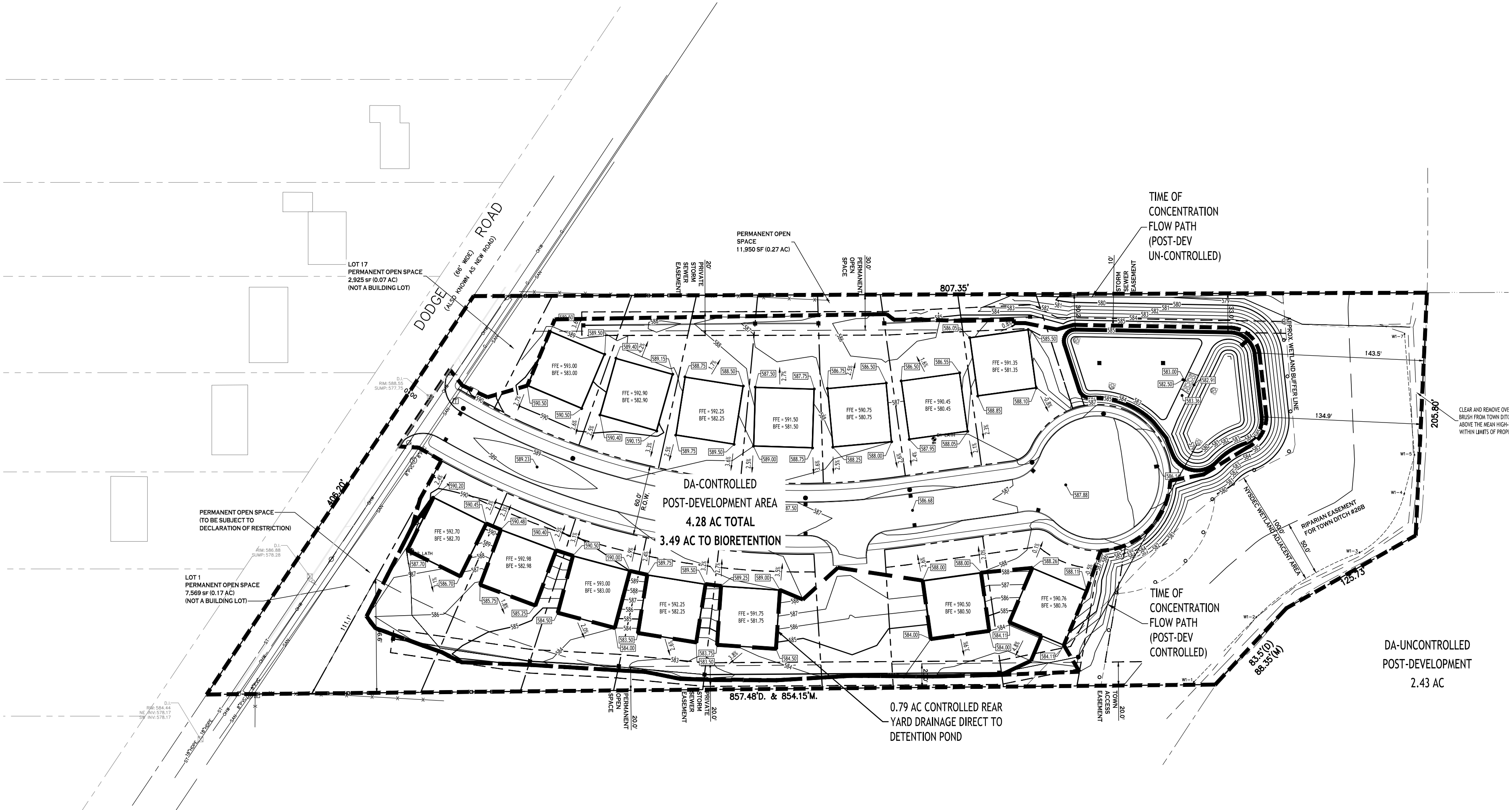


Hydrograph for Subcatchment 1S: DA PRE DEV

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
5.00	0.27	0.00	0.00
5.25	0.28	0.00	0.00
5.50	0.30	0.00	0.00
5.75	0.32	0.00	0.00
6.00	0.33	0.00	0.00
6.25	0.35	0.00	0.00
6.50	0.37	0.00	0.00
6.75	0.39	0.00	0.00
7.00	0.42	0.00	0.00
7.25	0.44	0.00	0.00
7.50	0.46	0.00	0.00
7.75	0.49	0.00	0.00
8.00	0.52	0.00	0.00
8.25	0.55	0.00	0.00
8.50	0.58	0.00	0.00
8.75	0.61	0.00	0.02
9.00	0.64	0.00	0.04
9.25	0.68	0.01	0.06
9.50	0.72	0.01	0.09
9.75	0.76	0.02	0.13
10.00	0.81	0.03	0.17
10.25	0.87	0.04	0.23
10.50	0.93	0.05	0.30
10.75	1.01	0.07	0.39
11.00	1.10	0.10	0.56
11.25	1.24	0.15	0.81
11.50	1.40	0.22	1.26
11.75	1.72	0.37	2.12
12.00	2.46	0.81	4.59
12.25	3.51	1.57	**14.79**
12.50	3.83	1.82	**14.60**
12.75	3.99	1.96	7.87
13.00	4.13	2.07	4.57
13.25	4.22	2.15	3.11
13.50	4.30	2.21	2.27
13.75	4.36	2.26	1.76
14.00	4.42	2.31	1.44
14.25	4.47	2.35	1.28
14.50	4.51	2.39	1.16
14.75	4.55	2.42	1.05
15.00	4.59	2.45	0.94
15.25	4.62	2.48	0.83
15.50	4.65	2.51	0.75
15.75	4.68	2.53	0.71
16.00	4.71	2.56	0.68
16.25	4.74	2.58	0.66
16.50	4.77	2.60	0.63
16.75	4.79	2.62	0.60
17.00	4.81	2.64	0.57
17.25	4.84	2.66	0.54
17.50	4.86	2.68	0.51
17.75	4.88	2.70	0.49
18.00	4.90	2.71	0.46
18.25	4.91	2.73	0.43
18.50	4.93	2.74	0.41
18.75	4.95	2.76	0.40
19.00	4.96	2.77	0.39
19.25	4.98	2.78	0.39
19.50	5.00	2.80	0.38
19.75	5.01	2.81	0.37
20.00	5.03	2.82	0.36
20.25	5.04	2.84	0.36
20.50	5.06	2.85	0.35
20.75	5.07	2.86	0.34
21.00	5.08	2.87	0.34
21.25	5.10	2.89	0.33
21.50	5.11	2.90	0.32
21.75	5.12	2.91	0.32
22.00	5.14	2.92	0.31
22.25	5.15	2.93	0.30
22.50	5.16	2.94	0.29
22.75	5.17	2.95	0.29
23.00	5.19	2.96	0.28
23.25	5.20	2.97	0.27
23.50	5.21	2.98	0.26
23.75	5.22	2.99	0.26
24.00	**5.23**	**3.00**	0.25

TABLE OF CONTENTS

Proposed Runoff



POST-DEV DRAINAGE MAP

SCALE: 1"=40'

NOTE: BOUNDARY AND TOPOGRAPHIC INFORMATION PROVIDED BY OTHERS. CARMINA WOOD DESIGN ASSUMES NO RESPONSIBILITY FOR ITS ACCURACY.

40' 40 0 40 80Ft.

TOWN OF AMHERST APPROVAL BOX:

CARMINA/WOOD DESIGN
Buffalo | Utica | Greensboro

Single Family Subdivision

1789 Dodge Road
Amherst, New York

REVISIONS:

No.	Description	Date
5	Rev. Per Town Comments	4/16/2025
6	Rev. Permanent Open Space	5/13/2025
7	Rev. Per Town Comments	5/23/2025
8	Rev. Per Town Comments	6/10/2025
9	Rev. Per Town Comments	7/01/2025
10	Rev. Per Town Comments	7/25/2025

PRELIMINARY
NOT FOR CONSTRUCTION

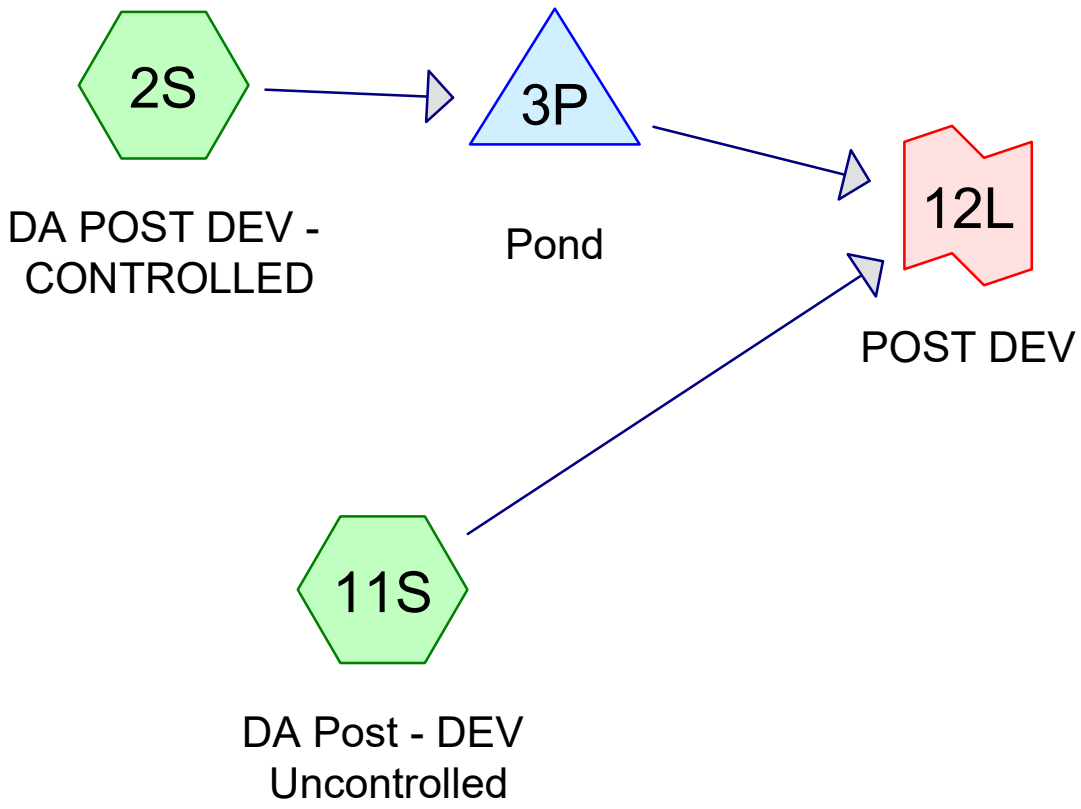
DRAWING NAME:
Post-Dev
Drainage Map

Date: 01/29/24
Drawn By: C. Wood
Scale: As Noted

DRAWING NO.
C-2

Project No: 20.247

POST-DEVELOPMENT



Subcat Reach Pond Link

Project Notes

Rainfall events imported from "NRCS-Rain.txt" for 7041 NY Erie

Rainfall Events Listing (selected events)

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	1-Year	NRCC 24-hr	A	Default	24.00	1	1.87	2
2	10-Year	NRCC 24-hr	A	Default	24.00	1	3.14	2
3	25-Year	NRCC 24-hr	A	Default	24.00	1	3.84	2
4	100-Year	NRCC 24-hr	A	Default	24.00	1	5.23	2

Area Listing (selected nodes)

Area (acres)	CN	Description (subcatchment-numbers)
3.270	87	1/4 acre lots, 38% imp, HSG D (2S)
2.470	80	>75% Grass cover, Good, HSG D (2S, 11S)
0.970	98	Paved parking, HSG D (2S)
6.710	**86**	**TOTAL AREA**

Soil Listing (selected nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
0.000	HSG B	
0.000	HSG C	
6.710	HSG D	2S, 11S
0.000	Other	
6.710		**TOTAL AREA**

Ground Covers (selected nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.000	0.000	0.000	3.270	0.000	3.270	1/4 acre lots, 38% imp	2S
0.000	0.000	0.000	2.470	0.000	2.470	>75% Grass cover, Good	2S, 11S
0.000	0.000	0.000	0.970	0.000	0.970	Paved parking	2S
0.000	**0.000**	**0.000**	**6.710**	**0.000**	**6.710**	**TOTAL AREA**	

Pipe Listing (selected nodes)

Line#	Node Number	In-Invert (feet)	Out-Invert (feet)	Length (feet)	Slope (ft/ft)	n	Width (inches)	Diam/Height (inches)	Inside-Fill (inches)
1	2S	0.00	0.00	740.0	0.0040	0.013	0.0	12.0	0.0
2	3P	578.51	578.45	16.0	0.0037	0.012	0.0	8.0	0.0
3	3P	578.34	578.21	34.0	0.0038	0.012	0.0	18.0	0.0

Time span=5.00-24.00 hrs, dt=0.05 hrs, 381 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 2S: DA POST DEV - Runoff Area=5.610 ac 39.44% Impervious Runoff Depth>0.80"
Flow Length=860' Tc=27.1 min CN=87 Runoff=3.74 cfs 0.374 af

Subcatchment 11S: DA Post - DEV Runoff Area=1.100 ac 0.00% Impervious Runoff Depth>0.48"
Flow Length=370' Slope=0.0100 '/' Tc=22.0 min CN=80 Runoff=0.45 cfs 0.044 af

Pond 3P: Pond Peak Elev=580.32' Storage=3,985 cf Inflow=3.74 cfs 0.374 af
Outflow=2.05 cfs 0.367 af

Link 12L: POST DEV Inflow=2.29 cfs 0.411 af
Primary=2.29 cfs 0.411 af

Total Runoff Area = 6.710 ac Runoff Volume = 0.418 af Average Runoff Depth = 0.75"
67.03% Pervious = 4.497 ac 32.97% Impervious = 2.213 ac

Summary for Subcatchment 2S: DA POST DEV - CONTROLLED

[47] Hint: Peak is 166% of capacity of segment #3

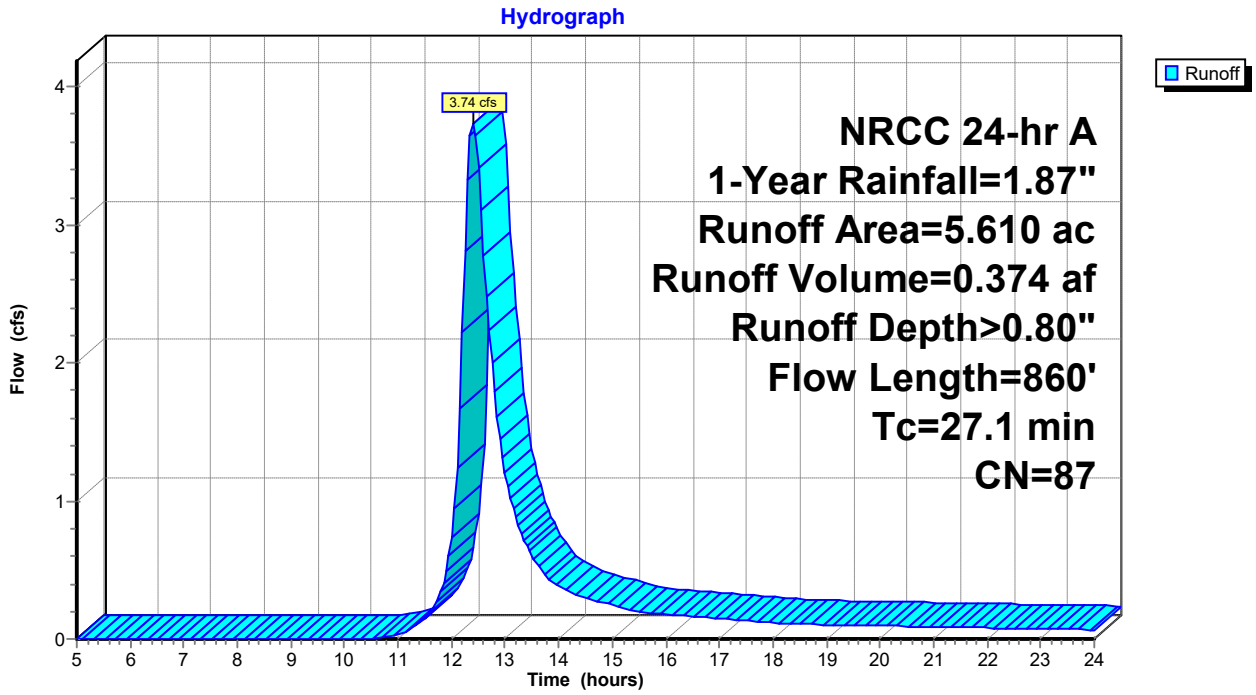
Runoff = 3.74 cfs @ 12.40 hrs, Volume= 0.374 af, Depth> 0.80"
Routed to Pond 3P : Pond

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-24.00 hrs, dt= 0.05 hrs
NRCC 24-hr A 1-Year Rainfall=1.87"

Area (ac)	CN	Description
0.970	98	Paved parking, HSG D
3.270	87	1/4 acre lots, 38% imp, HSG D
1.370	80	>75% Grass cover, Good, HSG D
5.610	87	Weighted Average
3.397		60.56% Pervious Area
2.213		39.44% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
22.7	100	0.0100	0.07		**Sheet Flow, SF** Grass: Dense n= 0.240 P2= 2.20"
0.1	20	0.0200	2.28		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
4.3	740	0.0040	2.87	2.25	**Pipe Channel,** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013 Concrete pipe, straight & clean
27.1	860	Total			

Subcatchment 2S: DA POST DEV - CONTROLLED



Hydrograph for Subcatchment 2S: DA POST DEV - CONTROLLED

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
5.00	0.10	0.00	0.00
5.25	0.10	0.00	0.00
5.50	0.11	0.00	0.00
5.75	0.11	0.00	0.00
6.00	0.12	0.00	0.00
6.25	0.13	0.00	0.00
6.50	0.13	0.00	0.00
6.75	0.14	0.00	0.00
7.00	0.15	0.00	0.00
7.25	0.16	0.00	0.00
7.50	0.17	0.00	0.00
7.75	0.18	0.00	0.00
8.00	0.19	0.00	0.00
8.25	0.20	0.00	0.00
8.50	0.21	0.00	0.00
8.75	0.22	0.00	0.00
9.00	0.23	0.00	0.00
9.25	0.24	0.00	0.00
9.50	0.26	0.00	0.00
9.75	0.27	0.00	0.00
10.00	0.29	0.00	0.00
10.25	0.31	0.00	0.00
10.50	0.33	0.00	0.00
10.75	0.36	0.00	0.01
11.00	0.39	0.01	0.04
11.25	0.44	0.01	0.07
11.50	0.50	0.02	0.15
11.75	0.62	0.06	0.29
12.00	0.88	0.16	0.74
12.25	1.25	0.37	**2.81**
12.50	1.37	0.45	**3.41**
12.75	1.43	0.49	2.00
13.00	1.48	0.52	1.20
13.25	1.51	0.54	0.82
13.50	1.54	0.56	0.60
13.75	1.56	0.58	0.46
14.00	1.58	0.59	0.38
14.25	1.60	0.60	0.33
14.50	1.61	0.62	0.30
14.75	1.63	0.63	0.27
15.00	1.64	0.64	0.24
15.25	1.65	0.64	0.22
15.50	1.66	0.65	0.20
15.75	1.67	0.66	0.18
16.00	1.68	0.67	0.18
16.25	1.69	0.67	0.17
16.50	1.70	0.68	0.16
16.75	1.71	0.69	0.16
17.00	1.72	0.69	0.15
17.25	1.73	0.70	0.14
17.50	1.74	0.71	0.13
17.75	1.74	0.71	0.13
18.00	1.75	0.72	0.12
18.25	1.76	0.72	0.11
18.50	1.76	0.72	0.11
18.75	1.77	0.73	0.10
19.00	1.77	0.73	0.10
19.25	1.78	0.74	0.10
19.50	1.79	0.74	0.10
19.75	1.79	0.75	0.10
20.00	1.80	0.75	0.10
20.25	1.80	0.75	0.09
20.50	1.81	0.76	0.09
20.75	1.81	0.76	0.09
21.00	1.82	0.77	0.09
21.25	1.82	0.77	0.09
21.50	1.83	0.77	0.08
21.75	1.83	0.78	0.08
22.00	1.84	0.78	0.08
22.25	1.84	0.78	0.08
22.50	1.85	0.79	0.08
22.75	1.85	0.79	0.08
23.00	1.85	0.79	0.07
23.25	1.86	0.80	0.07
23.50	1.86	0.80	0.07
23.75	1.87	0.80	0.07
24.00	**1.87**	**0.81**	0.07

Summary for Subcatchment 11S: DA Post - DEV Uncontrolled

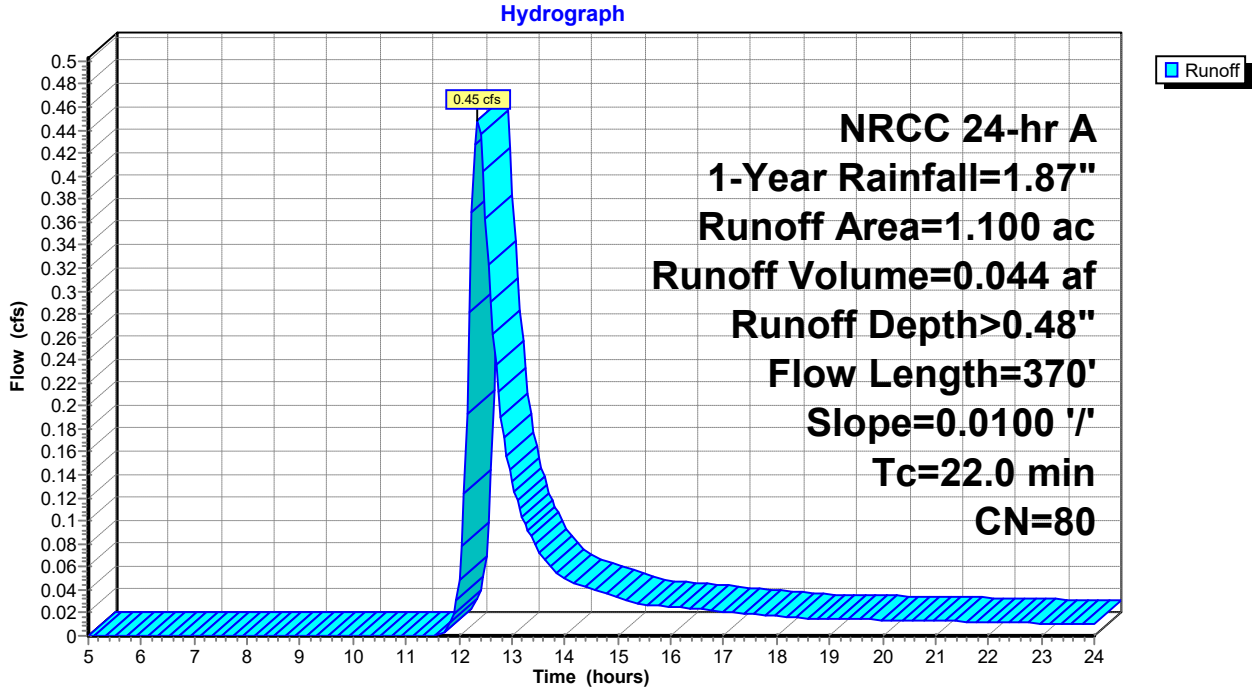
Runoff = 0.45 cfs @ 12.36 hrs, Volume= 0.044 af, Depth> 0.48"
Routed to Link 12L : POST DEV

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-24.00 hrs, dt= 0.05 hrs
NRCC 24-hr A 1-Year Rainfall=1.87"

Area (ac)	CN	Description
1.100	80	>75% Grass cover, Good, HSG D
1.100		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.6	100	0.0100	0.11		**Sheet Flow, SF** Grass: Short n= 0.150 P2= 2.20"
6.4	270	0.0100	0.70		**Shallow Concentrated Flow, SCF** Short Grass Pasture Kv= 7.0 fps
22.0	370	Total			

Subcatchment 11S: DA Post - DEV Uncontrolled



Hydrograph for Subcatchment 11S: DA Post - DEV Uncontrolled

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
5.00	0.10	0.00	0.00
5.25	0.10	0.00	0.00
5.50	0.11	0.00	0.00
5.75	0.11	0.00	0.00
6.00	0.12	0.00	0.00
6.25	0.13	0.00	0.00
6.50	0.13	0.00	0.00
6.75	0.14	0.00	0.00
7.00	0.15	0.00	0.00
7.25	0.16	0.00	0.00
7.50	0.17	0.00	0.00
7.75	0.18	0.00	0.00
8.00	0.19	0.00	0.00
8.25	0.20	0.00	0.00
8.50	0.21	0.00	0.00
8.75	0.22	0.00	0.00
9.00	0.23	0.00	0.00
9.25	0.24	0.00	0.00
9.50	0.26	0.00	0.00
9.75	0.27	0.00	0.00
10.00	0.29	0.00	0.00
10.25	0.31	0.00	0.00
10.50	0.33	0.00	0.00
10.75	0.36	0.00	0.00
11.00	0.39	0.00	0.00
11.25	0.44	0.00	0.00
11.50	0.50	0.00	0.00
11.75	0.62	0.01	0.00
12.00	0.88	0.05	0.05
12.25	1.25	0.17	**0.37**
12.50	1.37	0.22	**0.36**
12.75	1.43	0.25	0.21
13.00	1.48	0.27	0.13
13.25	1.51	0.29	0.10
13.50	1.54	0.30	0.07
13.75	1.56	0.32	0.06
14.00	1.58	0.33	0.05
14.25	1.60	0.33	0.05
14.50	1.61	0.34	0.04
14.75	1.63	0.35	0.04
15.00	1.64	0.36	0.03
15.25	1.65	0.36	0.03
15.50	1.66	0.37	0.03
15.75	1.67	0.38	0.03
16.00	1.68	0.38	0.03
16.25	1.69	0.39	0.02
16.50	1.70	0.39	0.02
16.75	1.71	0.40	0.02
17.00	1.72	0.40	0.02
17.25	1.73	0.41	0.02
17.50	1.74	0.41	0.02
17.75	1.74	0.41	0.02
18.00	1.75	0.42	0.02
18.25	1.76	0.42	0.02
18.50	1.76	0.42	0.02
18.75	1.77	0.43	0.02
19.00	1.77	0.43	0.01
19.25	1.78	0.43	0.01
19.50	1.79	0.44	0.01
19.75	1.79	0.44	0.01
20.00	1.80	0.44	0.01
20.25	1.80	0.45	0.01
20.50	1.81	0.45	0.01
20.75	1.81	0.45	0.01
21.00	1.82	0.45	0.01
21.25	1.82	0.46	0.01
21.50	1.83	0.46	0.01
21.75	1.83	0.46	0.01
22.00	1.84	0.47	0.01
22.25	1.84	0.47	0.01
22.50	1.85	0.47	0.01
22.75	1.85	0.47	0.01
23.00	1.85	0.48	0.01
23.25	1.86	0.48	0.01
23.50	1.86	0.48	0.01
23.75	1.87	0.48	0.01
24.00	**1.87**	**0.48**	0.01

Summary for Pond 3P: Pond

Inflow Area = 5.610 ac, 39.44% Impervious, Inflow Depth > 0.80" for 1-Year event
Inflow = 3.74 cfs @ 12.40 hrs, Volume= 0.374 af
Outflow = 2.05 cfs @ 12.74 hrs, Volume= 0.367 af, Atten= 45%, Lag= 20.5 min
Primary = 2.05 cfs @ 12.74 hrs, Volume= 0.367 af
Routed to Link 12L : POST DEV

Routing by Stor-Ind method, Time Span= 5.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 580.32' @ 12.74 hrs Surf.Area= 2,767 sf Storage= 3,985 cf

Plug-Flow detention time= 36.2 min calculated for 0.367 af (98% of inflow)
Center-of-Mass det. time= 25.4 min (871.8 - 846.4)

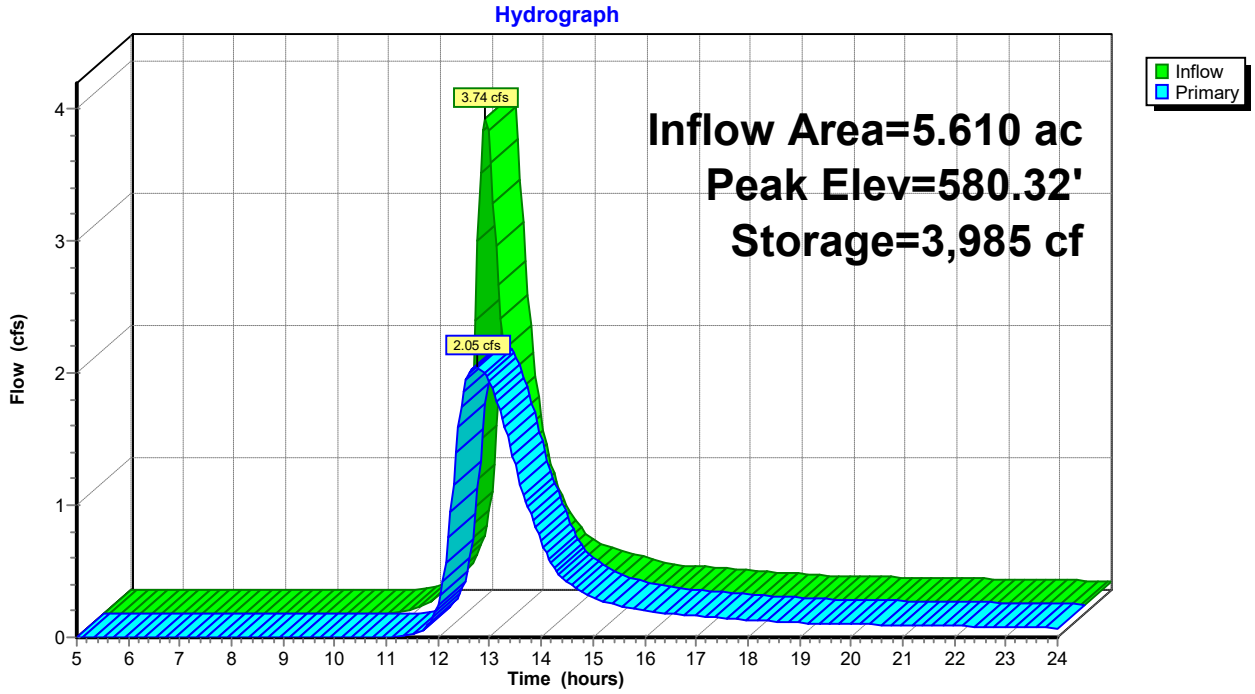
Volume	Invert	Avail.Storage	Storage Description
#1	578.50'	34,837 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
578.50	1,628	0	0
579.00	1,920	887	887
580.00	2,550	2,235	3,122
581.00	3,220	2,885	6,007
582.00	3,960	3,590	9,597
583.00	4,760	4,360	13,957
584.00	11,860	8,310	22,267
585.00	13,280	12,570	34,837

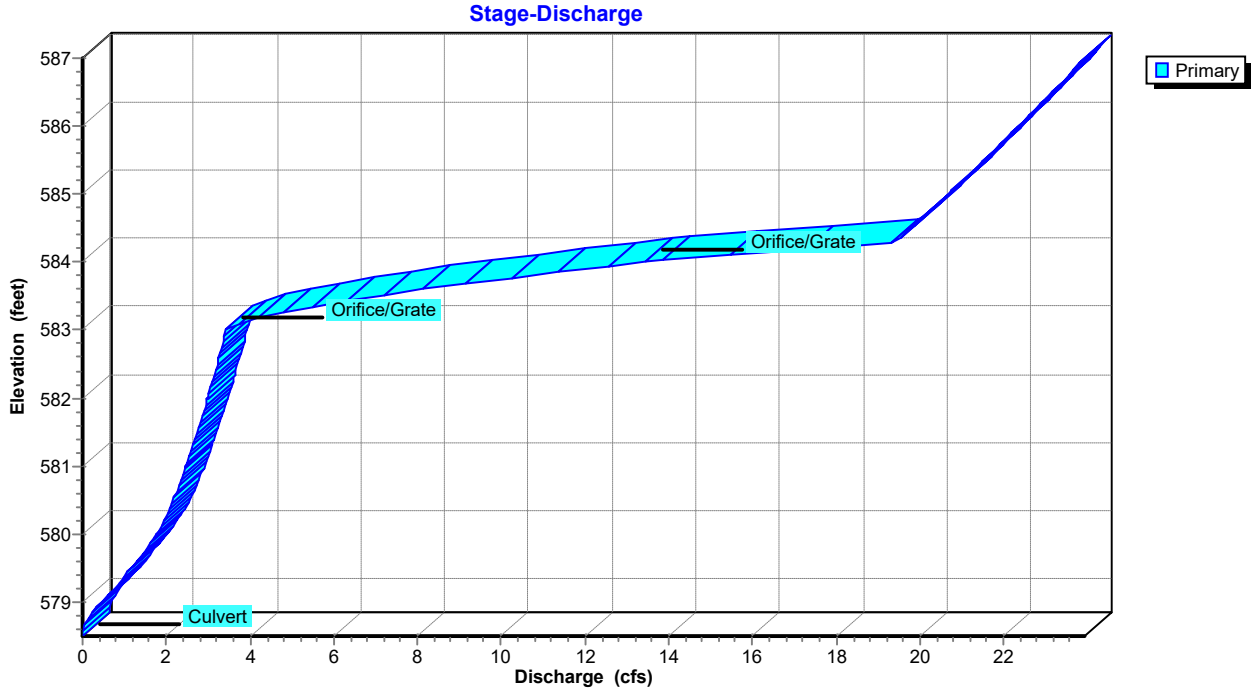
Device	Routing	Invert	Outlet Devices
#1	Device 4	578.51'	**8.0" Round Culvert** L= 16.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 578.51' / 578.45' S= 0.0037 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.35 sf
#2	Device 4	583.00'	**36.0" W x 36.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 4	584.00'	**36.0" W x 36.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Primary	578.34'	**18.0" Round Culvert** L= 34.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 578.34' / 578.21' S= 0.0038 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 1.77 sf

Primary OutFlow Max=2.04 cfs @ 12.74 hrs HW=580.32' (Free Discharge)
└**4=Culvert** (Passes 2.04 cfs of 7.94 cfs potential flow)
  ├**1=Culvert** (Inlet Controls 2.04 cfs @ 5.86 fps)
  ├**2=Orifice/Grate** (Controls 0.00 cfs)
  └**3=Orifice/Grate** (Controls 0.00 cfs)

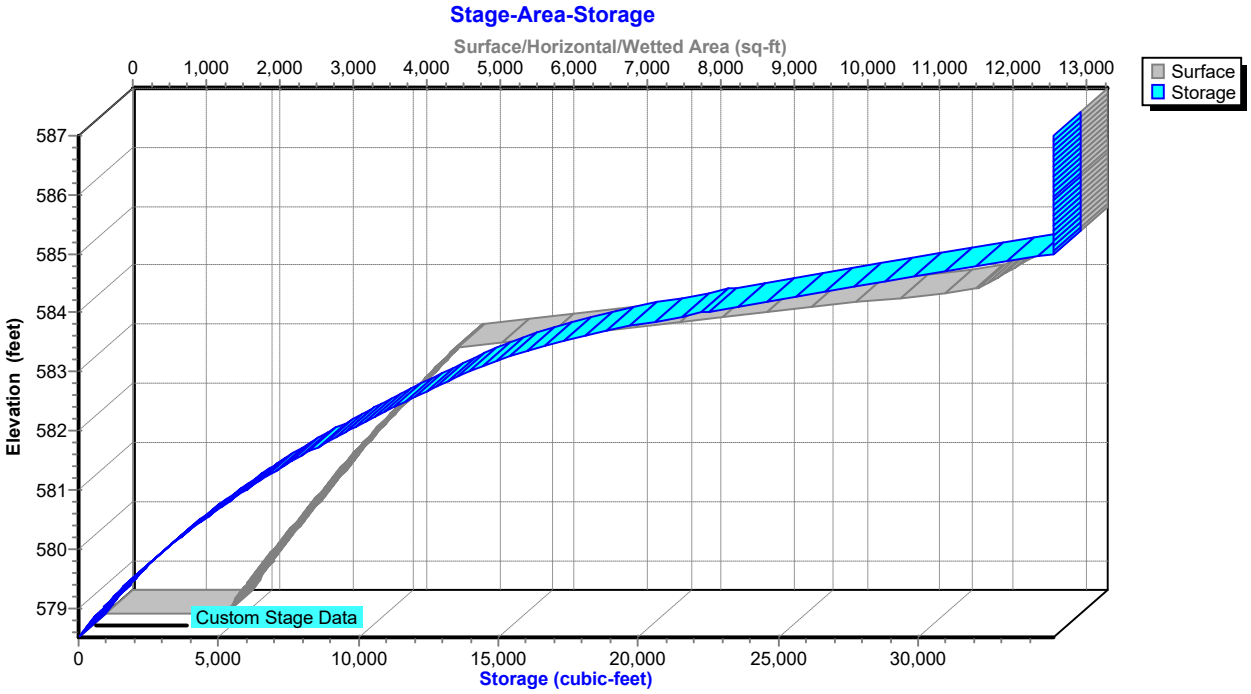
Pond 3P: Pond



Pond 3P: Pond



Pond 3P: Pond


Stage-Area-Storage
Surface/Horizontal/Wetted Area (sq-ft)
0
1,000
2,000
3,000
4,000
5,000
6,000
7,000
8,000
9,000
10,000
11,000
12,000
13,000
Surface
Storage
587
586
585
584
583
582
581
580
579
Elevation (feet)
Custom Stage Data
0
5,000
10,000
15,000
20,000
25,000
30,000
Storage (cubic-feet)

Hydrograph for Pond 3P: Pond

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
5.00	0.00	0	578.50	0.00
5.50	0.00	0	578.50	0.00
6.00	0.00	0	578.50	0.00
6.50	0.00	0	578.50	0.00
7.00	0.00	0	578.50	0.00
7.50	0.00	0	578.50	0.00
8.00	0.00	0	578.50	0.00
8.50	0.00	0	578.50	0.00
9.00	0.00	0	578.50	0.00
9.50	0.00	0	578.50	0.00
10.00	0.00	0	578.50	0.00
10.50	0.00	1	578.50	0.00
11.00	0.04	30	578.52	0.00
11.50	0.15	163	578.60	0.02
12.00	**0.74**	611	578.85	0.24
12.50	**3.41**	**3,384**	**580.10**	**1.86**
13.00	1.20	**3,583**	**580.18**	**1.93**
13.50	0.60	2,154	579.60	1.30
14.00	0.38	1,213	579.17	0.73
14.50	0.30	835	578.97	0.42
15.00	0.24	690	578.90	0.30
15.50	0.20	599	578.85	0.24
16.00	0.18	544	578.82	0.20
16.50	0.16	510	578.80	0.18
17.00	0.15	484	578.78	0.16
17.50	0.13	461	578.77	0.15
18.00	0.12	438	578.76	0.13
18.50	0.11	414	578.74	0.12
19.00	0.10	395	578.73	0.11
19.50	0.10	383	578.73	0.10
20.00	0.10	373	578.72	0.10
20.50	0.09	365	578.72	0.10
21.00	0.09	358	578.71	0.09
21.50	0.08	350	578.71	0.09
22.00	0.08	343	578.70	0.08
22.50	0.08	335	578.70	0.08
23.00	0.07	328	578.69	0.08
23.50	0.07	320	578.69	0.07
24.00	0.07	313	578.69	0.07

Stage-Discharge for Pond 3P: Pond

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
578.50	0.00	581.35	2.66	584.20	17.41
578.55	0.00	581.40	2.69	584.25	18.57
578.60	0.02	581.45	2.71	584.30	19.42
578.65	0.04	581.50	2.74	584.35	19.51
578.70	0.08	581.55	2.77	584.40	19.61
578.75	0.12	581.60	2.79	584.45	19.70
578.80	0.18	581.65	2.82	584.50	19.79
578.85	0.24	581.70	2.84	584.55	19.88
578.90	0.31	581.75	2.87	584.60	19.97
578.95	0.38	581.80	2.89	584.65	20.06
579.00	0.46	581.85	2.91	584.70	20.15
579.05	0.54	581.90	2.94	584.75	20.24
579.10	0.62	581.95	2.96	584.80	20.33
579.15	0.70	582.00	2.99	584.85	20.42
579.20	0.78	582.05	3.01	584.90	20.51
579.25	0.86	582.10	3.03	584.95	20.60
579.30	0.93	582.15	3.06	585.00	20.69
579.35	0.98	582.20	3.08	585.05	20.77
579.40	1.00	582.25	3.10	585.10	20.86
579.45	1.08	582.30	3.12	585.15	20.95
579.50	1.16	582.35	3.15	585.20	21.03
579.55	1.23	582.40	3.17	585.25	21.12
579.60	1.30	582.45	3.19	585.30	21.20
579.65	1.37	582.50	3.21	585.35	21.29
579.70	1.43	582.55	3.24	585.40	21.37
579.75	1.49	582.60	3.26	585.45	21.46
579.80	1.55	582.65	3.28	585.50	21.54
579.85	1.60	582.70	3.30	585.55	21.63
579.90	1.66	582.75	3.32	585.60	21.71
579.95	1.71	582.80	3.34	585.65	21.79
580.00	1.76	582.85	3.36	585.70	21.88
580.05	1.81	582.90	3.39	585.75	21.96
580.10	1.86	582.95	3.41	585.80	22.04
580.15	1.90	583.00	3.43	585.85	22.12
580.20	1.95	583.05	3.55	585.90	22.20
580.25	1.99	583.10	3.77	585.95	22.29
580.30	2.03	583.15	4.05	586.00	22.37
580.35	2.06	583.20	4.37	586.05	22.45
580.40	2.10	583.25	4.73	586.10	22.53
580.45	2.13	583.30	5.13	586.15	22.61
580.50	2.16	583.35	5.56	586.20	22.69
580.55	2.20	583.40	6.02	586.25	22.77
580.60	2.23	583.45	6.51	586.30	22.85
580.65	2.26	583.50	7.03	586.35	22.93
580.70	2.29	583.55	7.57	586.40	23.01
580.75	2.32	583.60	8.14	586.45	23.08
580.80	2.35	583.65	8.73	586.50	23.16
580.85	2.38	583.70	9.34	586.55	23.24
580.90	2.41	583.75	9.98	586.60	23.32
580.95	2.44	583.80	10.63	586.65	23.40
581.00	2.47	583.85	11.31	586.70	23.47
581.05	2.50	583.90	12.00	586.75	23.55
581.10	2.52	583.95	12.71	586.80	23.63
581.15	2.55	584.00	13.45	586.85	23.70
581.20	2.58	584.05	14.30	586.90	23.78
581.25	2.61	584.10	15.27	586.95	23.85
581.30	2.63	584.15	16.31	587.00	**23.93**

Stage-Area-Storage for Pond 3P: Pond

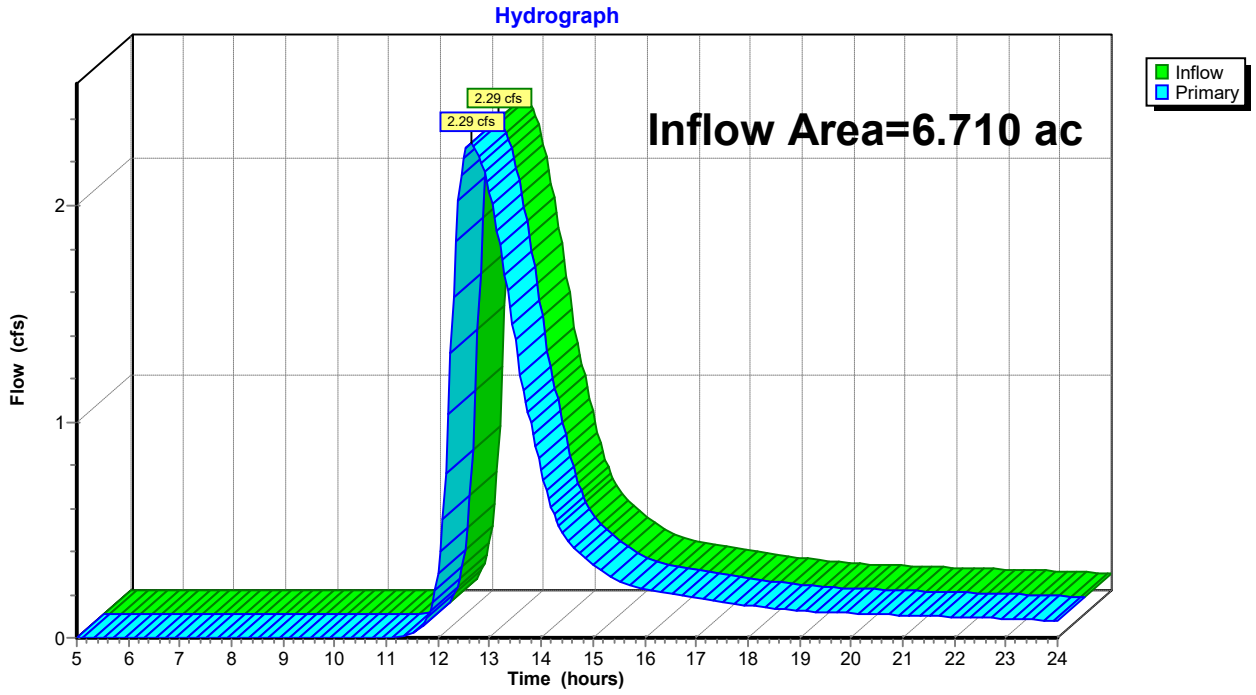
Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
578.50	1,628	0
578.60	1,686	166
578.70	1,745	337
578.80	1,803	515
578.90	1,862	698
579.00	1,920	887
579.10	1,983	1,082
579.20	2,046	1,284
579.30	2,109	1,491
579.40	2,172	1,705
579.50	2,235	1,926
579.60	2,298	2,152
579.70	2,361	2,385
579.80	2,424	2,625
579.90	2,487	2,870
580.00	2,550	3,122
580.10	2,617	3,380
580.20	2,684	3,645
580.30	2,751	3,917
580.40	2,818	4,196
580.50	2,885	4,481
580.60	2,952	4,773
580.70	3,019	5,071
580.80	3,086	5,376
580.90	3,153	5,688
581.00	3,220	6,007
581.10	3,294	6,333
581.20	3,368	6,666
581.30	3,442	7,006
581.40	3,516	7,354
581.50	3,590	7,710
581.60	3,664	8,072
581.70	3,738	8,442
581.80	3,812	8,820
581.90	3,886	9,205
582.00	3,960	9,597
582.10	4,040	9,997
582.20	4,120	10,405
582.30	4,200	10,821
582.40	4,280	11,245
582.50	4,360	11,677
582.60	4,440	12,117
582.70	4,520	12,565
582.80	4,600	13,021
582.90	4,680	13,485
583.00	4,760	13,957
583.10	5,470	14,469
583.20	6,180	15,051
583.30	6,890	15,704
583.40	7,600	16,429
583.50	8,310	17,225
583.60	9,020	18,091
583.70	9,730	19,029
583.80	10,440	20,037
583.90	11,150	21,116
584.00	11,860	22,267
584.10	12,002	23,460
584.20	12,144	24,667
584.30	12,286	25,889
584.40	12,428	27,125
584.50	12,570	28,375
584.60	12,712	29,639
584.70	12,854	30,917
584.80	12,996	32,209
584.90	13,138	33,516
585.00	**13,280**	**34,837**
585.10	13,280	34,837
585.20	13,280	34,837
585.30	13,280	34,837
585.40	13,280	34,837
585.50	13,280	34,837
585.60	13,280	34,837
585.70	13,280	34,837
585.80	13,280	34,837
585.90	13,280	34,837
586.00	13,280	34,837
586.10	13,280	34,837
586.20	13,280	34,837
586.30	13,280	34,837
586.40	13,280	34,837
586.50	13,280	34,837
586.60	13,280	34,837
586.70	13,280	34,837
586.80	13,280	34,837
586.90	13,280	34,837
587.00	13,280	34,837

Summary for Link 12L: POST DEV

Inflow Area = 6.710 ac, 32.97% Impervious, Inflow Depth > 0.74" for 1-Year event
Inflow = 2.29 cfs @ 12.63 hrs, Volume= 0.411 af
Primary = 2.29 cfs @ 12.63 hrs, Volume= 0.411 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-24.00 hrs, dt= 0.05 hrs

Link 12L: POST DEV



Hydrograph for Link 12L: POST DEV

Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
5.00	0.00	**0.00**	0.00
5.25	0.00	0.00	0.00
5.50	0.00	0.00	0.00
5.75	0.00	0.00	0.00
6.00	0.00	0.00	0.00
6.25	0.00	0.00	0.00
6.50	0.00	0.00	0.00
6.75	0.00	0.00	0.00
7.00	0.00	0.00	0.00
7.25	0.00	0.00	0.00
7.50	0.00	0.00	0.00
7.75	0.00	0.00	0.00
8.00	0.00	0.00	0.00
8.25	0.00	0.00	0.00
8.50	0.00	0.00	0.00
8.75	0.00	0.00	0.00
9.00	0.00	0.00	0.00
9.25	0.00	0.00	0.00
9.50	0.00	0.00	0.00
9.75	0.00	0.00	0.00
10.00	0.00	0.00	0.00
10.25	0.00	0.00	0.00
10.50	0.00	0.00	0.00
10.75	0.00	0.00	0.00
11.00	0.00	0.00	0.00
11.25	0.01	0.00	0.01
11.50	0.02	0.00	0.02
11.75	0.07	0.00	0.07
12.00	0.29	0.00	0.29
12.25	1.32	0.00	1.32
12.50	**2.22**	0.00	**2.22**
12.75	**2.26**	0.00	**2.26**
13.00	2.06	0.00	2.06
13.25	1.75	0.00	1.75
13.50	1.38	0.00	1.38
13.75	1.05	0.00	1.05
14.00	0.78	0.00	0.78
14.25	0.57	0.00	0.57
14.50	0.46	0.00	0.46
14.75	0.39	0.00	0.39
15.00	0.34	0.00	0.34
15.25	0.30	0.00	0.30
15.50	0.26	0.00	0.26
15.75	0.24	0.00	0.24
16.00	0.22	0.00	0.22
16.25	0.21	0.00	0.21
16.50	0.20	0.00	0.20
16.75	0.19	0.00	0.19
17.00	0.18	0.00	0.18
17.25	0.17	0.00	0.17
17.50	0.17	0.00	0.17
17.75	0.16	0.00	0.16
18.00	0.15	0.00	0.15
18.25	0.14	0.00	0.14
18.50	0.14	0.00	0.14
18.75	0.13	0.00	0.13
19.00	0.13	0.00	0.13
19.25	0.12	0.00	0.12
19.50	0.12	0.00	0.12
19.75	0.12	0.00	0.12
20.00	0.11	0.00	0.11
20.25	0.11	0.00	0.11
20.50	0.11	0.00	0.11
20.75	0.11	0.00	0.11
21.00	0.11	0.00	0.11
21.25	0.10	0.00	0.10
21.50	0.10	0.00	0.10
21.75	0.10	0.00	0.10
22.00	0.10	0.00	0.10
22.25	0.09	0.00	0.09
22.50	0.09	0.00	0.09
22.75	0.09	0.00	0.09
23.00	0.09	0.00	0.09
23.25	0.09	0.00	0.09
23.50	0.08	0.00	0.08
23.75	0.08	0.00	0.08
24.00	0.08	0.00	0.08

Time span=5.00-24.00 hrs, dt=0.05 hrs, 381 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 2S: DA POST DEV - Runoff Area=5.610 ac 39.44% Impervious Runoff Depth>1.85"
Flow Length=860' Tc=27.1 min CN=87 Runoff=8.76 cfs 0.866 af

Subcatchment 11S: DA Post - DEV Runoff Area=1.100 ac 0.00% Impervious Runoff Depth>1.35"
Flow Length=370' Slope=0.0100 '/' Tc=22.0 min CN=80 Runoff=1.37 cfs 0.124 af

Pond 3P: Pond Peak Elev=582.58' Storage=12,044 cf Inflow=8.76 cfs 0.866 af
Outflow=3.25 cfs 0.856 af

Link 12L: POST DEV Inflow=3.99 cfs 0.980 af
Primary=3.99 cfs 0.980 af

Total Runoff Area = 6.710 ac Runoff Volume = 0.990 af Average Runoff Depth = 1.77"
67.03% Pervious = 4.497 ac 32.97% Impervious = 2.213 ac

Summary for Subcatchment 2S: DA POST DEV - CONTROLLED

[47] Hint: Peak is 389% of capacity of segment #3

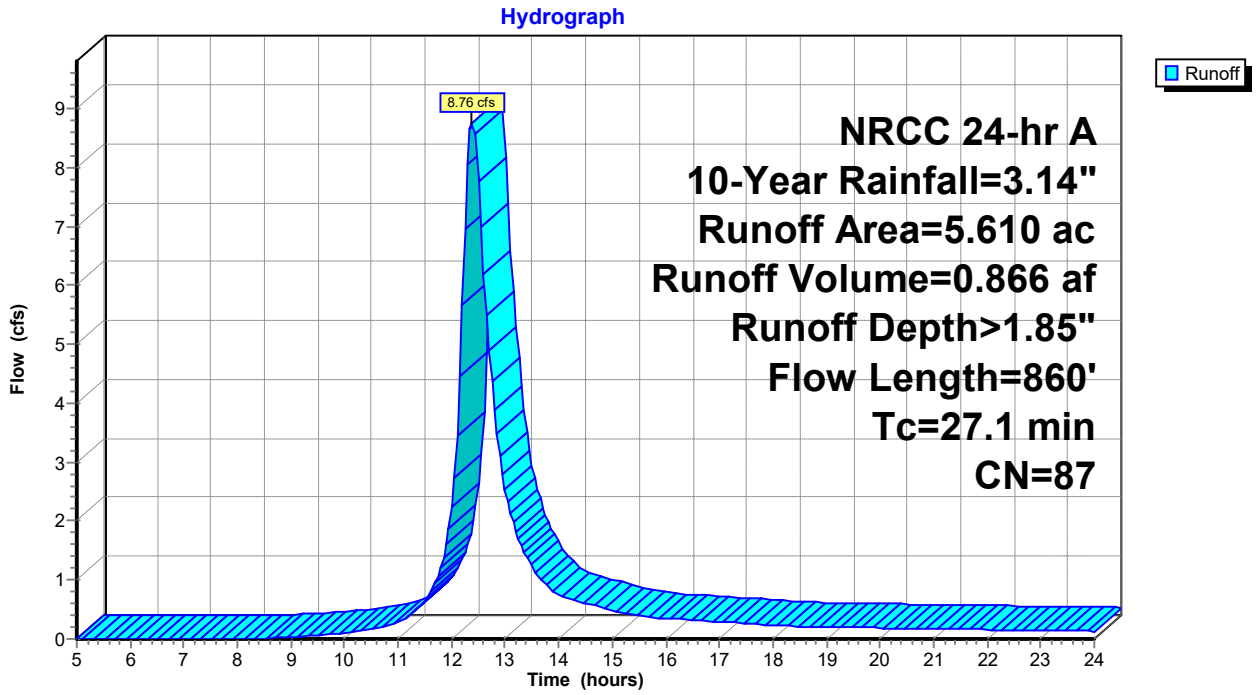
Runoff = 8.76 cfs @ 12.38 hrs, Volume= 0.866 af, Depth> 1.85"
Routed to Pond 3P : Pond

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-24.00 hrs, dt= 0.05 hrs
NRCC 24-hr A 10-Year Rainfall=3.14"

Area (ac)	CN	Description
0.970	98	Paved parking, HSG D
3.270	87	1/4 acre lots, 38% imp, HSG D
1.370	80	>75% Grass cover, Good, HSG D
5.610	87	Weighted Average
3.397		60.56% Pervious Area
2.213		39.44% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
22.7	100	0.0100	0.07		**Sheet Flow, SF** Grass: Dense n= 0.240 P2= 2.20"
0.1	20	0.0200	2.28		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
4.3	740	0.0040	2.87	2.25	**Pipe Channel,** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013 Concrete pipe, straight & clean
27.1	860	Total			

Subcatchment 2S: DA POST DEV - CONTROLLED



Hydrograph for Subcatchment 2S: DA POST DEV - CONTROLLED

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
5.00	0.16	0.00	0.00
5.25	0.17	0.00	0.00
5.50	0.18	0.00	0.00
5.75	0.19	0.00	0.00
6.00	0.20	0.00	0.00
6.25	0.21	0.00	0.00
6.50	0.22	0.00	0.00
6.75	0.24	0.00	0.00
7.00	0.25	0.00	0.00
7.25	0.26	0.00	0.00
7.50	0.28	0.00	0.00
7.75	0.29	0.00	0.00
8.00	0.31	0.00	0.00
8.25	0.33	0.00	0.00
8.50	0.35	0.00	0.01
8.75	0.36	0.00	0.02
9.00	0.38	0.00	0.03
9.25	0.41	0.01	0.04
9.50	0.43	0.01	0.06
9.75	0.46	0.02	0.08
10.00	0.49	0.02	0.10
10.25	0.52	0.03	0.13
10.50	0.56	0.04	0.17
10.75	0.61	0.05	0.21
11.00	0.66	0.07	0.30
11.25	0.74	0.10	0.43
11.50	0.84	0.15	0.65
11.75	1.03	0.24	1.07
12.00	1.48	0.52	2.24
12.25	2.11	0.99	**6.97**
12.50	2.30	1.14	**7.78**
12.75	2.40	1.23	4.36
13.00	2.48	1.29	2.54
13.25	2.53	1.34	1.70
13.50	2.58	1.38	1.22
13.75	2.62	1.41	0.93
14.00	2.65	1.44	0.76
14.25	2.68	1.46	0.67
14.50	2.71	1.49	0.60
14.75	2.73	1.51	0.54
15.00	2.76	1.53	0.49
15.25	2.78	1.54	0.43
15.50	2.79	1.56	0.39
15.75	2.81	1.58	0.37
16.00	2.83	1.59	0.35
16.25	2.85	1.60	0.34
16.50	2.86	1.62	0.32
16.75	2.88	1.63	0.31
17.00	2.89	1.64	0.29
17.25	2.90	1.66	0.28
17.50	2.92	1.67	0.26
17.75	2.93	1.68	0.25
18.00	2.94	1.69	0.24
18.25	2.95	1.70	0.22
18.50	2.96	1.70	0.21
18.75	2.97	1.71	0.20
19.00	2.98	1.72	0.20
19.25	2.99	1.73	0.20
19.50	3.00	1.74	0.19
19.75	3.01	1.75	0.19
20.00	3.02	1.75	0.19
20.25	3.03	1.76	0.18
20.50	3.04	1.77	0.18
20.75	3.04	1.78	0.18
21.00	3.05	1.79	0.17
21.25	3.06	1.79	0.17
21.50	3.07	1.80	0.16
21.75	3.08	1.81	0.16
22.00	3.08	1.81	0.16
22.25	3.09	1.82	0.15
22.50	3.10	1.83	0.15
22.75	3.11	1.83	0.15
23.00	3.11	1.84	0.14
23.25	3.12	1.84	0.14
23.50	3.13	1.85	0.14
23.75	3.13	1.86	0.13
24.00	**3.14**	**1.86**	0.13

Summary for Subcatchment 11S: DA Post - DEV Uncontrolled

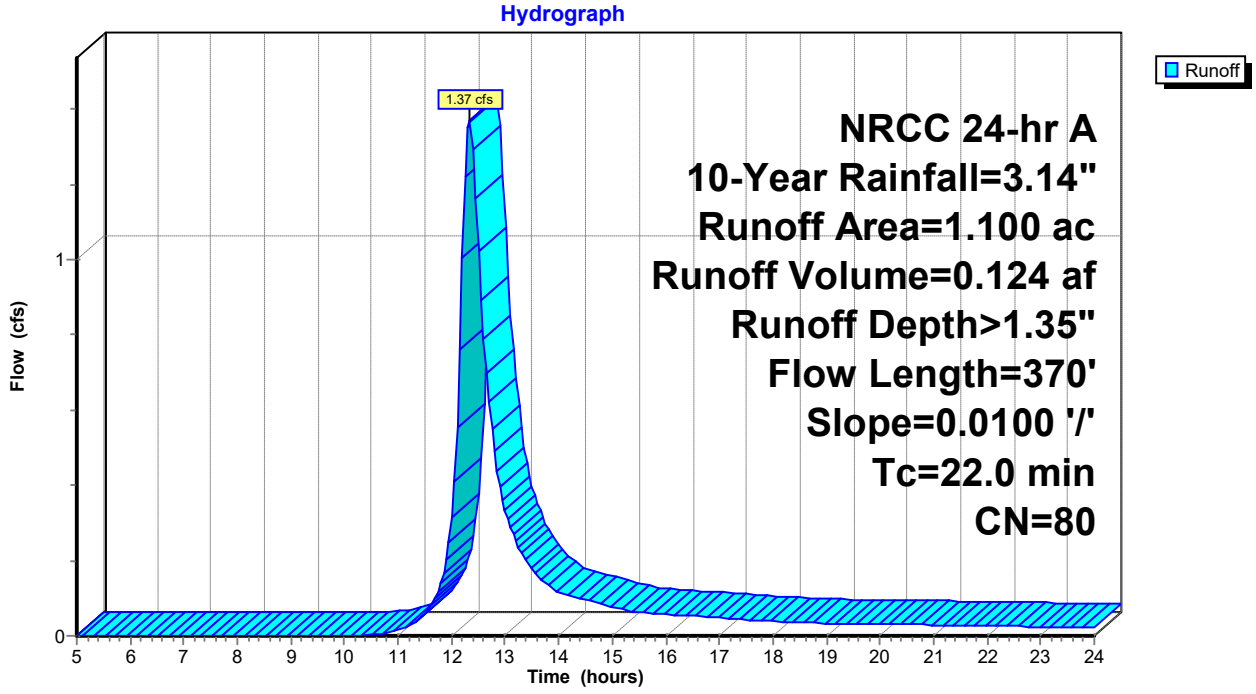
Runoff = 1.37 cfs @ 12.33 hrs, Volume= 0.124 af, Depth> 1.35"
Routed to Link 12L : POST DEV

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-24.00 hrs, dt= 0.05 hrs
NRCC 24-hr A 10-Year Rainfall=3.14"

Area (ac)	CN	Description
1.100	80	>75% Grass cover, Good, HSG D
1.100		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.6	100	0.0100	0.11		**Sheet Flow, SF** Grass: Short n= 0.150 P2= 2.20"
6.4	270	0.0100	0.70		**Shallow Concentrated Flow, SCF** Short Grass Pasture Kv= 7.0 fps
22.0	370	Total			

Subcatchment 11S: DA Post - DEV Uncontrolled



Hydrograph for Subcatchment 11S: DA Post - DEV Uncontrolled

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
5.00	0.16	0.00	0.00
5.25	0.17	0.00	0.00
5.50	0.18	0.00	0.00
5.75	0.19	0.00	0.00
6.00	0.20	0.00	0.00
6.25	0.21	0.00	0.00
6.50	0.22	0.00	0.00
6.75	0.24	0.00	0.00
7.00	0.25	0.00	0.00
7.25	0.26	0.00	0.00
7.50	0.28	0.00	0.00
7.75	0.29	0.00	0.00
8.00	0.31	0.00	0.00
8.25	0.33	0.00	0.00
8.50	0.35	0.00	0.00
8.75	0.36	0.00	0.00
9.00	0.38	0.00	0.00
9.25	0.41	0.00	0.00
9.50	0.43	0.00	0.00
9.75	0.46	0.00	0.00
10.00	0.49	0.00	0.00
10.25	0.52	0.00	0.00
10.50	0.56	0.00	0.00
10.75	0.61	0.00	0.01
11.00	0.66	0.01	0.02
11.25	0.74	0.02	0.03
11.50	0.84	0.04	0.06
11.75	1.03	0.09	0.12
12.00	1.48	0.28	0.31
12.25	2.11	0.63	**1.22**
12.50	2.30	0.75	**1.02**
12.75	2.40	0.82	0.55
13.00	2.48	0.87	0.33
13.25	2.53	0.91	0.23
13.50	2.58	0.95	0.18
13.75	2.62	0.97	0.14
14.00	2.65	1.00	0.12
14.25	2.68	1.02	0.11
14.50	2.71	1.04	0.10
14.75	2.73	1.05	0.09
15.00	2.76	1.07	0.08
15.25	2.78	1.08	0.07
15.50	2.79	1.10	0.06
15.75	2.81	1.11	0.06
16.00	2.83	1.12	0.06
16.25	2.85	1.14	0.06
16.50	2.86	1.15	0.05
16.75	2.88	1.16	0.05
17.00	2.89	1.17	0.05
17.25	2.90	1.18	0.05
17.50	2.92	1.19	0.04
17.75	2.93	1.20	0.04
18.00	2.94	1.20	0.04
18.25	2.95	1.21	0.04
18.50	2.96	1.22	0.03
18.75	2.97	1.23	0.03
19.00	2.98	1.23	0.03
19.25	2.99	1.24	0.03
19.50	3.00	1.25	0.03
19.75	3.01	1.26	0.03
20.00	3.02	1.26	0.03
20.25	3.03	1.27	0.03
20.50	3.04	1.28	0.03
20.75	3.04	1.28	0.03
21.00	3.05	1.29	0.03
21.25	3.06	1.30	0.03
21.50	3.07	1.30	0.03
21.75	3.08	1.31	0.03
22.00	3.08	1.31	0.03
22.25	3.09	1.32	0.03
22.50	3.10	1.33	0.03
22.75	3.11	1.33	0.02
23.00	3.11	1.34	0.02
23.25	3.12	1.34	0.02
23.50	3.13	1.35	0.02
23.75	3.13	1.35	0.02
24.00	**3.14**	**1.36**	0.02

Summary for Pond 3P: Pond

Inflow Area = 5.610 ac, 39.44% Impervious, Inflow Depth > 1.85" for 10-Year event
Inflow = 8.76 cfs @ 12.38 hrs, Volume= 0.866 af
Outflow = 3.25 cfs @ 12.88 hrs, Volume= 0.856 af, Atten= 63%, Lag= 29.8 min
Primary = 3.25 cfs @ 12.88 hrs, Volume= 0.856 af
Routed to Link 12L : POST DEV

Routing by Stor-Ind method, Time Span= 5.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 582.58' @ 12.88 hrs Surf.Area= 4,427 sf Storage= 12,044 cf

Plug-Flow detention time= 44.7 min calculated for 0.854 af (99% of inflow)
Center-of-Mass det. time= 37.8 min (864.4 - 826.5)

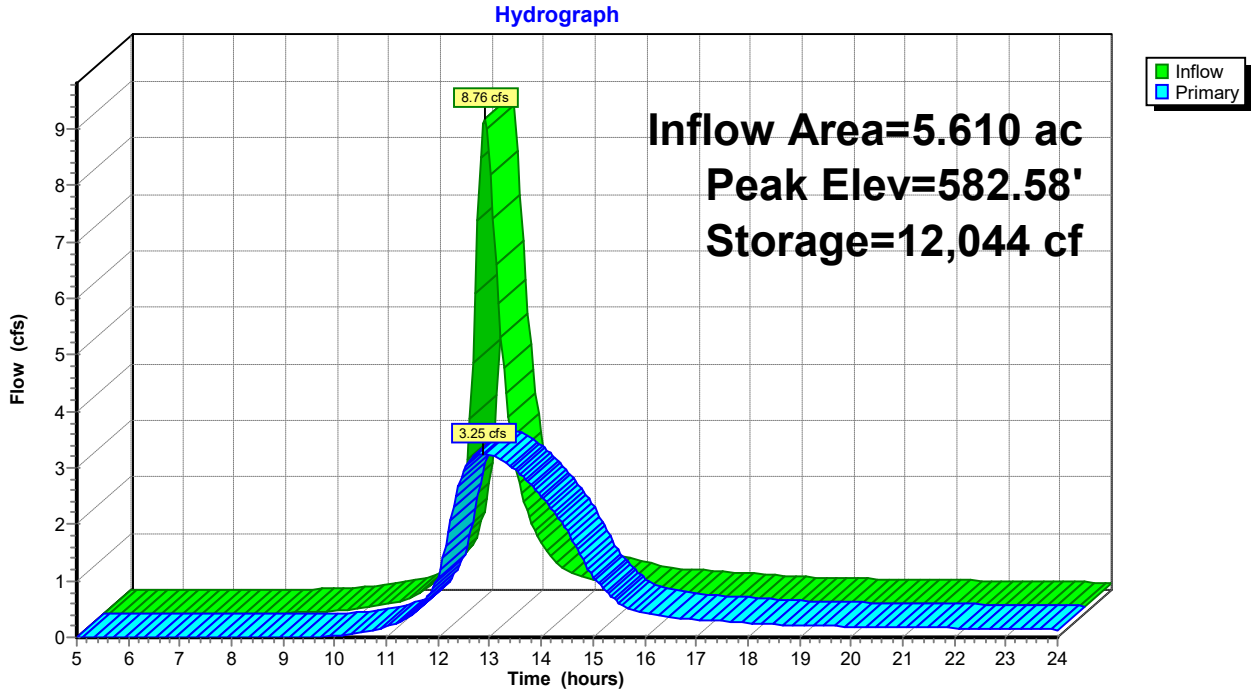
Volume	Invert	Avail.Storage	Storage Description
#1	578.50'	34,837 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
578.50	1,628	0	0
579.00	1,920	887	887
580.00	2,550	2,235	3,122
581.00	3,220	2,885	6,007
582.00	3,960	3,590	9,597
583.00	4,760	4,360	13,957
584.00	11,860	8,310	22,267
585.00	13,280	12,570	34,837

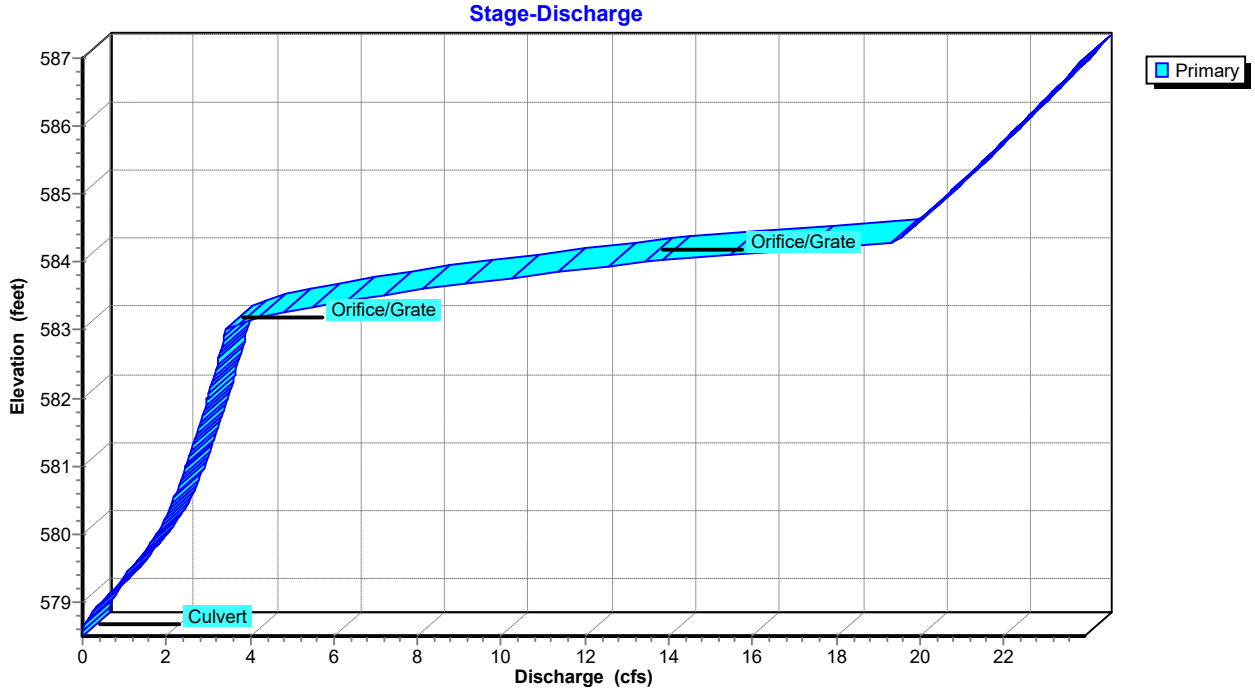
Device	Routing	Invert	Outlet Devices
#1	Device 4	578.51'	**8.0" Round Culvert** L= 16.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 578.51' / 578.45' S= 0.0037 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.35 sf
#2	Device 4	583.00'	**36.0" W x 36.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 4	584.00'	**36.0" W x 36.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Primary	578.34'	**18.0" Round Culvert** L= 34.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 578.34' / 578.21' S= 0.0038 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 1.77 sf

Primary OutFlow Max=3.25 cfs @ 12.88 hrs HW=582.58' (Free Discharge)
└**4=Culvert** (Passes 3.25 cfs of 15.90 cfs potential flow)
  ├**1=Culvert** (Inlet Controls 3.25 cfs @ 9.31 fps)
  ├**2=Orifice/Grate** (Controls 0.00 cfs)
  └**3=Orifice/Grate** (Controls 0.00 cfs)

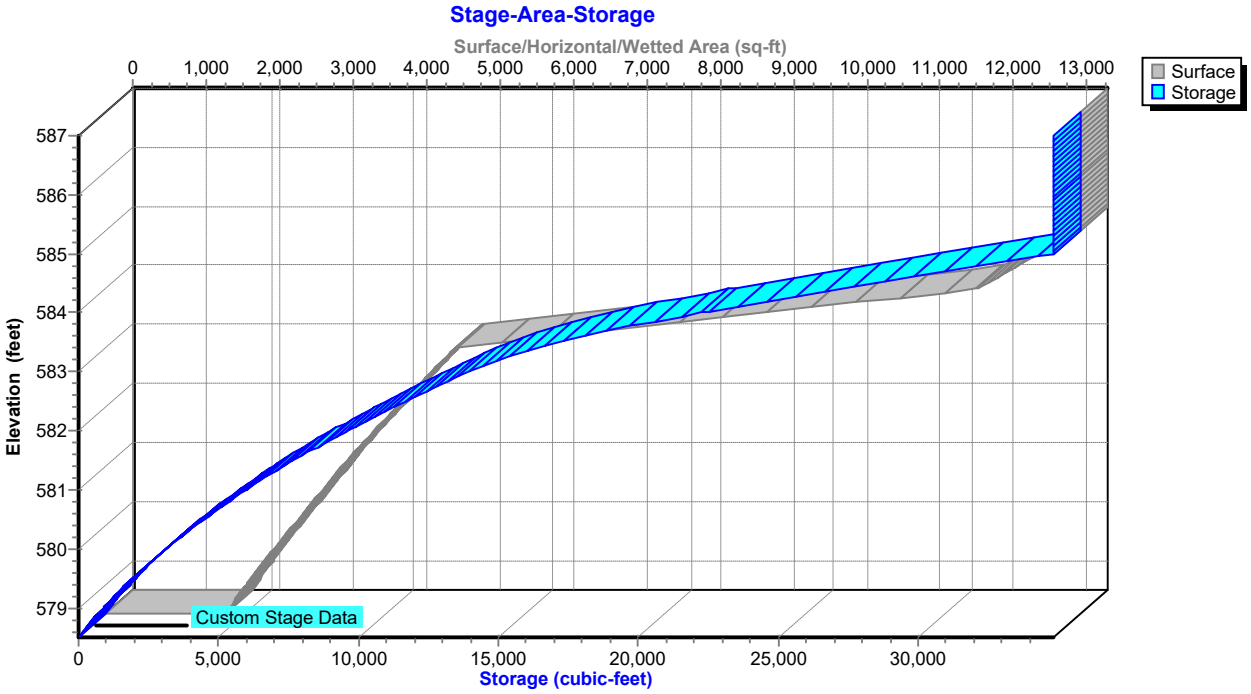
Pond 3P: Pond



Pond 3P: Pond



Pond 3P: Pond


Stage-Area-Storage
Surface/Horizontal/Wetted Area (sq-ft)
0
1,000
2,000
3,000
4,000
5,000
6,000
7,000
8,000
9,000
10,000
11,000
12,000
13,000
Surface
Storage
Elevation (feet)
587
586
585
584
583
582
581
580
579
Custom Stage Data
0
5,000
10,000
15,000
20,000
25,000
30,000
Storage (cubic-feet)

Hydrograph for Pond 3P: Pond

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
5.00	0.00	0	578.50	0.00
5.50	0.00	0	578.50	0.00
6.00	0.00	0	578.50	0.00
6.50	0.00	0	578.50	0.00
7.00	0.00	0	578.50	0.00
7.50	0.00	0	578.50	0.00
8.00	0.00	0	578.50	0.00
8.50	0.01	6	578.50	0.00
9.00	0.03	39	578.52	0.00
9.50	0.06	103	578.56	0.01
10.00	0.10	210	578.63	0.03
10.50	0.17	349	578.71	0.09
11.00	0.30	515	578.80	0.18
11.50	0.65	823	578.97	0.41
12.00	**2.24**	1,751	579.42	1.04
12.50	**7.78**	**9,263**	**581.91**	**2.95**
13.00	2.54	**11,884**	**582.55**	**3.23**
13.50	1.22	9,430	581.96	2.97
14.00	0.76	6,200	581.06	2.50
14.50	0.60	3,434	580.12	1.88
15.00	0.49	1,781	579.43	1.06
15.50	0.39	1,070	579.09	0.61
16.00	0.35	839	578.97	0.42
16.50	0.32	756	578.93	0.35
17.00	0.29	709	578.91	0.32
17.50	0.26	667	578.88	0.29
18.00	0.24	628	578.86	0.26
18.50	0.21	590	578.84	0.23
19.00	0.20	563	578.83	0.21
19.50	0.19	546	578.82	0.20
20.00	0.19	533	578.81	0.19
20.50	0.18	521	578.80	0.19
21.00	0.17	510	578.80	0.18
21.50	0.16	499	578.79	0.17
22.00	0.16	487	578.78	0.16
22.50	0.15	476	578.78	0.16
23.00	0.14	464	578.77	0.15
23.50	0.14	453	578.77	0.14
24.00	0.13	441	578.76	0.13

Stage-Discharge for Pond 3P: Pond

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
578.50	0.00	581.35	2.66	584.20	17.41
578.55	0.00	581.40	2.69	584.25	18.57
578.60	0.02	581.45	2.71	584.30	19.42
578.65	0.04	581.50	2.74	584.35	19.51
578.70	0.08	581.55	2.77	584.40	19.61
578.75	0.12	581.60	2.79	584.45	19.70
578.80	0.18	581.65	2.82	584.50	19.79
578.85	0.24	581.70	2.84	584.55	19.88
578.90	0.31	581.75	2.87	584.60	19.97
578.95	0.38	581.80	2.89	584.65	20.06
579.00	0.46	581.85	2.91	584.70	20.15
579.05	0.54	581.90	2.94	584.75	20.24
579.10	0.62	581.95	2.96	584.80	20.33
579.15	0.70	582.00	2.99	584.85	20.42
579.20	0.78	582.05	3.01	584.90	20.51
579.25	0.86	582.10	3.03	584.95	20.60
579.30	0.93	582.15	3.06	585.00	20.69
579.35	0.98	582.20	3.08	585.05	20.77
579.40	1.00	582.25	3.10	585.10	20.86
579.45	1.08	582.30	3.12	585.15	20.95
579.50	1.16	582.35	3.15	585.20	21.03
579.55	1.23	582.40	3.17	585.25	21.12
579.60	1.30	582.45	3.19	585.30	21.20
579.65	1.37	582.50	3.21	585.35	21.29
579.70	1.43	582.55	3.24	585.40	21.37
579.75	1.49	582.60	3.26	585.45	21.46
579.80	1.55	582.65	3.28	585.50	21.54
579.85	1.60	582.70	3.30	585.55	21.63
579.90	1.66	582.75	3.32	585.60	21.71
579.95	1.71	582.80	3.34	585.65	21.79
580.00	1.76	582.85	3.36	585.70	21.88
580.05	1.81	582.90	3.39	585.75	21.96
580.10	1.86	582.95	3.41	585.80	22.04
580.15	1.90	583.00	3.43	585.85	22.12
580.20	1.95	583.05	3.55	585.90	22.20
580.25	1.99	583.10	3.77	585.95	22.29
580.30	2.03	583.15	4.05	586.00	22.37
580.35	2.06	583.20	4.37	586.05	22.45
580.40	2.10	583.25	4.73	586.10	22.53
580.45	2.13	583.30	5.13	586.15	22.61
580.50	2.16	583.35	5.56	586.20	22.69
580.55	2.20	583.40	6.02	586.25	22.77
580.60	2.23	583.45	6.51	586.30	22.85
580.65	2.26	583.50	7.03	586.35	22.93
580.70	2.29	583.55	7.57	586.40	23.01
580.75	2.32	583.60	8.14	586.45	23.08
580.80	2.35	583.65	8.73	586.50	23.16
580.85	2.38	583.70	9.34	586.55	23.24
580.90	2.41	583.75	9.98	586.60	23.32
580.95	2.44	583.80	10.63	586.65	23.40
581.00	2.47	583.85	11.31	586.70	23.47
581.05	2.50	583.90	12.00	586.75	23.55
581.10	2.52	583.95	12.71	586.80	23.63
581.15	2.55	584.00	13.45	586.85	23.70
581.20	2.58	584.05	14.30	586.90	23.78
581.25	2.61	584.10	15.27	586.95	23.85
581.30	2.63	584.15	16.31	587.00	**23.93**

Stage-Area-Storage for Pond 3P: Pond

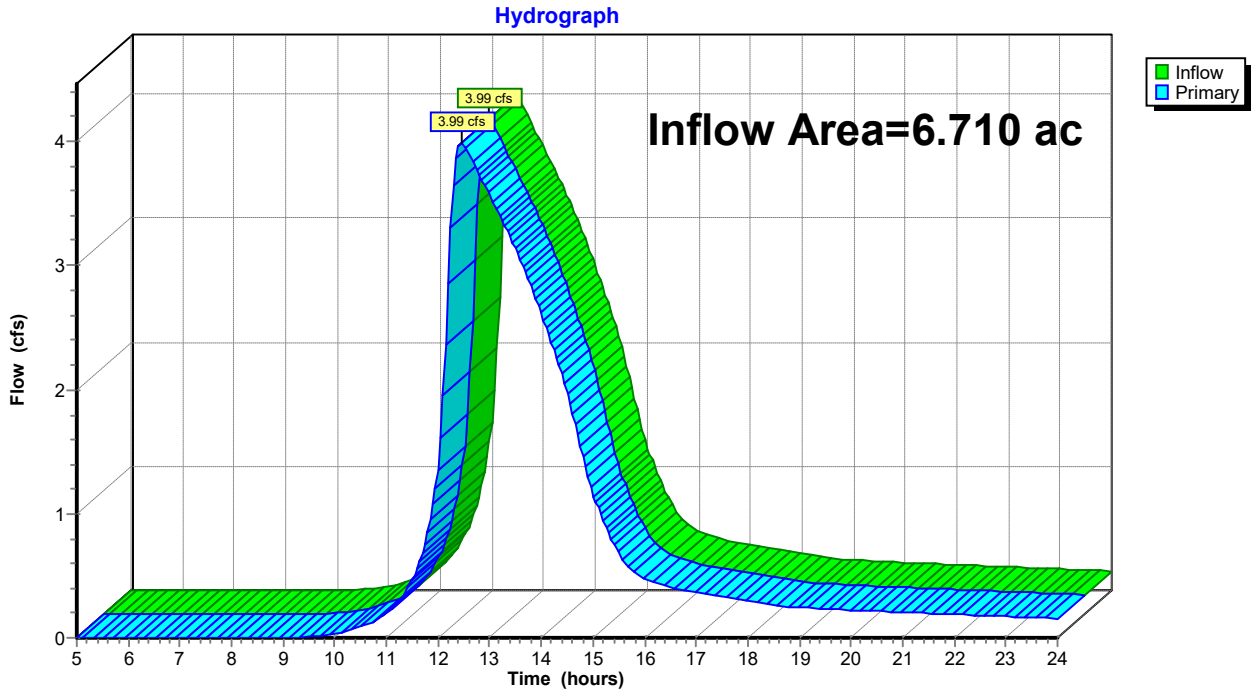
Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
578.50	1,628	0
578.60	1,686	166
578.70	1,745	337
578.80	1,803	515
578.90	1,862	698
579.00	1,920	887
579.10	1,983	1,082
579.20	2,046	1,284
579.30	2,109	1,491
579.40	2,172	1,705
579.50	2,235	1,926
579.60	2,298	2,152
579.70	2,361	2,385
579.80	2,424	2,625
579.90	2,487	2,870
580.00	2,550	3,122
580.10	2,617	3,380
580.20	2,684	3,645
580.30	2,751	3,917
580.40	2,818	4,196
580.50	2,885	4,481
580.60	2,952	4,773
580.70	3,019	5,071
580.80	3,086	5,376
580.90	3,153	5,688
581.00	3,220	6,007
581.10	3,294	6,333
581.20	3,368	6,666
581.30	3,442	7,006
581.40	3,516	7,354
581.50	3,590	7,710
581.60	3,664	8,072
581.70	3,738	8,442
581.80	3,812	8,820
581.90	3,886	9,205
582.00	3,960	9,597
582.10	4,040	9,997
582.20	4,120	10,405
582.30	4,200	10,821
582.40	4,280	11,245
582.50	4,360	11,677
582.60	4,440	12,117
582.70	4,520	12,565
582.80	4,600	13,021
582.90	4,680	13,485
583.00	4,760	13,957
583.10	5,470	14,469
583.20	6,180	15,051
583.30	6,890	15,704
583.40	7,600	16,429
583.50	8,310	17,225
583.60	9,020	18,091
583.70	9,730	19,029
583.80	10,440	20,037
583.90	11,150	21,116
584.00	11,860	22,267
584.10	12,002	23,460
584.20	12,144	24,667
584.30	12,286	25,889
584.40	12,428	27,125
584.50	12,570	28,375
584.60	12,712	29,639
584.70	12,854	30,917
584.80	12,996	32,209
584.90	13,138	33,516
585.00	**13,280**	**34,837**
585.10	13,280	34,837
585.20	13,280	34,837
585.30	13,280	34,837
585.40	13,280	34,837
585.50	13,280	34,837
585.60	13,280	34,837
585.70	13,280	34,837
585.80	13,280	34,837
585.90	13,280	34,837
586.00	13,280	34,837
586.10	13,280	34,837
586.20	13,280	34,837
586.30	13,280	34,837
586.40	13,280	34,837
586.50	13,280	34,837
586.60	13,280	34,837
586.70	13,280	34,837
586.80	13,280	34,837
586.90	13,280	34,837
587.00	13,280	34,837

Summary for Link 12L: POST DEV

Inflow Area = 6.710 ac, 32.97% Impervious, Inflow Depth > 1.75" for 10-Year event
Inflow = 3.99 cfs @ 12.45 hrs, Volume= 0.980 af
Primary = 3.99 cfs @ 12.45 hrs, Volume= 0.980 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-24.00 hrs, dt= 0.05 hrs

Link 12L: POST DEV



Hydrograph for Link 12L: POST DEV

Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
5.00	0.00	**0.00**	0.00
5.25	0.00	0.00	0.00
5.50	0.00	0.00	0.00
5.75	0.00	0.00	0.00
6.00	0.00	0.00	0.00
6.25	0.00	0.00	0.00
6.50	0.00	0.00	0.00
6.75	0.00	0.00	0.00
7.00	0.00	0.00	0.00
7.25	0.00	0.00	0.00
7.50	0.00	0.00	0.00
7.75	0.00	0.00	0.00
8.00	0.00	0.00	0.00
8.25	0.00	0.00	0.00
8.50	0.00	0.00	0.00
8.75	0.00	0.00	0.00
9.00	0.00	0.00	0.00
9.25	0.00	0.00	0.00
9.50	0.01	0.00	0.01
9.75	0.02	0.00	0.02
10.00	0.03	0.00	0.03
10.25	0.05	0.00	0.05
10.50	0.09	0.00	0.09
10.75	0.13	0.00	0.13
11.00	0.20	0.00	0.20
11.25	0.30	0.00	0.30
11.50	0.46	0.00	0.46
11.75	0.76	0.00	0.76
12.00	1.36	0.00	1.36
12.25	**3.31**	0.00	**3.31**
12.50	**3.97**	0.00	**3.97**
12.75	3.78	0.00	3.78
13.00	3.57	0.00	3.57
13.25	3.37	0.00	3.37
13.50	3.14	0.00	3.14
13.75	2.89	0.00	2.89
14.00	2.62	0.00	2.62
14.25	2.32	0.00	2.32
14.50	1.97	0.00	1.97
14.75	1.55	0.00	1.55
15.00	1.13	0.00	1.13
15.25	0.89	0.00	0.89
15.50	0.67	0.00	0.67
15.75	0.55	0.00	0.55
16.00	0.48	0.00	0.48
16.25	0.43	0.00	0.43
16.50	0.41	0.00	0.41
16.75	0.38	0.00	0.38
17.00	0.37	0.00	0.37
17.25	0.35	0.00	0.35
17.50	0.33	0.00	0.33
17.75	0.31	0.00	0.31
18.00	0.30	0.00	0.30
18.25	0.28	0.00	0.28
18.50	0.26	0.00	0.26
18.75	0.25	0.00	0.25
19.00	0.25	0.00	0.25
19.25	0.24	0.00	0.24
19.50	0.23	0.00	0.23
19.75	0.23	0.00	0.23
20.00	0.22	0.00	0.22
20.25	0.22	0.00	0.22
20.50	0.22	0.00	0.22
20.75	0.21	0.00	0.21
21.00	0.21	0.00	0.21
21.25	0.20	0.00	0.20
21.50	0.20	0.00	0.20
21.75	0.19	0.00	0.19
22.00	0.19	0.00	0.19
22.25	0.19	0.00	0.19
22.50	0.18	0.00	0.18
22.75	0.18	0.00	0.18
23.00	0.17	0.00	0.17
23.25	0.17	0.00	0.17
23.50	0.16	0.00	0.16
23.75	0.16	0.00	0.16
24.00	0.16	0.00	0.16

Time span=5.00-24.00 hrs, dt=0.05 hrs, 381 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 2S: DA POST DEV - Runoff Area=5.610 ac 39.44% Impervious Runoff Depth>2.48"
Flow Length=860' Tc=27.1 min CN=87 Runoff=11.67 cfs 1.159 af

Subcatchment 11S: DA Post - DEV Runoff Area=1.100 ac 0.00% Impervious Runoff Depth>1.90"
Flow Length=370' Slope=0.0100 '/' Tc=22.0 min CN=80 Runoff=1.95 cfs 0.174 af

Pond 3P: Pond Peak Elev=583.35' Storage=16,041 cf Inflow=11.67 cfs 1.159 af
Outflow=5.54 cfs 1.147 af

Link 12L: POST DEV Inflow=6.29 cfs 1.322 af
Primary=6.29 cfs 1.322 af

Total Runoff Area = 6.710 ac Runoff Volume = 1.333 af Average Runoff Depth = 2.38"
67.03% Pervious = 4.497 ac 32.97% Impervious = 2.213 ac

Summary for Subcatchment 2S: DA POST DEV - CONTROLLED

[47] Hint: Peak is 518% of capacity of segment #3

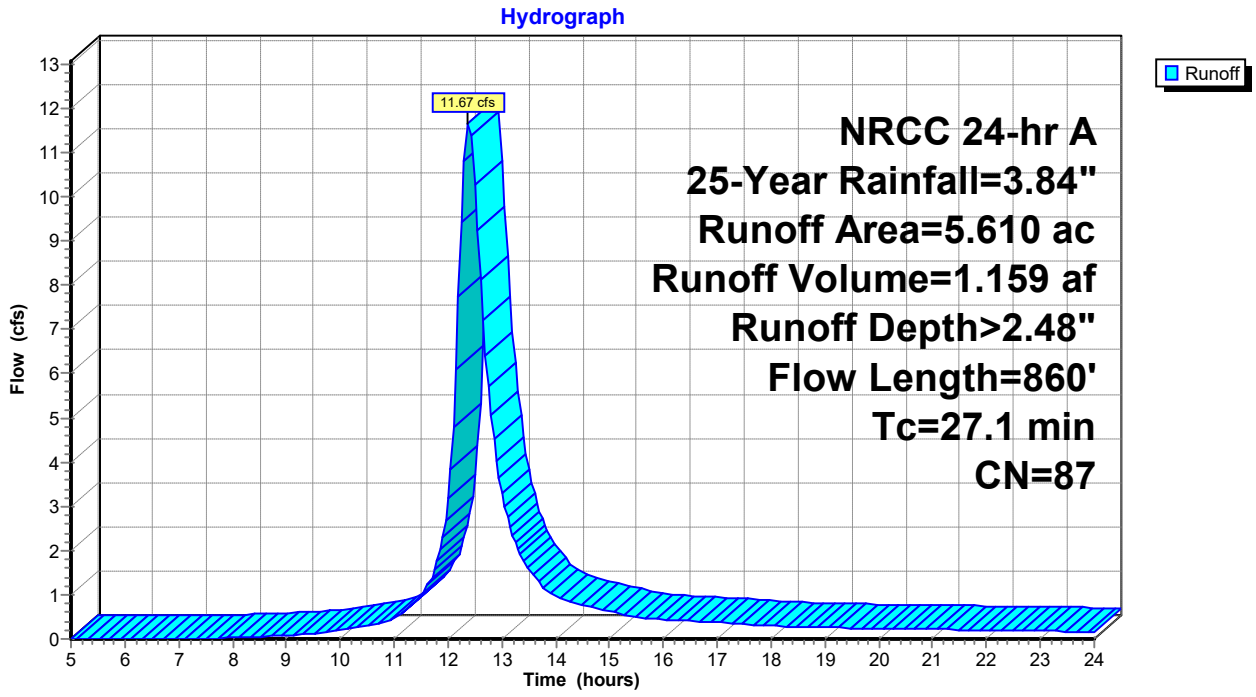
Runoff = 11.67 cfs @ 12.38 hrs, Volume= 1.159 af, Depth> 2.48"
Routed to Pond 3P : Pond

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-24.00 hrs, dt= 0.05 hrs
NRCC 24-hr A 25-Year Rainfall=3.84"

Area (ac)	CN	Description
0.970	98	Paved parking, HSG D
3.270	87	1/4 acre lots, 38% imp, HSG D
1.370	80	>75% Grass cover, Good, HSG D
5.610	87	Weighted Average
3.397		60.56% Pervious Area
2.213		39.44% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
22.7	100	0.0100	0.07		**Sheet Flow, SF** Grass: Dense n= 0.240 P2= 2.20"
0.1	20	0.0200	2.28		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
4.3	740	0.0040	2.87	2.25	**Pipe Channel,** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013 Concrete pipe, straight & clean
27.1	860	Total			

Subcatchment 2S: DA POST DEV - CONTROLLED



Hydrograph for Subcatchment 2S: DA POST DEV - CONTROLLED

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
5.00	0.20	0.00	0.00
5.25	0.21	0.00	0.00
5.50	0.22	0.00	0.00
5.75	0.23	0.00	0.00
6.00	0.25	0.00	0.00
6.25	0.26	0.00	0.00
6.50	0.27	0.00	0.00
6.75	0.29	0.00	0.00
7.00	0.31	0.00	0.00
7.25	0.32	0.00	0.00
7.50	0.34	0.00	0.01
7.75	0.36	0.00	0.02
8.00	0.38	0.00	0.03
8.25	0.40	0.01	0.04
8.50	0.42	0.01	0.05
8.75	0.45	0.01	0.06
9.00	0.47	0.02	0.08
9.25	0.50	0.02	0.10
9.50	0.53	0.03	0.12
9.75	0.56	0.04	0.15
10.00	0.60	0.05	0.19
10.25	0.64	0.06	0.24
10.50	0.68	0.08	0.29
10.75	0.74	0.10	0.36
11.00	0.81	0.13	0.48
11.25	0.91	0.18	0.67
11.50	1.03	0.24	0.99
11.75	1.26	0.38	1.57
12.00	1.81	0.76	3.17
12.25	2.58	1.38	**9.42**
12.50	2.81	1.57	**10.28**
12.75	2.93	1.68	5.70
13.00	3.03	1.76	3.29
13.25	3.10	1.83	2.18
13.50	3.16	1.88	1.57
13.75	3.20	1.92	1.20
14.00	3.24	1.95	0.97
14.25	3.28	1.99	0.85
14.50	3.31	2.02	0.77
14.75	3.34	2.04	0.69
15.00	3.37	2.07	0.62
15.25	3.39	2.09	0.55
15.50	3.42	2.11	0.50
15.75	3.44	2.13	0.47
16.00	3.46	2.15	0.45
16.25	3.48	2.16	0.43
16.50	3.50	2.18	0.41
16.75	3.52	2.20	0.39
17.00	3.53	2.21	0.37
17.25	3.55	2.23	0.35
17.50	3.57	2.24	0.34
17.75	3.58	2.25	0.32
18.00	3.59	2.27	0.30
18.25	3.61	2.28	0.28
18.50	3.62	2.29	0.27
18.75	3.63	2.30	0.26
19.00	3.64	2.31	0.25
19.25	3.66	2.32	0.25
19.50	3.67	2.33	0.25
19.75	3.68	2.34	0.24
20.00	3.69	2.35	0.24
20.25	3.70	2.36	0.23
20.50	3.71	2.37	0.23
20.75	3.72	2.38	0.22
21.00	3.73	2.39	0.22
21.25	3.74	2.40	0.21
21.50	3.75	2.41	0.21
21.75	3.76	2.42	0.20
22.00	3.77	2.43	0.20
22.25	3.78	2.44	0.19
22.50	3.79	2.45	0.19
22.75	3.80	2.45	0.19
23.00	3.81	2.46	0.18
23.25	3.82	2.47	0.18
23.50	3.82	2.48	0.17
23.75	3.83	2.48	0.17
24.00	**3.84**	**2.49**	0.16

Summary for Subcatchment 11S: DA Post - DEV Uncontrolled

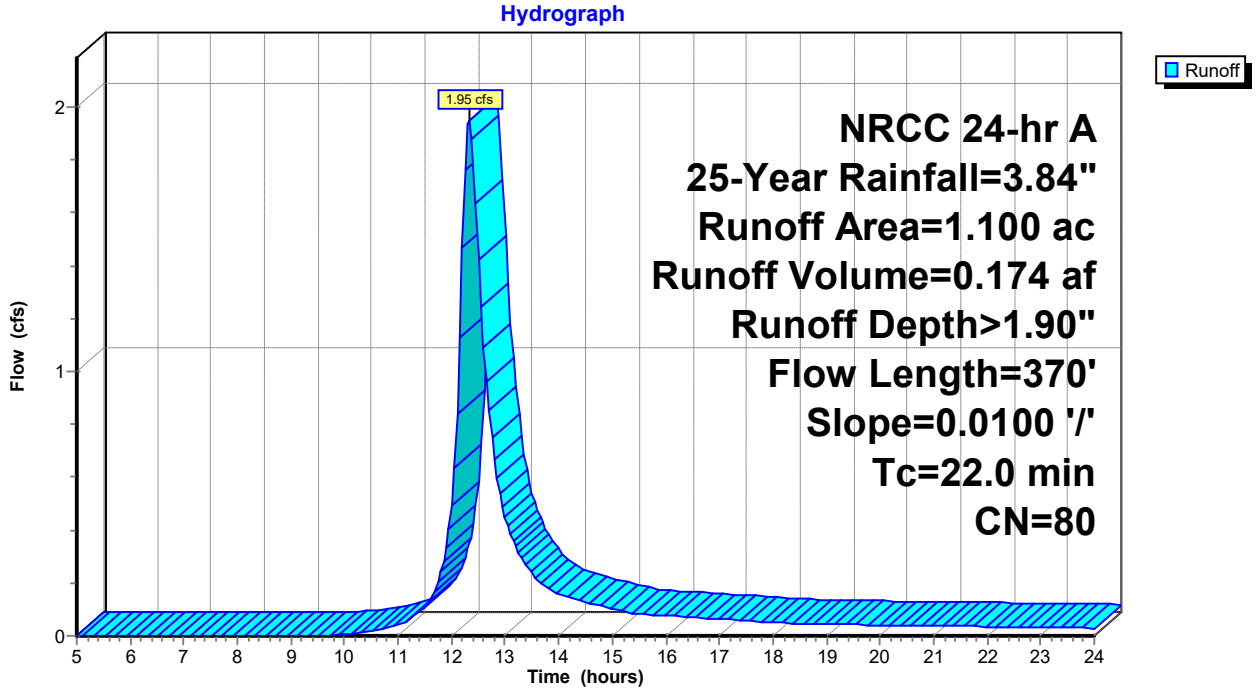
Runoff = 1.95 cfs @ 12.33 hrs, Volume= 0.174 af, Depth> 1.90"
Routed to Link 12L : POST DEV

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-24.00 hrs, dt= 0.05 hrs
NRCC 24-hr A 25-Year Rainfall=3.84"

Area (ac)	CN	Description
1.100	80	>75% Grass cover, Good, HSG D
1.100		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.6	100	0.0100	0.11		**Sheet Flow, SF** Grass: Short n= 0.150 P2= 2.20"
6.4	270	0.0100	0.70		**Shallow Concentrated Flow, SCF** Short Grass Pasture Kv= 7.0 fps
22.0	370	Total			

Subcatchment 11S: DA Post - DEV Uncontrolled



Hydrograph for Subcatchment 11S: DA Post - DEV Uncontrolled

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
5.00	0.20	0.00	0.00
5.25	0.21	0.00	0.00
5.50	0.22	0.00	0.00
5.75	0.23	0.00	0.00
6.00	0.25	0.00	0.00
6.25	0.26	0.00	0.00
6.50	0.27	0.00	0.00
6.75	0.29	0.00	0.00
7.00	0.31	0.00	0.00
7.25	0.32	0.00	0.00
7.50	0.34	0.00	0.00
7.75	0.36	0.00	0.00
8.00	0.38	0.00	0.00
8.25	0.40	0.00	0.00
8.50	0.42	0.00	0.00
8.75	0.45	0.00	0.00
9.00	0.47	0.00	0.00
9.25	0.50	0.00	0.00
9.50	0.53	0.00	0.00
9.75	0.56	0.00	0.00
10.00	0.60	0.00	0.01
10.25	0.64	0.01	0.01
10.50	0.68	0.01	0.02
10.75	0.74	0.02	0.03
11.00	0.81	0.03	0.04
11.25	0.91	0.06	0.07
11.50	1.03	0.09	0.11
11.75	1.26	0.18	0.21
12.00	1.81	0.45	0.50
12.25	2.58	0.94	**1.76**
12.50	2.81	1.11	**1.42**
12.75	2.93	1.20	0.75
13.00	3.03	1.27	0.45
13.25	3.10	1.33	0.31
13.50	3.16	1.37	0.24
13.75	3.20	1.40	0.19
14.00	3.24	1.43	0.16
14.25	3.28	1.46	0.14
14.50	3.31	1.49	0.13
14.75	3.34	1.51	0.12
15.00	3.37	1.53	0.10
15.25	3.39	1.55	0.09
15.50	3.42	1.57	0.08
15.75	3.44	1.59	0.08
16.00	3.46	1.60	0.08
16.25	3.48	1.62	0.07
16.50	3.50	1.64	0.07
16.75	3.52	1.65	0.07
17.00	3.53	1.66	0.06
17.25	3.55	1.68	0.06
17.50	3.57	1.69	0.06
17.75	3.58	1.70	0.05
18.00	3.59	1.71	0.05
18.25	3.61	1.72	0.05
18.50	3.62	1.73	0.05
18.75	3.63	1.74	0.04
19.00	3.64	1.75	0.04
19.25	3.66	1.76	0.04
19.50	3.67	1.77	0.04
19.75	3.68	1.78	0.04
20.00	3.69	1.79	0.04
20.25	3.70	1.80	0.04
20.50	3.71	1.81	0.04
20.75	3.72	1.82	0.04
21.00	3.73	1.82	0.04
21.25	3.74	1.83	0.04
21.50	3.75	1.84	0.04
21.75	3.76	1.85	0.04
22.00	3.77	1.86	0.03
22.25	3.78	1.86	0.03
22.50	3.79	1.87	0.03
22.75	3.80	1.88	0.03
23.00	3.81	1.88	0.03
23.25	3.82	1.89	0.03
23.50	3.82	1.90	0.03
23.75	3.83	1.90	0.03
24.00	**3.84**	**1.91**	0.03

Summary for Pond 3P: Pond

Inflow Area = 5.610 ac, 39.44% Impervious, Inflow Depth > 2.48" for 25-Year event
Inflow = 11.67 cfs @ 12.38 hrs, Volume= 1.159 af
Outflow = 5.54 cfs @ 12.77 hrs, Volume= 1.147 af, Atten= 53%, Lag= 23.1 min
Primary = 5.54 cfs @ 12.77 hrs, Volume= 1.147 af
Routed to Link 12L : POST DEV

Routing by Stor-Ind method, Time Span= 5.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 583.35' @ 12.77 hrs Surf.Area= 7,228 sf Storage= 16,041 cf

Plug-Flow detention time= 46.4 min calculated for 1.147 af (99% of inflow)
Center-of-Mass det. time= 40.6 min (860.3 - 819.7)

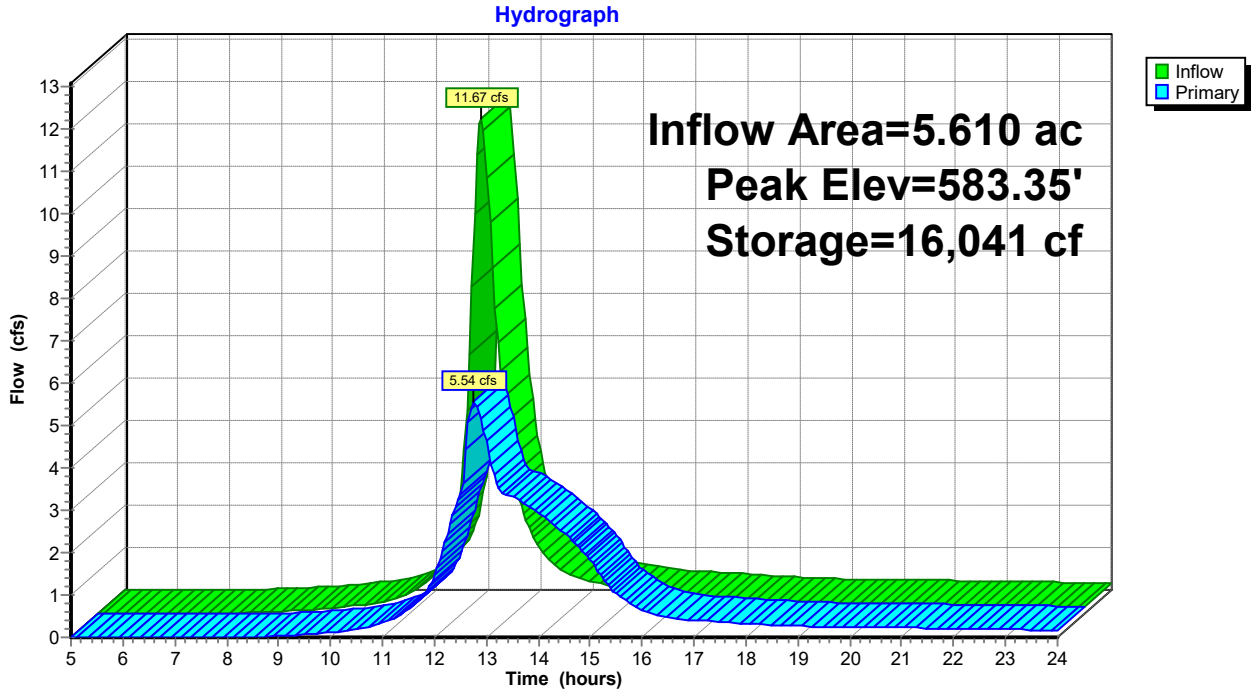
Volume	Invert	Avail.Storage	Storage Description
#1	578.50'	34,837 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
578.50	1,628	0	0
579.00	1,920	887	887
580.00	2,550	2,235	3,122
581.00	3,220	2,885	6,007
582.00	3,960	3,590	9,597
583.00	4,760	4,360	13,957
584.00	11,860	8,310	22,267
585.00	13,280	12,570	34,837

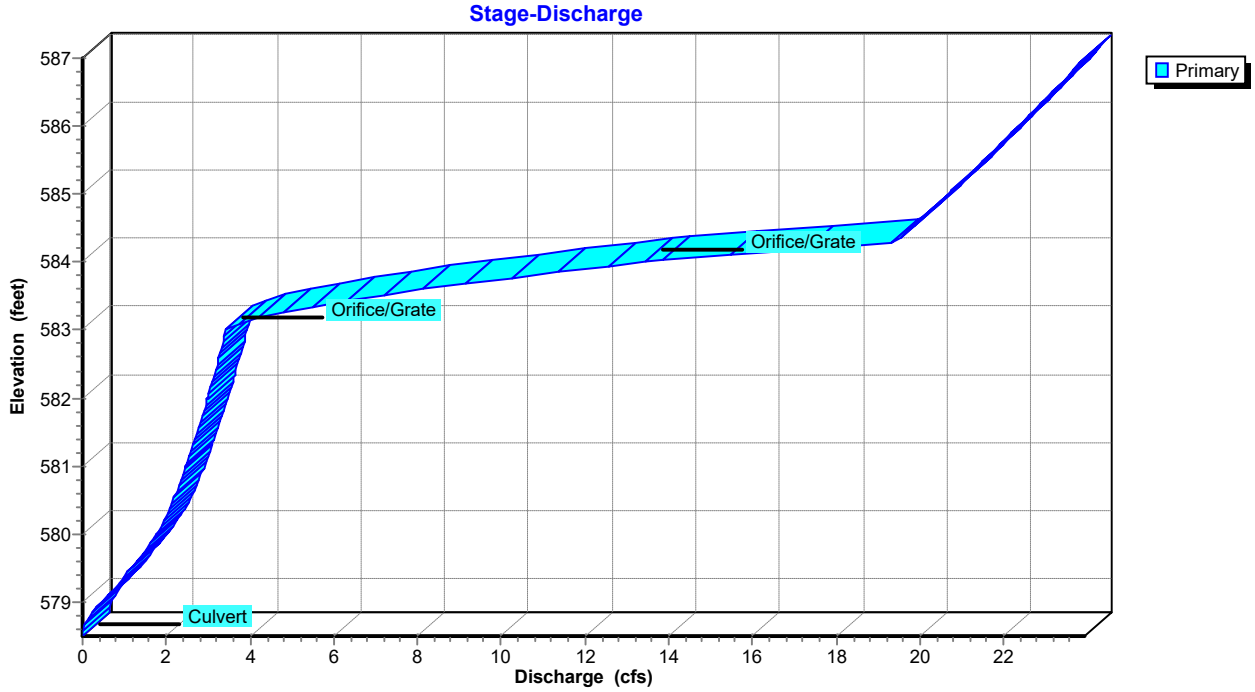
Device	Routing	Invert	Outlet Devices
#1	Device 4	578.51'	**8.0" Round Culvert** L= 16.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 578.51' / 578.45' S= 0.0037 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.35 sf
#2	Device 4	583.00'	**36.0" W x 36.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 4	584.00'	**36.0" W x 36.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Primary	578.34'	**18.0" Round Culvert** L= 34.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 578.34' / 578.21' S= 0.0038 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 1.77 sf

Primary OutFlow Max=5.52 cfs @ 12.77 hrs HW=583.35' (Free Discharge)
└**4=Culvert** (Passes 5.52 cfs of 17.55 cfs potential flow)
  ├**1=Culvert** (Inlet Controls 3.57 cfs @ 10.22 fps)
  ├**2=Orifice/Grate** (Orifice Controls 1.96 cfs @ 1.89 fps)
  └**3=Orifice/Grate** (Controls 0.00 cfs)

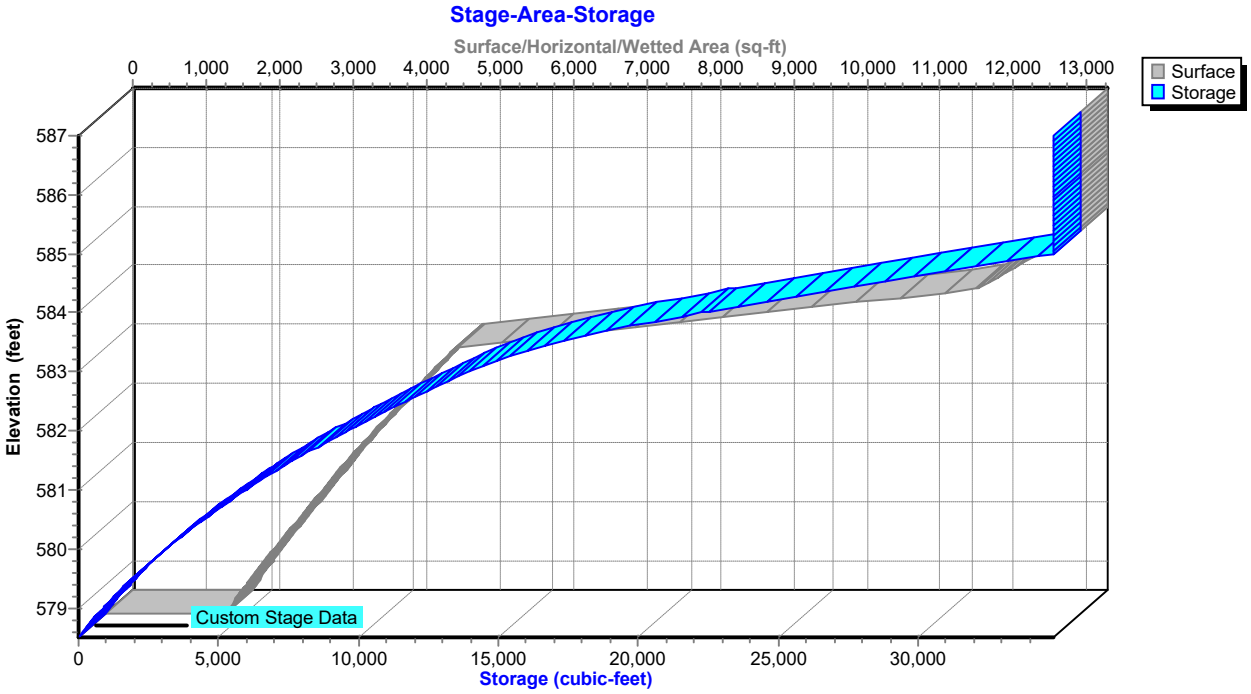
Pond 3P: Pond



Pond 3P: Pond



Pond 3P: Pond


Stage-Area-Storage
Surface/Horizontal/Wetted Area (sq-ft)
0
1,000
2,000
3,000
4,000
5,000
6,000
7,000
8,000
9,000
10,000
11,000
12,000
13,000
Surface
Storage
Elevation (feet)
587
586
585
584
583
582
581
580
579
Custom Stage Data
0
5,000
10,000
15,000
20,000
25,000
30,000
Storage (cubic-feet)

Hydrograph for Pond 3P: Pond

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
5.00	0.00	0	578.50	0.00
5.50	0.00	0	578.50	0.00
6.00	0.00	0	578.50	0.00
6.50	0.00	0	578.50	0.00
7.00	0.00	0	578.50	0.00
7.50	0.01	4	578.50	0.00
8.00	0.03	33	578.52	0.00
8.50	0.05	95	578.56	0.01
9.00	0.08	187	578.61	0.03
9.50	0.12	288	578.67	0.06
10.00	0.19	411	578.74	0.12
10.50	0.29	556	578.82	0.21
11.00	0.48	739	578.92	0.34
11.50	0.99	1,132	579.12	0.66
12.00	**3.17**	2,485	579.74	1.48
12.50	**10.28**	**13,162**	**582.83**	**3.36**
13.00	3.29	**15,270**	**583.23**	**4.62**
13.50	1.57	12,698	582.73	3.31
14.00	0.97	9,243	581.91	2.94
14.50	0.77	5,916	580.97	2.45
15.00	0.62	3,283	580.06	1.82
15.50	0.50	1,729	579.41	1.04
16.00	0.45	1,094	579.11	0.63
16.50	0.41	901	579.01	0.47
17.00	0.37	822	578.97	0.41
17.50	0.34	769	578.94	0.36
18.00	0.30	721	578.91	0.33
18.50	0.27	673	578.89	0.29
19.00	0.25	641	578.87	0.27
19.50	0.25	623	578.86	0.25
20.00	0.24	609	578.85	0.24
20.50	0.23	596	578.84	0.23
21.00	0.22	584	578.84	0.22
21.50	0.21	570	578.83	0.22
22.00	0.20	556	578.82	0.21
22.50	0.19	541	578.81	0.20
23.00	0.18	527	578.81	0.19
23.50	0.17	512	578.80	0.18
24.00	0.16	497	578.79	0.17

Stage-Discharge for Pond 3P: Pond

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
578.50	0.00	581.35	2.66	584.20	17.41
578.55	0.00	581.40	2.69	584.25	18.57
578.60	0.02	581.45	2.71	584.30	19.42
578.65	0.04	581.50	2.74	584.35	19.51
578.70	0.08	581.55	2.77	584.40	19.61
578.75	0.12	581.60	2.79	584.45	19.70
578.80	0.18	581.65	2.82	584.50	19.79
578.85	0.24	581.70	2.84	584.55	19.88
578.90	0.31	581.75	2.87	584.60	19.97
578.95	0.38	581.80	2.89	584.65	20.06
579.00	0.46	581.85	2.91	584.70	20.15
579.05	0.54	581.90	2.94	584.75	20.24
579.10	0.62	581.95	2.96	584.80	20.33
579.15	0.70	582.00	2.99	584.85	20.42
579.20	0.78	582.05	3.01	584.90	20.51
579.25	0.86	582.10	3.03	584.95	20.60
579.30	0.93	582.15	3.06	585.00	20.69
579.35	0.98	582.20	3.08	585.05	20.77
579.40	1.00	582.25	3.10	585.10	20.86
579.45	1.08	582.30	3.12	585.15	20.95
579.50	1.16	582.35	3.15	585.20	21.03
579.55	1.23	582.40	3.17	585.25	21.12
579.60	1.30	582.45	3.19	585.30	21.20
579.65	1.37	582.50	3.21	585.35	21.29
579.70	1.43	582.55	3.24	585.40	21.37
579.75	1.49	582.60	3.26	585.45	21.46
579.80	1.55	582.65	3.28	585.50	21.54
579.85	1.60	582.70	3.30	585.55	21.63
579.90	1.66	582.75	3.32	585.60	21.71
579.95	1.71	582.80	3.34	585.65	21.79
580.00	1.76	582.85	3.36	585.70	21.88
580.05	1.81	582.90	3.39	585.75	21.96
580.10	1.86	582.95	3.41	585.80	22.04
580.15	1.90	583.00	3.43	585.85	22.12
580.20	1.95	583.05	3.55	585.90	22.20
580.25	1.99	583.10	3.77	585.95	22.29
580.30	2.03	583.15	4.05	586.00	22.37
580.35	2.06	583.20	4.37	586.05	22.45
580.40	2.10	583.25	4.73	586.10	22.53
580.45	2.13	583.30	5.13	586.15	22.61
580.50	2.16	583.35	5.56	586.20	22.69
580.55	2.20	583.40	6.02	586.25	22.77
580.60	2.23	583.45	6.51	586.30	22.85
580.65	2.26	583.50	7.03	586.35	22.93
580.70	2.29	583.55	7.57	586.40	23.01
580.75	2.32	583.60	8.14	586.45	23.08
580.80	2.35	583.65	8.73	586.50	23.16
580.85	2.38	583.70	9.34	586.55	23.24
580.90	2.41	583.75	9.98	586.60	23.32
580.95	2.44	583.80	10.63	586.65	23.40
581.00	2.47	583.85	11.31	586.70	23.47
581.05	2.50	583.90	12.00	586.75	23.55
581.10	2.52	583.95	12.71	586.80	23.63
581.15	2.55	584.00	13.45	586.85	23.70
581.20	2.58	584.05	14.30	586.90	23.78
581.25	2.61	584.10	15.27	586.95	23.85
581.30	2.63	584.15	16.31	587.00	**23.93**

Stage-Area-Storage for Pond 3P: Pond

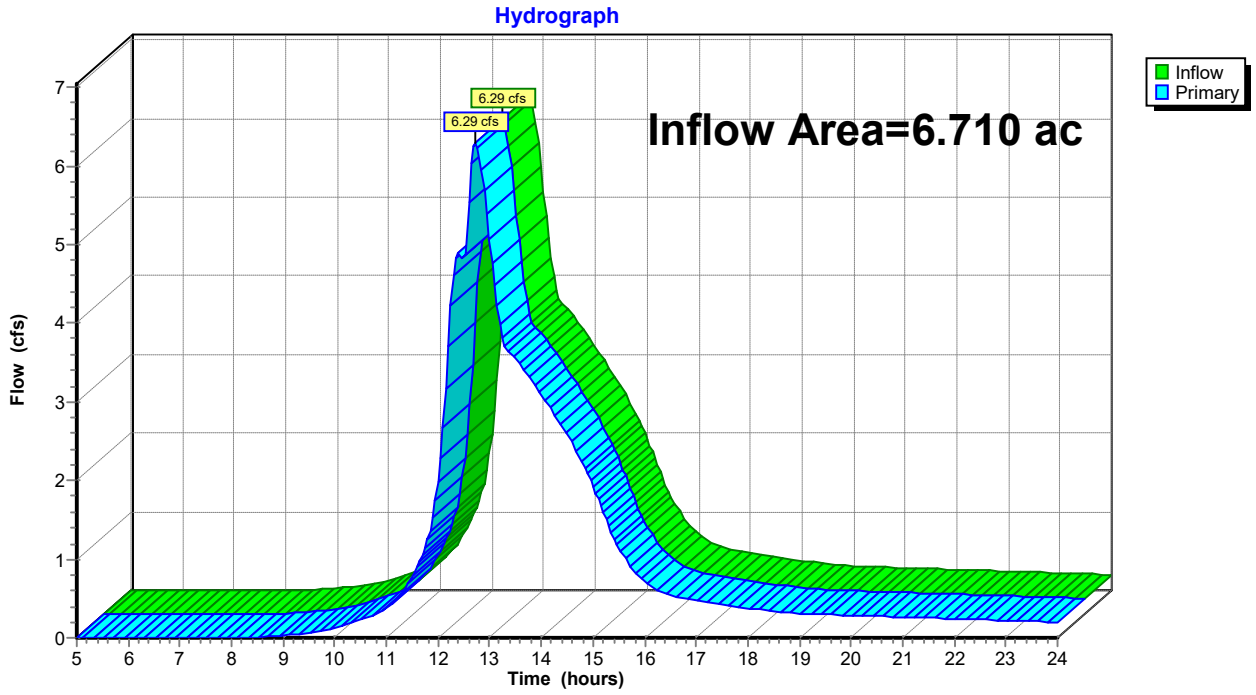
Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
578.50	1,628	0
578.60	1,686	166
578.70	1,745	337
578.80	1,803	515
578.90	1,862	698
579.00	1,920	887
579.10	1,983	1,082
579.20	2,046	1,284
579.30	2,109	1,491
579.40	2,172	1,705
579.50	2,235	1,926
579.60	2,298	2,152
579.70	2,361	2,385
579.80	2,424	2,625
579.90	2,487	2,870
580.00	2,550	3,122
580.10	2,617	3,380
580.20	2,684	3,645
580.30	2,751	3,917
580.40	2,818	4,196
580.50	2,885	4,481
580.60	2,952	4,773
580.70	3,019	5,071
580.80	3,086	5,376
580.90	3,153	5,688
581.00	3,220	6,007
581.10	3,294	6,333
581.20	3,368	6,666
581.30	3,442	7,006
581.40	3,516	7,354
581.50	3,590	7,710
581.60	3,664	8,072
581.70	3,738	8,442
581.80	3,812	8,820
581.90	3,886	9,205
582.00	3,960	9,597
582.10	4,040	9,997
582.20	4,120	10,405
582.30	4,200	10,821
582.40	4,280	11,245
582.50	4,360	11,677
582.60	4,440	12,117
582.70	4,520	12,565
582.80	4,600	13,021
582.90	4,680	13,485
583.00	4,760	13,957
583.10	5,470	14,469
583.20	6,180	15,051
583.30	6,890	15,704
583.40	7,600	16,429
583.50	8,310	17,225
583.60	9,020	18,091
583.70	9,730	19,029
583.80	10,440	20,037
583.90	11,150	21,116
584.00	11,860	22,267
584.10	12,002	23,460
584.20	12,144	24,667
584.30	12,286	25,889
584.40	12,428	27,125
584.50	12,570	28,375
584.60	12,712	29,639
584.70	12,854	30,917
584.80	12,996	32,209
584.90	13,138	33,516
585.00	**13,280**	**34,837**
585.10	13,280	34,837
585.20	13,280	34,837
585.30	13,280	34,837
585.40	13,280	34,837
585.50	13,280	34,837
585.60	13,280	34,837
585.70	13,280	34,837
585.80	13,280	34,837
585.90	13,280	34,837
586.00	13,280	34,837
586.10	13,280	34,837
586.20	13,280	34,837
586.30	13,280	34,837
586.40	13,280	34,837
586.50	13,280	34,837
586.60	13,280	34,837
586.70	13,280	34,837
586.80	13,280	34,837
586.90	13,280	34,837
587.00	13,280	34,837

Summary for Link 12L: POST DEV

Inflow Area = 6.710 ac, 32.97% Impervious, Inflow Depth > 2.36" for 25-Year event
Inflow = 6.29 cfs @ 12.73 hrs, Volume= 1.322 af
Primary = 6.29 cfs @ 12.73 hrs, Volume= 1.322 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-24.00 hrs, dt= 0.05 hrs

Link 12L: POST DEV



Hydrograph for Link 12L: POST DEV

Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
5.00	0.00	**0.00**	0.00
5.25	0.00	0.00	0.00
5.50	0.00	0.00	0.00
5.75	0.00	0.00	0.00
6.00	0.00	0.00	0.00
6.25	0.00	0.00	0.00
6.50	0.00	0.00	0.00
6.75	0.00	0.00	0.00
7.00	0.00	0.00	0.00
7.25	0.00	0.00	0.00
7.50	0.00	0.00	0.00
7.75	0.00	0.00	0.00
8.00	0.00	0.00	0.00
8.25	0.00	0.00	0.00
8.50	0.01	0.00	0.01
8.75	0.01	0.00	0.01
9.00	0.03	0.00	0.03
9.25	0.04	0.00	0.04
9.50	0.06	0.00	0.06
9.75	0.09	0.00	0.09
10.00	0.12	0.00	0.12
10.25	0.17	0.00	0.17
10.50	0.22	0.00	0.22
10.75	0.29	0.00	0.29
11.00	0.38	0.00	0.38
11.25	0.53	0.00	0.53
11.50	0.77	0.00	0.77
11.75	1.15	0.00	1.15
12.00	1.98	0.00	1.98
12.25	4.22	0.00	4.22
12.50	4.78	0.00	4.78
12.75	**6.29**	0.00	**6.29**
13.00	5.07	0.00	5.07
13.25	3.81	0.00	3.81
13.50	3.55	0.00	3.55
13.75	3.33	0.00	3.33
14.00	3.10	0.00	3.10
14.25	2.85	0.00	2.85
14.50	2.58	0.00	2.58
14.75	2.28	0.00	2.28
15.00	1.92	0.00	1.92
15.25	1.50	0.00	1.50
15.50	1.12	0.00	1.12
15.75	0.89	0.00	0.89
16.00	0.71	0.00	0.71
16.25	0.60	0.00	0.60
16.50	0.54	0.00	0.54
16.75	0.50	0.00	0.50
17.00	0.47	0.00	0.47
17.25	0.44	0.00	0.44
17.50	0.42	0.00	0.42
17.75	0.40	0.00	0.40
18.00	0.38	0.00	0.38
18.25	0.36	0.00	0.36
18.50	0.34	0.00	0.34
18.75	0.32	0.00	0.32
19.00	0.31	0.00	0.31
19.25	0.30	0.00	0.30
19.50	0.30	0.00	0.30
19.75	0.29	0.00	0.29
20.00	0.28	0.00	0.28
20.25	0.28	0.00	0.28
20.50	0.27	0.00	0.27
20.75	0.27	0.00	0.27
21.00	0.26	0.00	0.26
21.25	0.26	0.00	0.26
21.50	0.25	0.00	0.25
21.75	0.25	0.00	0.25
22.00	0.24	0.00	0.24
22.25	0.24	0.00	0.24
22.50	0.23	0.00	0.23
22.75	0.23	0.00	0.23
23.00	0.22	0.00	0.22
23.25	0.21	0.00	0.21
23.50	0.21	0.00	0.21
23.75	0.20	0.00	0.20
24.00	0.20	0.00	0.20

Time span=5.00-24.00 hrs, dt=0.05 hrs, 381 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 2S: DA POST DEV - Runoff Area=5.610 ac 39.44% Impervious Runoff Depth>3.77"
Flow Length=860' Tc=27.1 min CN=87 Runoff=17.52 cfs 1.761 af

Subcatchment 11S: DA Post - DEV Runoff Area=1.100 ac 0.00% Impervious Runoff Depth>3.08"
Flow Length=370' Slope=0.0100 '/' Tc=22.0 min CN=80 Runoff=3.17 cfs 0.283 af

Pond 3P: Pond Peak Elev=583.86' Storage=20,698 cf Inflow=17.52 cfs 1.761 af
Outflow=11.47 cfs 1.748 af

Link 12L: POST DEV Inflow=13.15 cfs 2.030 af
Primary=13.15 cfs 2.030 af

Total Runoff Area = 6.710 ac Runoff Volume = 2.044 af Average Runoff Depth = 3.66"
67.03% Pervious = 4.497 ac 32.97% Impervious = 2.213 ac

Summary for Subcatchment 2S: DA POST DEV - CONTROLLED

[47] Hint: Peak is 777% of capacity of segment #3

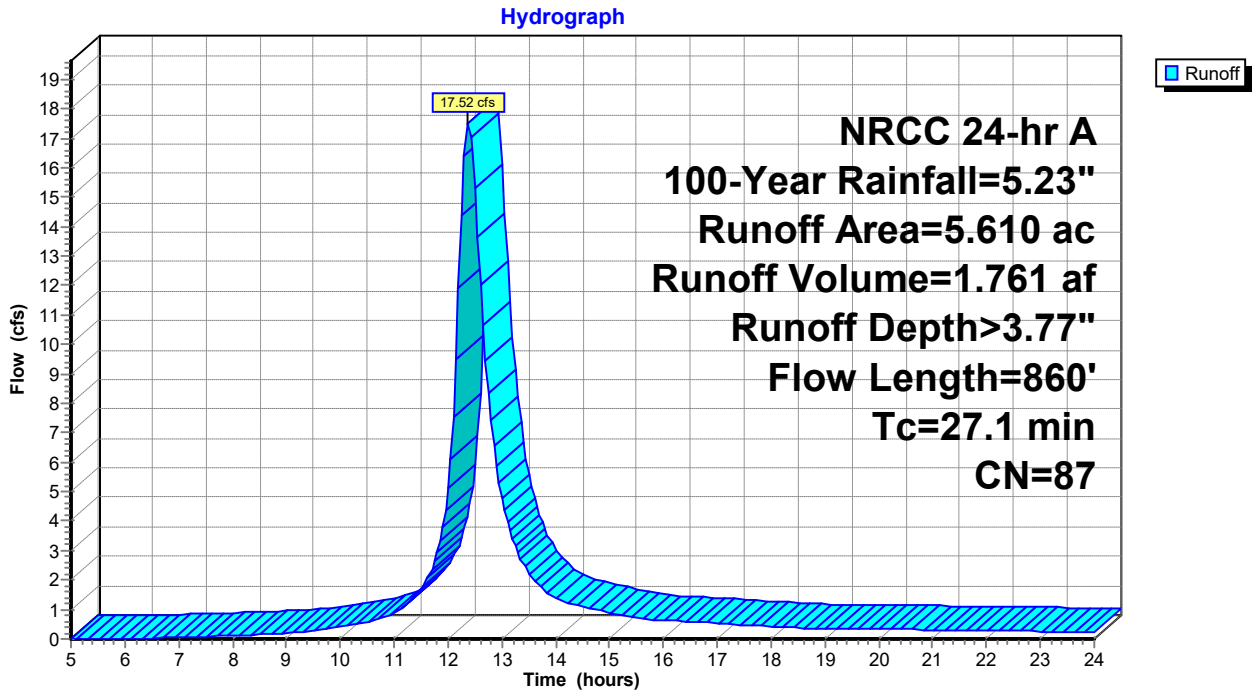
Runoff = 17.52 cfs @ 12.38 hrs, Volume= 1.761 af, Depth> 3.77"
Routed to Pond 3P : Pond

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-24.00 hrs, dt= 0.05 hrs
NRCC 24-hr A 100-Year Rainfall=5.23"

Area (ac)	CN	Description
0.970	98	Paved parking, HSG D
3.270	87	1/4 acre lots, 38% imp, HSG D
1.370	80	>75% Grass cover, Good, HSG D
5.610	87	Weighted Average
3.397		60.56% Pervious Area
2.213		39.44% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
22.7	100	0.0100	0.07		**Sheet Flow, SF** Grass: Dense n= 0.240 P2= 2.20"
0.1	20	0.0200	2.28		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
4.3	740	0.0040	2.87	2.25	**Pipe Channel,** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013 Concrete pipe, straight & clean
27.1	860	Total			

Subcatchment 2S: DA POST DEV - CONTROLLED



Hydrograph for Subcatchment 2S: DA POST DEV - CONTROLLED

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
5.00	0.27	0.00	0.00
5.25	0.28	0.00	0.00
5.50	0.30	0.00	0.00
5.75	0.32	0.00	0.00
6.00	0.33	0.00	0.01
6.25	0.35	0.00	0.01
6.50	0.37	0.00	0.02
6.75	0.39	0.01	0.03
7.00	0.42	0.01	0.05
7.25	0.44	0.01	0.06
7.50	0.46	0.02	0.08
7.75	0.49	0.02	0.10
8.00	0.52	0.03	0.12
8.25	0.55	0.04	0.14
8.50	0.58	0.04	0.16
8.75	0.61	0.05	0.18
9.00	0.64	0.06	0.21
9.25	0.68	0.08	0.24
9.50	0.72	0.09	0.28
9.75	0.76	0.11	0.34
10.00	0.81	0.13	0.41
10.25	0.87	0.16	0.49
10.50	0.93	0.19	0.57
10.75	1.01	0.23	0.68
11.00	1.10	0.28	0.89
11.25	1.24	0.36	1.21
11.50	1.40	0.47	1.72
11.75	1.72	0.69	2.63
12.00	2.46	1.28	5.11
12.25	3.51	2.19	**14.37**
12.50	3.83	2.48	**15.28**
12.75	3.99	2.63	8.35
13.00	4.13	2.75	4.77
13.25	4.22	2.84	3.15
13.50	4.30	2.91	2.25
13.75	4.36	2.97	1.71
14.00	4.42	3.02	1.39
14.25	4.47	3.07	1.22
14.50	4.51	3.11	1.10
14.75	4.55	3.15	0.99
15.00	4.59	3.18	0.89
15.25	4.62	3.21	0.78
15.50	4.65	3.24	0.71
15.75	4.68	3.27	0.66
16.00	4.71	3.30	0.63
16.25	4.74	3.32	0.61
16.50	4.77	3.35	0.58
16.75	4.79	3.37	0.56
17.00	4.81	3.39	0.53
17.25	4.84	3.41	0.50
17.50	4.86	3.43	0.48
17.75	4.88	3.45	0.45
18.00	4.90	3.47	0.42
18.25	4.91	3.49	0.40
18.50	4.93	3.50	0.38
18.75	4.95	3.52	0.37
19.00	4.96	3.53	0.36
19.25	4.98	3.55	0.35
19.50	5.00	3.56	0.35
19.75	5.01	3.58	0.34
20.00	5.03	3.59	0.33
20.25	5.04	3.61	0.33
20.50	5.06	3.62	0.32
20.75	5.07	3.63	0.31
21.00	5.08	3.65	0.31
21.25	5.10	3.66	0.30
21.50	5.11	3.67	0.29
21.75	5.12	3.69	0.29
22.00	5.14	3.70	0.28
22.25	5.15	3.71	0.28
22.50	5.16	3.72	0.27
22.75	5.17	3.73	0.26
23.00	5.19	3.74	0.26
23.25	5.20	3.75	0.25
23.50	5.21	3.76	0.24
23.75	5.22	3.77	0.24
24.00	**5.23**	**3.78**	0.23

Summary for Subcatchment 11S: DA Post - DEV Uncontrolled

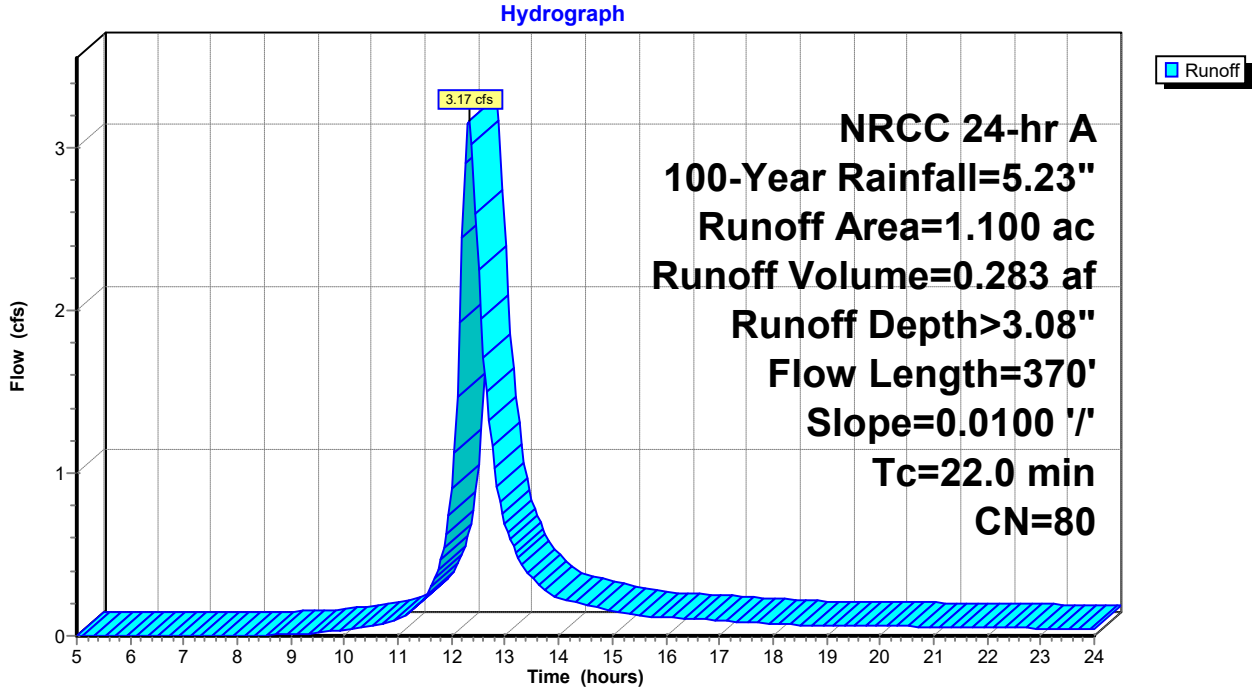
Runoff = 3.17 cfs @ 12.32 hrs, Volume= 0.283 af, Depth> 3.08"
Routed to Link 12L : POST DEV

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-24.00 hrs, dt= 0.05 hrs
NRCC 24-hr A 100-Year Rainfall=5.23"

Area (ac)	CN	Description
1.100	80	>75% Grass cover, Good, HSG D
1.100		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.6	100	0.0100	0.11		**Sheet Flow, SF** Grass: Short n= 0.150 P2= 2.20"
6.4	270	0.0100	0.70		**Shallow Concentrated Flow, SCF** Short Grass Pasture Kv= 7.0 fps
22.0	370	Total			

Subcatchment 11S: DA Post - DEV Uncontrolled



Hydrograph for Subcatchment 11S: DA Post - DEV Uncontrolled

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
5.00	0.27	0.00	0.00
5.25	0.28	0.00	0.00
5.50	0.30	0.00	0.00
5.75	0.32	0.00	0.00
6.00	0.33	0.00	0.00
6.25	0.35	0.00	0.00
6.50	0.37	0.00	0.00
6.75	0.39	0.00	0.00
7.00	0.42	0.00	0.00
7.25	0.44	0.00	0.00
7.50	0.46	0.00	0.00
7.75	0.49	0.00	0.00
8.00	0.52	0.00	0.00
8.25	0.55	0.00	0.00
8.50	0.58	0.00	0.00
8.75	0.61	0.00	0.01
9.00	0.64	0.01	0.01
9.25	0.68	0.01	0.01
9.50	0.72	0.02	0.02
9.75	0.76	0.02	0.03
10.00	0.81	0.03	0.04
10.25	0.87	0.05	0.05
10.50	0.93	0.06	0.06
10.75	1.01	0.09	0.08
11.00	1.10	0.12	0.11
11.25	1.24	0.17	0.16
11.50	1.40	0.24	0.24
11.75	1.72	0.40	0.41
12.00	2.46	0.86	0.90
12.25	3.51	1.64	**2.91**
12.50	3.83	1.90	**2.25**
12.75	3.99	2.04	1.16
13.00	4.13	2.15	0.69
13.25	4.22	2.23	0.48
13.50	4.30	2.29	0.36
13.75	4.36	2.34	0.28
14.00	4.42	2.39	0.23
14.25	4.47	2.43	0.21
14.50	4.51	2.47	0.19
14.75	4.55	2.51	0.17
15.00	4.59	2.54	0.15
15.25	4.62	2.57	0.13
15.50	4.65	2.59	0.12
15.75	4.68	2.62	0.12
16.00	4.71	2.64	0.11
16.25	4.74	2.67	0.11
16.50	4.77	2.69	0.10
16.75	4.79	2.71	0.10
17.00	4.81	2.73	0.09
17.25	4.84	2.75	0.09
17.50	4.86	2.77	0.08
17.75	4.88	2.79	0.08
18.00	4.90	2.80	0.08
18.25	4.91	2.82	0.07
18.50	4.93	2.83	0.07
18.75	4.95	2.85	0.07
19.00	4.96	2.86	0.07
19.25	4.98	2.88	0.06
19.50	5.00	2.89	0.06
19.75	5.01	2.90	0.06
20.00	5.03	2.92	0.06
20.25	5.04	2.93	0.06
20.50	5.06	2.94	0.06
20.75	5.07	2.95	0.06
21.00	5.08	2.97	0.06
21.25	5.10	2.98	0.05
21.50	5.11	2.99	0.05
21.75	5.12	3.00	0.05
22.00	5.14	3.01	0.05
22.25	5.15	3.02	0.05
22.50	5.16	3.04	0.05
22.75	5.17	3.05	0.05
23.00	5.19	3.06	0.05
23.25	5.20	3.07	0.04
23.50	5.21	3.08	0.04
23.75	5.22	3.08	0.04
24.00	**5.23**	**3.09**	0.04

Summary for Pond 3P: Pond

Inflow Area = 5.610 ac, 39.44% Impervious, Inflow Depth > 3.77" for 100-Year event
Inflow = 17.52 cfs @ 12.38 hrs, Volume= 1.761 af
Outflow = 11.47 cfs @ 12.62 hrs, Volume= 1.748 af, Atten= 35%, Lag= 14.8 min
Primary = 11.47 cfs @ 12.62 hrs, Volume= 1.748 af
Routed to Link 12L : POST DEV

Routing by Stor-Ind method, Time Span= 5.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 583.86' @ 12.62 hrs Surf.Area= 10,880 sf Storage= 20,698 cf

Plug-Flow detention time= 40.5 min calculated for 1.748 af (99% of inflow)
Center-of-Mass det. time= 35.7 min (845.6 - 809.9)

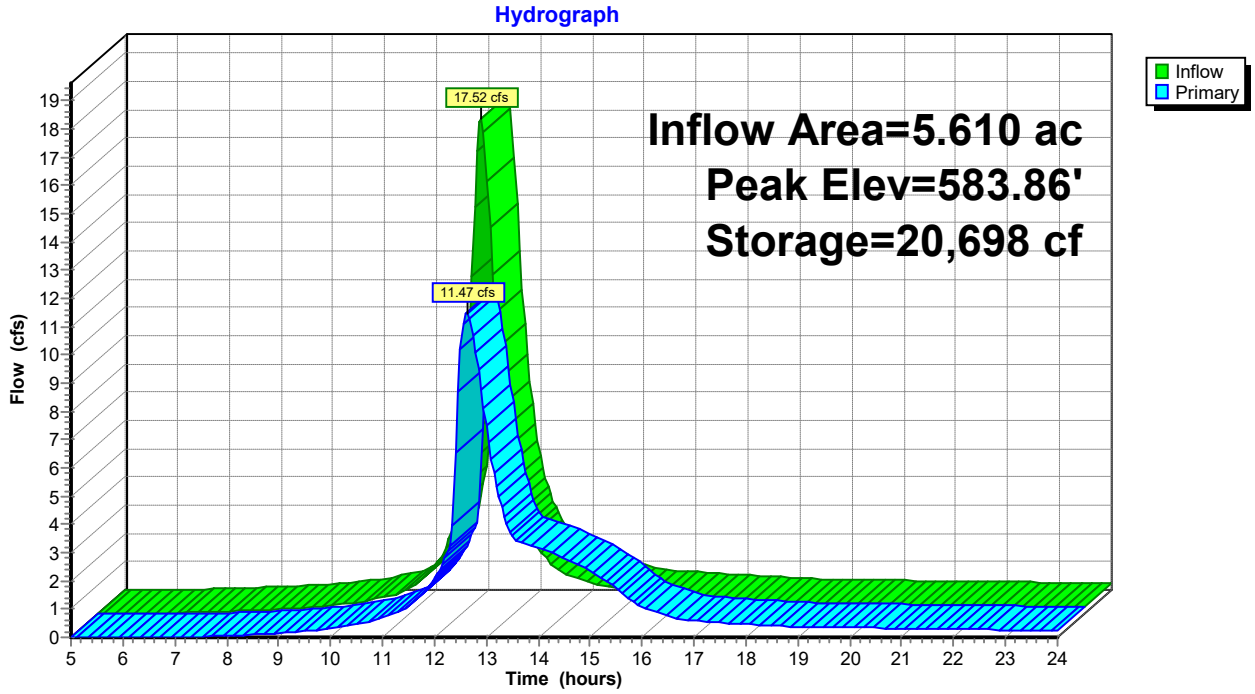
Volume	Invert	Avail.Storage	Storage Description
#1	578.50'	34,837 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
578.50	1,628	0	0
579.00	1,920	887	887
580.00	2,550	2,235	3,122
581.00	3,220	2,885	6,007
582.00	3,960	3,590	9,597
583.00	4,760	4,360	13,957
584.00	11,860	8,310	22,267
585.00	13,280	12,570	34,837

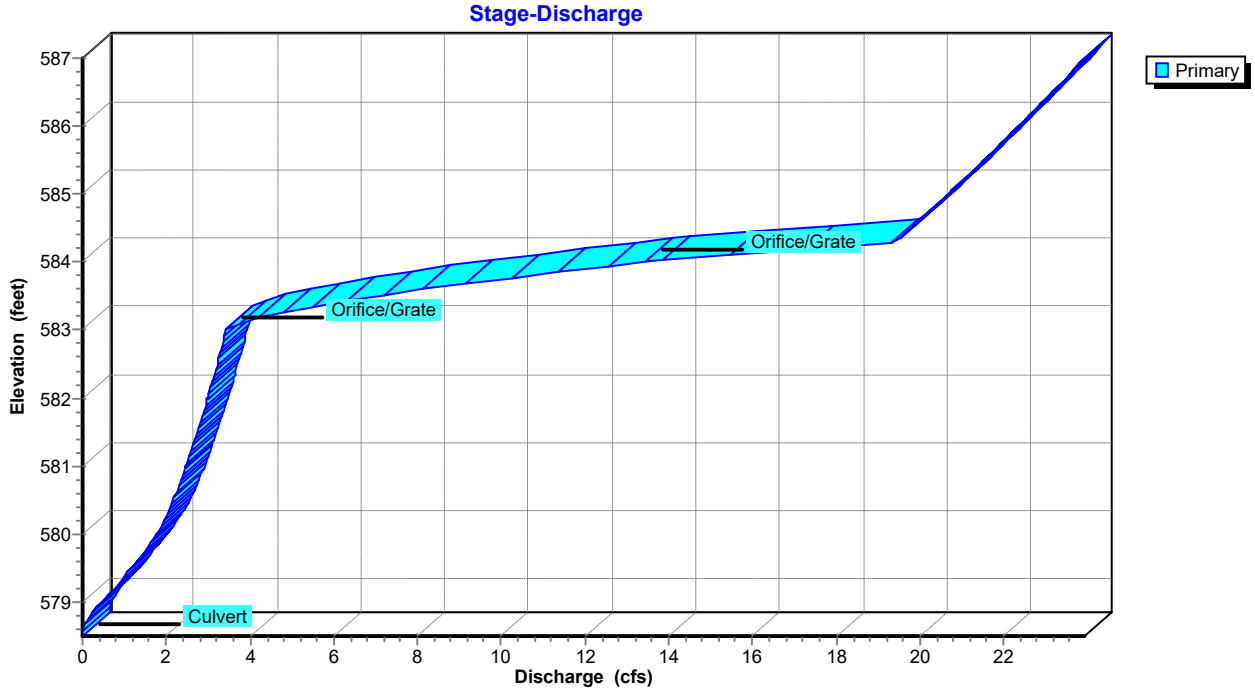
Device	Routing	Invert	Outlet Devices
#1	Device 4	578.51'	**8.0" Round Culvert** L= 16.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 578.51' / 578.45' S= 0.0037 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.35 sf
#2	Device 4	583.00'	**36.0" W x 36.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 4	584.00'	**36.0" W x 36.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Primary	578.34'	**18.0" Round Culvert** L= 34.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 578.34' / 578.21' S= 0.0038 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 1.77 sf

Primary OutFlow Max=11.42 cfs @ 12.62 hrs HW=583.86' (Free Discharge)
└**4=Culvert** (Passes 11.42 cfs of 18.58 cfs potential flow)
  ├**1=Culvert** (Inlet Controls 3.76 cfs @ 10.78 fps)
  ├**2=Orifice/Grate** (Orifice Controls 7.66 cfs @ 2.97 fps)
  └**3=Orifice/Grate** (Controls 0.00 cfs)

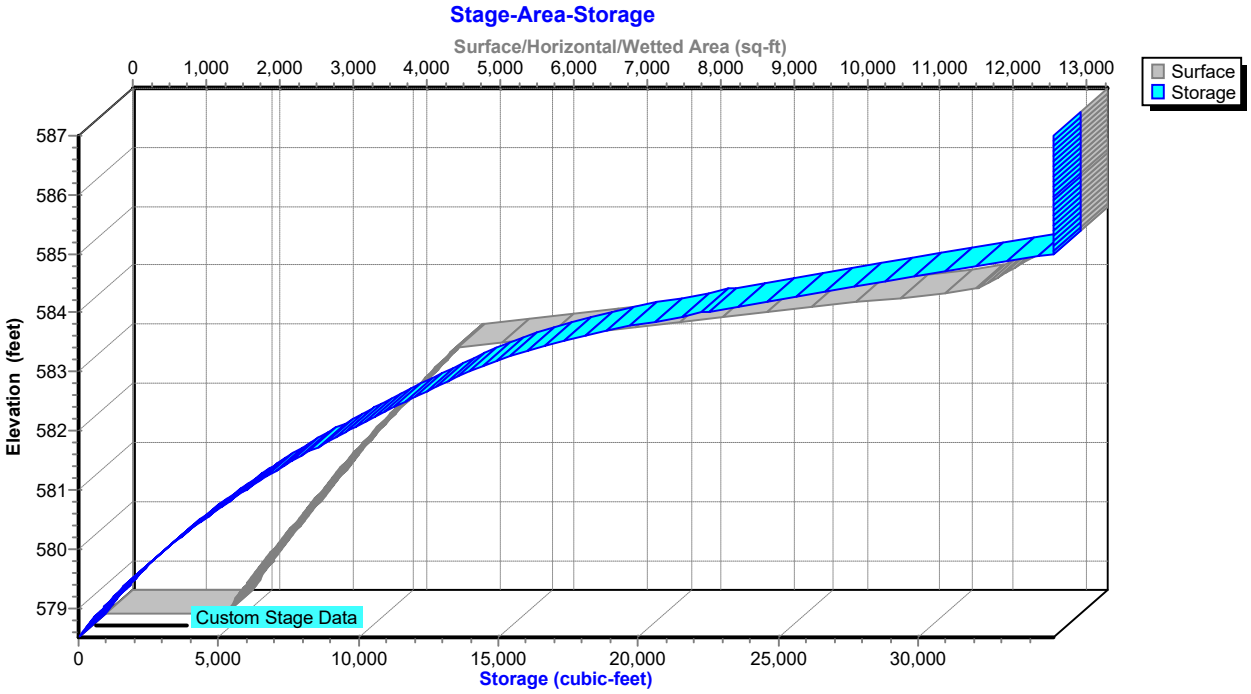
Pond 3P: Pond



Pond 3P: Pond



Pond 3P: Pond


Stage-Area-Storage
Surface/Horizontal/Wetted Area (sq-ft)
0
1,000
2,000
3,000
4,000
5,000
6,000
7,000
8,000
9,000
10,000
11,000
12,000
13,000
Surface
Storage
587
586
585
584
583
582
581
580
579
Elevation (feet)
Custom Stage Data
0
5,000
10,000
15,000
20,000
25,000
30,000
Storage (cubic-feet)

Hydrograph for Pond 3P: Pond

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
5.00	0.00	0	578.50	0.00
5.50	0.00	0	578.50	0.00
6.00	0.01	2	578.50	0.00
6.50	0.02	26	578.52	0.00
7.00	0.05	82	578.55	0.01
7.50	0.08	174	578.60	0.02
8.00	0.12	279	578.67	0.05
8.50	0.16	382	578.73	0.10
9.00	0.21	477	578.78	0.16
9.50	0.28	572	578.83	0.22
10.00	0.41	712	578.91	0.32
10.50	0.57	893	579.00	0.46
11.00	0.89	1,150	579.13	0.67
11.50	1.72	1,824	579.45	1.09
12.00	**5.11**	4,233	580.41	2.11
12.50	**15.28**	**19,692**	**583.77**	**10.19**
13.00	4.77	**17,576**	**583.54**	**7.48**
13.50	2.25	14,196	583.05	3.58
14.00	1.39	11,345	582.42	3.18
14.50	1.10	8,154	581.62	2.80
15.00	0.89	5,300	580.78	2.34
15.50	0.71	3,022	579.96	1.72
16.00	0.63	1,762	579.43	1.05
16.50	0.58	1,244	579.18	0.75
17.00	0.53	1,052	579.08	0.60
17.50	0.48	960	579.04	0.52
18.00	0.42	890	579.00	0.46
18.50	0.38	826	578.97	0.41
19.00	0.36	786	578.95	0.38
19.50	0.35	763	578.93	0.36
20.00	0.33	745	578.92	0.34
20.50	0.32	727	578.92	0.33
21.00	0.31	710	578.91	0.32
21.50	0.29	692	578.90	0.30
22.00	0.28	674	578.89	0.29
22.50	0.27	656	578.88	0.28
23.00	0.26	638	578.87	0.27
23.50	0.24	620	578.86	0.25
24.00	0.23	602	578.85	0.24

Stage-Discharge for Pond 3P: Pond

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
578.50	0.00	581.35	2.66	584.20	17.41
578.55	0.00	581.40	2.69	584.25	18.57
578.60	0.02	581.45	2.71	584.30	19.42
578.65	0.04	581.50	2.74	584.35	19.51
578.70	0.08	581.55	2.77	584.40	19.61
578.75	0.12	581.60	2.79	584.45	19.70
578.80	0.18	581.65	2.82	584.50	19.79
578.85	0.24	581.70	2.84	584.55	19.88
578.90	0.31	581.75	2.87	584.60	19.97
578.95	0.38	581.80	2.89	584.65	20.06
579.00	0.46	581.85	2.91	584.70	20.15
579.05	0.54	581.90	2.94	584.75	20.24
579.10	0.62	581.95	2.96	584.80	20.33
579.15	0.70	582.00	2.99	584.85	20.42
579.20	0.78	582.05	3.01	584.90	20.51
579.25	0.86	582.10	3.03	584.95	20.60
579.30	0.93	582.15	3.06	585.00	20.69
579.35	0.98	582.20	3.08	585.05	20.77
579.40	1.00	582.25	3.10	585.10	20.86
579.45	1.08	582.30	3.12	585.15	20.95
579.50	1.16	582.35	3.15	585.20	21.03
579.55	1.23	582.40	3.17	585.25	21.12
579.60	1.30	582.45	3.19	585.30	21.20
579.65	1.37	582.50	3.21	585.35	21.29
579.70	1.43	582.55	3.24	585.40	21.37
579.75	1.49	582.60	3.26	585.45	21.46
579.80	1.55	582.65	3.28	585.50	21.54
579.85	1.60	582.70	3.30	585.55	21.63
579.90	1.66	582.75	3.32	585.60	21.71
579.95	1.71	582.80	3.34	585.65	21.79
580.00	1.76	582.85	3.36	585.70	21.88
580.05	1.81	582.90	3.39	585.75	21.96
580.10	1.86	582.95	3.41	585.80	22.04
580.15	1.90	583.00	3.43	585.85	22.12
580.20	1.95	583.05	3.55	585.90	22.20
580.25	1.99	583.10	3.77	585.95	22.29
580.30	2.03	583.15	4.05	586.00	22.37
580.35	2.06	583.20	4.37	586.05	22.45
580.40	2.10	583.25	4.73	586.10	22.53
580.45	2.13	583.30	5.13	586.15	22.61
580.50	2.16	583.35	5.56	586.20	22.69
580.55	2.20	583.40	6.02	586.25	22.77
580.60	2.23	583.45	6.51	586.30	22.85
580.65	2.26	583.50	7.03	586.35	22.93
580.70	2.29	583.55	7.57	586.40	23.01
580.75	2.32	583.60	8.14	586.45	23.08
580.80	2.35	583.65	8.73	586.50	23.16
580.85	2.38	583.70	9.34	586.55	23.24
580.90	2.41	583.75	9.98	586.60	23.32
580.95	2.44	583.80	10.63	586.65	23.40
581.00	2.47	583.85	11.31	586.70	23.47
581.05	2.50	583.90	12.00	586.75	23.55
581.10	2.52	583.95	12.71	586.80	23.63
581.15	2.55	584.00	13.45	586.85	23.70
581.20	2.58	584.05	14.30	586.90	23.78
581.25	2.61	584.10	15.27	586.95	23.85
581.30	2.63	584.15	16.31	587.00	**23.93**

Stage-Area-Storage for Pond 3P: Pond

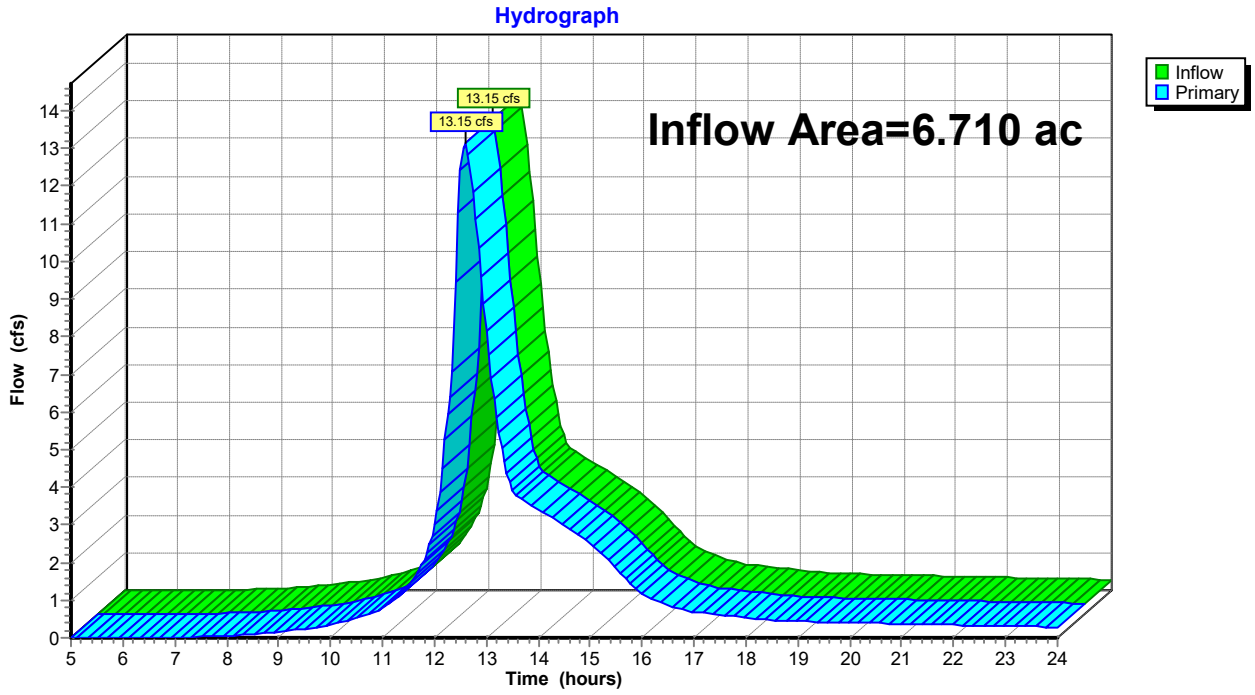
Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
578.50	1,628	0
578.60	1,686	166
578.70	1,745	337
578.80	1,803	515
578.90	1,862	698
579.00	1,920	887
579.10	1,983	1,082
579.20	2,046	1,284
579.30	2,109	1,491
579.40	2,172	1,705
579.50	2,235	1,926
579.60	2,298	2,152
579.70	2,361	2,385
579.80	2,424	2,625
579.90	2,487	2,870
580.00	2,550	3,122
580.10	2,617	3,380
580.20	2,684	3,645
580.30	2,751	3,917
580.40	2,818	4,196
580.50	2,885	4,481
580.60	2,952	4,773
580.70	3,019	5,071
580.80	3,086	5,376
580.90	3,153	5,688
581.00	3,220	6,007
581.10	3,294	6,333
581.20	3,368	6,666
581.30	3,442	7,006
581.40	3,516	7,354
581.50	3,590	7,710
581.60	3,664	8,072
581.70	3,738	8,442
581.80	3,812	8,820
581.90	3,886	9,205
582.00	3,960	9,597
582.10	4,040	9,997
582.20	4,120	10,405
582.30	4,200	10,821
582.40	4,280	11,245
582.50	4,360	11,677
582.60	4,440	12,117
582.70	4,520	12,565
582.80	4,600	13,021
582.90	4,680	13,485
583.00	4,760	13,957
583.10	5,470	14,469
583.20	6,180	15,051
583.30	6,890	15,704
583.40	7,600	16,429
583.50	8,310	17,225
583.60	9,020	18,091
583.70	9,730	19,029
583.80	10,440	20,037
583.90	11,150	21,116
584.00	11,860	22,267
584.10	12,002	23,460
584.20	12,144	24,667
584.30	12,286	25,889
584.40	12,428	27,125
584.50	12,570	28,375
584.60	12,712	29,639
584.70	12,854	30,917
584.80	12,996	32,209
584.90	13,138	33,516
585.00	**13,280**	**34,837**
585.10	13,280	34,837
585.20	13,280	34,837
585.30	13,280	34,837
585.40	13,280	34,837
585.50	13,280	34,837
585.60	13,280	34,837
585.70	13,280	34,837
585.80	13,280	34,837
585.90	13,280	34,837
586.00	13,280	34,837
586.10	13,280	34,837
586.20	13,280	34,837
586.30	13,280	34,837
586.40	13,280	34,837
586.50	13,280	34,837
586.60	13,280	34,837
586.70	13,280	34,837
586.80	13,280	34,837
586.90	13,280	34,837
587.00	13,280	34,837

Summary for Link 12L: POST DEV

Inflow Area = 6.710 ac, 32.97% Impervious, Inflow Depth > 3.63" for 100-Year event
Inflow = 13.15 cfs @ 12.59 hrs, Volume= 2.030 af
Primary = 13.15 cfs @ 12.59 hrs, Volume= 2.030 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-24.00 hrs, dt= 0.05 hrs

Link 12L: POST DEV



Hydrograph for Link 12L: POST DEV

Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
5.00	0.00	**0.00**	0.00
5.25	0.00	0.00	0.00
5.50	0.00	0.00	0.00
5.75	0.00	0.00	0.00
6.00	0.00	0.00	0.00
6.25	0.00	0.00	0.00
6.50	0.00	0.00	0.00
6.75	0.00	0.00	0.00
7.00	0.01	0.00	0.01
7.25	0.01	0.00	0.01
7.50	0.02	0.00	0.02
7.75	0.04	0.00	0.04
8.00	0.05	0.00	0.05
8.25	0.08	0.00	0.08
8.50	0.11	0.00	0.11
8.75	0.13	0.00	0.13
9.00	0.17	0.00	0.17
9.25	0.20	0.00	0.20
9.50	0.24	0.00	0.24
9.75	0.29	0.00	0.29
10.00	0.36	0.00	0.36
10.25	0.43	0.00	0.43
10.50	0.52	0.00	0.52
10.75	0.63	0.00	0.63
11.00	0.78	0.00	0.78
11.25	1.02	0.00	1.02
11.50	1.32	0.00	1.32
11.75	1.92	0.00	1.92
12.00	3.01	0.00	3.01
12.25	5.94	0.00	5.94
12.50	**12.44**	0.00	**12.44**
12.75	**11.83**	0.00	**11.83**
13.00	8.17	0.00	8.17
13.25	5.43	0.00	5.43
13.50	3.93	0.00	3.93
13.75	3.61	0.00	3.61
14.00	3.41	0.00	3.41
14.25	3.21	0.00	3.21
14.50	2.99	0.00	2.99
14.75	2.75	0.00	2.75
15.00	2.49	0.00	2.49
15.25	2.20	0.00	2.20
15.50	1.84	0.00	1.84
15.75	1.48	0.00	1.48
16.00	1.16	0.00	1.16
16.25	1.00	0.00	1.00
16.50	0.85	0.00	0.85
16.75	0.75	0.00	0.75
17.00	0.69	0.00	0.69
17.25	0.64	0.00	0.64
17.50	0.60	0.00	0.60
17.75	0.57	0.00	0.57
18.00	0.54	0.00	0.54
18.25	0.50	0.00	0.50
18.50	0.48	0.00	0.48
18.75	0.46	0.00	0.46
19.00	0.44	0.00	0.44
19.25	0.43	0.00	0.43
19.50	0.42	0.00	0.42
19.75	0.41	0.00	0.41
20.00	0.40	0.00	0.40
20.25	0.40	0.00	0.40
20.50	0.39	0.00	0.39
20.75	0.38	0.00	0.38
21.00	0.37	0.00	0.37
21.25	0.37	0.00	0.37
21.50	0.36	0.00	0.36
21.75	0.35	0.00	0.35
22.00	0.34	0.00	0.34
22.25	0.33	0.00	0.33
22.50	0.33	0.00	0.33
22.75	0.32	0.00	0.32
23.00	0.31	0.00	0.31
23.25	0.30	0.00	0.30
23.50	0.30	0.00	0.30
23.75	0.29	0.00	0.29
24.00	0.28	0.00	0.28

TABLE OF CONTENTS

Green Infrastructure & Water Quality Calculations

Step 2 - Calculate Water Quality Volume

Is this project subject to Section 4.3 of the NYS Design Manual for Enhanced Phosphorus Removal?	No
What is the nature of this construction project?	New Construction

Design Point:	1		
P=	0.90	inches	*Enter 90% Rainfall Event as P*

Calculate Required WQv

Drainage Area Number	Contributing Area (Acres)	Impervious Area (Acres)	Percent Impervious %	Rv	WQv (cf)	SMP Description
1	3.49	2.21	63	0.62	7,068	
2	3.22	0.00	0	0.05	0	
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						
20						
21						
22						
23						
24						
25						
26						
27						
28						
29						
30						
Total	6.71	2.21	33	0.35	**7594**	**Required WQv**

Steps 3 and 5 - Apply RR Techniques and Standard SMPs

Runoff Reduction Volume and Treated Volumes						
	Runoff Reduction Techiques/Standard SMPs		**Total Contributing Area**	**Total Contributing Impervious Area**	**WQv Reduced (RRv)**	**WQv Treated**
			(acres)	**(acres)**	**(cf)**	**(cf)**
RR Techniques	Conservation of Natural Areas	RR-1	0.00		0	
	Sheet Flow to Riparian Buffer/Filter Strip	RR-2	0.00	0.00	0	
	Tree Planting/Tree Pit/Tree Trench	RR-3	0.00	0.00	0	
	Disconnection of Rooftop Runoff	RR-4		0.00	0	
	Vegetated Swale	RR-5	0.00	0.00	0	
	Rain Garden	RR-6	0.00	0.00	0	
	Stormwater Planter	RR-7	0.00	0.00	0	
	Rainwater Harvesting Systems	RR-8	0.00	0.00	0	
	Porous Pavement	RR-9	0.00	0.00	0	
	Green Roof (Extensive & Intensive)	RR-10	0.00	0.00	0	
	Stream Daylighting	RR-11				
Standard SMPs w/ RRv Capacity	Infiltration Trench	I-1	0.00	0.00	0	0
	Infiltration Basin	I-2	0.00	0.00	0	0
	Dry Well	I-3	0.00	0.00	0	0
	Underground Infiltration System	I-4	0.00	0.00	0	0
	Infiltration Bioretention	F-4	0.00	0.00	0	0
	Filtration Bioretention	F-5	6.71	2.21	4,765	2,303
	Bioslope	F-6	0.00	0.00	0	0
	Dry swale	O-1	0.00	0.00	0	0
Standard SMPs	Micropool Extended Detention	P-1	3.22	0.00		0
	Wet Pond	P-2	0.00	0.00		0
	Wet Extended Detention	P-3	0.00	0.00		0
	Multiple Pond System	P-4	0.00	0.00		0
	Shallow Wetland	W-1	0.00	0.00		0
	Extended Detention Shallow Wetland	W-2	0.00	0.00		0
	Pond/Wetland System	W-3	0.00	0.00		0
	Pocket Wetland	W-4	0.00	0.00		0
	Gravel Wetland	W-5	0.00	0.00		0
	Surface Sand Filter	F-1	0.00	0.00		0
	Underground Sand Filter	F-2	0.00	0.00		0
	Perimeter Sand Filter	F-3	0.00	0.00		0
	Wet Swale	O-2	0.00	0.00		0
Alt. SMPs	Flow Based Alternative Practice	-	0.00	0.00		0
	Volume Based Alternative Practice	-				
Totals by RR Technique →			0.00	0.00	0	
Totals by Standard SMP w/RRV →			6.71	2.21	4,765	2,303
Totals by Standard SMP →			3.22	0.00		0
Totals by Alternative SMP →			0.00	0.00		0
Totals (RR Techniques + all SMPs) →			9.93	2.21	4,765	2,303

Step 4 - Calcuate Minimum RRv Required

Enter the Soils Data for the site		
Hydrologic Soil Group	Acres	S
A		55%
B		40%
C		30%
D	6.71	20%
Total Area	6.71	

Calculate the Minimum RRv		
S =	**0.20**	
Impervious =	6.71	*acres*
Precipitation	0.90	*inches*
Rv	0.95	
Minimum RRv	**0.096**	***af***
	4182	cf

Filtration Bioretention (F-5)

Design Point:	1

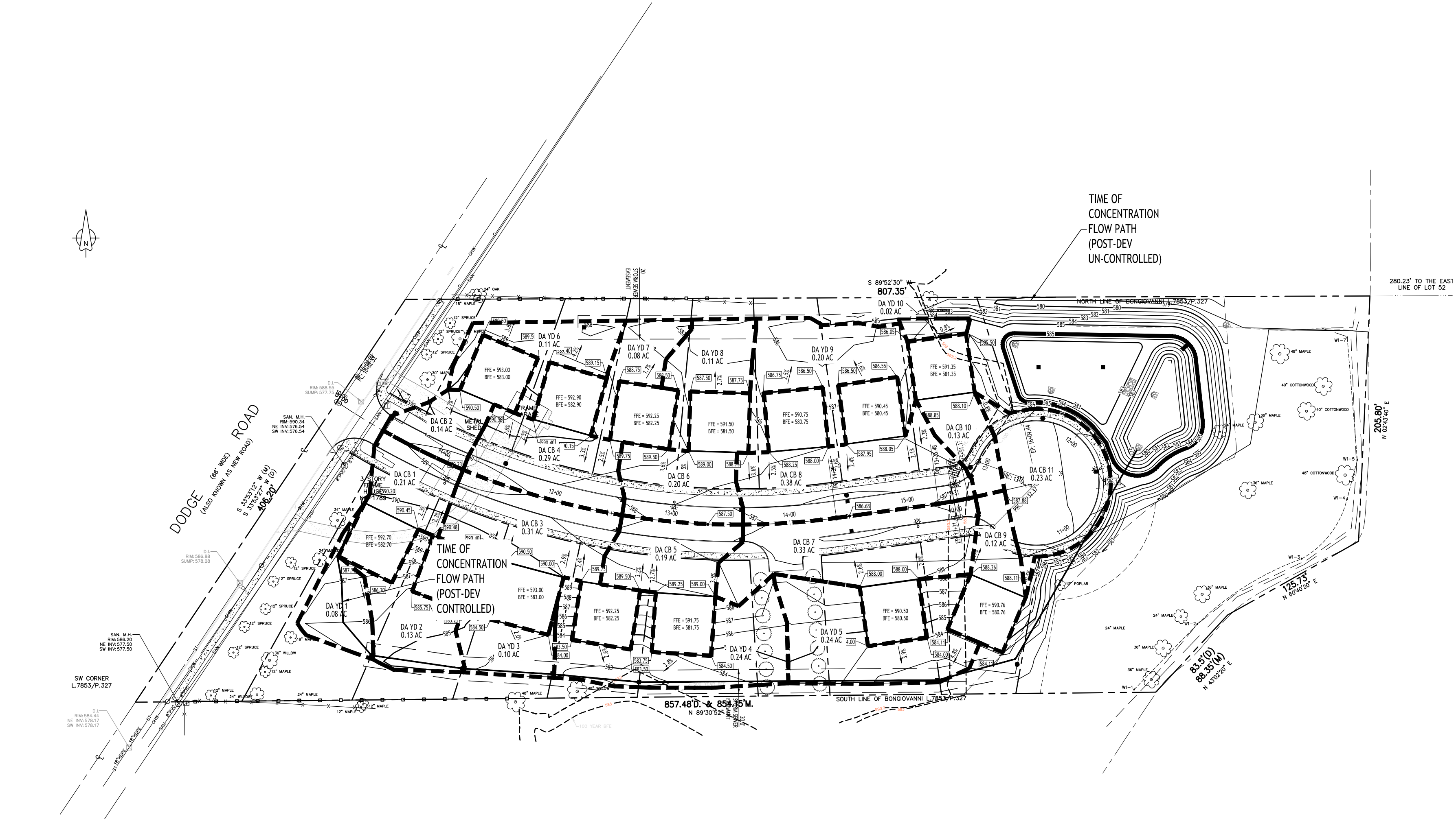
Enter Site Data For Drainage Area to be Treated by Practice							
Drainage Area Number	**Contributing Area** (Acres)	**Impervious Area** (Acres)	**Percent Impervious** %	**Rv**	**WQv** (cf)	**Precipitation** (in)	**Description**
1	3.49	2.21	63	0.62	7,068	0.90	0

Design Criteria		
Enter underlying soil infiltration rate (based on geotechnical testing, refer to Appendix D)	0	Underdrains required
Is the contributing area to the practice a stormwater hotspot?	No	
Is the practice the first in series for treatment of a Level 1 (Infiltration Restricted) hotspot?	No	
Is contributing area greater than max. contributing area?	No	
Enter depth to seasonal high water table (ft)	2	
Enter depth to bedrock (ft)	NA	
Is pretreatment provided, in conformance with Section 6.4.3.1	Yes	
Enter average height of ponding (ft)	0.5	
Enter depth of surface layer (inches)	3	
Enter depth of filter media (ft)	2.5	
Enter depth of drainage layer (inches)	12	
Enter slope of maintenance access (%)	5	
Enter width of maintenance access (ft)	12	

Sizing Criteria				
		Value	Units	Notes
Permeability Flow Rate	k	1	ft/day	
Filter Time	tf	2	days	
Required Filter Area	Af	2945	sf	
Enter Provided Filter Area	Af	4964	sf	
Recalculated Water Quality Volume (based on provided filter area)	WQv calc	11913.6	cf	

Calculate Runoff Reduction			
RRv Provided	**4,765**	***cf***	
WQv Treated	2303	cf	This is the portion of the WQv that is not reduced in the practice.

Storm Sewer Calculations



POST DEVELOPMENT DRAINAGE MAP

SCALE: 1"=40'

TOWN OF AMHERST APPROVAL BOX:

NOTE: BOUNDARY AND TOPOGRAPHIC INFORMATION PROVIDED BY OTHERS, CARMINA WOOD DESIGN ASSUMES NO RESPONSIBILITY FOR ITS ACCURACY.

40 0 40 80Ft.

CARMINA WOOD DESIGN

Buffalo | Utica | Greensboro

Single Family Subdivision

1789 Dodge Road
Amherst, New York

REVISIONS:

No.	Description	Date
1	Rev. Per Town Comments	9/19/2024
2	Rev. Per Town Comments	10/24/2024
3	Rev. Per Town Comments	11/11/2024

PRELIMINARY
NOT FOR CONSTRUCTION

DRAWING NAME:

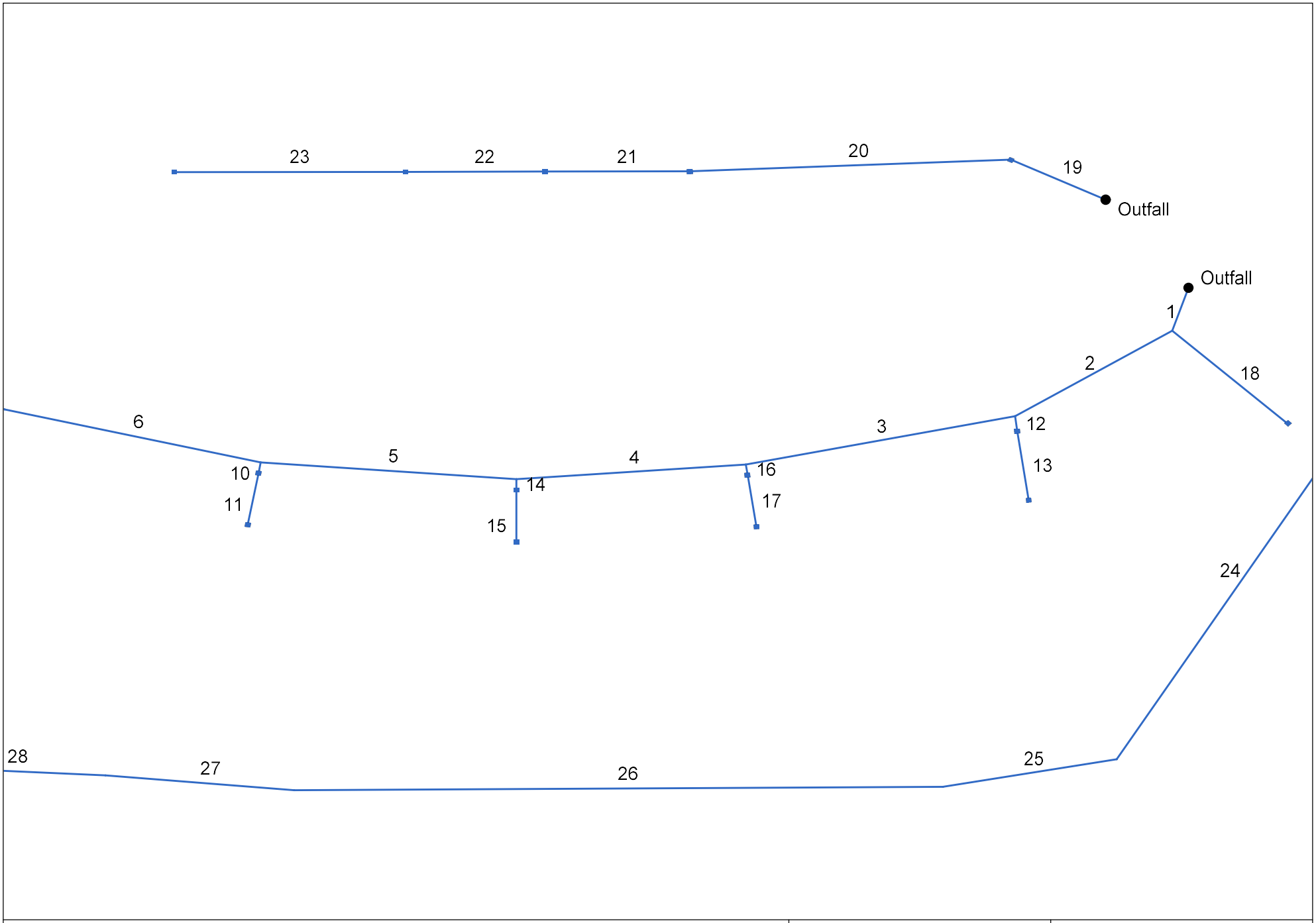
Storm Drainage Area Map

Date:	01/29/24
Drawn By:	C. Wood
Scale:	As Noted

DRAWING NO.

Project No: 20.247

Hydraflow Storm Sewers Extension for Autodesk® Civil 3D® Plan



Project File: HydraFlow.stm	Number of lines: 29	Date: 2/11/2025

Storm Sewer Inventory Report

Line No.	Alignment				Flow Data				Physical Data								Line ID
	Dnstr Line No.	Line Length (ft)	Defl angle (deg)	Junc Type	Known Q (cfs)	Drng Area (ac)	Runoff Coeff (C)	Inlet Time (min)	Invert El Dn (ft)	Line Slope (%)	Invert El Up (ft)	Line Size (in)	Line Shape	N Value (n)	J-Loss Coeff (K)	Inlet/ Rim El (ft)	
29	28	77.093	5.132	Genr	0.00	0.08	0.35	5.0	581.18	0.40	581.49	12	Cir	0.012	1.00	585.26	YD 1 - YD 2
28	27	75.349	-2.440	Genr	0.00	0.13	0.35	5.0	580.88	0.40	581.18	12	Cir	0.012	0.50	584.06	YD 2 - YD 3
27	26	72.927	5.999	Genr	0.00	0.10	0.35	5.0	580.59	0.40	580.88	12	Cir	0.012	0.50	583.32	YD 3 - YD 4
26	25	249.680	10.862	Genr	0.00	0.24	0.35	8.0	579.59	0.40	580.59	12	Cir	0.012	0.50	582.62	YD 4 - YD 5
25	24	68.135	49.571	Genr	0.00	0.24	0.35	8.0	579.32	0.40	579.59	12	Cir	0.012	0.50	582.14	YD 5 - STM MH 8
24	End	205.342	119.188	Genr	0.00	0.00	0.00	0.0	578.60	0.35	579.32	12	Cir	0.012	1.20	583.01	MH 8 - ES
23	22	88.884	0.002	Genr	0.00	0.11	0.35	5.0	583.46	1.27	584.59	12	Cir	0.012	1.00	587.92	YD 10 - YD 9
22	21	53.658	0.000	Genr	0.00	0.08	0.35	5.0	583.25	0.39	583.46	12	Cir	0.012	0.50	586.71	YD 9 - YD 8
21	20	55.745	2.507	Genr	0.00	0.11	0.35	5.0	583.03	0.39	583.25	12	Cir	0.012	0.50	586.17	YD 8 - YD 7
20	19	123.646	-30.328	Genr	0.00	0.20	0.35	5.0	582.64	0.32	583.03	12	Cir	0.012	0.50	585.06	YD 7 - YD 6
19	End	41.197	-152.273	Genr	0.00	0.02	0.35	5.0	582.50	0.34	582.64	12	Cir	0.012	0.84	585.50	YD 6 - ES
18	1	63.113	-61.600	Genr	0.00	0.23	0.35	10.0	582.89	0.40	583.14	12	Cir	0.012	1.00	586.14	CB 11 - MH 7
17	16	25.000	0.693	Genr	0.00	0.30	0.30	14.0	583.35	0.32	583.43	12	Cir	0.012	1.00	586.43	CB 7 - CB 8
16	3	5.225	-85.817	Genr	0.00	0.30	0.30	14.0	583.33	0.38	583.35	12	Cir	0.012	0.50	586.43	CB 8 - MH 5
15	14	24.988	0.800	Genr	0.00	0.19	0.35	8.0	583.86	0.52	583.99	12	Cir	0.012	1.00	586.96	CB 5 - CB 6
14	4	5.265	-86.259	Genr	0.00	0.20	0.35	8.0	583.84	0.38	583.86	12	Cir	0.012	0.50	586.96	CB 6 - MH 4
13	12	33.529	0.000	Genr	0.00	0.12	0.45	5.0	584.25	0.39	584.38	12	Cir	0.012	1.00	587.38	CB 9 - CB 10
12	2	7.220	-63.196	Genr	0.00	0.13	0.35	5.0	584.22	0.42	584.25	12	Cir	0.012	0.50	587.41	CB 10 - MH 6
11	10	24.968	0.039	Genr	0.00	0.31	0.45	5.0	584.88	0.40	584.98	12	Cir	0.012	1.00	587.98	CB 3 - CB 4
10	5	5.280	-85.144	Genr	0.00	0.29	0.45	0.0	584.86	0.38	584.88	12	Cir	0.012	0.50	587.98	CB 4 - MH 3
9	8	24.937	0.235	Genr	0.00	0.21	0.45	5.0	585.45	0.40	585.55	12	Cir	0.012	1.00	588.55	CB 1 - CB 2
8	7	5.265	-85.303	Genr	0.00	0.14	0.35	5.0	585.43	0.38	585.45	12	Cir	0.012	0.50	588.51	CB 2 - MH 1
7	6	101.916	10.042	Genr	0.00	0.00	0.00	0.0	584.51	0.40	584.92	12	Cir	0.012	1.50	589.08	MH 1 - MH 2

Project File: HydraFlow.stm

Number of lines: 29

Date: 2/11/2025

Storm Sewer Inventory Report

Line No.	Alignment				Flow Data				Physical Data								Line ID
	Dnstr Line No.	Line Length (ft)	Defl angle (deg)	Junc Type	Known Q (cfs)	Drng Area (ac)	Runoff Coeff (C)	Inlet Time (min)	Invert El Dn (ft)	Line Slope (%)	Invert El Up (ft)	Line Size (in)	Line Shape	N Value (n)	J-Loss Coeff (K)	Inlet/ Rim El (ft)	
6	5	101.918	9.883	Genr	0.00	0.00	0.00	0.0	584.10	0.40	584.51	12	Cir	0.012	0.50	589.45	MH 2 - MH 3
5	4	98.692	9.151	Genr	0.00	0.00	0.00	0.0	583.71	0.40	584.10	18	Cir	0.012	1.50	588.52	MH 3 - MH 4
4	3	88.483	8.095	Genr	0.00	0.00	0.00	0.0	583.33	0.43	583.71	18	Cir	0.012	1.50	587.50	MH 4 - MH 5
3	2	106.221	21.577	Genr	0.00	0.00	0.00	0.0	582.91	0.40	583.33	18	Cir	0.012	1.50	586.96	MH 5 - MH 6
2	1	73.200	39.076	Genr	0.00	0.00	0.00	0.0	582.62	0.40	582.91	18	Cir	0.012	1.37	587.99	MH 6 - MH 7
1	End	21.560	106.728	Genr	0.00	0.00	0.00	0.0	582.50	0.56	582.62	18	Cir	0.012	1.35	587.75	MH 7 - ES

Storm Sewer Inlet Time Tabulation

Line No.	Line ID	Tc Method	Sheet Flow					Shallow Concentrated Flow					Channel Flow							Total Travel Time (min)
			n-Value	flow Length (ft)	2-yr 24h P (in)	Land Slope (%)	Travel Time (min)	flow Length (ft)	Water Slope (%)	Surf Descr	Ave Vel (ft/s)	Travel Time (min)	X-sec Area (sqft)	Wetted Perim (ft)	Chan Slope (%)	n-Value	Vel	flow Length (ft)	Travel Time (min)	
29	YD 1 - YD 2	User																		5.00
28	YD 2 - YD 3	User																		5.00
27	YD 3 - YD 4	User																		5.00
26	YD 4 - YD 5	User																		8.00
25	YD 5 - STM MH 8	User																		8.00
24	MH 8 - ES	User																		0.00
23	YD 10 - YD 9	User																		5.00
22	YD 9 - YD 8	User																		5.00
21	YD 8 - YD 7	User																		5.00
20	YD 7 - YD 6	User																		5.00
19	YD 6 - ES	User																		5.00
18	CB 11 - MH 7	User																		10.00
17	CB 7 - CB 8	User																		14.00
16	CB 8 - MH 5	User																		14.00
15	CB 5 - CB 6	User																		8.00
14	CB 6 - MH 4	User																		8.00
13	CB 9 - CB 10	User																		5.00
12	CB 10 - MH 6	User																		5.00
11	CB 3 - CB 4	User																		5.00
10	CB 4 - MH 3	User																		0.00
9	CB 1 - CB 2	User																		5.00
8	CB 2 - MH 1	User																		5.00
7	MH 1 - MH 2	User																		0.00
6	MH 2 - MH 3	User																		0.00

Project File: HydraFlow.stm | Min. Tc used for intensity calculations = 5 min | Number of lines: 29 | Date: 2/11/2025

Storm Sewer Inlet Time Tabulation

Line No.	Line ID	Tc Method	Sheet Flow					Shallow Concentrated Flow					Channel Flow							Total Travel Time (min)
			n-Value	flow Length (ft)	2-yr 24h P (in)	Land Slope (%)	Travel Time (min)	flow Length (ft)	Water Slope (%)	Surf Descr	Ave Vel (ft/s)	Travel Time (min)	X-sec Area (sqft)	Wetted Perim (ft)	Chan Slope (%)	n-Value	Vel	flow Length (ft)	Travel Time (min)	
5	MH 3 - MH 4	User																		0.00
4	MH 4 - MH 5	User																		0.00
3	MH 5 - MH 6	User																		0.00
2	MH 6 - MH 7	User																		0.00
1	MH 7 - ES	User																		0.00

Project File: HydraFlow.stm | Min. Tc used for intensity calculations = 5 min | Number of lines: 29 | Date: 2/11/2025

Hydraulic Grade Line Computations

Line	Size	Q	Downstream								Len	Upstream								Check		JL coeff	Minor loss
			Invert elev	HGL elev	Depth	Area	Vel	Vel head	EGL elev	Sf		Invert elev	HGL elev	Depth	Area	Vel	Vel head	EGL elev	Sf	Ave Sf	Enrgy loss		
	(in)	(cfs)	(ft)	(ft)	(ft)	(sqft)	(ft/s)	(ft)	(ft)	(%)	(ft)	(ft)	(ft)	(ft)	(sqft)	(ft/s)	(ft)	(ft)	(%)	(%)	(ft)	(K)	(ft)
29	12	0.20	581.18	581.51	0.33	0.10	0.91	0.01	581.52	0.052	77.093	581.49	581.68 j	0.19**	0.10	2.00	0.06	581.74	0.479	0.265	0.205	1.00	0.06
28	12	0.44	580.88	581.27	0.39	0.18	1.58	0.04	581.31	0.131	75.349	581.18	581.46	0.28**	0.18	2.49	0.10	581.55	0.466	0.299	0.225	0.50	0.05
27	12	0.62	580.59	581.02	0.43	0.22	1.90	0.06	581.08	0.171	72.927	580.88	581.21	0.33**	0.23	2.74	0.12	581.33	0.468	0.320	0.233	0.50	0.06
26	12	1.06	579.59	580.25	0.66	0.32	1.91	0.06	580.31	0.124	249.680	580.59	581.02	0.43**	0.32	3.25	0.16	581.19	0.500	0.312	n/a	0.50	0.08
25	12	1.41	579.32	580.09	0.77	0.65	2.17	0.07	580.16	0.151	68.135	579.59	580.19	0.60	0.49	2.87	0.13	580.32	0.298	0.224	0.153	0.50	0.06
24	12	1.39	578.60	579.10	0.50	0.39	3.55	0.20	579.30	0.521	205.342	579.32	579.96	0.64	0.53	2.60	0.11	580.07	0.234	0.377	0.775	1.20	0.13
23	12	0.28	583.46	583.87	0.41	0.13	0.93	0.08	583.94	0.000	88.884	584.59	584.81 j	0.22**	0.13	2.22	0.08	584.88	0.000	0.000	n/a	1.00	n/a
22	12	0.41	583.25	583.83	0.58	0.48	0.87	0.01	583.84	0.028	53.658	583.46	583.85	0.39	0.28	1.46	0.03	583.88	0.111	0.070	0.037	0.50	0.02
21	12	0.62	583.03	583.81	0.78	0.65	0.95	0.01	583.82	0.029	55.745	583.25	583.82	0.57	0.46	1.35	0.03	583.85	0.068	0.048	0.027	0.50	0.01
20	12	1.00	582.64	583.71	1.00	0.79	1.28	0.03	583.73	0.068	123.646	583.03	583.79	0.76	0.64	1.57	0.04	583.83	0.080	0.074	0.091	0.50	0.02
19	12	1.00	582.50	583.66	1.00	0.79	1.28	0.03	583.69	0.068	41.197	582.64	583.69	1.00	0.79	1.28	0.03	583.71	0.068	0.068	0.028	0.84	0.02
18	12	0.49	582.89	583.44	0.55	0.45	1.09	0.02	583.46	0.045	63.113	583.14	583.49	0.35	0.24	1.99	0.06	583.55	0.231	0.138	0.087	1.00	0.06
17	12	0.48	583.35	584.52	1.00	0.79	0.61	0.01	584.53	0.016	25.000	583.43	584.53	1.00	0.79	0.61	0.01	584.53	0.016	0.016	0.004	1.00	0.01
16	12	0.95	583.33	584.51	1.00	0.79	1.20	0.02	584.53	0.060	5.225	583.35	584.51	1.00	0.79	1.20	0.02	584.53	0.060	0.060	0.003	0.50	0.01
15	12	0.43	583.86	584.83	0.97	0.17	0.55	0.10	584.93	0.000	24.988	583.99	584.26	0.27**	0.17	2.50	0.10	584.36	0.000	0.000	n/a	1.00	0.10
14	12	0.86	583.84	584.82	0.98	0.78	1.10	0.02	584.84	0.044	5.265	583.86	584.82	0.96	0.77	1.11	0.02	584.84	0.043	0.044	0.002	0.50	0.01
13	12	0.39	584.25	584.67	0.42	0.31	1.26	0.02	584.69	0.078	33.529	584.38	584.69	0.31	0.21	1.88	0.06	584.75	0.236	0.157	0.053	1.00	0.06
12	12	0.69	584.22	584.58	0.36*	0.25	2.71	0.11	584.69	0.415	7.220	584.25	584.61	0.36	0.25	2.70	0.11	584.72	0.414	0.415	0.030	0.50	0.06
11	12	1.01	584.88	585.65	0.77	0.65	1.55	0.04	585.69	0.077	24.968	584.98	585.66	0.68	0.57	1.76	0.05	585.71	0.104	0.090	0.023	1.00	0.05
10	12	1.93	584.86	585.54	0.68*	0.57	3.37	0.18	585.72	0.379	5.280	584.88	585.57	0.69	0.57	3.36	0.18	585.74	0.378	0.378	0.020	0.50	0.09
9	12	0.68	585.45	585.97	0.52	0.42	1.65	0.04	586.01	0.108	24.937	585.55	585.99	0.44	0.33	2.07	0.07	586.05	0.201	0.155	0.039	1.00	0.07
8	12	1.02	585.43	585.89	0.46*	0.35	2.91	0.13	586.02	0.380	5.265	585.45	585.91	0.46	0.35	2.92	0.13	586.04	0.383	0.382	0.020	0.50	0.07

Project File: HydraFlow.stm | Number of lines: 29 | Run Date: 2/11/2025

Notes: * depth assumed; ** Critical depth.; j-Line contains hyd. jump ; c = cir e = ellip b = box

Hydraulic Grade Line Computations

Line	Size	Q	Downstream								Len	Upstream								Check		JL coeff	Minor loss
			Invert elev	HGL elev	Depth	Area	Vel	Vel head	EGL elev	Sf		Invert elev	HGL elev	Depth	Area	Vel	Vel head	EGL elev	Sf	Ave Sf	Enrgy loss		
	(in)	(cfs)	(ft)	(ft)	(ft)	(sqft)	(ft/s)	(ft)	(ft)	(%)	(ft)	(ft)	(ft)	(ft)	(sqft)	(ft/s)	(ft)	(ft)	(%)	(%)	(ft)	(K)	(ft)
7	12	1.02	584.51	585.16	0.65	0.54	1.89	0.06	585.21	0.122	101.916	584.92	585.36	0.44	0.33	3.09	0.15	585.50	0.449	0.286	0.291	1.50	0.22
6	12	0.97	584.10	585.07	0.97	0.78	1.24	0.02	585.09	0.055	101.918	584.51	585.13	0.62	0.51	1.89	0.06	585.19	0.126	0.090	0.092	0.50	0.03
5	18	2.66	583.71	584.82	1.11	1.40	1.90	0.06	584.87	0.068	98.692	584.10	584.87	0.77	0.92	2.89	0.13	585.00	0.196	0.132	0.130	1.50	0.19
4	18	3.41	583.33	584.51	1.18	1.49	2.29	0.08	584.59	0.098	88.483	583.71	584.57	0.86	1.05	3.25	0.16	584.74	0.229	0.163	0.144	1.50	0.25
3	18	3.83	582.91	584.12	1.21	1.53	2.50	0.10	584.22	0.116	106.221	583.33	584.23	0.90	1.11	3.46	0.19	584.42	0.251	0.183	0.195	1.50	0.28
2	18	4.26	582.62	583.45	0.83*	1.01	4.23	0.28	583.73	0.396	73.200	582.91	583.74	0.83	1.01	4.23	0.28	584.02	0.398	0.397	0.291	1.37	0.38
1	18	4.61	582.50	583.39	0.89	0.99	4.22	0.33	583.72	0.000	21.560	582.62	583.44	0.82**	0.99	4.64	0.33	583.78	0.000	0.000	n/a	1.35	0.45

Project File: HydraFlow.stm | Number of lines: 29 | Run Date: 2/11/2025

Notes: * depth assumed; ** Critical depth.; j-Line contains hyd. jump ; c = cir e = ellip b = box

Appendix C

Earthwork Calculations

Cut/Fill Report

Generated: 2025-02-11 14:39:10

By user: dlapietra

Drawing: K:\Civil\2020\20.247 1789 Dodge Road, Amherst\03 - CIVIL\DWG\K:\Civil\2020\20.247 1789 Dodge Road, Amherst\03 - CIVIL\DWG\20.247 C-200.dwg

Volume Summary

Name	Type	Cut Factor	Fill Factor	2d Area (Sq. Ft.)	Cut (Cu. Yd.)	Fill (Cu. Yd.)	Net (Cu. Yd.)
Cut & Fill Report	full	1.000	1.000	203694.40	7308.39	11743.90	4435.51<Fill>

Totals

	2d Area (Sq. Ft.)	Cut (Cu. Yd.)	Fill (Cu. Yd.)	Net (Cu. Yd.)
Total	203694.40	7308.39	11743.90	4435.51<Fill>

* Value adjusted by cut or fill factor other than 1.0