

CARMINAWOOD DESIGN

ENGINEER'S REPORT

for

Sawyer's Landing
Dodge & Sweet Home Road
Town of Amherst, Erie County, New York

Prepared for

Sawyer's Landing LLC

c/o Severyn Development
43 Central Ave Suite #300
Lancaster, NY 14086

Prepared by

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February 2021

Revised 6/20/2024



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Section 1 - Location & Description

This project is a development of a 17.4 acre site located on the north side of Dodge Road, west of Sweet Home Road in the Town of Amherst. Both Dodge Road and Sweet Home Road are Erie County roads. Proposed is the construction of a mixed-use development to include (2) 4-story mixed-use buildings with 100 apartment units total, (22) 2-story duplex townhomes with 44-units total, (1) 4-story self-storage building and (63) 2-story townhomes. A bike trail will be constructed on site, this trail will connect to the existing Town of Amherst bike trail on the south side of Dodge Road. The approximately 1 acre westerly portion will remain undisturbed and be deed restricted as permanent open space. The site is currently undeveloped consisting of woods and overgrown brush/grass. NYSDEC and Federal wetlands were delineated on site by Earth Dimensions, Inc. Approximately 6.1 acres of Federal and 1.2 acres of NYSDEC wetlands have been permitted to be impacted. The proposed site development area to be disturbed for this project is approximately 16.4 acres.

Section 2 - Water Service

A new 8" D.I. combined service will be tapped off the existing 24" D.I.P. ECWA water main along the north side of Dodge Road at the northern portion of the project site. Following the tap, the 8" D.I. service will continue north into the site where it will enter into a Hot-Box enclosure. Within the Hot-Box enclosure an 8" meter (by ECWA) and an 8" Watts 957 RPZ will be installed. Similarly, a second 8" D.I. combined service will be tapped off the existing 24" ECWA main at the southern portion of the site along Dodge Road. As with the first installation, following the tap, the 8" D.I. service will continue northeast into the site where it will enter a hotbox with the same 8" meter (by ECWA) and 8" Watts 957 RPZ. The services will exit the Hot-Box enclosures and then transition into 8" AWWA C-900 PVC. The services will run throughout the site to provide both domestic and fire service to the proposed buildings. Heat & light for testing will be provided in the areas of the meters & RPZs to prevent freezing. Drainage due to testing or failure will be to the exterior through a drain, drainage will be away from the enclosures. The owner will be responsible for keeping the drainage ports clear of snow and debris. A total of 5 (five) proposed fire hydrants shall be installed around the site to provide fire protection coverage. There are no existing water services to this site, and therefore none to be killed/abandoned per ECWA requirements.

Domestic Summary:

Peak Operating Demand:	141.31 gpm
Water Main:	24" on Dodge Road
Static Pressure:	105 psi (per ECWA, 98 psi residual)
Friction Loss:	0.0 psi
Loss through meter/RPZ:	13.0 psi
Elevation Loss:	0.0 psi
Pressure after RPZ & Meter:	92 psi
Pressure at 4 th floor:	76.8 psi

Repairs to all devices will be made during off hours, dual backflow preventers are not required. The site is not located in a 100-year flood plain. Disinfection of the water service following installation will be continuous feed, according to AWWA C-651, latest revision.

Section 3 - Sanitary Sewer Service

The proposed sanitary sewer service will connect to the existing 60" sanitary sewer (peanut line) located on the south side of Dodge Road. In order to connect to this sewer, a public sewer extension along the south side of Dodge Road will be required. This public extension will consist of a total of 643 LF of 8" SDR-35 PVC at a minimum slope of 0.4%.

The proposed private on-site sewer mains will consist of 8" SDR-35 PVC at a minimum slope of 0.4%. Each of the proposed commercial buildings and apartment buildings will have a 6" SDR-35 PVC sanitary sewer lateral at a minimum slope of 1.0% tied into the private main. The townhouse units will have a 4" SDR-35 PVC sanitary sewer lateral at a minimum slope of 1.0% tied into the private main. The 8" private main will tie into the proposed public extension on the south side of Dodge Road across from the SE portion of the project site.

A downstream sanitary sewer capacity analysis (DSCA) is required to be prepared for the site given the flows will exceed 2,500 gpd. This report is included in Appendix A.

Design Parameters

Housing: use 220/gpd/unit
 $Q = 207 \text{ units} \times 220 \text{ gpd/unit} = 45,540 \text{ gpd}$

Commercial: use 0.1 gpd/sf
 $Q = 11,906 \text{ sf} \times 0.1 \text{ gpd/sf} = 1,190.6 \text{ gpd}$

Office: use 0.1 gpd/sf
 $Q = 10,798 \text{ sf} \times 0.1 \text{ gpd/sf} = 1,079.8 \text{ gpd}$

Self Storage: use 15 gpd/employee
 $Q = 5 \text{ employees} \times 15 \text{ gpd} = 75 \text{ gpd}$

Restaurant: use 35 gpd/seat
 $Q = 100 \text{ seats} \times 35 \text{ gpd/seat} = 3,500 \text{ gpd}$

Total = 51,385 gpd (average) using a 3.97 PF (see appendix A for calc)

Total = $51,385 \times 3.97 = 203,902 \text{ gpd} = 141.60 \text{ gpm} = 0.315 \text{ cfs}$

The hydraulic loading rates per "Design Standard for Wastewater Treatment Works" 2014, NYSDEC. See attached Sanitary Sewer & Water Calculations for additional information.

I/I Mitigation:

Peak Flow = 141.60 gpm

4:1 offset = $141.60 \times 4 = 566.39$ gpm

Mitigation Credit = \$250/gpm

I/I Mitigation = $566.39 \text{ gpm} \times \$250/\text{gpm} = \$141,598.58$

Refer to Appendix A for additional information.

Section 4 - Storm Sewer Service

The existing site is generally flat and slopes west with portions sloping east. The portion that slopes west settles in a low area and once the capacity of that area is exceeded, sheet flow continues towards Sweet Home Road and is collected by an existing 12" pipe on the north side of Dodge Road. This pipe flows to the Erie County system on Sweet Home Road. The portion that flows east flows to the offsite wetlands.

Currently Dodge Road does not have a drainage system. A series of catch basins and pipes will be installed in the green area on the north side of Dodge Road to collect the road drainage. The west portion of this system will connect to the existing closed drainage system on Sweet Home Road. The east portion will discharge to the Ellicott Creek diversion channel using an existing discharge point. This new system will also convey the proposed discharge from the site as described below.

The proposed onsite storm sewer system consists of smooth interior and perforated HDPE pipes connected by a series of catch basins, manholes and yard drains. The site is split into a storm water management area on the east and west sides.

West Side

The west side of the site has (2) bioretention areas which portions of the westerly area will discharge to. These bioretention areas along with the remainder of the west portion of the site will discharge to the underground detention area. Note that the yard drains installed along the north property line discharge to the underground detention area. An outlet structure in the SW portion of this area will control runoff to at or below existing runoff flow rates. The discharge from the outlet control structure will discharge to the new system on Dodge Road which flows to the Sweet Home Road system.

Underground Detention Summary

(286) ADS Stormtech SC-740 chambers

Top of stone elev. = 573.00

Top of chamber elev. = 572.50

Bottom of chamber elev. = 570.00

Bottom of stone elev. = 569.50

Total storage = 18,574 CF

Sawyer's Landing

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<u>Event</u>	<u>Ex. Discharge</u>	<u>Pro. Discharge</u>	<u>Elev.</u>
1 yr	0.87 cfs	0.33 cfs	570.29
2 yr	1.34 cfs	0.68 cfs	570.46
5 yr	2.14 cfs	1.05 cfs	570.79
10 yr	2.94 cfs	1.28 cfs	571.13
25 yr	4.34 cfs	1.61 cfs	571.73
50 yr	5.69 cfs	3.61 cfs	572.23
100 yr	7.33 cfs	4.83 cfs	572.92

East Side

The east side of the site has a bioretention area and wet detention pond which this portion of the site discharges to. The NE portion of the site discharges to a forebay which spills into the main micropool portion of the wet detention basin. The SE portion of the site discharges to the bioretention area which also spills into the main micropool portion of the site. An outlet control structure is located in the SE portion of the micropool and controls the discharge from this storm water management area. Spillways are also located on the east portion of the micropool which will discharge to the existing wetlands to the east in order to not cut off all flow from this site into this area. The discharge from the outlet control structure will discharge to the new system on Dodge Road which flows to the Ellicott Creek diversion channel.

The bioretention areas and wet detention pond for the project area are sized to provide 100% of the required Runoff Reduction Volume (RRv) and Water Quality Volume (WQv) treatment for the overall site in accordance with Chapter 4 of the NYSDEC Stormwater design manual. The soils in the vicinity of the bioretention areas are mainly USDA hydrologic group 'D' and therefore the system will be installed with underdrains per NYSDEC requirements. The bioretention areas will consist of 6" and 8" perforated HDPE underdrains in 12" of drainage gravel, followed by filter fabric and 18" minimum of planting soil. Overflow yard drains will be installed to allow 6" maximum temporary ponding for RRv treatment. The east bioretention area (area #3) spills into the wet detention pond and the underdrain pipe ties together with the pond discharge and flows to Dodge Road. The east bioretention areas (areas #1 & #2) have a catch basin to act as the spillway and this catch basin and the underdrain pipes discharge to the underground detention area.

Storm Water Management Area Summary

Forebay

Top of basin elev. = 576.80
 Permanent water elev. = 575.00
 Aquatic bench elev. = 574.50
 Bottom of basin elev. = 569.00

Micropool

Top of basin elev. = 576.80
 Permanent water elev. = 575.00

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6/20/2024

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Aquatic bench elev. = 574.50
Bottom of basin elev. = 563.00

Overall Storm Water Summary

WQv Provided = 152,678 cf (pond)
WQv Provided = 6,948 cf (bioretention)
WQv Provided = 159,626 cf (total)

Bioretention Area Summary:

Area	Rim Elev.	Bottom Elev.	Area
1	574.50	574.00	2,300 sf
2	574.50	574.00	2,600 sf
3	575.50	575.00	<u>11,000 sf</u>
			Total Provided = 15,900 sf

Water Quality Summary:

WQv req'd = 28,804 cf (0.661 ac-ft)
RRv min. req'd = 5,518 cf (0.127 ac-ft)
RRv provided = 8,662 cf (0.199 ac-ft)
WQv provided = 159,626 cf (3.665 ac-ft)
Total RRv + WQv provided = 8,662 cf + 159,626 cf = 168,287 cf (3.868 ac-ft)

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 100-year vs. the proposed 100-year runoff

Storm pipes: 10-year storm

Appendix A

Sanitary Sewer and Water Demand Calculations

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 BUFFALO, NEW YORK, 14203
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Project No.: 24-4034 Date: 6/20/2024
 Project Name: Muir Woods
 Project Address: Sweet Home Road and Dodge Road - Amherst, NY
 Subject: Sanitary Sewer Demand Calcs
 Sheet: 1 of 1

Sanitary Sewage Demand Calculations:

West - Mixed Use Buildings

0.1 gal/d/sf	x	11,906 sf	=	1,191 gpd	*use 0.1 gallons per day per square foot (Retail)
35.0 gal/d/seat	x	100 seats	=	3,500 gpd	*use 35 gallons per day per seat (fast food)
0.1 gal/d/sf	x	10,798 sf	=	1,080 gpd	*use 0.1 gallons per day per square foot (Office)
15 gal/d/employee	x	5 employees	=	75 gpd	*use 15 gallons per employee (Self-Storage)

West - Apartments

220 gal/d/unit	x	100 units	=	22,000 gpd	*use 220 gallons per day per 2-bedroom unit
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North - Apartments and Duplex Buildings

220 gal/d/unit	x	63 units	=	13,860 gpd	*use 220 gallons per day per 2-bedroom unit
220 gal/d/unit	x	44 units	=	9,680 gpd	*use 220 gallons per day per 2-bedroom unit

<u>Total Site Sanitary Demand:</u>	=	51,385 gpd
	=	0.051 MGD

<u>Find Peak Sanitary Demand:</u>	=	0.079 cfs
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Peaking Factor based on Population:

Total demand:	51,385 gpd	/	100 gpcc	=	514 per capita
			Population (P)	=	514 people

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

Peaking Factor = 3.97

Peak Sanitary Demand	=	51,385 x 3.97	=	203,902 gpd
			=	0.204 MGD
			=	0.315 cfs

Required Infiltration and Inflow Mitigation:

Peak Sanitary Flow	=	203,902 gpd	=	141.60 gpm
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4:1 offset flow per NYSDEC requirements	=	141.6 x 4	=	566.39 gpm req'd
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Mitigation Credit	=	\$250 / gpm
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Mitigation Agreement Amount	=	\$141,598.58
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Water Demand Calculations (domestic):

Site

$$51,385 \text{ gpd} \times 1.1 = 56,524 \text{ gpd} \quad \text{*use 110\% of sewage demand}$$

*use 1.8 peaking factor and assume a 12 hour day

$$56,524 \text{ gpm} \times 1 \text{ day}/12 \text{ hr} \times 1 \text{ hr}/60 \text{ min} = 78.50 \text{ gpm}$$

$$78.50 \text{ gpm} \times 1.8 = 141.31 \text{ gpm } Q_{\text{peak}}$$

Headlosses:

$$Q_{\text{peak}} = 141.31 \text{ gpm}$$

$$\text{Pipe} = 8 \text{ inch Ductile Iron } C = 140$$

$$\text{Length} = 33 \text{ LF (approx. distance from tap to RPZ)}$$

$$H_L = \frac{10.44 L Q^{1.85}}{C^{1.85} D^{4.866}} = \frac{10.44(33)(141.31)^{1.85}}{(140)^{1.85} (8)^{4.866}} = 0.01 \text{ ft} = 0.01 \text{ psi}$$

$$\Delta \text{ elev} = 0 \text{ ft} = 0.00 \text{ psi}$$

$$\text{Loss through meter} = 1 \text{ psi}$$

$$\text{Loss through RPZ} = 12 \text{ psi}$$

$$\text{Total Losses} = 13.0 \text{ psi}$$

$$\text{Static Pressure} = 105 \text{ psi (per ECWA - residual pressure 98 psi)}$$

$$\text{Residual Pressure Following RPZ} = 105 - 13.0 = 92.0 \text{ psi (available after rpz \& meter)}$$

Headlosses to furthest hydrant

$$Q_{\text{peak}} = 141.31 \text{ gpm}$$

$$\text{Pipe} = 8 \text{ inch C-900 PVC } C = 140$$

$$\text{Length} = 1,293 \text{ LF (approx. distance from RPZ to hydrant)}$$

$$H_L = \frac{10.44 L Q^{1.85}}{C^{1.85} D^{4.866}} = \frac{10.44(1,293)(141.31)^{1.85}}{(140)^{1.85} (8)^{4.866}} = 0.55 \text{ ft} = 0.24 \text{ psi}$$

$$\Delta \text{ elev} = 1.1 \text{ ft} = 0.48 \text{ psi}$$

$$\text{Total Losses} = 0.7 \text{ psi}$$

$$\text{Static Pressure} = 92 \text{ psi (per ECWA - residual pressure 98 psi)}$$

$$\text{Residual Pressure Following hydrant} = 92.0 - 0.7 = 91.3 \text{ psi (available after furthest hydrant)}$$

Residual Pressure 30" above 4th Floor

$$\Delta \text{ elev} = 35 \text{ ft} = 15.16 \text{ psi}$$

$$\text{Residual Pressure 30" above 4th Floor} = 92.0 - 15.16 = 76.8 \text{ psi}$$

Downstream Sewer Capacity Analysis

**DOWNSTREAM SANITARY SEWER CAPACITY
ANALYSIS REPORT**

for

Muir Woods Site
Sweet Home & Dodge Road
Amherst, Erie County, New York

Prepared for

Sawyer's Landing, LLC

c/o Severyn Development
43 Central Ave Suite #300
Lancaster, New York 14086

Prepared by

Carmina Wood Design

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Buffalo, NY 14203

Telephone: (716) 842-3165
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REVISED
June 2024



Project Description

This new site development project will consist of the construction of apartment buildings, duplexes, office, restaurant, and retail space as well as self-storage. Construction will also include on-site utility, landscaping improvements, and associated roads and parking. The overall acreage of the site is 28.47 acres. The site is located at Sweet Home Road and Dodge Road on a western portion of parcel 40.08-3-13.1 in the Town of Amherst and is zoned NCD-SA.

The proposed sewer for this project will leave the site via a privately owned sanitary service and cross Dodge Road to connect to a proposed 8” publicly owned sewer extension. The public line will then tie in to the existing 60” RCP Peanut line along Dodge Road. Sewage will then be conveyed west and then eventually north through the 84” West Side Interceptor to the Town of Amherst Wastewater Treatment Facility #16. The proposed public extension from the tie in to the existing 60” RCP line will be owned and maintained by the Town of Amherst.

Node 1 - Dodge Road (60”):

Existing Peak Flow measured (wet weather event)	=	40.602 cfs (21.851 mgd)*
Proposed Muir Woods Peak Flow	=	0.315 cfs **
Proposed Peak Flow	=	40.917 cfs

Theoretical capacity of existing 60” RCP pipe @ 0.07% = 81.366 cfs

Conclusion: The proposed peak flow is less than the capacity of the 60” 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 Ellicott Creek Rd (60”)

Existing Peak Flow measured (wet weather event)	=	99.524 cfs (53.561 mgd)*
Proposed Muir Woods Peak Flow	=	0.315 cfs **
Proposed Peak Flow	=	99.839 cfs

Theoretical capacity of existing 60” pipe = 82.873 cfs (44.60 mgd)

Conclusion: Current flows the day following the 1.21” rainfall event exceeded the capacity of the existing 60” 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 (SSO) did not occur. I/I mitigation shall be required for the contribution proposed for this project.

Node 3 - Sweet Home (66")

Existing Peak Flow measured (overall) = 69.058 cfs (39.601 mgd)*

Proposed Muir Woods Peak Flow = 0.315cfs **

Proposed Peak Flow = 69.373 cfs

Capacity of existing 66" pipe = 106.657 cfs (57.40 mgd)

Conclusion: The proposed peak flow is less than the capacity of the 66" pipe, therefore there is sufficient capacity. At no time during the monitoring did the flow depth exceed the pipe diameter at Node 3 of the downstream monitoring points during the rain events monitored.

Foot Notes:

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

* Converted from measurements in TECSmith report dated 8/12/20

** See Sanitary Sewage Demand Calculations

Location Map

Muir Woods Site - Sweet Home and Dodge Rd

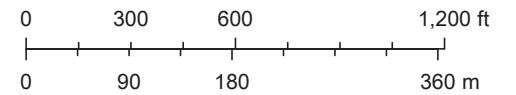


8/18/2020, 8:51:26 AM

 Parcels

 Municipal Boundaries

1:9,028



Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS,

Web AppBuilder for ArcGIS

USGS TNM - National Hydrography Dataset. Data Refreshed July, 2020. | NYS GIS Program Office | Telephone: (518) 242-5029 | Email: its.sm.SAM.Maintenance@its.ny.gov

Sanitary Demand Calculations

CARMINA WOOD MORRIS, D.P.C.
 487 MAIN STREET, SUITE 500
 BUFFALO, NEW YORK, 14203
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Sanitary Sewage Demand Calculations:

West - Mixed Use Buildings

0.1 gal/d/sf	x	11,906 sf	=	1,191 gpd	*use 0.1 gallons per day per square foot (Retail)
35.0 gal/d/seat	x	100 seats	=	3,500 gpd	*use 35 gallons per day per seat (fast food)
0.1 gal/d/sf	x	10,798 sf	=	1,080 gpd	*use 15 gallons per day per employee (Office)
15 gal/d/employee	x	5 employees	=	75 gpd	*use 15 gallons per employee (Self-Storage)

West - Apartments

220 gal/d/unit	x	100 units	=	22,000 gpd	*use 220 gallons per day per 2-bedroom unit
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North - Apartments and Duplex Buildings

220 gal/d/unit	x	63 units	=	13,860 gpd	*use 220 gallons per day per 2-bedroom unit
220 gal/d/unit	x	44 units	=	9,680 gpd	*use 220 gallons per day per 2-bedroom unit

<u>Total Site Sanitary Demand:</u>	=	51,385 gpd
	=	0.051 MGD

<u>Find Peak Sanitary Demand:</u>	=	0.079 cfs
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Peaking Factor based on Population:

Total demand:	51,385 gpd	/	100 gpcc	=	514 per capita
			Population (P)	=	514 people

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

Peaking Factor = 3.97

Peak Sanitary Demand	=	51,385 x 3.97	=	203,902 gpd
			=	0.204 MGD
			=	0.315 cfs

Required Infiltration and Inflow Mitigation:

Peak Sanitary Flow	=	203,902 gpd	=	141.60 gpm
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4:1 offset flow per NYSDEC requirements	=	141.6 x 4	=	566.39 gpm req'd
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Mitigation Credit	=	\$250 / gpm
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Mitigation Agreement Amount	=	\$141,598.58
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TECSmith Monitoring Report

Date: August 12, 2020

SANITARY SEWER FLOW CAPACITY STUDY – Summary Review

Prepared For: Muir Woods Capacity Analysis

Christopher Wood
487 Main Street, Suite 600
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P: (716) 842-3165
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Project Name: Muir Woods Capacity Analysis

Flow Monitoring Period: July 8, 2020 to August 5, 2020

Rain Events (> 0.5-inches) Monitored: July 11 (1.21”), July 16 (0.86”), and August (0.90”)

Number of Monitoring Nodes: Three (3) downstream manholes

Node Locations and Descriptions:

- Node 1 Dodge Rd 60" (60")
- Node 2 North Ellicott Creek Rd. (60")
- Node 3 Sweethome 66 (66")

Summary Conclusion:

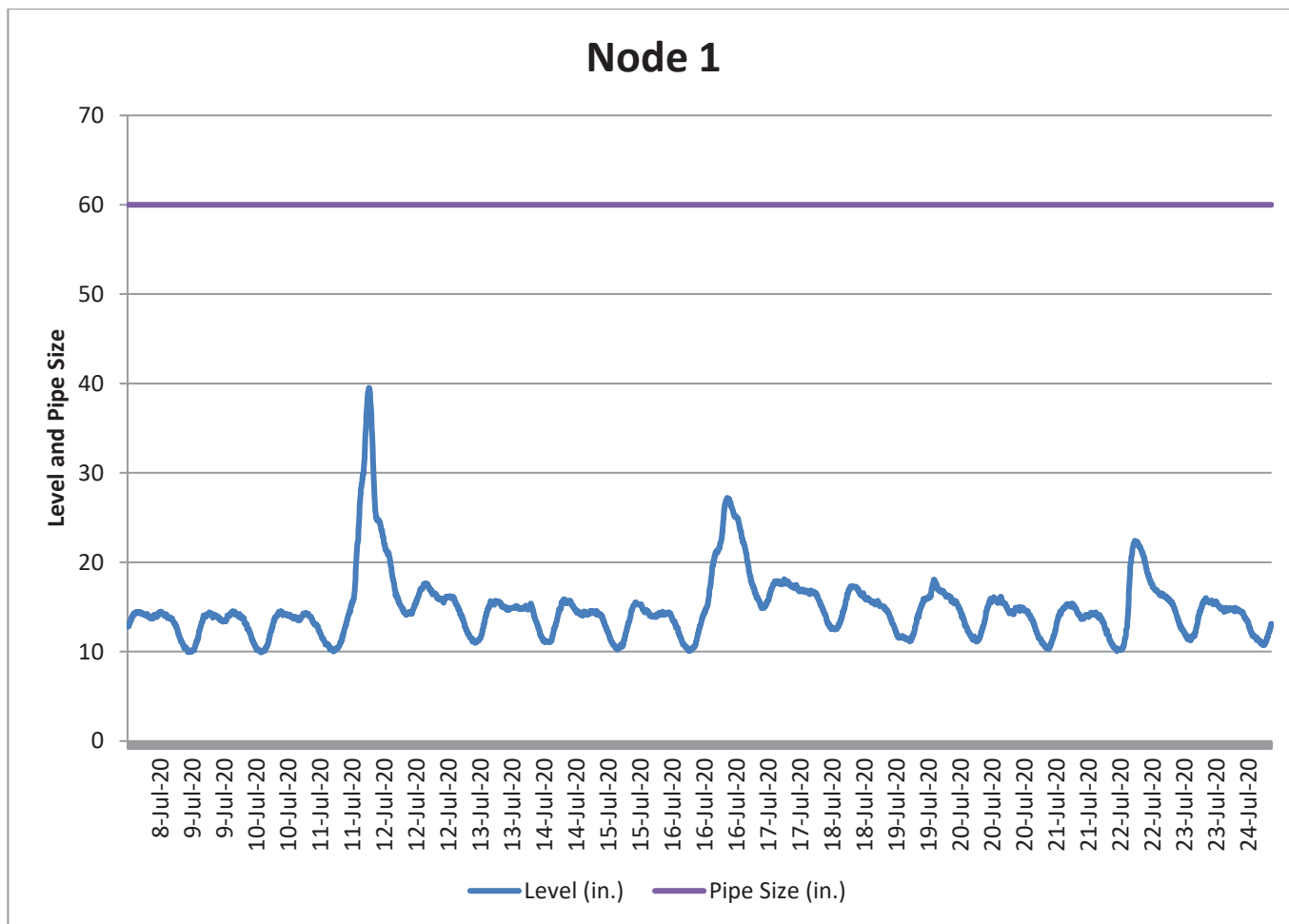
Based on the data presented in this report, specifically the flow depth measurements recorded (see graphs below)

- At no time did the flow depth exceed pipe diameter at Node 1 and Node3 of the downstream monitoring points during the rain events monitored.
- One time the flow depth exceed pipe diameter at Node 2 of the downstream monitoring points during the rain events monitored.
- 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.

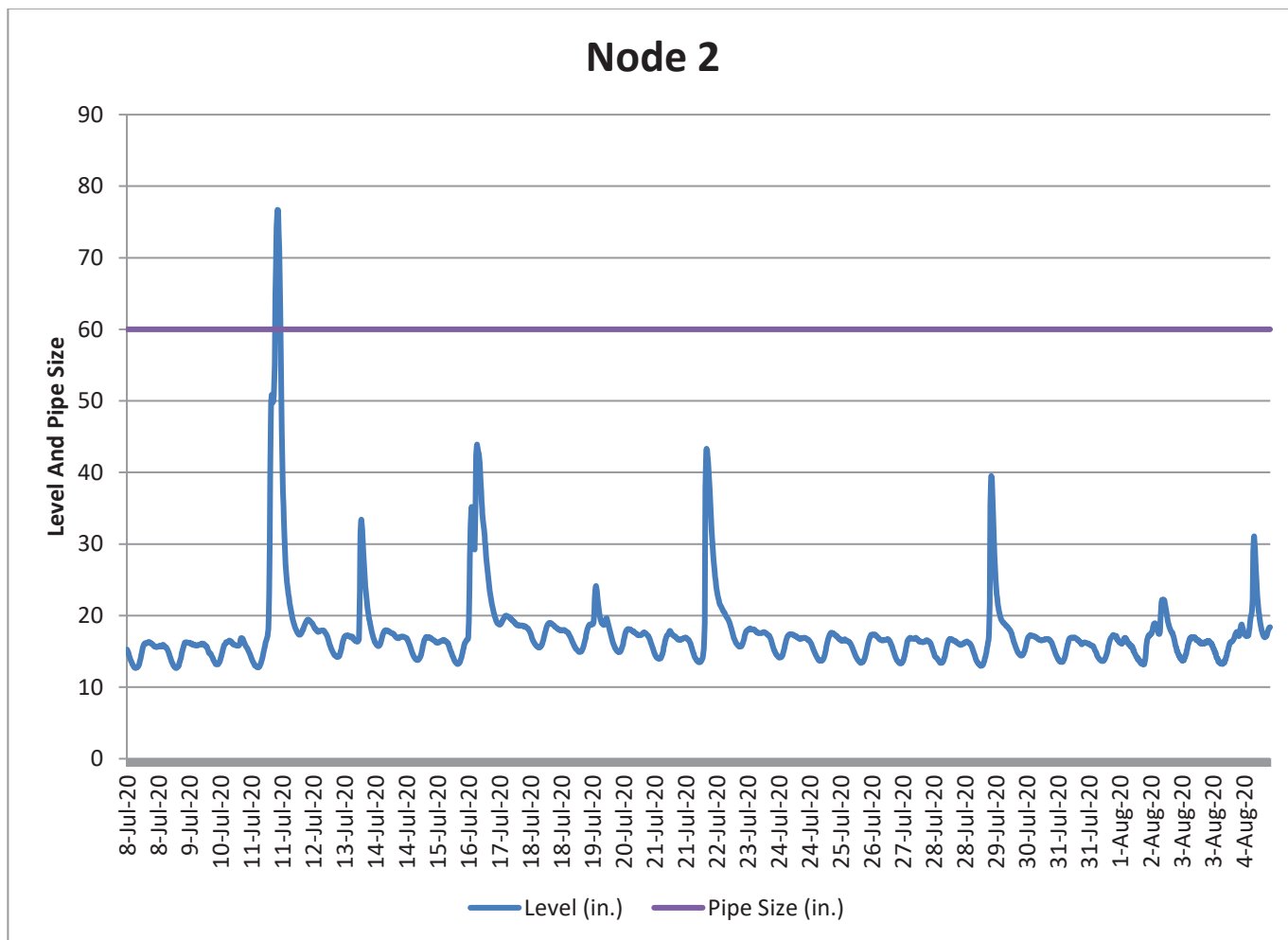
Depth of Flow Capacity Summary:

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

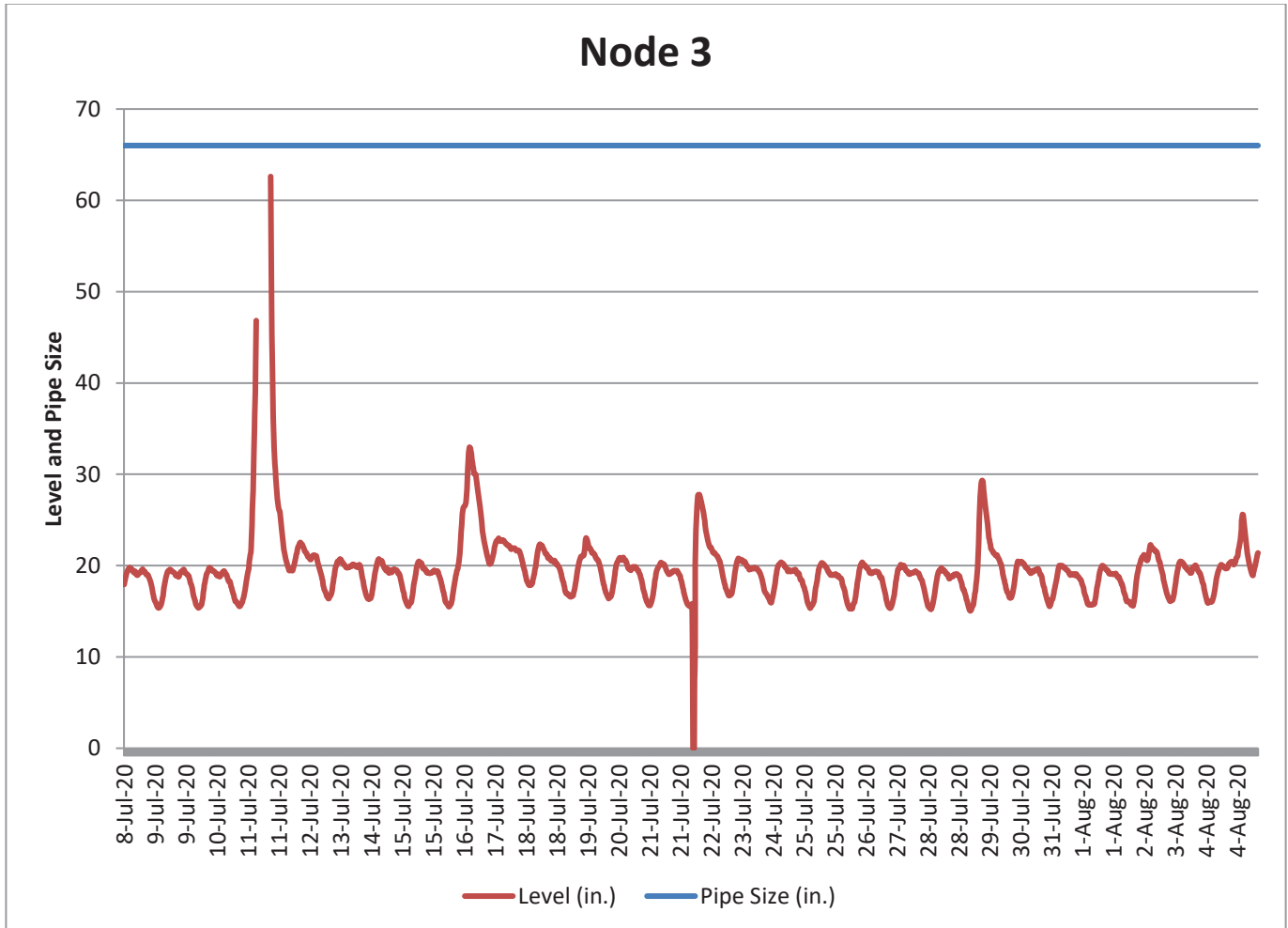
- At no time during the monitoring period did depth of flow exceed pipe diameter at Node 1.



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



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



Date	Node 1			Node 2			Node 3			Rain. (inches)
	Dodge Rd 60" (60")			North Ellicott Creek Rd. (60")			Sweethome 66 (66")			
	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)	PEAK FLOW (MDG)	PEAK LEVEL (IN)	
7/8/2020	4186.283	8.161	14.473	7265.409	8.598	16.319	4800986323.2	8.025	19.770	0
7/9/2020	6195.964	8.253	14.556	7387.504	8.661	16.273	6645115872.8	8.044	19.590	0
7/10/2020	6231.790	8.143	14.521	7625.321	9.362	16.873	6667623530.3	8.079	19.790	0
7/11/2020	10033.769	21.851	39.526	20780.607	53.561	76.701	10540796680.3	28.096	66.000	1.21
7/12/2020	9184.078	14.374	22.474	11292.759	17.205	23.420	9306202243.7	13.750	25.810	0
7/13/2020	7070.585	9.115	15.714	11243.925	29.525	33.420	7609650153.8	9.108	20.730	0.47
7/14/2020	6974.494	9.101	15.869	9685.896	13.288	20.168	7274548275.2	9.280	20.720	0
7/15/2020	6591.385	8.845	15.512	8174.879	9.503	17.013	6975378581.5	8.831	20.460	0
7/16/2020	9916.241	20.532	27.213	18886.012	44.070	43.892	12067803314.2	39.601	32.990	0.86
7/17/2020	10096.644	16.639	23.493	12451.728	18.137	24.043	10307997546.4	14.224	26.250	0.03
7/18/2020	8256.593	10.757	17.307	9766.538	11.556	18.960	8664937727.1	10.772	22.350	0
7/19/2020	7589.558	11.382	18.060	10166.964	17.245	24.128	8331695207.5	24.048	23.030	0.21
7/20/2020	7269.757	9.235	16.144	8853.911	10.160	18.118	7730113857.4	9.669	20.890	0
7/21/2020	6681.658	8.895	15.365	8179.097	9.991	17.880	1603593925.8	9.197	20.330	0
7/22/2020	8633.887	15.390	22.402	15950.443	42.105	43.300	16326027301.0	29.736	27.790	0.42
7/23/2020	7327.211	9.216	16.027	9664.310	11.130	18.508	6916249204.1	19.172	20.800	0
7/24/2020	6764.464	8.779	15.317	8434.117	9.760	17.405	8296938032.2	15.723	20.360	0
7/25/2020	6426.122	8.861	15.407	8159.333	9.969	17.608	6871634377.4	12.359	20.320	0
7/26/2020	6409.255	8.667	15.297	8027.060	9.774	17.372	6816880470.0	9.106	20.360	0
7/27/2020	6487.339	8.269	15.107	7871.954	9.244	16.902	6854655651.9	8.336	20.100	0.03
7/28/2020	6298.427	8.016	14.780	7696.223	9.134	16.757	6692447010.5	8.080	19.740	0.01
7/29/2020	8340.302	16.584	23.592	12134.192	36.728	39.530	9170179156.5	20.222	29.310	0.18
7/30/2020	6969.955	8.785	15.769	8383.294	9.650	17.268	7523641190.2	9.272	20.460	0
7/31/2020	6450.443	8.415	15.050	7762.583	9.287	16.964	7145517425.5	9.079	20.020	0
8/1/2020	6190.340	8.162	14.979	7900.808	9.762	17.305	6954528215.3	13.188	20.010	0
8/2/2020	7093.727	10.270	17.033	9801.968	15.922	22.240	7827565960.7	17.585	22.270	0.29
8/3/2020	6767.967	8.538	15.346	8117.853	9.663	17.172	7374180322.3	9.104	20.460	0
8/4/2020	6796.062	10.365	17.180	8920.731	24.649	28.896	7717920498.0	19.489	24.920	0.9
8/5/2020	4464.403	13.072	20.203	5583.196	26.407	31.097	3896577334.0	14.011	25.600	0
---	---	---	---	---	---	---	---	---	---	4.61

	MGD	CFS		MGD	CFS		MGD	CFS
Wet	21.851	33.808	Wet	53.561	82.871	Wet	39.601	61.271
Overall	16.639	25.744	Overall	42.105	65.146	Overall	29.736	46.008

**(T) Amherst Engineering Department Sewer Maintenance Division
Downstream Routing Map**

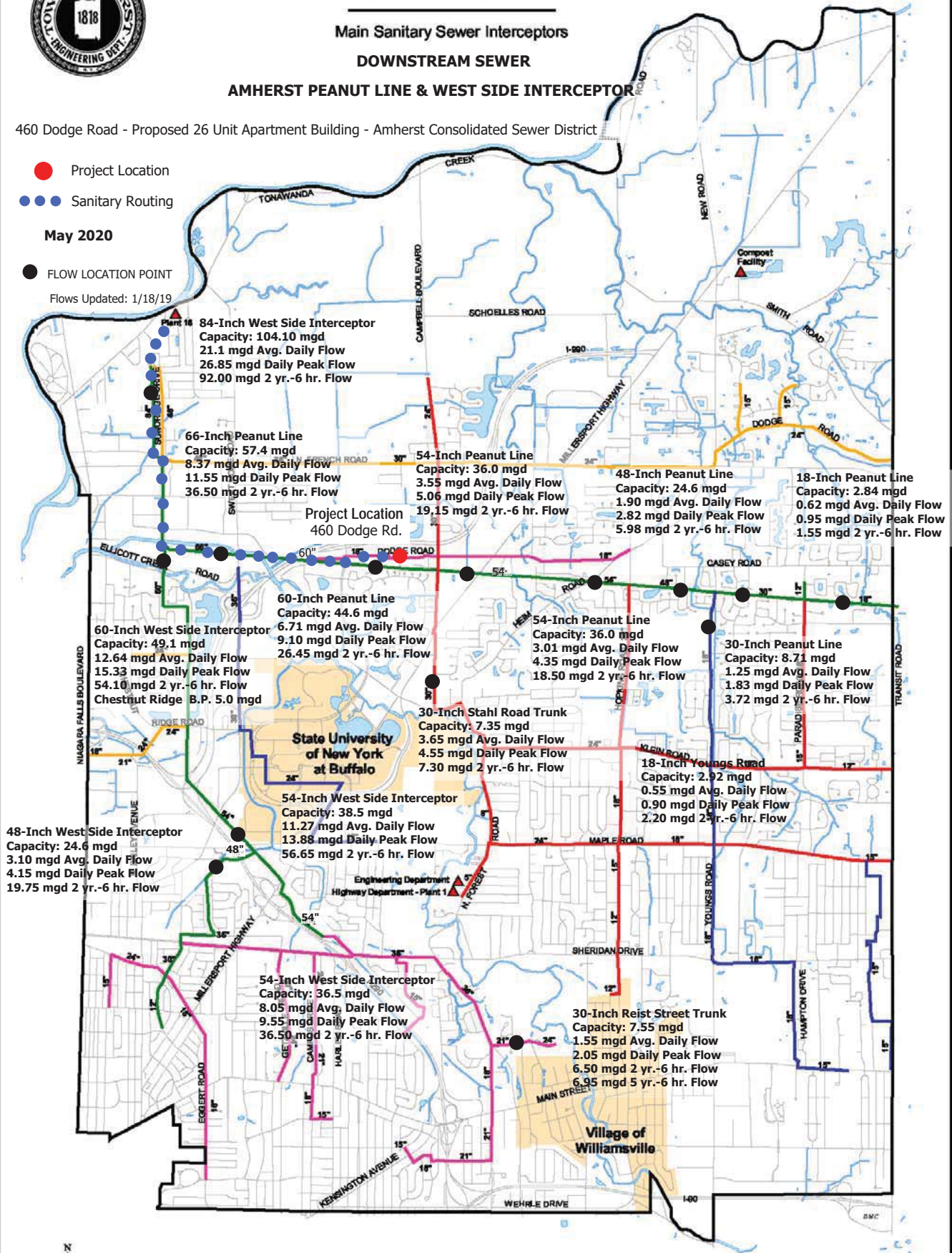


Town of Amherst Engineering Department
Sewer Maintenance Division

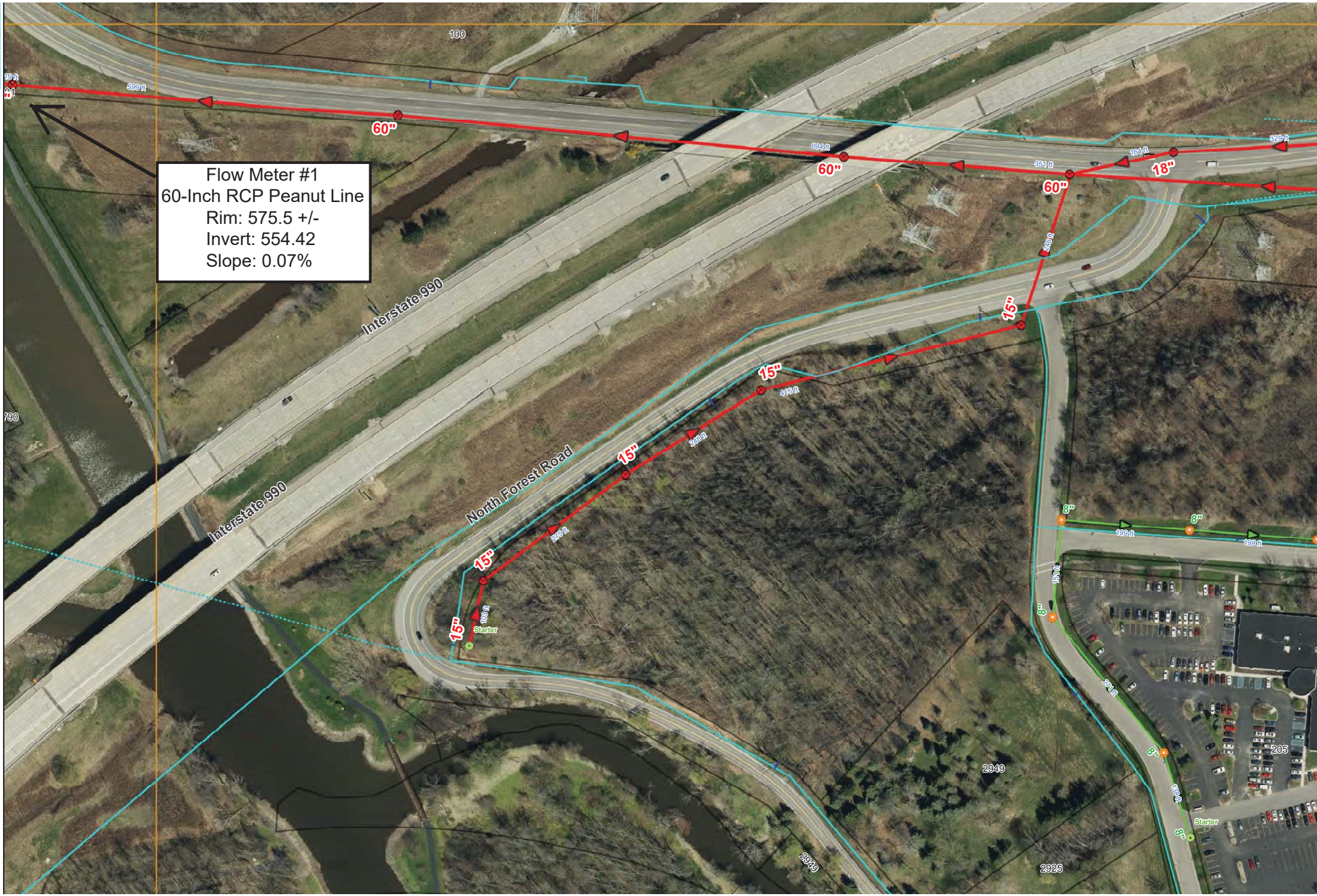
Main Sanitary Sewer Interceptors
DOWNSTREAM SEWER
AMHERST PEANUT LINE & WEST SIDE INTERCEPTOR

460 Dodge Road - Proposed 26 Unit Apartment Building - Amherst Consolidated Sewer District

- Project Location
 - Sanitary Routing
 - FLOW LOCATION POINT
- May 2020
Flows Updated: 1/18/19



Flow Meter #1
60-Inch RCP Peanut Line
Rim: 575.5 +/-
Invert: 554.42
Slope: 0.07%

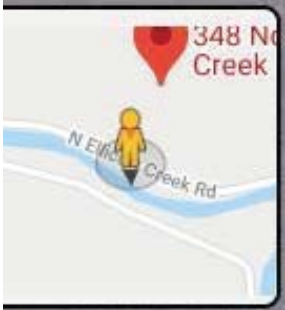


348 N Ellicott Creek Rd
Buffalo, New York



Street View

Flow Meter #2



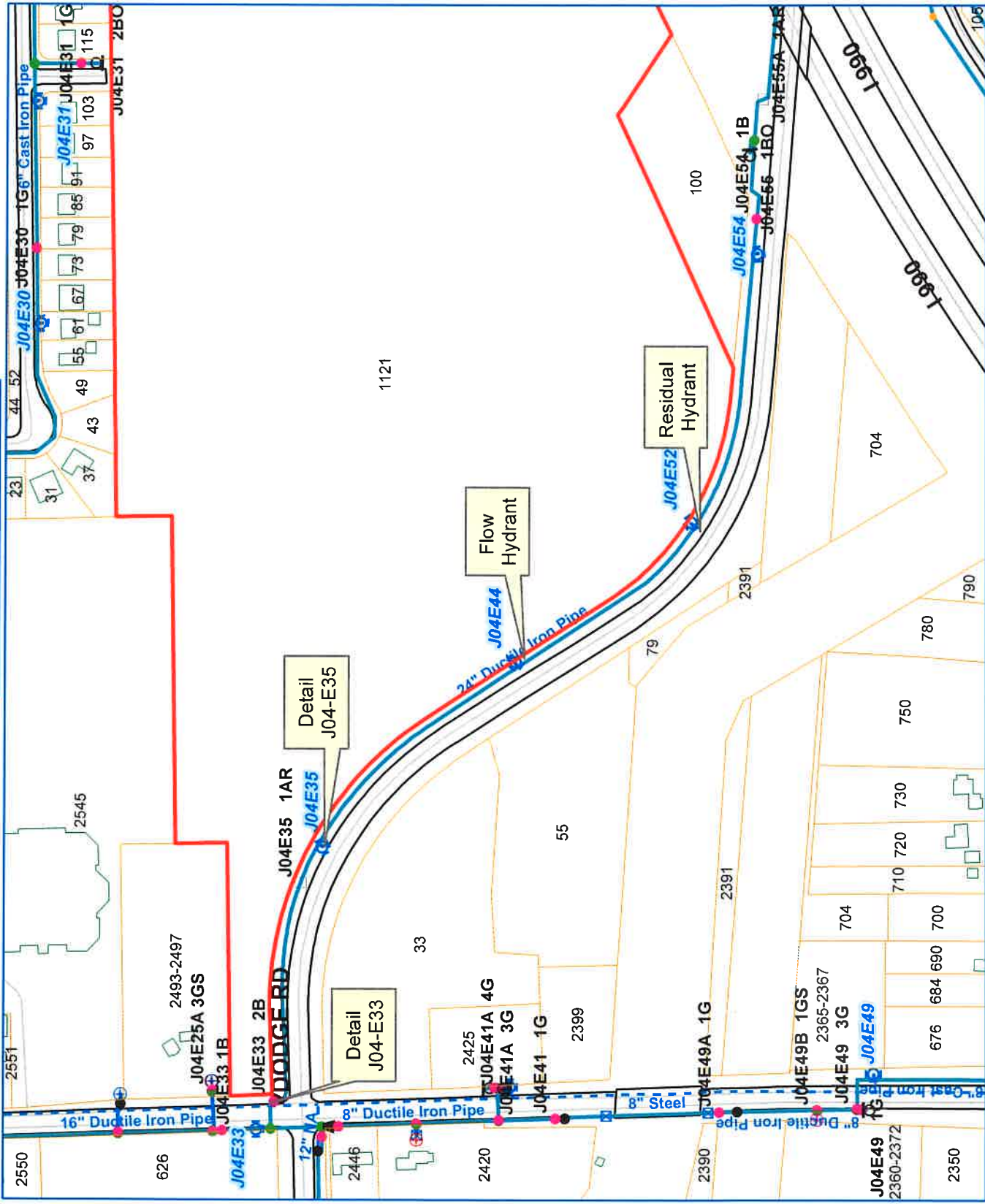
Google

Flow Meter #3



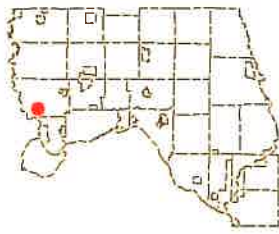
Water Demand Calculations

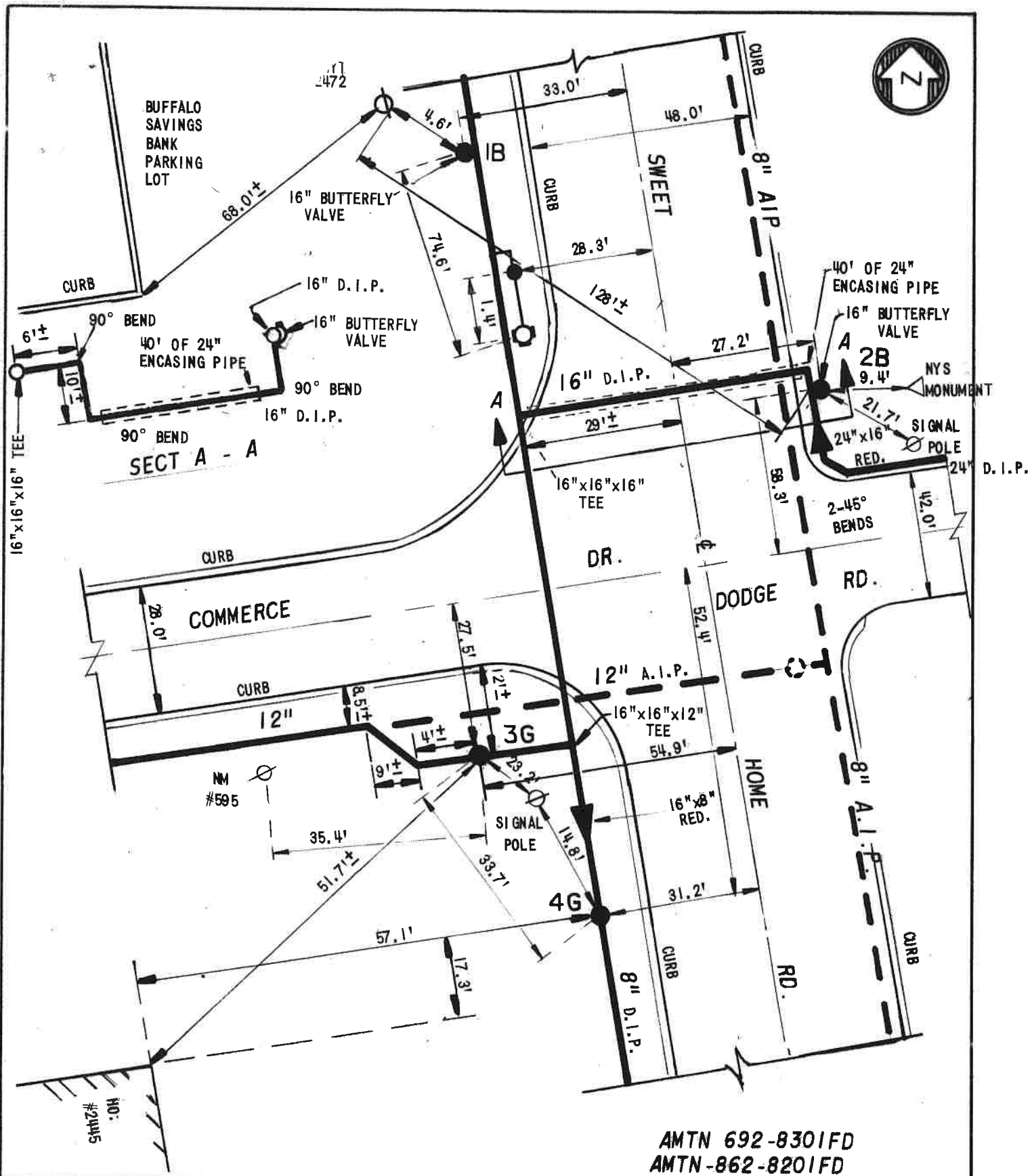
1121 Dodge Rd., AMTN



1 inch = 300 feet

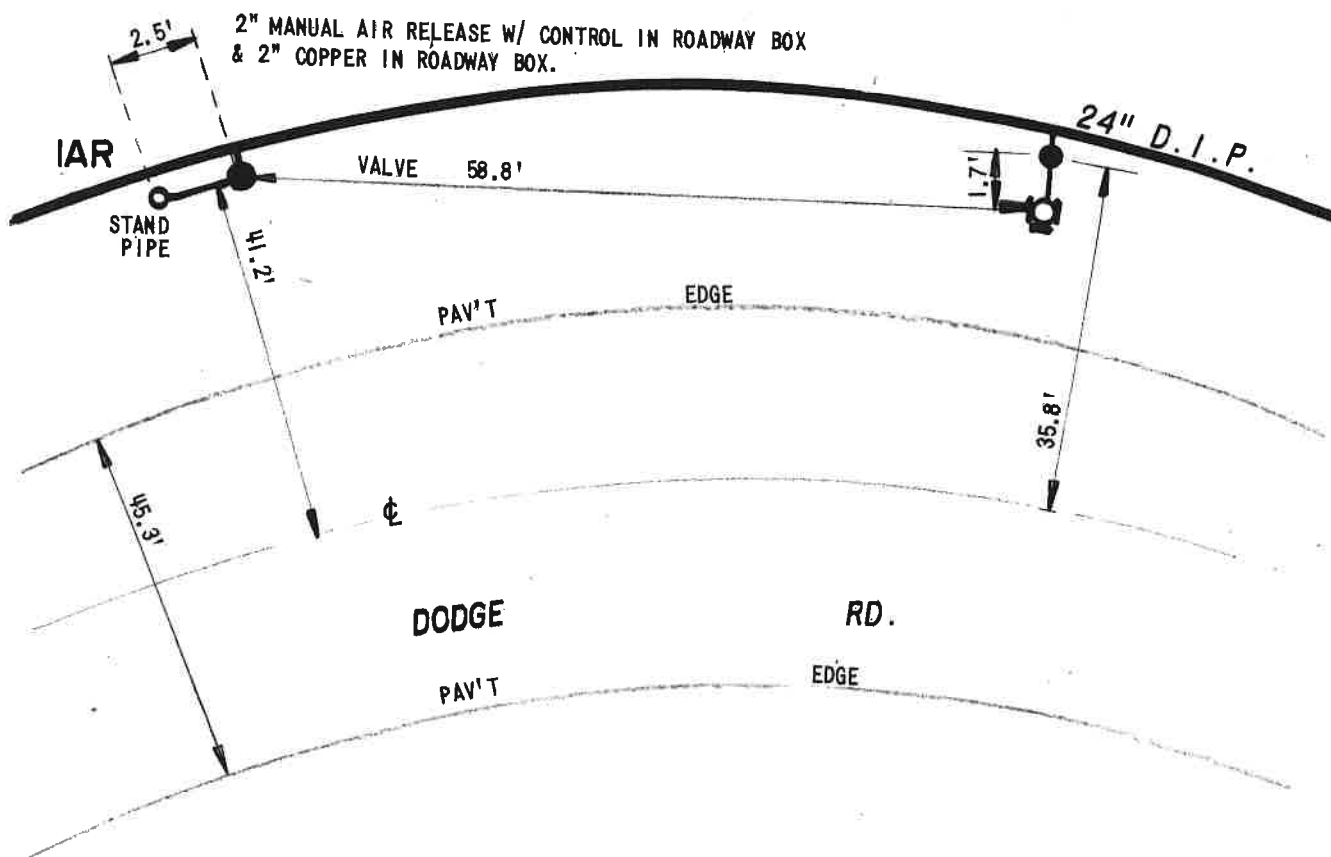
Legend:





AMTN 692-8301FD
 AMTN-862-8201FD

<p>ERIE COUNTY WATER AUTHORITY BUFFALO, NEW YORK</p>	REVISED DR. BY: RLS	TOWN OF AMHERST W.D 15C	JO4-E33 DETAIL SHEET NO.
	DATE: 6-30-06		
	NOT TO SCALE		



AMTN-692-8301-FD
SHEET 1

EC **ERIE COUNTY**
WA **WATER AUTHORITY**
BUFFALO, NEW YORK

REVISED
DR. BY: **RLS**
DATE: **6-30-06**
NOT TO SCALE

TOWN OF AMHERST
W.D. 15C

J04-E35

DETAIL SHEET NO.

Performed By: JRS & DPZ

Comments: HYDRANT FLOW TEST REQUESTED BY BILL GROFF
PRATT & HUTH, PHONE: 633-4844, FAX: 633-4940

Dischrg Coef: .90 Elvtn Usgs(ft): Static(psi): 105 Residual(psi): 98 Required Residual Pressure(psi): 20
Gallons Used.: 7,680 Total Flow(gpm): 2,558 Flow at Reqd Resid Pressure: 9,850

Flow Hydrants:

C	Flow Hyd	Flow Hydrant Address	Main/Branch	Nzle	Size	Pitot	Flow	Comments
-	J04 E44	DODGE RD	24"/6"	1:	2.50	58.0	1,279	
		2ND HYD E/O SWEET HOME RD		2:	2.50	58.0	1,279	
				3:				Tot Flow: 2,558

Bottom

I=Flow Hydrant Inquiry

ENTER=Continue F3=Exit F6=Maintain Test F7=Test Hydrant Inquiry F15=Print Test Information

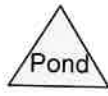
Appendix B

Storm Sewer System Drainage Calculations

Existing Runoff



Existing

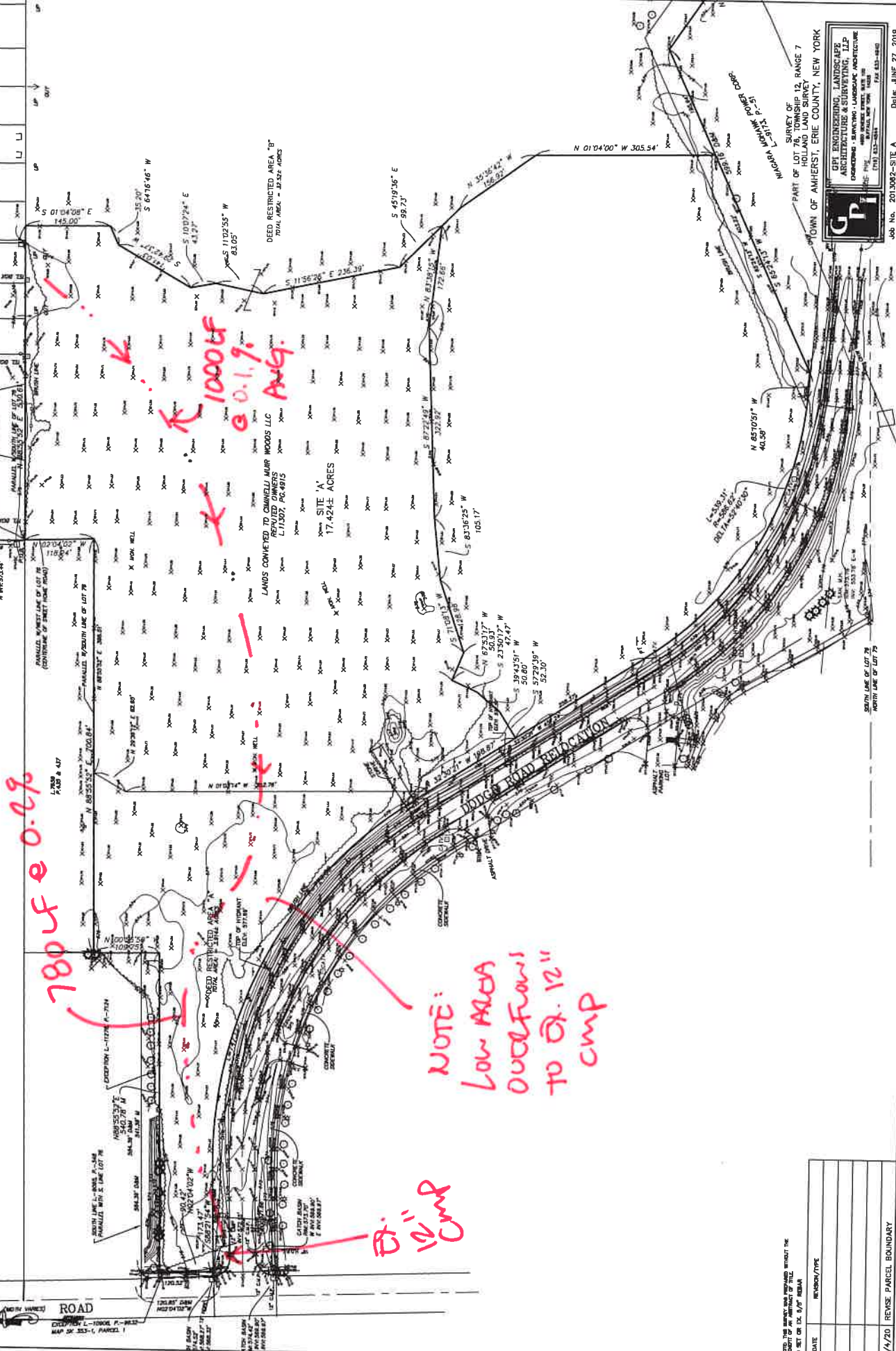


SEE MAP SHEET 2013002-SITE A FOR THE DEED COVERED BY THIS SURVEY TO THE SOUTHWEST CORNER OF LOT 78 TO THE NEW YORK STATE EDUCATION LINE.

PLEASANT ACRES PART III;
MAP COVER 2305

PLEASANT ACRES PART II;
MAP COVER 2273

CENTRAL SCHOOL DISTRICT No. 7 OF THE TOWNS
OF AMHERST & TOWNSHANDIA
L. 6846, P. 309, L. 7090, P. 207



780 LF ± 0.0%

1000 LF ± 0.1%

NOTE:
LOW AREA
OVERFRONT
TO EX. 12"
CMP

EX. 12" CMP

NOTE: THE BOUNDARY LINE SHOWN ON THIS MAP IS THE BOUNDARY OF AN INTEREST IN THE LAND AS SET OUT IN THE DEED REFERRED TO.

DATE	REVISION/TYPE
12/4/20	REVISE PARCEL BOUNDARY

SURVEY OF
PART OF LOT 78
HOLLAND LAND SURVEY
TOWNSHIP 13, RANGE 7
TOWN OF AMHERST, ERIE COUNTY, NEW YORK



GPI ENGINEERING, LANDSCAPE
ARCHITECTURE & SURVEYING, LLP
CHANDLER - LAWRENCE - LANDSCAPE ARCHITECTURE
1000 W. BROADWAY, SUITE 1000
ANN ARBOR, MI 48106-1000
TEL: (734) 769-1000 FAX: (734) 769-1000

Job No. 2013002-SITE A Date: JUNE 27, 2019
Scale: 1" = 100' TAX No.

21.011 Existing*Type II 24-hr 100-Year Rainfall=5.28"*

Prepared by Hewlett-Packard Company

Printed 3/1/2021

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Events for Subcatchment 1S: Existing

Event	Runoff (cfs)	Volume (acre-feet)	Depth (inches)
1-Year	0.87	0.578	0.41
2-Year	1.34	0.851	0.60
5-Year	2.14	1.304	0.92
10-Year	2.94	1.752	1.24
25-Year	4.34	2.527	1.78
50-Year	5.69	3.272	2.31
100-Year	7.33	4.181	2.95

21.011 Existing

Prepared by Hewlett-Packard Company

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Page 2

Area Listing (selected nodes)

Area (acres)	CN	Description (subcatchment-numbers)
4.830	77	Brush, Fair, HSG D (1S)
12.170	79	Woods, Fair, HSG D (1S)

21.011 Existing

Prepared by Hewlett-Packard Company

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Page 3

Soil Listing (selected nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
0.000	HSG B	
0.000	HSG C	
17.000	HSG D	1S
0.000	Other	

21.011 Existing

Prepared by Hewlett-Packard Company

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Page 4

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	4.830	0.000	4.830	Brush, Fair	1S
0.000	0.000	0.000	12.170	0.000	12.170	Woods, Fair	1S

21.011 Existing

Prepared by Hewlett-Packard Company

HydroCAD® 10.00-18 s/n 05019 © 2016 HydroCAD Software Solutions LLC

Type II 24-hr 1-Year Rainfall=1.86"

Printed 3/1/2021

Page 5

Summary for Subcatchment 1S: Existing

Runoff = 0.87 cfs @ 16.65 hrs, Volume= 0.578 af, Depth= 0.41"

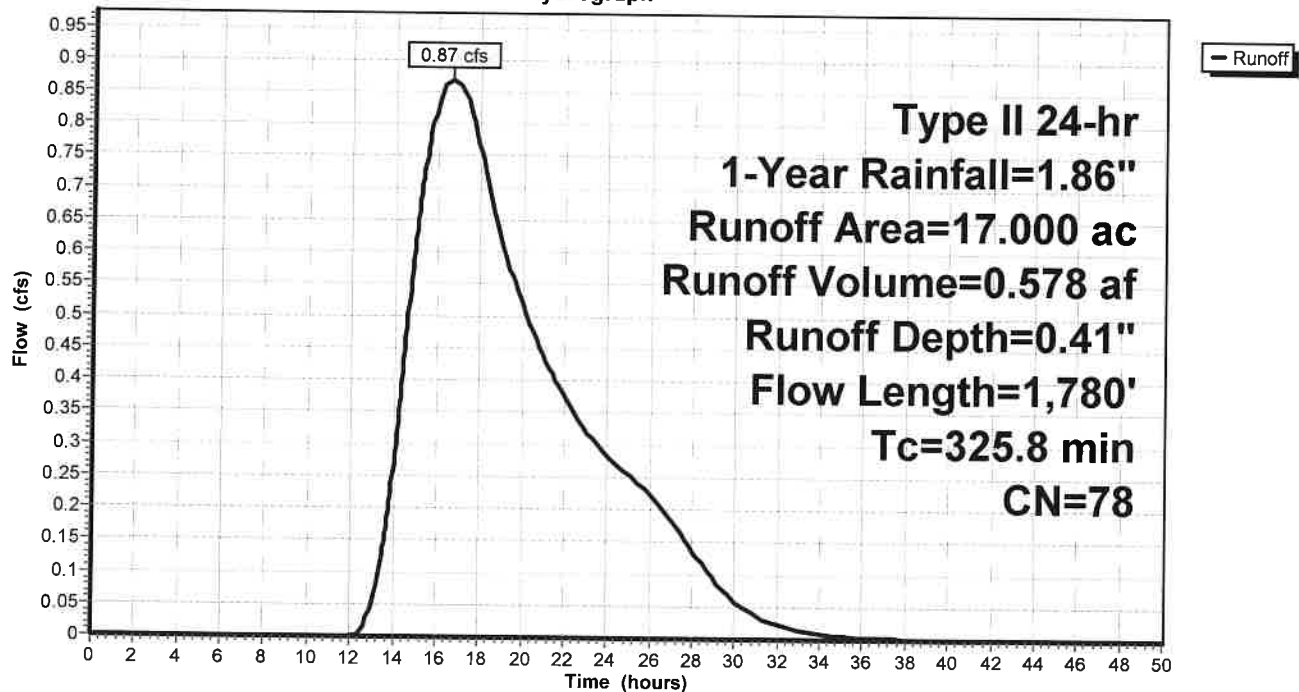
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs
Type II 24-hr 1-Year Rainfall=1.86"

Area (ac)	CN	Description
12.170	79	Woods, Fair, HSG D
4.830	77	Brush, Fair, HSG D
17.000	78	Weighted Average
17.000		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
193.9	300	0.0010	0.03		Sheet Flow, woods Woods: Light underbrush n= 0.400 P2= 2.50"
73.8	700	0.0010	0.16		Shallow Concentrated Flow, woods Woodland Kv= 5.0 fps
58.1	780	0.0020	0.22		Shallow Concentrated Flow, woods Woodland Kv= 5.0 fps
325.8	1,780	Total			

Subcatchment 1S: Existing

Hydrograph



21.011 Existing

Prepared by Hewlett-Packard Company

HydroCAD® 10.00-18 s/n 05019 © 2016 HydroCAD Software Solutions LLC

Type II 24-hr 2-Year Rainfall=2.20"

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Page 6

Summary for Subcatchment 1S: Existing

Runoff = 1.34 cfs @ 16.35 hrs, Volume= 0.851 af, Depth= 0.60"

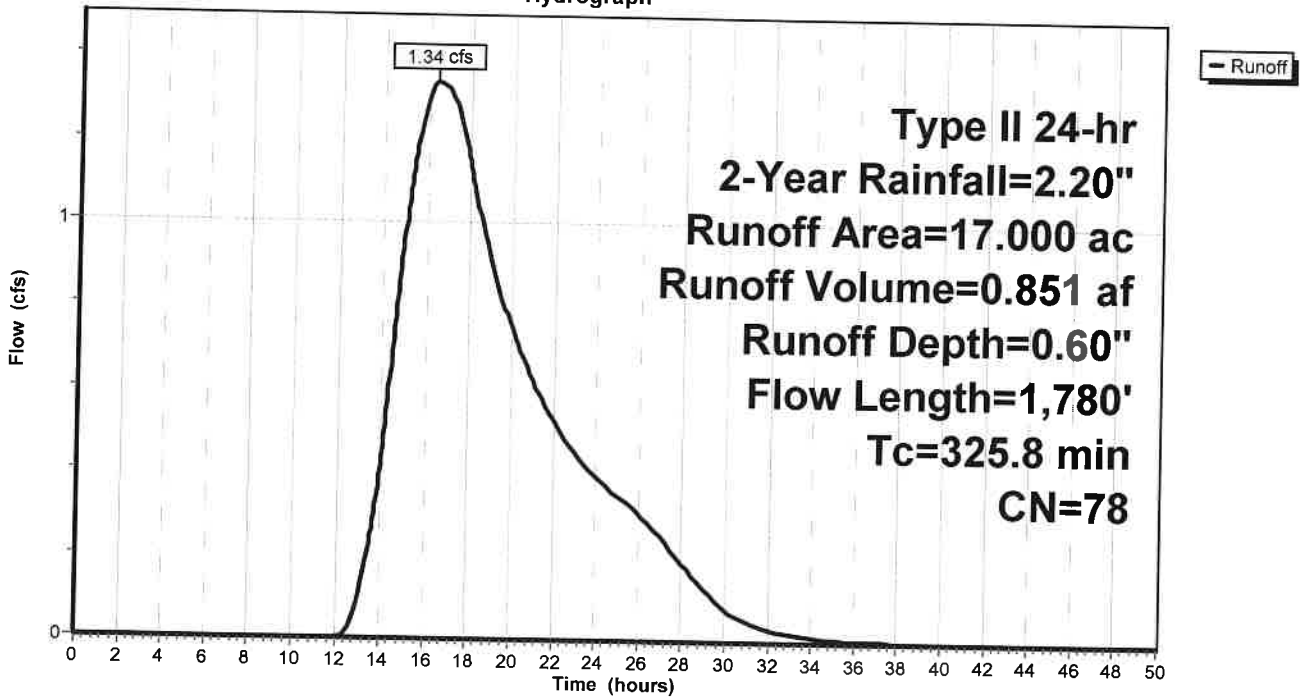
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs
Type II 24-hr 2-Year Rainfall=2.20"

Area (ac)	CN	Description
12.170	79	Woods, Fair, HSG D
4.830	77	Brush, Fair, HSG D
17.000	78	Weighted Average
17.000		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
193.9	300	0.0010	0.03		Sheet Flow, woods
73.8	700	0.0010	0.16		Woods: Light underbrush n= 0.400 P2= 2.50" Shallow Concentrated Flow, woods
58.1	780	0.0020	0.22		Woodland Kv= 5.0 fps Shallow Concentrated Flow, woods
325.8	1,780	Total			Woodland Kv= 5.0 fps

Subcatchment 1S: Existing

Hydrograph



21.011 Existing

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Type II 24-hr 5-Year Rainfall=2.70"

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Page 7

Summary for Subcatchment 1S: Existing

Runoff = 2.14 cfs @ 16.31 hrs, Volume= 1.304 af, Depth= 0.92"

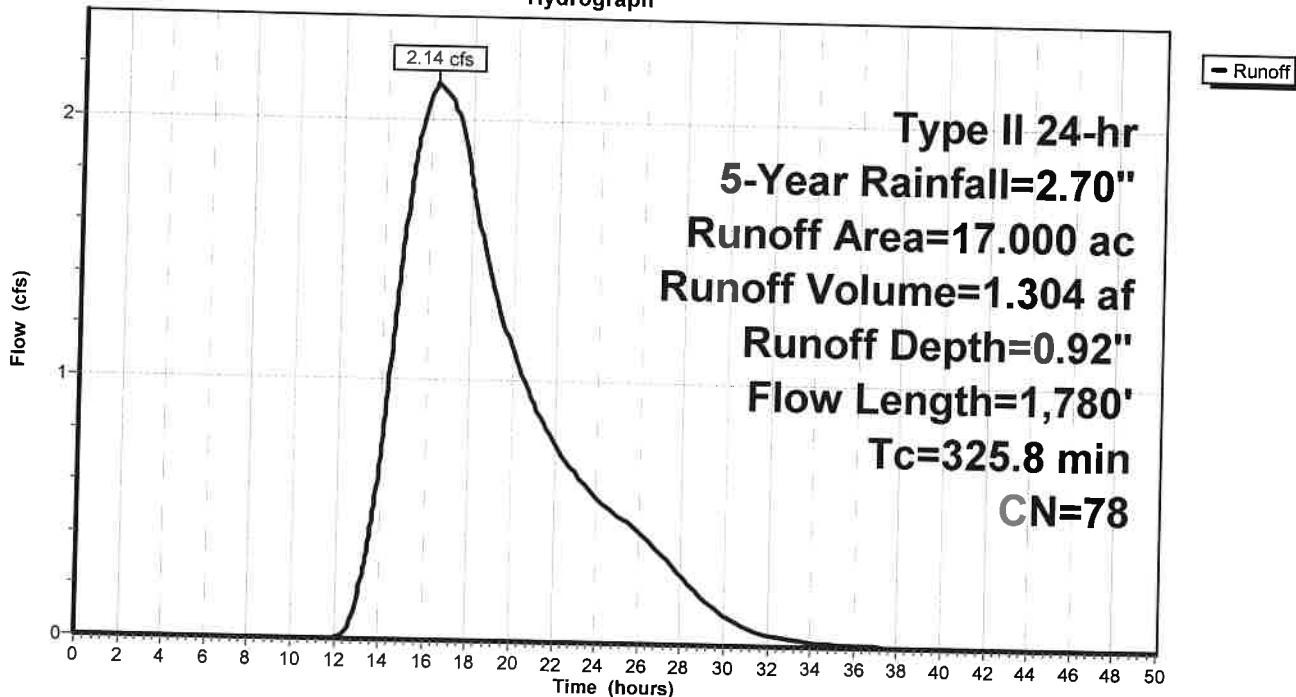
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs
Type II 24-hr 5-Year Rainfall=2.70"

Area (ac)	CN	Description
12.170	79	Woods, Fair, HSG D
4.830	77	Brush, Fair, HSG D
17.000	78	Weighted Average
17.000		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
193.9	300	0.0010	0.03		Sheet Flow, woods
73.8	700	0.0010	0.16		Woods: Light underbrush n= 0.400 P2= 2.50" Shallow Concentrated Flow, woods
58.1	780	0.0020	0.22		Woodland Kv= 5.0 fps Shallow Concentrated Flow, woods
325.8	1,780	Total			Woodland Kv= 5.0 fps

Subcatchment 1S: Existing

Hydrograph



21.011 Existing

Prepared by Hewlett-Packard Company

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Type II 24-hr 10-Year Rainfall=3.15"

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Page 8

Summary for Subcatchment 1S: Existing

Runoff = 2.94 cfs @ 16.31 hrs, Volume= 1.752 af, Depth= 1.24"

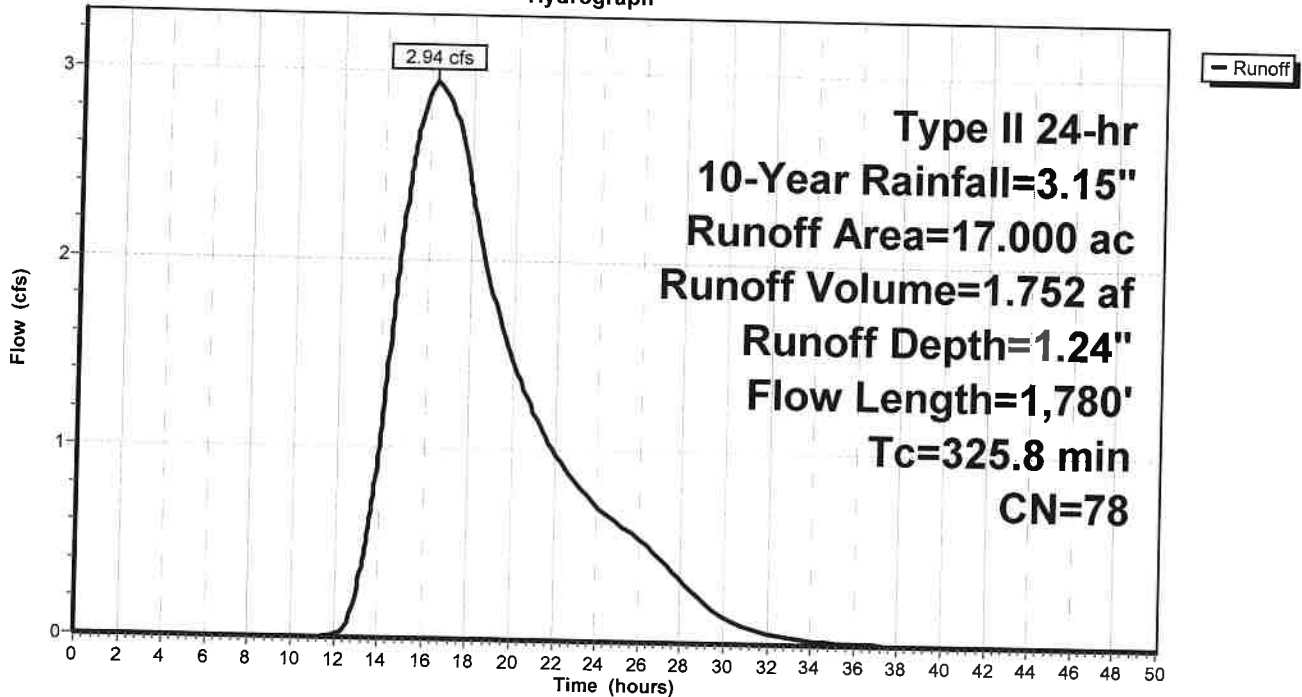
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-Year Rainfall=3.15"

Area (ac)	CN	Description
12.170	79	Woods, Fair, HSG D
4.830	77	Brush, Fair, HSG D
17.000	78	Weighted Average
17.000		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
193.9	300	0.0010	0.03		Sheet Flow, woods
73.8	700	0.0010	0.16		Woods: Light underbrush n= 0.400 P2= 2.50"
58.1	780	0.0020	0.22		Shallow Concentrated Flow, woods
					Woodland Kv= 5.0 fps
325.8	1,780	Total			Shallow Concentrated Flow, woods
					Woodland Kv= 5.0 fps

Subcatchment 1S: Existing

Hydrograph



21.011 Existing

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Type II 24-hr 25-Year Rainfall=3.87"

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Page 9

Summary for Subcatchment 1S: Existing

Runoff = 4.34 cfs @ 16.30 hrs, Volume= 2.527 af, Depth= 1.78"

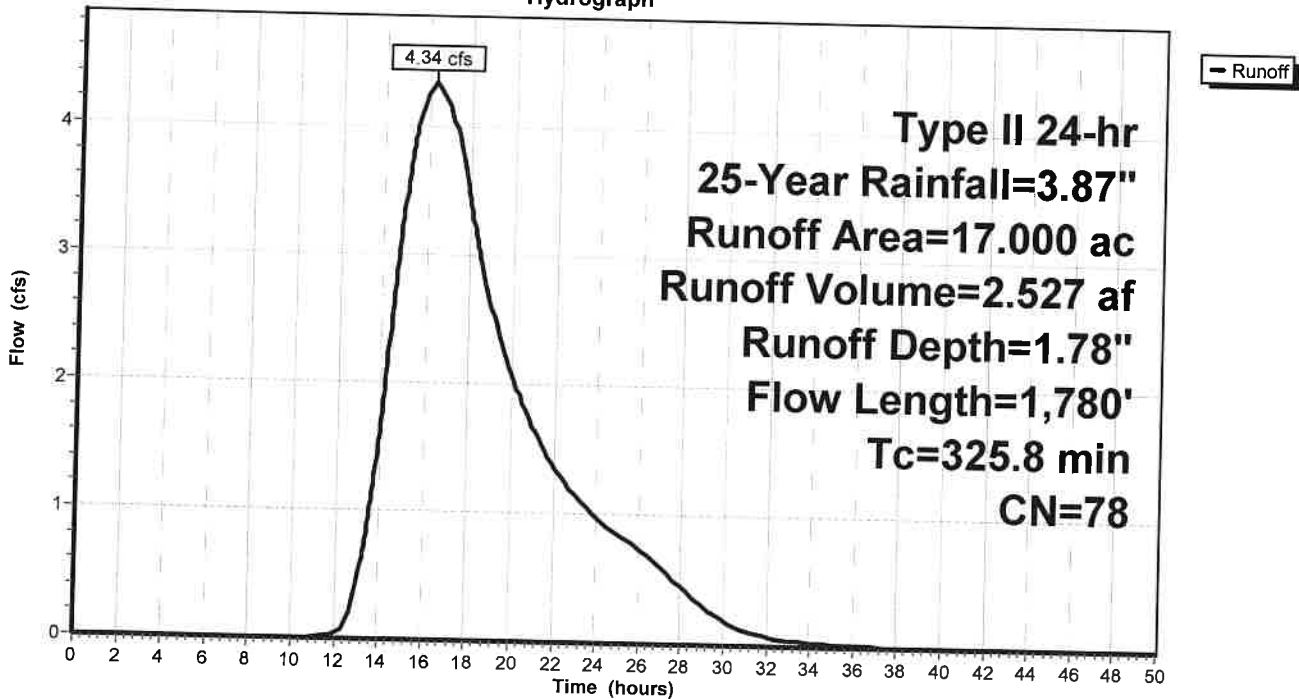
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs
Type II 24-hr 25-Year Rainfall=3.87"

Area (ac)	CN	Description
12.170	79	Woods, Fair, HSG D
4.830	77	Brush, Fair, HSG D
17.000	78	Weighted Average
17.000		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
193.9	300	0.0010	0.03		Sheet Flow, woods
73.8	700	0.0010	0.16		Woods: Light underbrush n= 0.400 P2= 2.50"
58.1	780	0.0020	0.22		Shallow Concentrated Flow, woods
					Woodland Kv= 5.0 fps
325.8	1,780	Total			Shallow Concentrated Flow, woods
					Woodland Kv= 5.0 fps

Subcatchment 1S: Existing

Hydrograph



21.011 Existing

Prepared by Hewlett-Packard Company

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Type II 24-hr 50-Year Rainfall=4.52"

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Page 10

Summary for Subcatchment 1S: Existing

Runoff = 5.69 cfs @ 16.29 hrs, Volume= 3.272 af, Depth= 2.31"

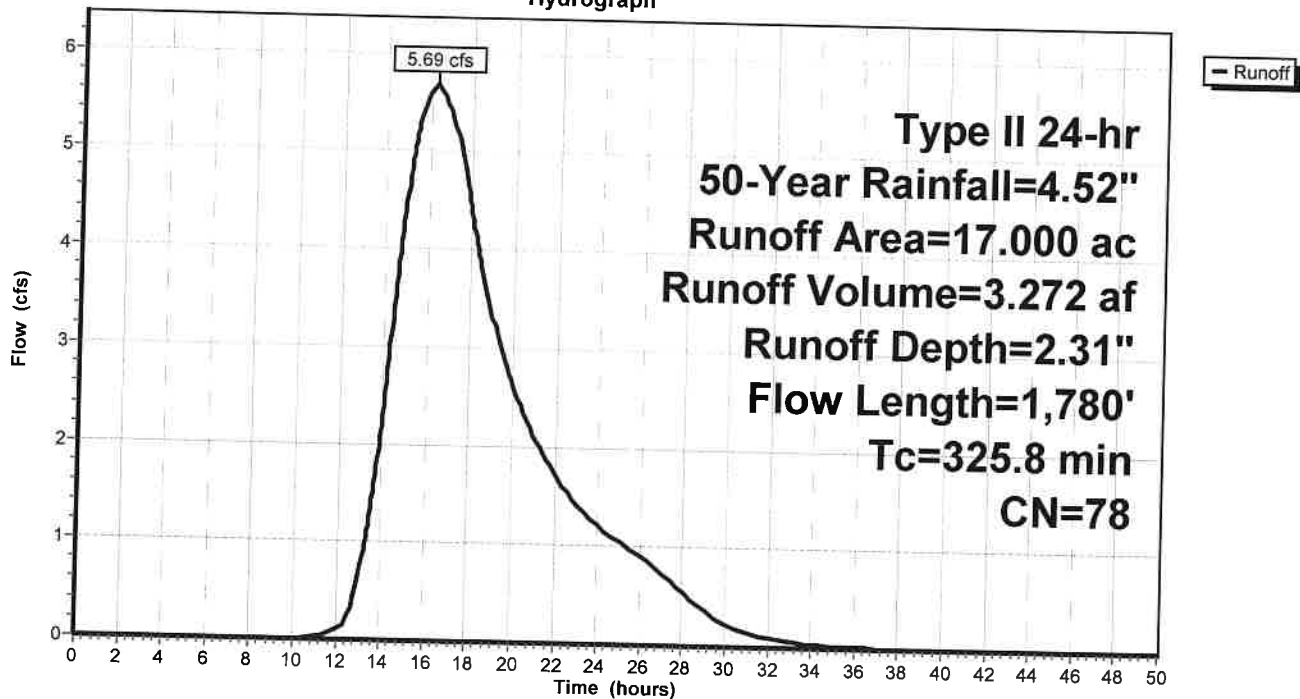
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs
Type II 24-hr 50-Year Rainfall=4.52"

Area (ac)	CN	Description
12.170	79	Woods, Fair, HSG D
4.830	77	Brush, Fair, HSG D
17.000	78	Weighted Average
17.000		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
193.9	300	0.0010	0.03		Sheet Flow, woods
73.8	700	0.0010	0.16		Woods: Light underbrush n= 0.400 P2= 2.50"
58.1	780	0.0020	0.22		Shallow Concentrated Flow, woods
					Woodland Kv= 5.0 fps
325.8	1,780	Total			Shallow Concentrated Flow, woods
					Woodland Kv= 5.0 fps

Subcatchment 1S: Existing

Hydrograph



21.011 Existing

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Type II 24-hr 100-Year Rainfall=5.28"

Printed 3/1/2021

Page 11

Summary for Subcatchment 1S: Existing

Runoff = 7.33 cfs @ 16.29 hrs, Volume= 4.181 af, Depth= 2.95"

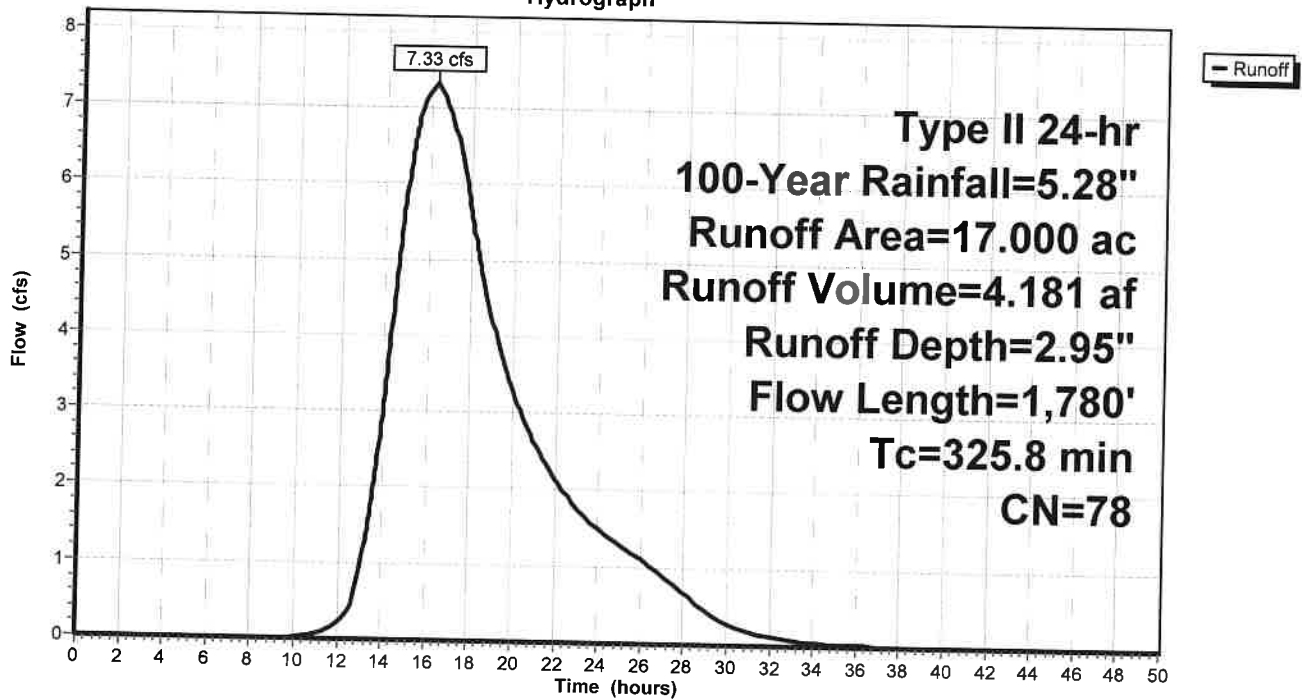
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs
Type II 24-hr 100-Year Rainfall=5.28"

Area (ac)	CN	Description
12.170	79	Woods, Fair, HSG D
4.830	77	Brush, Fair, HSG D
17.000	78	Weighted Average
17.000		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
193.9	300	0.0010	0.03		Sheet Flow, woods
73.8	700	0.0010	0.16		Woods: Light underbrush n= 0.400 P2= 2.50"
58.1	780	0.0020	0.22		Shallow Concentrated Flow, woods
					Woodland Kv= 5.0 fps
325.8	1,780	Total			Shallow Concentrated Flow, woods
					Woodland Kv= 5.0 fps

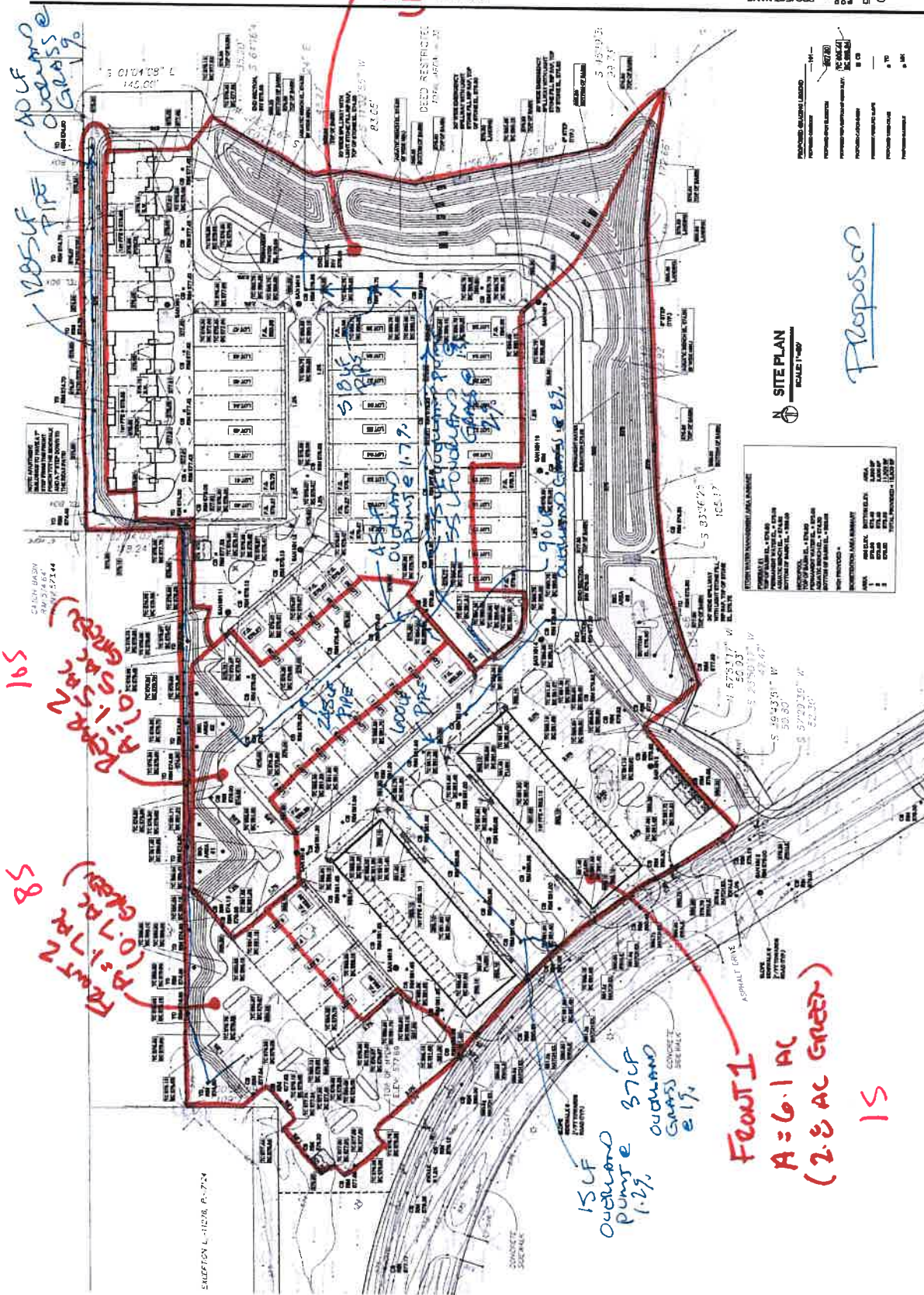
Subcatchment 1S: Existing

Hydrograph



Proposed Runoff

Proposed Runoff - East



105
AREA 1-5 AC (GREEN)
FRONT 2
A=1.7 AC (GREEN)

85
FRONT 2
A=1.7 AC (GREEN)

105
AREA 2-4 AC (GREEN)
FRONT 1
A=4.4 AC (GREEN)

FRONT 1
A=6.1 AC (2.8 AC GREEN)

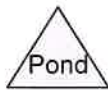
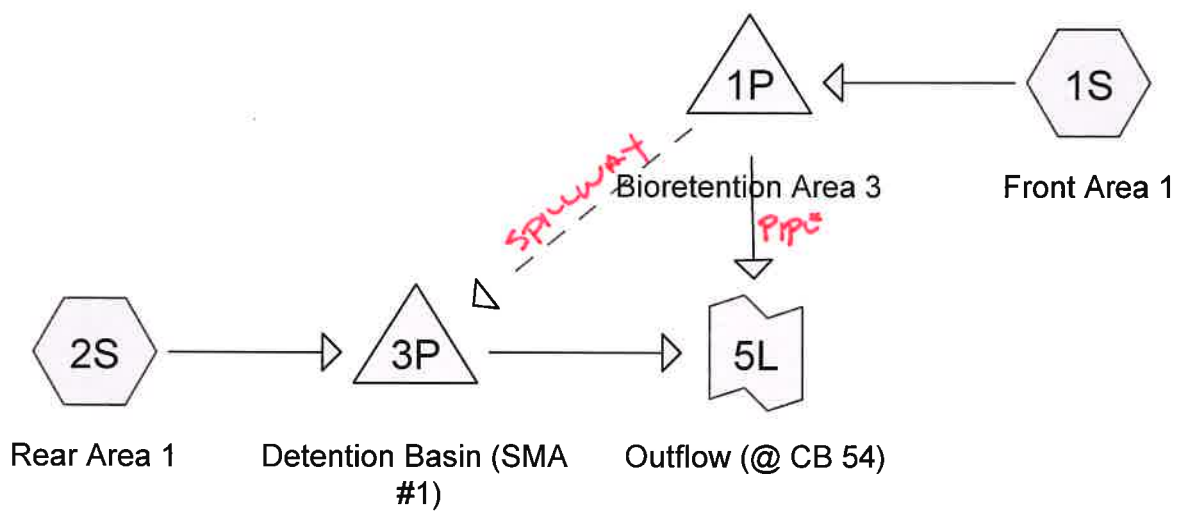
15

N SITE PLAN
 SCALE 1"=40'

PROPOSED EXISTENTIAL AREAS SUMMARY			
AREA	AREA (SQ FEET)	PERCENT GREEN	TOTAL PERCENT GREEN (SQ FT)
1	15,000	20%	3,000
2	37,500	20%	7,500
3	105,000	20%	21,000
4	105,000	20%	21,000
5	510,000	20%	102,000
6	55,000	20%	11,000
7	45,000	20%	9,000
8	90,000	20%	18,000
9	105,000	20%	21,000
10	105,000	20%	21,000
11	105,000	20%	21,000
12	105,000	20%	21,000
13	105,000	20%	21,000
14	105,000	20%	21,000
15	105,000	20%	21,000
16	105,000	20%	21,000
17	105,000	20%	21,000
18	105,000	20%	21,000
19	105,000	20%	21,000
20	105,000	20%	21,000
21	105,000	20%	21,000
22	105,000	20%	21,000
23	105,000	20%	21,000
24	105,000	20%	21,000
25	105,000	20%	21,000
26	105,000	20%	21,000
27	105,000	20%	21,000
28	105,000	20%	21,000
29	105,000	20%	21,000
30	105,000	20%	21,000
31	105,000	20%	21,000
32	105,000	20%	21,000
33	105,000	20%	21,000
34	105,000	20%	21,000
35	105,000	20%	21,000
36	105,000	20%	21,000
37	105,000	20%	21,000
38	105,000	20%	21,000
39	105,000	20%	21,000
40	105,000	20%	21,000
41	105,000	20%	21,000
42	105,000	20%	21,000
43	105,000	20%	21,000
44	105,000	20%	21,000
45	105,000	20%	21,000
46	105,000	20%	21,000
47	105,000	20%	21,000
48	105,000	20%	21,000
49	105,000	20%	21,000
50	105,000	20%	21,000

Proposor

THIS PLAN IS FOR INFORMATION ONLY. IT IS NOT TO BE USED FOR CONSTRUCTION OR AS A CONTRACT DOCUMENT. THE USER SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS FROM THE APPROPRIATE AGENCIES AND AUTHORITIES. THE USER SHALL BE RESPONSIBLE FOR VERIFYING THE ACCURACY OF ALL INFORMATION AND DATA PROVIDED TO THE ENGINEER. THE ENGINEER SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS FROM THE APPROPRIATE AGENCIES AND AUTHORITIES. THE ENGINEER SHALL BE RESPONSIBLE FOR VERIFYING THE ACCURACY OF ALL INFORMATION AND DATA PROVIDED TO THE ENGINEER.



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Type II 24-hr 100-Year Rainfall=5.28"

Printed 3/4/2021

Events for Link 5L: Outflow (@ CB 54)

Event	Inflow (cfs)	Primary (cfs)	Elevation (feet)
1-Year	2.78	2.78	0.00
2-Year	2.86	2.86	0.00
5-Year	3.01	3.01	0.00
10-Year	3.16	3.16	0.00
25-Year	3.36	3.36	0.00
50-Year	3.48	3.48	0.00
100-Year	3.60	3.60	0.00

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Type II 24-hr 100-Year Rainfall=5.28"

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Events for Pond 3P: Detention Basin (SMA #1)

Event	Inflow (cfs)	Outflow (cfs)	Primary (cfs)	Secondary (cfs)	Elevation (feet)	Storage (cubic-feet)
1-Year	6.05	0.10	0.10	0.00	575.23	13,685
2-Year	12.29	0.18	0.18	0.00	575.32	19,129
5-Year	20.08	0.33	0.33	0.00	575.46	28,218
10-Year	26.01	0.47	0.47	0.00	575.60	37,117
25-Year	34.94	0.64	0.64	0.00	575.83	51,964
50-Year	42.93	1.97	0.72	1.25	576.00	62,935
100-Year	52.24	8.57	0.78	7.80	576.11	70,722

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TO
WETLANDS

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Type II 24-hr 100-Year Rainfall=5.28"

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Events for Pond 1P: Bioretention Area 3

Event	Inflow (cfs)	Outflow (cfs)	Primary (cfs)	Secondary (cfs)	Elevation (feet)	Storage (cubic-feet)
1-Year	8.17	4.38	2.74	1.63	575.82	7,520
2-Year	10.57	8.19	2.79	5.41	575.91	8,359
5-Year	14.18	12.91	2.83	10.09	575.99	9,153
10-Year	17.46	16.45	2.85	13.60	576.04	9,672
25-Year	22.74	21.73	2.89	18.84	576.11	10,375
50-Year	27.50	26.43	2.91	23.52	576.17	10,954
100-Year	33.05	31.92	2.94	28.98	576.23	11,585

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Area Listing (selected nodes)

Area (acres)	CN	Description (subcatchment-numbers)
4.500	80	>75% Grass cover, Good, HSG D (1S, 2S)
3.200	98	Paved parking, HSG D (1S, 2S)
2.800	98	Roofs, HSG D (1S, 2S)
10.500	90	TOTAL AREA

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Soil Listing (selected nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
0.000	HSG B	
0.000	HSG C	
10.500	HSG D	1S, 2S
0.000	Other	
10.500		TOTAL AREA

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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	4.500	0.000	4.500	>75% Grass cover, Good	1S, 2S
0.000	0.000	0.000	3.200	0.000	3.200	Paved parking	1S, 2S
0.000	0.000	0.000	2.800	0.000	2.800	Roofs	1S, 2S
0.000	0.000	0.000	10.500	0.000	10.500	TOTAL AREA	

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Type II 24-hr 1-Year Rainfall=1.86"

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Time span=0.00-60.00 hrs, dt=0.01 hrs, 6001 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: Front Area 1

Runoff Area=6.100 ac 54.10% Impervious Runoff Depth=0.98"
Flow Length=652' Tc=13.3 min CN=90 Runoff=8.17 cfs 0.496 af

Subcatchment 2S: Rear Area 1

Runoff Area=4.400 ac 61.36% Impervious Runoff Depth=1.04"
Flow Length=683' Tc=14.4 min CN=91 Runoff=6.05 cfs 0.382 af

Pond 1P: Bioretention Area 3

Peak Elev=575.82' Storage=7,520 cf Inflow=8.17 cfs 0.496 af
Primary=2.74 cfs 0.475 af Secondary=1.63 cfs 0.021 af Outflow=4.38 cfs 0.496 af

Pond 3P: Detention Basin (SMA #1)

Peak Elev=575.23' Storage=13,685 cf Inflow=6.05 cfs 0.403 af
Primary=0.10 cfs 0.249 af Secondary=0.00 cfs 0.000 af Outflow=0.10 cfs 0.249 af

Link 5L: Outflow (@ CB 54)

Inflow=2.78 cfs 0.724 af
Primary=2.78 cfs 0.724 af

Total Runoff Area = 10.500 ac Runoff Volume = 0.878 af Average Runoff Depth = 1.00"
42.86% Pervious = 4.500 ac 57.14% Impervious = 6.000 ac

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Type II 24-hr 1-Year Rainfall=1.86"

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Summary for Subcatchment 1S: Front Area 1

Runoff = 8.17 cfs @ 12.05 hrs, Volume= 0.496 af, Depth= 0.98"

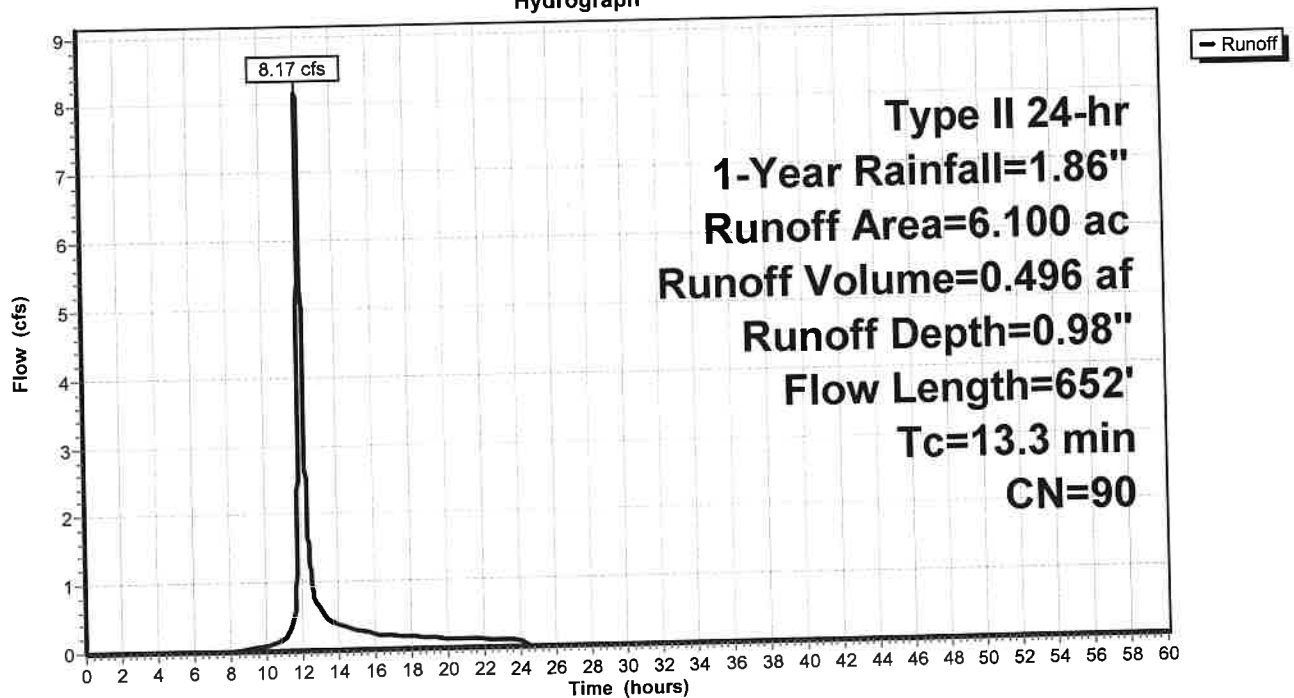
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
 Type II 24-hr 1-Year Rainfall=1.86"

Area (ac)	CN	Description
1.800	98	Paved parking, HSG D
1.500	98	Roofs, HSG D
2.800	80	>75% Grass cover, Good, HSG D
6.100	90	Weighted Average
2.800		45.90% Pervious Area
3.300		54.10% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.6	37	0.0100	0.06		Sheet Flow, grass Grass: Dense n= 0.240 P2= 2.50"
0.4	15	0.0120	0.68		Sheet Flow, pavement Smooth surfaces n= 0.011 P2= 2.50"
3.3	600		3.00		Direct Entry, pipe flow
13.3	652	Total			

Subcatchment 1S: Front Area 1

Hydrograph



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Type II 24-hr 1-Year Rainfall=1.86"

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Hydrograph for Subcatchment 1S: Front Area 1

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	52.00	1.86	0.98	0.00
1.00	0.02	0.00	0.00	53.00	1.86	0.98	0.00
2.00	0.04	0.00	0.00	54.00	1.86	0.98	0.00
3.00	0.06	0.00	0.00	55.00	1.86	0.98	0.00
4.00	0.09	0.00	0.00	56.00	1.86	0.98	0.00
5.00	0.12	0.00	0.00	57.00	1.86	0.98	0.00
6.00	0.15	0.00	0.00	58.00	1.86	0.98	0.00
7.00	0.18	0.00	0.00	59.00	1.86	0.98	0.00
8.00	0.22	0.00	0.00	60.00	1.86	0.98	0.00
9.00	0.27	0.00	0.02				
10.00	0.34	0.01	0.07				
11.00	0.44	0.03	0.20				
12.00	1.23	0.48	7.23				
13.00	1.44	0.63	0.63				
14.00	1.53	0.70	0.37				
15.00	1.59	0.75	0.29				
16.00	1.64	0.79	0.23				
17.00	1.68	0.83	0.20				
18.00	1.71	0.85	0.17				
19.00	1.74	0.88	0.15				
20.00	1.77	0.90	0.13				
21.00	1.79	0.92	0.12				
22.00	1.82	0.94	0.12				
23.00	1.84	0.96	0.11				
24.00	1.86	0.98	0.11				
25.00	1.86	0.98	0.00				
26.00	1.86	0.98	0.00				
27.00	1.86	0.98	0.00				
28.00	1.86	0.98	0.00				
29.00	1.86	0.98	0.00				
30.00	1.86	0.98	0.00				
31.00	1.86	0.98	0.00				
32.00	1.86	0.98	0.00				
33.00	1.86	0.98	0.00				
34.00	1.86	0.98	0.00				
35.00	1.86	0.98	0.00				
36.00	1.86	0.98	0.00				
37.00	1.86	0.98	0.00				
38.00	1.86	0.98	0.00				
39.00	1.86	0.98	0.00				
40.00	1.86	0.98	0.00				
41.00	1.86	0.98	0.00				
42.00	1.86	0.98	0.00				
43.00	1.86	0.98	0.00				
44.00	1.86	0.98	0.00				
45.00	1.86	0.98	0.00				
46.00	1.86	0.98	0.00				
47.00	1.86	0.98	0.00				
48.00	1.86	0.98	0.00				
49.00	1.86	0.98	0.00				
50.00	1.86	0.98	0.00				
51.00	1.86	0.98	0.00				

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Type II 24-hr 1-Year Rainfall=1.86"

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Summary for Subcatchment 2S: Rear Area 1

Runoff = 6.05 cfs @ 12.06 hrs, Volume= 0.382 af, Depth= 1.04"

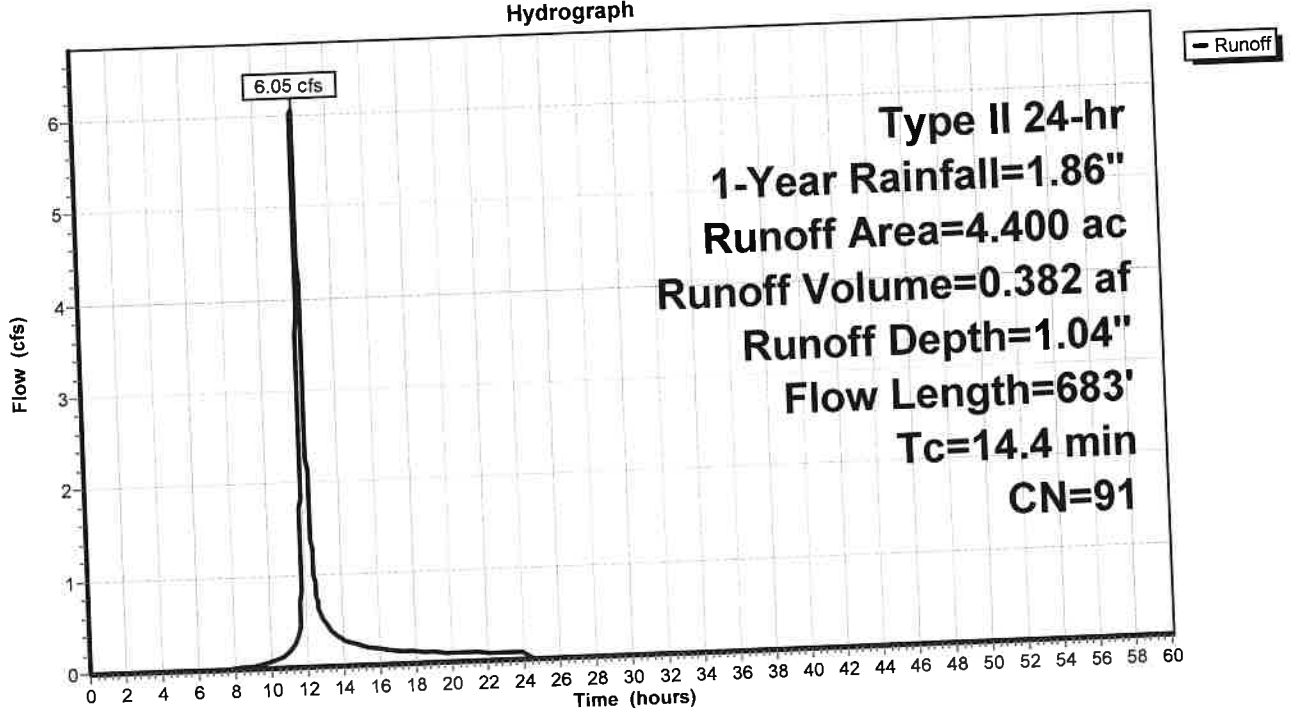
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
 Type II 24-hr 1-Year Rainfall=1.86"

Area (ac)	CN	Description
1.400	98	Paved parking, HSG D
1.300	98	Roofs, HSG D
1.700	80	>75% Grass cover, Good, HSG D
4.400	91	Weighted Average
1.700		38.64% Pervious Area
2.700		61.36% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.2	90	0.0200	0.15		Sheet Flow, grass Grass: Short n= 0.150 P2= 2.50"
1.3	75	0.0130	0.97		Sheet Flow, pavement Smooth surfaces n= 0.011 P2= 2.50"
2.9	518		3.00		Direct Entry, Pipe flow
14.4	683	Total			

Subcatchment 2S: Rear Area 1

Hydrograph



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Type II 24-hr 1-Year Rainfall=1.86"

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Hydrograph for Subcatchment 2S: Rear Area 1

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	52.00	1.86	1.04	0.00
1.00	0.02	0.00	0.00	53.00	1.86	1.04	0.00
2.00	0.04	0.00	0.00	54.00	1.86	1.04	0.00
3.00	0.06	0.00	0.00	55.00	1.86	1.04	0.00
4.00	0.09	0.00	0.00	56.00	1.86	1.04	0.00
5.00	0.12	0.00	0.00	57.00	1.86	1.04	0.00
6.00	0.15	0.00	0.00	58.00	1.86	1.04	0.00
7.00	0.18	0.00	0.00	59.00	1.86	1.04	0.00
8.00	0.22	0.00	0.01	60.00	1.86	1.04	0.00
9.00	0.27	0.01	0.03				
10.00	0.34	0.02	0.06				
11.00	0.44	0.05	0.17				
12.00	1.23	0.53	5.18				
13.00	1.44	0.69	0.48				
14.00	1.53	0.76	0.28				
15.00	1.59	0.81	0.21				
16.00	1.64	0.85	0.17				
17.00	1.68	0.89	0.15				
18.00	1.71	0.92	0.13				
19.00	1.74	0.94	0.11				
20.00	1.77	0.97	0.10				
21.00	1.79	0.99	0.09				
22.00	1.82	1.01	0.09				
23.00	1.84	1.02	0.08				
24.00	1.86	1.04	0.08				
25.00	1.86	1.04	0.00				
26.00	1.86	1.04	0.00				
27.00	1.86	1.04	0.00				
28.00	1.86	1.04	0.00				
29.00	1.86	1.04	0.00				
30.00	1.86	1.04	0.00				
31.00	1.86	1.04	0.00				
32.00	1.86	1.04	0.00				
33.00	1.86	1.04	0.00				
34.00	1.86	1.04	0.00				
35.00	1.86	1.04	0.00				
36.00	1.86	1.04	0.00				
37.00	1.86	1.04	0.00				
38.00	1.86	1.04	0.00				
39.00	1.86	1.04	0.00				
40.00	1.86	1.04	0.00				
41.00	1.86	1.04	0.00				
42.00	1.86	1.04	0.00				
43.00	1.86	1.04	0.00				
44.00	1.86	1.04	0.00				
45.00	1.86	1.04	0.00				
46.00	1.86	1.04	0.00				
47.00	1.86	1.04	0.00				
48.00	1.86	1.04	0.00				
49.00	1.86	1.04	0.00				
50.00	1.86	1.04	0.00				
51.00	1.86	1.04	0.00				

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Type II 24-hr 1-Year Rainfall=1.86"
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Summary for Pond 1P: Bioretention Area 3

Inflow Area = 6.100 ac, 54.10% Impervious, Inflow Depth = 0.98" for 1-Year event
 Inflow = 8.17 cfs @ 12.05 hrs, Volume= 0.496 af
 Outflow = 4.38 cfs @ 12.19 hrs, Volume= 0.496 af, Atten= 46%, Lag= 8.2 min
 Primary = 2.74 cfs @ 12.19 hrs, Volume= 0.475 af
 Secondary = 1.63 cfs @ 12.19 hrs, Volume= 0.021 af

Routing by Stor-Ind method, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
 Peak Elev= 575.82' @ 12.19 hrs Surf.Area= 9,695 sf Storage= 7,520 cf

Plug-Flow detention time= 319.4 min calculated for 0.496 af (100% of inflow)
 Center-of-Mass det. time= 319.4 min (1,152.7 - 833.3)

Volume Invert Avail.Storage Storage Description
 #1 575.00' 25,904 cf **Custom Stage Data (Prismatic) Listed below (Recalc)**

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
575.00	8,648	0	0
576.00	9,925	9,287	9,287
576.50	10,585	5,128	14,414
577.00	11,350	5,484	19,898
577.50	12,675	6,006	25,904

Device	Routing	Invert	Outlet Devices
#1	Primary	572.50'	8.0" Round 8" pipe L= 25.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 572.50' / 572.42' S= 0.0032 ' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.35 sf
#2	Device 1	575.50'	8.0" Horiz. Grate X 4.00 C= 0.600 Limited to weir flow at low heads
#3	Device 1	575.00'	0.250 in/hr Exfiltration over Surface area Conductivity to Groundwater Elevation = 560.00'
#4	Secondary	575.75'	30.0' long (Profile 1) Broad-Crested Rectangular Weir Head (feet) 0.49 0.98 1.48 Coef. (English) 2.92 3.37 3.59

Primary OutFlow Max=2.74 cfs @ 12.19 hrs HW=575.82' (Free Discharge)
 1=8" pipe (Barrel Controls 2.74 cfs @ 7.86 fps)
 2=Grate (Passes < 3.80 cfs potential flow)
 3=Exfiltration (Passes < 0.06 cfs potential flow)

Secondary OutFlow Max=1.62 cfs @ 12.19 hrs HW=575.82' (Free Discharge)
 4=Broad-Crested Rectangular Weir (Weir Controls 1.62 cfs @ 0.77 fps)

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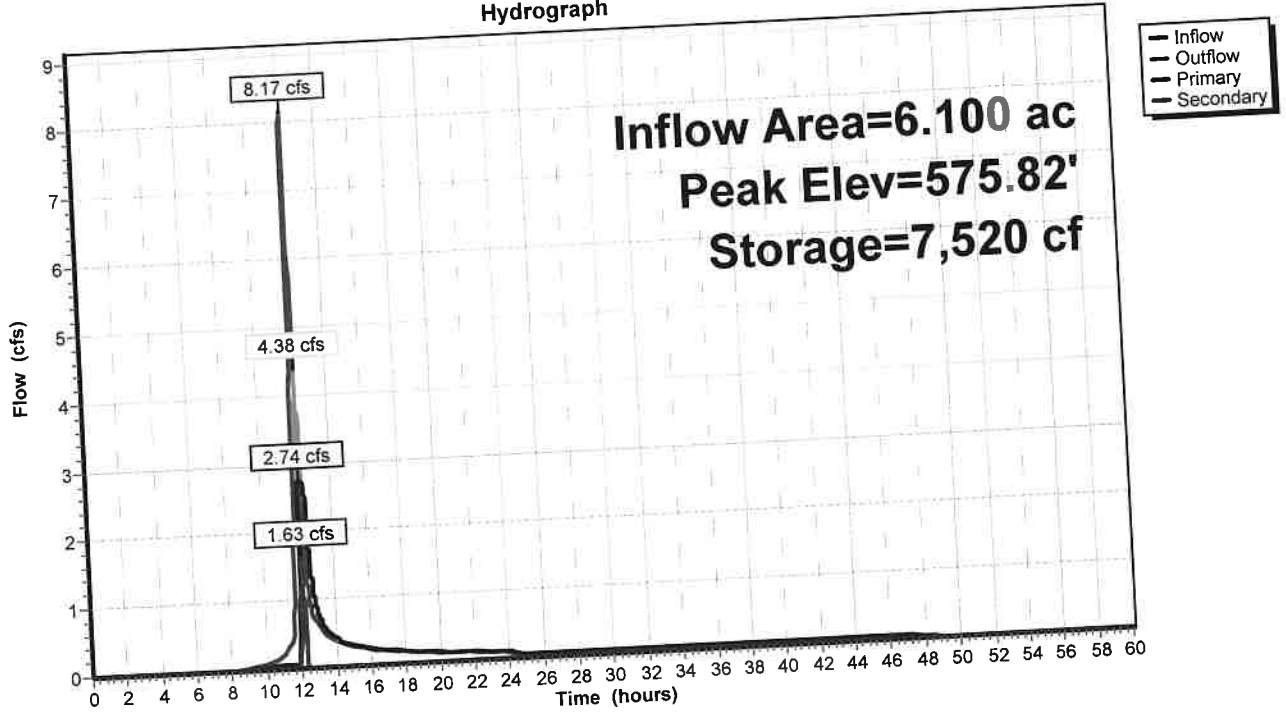
Type II 24-hr 1-Year Rainfall=1.86"

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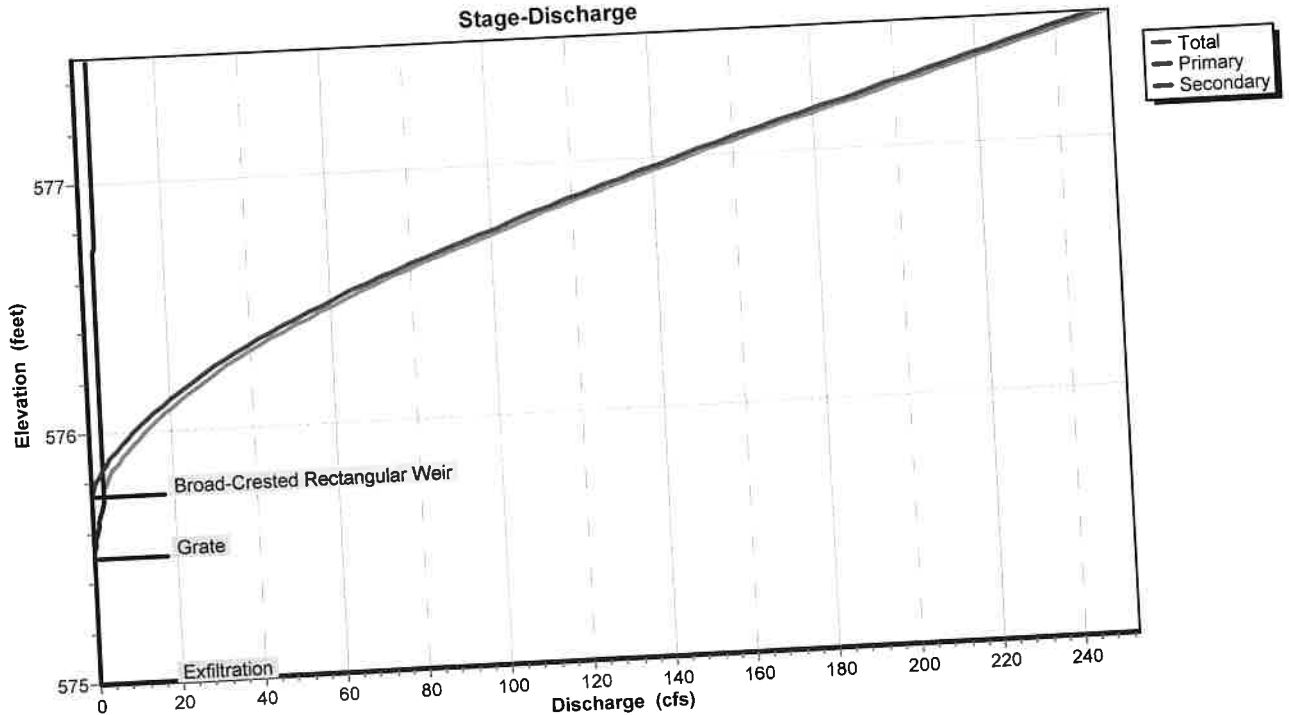
Pond 1P: Bioretention Area 3

Hydrograph



Pond 1P: Bioretention Area 3

Stage-Discharge



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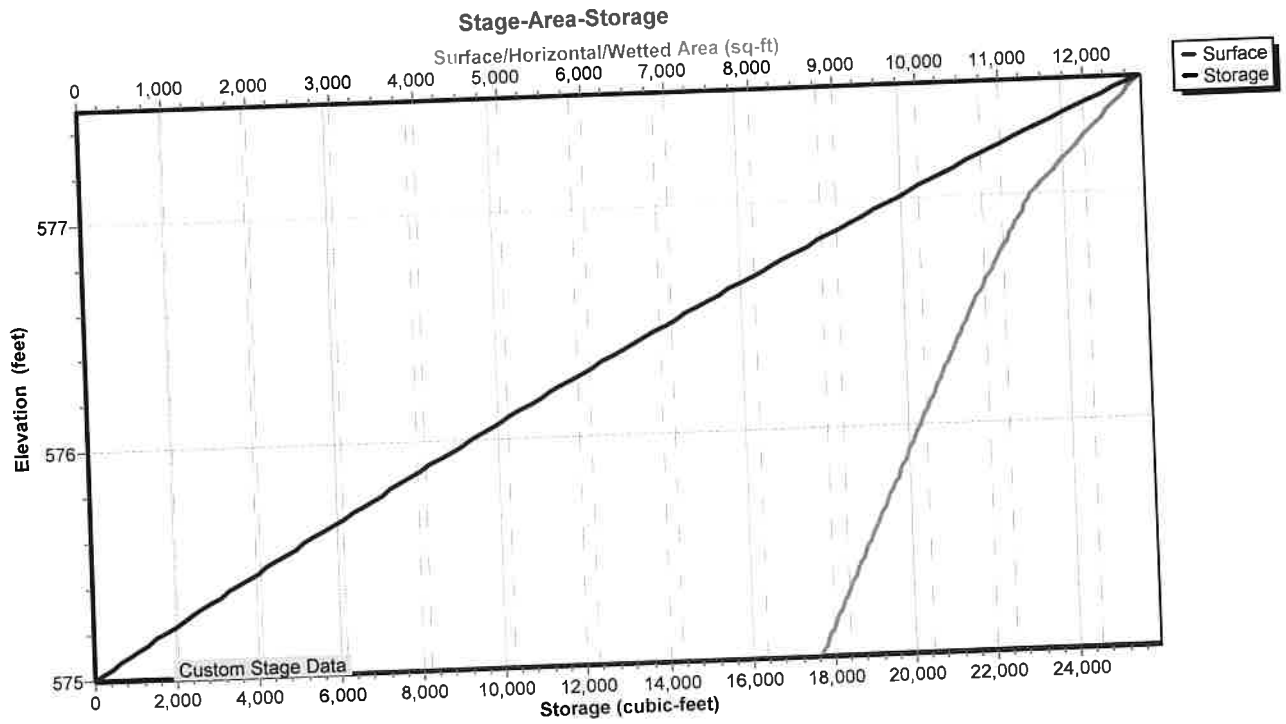
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Pond 1P: Bioretention Area 3



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Hydrograph for Pond 1P: Bioretention Area 3

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Primary (cfs)	Secondary (cfs)
0.00	0.00	0	575.00	0.00	0.00	0.00
2.00	0.00	0	575.00	0.00	0.00	0.00
4.00	0.00	0	575.00	0.00	0.00	0.00
6.00	0.00	0	575.00	0.00	0.00	0.00
8.00	0.00	0	575.00	0.00	0.00	0.00
10.00	0.07	121	575.01	0.03	0.03	0.00
12.00	7.23	4,533	575.51	0.08	0.08	0.00
14.00	0.37	5,004	575.56	0.42	0.42	0.00
16.00	0.23	4,812	575.54	0.25	0.25	0.00
18.00	0.17	4,735	575.53	0.18	0.18	0.00
20.00	0.13	4,666	575.52	0.14	0.14	0.00
22.00	0.12	4,618	575.51	0.12	0.12	0.00
24.00	0.11	4,598	575.51	0.11	0.11	0.00
26.00	0.00	4,207	575.47	0.06	0.06	0.00
28.00	0.00	3,812	575.43	0.05	0.05	0.00
30.00	0.00	3,420	575.38	0.05	0.05	0.00
32.00	0.00	3,031	575.34	0.05	0.05	0.00
34.00	0.00	2,646	575.30	0.05	0.05	0.00
36.00	0.00	2,264	575.26	0.05	0.05	0.00
38.00	0.00	1,885	575.21	0.05	0.05	0.00
40.00	0.00	1,510	575.17	0.05	0.05	0.00
42.00	0.00	1,138	575.13	0.05	0.05	0.00
44.00	0.00	769	575.09	0.05	0.05	0.00
46.00	0.00	404	575.05	0.05	0.05	0.00
48.00	0.00	96	575.01	0.02	0.02	0.00
50.00	0.00	18	575.00	0.00	0.00	0.00
52.00	0.00	3	575.00	0.00	0.00	0.00
54.00	0.00	1	575.00	0.00	0.00	0.00
56.00	0.00	0	575.00	0.00	0.00	0.00
58.00	0.00	0	575.00	0.00	0.00	0.00
60.00	0.00	0	575.00	0.00	0.00	0.00

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Type II 24-hr 1-Year Rainfall=1.86"

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Stage-Discharge for Pond 1P: Bioretention Area 3

Elevation (feet)	Discharge (cfs)	Primary (cfs)	Secondary (cfs)
575.00	0.00	0.00	0.00
575.05	0.05	0.05	0.00
575.10	0.05	0.05	0.00
575.15	0.05	0.05	0.00
575.20	0.05	0.05	0.00
575.25	0.05	0.05	0.00
575.30	0.05	0.05	0.00
575.35	0.05	0.05	0.00
575.40	0.05	0.05	0.00
575.45	0.05	0.05	0.00
575.50	0.06	0.06	0.00
575.55	0.36	0.36	0.00
575.60	0.92	0.92	0.00
575.65	1.65	1.65	0.00
575.70	2.51	2.51	0.00
575.75	2.71	2.71	0.00
575.80	3.71	2.73	0.98
575.85	5.53	2.76	2.77
575.90	7.87	2.78	5.09
575.95	10.64	2.81	7.84
576.00	13.78	2.83	10.95
576.05	17.25	2.86	14.39
576.10	21.02	2.88	18.14
576.15	25.07	2.91	22.16
576.20	29.37	2.93	26.44
576.25	34.02	2.95	31.07
576.30	39.38	2.98	36.41
576.35	45.12	3.00	42.12
576.40	51.24	3.02	48.22
576.45	57.74	3.04	54.69
576.50	64.62	3.07	61.55
576.55	71.88	3.09	68.79
576.60	79.53	3.11	76.42
576.65	87.57	3.13	84.44
576.70	96.00	3.16	92.85
576.75	104.54	3.18	101.36
576.80	112.97	3.20	109.77
576.85	121.69	3.22	118.47
576.90	130.69	3.24	127.45
576.95	139.98	3.26	136.72
577.00	149.56	3.28	146.27
577.05	159.42	3.30	156.11
577.10	169.57	3.33	166.24
577.15	180.00	3.35	176.66
577.20	190.72	3.37	187.36
577.25	201.24	3.39	197.86
577.30	211.24	3.41	207.83
577.35	221.40	3.43	217.97
577.40	231.71	3.45	228.27
577.45	242.19	3.47	238.72
577.50	252.82	3.49	249.33

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Type II 24-hr 1-Year Rainfall=1.86"

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Stage-Area-Storage for Pond 1P: Bioretention Area 3

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
575.00	8,648	0
575.05	8,712	434
575.10	8,776	871
575.15	8,840	1,312
575.20	8,903	1,755
575.25	8,967	2,202
575.30	9,031	2,652
575.35	9,095	3,105
575.40	9,159	3,561
575.45	9,223	4,021
575.50	9,287	4,484
575.55	9,350	4,950
575.60	9,414	5,419
575.65	9,478	5,891
575.70	9,542	6,366
575.75	9,606	6,845
575.80	9,670	7,327
575.85	9,733	7,812
575.90	9,797	8,300
575.95	9,861	8,792
576.00	9,925	9,287
576.05	9,991	9,784
576.10	10,057	10,286
576.15	10,123	10,790
576.20	10,189	11,298
576.25	10,255	11,809
576.30	10,321	12,323
576.35	10,387	12,841
576.40	10,453	13,362
576.45	10,519	13,886
576.50	10,585	14,414
576.55	10,661	14,945
576.60	10,738	15,480
576.65	10,814	16,019
576.70	10,891	16,562
576.75	10,968	17,108
576.80	11,044	17,658
576.85	11,121	18,212
576.90	11,197	18,770
576.95	11,274	19,332
577.00	11,350	19,898
577.05	11,482	20,469
577.10	11,615	21,046
577.15	11,747	21,630
577.20	11,880	22,221
577.25	12,013	22,818
577.30	12,145	23,422
577.35	12,278	24,033
577.40	12,410	24,650
577.45	12,543	25,274
577.50	12,675	25,904

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Summary for Pond 3P: Detention Basin (SMA #1)

Inflow Area = 4.400 ac, 61.36% Impervious, Inflow Depth = 1.10" for 1-Year event
 Inflow = 6.05 cfs @ 12.06 hrs, Volume= 0.403 af
 Outflow = 0.10 cfs @ 19.66 hrs, Volume= 0.249 af, Atten= 98%, Lag= 455.7 min
 Primary = 0.10 cfs @ 19.66 hrs, Volume= 0.249 af
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
 Peak Elev= 575.23' @ 19.66 hrs Surf.Area= 60,952 sf Storage= 13,685 cf

Plug-Flow detention time= 1,134.7 min calculated for 0.249 af (62% of inflow)
 Center-of-Mass det. time= 1,028.3 min (1,852.6 - 824.2)

Volume	Invert	Avail.Storage	Storage Description
#1	575.00'	118,224 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
575.00	59,213	0	0
576.00	66,849	63,031	63,031
576.80	71,134	55,193	118,224

Device	Routing	Invert	Outlet Devices
#1	Primary	574.00'	12.0" Round 12" outlet pipe L= 160.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 574.00' / 573.79' S= 0.0013 '/ Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Device 1	575.00'	6.0" Round low flow outlet pipe L= 10.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 575.00' / 574.95' S= 0.0050 '/ Cc= 0.900 n= 0.010 Corrugated PE, smooth interior, Flow Area= 0.20 sf
#3	Device 1	576.50'	30.0" x 30.0" Horiz. Grate C= 0.600 Limited to weir flow at low heads
#4	Secondary	575.95'	20.0' long (Profile 1) Broad-Crested Rectangular Weir X 2.00 Head (feet) 0.49 0.98 1.48 Coef. (English) 2.92 3.37 3.59

Primary OutFlow Max=0.10 cfs @ 19.66 hrs HW=575.23' (Free Discharge)

↑ 1=12" outlet pipe (Passes 0.10 cfs of 1.85 cfs potential flow)
 ↑ 2=low flow outlet pipe (Barrel Controls 0.10 cfs @ 1.70 fps)
 ↑ 3=Grate (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=575.00' (Free Discharge)

↑ 4=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

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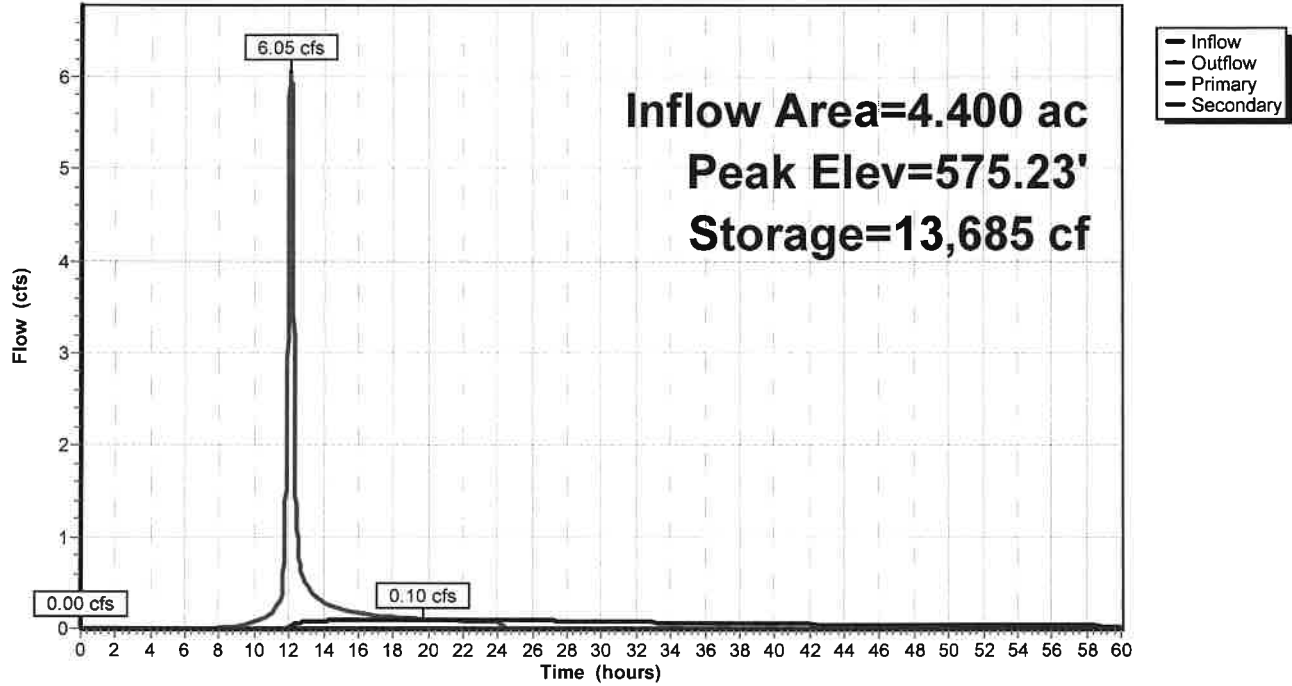
Type II 24-hr 1-Year Rainfall=1.86"

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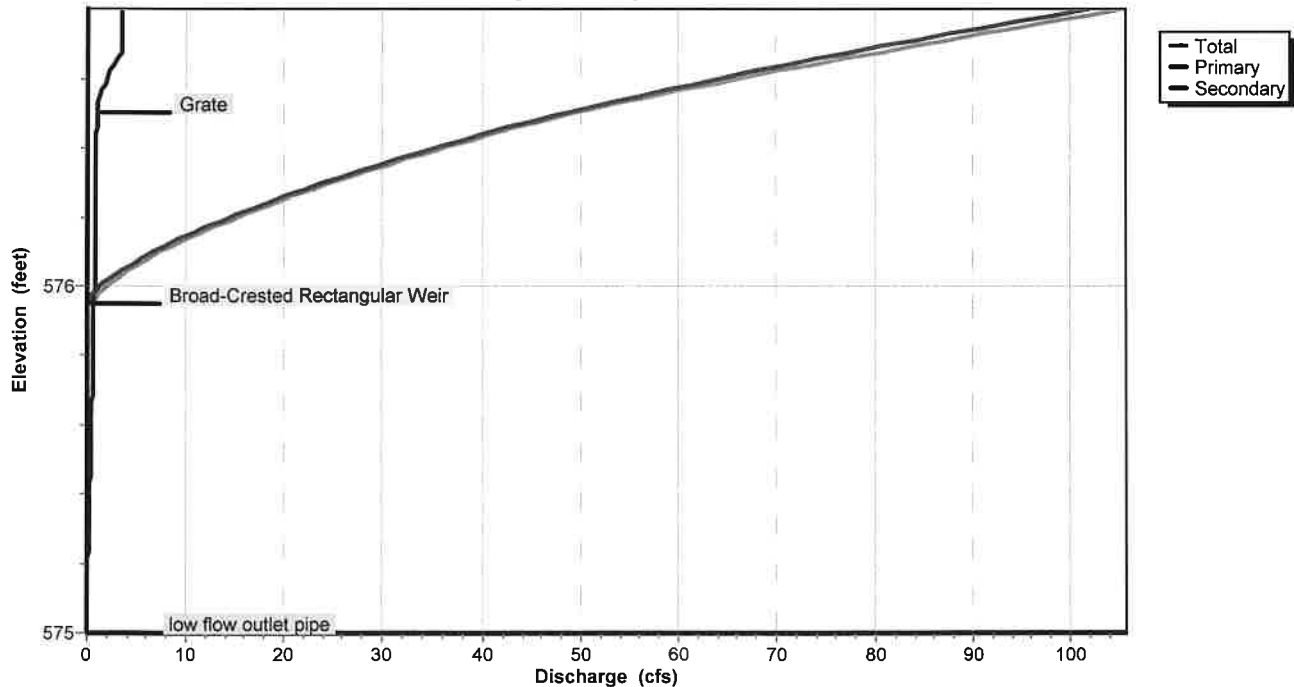
Pond 3P: Detention Basin (SMA #1)

Hydrograph

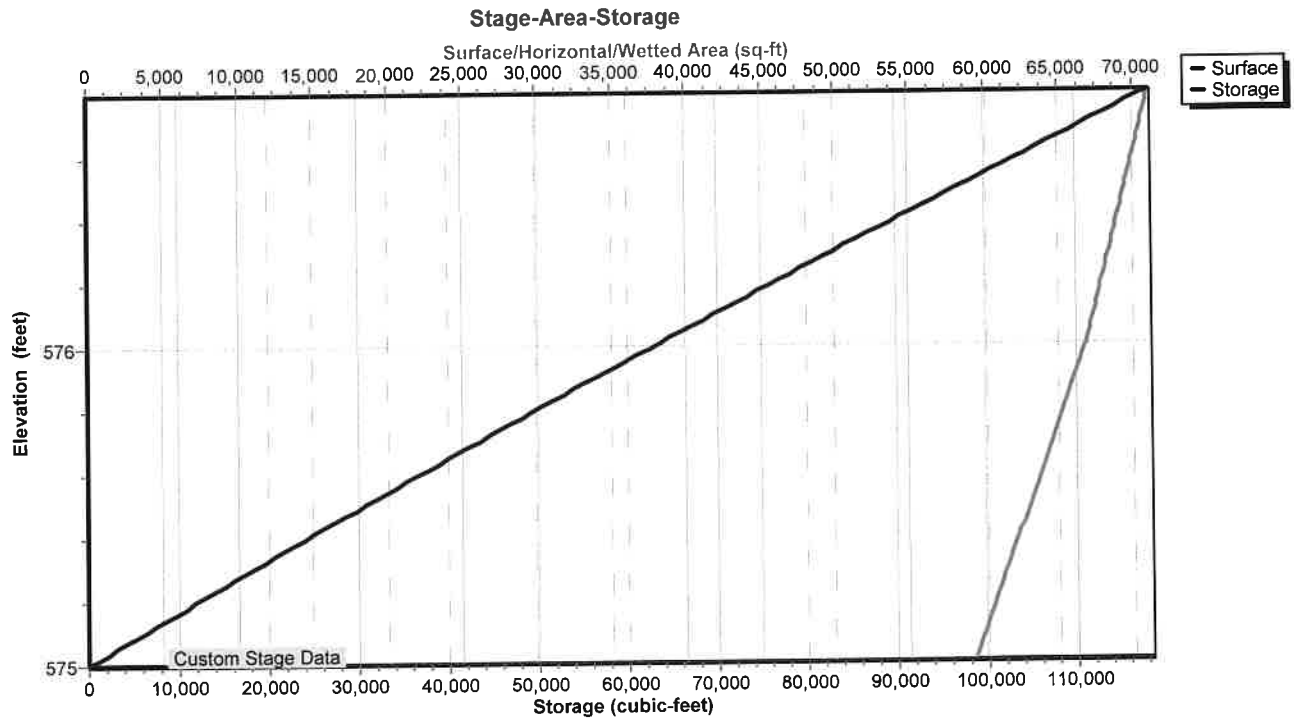


Pond 3P: Detention Basin (SMA #1)

Stage-Discharge



Pond 3P: Detention Basin (SMA #1)



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Hydrograph for Pond 3P: Detention Basin (SMA #1)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Primary (cfs)	Secondary (cfs)
0.00	0.00	0	575.00	0.00	0.00	0.00
2.00	0.00	0	575.00	0.00	0.00	0.00
4.00	0.00	0	575.00	0.00	0.00	0.00
6.00	0.00	0	575.00	0.00	0.00	0.00
8.00	0.01	5	575.00	0.00	0.00	0.00
10.00	0.06	218	575.00	0.00	0.00	0.00
12.00	5.18	3,798	575.06	0.01	0.01	0.00
14.00	0.28	12,350	575.21	0.08	0.08	0.00
16.00	0.17	13,252	575.22	0.10	0.10	0.00
18.00	0.13	13,599	575.23	0.10	0.10	0.00
20.00	0.10	13,682	575.23	0.10	0.10	0.00
22.00	0.09	13,599	575.23	0.10	0.10	0.00
24.00	0.08	13,477	575.22	0.10	0.10	0.00
26.00	0.00	12,859	575.21	0.09	0.09	0.00
28.00	0.00	12,236	575.20	0.08	0.08	0.00
30.00	0.00	11,664	575.19	0.08	0.08	0.00
32.00	0.00	11,139	575.19	0.07	0.07	0.00
34.00	0.00	10,655	575.18	0.06	0.06	0.00
36.00	0.00	10,207	575.17	0.06	0.06	0.00
38.00	0.00	9,792	575.16	0.06	0.06	0.00
40.00	0.00	9,408	575.16	0.05	0.05	0.00
42.00	0.00	9,050	575.15	0.05	0.05	0.00
44.00	0.00	8,716	575.15	0.04	0.04	0.00
46.00	0.00	8,404	575.14	0.04	0.04	0.00
48.00	0.00	8,113	575.14	0.04	0.04	0.00
50.00	0.00	7,839	575.13	0.04	0.04	0.00
52.00	0.00	7,582	575.13	0.03	0.03	0.00
54.00	0.00	7,341	575.12	0.03	0.03	0.00
56.00	0.00	7,114	575.12	0.03	0.03	0.00
58.00	0.00	6,899	575.12	0.03	0.03	0.00
60.00	0.00	6,696	575.11	0.03	0.03	0.00

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Type II 24-hr 1-Year Rainfall=1.86"

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Stage-Discharge for Pond 3P: Detention Basin (SMA #1)

Elevation (feet)	Discharge (cfs)	Primary (cfs)	Secondary (cfs)	Elevation (feet)	Discharge (cfs)	Primary (cfs)	Secondary (cfs)
575.00	0.00	0.00	0.00	576.04	3.90	0.74	3.15
575.02	0.00	0.00	0.00	576.06	5.01	0.75	4.26
575.04	0.00	0.00	0.00	576.08	6.23	0.76	5.47
575.06	0.01	0.01	0.00	576.10	7.55	0.77	6.79
575.08	0.01	0.01	0.00	576.12	8.96	0.78	8.19
575.10	0.02	0.02	0.00	576.14	10.46	0.79	9.67
575.12	0.03	0.03	0.00	576.16	12.04	0.80	11.24
575.14	0.04	0.04	0.00	576.18	13.69	0.80	12.88
575.16	0.05	0.05	0.00	576.20	15.41	0.81	14.60
575.18	0.07	0.07	0.00	576.22	17.21	0.82	16.39
575.20	0.08	0.08	0.00	576.24	19.07	0.83	18.24
575.22	0.09	0.09	0.00	576.26	21.00	0.84	20.16
575.24	0.11	0.11	0.00	576.28	22.99	0.85	22.14
575.26	0.13	0.13	0.00	576.30	25.04	0.85	24.18
575.28	0.15	0.15	0.00	576.32	27.15	0.86	26.29
575.30	0.16	0.16	0.00	576.34	29.32	0.87	28.45
575.32	0.18	0.18	0.00	576.36	31.54	0.88	30.66
575.34	0.20	0.20	0.00	576.38	33.82	0.89	32.93
575.36	0.22	0.22	0.00	576.40	36.15	0.89	35.26
575.38	0.24	0.24	0.00	576.42	38.54	0.90	37.63
575.40	0.26	0.26	0.00	576.44	40.97	0.91	40.06
575.42	0.28	0.28	0.00	576.46	43.73	0.92	42.81
575.44	0.31	0.31	0.00	576.48	46.56	0.93	45.63
575.46	0.33	0.33	0.00	576.50	49.47	0.93	48.54
575.48	0.35	0.35	0.00	576.52	52.56	1.03	51.53
575.50	0.37	0.37	0.00	576.54	55.81	1.21	54.60
575.52	0.39	0.39	0.00	576.56	59.18	1.44	57.75
575.54	0.41	0.41	0.00	576.58	62.68	1.70	60.98
575.56	0.43	0.43	0.00	576.60	66.29	2.00	64.29
575.58	0.45	0.45	0.00	576.62	70.02	2.34	67.68
575.60	0.46	0.46	0.00	576.64	73.85	2.70	71.16
575.62	0.48	0.48	0.00	576.66	77.79	3.08	74.71
575.64	0.49	0.49	0.00	576.68	81.74	3.39	78.35
575.66	0.50	0.50	0.00	576.70	85.48	3.41	82.07
575.68	0.51	0.51	0.00	576.72	89.30	3.43	85.87
575.70	0.54	0.54	0.00	576.74	93.20	3.45	89.75
575.72	0.56	0.56	0.00	576.76	97.18	3.46	93.72
575.74	0.58	0.58	0.00	576.78	101.25	3.48	97.76
575.76	0.60	0.60	0.00	576.80	105.39	3.50	101.90
575.78	0.61	0.61	0.00				
575.80	0.62	0.62	0.00				
575.82	0.63	0.63	0.00				
575.84	0.64	0.64	0.00				
575.86	0.65	0.65	0.00				
575.88	0.66	0.66	0.00				
575.90	0.67	0.67	0.00				
575.92	0.68	0.68	0.00				
575.94	0.69	0.69	0.00				
575.96	0.82	0.70	0.12				
575.98	1.32	0.71	0.61				
576.00	2.03	0.72	1.31				
576.02	2.90	0.73	2.16				

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Type II 24-hr 1-Year Rainfall=1.86"

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Stage-Area-Storage for Pond 3P: Detention Basin (SMA #1)

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
575.00	59,213	0	576.04	67,063	65,709
575.02	59,366	1,186	576.06	67,170	67,052
575.04	59,518	2,375	576.08	67,278	68,396
575.06	59,671	3,567	576.10	67,385	69,743
575.08	59,824	4,761	576.12	67,492	71,091
575.10	59,977	5,959	576.14	67,599	72,442
575.12	60,129	7,161	576.16	67,706	73,795
575.14	60,282	8,365	576.18	67,813	75,151
575.16	60,435	9,572	576.20	67,920	76,508
575.18	60,587	10,782	576.22	68,027	77,867
575.20	60,740	11,995	576.24	68,135	79,229
575.22	60,893	13,212	576.26	68,242	80,593
575.24	61,046	14,431	576.28	68,349	81,959
575.26	61,198	15,653	576.30	68,456	83,327
575.28	61,351	16,879	576.32	68,563	84,697
575.30	61,504	18,108	576.34	68,670	86,069
575.32	61,657	19,339	576.36	68,777	87,444
575.34	61,809	20,574	576.38	68,884	88,820
575.36	61,962	21,811	576.40	68,992	90,199
575.38	62,115	23,052	576.42	69,099	91,580
575.40	62,267	24,296	576.44	69,206	92,963
575.42	62,420	25,543	576.46	69,313	94,348
575.44	62,573	26,793	576.48	69,420	95,736
575.46	62,726	28,046	576.50	69,527	97,125
575.48	62,878	29,302	576.52	69,634	98,517
575.50	63,031	30,561	576.54	69,741	99,910
575.52	63,184	31,823	576.56	69,848	101,306
575.54	63,336	33,088	576.58	69,956	102,704
575.56	63,489	34,357	576.60	70,063	104,105
575.58	63,642	35,628	576.62	70,170	105,507
575.60	63,795	36,902	576.64	70,277	106,911
575.62	63,947	38,180	576.66	70,384	108,318
575.64	64,100	39,460	576.68	70,491	109,727
575.66	64,253	40,744	576.70	70,598	111,138
575.68	64,405	42,030	576.72	70,706	112,551
575.70	64,558	43,320	576.74	70,813	113,966
575.72	64,711	44,613	576.76	70,920	115,383
575.74	64,864	45,908	576.78	71,027	116,803
575.76	65,016	47,207	576.80	71,134	118,224
575.78	65,169	48,509			
575.80	65,322	49,814			
575.82	65,475	51,122			
575.84	65,627	52,433			
575.86	65,780	53,747			
575.88	65,933	55,064			
575.90	66,085	56,384			
575.92	66,238	57,708			
575.94	66,391	59,034			
575.96	66,544	60,363			
575.98	66,696	61,696			
576.00	66,849	63,031			
576.02	66,956	64,369			

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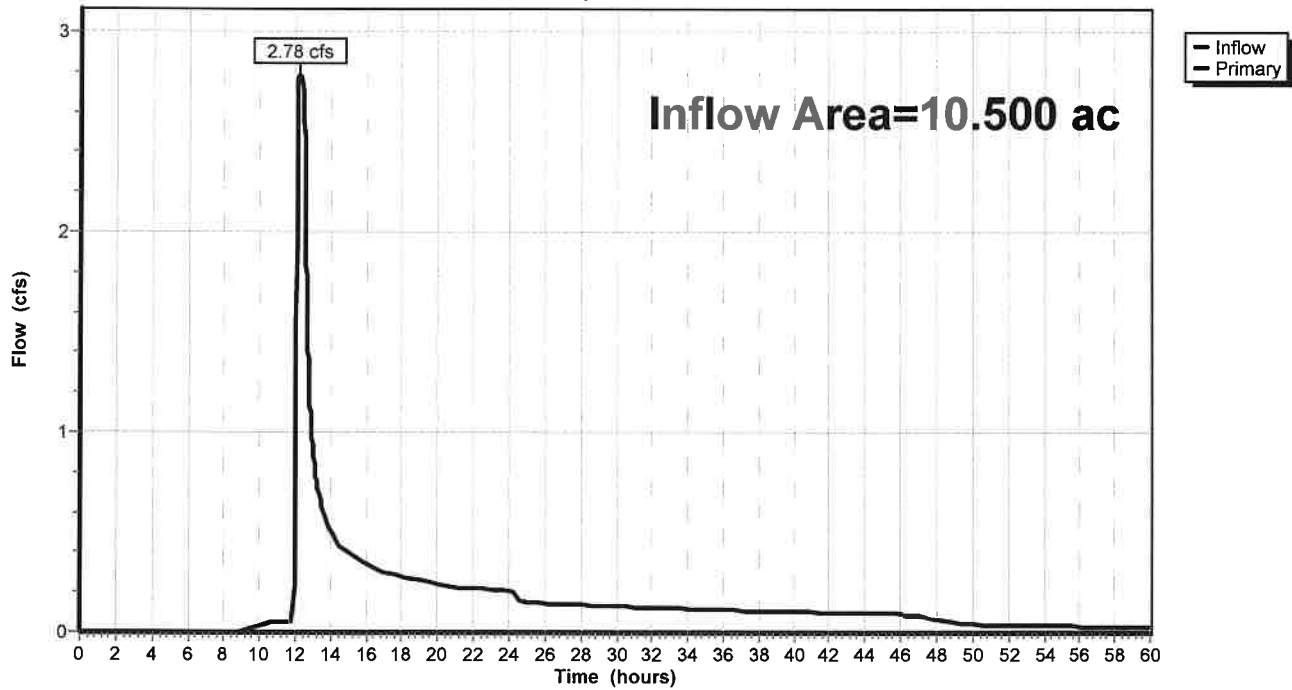
Summary for Link 5L: Outflow (@ CB 54)

Inflow Area = 10.500 ac, 57.14% Impervious, Inflow Depth > 0.83" for 1-Year event
Inflow = 2.78 cfs @ 12.22 hrs, Volume= 0.724 af
Primary = 2.78 cfs @ 12.22 hrs, Volume= 0.724 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs

Link 5L: Outflow (@ CB 54)

Hydrograph



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Type II 24-hr 1-Year Rainfall=1.86"

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Hydrograph for Link 5L: Outflow (@ CB 54)

Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)	Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
0.00	0.00	0.00	0.00	52.00	0.04	0.00	0.04
1.00	0.00	0.00	0.00	53.00	0.03	0.00	0.03
2.00	0.00	0.00	0.00	54.00	0.03	0.00	0.03
3.00	0.00	0.00	0.00	55.00	0.03	0.00	0.03
4.00	0.00	0.00	0.00	56.00	0.03	0.00	0.03
5.00	0.00	0.00	0.00	57.00	0.03	0.00	0.03
6.00	0.00	0.00	0.00	58.00	0.03	0.00	0.03
7.00	0.00	0.00	0.00	59.00	0.03	0.00	0.03
8.00	0.00	0.00	0.00	60.00	0.03	0.00	0.03
9.00	0.01	0.00	0.01				
10.00	0.03	0.00	0.03				
11.00	0.05	0.00	0.05				
12.00	0.09	0.00	0.09				
13.00	0.91	0.00	0.91				
14.00	0.51	0.00	0.51				
15.00	0.40	0.00	0.40				
16.00	0.34	0.00	0.34				
17.00	0.30	0.00	0.30				
18.00	0.28	0.00	0.28				
19.00	0.26	0.00	0.26				
20.00	0.24	0.00	0.24				
21.00	0.23	0.00	0.23				
22.00	0.22	0.00	0.22				
23.00	0.21	0.00	0.21				
24.00	0.21	0.00	0.21				
25.00	0.15	0.00	0.15				
26.00	0.15	0.00	0.15				
27.00	0.14	0.00	0.14				
28.00	0.14	0.00	0.14				
29.00	0.13	0.00	0.13				
30.00	0.13	0.00	0.13				
31.00	0.13	0.00	0.13				
32.00	0.12	0.00	0.12				
33.00	0.12	0.00	0.12				
34.00	0.12	0.00	0.12				
35.00	0.12	0.00	0.12				
36.00	0.11	0.00	0.11				
37.00	0.11	0.00	0.11				
38.00	0.11	0.00	0.11				
39.00	0.11	0.00	0.11				
40.00	0.10	0.00	0.10				
41.00	0.10	0.00	0.10				
42.00	0.10	0.00	0.10				
43.00	0.10	0.00	0.10				
44.00	0.10	0.00	0.10				
45.00	0.09	0.00	0.09				
46.00	0.09	0.00	0.09				
47.00	0.09	0.00	0.09				
48.00	0.06	0.00	0.06				
49.00	0.05	0.00	0.05				
50.00	0.04	0.00	0.04				
51.00	0.04	0.00	0.04				

21.011 Proposed

Type II 24-hr 2-Year Rainfall=2.20"

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Time span=0.00-60.00 hrs, dt=0.01 hrs, 6001 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: Front Area 1

Runoff Area=6.100 ac 54.10% Impervious Runoff Depth=1.27"
Flow Length=652' Tc=13.3 min CN=90 Runoff=10.57 cfs 0.644 af

Subcatchment 2S: Rear Area 1

Runoff Area=4.400 ac 61.36% Impervious Runoff Depth=1.34"
Flow Length=683' Tc=14.4 min CN=91 Runoff=7.75 cfs 0.491 af

Pond 1P: Bioretention Area 3

Peak Elev=575.91' Storage=8,359 cf Inflow=10.57 cfs 0.644 af
Primary=2.79 cfs 0.556 af Secondary=5.41 cfs 0.088 af Outflow=8.19 cfs 0.644 af

Pond 3P: Detention Basin (SMA #1)

Peak Elev=575.32' Storage=19,128 cf Inflow=12.29 cfs 0.579 af
Primary=0.18 cfs 0.400 af Secondary=0.00 cfs 0.000 af Outflow=0.18 cfs 0.400 af

Link 5L: Outflow (@ CB 54)

Inflow=2.86 cfs 0.956 af
Primary=2.86 cfs 0.956 af

Total Runoff Area = 10.500 ac Runoff Volume = 1.135 af Average Runoff Depth = 1.30"
42.86% Pervious = 4.500 ac 57.14% Impervious = 6.000 ac

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Type II 24-hr 2-Year Rainfall=2.20"

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Summary for Subcatchment 1S: Front Area 1

Runoff = 10.57 cfs @ 12.05 hrs, Volume= 0.644 af, Depth= 1.27"

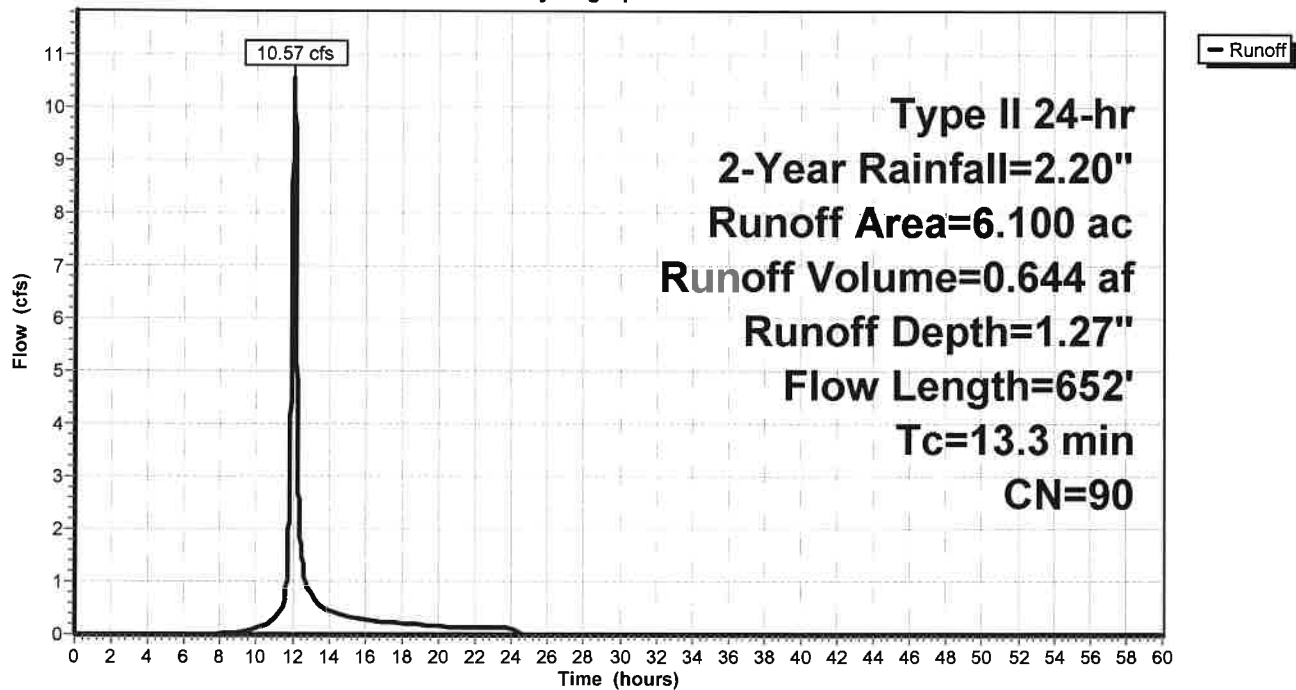
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
Type II 24-hr 2-Year Rainfall=2.20"

Area (ac)	CN	Description
1.800	98	Paved parking, HSG D
1.500	98	Roofs, HSG D
2.800	80	>75% Grass cover, Good, HSG D
6.100	90	Weighted Average
2.800		45.90% Pervious Area
3.300		54.10% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.6	37	0.0100	0.06		Sheet Flow, grass Grass: Dense n= 0.240 P2= 2.50"
0.4	15	0.0120	0.68		Sheet Flow, pavement Smooth surfaces n= 0.011 P2= 2.50"
3.3	600		3.00		Direct Entry, pipe flow
13.3	652	Total			

Subcatchment 1S: Front Area 1

Hydrograph



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Type II 24-hr 2-Year Rainfall=2.20"

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Hydrograph for Subcatchment 1S: Front Area 1

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	52.00	2.20	1.27	0.00
1.00	0.02	0.00	0.00	53.00	2.20	1.27	0.00
2.00	0.05	0.00	0.00	54.00	2.20	1.27	0.00
3.00	0.08	0.00	0.00	55.00	2.20	1.27	0.00
4.00	0.11	0.00	0.00	56.00	2.20	1.27	0.00
5.00	0.14	0.00	0.00	57.00	2.20	1.27	0.00
6.00	0.18	0.00	0.00	58.00	2.20	1.27	0.00
7.00	0.22	0.00	0.00	59.00	2.20	1.27	0.00
8.00	0.26	0.00	0.02	60.00	2.20	1.27	0.00
9.00	0.32	0.01	0.06				
10.00	0.40	0.02	0.12				
11.00	0.52	0.06	0.30				
12.00	1.46	0.65	9.45				
13.00	1.70	0.84	0.79				
14.00	1.80	0.93	0.46				
15.00	1.88	0.99	0.36				
16.00	1.94	1.04	0.28				
17.00	1.98	1.08	0.24				
18.00	2.03	1.12	0.21				
19.00	2.06	1.15	0.19				
20.00	2.09	1.17	0.16				
21.00	2.12	1.20	0.15				
22.00	2.15	1.22	0.14				
23.00	2.18	1.24	0.14				
24.00	2.20	1.27	0.13				
25.00	2.20	1.27	0.00				
26.00	2.20	1.27	0.00				
27.00	2.20	1.27	0.00				
28.00	2.20	1.27	0.00				
29.00	2.20	1.27	0.00				
30.00	2.20	1.27	0.00				
31.00	2.20	1.27	0.00				
32.00	2.20	1.27	0.00				
33.00	2.20	1.27	0.00				
34.00	2.20	1.27	0.00				
35.00	2.20	1.27	0.00				
36.00	2.20	1.27	0.00				
37.00	2.20	1.27	0.00				
38.00	2.20	1.27	0.00				
39.00	2.20	1.27	0.00				
40.00	2.20	1.27	0.00				
41.00	2.20	1.27	0.00				
42.00	2.20	1.27	0.00				
43.00	2.20	1.27	0.00				
44.00	2.20	1.27	0.00				
45.00	2.20	1.27	0.00				
46.00	2.20	1.27	0.00				
47.00	2.20	1.27	0.00				
48.00	2.20	1.27	0.00				
49.00	2.20	1.27	0.00				
50.00	2.20	1.27	0.00				
51.00	2.20	1.27	0.00				

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Type II 24-hr 2-Year Rainfall=2.20"

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Summary for Subcatchment 2S: Rear Area 1

Runoff = 7.75 cfs @ 12.06 hrs, Volume= 0.491 af, Depth= 1.34"

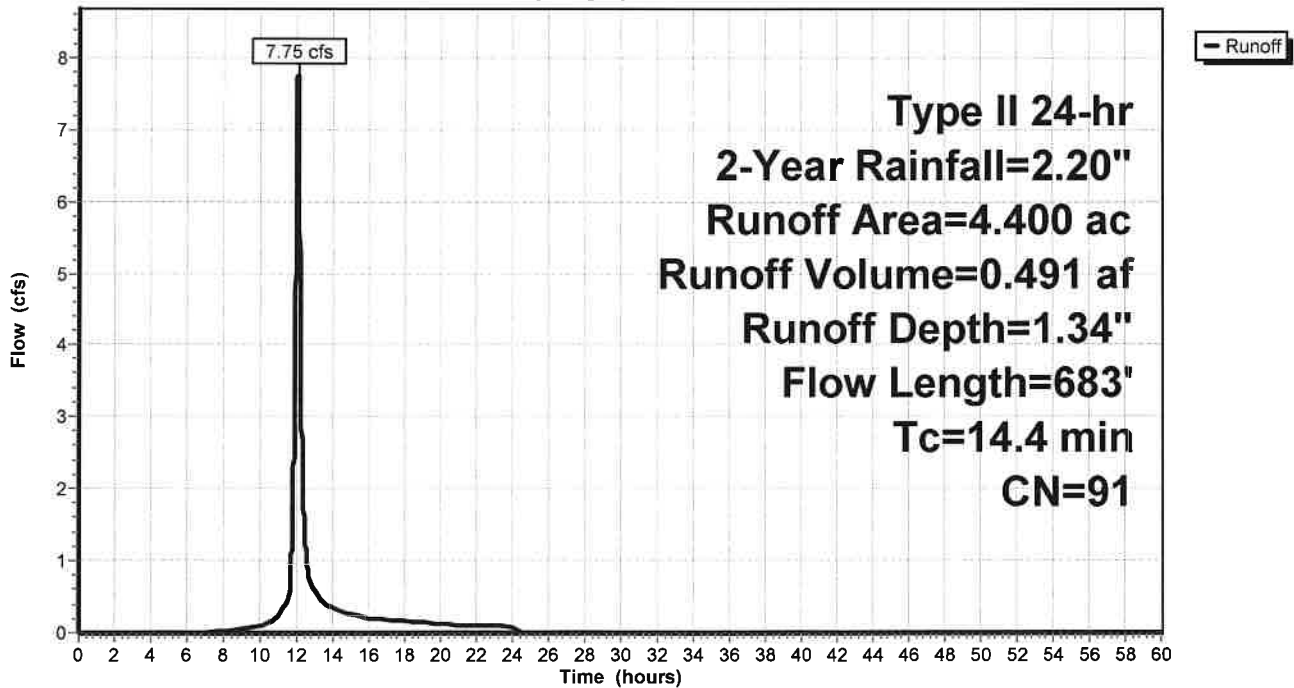
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
 Type II 24-hr 2-Year Rainfall=2.20"

Area (ac)	CN	Description
1.400	98	Paved parking, HSG D
1.300	98	Roofs, HSG D
1.700	80	>75% Grass cover, Good, HSG D
4.400	91	Weighted Average
1.700		38.64% Pervious Area
2.700		61.36% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.2	90	0.0200	0.15		Sheet Flow, grass Grass: Short n= 0.150 P2= 2.50"
1.3	75	0.0130	0.97		Sheet Flow, pavement Smooth surfaces n= 0.011 P2= 2.50"
2.9	518		3.00		Direct Entry, Pipe flow
14.4	683	Total			

Subcatchment 2S: Rear Area 1

Hydrograph



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Type II 24-hr 2-Year Rainfall=2.20"

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Hydrograph for Subcatchment 2S: Rear Area 1

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	52.00	2.20	1.34	0.00
1.00	0.02	0.00	0.00	53.00	2.20	1.34	0.00
2.00	0.05	0.00	0.00	54.00	2.20	1.34	0.00
3.00	0.08	0.00	0.00	55.00	2.20	1.34	0.00
4.00	0.11	0.00	0.00	56.00	2.20	1.34	0.00
5.00	0.14	0.00	0.00	57.00	2.20	1.34	0.00
6.00	0.18	0.00	0.00	58.00	2.20	1.34	0.00
7.00	0.22	0.00	0.00	59.00	2.20	1.34	0.00
8.00	0.26	0.00	0.02	60.00	2.20	1.34	0.00
9.00	0.32	0.01	0.06				
10.00	0.40	0.03	0.10				
11.00	0.52	0.08	0.25				
12.00	1.46	0.71	6.69				
13.00	1.70	0.90	0.60				
14.00	1.80	0.99	0.35				
15.00	1.88	1.06	0.27				
16.00	1.94	1.11	0.21				
17.00	1.98	1.15	0.18				
18.00	2.03	1.19	0.16				
19.00	2.06	1.22	0.14				
20.00	2.09	1.25	0.12				
21.00	2.12	1.27	0.11				
22.00	2.15	1.30	0.10				
23.00	2.18	1.32	0.10				
24.00	2.20	1.34	0.10				
25.00	2.20	1.34	0.00				
26.00	2.20	1.34	0.00				
27.00	2.20	1.34	0.00				
28.00	2.20	1.34	0.00				
29.00	2.20	1.34	0.00				
30.00	2.20	1.34	0.00				
31.00	2.20	1.34	0.00				
32.00	2.20	1.34	0.00				
33.00	2.20	1.34	0.00				
34.00	2.20	1.34	0.00				
35.00	2.20	1.34	0.00				
36.00	2.20	1.34	0.00				
37.00	2.20	1.34	0.00				
38.00	2.20	1.34	0.00				
39.00	2.20	1.34	0.00				
40.00	2.20	1.34	0.00				
41.00	2.20	1.34	0.00				
42.00	2.20	1.34	0.00				
43.00	2.20	1.34	0.00				
44.00	2.20	1.34	0.00				
45.00	2.20	1.34	0.00				
46.00	2.20	1.34	0.00				
47.00	2.20	1.34	0.00				
48.00	2.20	1.34	0.00				
49.00	2.20	1.34	0.00				
50.00	2.20	1.34	0.00				
51.00	2.20	1.34	0.00				

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Type II 24-hr 2-Year Rainfall=2.20"

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Summary for Pond 1P: Bioretention Area 3

Inflow Area = 6.100 ac, 54.10% Impervious, Inflow Depth = 1.27" for 2-Year event
Inflow = 10.57 cfs @ 12.05 hrs, Volume= 0.644 af
Outflow = 8.19 cfs @ 12.13 hrs, Volume= 0.644 af, Atten= 22%, Lag= 4.9 min
Primary = 2.79 cfs @ 12.13 hrs, Volume= 0.556 af
Secondary = 5.41 cfs @ 12.13 hrs, Volume= 0.088 af

Routing by Stor-Ind method, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
Peak Elev= 575.91' @ 12.13 hrs Surf.Area= 9,805 sf Storage= 8,359 cf

Plug-Flow detention time= 252.3 min calculated for 0.644 af (100% of inflow)
Center-of-Mass det. time= 252.2 min (1,078.1 - 825.9)

Volume	Invert	Avail.Storage	Storage Description
#1	575.00'	25,904 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
575.00	8,648	0	0
576.00	9,925	9,287	9,287
576.50	10,585	5,128	14,414
577.00	11,350	5,484	19,898
577.50	12,675	6,006	25,904

Device	Routing	Invert	Outlet Devices
#1	Primary	572.50'	8.0" Round 8" pipe L= 25.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 572.50' / 572.42' S= 0.0032 ' ' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.35 sf
#2	Device 1	575.50'	8.0" Horiz. Grate X 4.00 C= 0.600 Limited to weir flow at low heads
#3	Device 1	575.00'	0.250 in/hr Exfiltration over Surface area Conductivity to Groundwater Elevation = 560.00'
#4	Secondary	575.75'	30.0' long (Profile 1) Broad-Crested Rectangular Weir Head (feet) 0.49 0.98 1.48 Coef. (English) 2.92 3.37 3.59

Primary OutFlow Max=2.79 cfs @ 12.13 hrs HW=575.91' (Free Discharge)

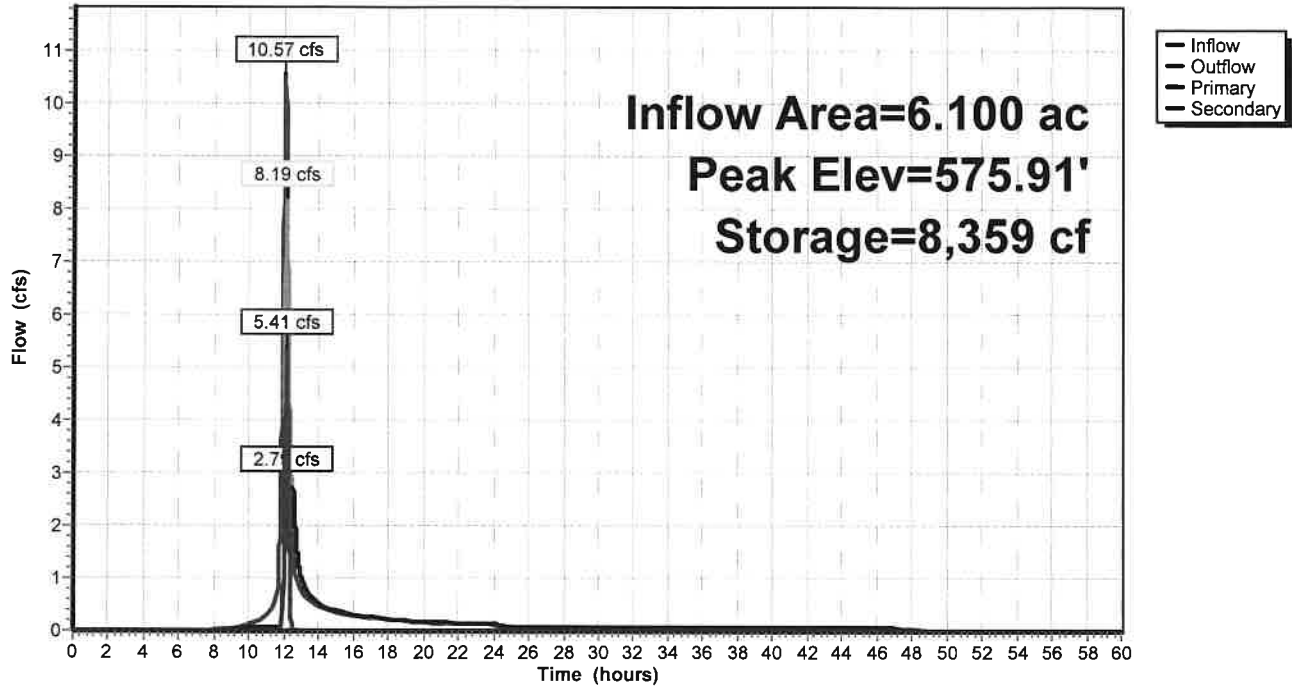
- 1=8" pipe (Barrel Controls 2.79 cfs @ 7.98 fps)
- 2=Grate (Passes < 4.28 cfs potential flow)
- 3=Exfiltration (Passes < 0.06 cfs potential flow)

Secondary OutFlow Max=5.39 cfs @ 12.13 hrs HW=575.91' (Free Discharge)

- 4=Broad-Crested Rectangular Weir (Weir Controls 5.39 cfs @ 1.15 fps)

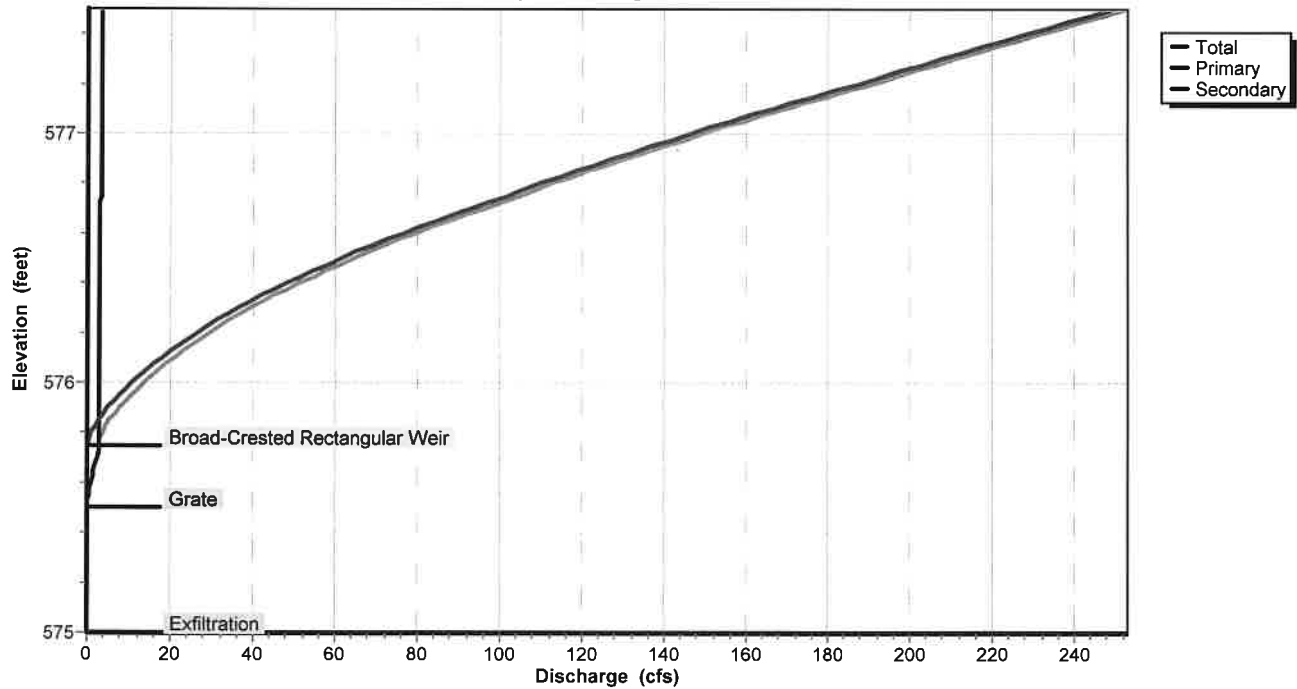
Pond 1P: Bioretention Area 3

Hydrograph

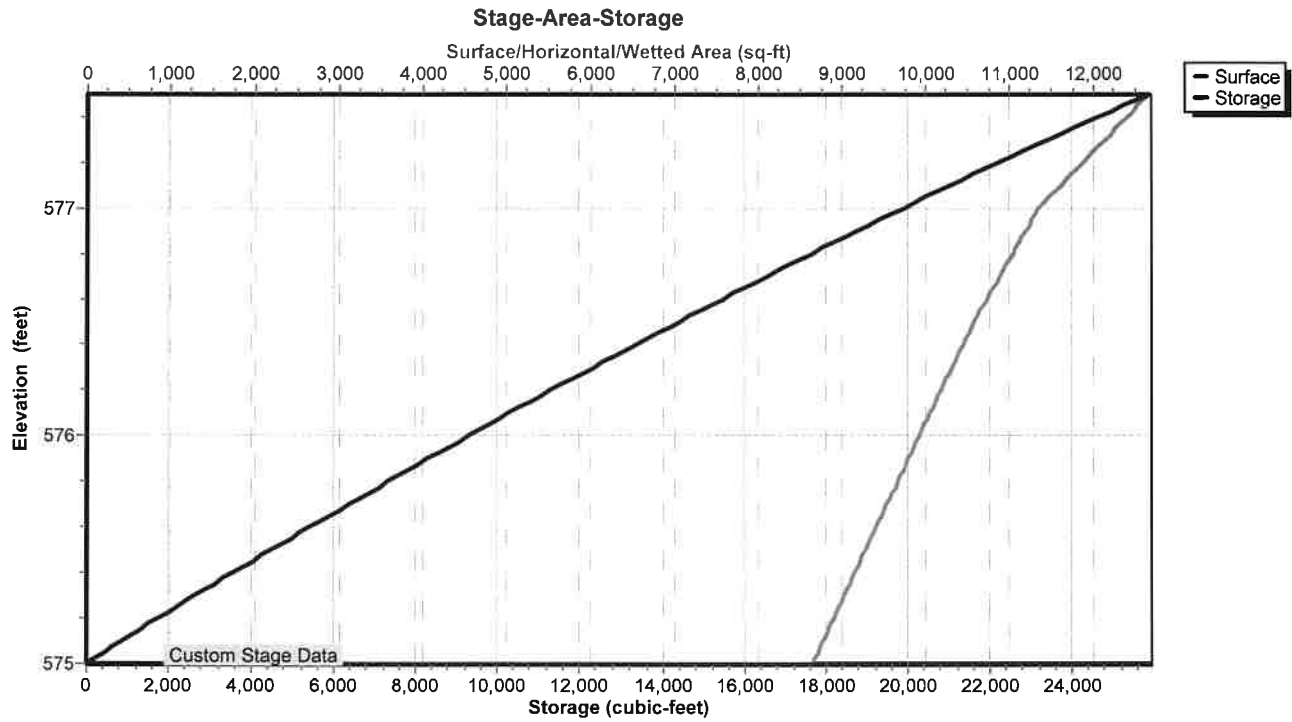


Pond 1P: Bioretention Area 3

Stage-Discharge



Pond 1P: Bioretention Area 3



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Hydrograph for Pond 1P: Bioretention Area 3

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Primary (cfs)	Secondary (cfs)
0.00	0.00	0	575.00	0.00	0.00	0.00
2.00	0.00	0	575.00	0.00	0.00	0.00
4.00	0.00	0	575.00	0.00	0.00	0.00
6.00	0.00	0	575.00	0.00	0.00	0.00
8.00	0.02	17	575.00	0.00	0.00	0.00
10.00	0.12	257	575.03	0.05	0.05	0.00
12.00	9.45	6,253	575.69	2.30	2.30	0.00
14.00	0.46	5,096	575.57	0.52	0.52	0.00
16.00	0.28	4,881	575.54	0.30	0.30	0.00
18.00	0.21	4,786	575.53	0.22	0.22	0.00
20.00	0.16	4,719	575.53	0.17	0.17	0.00
22.00	0.14	4,676	575.52	0.15	0.15	0.00
24.00	0.13	4,652	575.52	0.13	0.13	0.00
26.00	0.00	4,232	575.47	0.06	0.06	0.00
28.00	0.00	3,836	575.43	0.05	0.05	0.00
30.00	0.00	3,444	575.39	0.05	0.05	0.00
32.00	0.00	3,055	575.34	0.05	0.05	0.00
34.00	0.00	2,670	575.30	0.05	0.05	0.00
36.00	0.00	2,287	575.26	0.05	0.05	0.00
38.00	0.00	1,909	575.22	0.05	0.05	0.00
40.00	0.00	1,533	575.18	0.05	0.05	0.00
42.00	0.00	1,161	575.13	0.05	0.05	0.00
44.00	0.00	792	575.09	0.05	0.05	0.00
46.00	0.00	426	575.05	0.05	0.05	0.00
48.00	0.00	107	575.01	0.02	0.02	0.00
50.00	0.00	20	575.00	0.00	0.00	0.00
52.00	0.00	4	575.00	0.00	0.00	0.00
54.00	0.00	1	575.00	0.00	0.00	0.00
56.00	0.00	0	575.00	0.00	0.00	0.00
58.00	0.00	0	575.00	0.00	0.00	0.00
60.00	0.00	0	575.00	0.00	0.00	0.00

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Stage-Discharge for Pond 1P: Bioretention Area 3

Elevation (feet)	Discharge (cfs)	Primary (cfs)	Secondary (cfs)
575.00	0.00	0.00	0.00
575.05	0.05	0.05	0.00
575.10	0.05	0.05	0.00
575.15	0.05	0.05	0.00
575.20	0.05	0.05	0.00
575.25	0.05	0.05	0.00
575.30	0.05	0.05	0.00
575.35	0.05	0.05	0.00
575.40	0.05	0.05	0.00
575.45	0.05	0.05	0.00
575.50	0.06	0.06	0.00
575.55	0.36	0.36	0.00
575.60	0.92	0.92	0.00
575.65	1.65	1.65	0.00
575.70	2.51	2.51	0.00
575.75	2.71	2.71	0.00
575.80	3.71	2.73	0.98
575.85	5.53	2.76	2.77
575.90	7.87	2.78	5.09
575.95	10.64	2.81	7.84
576.00	13.78	2.83	10.95
576.05	17.25	2.86	14.39
576.10	21.02	2.88	18.14
576.15	25.07	2.91	22.16
576.20	29.37	2.93	26.44
576.25	34.02	2.95	31.07
576.30	39.38	2.98	36.41
576.35	45.12	3.00	42.12
576.40	51.24	3.02	48.22
576.45	57.74	3.04	54.69
576.50	64.62	3.07	61.55
576.55	71.88	3.09	68.79
576.60	79.53	3.11	76.42
576.65	87.57	3.13	84.44
576.70	96.00	3.16	92.85
576.75	104.54	3.18	101.36
576.80	112.97	3.20	109.77
576.85	121.69	3.22	118.47
576.90	130.69	3.24	127.45
576.95	139.98	3.26	136.72
577.00	149.56	3.28	146.27
577.05	159.42	3.30	156.11
577.10	169.57	3.33	166.24
577.15	180.00	3.35	176.66
577.20	190.72	3.37	187.36
577.25	201.24	3.39	197.86
577.30	211.24	3.41	207.83
577.35	221.40	3.43	217.97
577.40	231.71	3.45	228.27
577.45	242.19	3.47	238.72
577.50	252.82	3.49	249.33

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Type II 24-hr 2-Year Rainfall=2.20"

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Stage-Area-Storage for Pond 1P: Bioretention Area 3

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
575.00	8,648	0
575.05	8,712	434
575.10	8,776	871
575.15	8,840	1,312
575.20	8,903	1,755
575.25	8,967	2,202
575.30	9,031	2,652
575.35	9,095	3,105
575.40	9,159	3,561
575.45	9,223	4,021
575.50	9,287	4,484
575.55	9,350	4,950
575.60	9,414	5,419
575.65	9,478	5,891
575.70	9,542	6,366
575.75	9,606	6,845
575.80	9,670	7,327
575.85	9,733	7,812
575.90	9,797	8,300
575.95	9,861	8,792
576.00	9,925	9,287
576.05	9,991	9,784
576.10	10,057	10,286
576.15	10,123	10,790
576.20	10,189	11,298
576.25	10,255	11,809
576.30	10,321	12,323
576.35	10,387	12,841
576.40	10,453	13,362
576.45	10,519	13,886
576.50	10,585	14,414
576.55	10,661	14,945
576.60	10,738	15,480
576.65	10,814	16,019
576.70	10,891	16,562
576.75	10,968	17,108
576.80	11,044	17,658
576.85	11,121	18,212
576.90	11,197	18,770
576.95	11,274	19,332
577.00	11,350	19,898
577.05	11,482	20,469
577.10	11,615	21,046
577.15	11,747	21,630
577.20	11,880	22,221
577.25	12,013	22,818
577.30	12,145	23,422
577.35	12,278	24,033
577.40	12,410	24,650
577.45	12,543	25,274
577.50	12,675	25,904

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Type II 24-hr 2-Year Rainfall=2.20"

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Summary for Pond 3P: Detention Basin (SMA #1)

Inflow Area = 4.400 ac, 61.36% Impervious, Inflow Depth = 1.58" for 2-Year event
 Inflow = 12.29 cfs @ 12.11 hrs, Volume= 0.579 af
 Outflow = 0.18 cfs @ 17.01 hrs, Volume= 0.400 af, Atten= 99%, Lag= 293.7 min
 Primary = 0.18 cfs @ 17.01 hrs, Volume= 0.400 af
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
 Peak Elev= 575.32' @ 17.01 hrs Surf.Area= 61,630 sf Storage= 19,128 cf

Plug-Flow detention time= 1,051.7 min calculated for 0.400 af (69% of inflow)
 Center-of-Mass det. time= 962.0 min (1,770.2 - 808.1)

Volume	Invert	Avail.Storage	Storage Description
#1	575.00'	118,224 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
575.00	59,213	0	0
576.00	66,849	63,031	63,031
576.80	71,134	55,193	118,224

Device	Routing	Invert	Outlet Devices
#1	Primary	574.00'	12.0" Round 12" outlet pipe L= 160.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 574.00' / 573.79' S= 0.0013 ' /' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Device 1	575.00'	6.0" Round low flow outlet pipe L= 10.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 575.00' / 574.95' S= 0.0050 ' /' Cc= 0.900 n= 0.010 Corrugated PE, smooth interior, Flow Area= 0.20 sf
#3	Device 1	576.50'	30.0" x 30.0" Horiz. Gate C= 0.600 Limited to weir flow at low heads
#4	Secondary	575.95'	20.0' long (Profile 1) Broad-Crested Rectangular Weir X 2.00 Head (feet) 0.49 0.98 1.48 Coef. (English) 2.92 3.37 3.59

Primary OutFlow Max=0.18 cfs @ 17.01 hrs HW=575.32' (Free Discharge)

- 1=12" outlet pipe (Passes 0.18 cfs of 1.87 cfs potential flow)
- 2=low flow outlet pipe (Barrel Controls 0.18 cfs @ 1.95 fps)
- 3=Gate (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=575.00' (Free Discharge)

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

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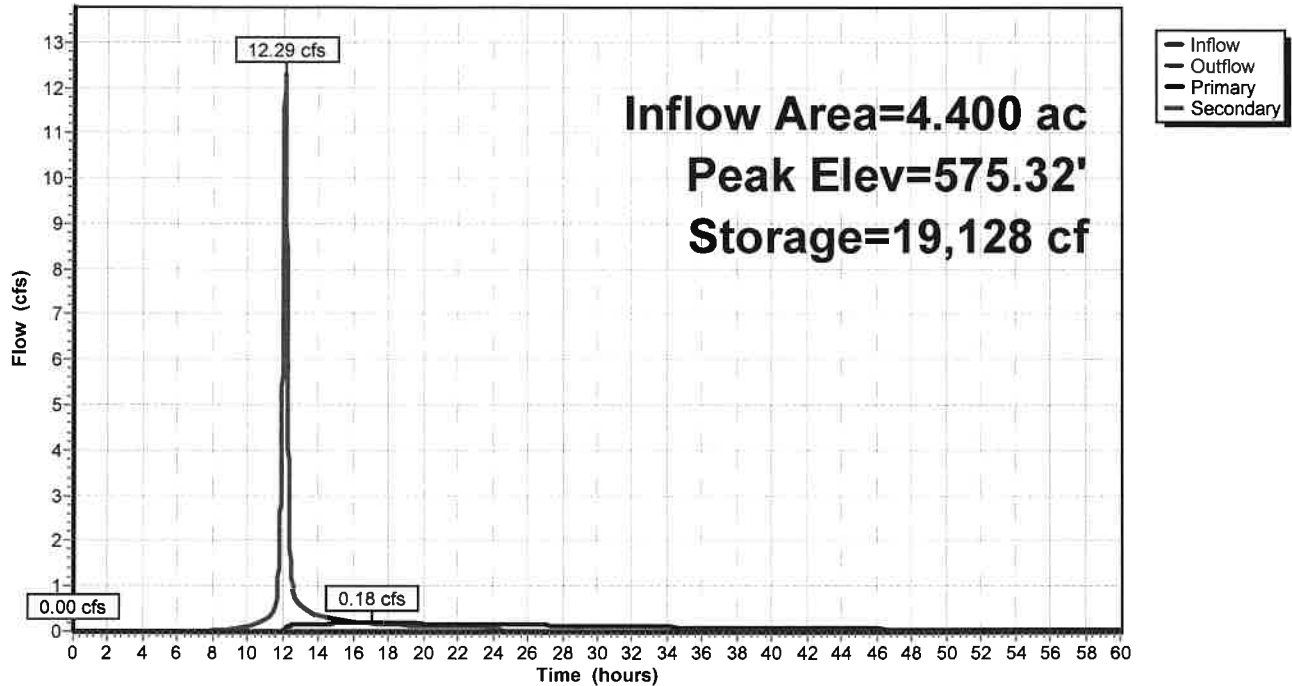
Type II 24-hr 2-Year Rainfall=2.20"

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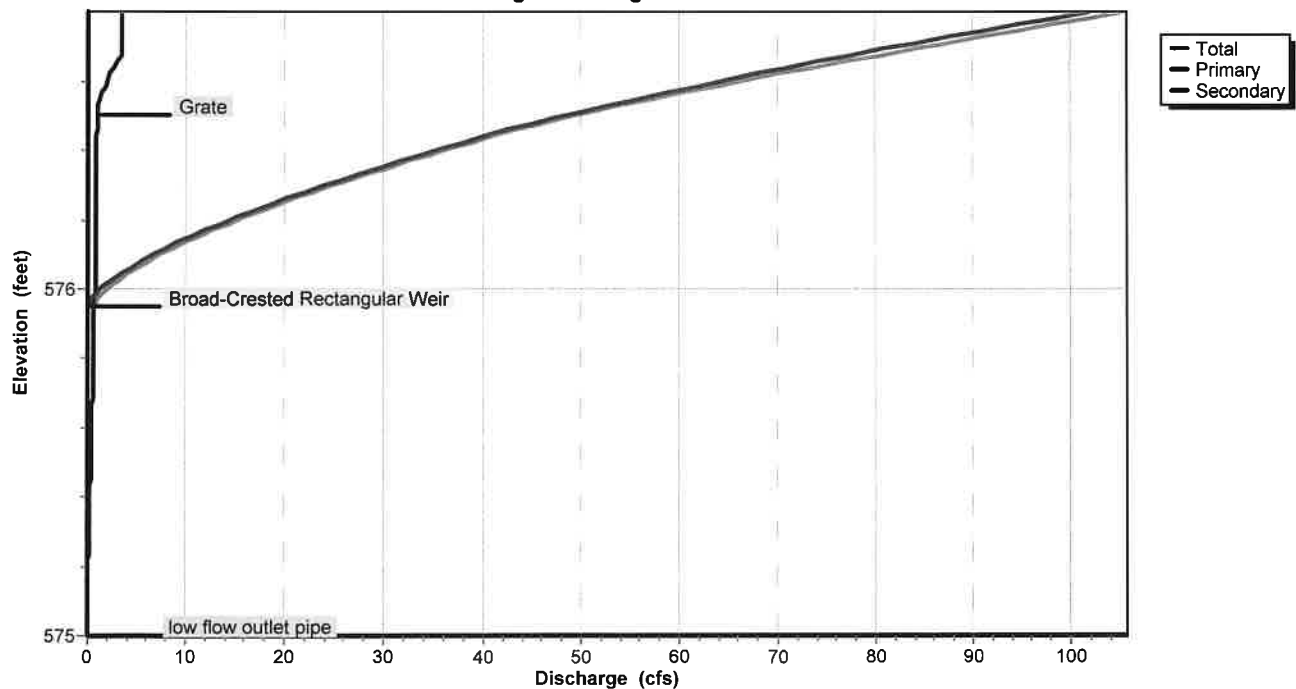
Pond 3P: Detention Basin (SMA #1)

Hydrograph

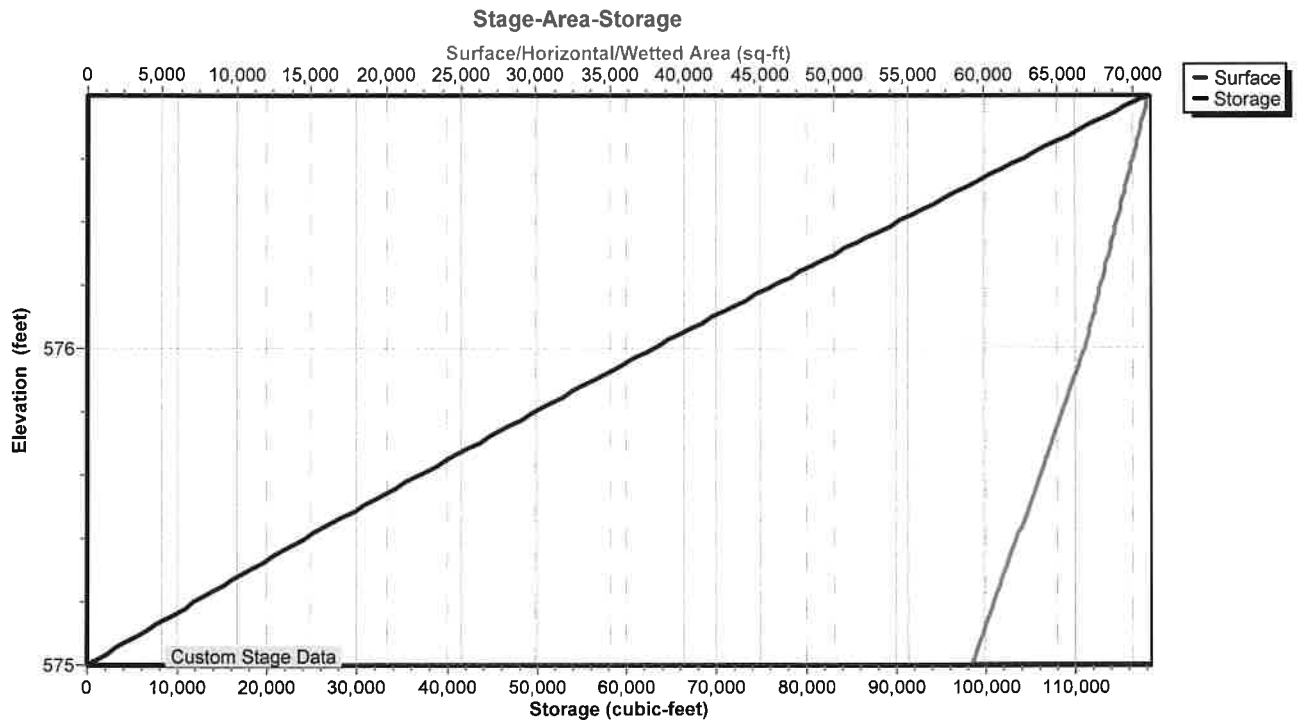


Pond 3P: Detention Basin (SMA #1)

Stage-Discharge



Pond 3P: Detention Basin (SMA #1)



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Hydrograph for Pond 3P: Detention Basin (SMA #1)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Primary (cfs)	Secondary (cfs)
0.00	0.00	0	575.00	0.00	0.00	0.00
2.00	0.00	0	575.00	0.00	0.00	0.00
4.00	0.00	0	575.00	0.00	0.00	0.00
6.00	0.00	0	575.00	0.00	0.00	0.00
8.00	0.02	48	575.00	0.00	0.00	0.00
10.00	0.10	451	575.01	0.00	0.00	0.00
12.00	6.69	5,327	575.09	0.02	0.02	0.00
14.00	0.35	18,425	575.31	0.17	0.17	0.00
16.00	0.21	19,087	575.32	0.18	0.18	0.00
18.00	0.16	19,093	575.32	0.18	0.18	0.00
20.00	0.12	18,812	575.31	0.17	0.17	0.00
22.00	0.10	18,367	575.30	0.17	0.17	0.00
24.00	0.10	17,912	575.30	0.16	0.16	0.00
26.00	0.00	16,886	575.28	0.15	0.15	0.00
28.00	0.00	15,893	575.26	0.13	0.13	0.00
30.00	0.00	14,996	575.25	0.12	0.12	0.00
32.00	0.00	14,184	575.24	0.11	0.11	0.00
34.00	0.00	13,445	575.22	0.10	0.10	0.00
36.00	0.00	12,772	575.21	0.09	0.09	0.00
38.00	0.00	12,156	575.20	0.08	0.08	0.00
40.00	0.00	11,591	575.19	0.08	0.08	0.00
42.00	0.00	11,071	575.18	0.07	0.07	0.00
44.00	0.00	10,592	575.18	0.06	0.06	0.00
46.00	0.00	10,149	575.17	0.06	0.06	0.00
48.00	0.00	9,739	575.16	0.05	0.05	0.00
50.00	0.00	9,358	575.16	0.05	0.05	0.00
52.00	0.00	9,003	575.15	0.05	0.05	0.00
54.00	0.00	8,673	575.15	0.04	0.04	0.00
56.00	0.00	8,364	575.14	0.04	0.04	0.00
58.00	0.00	8,075	575.14	0.04	0.04	0.00
60.00	0.00	7,803	575.13	0.04	0.04	0.00

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Type II 24-hr 2-Year Rainfall=2.20"

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Stage-Discharge for Pond 3P: Detention Basin (SMA #1)

Elevation (feet)	Discharge (cfs)	Primary (cfs)	Secondary (cfs)	Elevation (feet)	Discharge (cfs)	Primary (cfs)	Secondary (cfs)
575.00	0.00	0.00	0.00	576.04	3.90	0.74	3.15
575.02	0.00	0.00	0.00	576.06	5.01	0.75	4.26
575.04	0.00	0.00	0.00	576.08	6.23	0.76	5.47
575.06	0.01	0.01	0.00	576.10	7.55	0.77	6.79
575.08	0.01	0.01	0.00	576.12	8.96	0.78	8.19
575.10	0.02	0.02	0.00	576.14	10.46	0.79	9.67
575.12	0.03	0.03	0.00	576.16	12.04	0.80	11.24
575.14	0.04	0.04	0.00	576.18	13.69	0.80	12.88
575.16	0.05	0.05	0.00	576.20	15.41	0.81	14.60
575.18	0.07	0.07	0.00	576.22	17.21	0.82	16.39
575.20	0.08	0.08	0.00	576.24	19.07	0.83	18.24
575.22	0.09	0.09	0.00	576.26	21.00	0.84	20.16
575.24	0.11	0.11	0.00	576.28	22.99	0.85	22.14
575.26	0.13	0.13	0.00	576.30	25.04	0.85	24.18
575.28	0.15	0.15	0.00	576.32	27.15	0.86	26.29
575.30	0.16	0.16	0.00	576.34	29.32	0.87	28.45
575.32	0.18	0.18	0.00	576.36	31.54	0.88	30.66
575.34	0.20	0.20	0.00	576.38	33.82	0.89	32.93
575.36	0.22	0.22	0.00	576.40	36.15	0.89	35.26
575.38	0.24	0.24	0.00	576.42	38.54	0.90	37.63
575.40	0.26	0.26	0.00	576.44	40.97	0.91	40.06
575.42	0.28	0.28	0.00	576.46	43.73	0.92	42.81
575.44	0.31	0.31	0.00	576.48	46.56	0.93	45.63
575.46	0.33	0.33	0.00	576.50	49.47	0.93	48.54
575.48	0.35	0.35	0.00	576.52	52.56	1.03	51.53
575.50	0.37	0.37	0.00	576.54	55.81	1.21	54.60
575.52	0.39	0.39	0.00	576.56	59.18	1.44	57.75
575.54	0.41	0.41	0.00	576.58	62.68	1.70	60.98
575.56	0.43	0.43	0.00	576.60	66.29	2.00	64.29
575.58	0.45	0.45	0.00	576.62	70.02	2.34	67.68
575.60	0.46	0.46	0.00	576.64	73.85	2.70	71.16
575.62	0.48	0.48	0.00	576.66	77.79	3.08	74.71
575.64	0.49	0.49	0.00	576.68	81.74	3.39	78.35
575.66	0.50	0.50	0.00	576.70	85.48	3.41	82.07
575.68	0.51	0.51	0.00	576.72	89.30	3.43	85.87
575.70	0.54	0.54	0.00	576.74	93.20	3.45	89.75
575.72	0.56	0.56	0.00	576.76	97.18	3.46	93.72
575.74	0.58	0.58	0.00	576.78	101.25	3.48	97.76
575.76	0.60	0.60	0.00	576.80	105.39	3.50	101.90
575.78	0.61	0.61	0.00				
575.80	0.62	0.62	0.00				
575.82	0.63	0.63	0.00				
575.84	0.64	0.64	0.00				
575.86	0.65	0.65	0.00				
575.88	0.66	0.66	0.00				
575.90	0.67	0.67	0.00				
575.92	0.68	0.68	0.00				
575.94	0.69	0.69	0.00				
575.96	0.82	0.70	0.12				
575.98	1.32	0.71	0.61				
576.00	2.03	0.72	1.31				
576.02	2.90	0.73	2.16				

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Type II 24-hr 2-Year Rainfall=2.20"

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Stage-Area-Storage for Pond 3P: Detention Basin (SMA #1)

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
575.00	59,213	0	576.04	67,063	65,709
575.02	59,366	1,186	576.06	67,170	67,052
575.04	59,518	2,375	576.08	67,278	68,396
575.06	59,671	3,567	576.10	67,385	69,743
575.08	59,824	4,761	576.12	67,492	71,091
575.10	59,977	5,959	576.14	67,599	72,442
575.12	60,129	7,161	576.16	67,706	73,795
575.14	60,282	8,365	576.18	67,813	75,151
575.16	60,435	9,572	576.20	67,920	76,508
575.18	60,587	10,782	576.22	68,027	77,867
575.20	60,740	11,995	576.24	68,135	79,229
575.22	60,893	13,212	576.26	68,242	80,593
575.24	61,046	14,431	576.28	68,349	81,959
575.26	61,198	15,653	576.30	68,456	83,327
575.28	61,351	16,879	576.32	68,563	84,697
575.30	61,504	18,108	576.34	68,670	86,069
575.32	61,657	19,339	576.36	68,777	87,444
575.34	61,809	20,574	576.38	68,884	88,820
575.36	61,962	21,811	576.40	68,992	90,199
575.38	62,115	23,052	576.42	69,099	91,580
575.40	62,267	24,296	576.44	69,206	92,963
575.42	62,420	25,543	576.46	69,313	94,348
575.44	62,573	26,793	576.48	69,420	95,736
575.46	62,726	28,046	576.50	69,527	97,125
575.48	62,878	29,302	576.52	69,634	98,517
575.50	63,031	30,561	576.54	69,741	99,910
575.52	63,184	31,823	576.56	69,848	101,306
575.54	63,336	33,088	576.58	69,956	102,704
575.56	63,489	34,357	576.60	70,063	104,105
575.58	63,642	35,628	576.62	70,170	105,507
575.60	63,795	36,902	576.64	70,277	106,911
575.62	63,947	38,180	576.66	70,384	108,318
575.64	64,100	39,460	576.68	70,491	109,727
575.66	64,253	40,744	576.70	70,598	111,138
575.68	64,405	42,030	576.72	70,706	112,551
575.70	64,558	43,320	576.74	70,813	113,966
575.72	64,711	44,613	576.76	70,920	115,383
575.74	64,864	45,908	576.78	71,027	116,803
575.76	65,016	47,207	576.80	71,134	118,224
575.78	65,169	48,509			
575.80	65,322	49,814			
575.82	65,475	51,122			
575.84	65,627	52,433			
575.86	65,780	53,747			
575.88	65,933	55,064			
575.90	66,085	56,384			
575.92	66,238	57,708			
575.94	66,391	59,034			
575.96	66,544	60,363			
575.98	66,696	61,696			
576.00	66,849	63,031			
576.02	66,956	64,369			

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Type II 24-hr 2-Year Rainfall=2.20"

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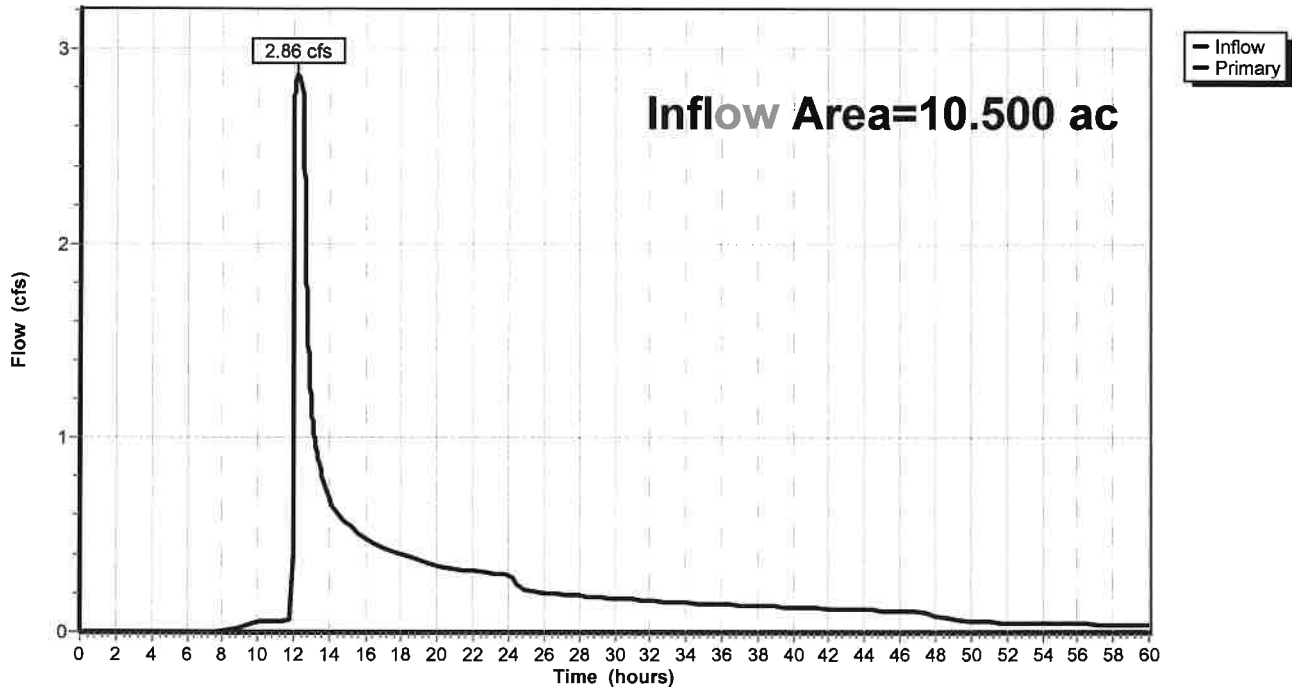
Summary for Link 5L: Outflow (@ CB 54)

Inflow Area = 10.500 ac, 57.14% Impervious, Inflow Depth > 1.09" for 2-Year event
Inflow = 2.86 cfs @ 12.23 hrs, Volume= 0.956 af
Primary = 2.86 cfs @ 12.23 hrs, Volume= 0.956 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs

Link 5L: Outflow (@ CB 54)

Hydrograph



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Type II 24-hr 2-Year Rainfall=2.20"

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Hydrograph for Link 5L: Outflow (@ CB 54)

Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)	Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
0.00	0.00	0.00	0.00	52.00	0.05	0.00	0.05
1.00	0.00	0.00	0.00	53.00	0.05	0.00	0.05
2.00	0.00	0.00	0.00	54.00	0.04	0.00	0.04
3.00	0.00	0.00	0.00	55.00	0.04	0.00	0.04
4.00	0.00	0.00	0.00	56.00	0.04	0.00	0.04
5.00	0.00	0.00	0.00	57.00	0.04	0.00	0.04
6.00	0.00	0.00	0.00	58.00	0.04	0.00	0.04
7.00	0.00	0.00	0.00	59.00	0.04	0.00	0.04
8.00	0.00	0.00	0.00	60.00	0.04	0.00	0.04
9.00	0.02	0.00	0.02				
10.00	0.05	0.00	0.05				
11.00	0.05	0.00	0.05				
12.00	2.31	0.00	2.31				
13.00	1.18	0.00	1.18				
14.00	0.69	0.00	0.69				
15.00	0.55	0.00	0.55				
16.00	0.48	0.00	0.48				
17.00	0.43	0.00	0.43				
18.00	0.40	0.00	0.40				
19.00	0.37	0.00	0.37				
20.00	0.34	0.00	0.34				
21.00	0.32	0.00	0.32				
22.00	0.31	0.00	0.31				
23.00	0.30	0.00	0.30				
24.00	0.29	0.00	0.29				
25.00	0.21	0.00	0.21				
26.00	0.20	0.00	0.20				
27.00	0.19	0.00	0.19				
28.00	0.19	0.00	0.19				
29.00	0.18	0.00	0.18				
30.00	0.17	0.00	0.17				
31.00	0.17	0.00	0.17				
32.00	0.16	0.00	0.16				
33.00	0.16	0.00	0.16				
34.00	0.15	0.00	0.15				
35.00	0.15	0.00	0.15				
36.00	0.14	0.00	0.14				
37.00	0.14	0.00	0.14				
38.00	0.13	0.00	0.13				
39.00	0.13	0.00	0.13				
40.00	0.13	0.00	0.13				
41.00	0.12	0.00	0.12				
42.00	0.12	0.00	0.12				
43.00	0.12	0.00	0.12				
44.00	0.11	0.00	0.11				
45.00	0.11	0.00	0.11				
46.00	0.11	0.00	0.11				
47.00	0.11	0.00	0.11				
48.00	0.08	0.00	0.08				
49.00	0.06	0.00	0.06				
50.00	0.06	0.00	0.06				
51.00	0.05	0.00	0.05				

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Type II 24-hr 5-Year Rainfall=2.70"

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Time span=0.00-60.00 hrs, dt=0.01 hrs, 6001 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: Front Area 1

Runoff Area=6.100 ac 54.10% Impervious Runoff Depth=1.71"
Flow Length=652' Tc=13.3 min CN=90 Runoff=14.18 cfs 0.870 af

Subcatchment 2S: Rear Area 1

Runoff Area=4.400 ac 61.36% Impervious Runoff Depth=1.79"
Flow Length=683' Tc=14.4 min CN=91 Runoff=10.29 cfs 0.658 af

Pond 1P: Bioretention Area 3

Peak Elev=575.99' Storage=9,153 cf Inflow=14.18 cfs 0.870 af
Primary=2.83 cfs 0.666 af Secondary=10.09 cfs 0.203 af Outflow=12.91 cfs 0.870 af

Pond 3P: Detention Basin (SMA #1)

Peak Elev=575.46' Storage=28,218 cf Inflow=20.08 cfs 0.861 af
Primary=0.33 cfs 0.652 af Secondary=0.00 cfs 0.000 af Outflow=0.33 cfs 0.652 af

Link 5L: Outflow (@ CB 54)

Inflow=3.01 cfs 1.318 af
Primary=3.01 cfs 1.318 af

Total Runoff Area = 10.500 ac Runoff Volume = 1.527 af Average Runoff Depth = 1.75"
42.86% Pervious = 4.500 ac 57.14% Impervious = 6.000 ac

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Type II 24-hr 5-Year Rainfall=2.70"

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Summary for Subcatchment 1S: Front Area 1

Runoff = 14.18 cfs @ 12.05 hrs, Volume= 0.870 af, Depth= 1.71"

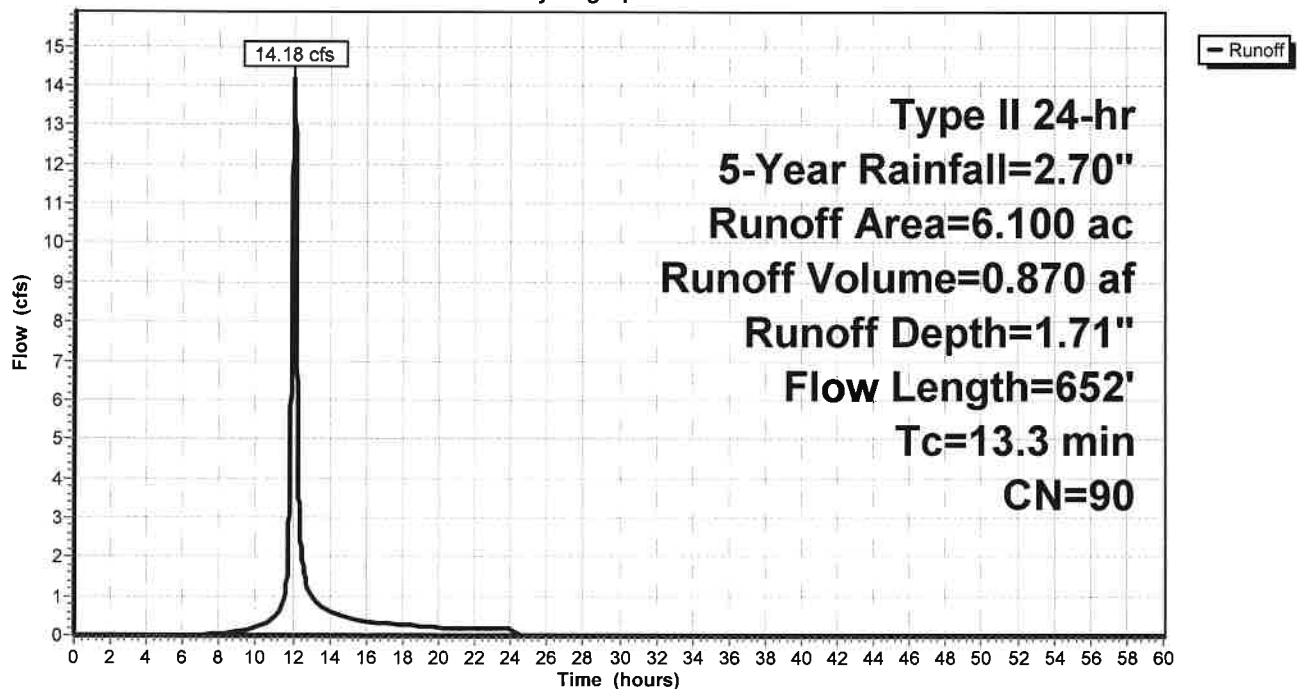
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
Type II 24-hr 5-Year Rainfall=2.70"

Area (ac)	CN	Description
1.800	98	Paved parking, HSG D
1.500	98	Roofs, HSG D
2.800	80	>75% Grass cover, Good, HSG D
6.100	90	Weighted Average
2.800		45.90% Pervious Area
3.300		54.10% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.6	37	0.0100	0.06		Sheet Flow, grass Grass: Dense n= 0.240 P2= 2.50"
0.4	15	0.0120	0.68		Sheet Flow, pavement Smooth surfaces n= 0.011 P2= 2.50"
3.3	600		3.00		Direct Entry, pipe flow
13.3	652	Total			

Subcatchment 1S: Front Area 1

Hydrograph



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Type II 24-hr 5-Year Rainfall=2.70"

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Hydrograph for Subcatchment 1S: Front Area 1

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	52.00	2.70	1.71	0.00
1.00	0.03	0.00	0.00	53.00	2.70	1.71	0.00
2.00	0.06	0.00	0.00	54.00	2.70	1.71	0.00
3.00	0.09	0.00	0.00	55.00	2.70	1.71	0.00
4.00	0.13	0.00	0.00	56.00	2.70	1.71	0.00
5.00	0.17	0.00	0.00	57.00	2.70	1.71	0.00
6.00	0.22	0.00	0.00	58.00	2.70	1.71	0.00
7.00	0.27	0.00	0.02	59.00	2.70	1.71	0.00
8.00	0.32	0.01	0.05	60.00	2.70	1.71	0.00
9.00	0.40	0.02	0.12				
10.00	0.49	0.05	0.20				
11.00	0.63	0.11	0.47				
12.00	1.79	0.92	12.79				
13.00	2.08	1.17	1.02				
14.00	2.21	1.28	0.59				
15.00	2.30	1.36	0.46				
16.00	2.38	1.42	0.36				
17.00	2.43	1.47	0.31				
18.00	2.49	1.52	0.27				
19.00	2.53	1.56	0.24				
20.00	2.57	1.59	0.20				
21.00	2.60	1.62	0.19				
22.00	2.64	1.65	0.18				
23.00	2.67	1.68	0.17				
24.00	2.70	1.71	0.17				
25.00	2.70	1.71	0.00				
26.00	2.70	1.71	0.00				
27.00	2.70	1.71	0.00				
28.00	2.70	1.71	0.00				
29.00	2.70	1.71	0.00				
30.00	2.70	1.71	0.00				
31.00	2.70	1.71	0.00				
32.00	2.70	1.71	0.00				
33.00	2.70	1.71	0.00				
34.00	2.70	1.71	0.00				
35.00	2.70	1.71	0.00				
36.00	2.70	1.71	0.00				
37.00	2.70	1.71	0.00				
38.00	2.70	1.71	0.00				
39.00	2.70	1.71	0.00				
40.00	2.70	1.71	0.00				
41.00	2.70	1.71	0.00				
42.00	2.70	1.71	0.00				
43.00	2.70	1.71	0.00				
44.00	2.70	1.71	0.00				
45.00	2.70	1.71	0.00				
46.00	2.70	1.71	0.00				
47.00	2.70	1.71	0.00				
48.00	2.70	1.71	0.00				
49.00	2.70	1.71	0.00				
50.00	2.70	1.71	0.00				
51.00	2.70	1.71	0.00				

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Type II 24-hr 5-Year Rainfall=2.70"

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Summary for Subcatchment 2S: Rear Area 1

Runoff = 10.29 cfs @ 12.06 hrs, Volume= 0.658 af, Depth= 1.79"

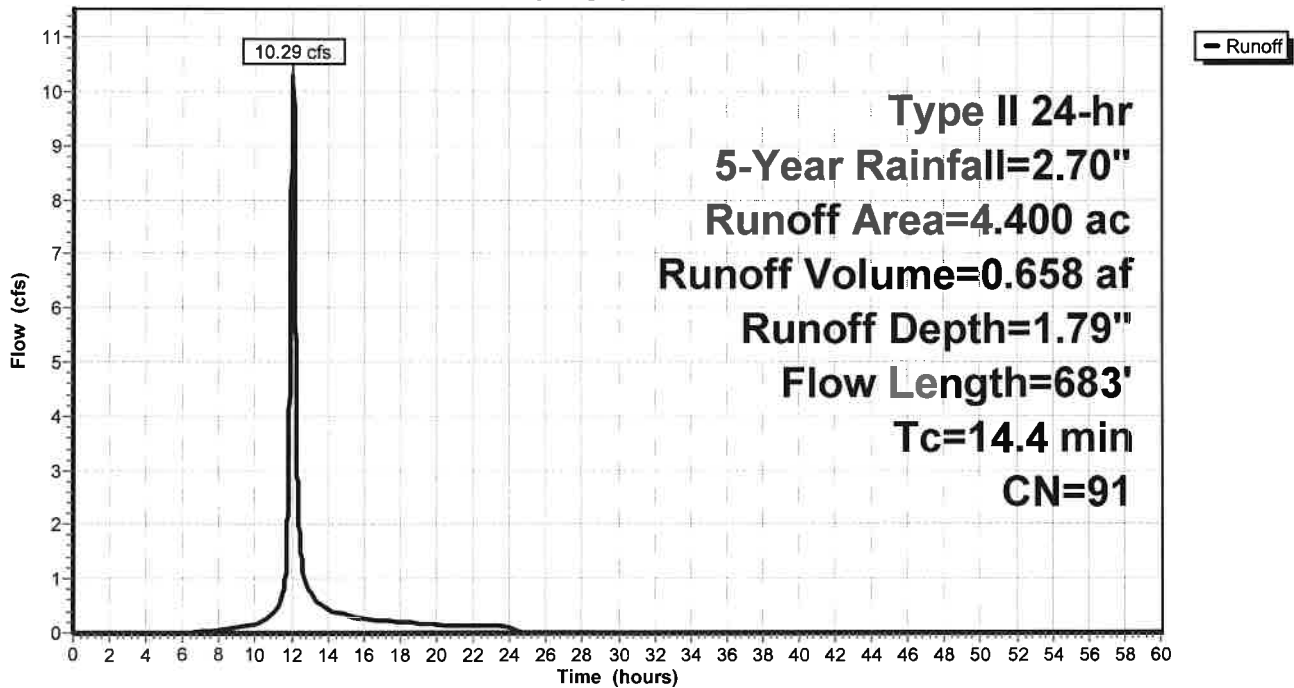
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
Type II 24-hr 5-Year Rainfall=2.70"

Area (ac)	CN	Description
1.400	98	Paved parking, HSG D
1.300	98	Roofs, HSG D
1.700	80	>75% Grass cover, Good, HSG D
4.400	91	Weighted Average
1.700		38.64% Pervious Area
2.700		61.36% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.2	90	0.0200	0.15		Sheet Flow, grass Grass: Short n= 0.150 P2= 2.50"
1.3	75	0.0130	0.97		Sheet Flow, pavement Smooth surfaces n= 0.011 P2= 2.50"
2.9	518		3.00		Direct Entry, Pipe flow
14.4	683	Total			

Subcatchment 2S: Rear Area 1

Hydrograph



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Type II 24-hr 5-Year Rainfall=2.70"

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Hydrograph for Subcatchment 2S: Rear Area 1

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	52.00	2.70	1.79	0.00
1.00	0.03	0.00	0.00	53.00	2.70	1.79	0.00
2.00	0.06	0.00	0.00	54.00	2.70	1.79	0.00
3.00	0.09	0.00	0.00	55.00	2.70	1.79	0.00
4.00	0.13	0.00	0.00	56.00	2.70	1.79	0.00
5.00	0.17	0.00	0.00	57.00	2.70	1.79	0.00
6.00	0.22	0.00	0.00	58.00	2.70	1.79	0.00
7.00	0.27	0.00	0.03	59.00	2.70	1.79	0.00
8.00	0.32	0.01	0.05	60.00	2.70	1.79	0.00
9.00	0.40	0.03	0.10				
10.00	0.49	0.07	0.17				
11.00	0.63	0.13	0.37				
12.00	1.79	0.98	8.97				
13.00	2.08	1.24	0.77				
14.00	2.21	1.35	0.44				
15.00	2.30	1.43	0.34				
16.00	2.38	1.50	0.27				
17.00	2.43	1.55	0.23				
18.00	2.49	1.60	0.20				
19.00	2.53	1.64	0.18				
20.00	2.57	1.67	0.15				
21.00	2.60	1.71	0.14				
22.00	2.64	1.74	0.13				
23.00	2.67	1.77	0.13				
24.00	2.70	1.79	0.12				
25.00	2.70	1.79	0.00				
26.00	2.70	1.79	0.00				
27.00	2.70	1.79	0.00				
28.00	2.70	1.79	0.00				
29.00	2.70	1.79	0.00				
30.00	2.70	1.79	0.00				
31.00	2.70	1.79	0.00				
32.00	2.70	1.79	0.00				
33.00	2.70	1.79	0.00				
34.00	2.70	1.79	0.00				
35.00	2.70	1.79	0.00				
36.00	2.70	1.79	0.00				
37.00	2.70	1.79	0.00				
38.00	2.70	1.79	0.00				
39.00	2.70	1.79	0.00				
40.00	2.70	1.79	0.00				
41.00	2.70	1.79	0.00				
42.00	2.70	1.79	0.00				
43.00	2.70	1.79	0.00				
44.00	2.70	1.79	0.00				
45.00	2.70	1.79	0.00				
46.00	2.70	1.79	0.00				
47.00	2.70	1.79	0.00				
48.00	2.70	1.79	0.00				
49.00	2.70	1.79	0.00				
50.00	2.70	1.79	0.00				
51.00	2.70	1.79	0.00				

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Type II 24-hr 5-Year Rainfall=2.70"

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Summary for Pond 1P: Bioretention Area 3

Inflow Area = 6.100 ac, 54.10% Impervious, Inflow Depth = 1.71" for 5-Year event
 Inflow = 14.18 cfs @ 12.05 hrs, Volume= 0.870 af
 Outflow = 12.91 cfs @ 12.10 hrs, Volume= 0.870 af, Atten= 9%, Lag= 2.9 min
 Primary = 2.83 cfs @ 12.10 hrs, Volume= 0.666 af
 Secondary = 10.09 cfs @ 12.10 hrs, Volume= 0.203 af

Routing by Stor-Ind method, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
 Peak Elev= 575.99' @ 12.10 hrs Surf.Area= 9,908 sf Storage= 9,153 cf

Plug-Flow detention time= 193.1 min calculated for 0.869 af (100% of inflow)
 Center-of-Mass det. time= 193.4 min (1,010.7 - 817.3)

Volume	Invert	Avail.Storage	Storage Description
#1	575.00'	25,904 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
575.00	8,648	0	0
576.00	9,925	9,287	9,287
576.50	10,585	5,128	14,414
577.00	11,350	5,484	19,898
577.50	12,675	6,006	25,904

Device	Routing	Invert	Outlet Devices
#1	Primary	572.50'	8.0" Round 8" pipe L= 25.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 572.50' / 572.42' S= 0.0032 ' S= 0.0032 ' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.35 sf
#2	Device 1	575.50'	8.0" Horiz. Grate X 4.00 C= 0.600 Limited to weir flow at low heads
#3	Device 1	575.00'	0.250 in/hr Exfiltration over Surface area Conductivity to Groundwater Elevation = 560.00'
#4	Secondary	575.75'	30.0' long (Profile 1) Broad-Crested Rectangular Weir Head (feet) 0.49 0.98 1.48 Coef. (English) 2.92 3.37 3.59

Primary OutFlow Max=2.83 cfs @ 12.10 hrs HW=575.99' (Free Discharge)

- ↑ 1=8" pipe (Barrel Controls 2.83 cfs @ 8.10 fps)
- ↑ 2=Grate (Passes < 4.69 cfs potential flow)
- ↑ 3=Exfiltration (Passes < 0.06 cfs potential flow)

Secondary OutFlow Max=10.07 cfs @ 12.10 hrs HW=575.99' (Free Discharge)

- ↑ 4=Broad-Crested Rectangular Weir (Weir Controls 10.07 cfs @ 1.42 fps)

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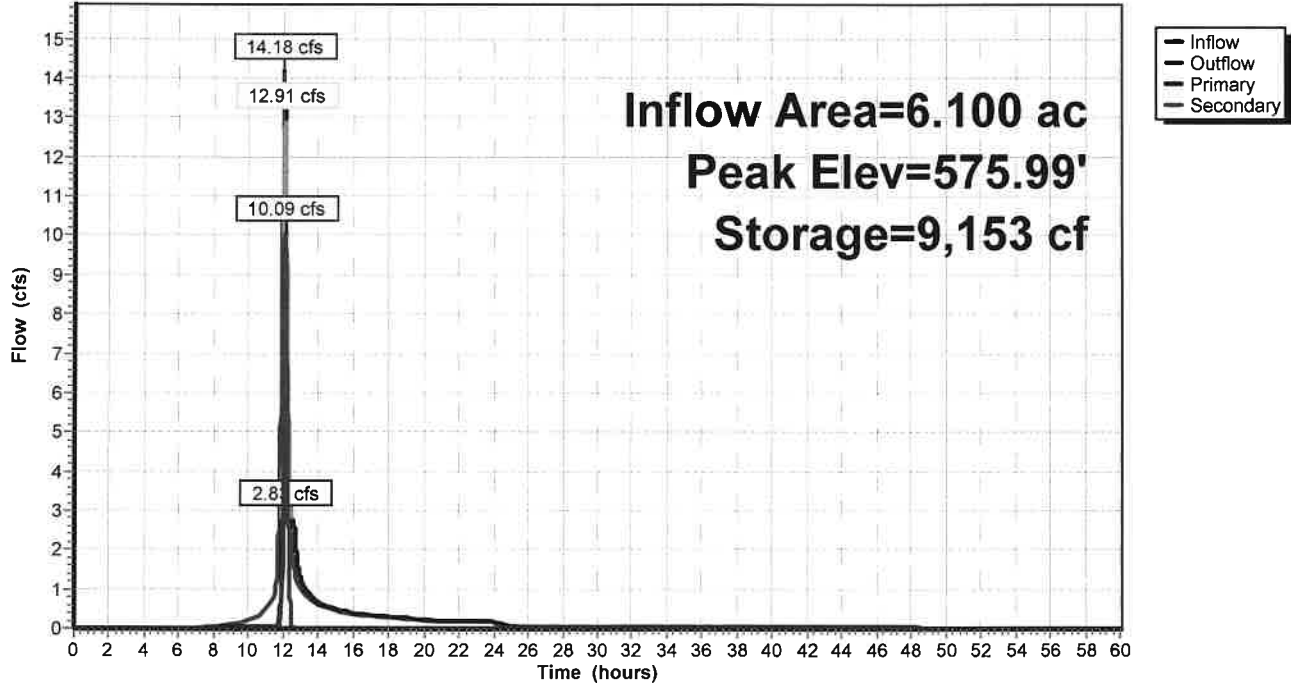
Type II 24-hr 5-Year Rainfall=2.70"

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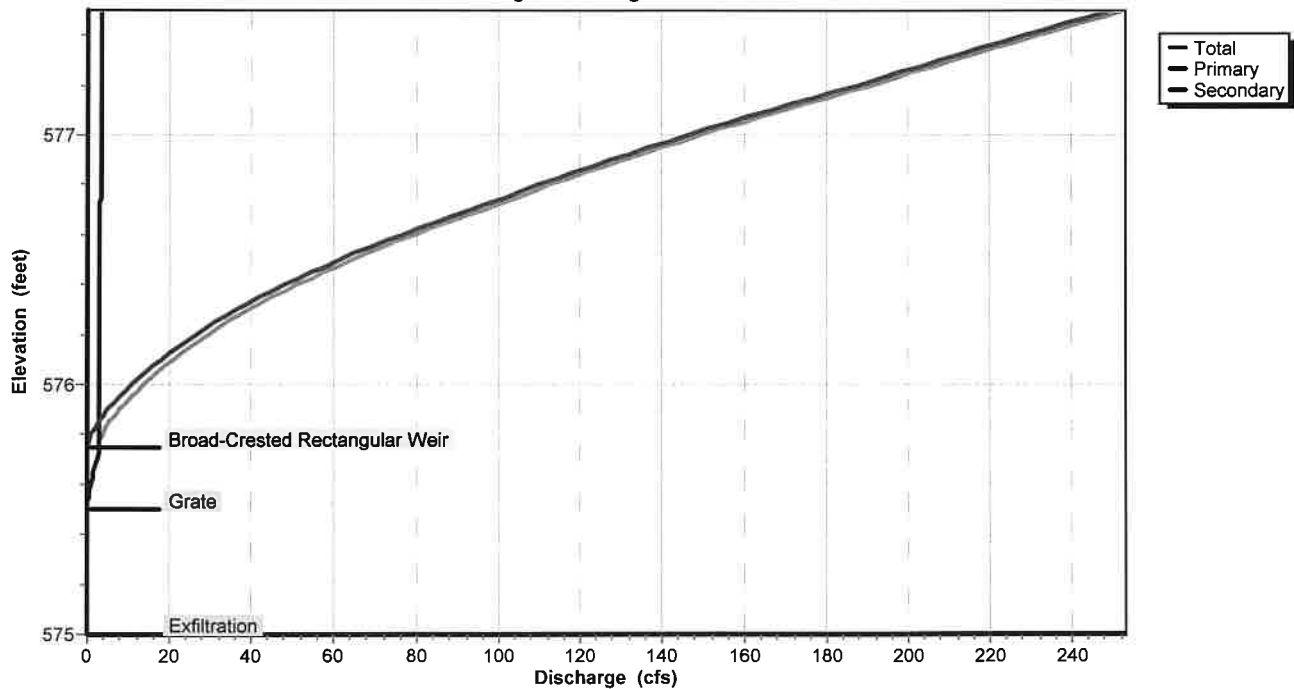
Pond 1P: Bioretention Area 3

Hydrograph

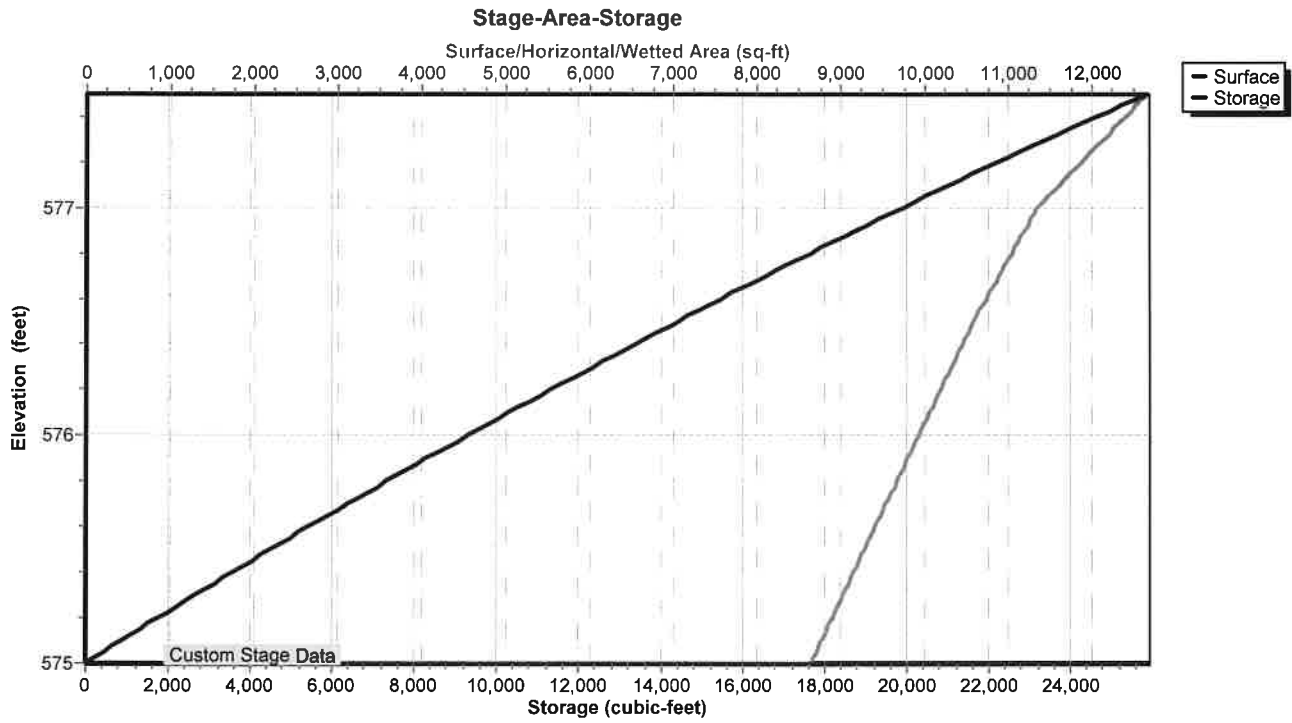


Pond 1P: Bioretention Area 3

Stage-Discharge



Pond 1P: Bioretention Area 3



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Type II 24-hr 5-Year Rainfall=2.70"

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Hydrograph for Pond 1P: Bioretention Area 3

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Primary (cfs)	Secondary (cfs)
0.00	0.00	0	575.00	0.00	0.00	0.00
2.00	0.00	0	575.00	0.00	0.00	0.00
4.00	0.00	0	575.00	0.00	0.00	0.00
6.00	0.00	0	575.00	0.00	0.00	0.00
8.00	0.05	99	575.01	0.02	0.02	0.00
10.00	0.20	617	575.07	0.05	0.05	0.00
12.00	12.79	8,183	575.89	7.28	2.78	4.50
14.00	0.59	5,218	575.58	0.66	0.66	0.00
16.00	0.36	4,969	575.55	0.38	0.38	0.00
18.00	0.27	4,859	575.54	0.29	0.29	0.00
20.00	0.20	4,774	575.53	0.21	0.21	0.00
22.00	0.18	4,739	575.53	0.18	0.18	0.00
24.00	0.17	4,722	575.53	0.17	0.17	0.00
26.00	0.00	4,258	575.48	0.06	0.06	0.00
28.00	0.00	3,862	575.43	0.05	0.05	0.00
30.00	0.00	3,470	575.39	0.05	0.05	0.00
32.00	0.00	3,081	575.35	0.05	0.05	0.00
34.00	0.00	2,695	575.30	0.05	0.05	0.00
36.00	0.00	2,313	575.26	0.05	0.05	0.00
38.00	0.00	1,934	575.22	0.05	0.05	0.00
40.00	0.00	1,558	575.18	0.05	0.05	0.00
42.00	0.00	1,186	575.14	0.05	0.05	0.00
44.00	0.00	816	575.09	0.05	0.05	0.00
46.00	0.00	450	575.05	0.05	0.05	0.00
48.00	0.00	119	575.01	0.03	0.03	0.00
50.00	0.00	22	575.00	0.01	0.01	0.00
52.00	0.00	4	575.00	0.00	0.00	0.00
54.00	0.00	1	575.00	0.00	0.00	0.00
56.00	0.00	0	575.00	0.00	0.00	0.00
58.00	0.00	0	575.00	0.00	0.00	0.00
60.00	0.00	0	575.00	0.00	0.00	0.00

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Type II 24-hr 5-Year Rainfall=2.70"

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Stage-Discharge for Pond 1P: Bioretention Area 3

Elevation (feet)	Discharge (cfs)	Primary (cfs)	Secondary (cfs)
575.00	0.00	0.00	0.00
575.05	0.05	0.05	0.00
575.10	0.05	0.05	0.00
575.15	0.05	0.05	0.00
575.20	0.05	0.05	0.00
575.25	0.05	0.05	0.00
575.30	0.05	0.05	0.00
575.35	0.05	0.05	0.00
575.40	0.05	0.05	0.00
575.45	0.05	0.05	0.00
575.50	0.06	0.06	0.00
575.55	0.36	0.36	0.00
575.60	0.92	0.92	0.00
575.65	1.65	1.65	0.00
575.70	2.51	2.51	0.00
575.75	2.71	2.71	0.00
575.80	3.71	2.73	0.98
575.85	5.53	2.76	2.77
575.90	7.87	2.78	5.09
575.95	10.64	2.81	7.84
576.00	13.78	2.83	10.95
576.05	17.25	2.86	14.39
576.10	21.02	2.88	18.14
576.15	25.07	2.91	22.16
576.20	29.37	2.93	26.44
576.25	34.02	2.95	31.07
576.30	39.38	2.98	36.41
576.35	45.12	3.00	42.12
576.40	51.24	3.02	48.22
576.45	57.74	3.04	54.69
576.50	64.62	3.07	61.55
576.55	71.88	3.09	68.79
576.60	79.53	3.11	76.42
576.65	87.57	3.13	84.44
576.70	96.00	3.16	92.85
576.75	104.54	3.18	101.36
576.80	112.97	3.20	109.77
576.85	121.69	3.22	118.47
576.90	130.69	3.24	127.45
576.95	139.98	3.26	136.72
577.00	149.56	3.28	146.27
577.05	159.42	3.30	156.11
577.10	169.57	3.33	166.24
577.15	180.00	3.35	176.66
577.20	190.72	3.37	187.36
577.25	201.24	3.39	197.86
577.30	211.24	3.41	207.83
577.35	221.40	3.43	217.97
577.40	231.71	3.45	228.27
577.45	242.19	3.47	238.72
577.50	252.82	3.49	249.33

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Type II 24-hr 5-Year Rainfall=2.70"

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Stage-Area-Storage for Pond 1P: Bioretention Area 3

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
575.00	8,648	0
575.05	8,712	434
575.10	8,776	871
575.15	8,840	1,312
575.20	8,903	1,755
575.25	8,967	2,202
575.30	9,031	2,652
575.35	9,095	3,105
575.40	9,159	3,561
575.45	9,223	4,021
575.50	9,287	4,484
575.55	9,350	4,950
575.60	9,414	5,419
575.65	9,478	5,891
575.70	9,542	6,366
575.75	9,606	6,845
575.80	9,670	7,327
575.85	9,733	7,812
575.90	9,797	8,300
575.95	9,861	8,792
576.00	9,925	9,287
576.05	9,991	9,784
576.10	10,057	10,286
576.15	10,123	10,790
576.20	10,189	11,298
576.25	10,255	11,809
576.30	10,321	12,323
576.35	10,387	12,841
576.40	10,453	13,362
576.45	10,519	13,886
576.50	10,585	14,414
576.55	10,661	14,945
576.60	10,738	15,480
576.65	10,814	16,019
576.70	10,891	16,562
576.75	10,968	17,108
576.80	11,044	17,658
576.85	11,121	18,212
576.90	11,197	18,770
576.95	11,274	19,332
577.00	11,350	19,898
577.05	11,422	20,469
577.10	11,615	21,046
577.15	11,747	21,630
577.20	11,880	22,221
577.25	12,013	22,818
577.30	12,145	23,422
577.35	12,278	24,033
577.40	12,410	24,650
577.45	12,543	25,274
577.50	12,675	25,904

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Type II 24-hr 5-Year Rainfall=2.70"

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Summary for Pond 3P: Detention Basin (SMA #1)

Inflow Area = 4.400 ac, 61.36% Impervious, Inflow Depth = 2.35" for 5-Year event
 Inflow = 20.08 cfs @ 12.08 hrs, Volume= 0.861 af
 Outflow = 0.33 cfs @ 15.13 hrs, Volume= 0.652 af, Atten= 98%, Lag= 182.5 min
 Primary = 0.33 cfs @ 15.13 hrs, Volume= 0.652 af
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
 Peak Elev= 575.46' @ 15.13 hrs Surf.Area= 62,747 sf Storage= 28,218 cf

Plug-Flow detention time= 974.3 min calculated for 0.652 af (76% of inflow)
 Center-of-Mass det. time= 898.6 min (1,692.2 - 793.6)

Volume	Invert	Avail.Storage	Storage Description
#1	575.00'	118,224 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
575.00	59,213	0	0
576.00	66,849	63,031	63,031
576.80	71,134	55,193	118,224

Device	Routing	Invert	Outlet Devices
#1	Primary	574.00'	12.0" Round 12" outlet pipe L= 160.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 574.00' / 573.79' S= 0.0013 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Device 1	575.00'	6.0" Round low flow outlet pipe L= 10.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 575.00' / 574.95' S= 0.0050 '/' Cc= 0.900 n= 0.010 Corrugated PE, smooth interior, Flow Area= 0.20 sf
#3	Device 1	576.50'	30.0" x 30.0" Horiz. Grate C= 0.600 Limited to weir flow at low heads
#4	Secondary	575.95'	20.0' long (Profile 1) Broad-Crested Rectangular Weir X 2.00 Head (feet) 0.49 0.98 1.48 Coef. (English) 2.92 3.37 3.59

Primary OutFlow Max=0.33 cfs @ 15.13 hrs HW=575.46' (Free Discharge)

- ↑ 1=12" outlet pipe (Passes 0.33 cfs of 2.02 cfs potential flow)
- ↑ 2=low flow outlet pipe (Barrel Controls 0.33 cfs @ 2.27 fps)
- ↑ 3=Grate (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=575.00' (Free Discharge)

- ↑ 4=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

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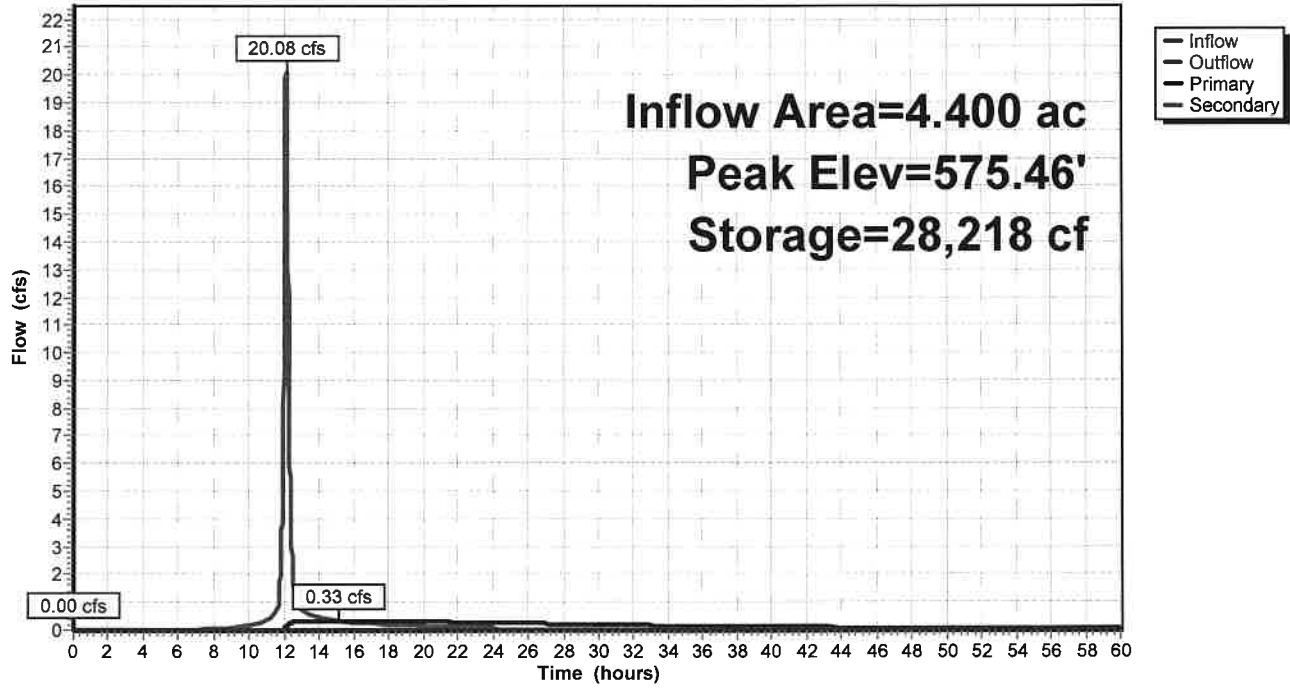
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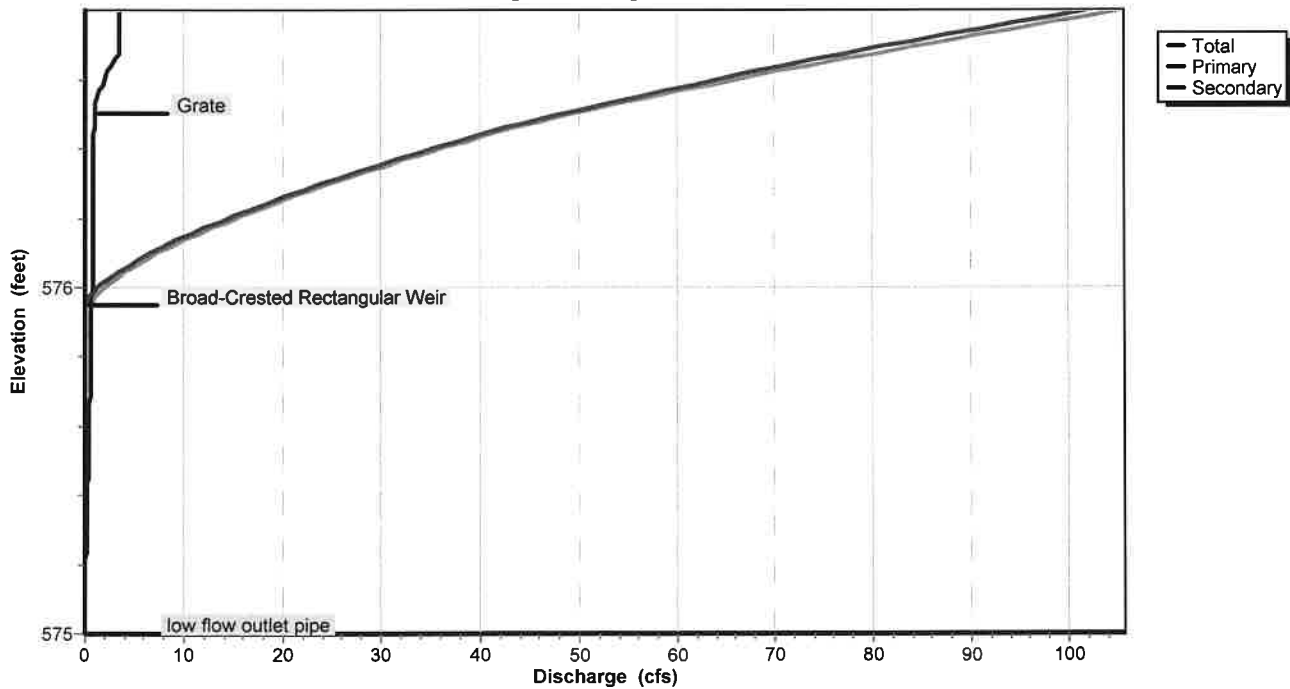
Pond 3P: Detention Basin (SMA #1)

Hydrograph

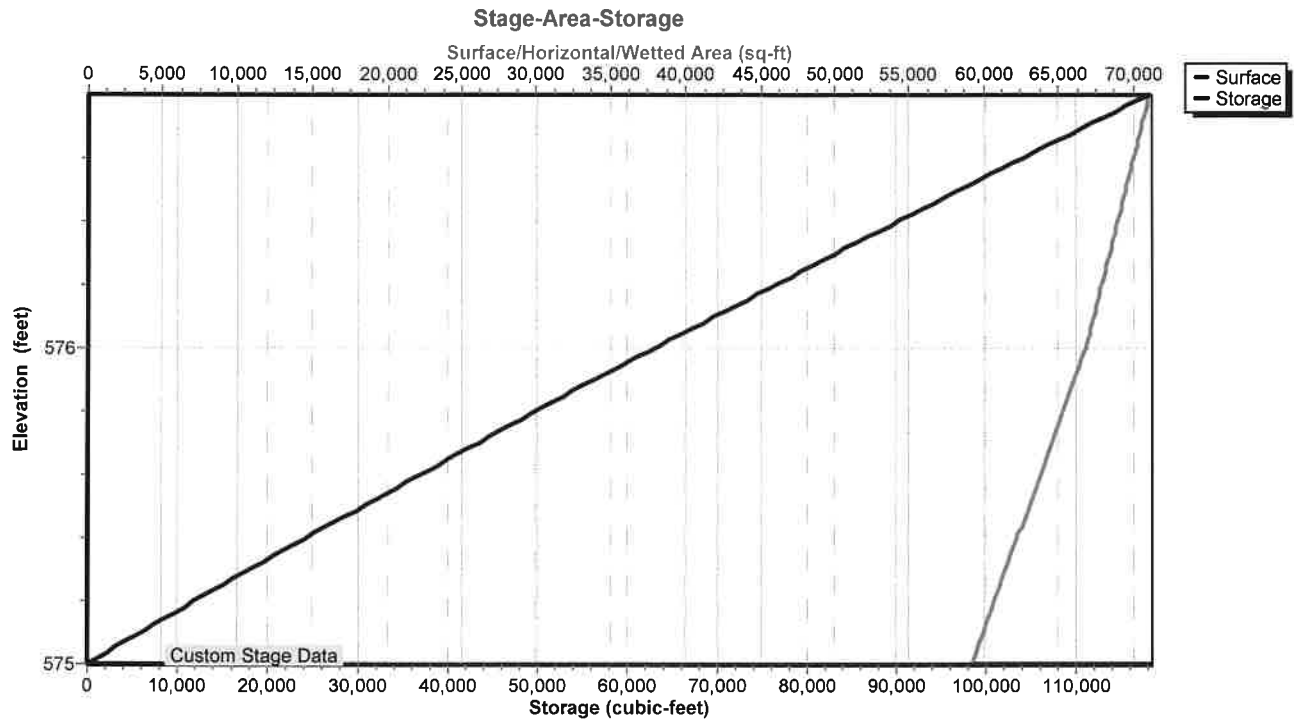


Pond 3P: Detention Basin (SMA #1)

Stage-Discharge



Pond 3P: Detention Basin (SMA #1)



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Hydrograph for Pond 3P: Detention Basin (SMA #1)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Primary (cfs)	Secondary (cfs)
0.00	0.00	0	575.00	0.00	0.00	0.00
2.00	0.00	0	575.00	0.00	0.00	0.00
4.00	0.00	0	575.00	0.00	0.00	0.00
6.00	0.00	1	575.00	0.00	0.00	0.00
8.00	0.05	186	575.00	0.00	0.00	0.00
10.00	0.17	912	575.02	0.00	0.00	0.00
12.00	13.47	8,186	575.14	0.04	0.04	0.00
14.00	0.44	28,034	575.46	0.33	0.33	0.00
16.00	0.27	28,118	575.46	0.33	0.33	0.00
18.00	0.20	27,442	575.45	0.32	0.32	0.00
20.00	0.15	26,479	575.43	0.30	0.30	0.00
22.00	0.13	25,382	575.42	0.28	0.28	0.00
24.00	0.12	24,337	575.40	0.26	0.26	0.00
26.00	0.00	22,633	575.37	0.24	0.24	0.00
28.00	0.00	21,033	575.35	0.21	0.21	0.00
30.00	0.00	19,609	575.32	0.19	0.19	0.00
32.00	0.00	18,338	575.30	0.17	0.17	0.00
34.00	0.00	17,199	575.29	0.15	0.15	0.00
36.00	0.00	16,175	575.27	0.13	0.13	0.00
38.00	0.00	15,251	575.25	0.12	0.12	0.00
40.00	0.00	14,415	575.24	0.11	0.11	0.00
42.00	0.00	13,655	575.23	0.10	0.10	0.00
44.00	0.00	12,964	575.22	0.09	0.09	0.00
46.00	0.00	12,331	575.21	0.08	0.08	0.00
48.00	0.00	11,752	575.20	0.08	0.08	0.00
50.00	0.00	11,220	575.19	0.07	0.07	0.00
52.00	0.00	10,729	575.18	0.07	0.07	0.00
54.00	0.00	10,276	575.17	0.06	0.06	0.00
56.00	0.00	9,856	575.16	0.06	0.06	0.00
58.00	0.00	9,467	575.16	0.05	0.05	0.00
60.00	0.00	9,105	575.15	0.05	0.05	0.00

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Type II 24-hr 5-Year Rainfall=2.70"

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Stage-Discharge for Pond 3P: Detention Basin (SMA #1)

Elevation (feet)	Discharge (cfs)	Primary (cfs)	Secondary (cfs)	Elevation (feet)	Discharge (cfs)	Primary (cfs)	Secondary (cfs)
575.00	0.00	0.00	0.00	576.04	3.90	0.74	3.15
575.02	0.00	0.00	0.00	576.06	5.01	0.75	4.26
575.04	0.00	0.00	0.00	576.08	6.23	0.76	5.47
575.06	0.01	0.01	0.00	576.10	7.55	0.77	6.79
575.08	0.01	0.01	0.00	576.12	8.96	0.78	8.19
575.10	0.02	0.02	0.00	576.14	10.46	0.79	9.67
575.12	0.03	0.03	0.00	576.16	12.04	0.80	11.24
575.14	0.04	0.04	0.00	576.18	13.69	0.80	12.88
575.16	0.05	0.05	0.00	576.20	15.41	0.81	14.60
575.18	0.07	0.07	0.00	576.22	17.21	0.82	16.39
575.20	0.08	0.08	0.00	576.24	19.07	0.83	18.24
575.22	0.09	0.09	0.00	576.26	21.00	0.84	20.16
575.24	0.11	0.11	0.00	576.28	22.99	0.85	22.14
575.26	0.13	0.13	0.00	576.30	25.04	0.85	24.18
575.28	0.15	0.15	0.00	576.32	27.15	0.86	26.29
575.30	0.16	0.16	0.00	576.34	29.32	0.87	28.45
575.32	0.18	0.18	0.00	576.36	31.54	0.88	30.66
575.34	0.20	0.20	0.00	576.38	33.82	0.89	32.93
575.36	0.22	0.22	0.00	576.40	36.15	0.89	35.26
575.38	0.24	0.24	0.00	576.42	38.54	0.90	37.63
575.40	0.26	0.26	0.00	576.44	40.97	0.91	40.06
575.42	0.28	0.28	0.00	576.46	43.73	0.92	42.81
575.44	0.31	0.31	0.00	576.48	46.56	0.93	45.63
575.46	0.33	0.33	0.00	576.50	49.47	0.93	48.54
575.48	0.35	0.35	0.00	576.52	52.56	1.03	51.53
575.50	0.37	0.37	0.00	576.54	55.81	1.21	54.60
575.52	0.39	0.39	0.00	576.56	59.18	1.44	57.75
575.54	0.41	0.41	0.00	576.58	62.68	1.70	60.98
575.56	0.43	0.43	0.00	576.60	66.29	2.00	64.29
575.58	0.45	0.45	0.00	576.62	70.02	2.34	67.68
575.60	0.46	0.46	0.00	576.64	73.85	2.70	71.16
575.62	0.48	0.48	0.00	576.66	77.79	3.08	74.71
575.64	0.49	0.49	0.00	576.68	81.74	3.39	78.35
575.66	0.50	0.50	0.00	576.70	85.48	3.41	82.07
575.68	0.51	0.51	0.00	576.72	89.30	3.43	85.87
575.70	0.54	0.54	0.00	576.74	93.20	3.45	89.75
575.72	0.56	0.56	0.00	576.76	97.18	3.46	93.72
575.74	0.58	0.58	0.00	576.78	101.25	3.48	97.76
575.76	0.60	0.60	0.00	576.80	105.39	3.50	101.90
575.78	0.61	0.61	0.00				
575.80	0.62	0.62	0.00				
575.82	0.63	0.63	0.00				
575.84	0.64	0.64	0.00				
575.86	0.65	0.65	0.00				
575.88	0.66	0.66	0.00				
575.90	0.67	0.67	0.00				
575.92	0.68	0.68	0.00				
575.94	0.69	0.69	0.00				
575.96	0.82	0.70	0.12				
575.98	1.32	0.71	0.61				
576.00	2.03	0.72	1.31				
576.02	2.90	0.73	2.16				

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Type II 24-hr 5-Year Rainfall=2.70"

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Stage-Area-Storage for Pond 3P: Detention Basin (SMA #1)

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
575.00	59,213	0	576.04	67,063	65,709
575.02	59,366	1,186	576.06	67,170	67,052
575.04	59,518	2,375	576.08	67,278	68,396
575.06	59,671	3,567	576.10	67,385	69,743
575.08	59,824	4,761	576.12	67,492	71,091
575.10	59,977	5,959	576.14	67,599	72,442
575.12	60,129	7,161	576.16	67,706	73,795
575.14	60,282	8,365	576.18	67,813	75,151
575.16	60,435	9,572	576.20	67,920	76,508
575.18	60,587	10,782	576.22	68,027	77,867
575.20	60,740	11,995	576.24	68,135	79,229
575.22	60,893	13,212	576.26	68,242	80,593
575.24	61,046	14,431	576.28	68,349	81,959
575.26	61,198	15,653	576.30	68,456	83,327
575.28	61,351	16,879	576.32	68,563	84,697
575.30	61,504	18,108	576.34	68,670	86,069
575.32	61,657	19,339	576.36	68,777	87,444
575.34	61,809	20,574	576.38	68,884	88,820
575.36	61,962	21,811	576.40	68,992	90,199
575.38	62,115	23,052	576.42	69,099	91,580
575.40	62,267	24,296	576.44	69,206	92,963
575.42	62,420	25,543	576.46	69,313	94,348
575.44	62,573	26,793	576.48	69,420	95,736
575.46	62,726	28,046	576.50	69,527	97,125
575.48	62,878	29,302	576.52	69,634	98,517
575.50	63,031	30,561	576.54	69,741	99,910
575.52	63,184	31,823	576.56	69,848	101,306
575.54	63,336	33,088	576.58	69,956	102,704
575.56	63,489	34,357	576.60	70,063	104,105
575.58	63,642	35,628	576.62	70,170	105,507
575.60	63,795	36,902	576.64	70,277	106,911
575.62	63,947	38,180	576.66	70,384	108,318
575.64	64,100	39,460	576.68	70,491	109,727
575.66	64,253	40,744	576.70	70,598	111,138
575.68	64,405	42,030	576.72	70,706	112,551
575.70	64,558	43,320	576.74	70,813	113,966
575.72	64,711	44,613	576.76	70,920	115,383
575.74	64,864	45,908	576.78	71,027	116,803
575.76	65,016	47,207	576.80	71,134	118,224
575.78	65,169	48,509			
575.80	65,322	49,814			
575.82	65,475	51,122			
575.84	65,627	52,433			
575.86	65,780	53,747			
575.88	65,933	55,064			
575.90	66,085	56,384			
575.92	66,238	57,708			
575.94	66,391	59,034			
575.96	66,544	60,363			
575.98	66,696	61,696			
576.00	66,849	63,031			
576.02	66,956	64,369			

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Type II 24-hr 5-Year Rainfall=2.70"

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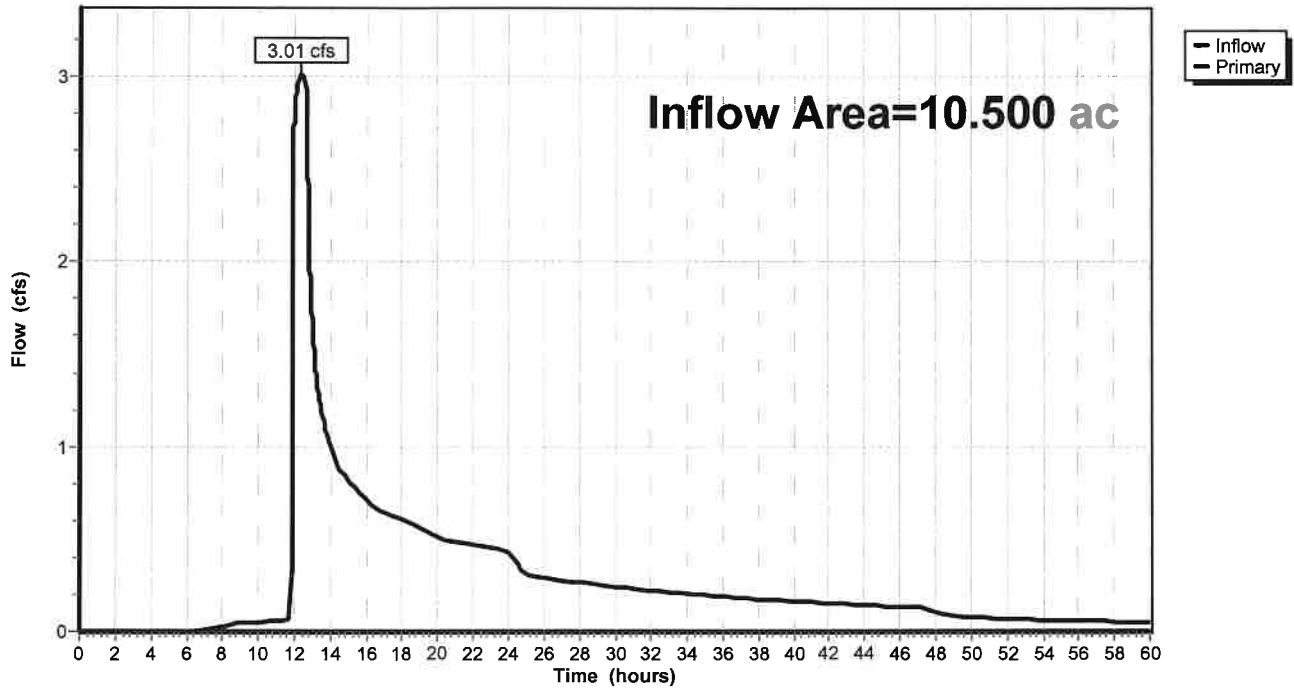
Summary for Link 5L: Outflow (@ CB 54)

Inflow Area = 10.500 ac, 57.14% Impervious, Inflow Depth > 1.51" for 5-Year event
Inflow = 3.01 cfs @ 12.34 hrs, Volume= 1.318 af
Primary = 3.01 cfs @ 12.34 hrs, Volume= 1.318 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs

Link 5L: Outflow (@ CB 54)

Hydrograph



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Type II 24-hr 5-Year Rainfall=2.70"

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Hydrograph for Link 5L: Outflow (@ CB 54)

Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)	Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
0.00	0.00	0.00	0.00	52.00	0.07	0.00	0.07
1.00	0.00	0.00	0.00	53.00	0.06	0.00	0.06
2.00	0.00	0.00	0.00	54.00	0.06	0.00	0.06
3.00	0.00	0.00	0.00	55.00	0.06	0.00	0.06
4.00	0.00	0.00	0.00	56.00	0.06	0.00	0.06
5.00	0.00	0.00	0.00	57.00	0.05	0.00	0.05
6.00	0.00	0.00	0.00	58.00	0.05	0.00	0.05
7.00	0.00	0.00	0.00	59.00	0.05	0.00	0.05
8.00	0.02	0.00	0.02	60.00	0.05	0.00	0.05
9.00	0.05	0.00	0.05				
10.00	0.05	0.00	0.05				
11.00	0.05	0.00	0.05				
12.00	2.82	0.00	2.82				
13.00	1.62	0.00	1.62				
14.00	0.99	0.00	0.99				
15.00	0.81	0.00	0.81				
16.00	0.71	0.00	0.71				
17.00	0.65	0.00	0.65				
18.00	0.60	0.00	0.60				
19.00	0.56	0.00	0.56				
20.00	0.51	0.00	0.51				
21.00	0.48	0.00	0.48				
22.00	0.47	0.00	0.47				
23.00	0.45	0.00	0.45				
24.00	0.43	0.00	0.43				
25.00	0.31	0.00	0.31				
26.00	0.29	0.00	0.29				
27.00	0.28	0.00	0.28				
28.00	0.26	0.00	0.26				
29.00	0.25	0.00	0.25				
30.00	0.24	0.00	0.24				
31.00	0.23	0.00	0.23				
32.00	0.22	0.00	0.22				
33.00	0.21	0.00	0.21				
34.00	0.20	0.00	0.20				
35.00	0.20	0.00	0.20				
36.00	0.19	0.00	0.19				
37.00	0.18	0.00	0.18				
38.00	0.17	0.00	0.17				
39.00	0.17	0.00	0.17				
40.00	0.16	0.00	0.16				
41.00	0.16	0.00	0.16				
42.00	0.15	0.00	0.15				
43.00	0.15	0.00	0.15				
44.00	0.14	0.00	0.14				
45.00	0.14	0.00	0.14				
46.00	0.13	0.00	0.13				
47.00	0.13	0.00	0.13				
48.00	0.10	0.00	0.10				
49.00	0.09	0.00	0.09				
50.00	0.08	0.00	0.08				
51.00	0.07	0.00	0.07				

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Type II 24-hr 10-Year Rainfall=3.15"

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Time span=0.00-60.00 hrs, dt=0.01 hrs, 6001 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: Front Area 1

Runoff Area=6.100 ac 54.10% Impervious Runoff Depth=2.12"
Flow Length=652' Tc=13.3 min CN=90 Runoff=17.46 cfs 1.079 af

Subcatchment 2S: Rear Area 1

Runoff Area=4.400 ac 61.36% Impervious Runoff Depth=2.21"
Flow Length=683' Tc=14.4 min CN=91 Runoff=12.59 cfs 0.811 af

Pond 1P: Bioretention Area 3

Peak Elev=576.04' Storage=9,672 cf Inflow=17.46 cfs 1.079 af
Primary=2.85 cfs 0.765 af Secondary=13.60 cfs 0.314 af Outflow=16.45 cfs 1.079 af

Pond 3P: Detention Basin (SMA #1)

Peak Elev=575.60' Storage=37,117 cf Inflow=26.01 cfs 1.125 af
Primary=0.47 cfs 0.892 af Secondary=0.00 cfs 0.000 af Outflow=0.47 cfs 0.892 af

Link 5L: Outflow (@ CB 54)

Inflow=3.16 cfs 1.657 af
Primary=3.16 cfs 1.657 af

Total Runoff Area = 10.500 ac Runoff Volume = 1.890 af Average Runoff Depth = 2.16"
42.86% Pervious = 4.500 ac 57.14% Impervious = 6.000 ac

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Type II 24-hr 10-Year Rainfall=3.15"

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Summary for Subcatchment 1S: Front Area 1

Runoff = 17.46 cfs @ 12.05 hrs, Volume= 1.079 af, Depth= 2.12"

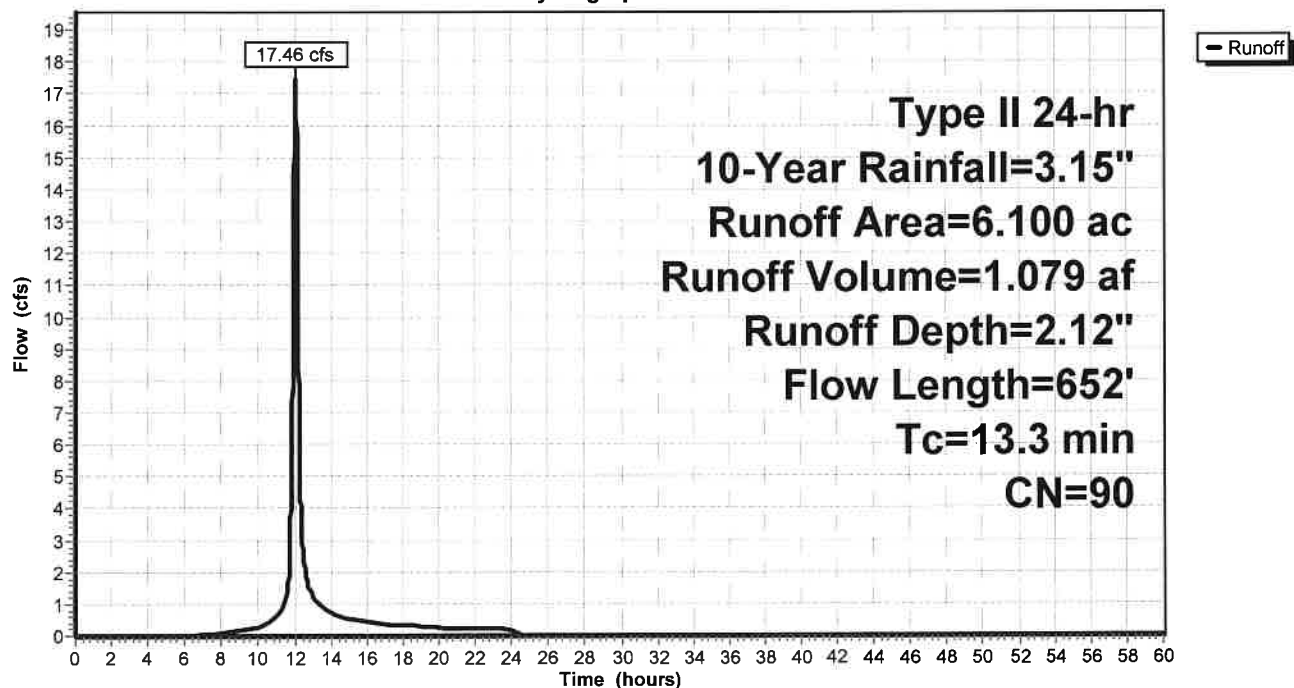
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
Type II 24-hr 10-Year Rainfall=3.15"

Area (ac)	CN	Description
1.800	98	Paved parking, HSG D
1.500	98	Roofs, HSG D
2.800	80	>75% Grass cover, Good, HSG D
6.100	90	Weighted Average
2.800		45.90% Pervious Area
3.300		54.10% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.6	37	0.0100	0.06		Sheet Flow, grass Grass: Dense n= 0.240 P2= 2.50"
0.4	15	0.0120	0.68		Sheet Flow, pavement Smooth surfaces n= 0.011 P2= 2.50"
3.3	600		3.00		Direct Entry, pipe flow
13.3	652	Total			

Subcatchment 1S: Front Area 1

Hydrograph



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Type II 24-hr 10-Year Rainfall=3.15"

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Hydrograph for Subcatchment 1S: Front Area 1

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	52.00	3.15	2.12	0.00
1.00	0.03	0.00	0.00	53.00	3.15	2.12	0.00
2.00	0.07	0.00	0.00	54.00	3.15	2.12	0.00
3.00	0.11	0.00	0.00	55.00	3.15	2.12	0.00
4.00	0.15	0.00	0.00	56.00	3.15	2.12	0.00
5.00	0.20	0.00	0.00	57.00	3.15	2.12	0.00
6.00	0.25	0.00	0.01	58.00	3.15	2.12	0.00
7.00	0.31	0.01	0.05	59.00	3.15	2.12	0.00
8.00	0.38	0.02	0.09	60.00	3.15	2.12	0.00
9.00	0.46	0.04	0.18				
10.00	0.57	0.08	0.28				
11.00	0.74	0.16	0.63				
12.00	2.09	1.17	15.84				
13.00	2.43	1.47	1.23				
14.00	2.58	1.61	0.71				
15.00	2.69	1.70	0.55				
16.00	2.77	1.78	0.43				
17.00	2.84	1.84	0.37				
18.00	2.90	1.89	0.33				
19.00	2.95	1.94	0.28				
20.00	3.00	1.98	0.24				
21.00	3.04	2.02	0.22				
22.00	3.08	2.06	0.22				
23.00	3.11	2.09	0.21				
24.00	3.15	2.12	0.20				
25.00	3.15	2.12	0.00				
26.00	3.15	2.12	0.00				
27.00	3.15	2.12	0.00				
28.00	3.15	2.12	0.00				
29.00	3.15	2.12	0.00				
30.00	3.15	2.12	0.00				
31.00	3.15	2.12	0.00				
32.00	3.15	2.12	0.00				
33.00	3.15	2.12	0.00				
34.00	3.15	2.12	0.00				
35.00	3.15	2.12	0.00				
36.00	3.15	2.12	0.00				
37.00	3.15	2.12	0.00				
38.00	3.15	2.12	0.00				
39.00	3.15	2.12	0.00				
40.00	3.15	2.12	0.00				
41.00	3.15	2.12	0.00				
42.00	3.15	2.12	0.00				
43.00	3.15	2.12	0.00				
44.00	3.15	2.12	0.00				
45.00	3.15	2.12	0.00				
46.00	3.15	2.12	0.00				
47.00	3.15	2.12	0.00				
48.00	3.15	2.12	0.00				
49.00	3.15	2.12	0.00				
50.00	3.15	2.12	0.00				
51.00	3.15	2.12	0.00				

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Type II 24-hr 10-Year Rainfall=3.15"

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Summary for Subcatchment 2S: Rear Area 1

Runoff = 12.59 cfs @ 12.06 hrs, Volume= 0.811 af, Depth= 2.21"

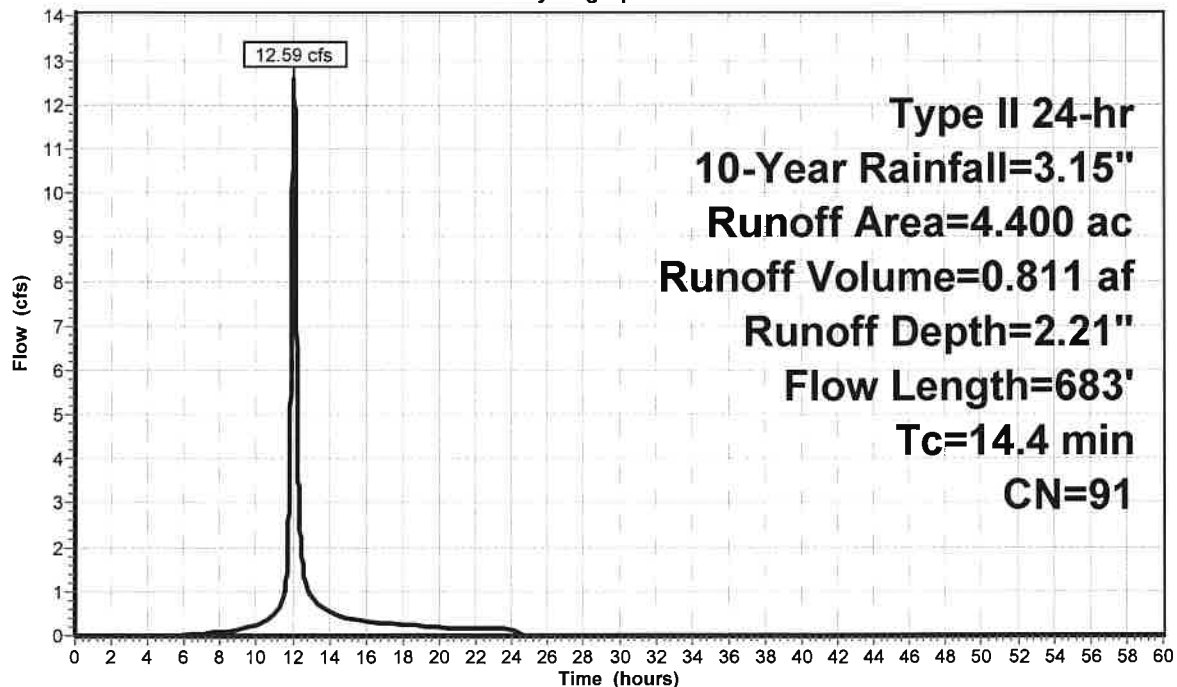
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
Type II 24-hr 10-Year Rainfall=3.15"

Area (ac)	CN	Description
1.400	98	Paved parking, HSG D
1.300	98	Roofs, HSG D
1.700	80	>75% Grass cover, Good, HSG D
4.400	91	Weighted Average
1.700		38.64% Pervious Area
2.700		61.36% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.2	90	0.0200	0.15		Sheet Flow, grass Grass: Short n= 0.150 P2= 2.50"
1.3	75	0.0130	0.97		Sheet Flow, pavement Smooth surfaces n= 0.011 P2= 2.50"
2.9	518		3.00		Direct Entry, Pipe flow
14.4	683	Total			

Subcatchment 2S: Rear Area 1

Hydrograph



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Type II 24-hr 10-Year Rainfall=3.15"

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Hydrograph for Subcatchment 2S: Rear Area 1

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	52.00	3.15	2.21	0.00
1.00	0.03	0.00	0.00	53.00	3.15	2.21	0.00
2.00	0.07	0.00	0.00	54.00	3.15	2.21	0.00
3.00	0.11	0.00	0.00	55.00	3.15	2.21	0.00
4.00	0.15	0.00	0.00	56.00	3.15	2.21	0.00
5.00	0.20	0.00	0.00	57.00	3.15	2.21	0.00
6.00	0.25	0.00	0.02	58.00	3.15	2.21	0.00
7.00	0.31	0.01	0.05	59.00	3.15	2.21	0.00
8.00	0.38	0.03	0.08	60.00	3.15	2.21	0.00
9.00	0.46	0.06	0.15				
10.00	0.57	0.10	0.23				
11.00	0.74	0.19	0.49				
12.00	2.09	1.24	11.04				
13.00	2.43	1.55	0.92				
14.00	2.58	1.69	0.53				
15.00	2.69	1.78	0.40				
16.00	2.77	1.86	0.32				
17.00	2.84	1.92	0.27				
18.00	2.90	1.98	0.24				
19.00	2.95	2.03	0.21				
20.00	3.00	2.07	0.18				
21.00	3.04	2.11	0.16				
22.00	3.08	2.14	0.16				
23.00	3.11	2.18	0.15				
24.00	3.15	2.21	0.15				
25.00	3.15	2.21	0.00				
26.00	3.15	2.21	0.00				
27.00	3.15	2.21	0.00				
28.00	3.15	2.21	0.00				
29.00	3.15	2.21	0.00				
30.00	3.15	2.21	0.00				
31.00	3.15	2.21	0.00				
32.00	3.15	2.21	0.00				
33.00	3.15	2.21	0.00				
34.00	3.15	2.21	0.00				
35.00	3.15	2.21	0.00				
36.00	3.15	2.21	0.00				
37.00	3.15	2.21	0.00				
38.00	3.15	2.21	0.00				
39.00	3.15	2.21	0.00				
40.00	3.15	2.21	0.00				
41.00	3.15	2.21	0.00				
42.00	3.15	2.21	0.00				
43.00	3.15	2.21	0.00				
44.00	3.15	2.21	0.00				
45.00	3.15	2.21	0.00				
46.00	3.15	2.21	0.00				
47.00	3.15	2.21	0.00				
48.00	3.15	2.21	0.00				
49.00	3.15	2.21	0.00				
50.00	3.15	2.21	0.00				
51.00	3.15	2.21	0.00				

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Type II 24-hr 10-Year Rainfall=3.15"

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Summary for Pond 1P: Bioretention Area 3

Inflow Area = 6.100 ac, 54.10% Impervious, Inflow Depth = 2.12" for 10-Year event
 Inflow = 17.46 cfs @ 12.05 hrs, Volume= 1.079 af
 Outflow = 16.45 cfs @ 12.09 hrs, Volume= 1.079 af, Atten= 6%, Lag= 2.3 min
 Primary = 2.85 cfs @ 12.09 hrs, Volume= 0.765 af
 Secondary = 13.60 cfs @ 12.09 hrs, Volume= 0.314 af

Routing by Stor-Ind method, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
 Peak Elev= 576.04' @ 12.09 hrs Surf.Area= 9,976 sf Storage= 9,672 cf

Plug-Flow detention time= 160.8 min calculated for 1.079 af (100% of inflow)
 Center-of-Mass det. time= 160.7 min (971.9 - 811.2)

Volume	Invert	Avail.Storage	Storage Description
#1	575.00'	25,904 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
575.00	8,648	0	0
576.00	9,925	9,287	9,287
576.50	10,585	5,128	14,414
577.00	11,350	5,484	19,898
577.50	12,675	6,006	25,904

Device	Routing	Invert	Outlet Devices
#1	Primary	572.50'	8.0" Round 8" pipe L= 25.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 572.50' / 572.42' S= 0.0032 ' / Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.35 sf
#2	Device 1	575.50'	8.0" Horiz. Grate X 4.00 C= 0.600 Limited to weir flow at low heads
#3	Device 1	575.00'	0.250 in/hr Exfiltration over Surface area Conductivity to Groundwater Elevation = 560.00'
#4	Secondary	575.75'	30.0' long (Profile 1) Broad-Crested Rectangular Weir Head (feet) 0.49 0.98 1.48 Coef. (English) 2.92 3.37 3.59

Primary OutFlow Max=2.85 cfs @ 12.09 hrs HW=576.04' (Free Discharge)

- ↑ 1=8" pipe (Barrel Controls 2.85 cfs @ 8.17 fps)
- ↑ 2=Grate (Passes < 4.93 cfs potential flow)
- ↑ 3=Exfiltration (Passes < 0.06 cfs potential flow)

Secondary OutFlow Max=13.58 cfs @ 12.09 hrs HW=576.04' (Free Discharge)

- ↑ 4=Broad-Crested Rectangular Weir (Weir Controls 13.58 cfs @ 1.57 fps)

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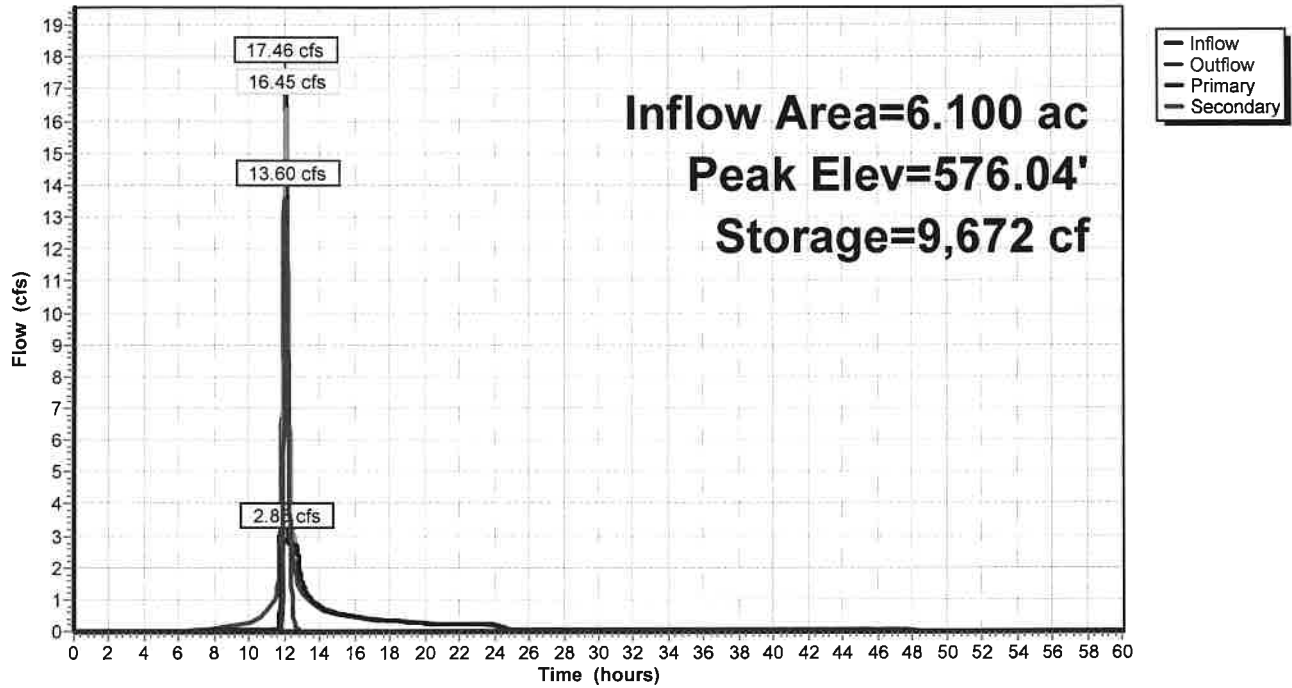
Type II 24-hr 10-Year Rainfall=3.15"

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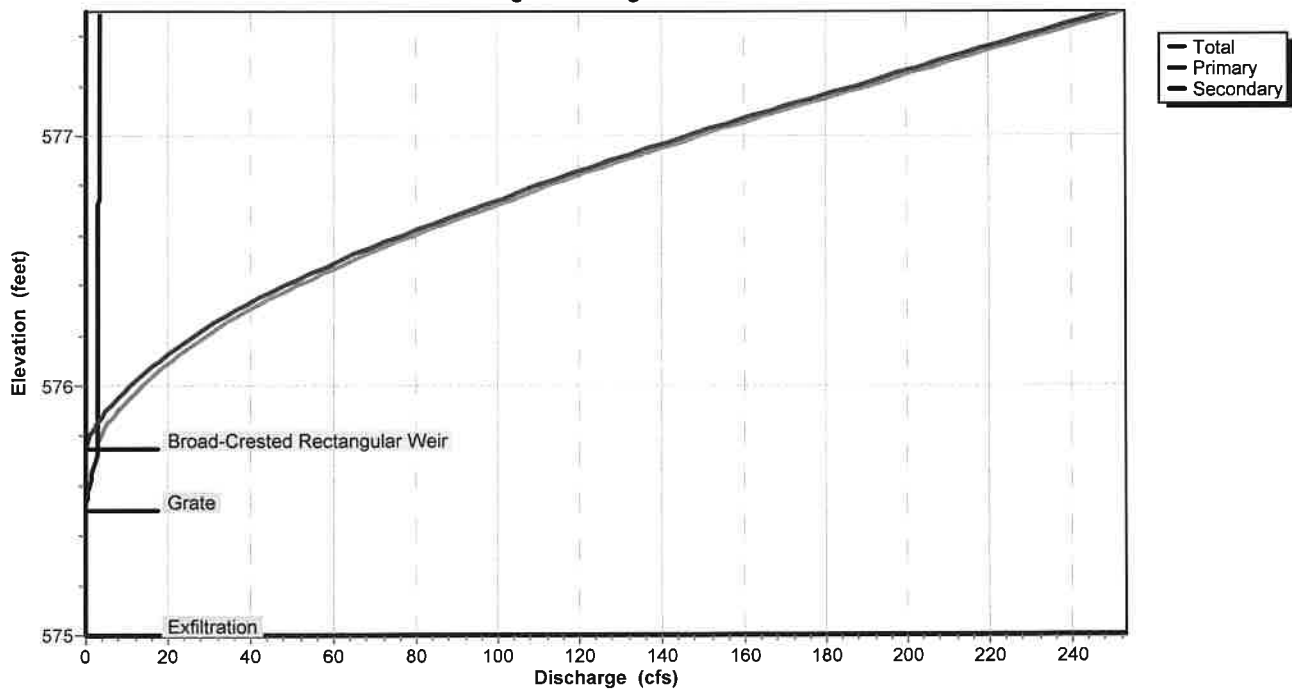
Pond 1P: Bioretention Area 3

Hydrograph



Pond 1P: Bioretention Area 3

Stage-Discharge



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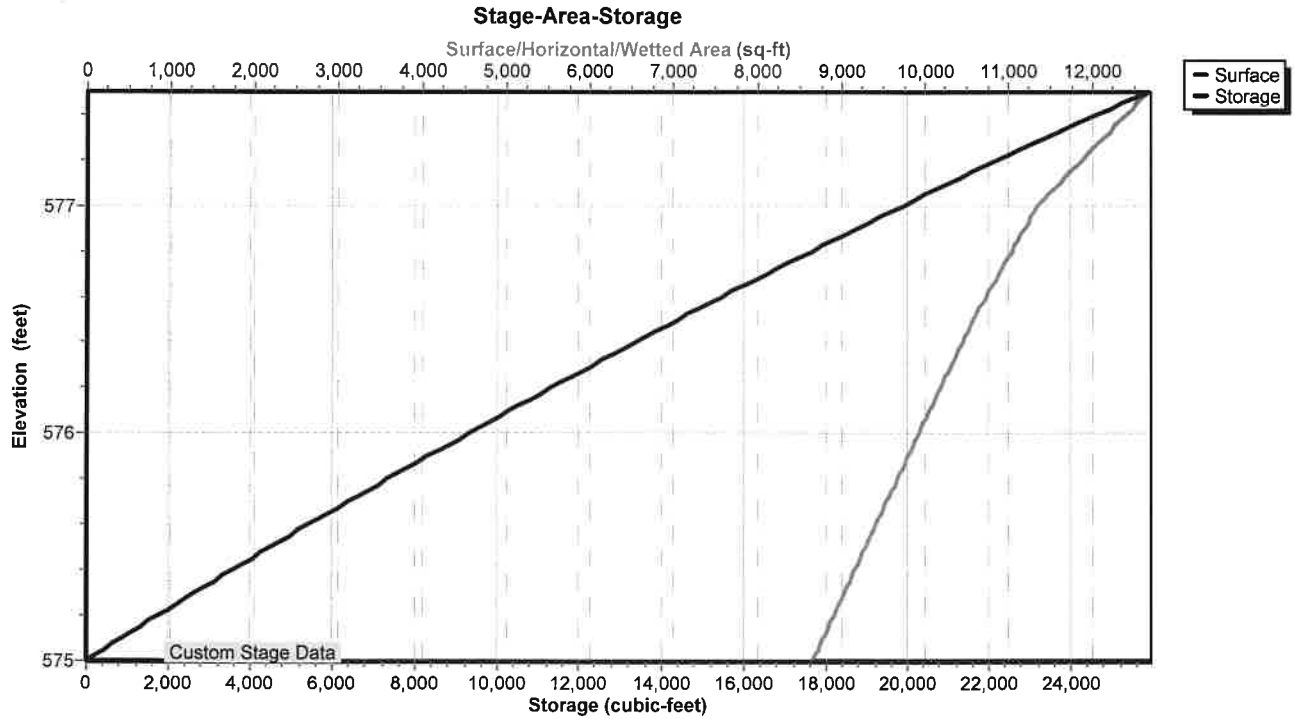
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Pond 1P: Bioretention Area 3



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Hydrograph for Pond 1P: Bioretention Area 3

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Primary (cfs)	Secondary (cfs)
0.00	0.00	0	575.00	0.00	0.00	0.00
2.00	0.00	0	575.00	0.00	0.00	0.00
4.00	0.00	0	575.00	0.00	0.00	0.00
6.00	0.01	6	575.00	0.00	0.00	0.00
8.00	0.09	207	575.02	0.05	0.05	0.00
10.00	0.28	1,102	575.13	0.05	0.05	0.00
12.00	15.84	9,006	575.97	11.97	2.82	9.15
14.00	0.71	5,320	575.59	0.79	0.79	0.00
16.00	0.43	5,039	575.56	0.46	0.46	0.00
18.00	0.33	4,925	575.55	0.34	0.34	0.00
20.00	0.24	4,823	575.54	0.25	0.25	0.00
22.00	0.22	4,781	575.53	0.22	0.22	0.00
24.00	0.20	4,760	575.53	0.20	0.20	0.00
26.00	0.00	4,270	575.48	0.06	0.06	0.00
28.00	0.00	3,874	575.43	0.05	0.05	0.00
30.00	0.00	3,482	575.39	0.05	0.05	0.00
32.00	0.00	3,093	575.35	0.05	0.05	0.00
34.00	0.00	2,707	575.31	0.05	0.05	0.00
36.00	0.00	2,324	575.26	0.05	0.05	0.00
38.00	0.00	1,945	575.22	0.05	0.05	0.00
40.00	0.00	1,569	575.18	0.05	0.05	0.00
42.00	0.00	1,197	575.14	0.05	0.05	0.00
44.00	0.00	828	575.10	0.05	0.05	0.00
46.00	0.00	461	575.05	0.05	0.05	0.00
48.00	0.00	126	575.01	0.03	0.03	0.00
50.00	0.00	24	575.00	0.01	0.01	0.00
52.00	0.00	4	575.00	0.00	0.00	0.00
54.00	0.00	1	575.00	0.00	0.00	0.00
56.00	0.00	0	575.00	0.00	0.00	0.00
58.00	0.00	0	575.00	0.00	0.00	0.00
60.00	0.00	0	575.00	0.00	0.00	0.00

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Stage-Discharge for Pond 1P: Bioretention Area 3

Elevation (feet)	Discharge (cfs)	Primary (cfs)	Secondary (cfs)
575.00	0.00	0.00	0.00
575.05	0.05	0.05	0.00
575.10	0.05	0.05	0.00
575.15	0.05	0.05	0.00
575.20	0.05	0.05	0.00
575.25	0.05	0.05	0.00
575.30	0.05	0.05	0.00
575.35	0.05	0.05	0.00
575.40	0.05	0.05	0.00
575.45	0.05	0.05	0.00
575.50	0.06	0.06	0.00
575.55	0.36	0.36	0.00
575.60	0.92	0.92	0.00
575.65	1.65	1.65	0.00
575.70	2.51	2.51	0.00
575.75	2.71	2.71	0.00
575.80	3.71	2.73	0.98
575.85	5.53	2.76	2.77
575.90	7.87	2.78	5.09
575.95	10.64	2.81	7.84
576.00	13.78	2.83	10.95
576.05	17.25	2.86	14.39
576.10	21.02	2.88	18.14
576.15	25.07	2.91	22.16
576.20	29.37	2.93	26.44
576.25	34.02	2.95	31.07
576.30	39.38	2.98	36.41
576.35	45.12	3.00	42.12
576.40	51.24	3.02	48.22
576.45	57.74	3.04	54.69
576.50	64.62	3.07	61.55
576.55	71.88	3.09	68.79
576.60	79.53	3.11	76.42
576.65	87.57	3.13	84.44
576.70	96.00	3.16	92.85
576.75	104.54	3.18	101.36
576.80	112.97	3.20	109.77
576.85	121.69	3.22	118.47
576.90	130.69	3.24	127.45
576.95	139.98	3.26	136.72
577.00	149.56	3.28	146.27
577.05	159.42	3.30	156.11
577.10	169.57	3.33	166.24
577.15	180.00	3.35	176.66
577.20	190.72	3.37	187.36
577.25	201.24	3.39	197.86
577.30	211.24	3.41	207.83
577.35	221.40	3.43	217.97
577.40	231.71	3.45	228.27
577.45	242.19	3.47	238.72
577.50	252.82	3.49	249.33

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Stage-Area-Storage for Pond 1P: Bioretention Area 3

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
575.00	8,648	0
575.05	8,712	434
575.10	8,776	871
575.15	8,840	1,312
575.20	8,903	1,755
575.25	8,967	2,202
575.30	9,031	2,652
575.35	9,095	3,105
575.40	9,159	3,561
575.45	9,223	4,021
575.50	9,287	4,484
575.55	9,350	4,950
575.60	9,414	5,419
575.65	9,478	5,891
575.70	9,542	6,366
575.75	9,606	6,845
575.80	9,670	7,327
575.85	9,733	7,812
575.90	9,797	8,300
575.95	9,861	8,792
576.00	9,925	9,287
576.05	9,991	9,784
576.10	10,057	10,286
576.15	10,123	10,790
576.20	10,189	11,298
576.25	10,255	11,809
576.30	10,321	12,323
576.35	10,387	12,841
576.40	10,453	13,362
576.45	10,519	13,886
576.50	10,585	14,414
576.55	10,661	14,945
576.60	10,738	15,480
576.65	10,814	16,019
576.70	10,891	16,562
576.75	10,968	17,108
576.80	11,044	17,658
576.85	11,121	18,212
576.90	11,197	18,770
576.95	11,274	19,332
577.00	11,350	19,898
577.05	11,482	20,469
577.10	11,615	21,046
577.15	11,747	21,630
577.20	11,880	22,221
577.25	12,013	22,818
577.30	12,145	23,422
577.35	12,278	24,033
577.40	12,410	24,650
577.45	12,543	25,274
577.50	12,675	25,904

Summary for Pond 3P: Detention Basin (SMA #1)

Inflow Area = 4.400 ac, 61.36% Impervious, Inflow Depth = 3.07" for 10-Year event
 Inflow = 26.01 cfs @ 12.08 hrs, Volume= 1.125 af
 Outflow = 0.47 cfs @ 14.32 hrs, Volume= 0.892 af, Atten= 98%, Lag= 134.6 min
 Primary = 0.47 cfs @ 14.32 hrs, Volume= 0.892 af
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
 Peak Elev= 575.60' @ 14.32 hrs Surf.Area= 63,820 sf Storage= 37,117 cf

Plug-Flow detention time= 942.6 min calculated for 0.892 af (79% of inflow)
 Center-of-Mass det. time= 874.9 min (1,660.4 - 785.4)

Volume	Invert	Avail.Storage	Storage Description
#1	575.00'	118,224 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
575.00	59,213	0	0
576.00	66,849	63,031	63,031
576.80	71,134	55,193	118,224

Device	Routing	Invert	Outlet Devices
#1	Primary	574.00'	12.0" Round 12" outlet pipe L= 160.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 574.00' / 573.79' S= 0.0013 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Device 1	575.00'	6.0" Round low flow outlet pipe L= 10.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 575.00' / 574.95' S= 0.0050 '/' Cc= 0.900 n= 0.010 Corrugated PE, smooth interior, Flow Area= 0.20 sf
#3	Device 1	576.50'	30.0" x 30.0" Horiz. Grate C= 0.600 Limited to weir flow at low heads
#4	Secondary	575.95'	20.0' long (Profile 1) Broad-Crested Rectangular Weir X 2.00 Head (feet) 0.49 0.98 1.48 Coef. (English) 2.92 3.37 3.59

Primary OutFlow Max=0.47 cfs @ 14.32 hrs HW=575.60' (Free Discharge)
 ↳ 1=12" outlet pipe (Passes 0.47 cfs of 2.23 cfs potential flow)
 ↳ ↳ 2=low flow outlet pipe (Barrel Controls 0.47 cfs @ 2.50 fps)
 ↳ ↳ ↳ 3=Grate (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=575.00' (Free Discharge)
 ↳ 4=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

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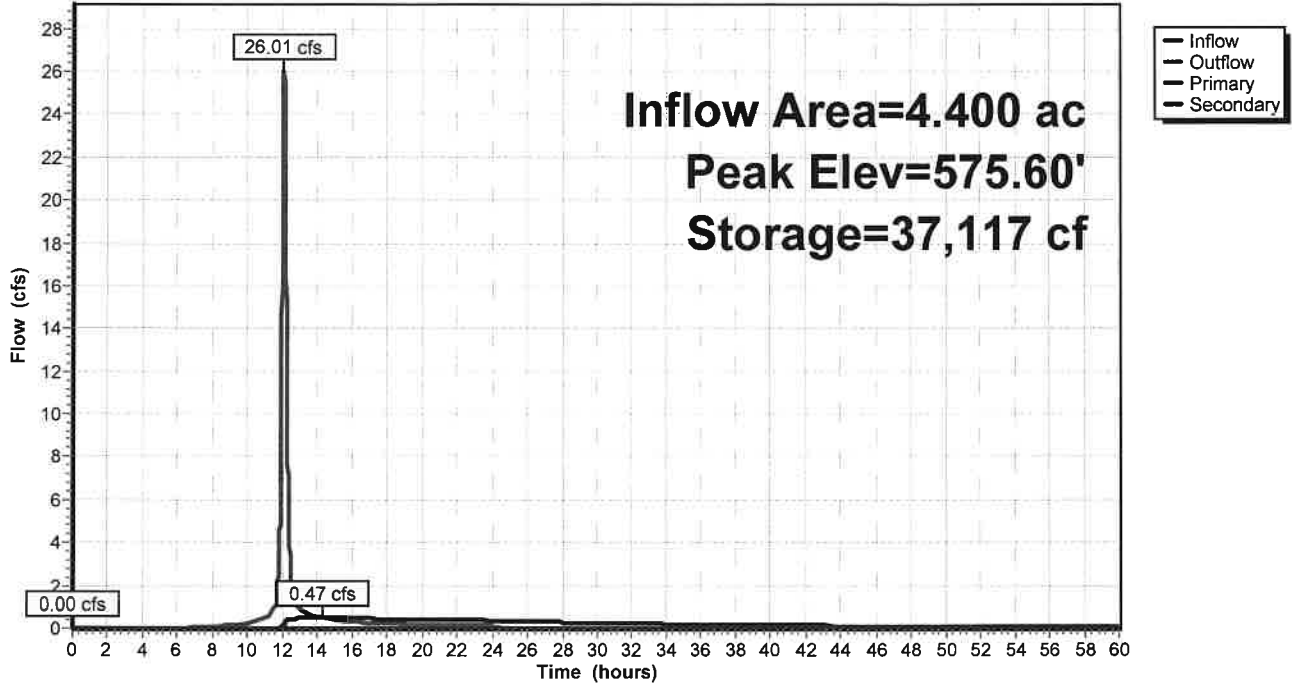
Type II 24-hr 10-Year Rainfall=3.15"

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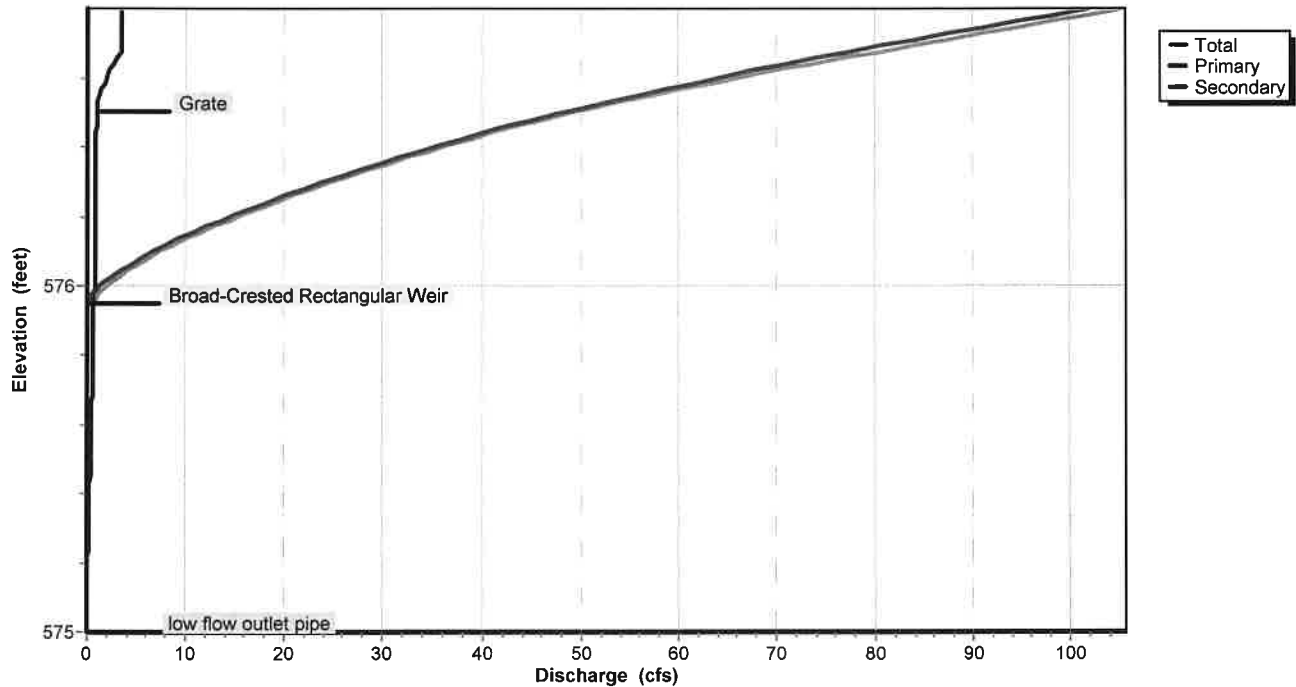
Pond 3P: Detention Basin (SMA #1)

Hydrograph



Pond 3P: Detention Basin (SMA #1)

Stage-Discharge



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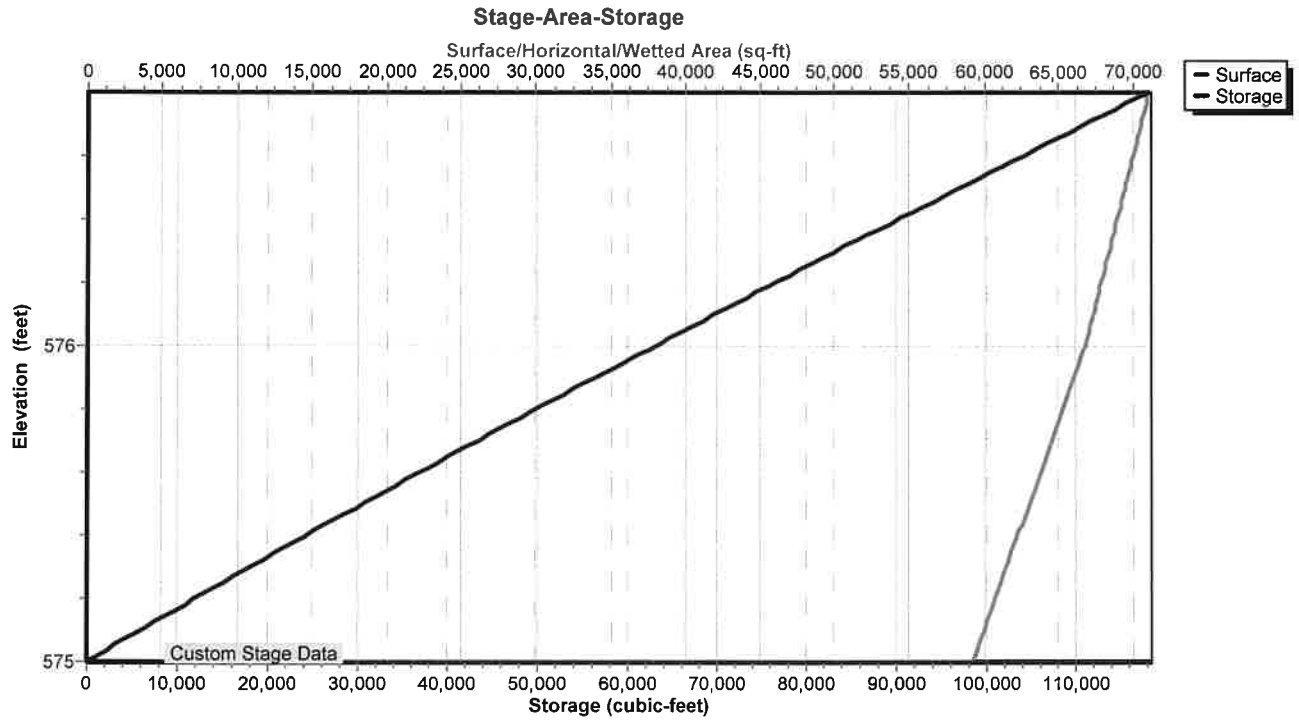
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Pond 3P: Detention Basin (SMA #1)



Hydrograph for Pond 3P: Detention Basin (SMA #1)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Primary (cfs)	Secondary (cfs)
0.00	0.00	0	575.00	0.00	0.00	0.00
2.00	0.00	0	575.00	0.00	0.00	0.00
4.00	0.00	0	575.00	0.00	0.00	0.00
6.00	0.02	28	575.00	0.00	0.00	0.00
8.00	0.08	376	575.01	0.00	0.00	0.00
10.00	0.23	1,427	575.02	0.00	0.00	0.00
12.00	20.19	11,922	575.20	0.08	0.08	0.00
14.00	0.53	37,087	575.60	0.47	0.47	0.00
16.00	0.32	36,669	575.60	0.46	0.46	0.00
18.00	0.24	35,374	575.58	0.44	0.44	0.00
20.00	0.18	33,764	575.55	0.42	0.42	0.00
22.00	0.16	32,024	575.52	0.39	0.39	0.00
24.00	0.15	30,385	575.50	0.37	0.37	0.00
26.00	0.00	28,005	575.46	0.33	0.33	0.00
28.00	0.00	25,794	575.42	0.29	0.29	0.00
30.00	0.00	23,836	575.39	0.26	0.26	0.00
32.00	0.00	22,102	575.36	0.23	0.23	0.00
34.00	0.00	20,561	575.34	0.20	0.20	0.00
36.00	0.00	19,188	575.32	0.18	0.18	0.00
38.00	0.00	17,961	575.30	0.16	0.16	0.00
40.00	0.00	16,860	575.28	0.14	0.14	0.00
42.00	0.00	15,870	575.26	0.13	0.13	0.00
44.00	0.00	14,975	575.25	0.12	0.12	0.00
46.00	0.00	14,165	575.24	0.11	0.11	0.00
48.00	0.00	13,428	575.22	0.10	0.10	0.00
50.00	0.00	12,756	575.21	0.09	0.09	0.00
52.00	0.00	12,141	575.20	0.08	0.08	0.00
54.00	0.00	11,578	575.19	0.08	0.08	0.00
56.00	0.00	11,059	575.18	0.07	0.07	0.00
58.00	0.00	10,581	575.18	0.06	0.06	0.00
60.00	0.00	10,139	575.17	0.06	0.06	0.00

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Type II 24-hr 10-Year Rainfall=3.15"

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Stage-Discharge for Pond 3P: Detention Basin (SMA #1)

Elevation (feet)	Discharge (cfs)	Primary (cfs)	Secondary (cfs)	Elevation (feet)	Discharge (cfs)	Primary (cfs)	Secondary (cfs)
575.00	0.00	0.00	0.00	576.04	3.90	0.74	3.15
575.02	0.00	0.00	0.00	576.06	5.01	0.75	4.26
575.04	0.00	0.00	0.00	576.08	6.23	0.76	5.47
575.06	0.01	0.01	0.00	576.10	7.55	0.77	6.79
575.08	0.01	0.01	0.00	576.12	8.96	0.78	8.19
575.10	0.02	0.02	0.00	576.14	10.46	0.79	9.67
575.12	0.03	0.03	0.00	576.16	12.04	0.80	11.24
575.14	0.04	0.04	0.00	576.18	13.69	0.80	12.88
575.16	0.05	0.05	0.00	576.20	15.41	0.81	14.60
575.18	0.07	0.07	0.00	576.22	17.21	0.82	16.39
575.20	0.08	0.08	0.00	576.24	19.07	0.83	18.24
575.22	0.09	0.09	0.00	576.26	21.00	0.84	20.16
575.24	0.11	0.11	0.00	576.28	22.99	0.85	22.14
575.26	0.13	0.13	0.00	576.30	25.04	0.85	24.18
575.28	0.15	0.15	0.00	576.32	27.15	0.86	26.29
575.30	0.16	0.16	0.00	576.34	29.32	0.87	28.45
575.32	0.18	0.18	0.00	576.36	31.54	0.88	30.66
575.34	0.20	0.20	0.00	576.38	33.82	0.89	32.93
575.36	0.22	0.22	0.00	576.40	36.15	0.89	35.26
575.38	0.24	0.24	0.00	576.42	38.54	0.90	37.63
575.40	0.26	0.26	0.00	576.44	40.97	0.91	40.06
575.42	0.28	0.28	0.00	576.46	43.73	0.92	42.81
575.44	0.31	0.31	0.00	576.48	46.56	0.93	45.63
575.46	0.33	0.33	0.00	576.50	49.47	0.93	48.54
575.48	0.35	0.35	0.00	576.52	52.56	1.03	51.53
575.50	0.37	0.37	0.00	576.54	55.81	1.21	54.60
575.52	0.39	0.39	0.00	576.56	59.18	1.44	57.75
575.54	0.41	0.41	0.00	576.58	62.68	1.70	60.98
575.56	0.43	0.43	0.00	576.60	66.29	2.00	64.29
575.58	0.45	0.45	0.00	576.62	70.02	2.34	67.68
575.60	0.46	0.46	0.00	576.64	73.85	2.70	71.16
575.62	0.48	0.48	0.00	576.66	77.79	3.08	74.71
575.64	0.49	0.49	0.00	576.68	81.74	3.39	78.35
575.66	0.50	0.50	0.00	576.70	85.48	3.41	82.07
575.68	0.51	0.51	0.00	576.72	89.30	3.43	85.87
575.70	0.54	0.54	0.00	576.74	93.20	3.45	89.75
575.72	0.56	0.56	0.00	576.76	97.18	3.46	93.72
575.74	0.58	0.58	0.00	576.78	101.25	3.48	97.76
575.76	0.60	0.60	0.00	576.80	105.39	3.50	101.90
575.78	0.61	0.61	0.00				
575.80	0.62	0.62	0.00				
575.82	0.63	0.63	0.00				
575.84	0.64	0.64	0.00				
575.86	0.65	0.65	0.00				
575.88	0.66	0.66	0.00				
575.90	0.67	0.67	0.00				
575.92	0.68	0.68	0.00				
575.94	0.69	0.69	0.00				
575.96	0.82	0.70	0.12				
575.98	1.32	0.71	0.61				
576.00	2.03	0.72	1.31				
576.02	2.90	0.73	2.16				

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Type II 24-hr 10-Year Rainfall=3.15"

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Stage-Area-Storage for Pond 3P: Detention Basin (SMA #1)

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
575.00	59,213	0	576.04	67,063	65,709
575.02	59,366	1,186	576.06	67,170	67,052
575.04	59,518	2,375	576.08	67,278	68,396
575.06	59,671	3,567	576.10	67,385	69,743
575.08	59,824	4,761	576.12	67,492	71,091
575.10	59,977	5,959	576.14	67,599	72,442
575.12	60,129	7,161	576.16	67,706	73,795
575.14	60,282	8,365	576.18	67,813	75,151
575.16	60,435	9,572	576.20	67,920	76,508
575.18	60,587	10,782	576.22	68,027	77,867
575.20	60,740	11,995	576.24	68,135	79,229
575.22	60,893	13,212	576.26	68,242	80,593
575.24	61,046	14,431	576.28	68,349	81,959
575.26	61,198	15,653	576.30	68,456	83,327
575.28	61,351	16,879	576.32	68,563	84,697
575.30	61,504	18,108	576.34	68,670	86,069
575.32	61,657	19,339	576.36	68,777	87,444
575.34	61,809	20,574	576.38	68,884	88,820
575.36	61,962	21,811	576.40	68,992	90,199
575.38	62,115	23,052	576.42	69,099	91,580
575.40	62,267	24,296	576.44	69,206	92,963
575.42	62,420	25,543	576.46	69,313	94,348
575.44	62,573	26,793	576.48	69,420	95,736
575.46	62,726	28,046	576.50	69,527	97,125
575.48	62,878	29,302	576.52	69,634	98,517
575.50	63,031	30,561	576.54	69,741	99,910
575.52	63,184	31,823	576.56	69,848	101,306
575.54	63,336	33,088	576.58	69,956	102,704
575.56	63,489	34,357	576.60	70,063	104,105
575.58	63,642	35,628	576.62	70,170	105,507
575.60	63,795	36,902	576.64	70,277	106,911
575.62	63,947	38,180	576.66	70,384	108,318
575.64	64,100	39,460	576.68	70,491	109,727
575.66	64,253	40,744	576.70	70,598	111,138
575.68	64,405	42,030	576.72	70,706	112,551
575.70	64,558	43,320	576.74	70,813	113,966
575.72	64,711	44,613	576.76	70,920	115,383
575.74	64,864	45,908	576.78	71,027	116,803
575.76	65,016	47,207	576.80	71,134	118,224
575.78	65,169	48,509			
575.80	65,322	49,814			
575.82	65,475	51,122			
575.84	65,627	52,433			
575.86	65,780	53,747			
575.88	65,933	55,064			
575.90	66,085	56,384			
575.92	66,238	57,708			
575.94	66,391	59,034			
575.96	66,544	60,363			
575.98	66,696	61,696			
576.00	66,849	63,031			
576.02	66,956	64,369			

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Type II 24-hr 10-Year Rainfall=3.15"

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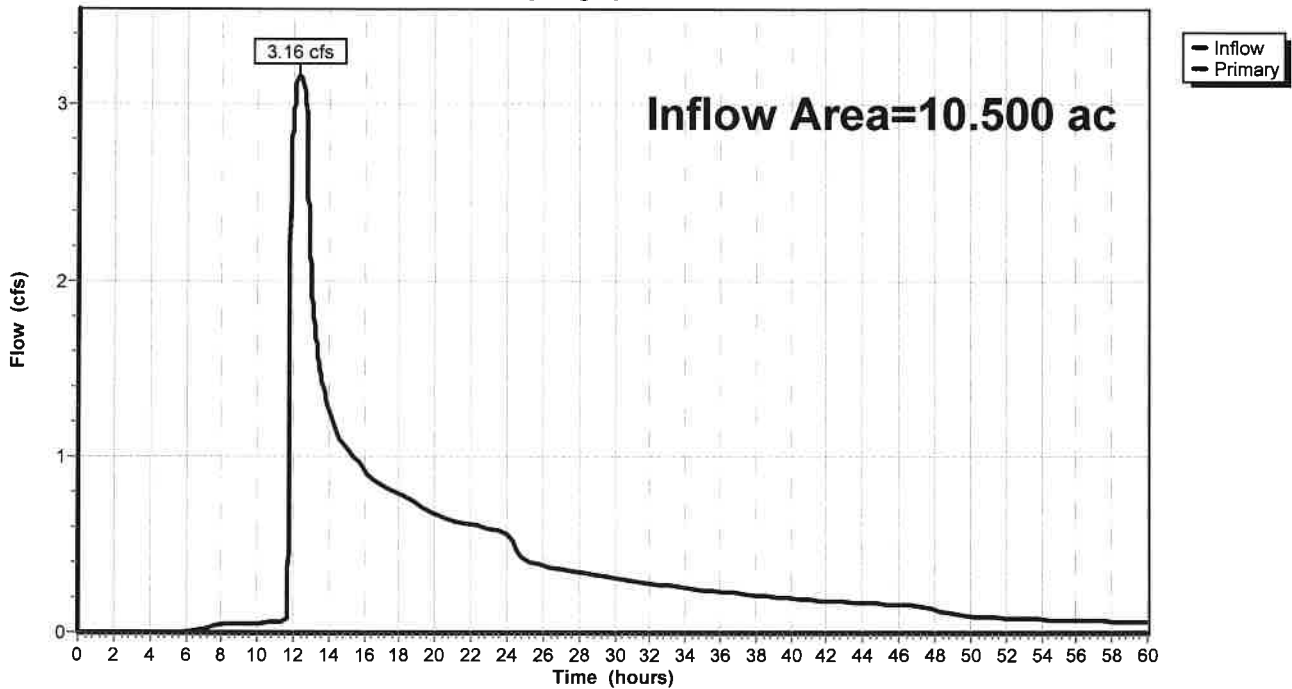
Summary for Link 5L: Outflow (@ CB 54)

Inflow Area = 10.500 ac, 57.14% Impervious, Inflow Depth > 1.89" for 10-Year event
Inflow = 3.16 cfs @ 12.39 hrs, Volume= 1.657 af
Primary = 3.16 cfs @ 12.39 hrs, Volume= 1.657 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs

Link 5L: Outflow (@ CB 54)

Hydrograph



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Type II 24-hr 10-Year Rainfall=3.15"

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Hydrograph for Link 5L: Outflow (@ CB 54)

Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)	Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
0.00	0.00	0.00	0.00	52.00	0.08	0.00	0.08
1.00	0.00	0.00	0.00	53.00	0.08	0.00	0.08
2.00	0.00	0.00	0.00	54.00	0.08	0.00	0.08
3.00	0.00	0.00	0.00	55.00	0.07	0.00	0.07
4.00	0.00	0.00	0.00	56.00	0.07	0.00	0.07
5.00	0.00	0.00	0.00	57.00	0.07	0.00	0.07
6.00	0.00	0.00	0.00	58.00	0.06	0.00	0.06
7.00	0.02	0.00	0.02	59.00	0.06	0.00	0.06
8.00	0.05	0.00	0.05	60.00	0.06	0.00	0.06
9.00	0.05	0.00	0.05				
10.00	0.05	0.00	0.05				
11.00	0.06	0.00	0.06				
12.00	2.90	0.00	2.90				
13.00	2.02	0.00	2.02				
14.00	1.26	0.00	1.26				
15.00	1.05	0.00	1.05				
16.00	0.92	0.00	0.92				
17.00	0.84	0.00	0.84				
18.00	0.78	0.00	0.78				
19.00	0.73	0.00	0.73				
20.00	0.67	0.00	0.67				
21.00	0.63	0.00	0.63				
22.00	0.61	0.00	0.61				
23.00	0.59	0.00	0.59				
24.00	0.57	0.00	0.57				
25.00	0.40	0.00	0.40				
26.00	0.38	0.00	0.38				
27.00	0.36	0.00	0.36				
28.00	0.34	0.00	0.34				
29.00	0.33	0.00	0.33				
30.00	0.31	0.00	0.31				
31.00	0.29	0.00	0.29				
32.00	0.28	0.00	0.28				
33.00	0.27	0.00	0.27				
34.00	0.26	0.00	0.26				
35.00	0.24	0.00	0.24				
36.00	0.23	0.00	0.23				
37.00	0.22	0.00	0.22				
38.00	0.21	0.00	0.21				
39.00	0.20	0.00	0.20				
40.00	0.20	0.00	0.20				
41.00	0.19	0.00	0.19				
42.00	0.18	0.00	0.18				
43.00	0.18	0.00	0.18				
44.00	0.17	0.00	0.17				
45.00	0.16	0.00	0.16				
46.00	0.16	0.00	0.16				
47.00	0.15	0.00	0.15				
48.00	0.13	0.00	0.13				
49.00	0.11	0.00	0.11				
50.00	0.09	0.00	0.09				
51.00	0.09	0.00	0.09				

21.011 Proposed

Type II 24-hr 25-Year Rainfall=3.87"

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Time span=0.00-60.00 hrs, dt=0.01 hrs, 6001 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: Front Area 1

Runoff Area=6.100 ac 54.10% Impervious Runoff Depth=2.80"
Flow Length=652' Tc=13.3 min CN=90 Runoff=22.74 cfs 1.421 af

Subcatchment 2S: Rear Area 1

Runoff Area=4.400 ac 61.36% Impervious Runoff Depth=2.89"
Flow Length=683' Tc=14.4 min CN=91 Runoff=16.27 cfs 1.061 af

Pond 1P: Bioretention Area 3

Peak Elev=576.11' Storage=10,375 cf Inflow=22.74 cfs 1.421 af
Primary=2.89 cfs 0.934 af Secondary=18.84 cfs 0.487 af Outflow=21.73 cfs 1.421 af

Pond 3P: Detention Basin (SMA #1)

Peak Elev=575.83' Storage=51,963 cf Inflow=34.94 cfs 1.548 af
Primary=0.64 cfs 1.276 af Secondary=0.00 cfs 0.000 af Outflow=0.64 cfs 1.276 af

Link 5L: Outflow (@ CB 54)

Inflow=3.36 cfs 2.210 af
Primary=3.36 cfs 2.210 af

Total Runoff Area = 10.500 ac Runoff Volume = 2.482 af Average Runoff Depth = 2.84"
42.86% Pervious = 4.500 ac 57.14% Impervious = 6.000 ac

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Type II 24-hr 25-Year Rainfall=3.87"

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Summary for Subcatchment 1S: Front Area 1

Runoff = 22.74 cfs @ 12.05 hrs, Volume= 1.421 af, Depth= 2.80"

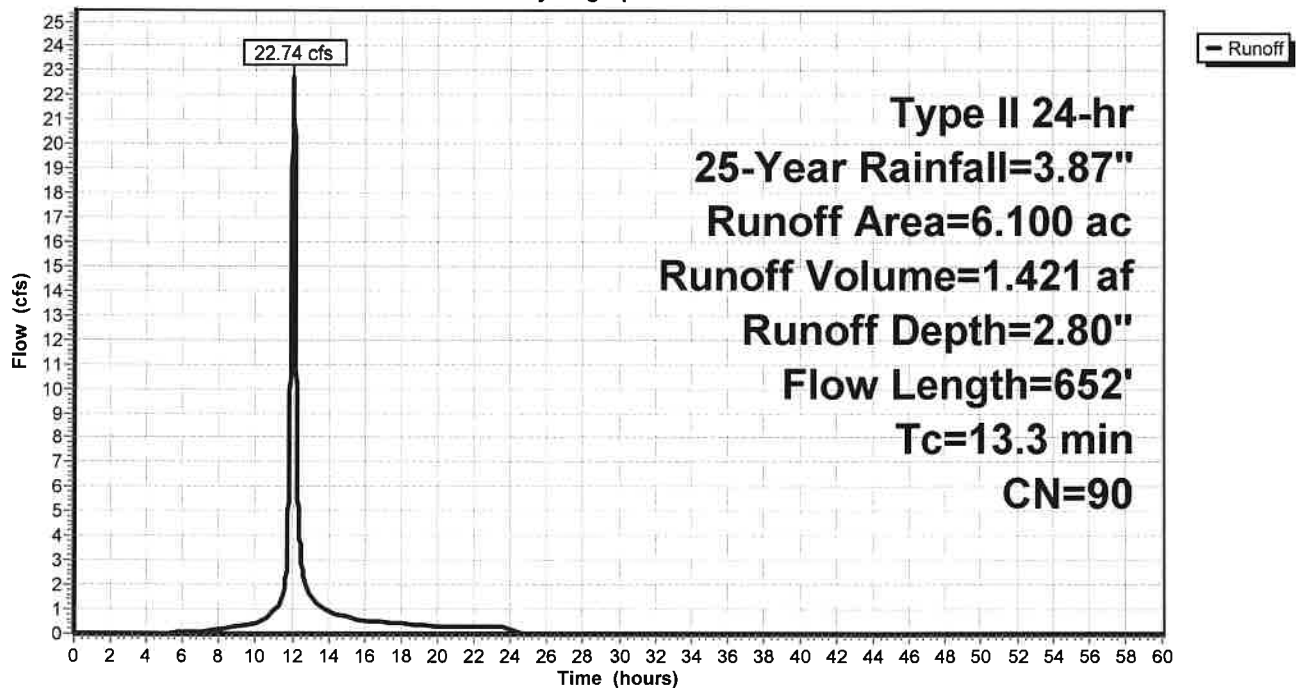
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
Type II 24-hr 25-Year Rainfall=3.87"

Area (ac)	CN	Description
1.800	98	Paved parking, HSG D
1.500	98	Roofs, HSG D
2.800	80	>75% Grass cover, Good, HSG D
6.100	90	Weighted Average
2.800		45.90% Pervious Area
3.300		54.10% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.6	37	0.0100	0.06		Sheet Flow, grass Grass: Dense n= 0.240 P2= 2.50"
0.4	15	0.0120	0.68		Sheet Flow, pavement Smooth surfaces n= 0.011 P2= 2.50"
3.3	600		3.00		Direct Entry, pipe flow
13.3	652	Total			

Subcatchment 1S: Front Area 1

Hydrograph



21.011 Proposed

Type II 24-hr 25-Year Rainfall=3.87"

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Hydrograph for Subcatchment 1S: Front Area 1

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	52.00	3.87	2.80	0.00
1.00	0.04	0.00	0.00	53.00	3.87	2.80	0.00
2.00	0.09	0.00	0.00	54.00	3.87	2.80	0.00
3.00	0.13	0.00	0.00	55.00	3.87	2.80	0.00
4.00	0.19	0.00	0.00	56.00	3.87	2.80	0.00
5.00	0.24	0.00	0.01	57.00	3.87	2.80	0.00
6.00	0.31	0.01	0.05	58.00	3.87	2.80	0.00
7.00	0.38	0.02	0.10	59.00	3.87	2.80	0.00
8.00	0.46	0.04	0.16	60.00	3.87	2.80	0.00
9.00	0.57	0.08	0.28				
10.00	0.70	0.14	0.43				
11.00	0.91	0.26	0.90				
12.00	2.57	1.59	20.75				
13.00	2.99	1.97	1.57				
14.00	3.17	2.14	0.90				
15.00	3.30	2.26	0.70				
16.00	3.41	2.36	0.54				
17.00	3.49	2.44	0.47				
18.00	3.56	2.51	0.41				
19.00	3.63	2.57	0.36				
20.00	3.68	2.62	0.30				
21.00	3.73	2.67	0.28				
22.00	3.78	2.71	0.27				
23.00	3.83	2.75	0.26				
24.00	3.87	2.80	0.25				
25.00	3.87	2.80	0.00				
26.00	3.87	2.80	0.00				
27.00	3.87	2.80	0.00				
28.00	3.87	2.80	0.00				
29.00	3.87	2.80	0.00				
30.00	3.87	2.80	0.00				
31.00	3.87	2.80	0.00				
32.00	3.87	2.80	0.00				
33.00	3.87	2.80	0.00				
34.00	3.87	2.80	0.00				
35.00	3.87	2.80	0.00				
36.00	3.87	2.80	0.00				
37.00	3.87	2.80	0.00				
38.00	3.87	2.80	0.00				
39.00	3.87	2.80	0.00				
40.00	3.87	2.80	0.00				
41.00	3.87	2.80	0.00				
42.00	3.87	2.80	0.00				
43.00	3.87	2.80	0.00				
44.00	3.87	2.80	0.00				
45.00	3.87	2.80	0.00				
46.00	3.87	2.80	0.00				
47.00	3.87	2.80	0.00				
48.00	3.87	2.80	0.00				
49.00	3.87	2.80	0.00				
50.00	3.87	2.80	0.00				
51.00	3.87	2.80	0.00				

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Type II 24-hr 25-Year Rainfall=3.87"

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Summary for Subcatchment 2S: Rear Area 1

Runoff = 16.27 cfs @ 12.06 hrs, Volume= 1.061 af, Depth= 2.89"

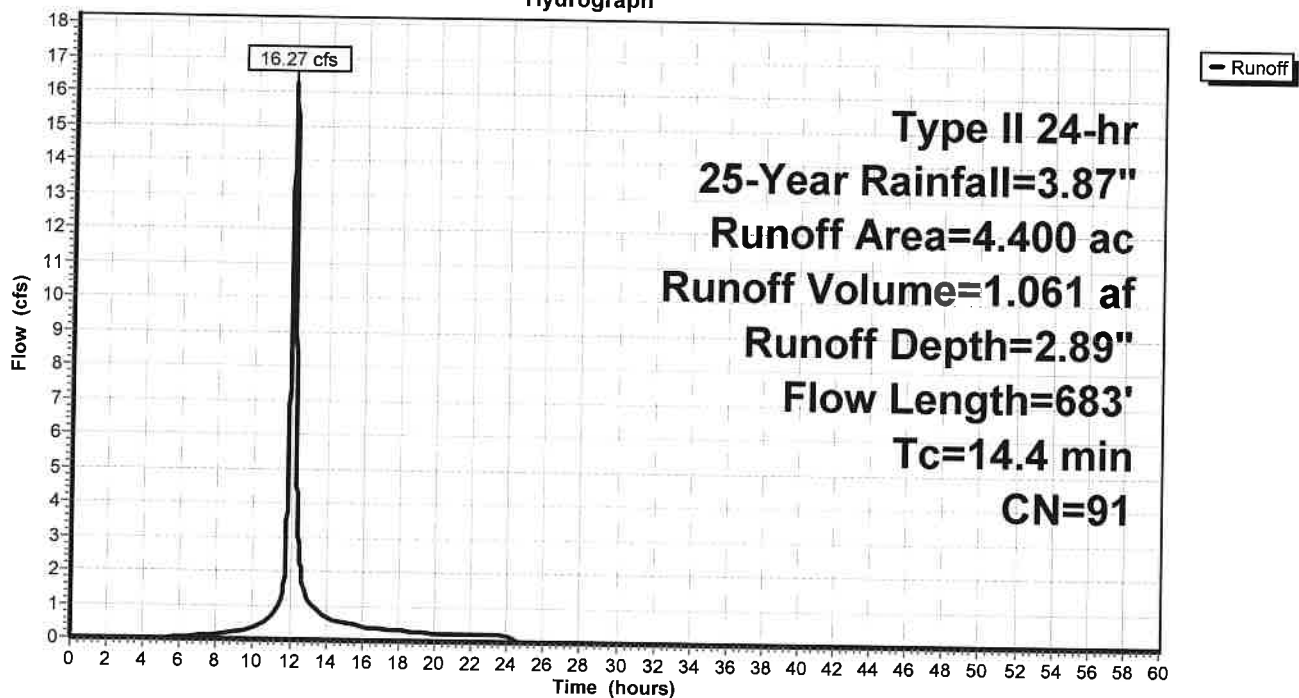
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
Type II 24-hr 25-Year Rainfall=3.87"

Area (ac)	CN	Description
1.400	98	Paved parking, HSG D
1.300	98	Roofs, HSG D
1.700	80	>75% Grass cover, Good, HSG D
4.400	91	Weighted Average
1.700		38.64% Pervious Area
2.700		61.36% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.2	90	0.0200	0.15		Sheet Flow, grass Grass: Short n= 0.150 P2= 2.50"
1.3	75	0.0130	0.97		Sheet Flow, pavement Smooth surfaces n= 0.011 P2= 2.50"
2.9	518		3.00		Direct Entry, Pipe flow
14.4	683	Total			

Subcatchment 2S: Rear Area 1

Hydrograph



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Type II 24-hr 25-Year Rainfall=3.87"

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Hydrograph for Subcatchment 2S: Rear Area 1

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	52.00	3.87	2.89	0.00
1.00	0.04	0.00	0.00	53.00	3.87	2.89	0.00
2.00	0.09	0.00	0.00	54.00	3.87	2.89	0.00
3.00	0.13	0.00	0.00	55.00	3.87	2.89	0.00
4.00	0.19	0.00	0.00	56.00	3.87	2.89	0.00
5.00	0.24	0.00	0.02	57.00	3.87	2.89	0.00
6.00	0.31	0.01	0.05	58.00	3.87	2.89	0.00
7.00	0.38	0.03	0.09	59.00	3.87	2.89	0.00
8.00	0.46	0.06	0.13	60.00	3.87	2.89	0.00
9.00	0.57	0.10	0.23				
10.00	0.70	0.17	0.34				
11.00	0.91	0.30	0.69				
12.00	2.57	1.67	14.36				
13.00	2.99	2.06	1.16				
14.00	3.17	2.23	0.67				
15.00	3.30	2.36	0.51				
16.00	3.41	2.45	0.40				
17.00	3.49	2.53	0.34				
18.00	3.56	2.60	0.30				
19.00	3.63	2.66	0.26				
20.00	3.68	2.72	0.22				
21.00	3.73	2.76	0.21				
22.00	3.78	2.81	0.20				
23.00	3.83	2.85	0.19				
24.00	3.87	2.89	0.18				
25.00	3.87	2.89	0.00				
26.00	3.87	2.89	0.00				
27.00	3.87	2.89	0.00				
28.00	3.87	2.89	0.00				
29.00	3.87	2.89	0.00				
30.00	3.87	2.89	0.00				
31.00	3.87	2.89	0.00				
32.00	3.87	2.89	0.00				
33.00	3.87	2.89	0.00				
34.00	3.87	2.89	0.00				
35.00	3.87	2.89	0.00				
36.00	3.87	2.89	0.00				
37.00	3.87	2.89	0.00				
38.00	3.87	2.89	0.00				
39.00	3.87	2.89	0.00				
40.00	3.87	2.89	0.00				
41.00	3.87	2.89	0.00				
42.00	3.87	2.89	0.00				
43.00	3.87	2.89	0.00				
44.00	3.87	2.89	0.00				
45.00	3.87	2.89	0.00				
46.00	3.87	2.89	0.00				
47.00	3.87	2.89	0.00				
48.00	3.87	2.89	0.00				
49.00	3.87	2.89	0.00				
50.00	3.87	2.89	0.00				
51.00	3.87	2.89	0.00				

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Type II 24-hr 25-Year Rainfall=3.87"

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Summary for Pond 1P: Bioretention Area 3

Inflow Area = 6.100 ac, 54.10% Impervious, Inflow Depth = 2.80" for 25-Year event
 Inflow = 22.74 cfs @ 12.05 hrs, Volume= 1.421 af
 Outflow = 21.73 cfs @ 12.08 hrs, Volume= 1.421 af, Atten= 4%, Lag= 2.0 min
 Primary = 2.89 cfs @ 12.08 hrs, Volume= 0.934 af
 Secondary = 18.84 cfs @ 12.08 hrs, Volume= 0.487 af

Routing by Stor-Ind method, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
 Peak Elev= 576.11' @ 12.08 hrs Surf.Area= 10,069 sf Storage= 10,375 cf

Plug-Flow detention time= 127.9 min calculated for 1.421 af (100% of inflow)
 Center-of-Mass det. time= 128.1 min (931.5 - 803.4)

Volume	Invert	Avail.Storage	Storage Description
#1	575.00'	25,904 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
575.00	8,648	0	0
576.00	9,925	9,287	9,287
576.50	10,585	5,128	14,414
577.00	11,350	5,484	19,898
577.50	12,675	6,006	25,904

Device	Routing	Invert	Outlet Devices
#1	Primary	572.50'	8.0" Round 8" pipe L= 25.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 572.50' / 572.42' S= 0.0032 ' / Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.35 sf
#2	Device 1	575.50'	8.0" Horiz. Grate X 4.00 C= 0.600 Limited to weir flow at low heads
#3	Device 1	575.00'	0.250 in/hr Exfiltration over Surface area Conductivity to Groundwater Elevation = 560.00'
#4	Secondary	575.75'	30.0' long (Profile 1) Broad-Crested Rectangular Weir Head (feet) 0.49 0.98 1.48 Coef. (English) 2.92 3.37 3.59

Primary OutFlow Max=2.89 cfs @ 12.08 hrs HW=576.11' (Free Discharge)

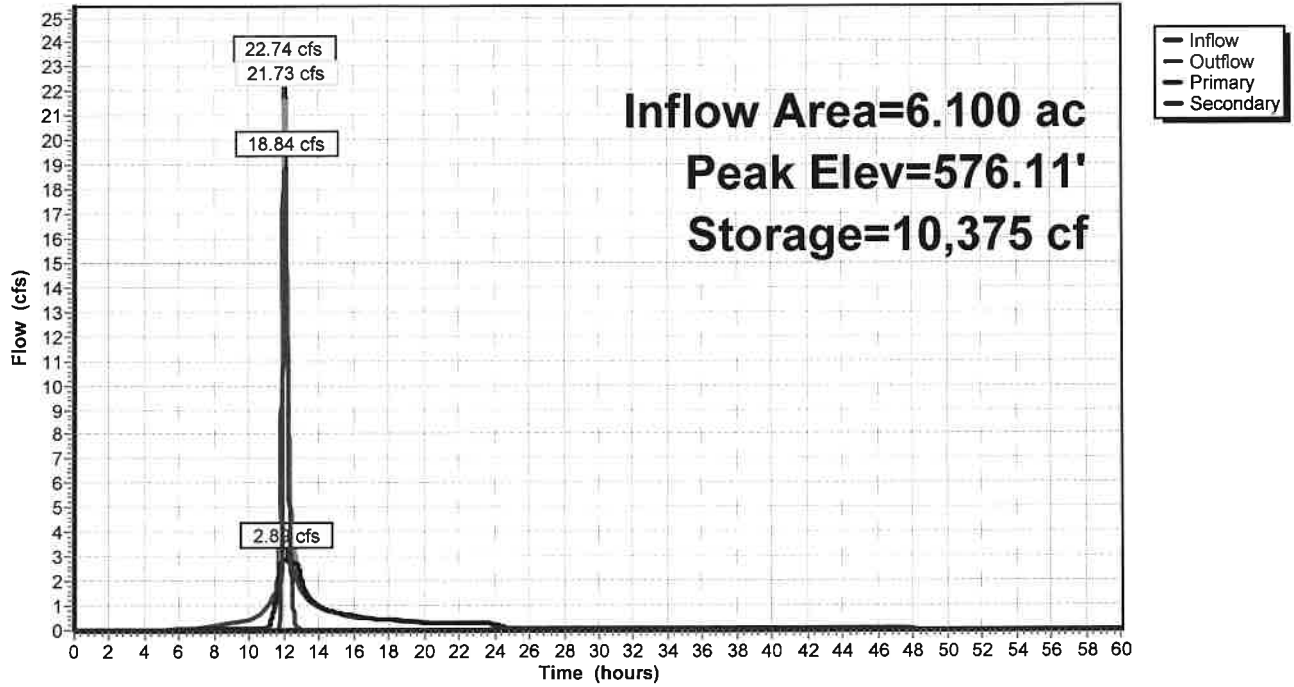
- ↑ 1=8" pipe (Barrel Controls 2.89 cfs @ 8.27 fps)
- ↑ 2=Grate (Passes < 5.25 cfs potential flow)
- ↑ 3=Exfiltration (Passes < 0.06 cfs potential flow)

Secondary OutFlow Max=18.83 cfs @ 12.08 hrs HW=576.11' (Free Discharge)

- ↑ 4=Broad-Crested Rectangular Weir (Weir Controls 18.83 cfs @ 1.75 fps)

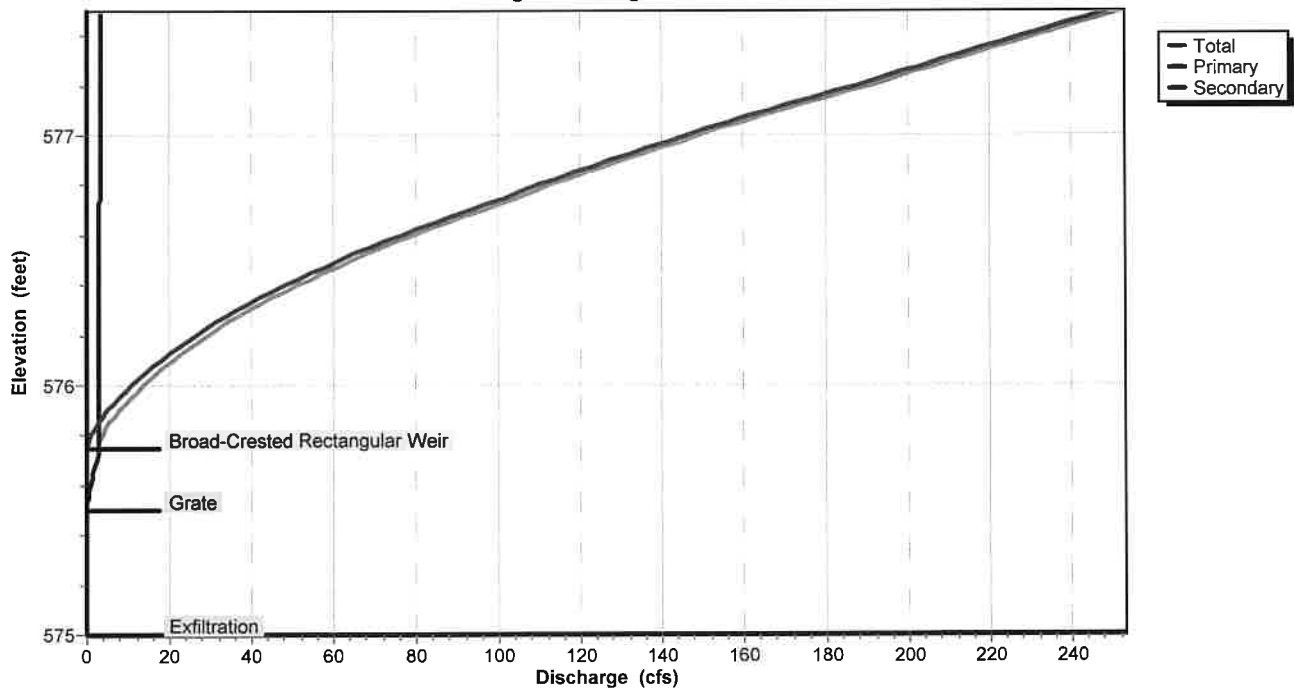
Pond 1P: Bioretention Area 3

Hydrograph

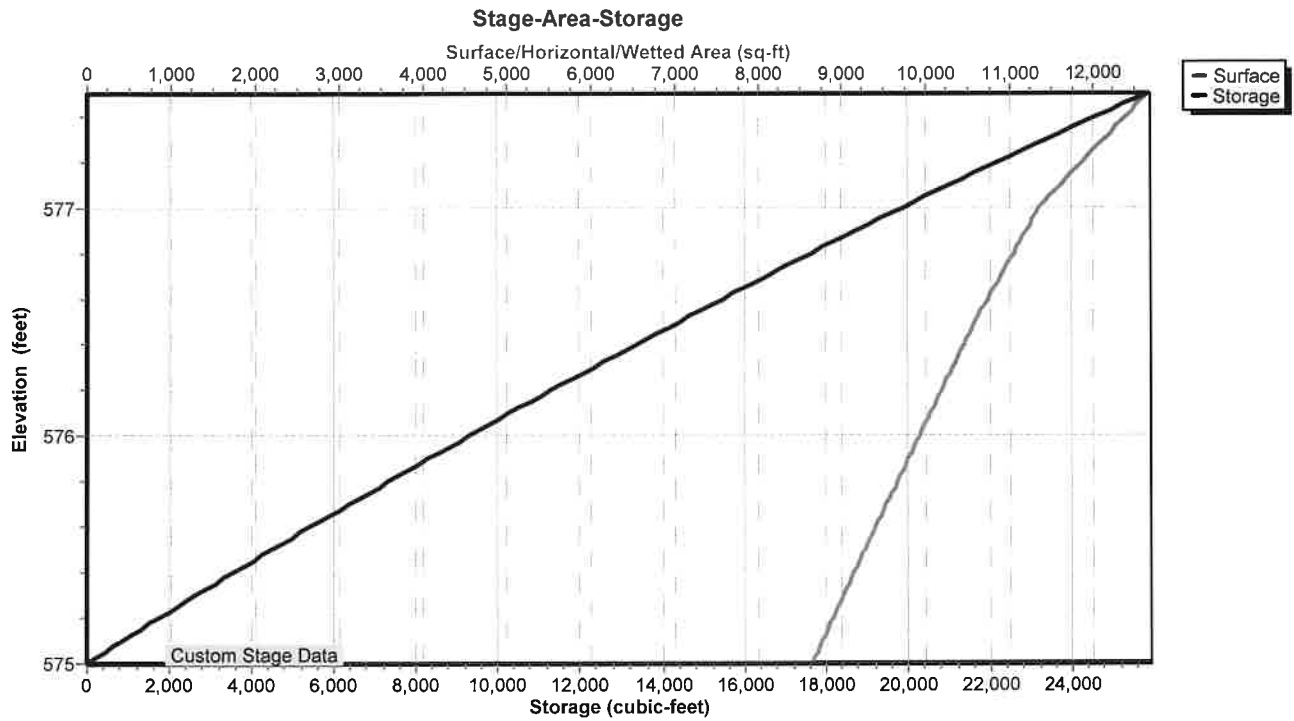


Pond 1P: Bioretention Area 3

Stage-Discharge



Pond 1P: Bioretention Area 3



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Type II 24-hr 25-Year Rainfall=3.87"

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Hydrograph for Pond 1P: Bioretention Area 3

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Primary (cfs)	Secondary (cfs)
0.00	0.00	0	575.00	0.00	0.00	0.00
2.00	0.00	0	575.00	0.00	0.00	0.00
4.00	0.00	0	575.00	0.00	0.00	0.00
6.00	0.05	75	575.01	0.02	0.02	0.00
8.00	0.16	510	575.06	0.05	0.05	0.00
10.00	0.43	2,153	575.24	0.05	0.05	0.00
12.00	20.75	9,748	576.05	16.99	2.86	14.14
14.00	0.90	5,469	575.61	1.00	1.00	0.00
16.00	0.54	5,148	575.57	0.58	0.58	0.00
18.00	0.41	5,009	575.56	0.43	0.43	0.00
20.00	0.30	4,900	575.54	0.32	0.32	0.00
22.00	0.27	4,847	575.54	0.28	0.28	0.00
24.00	0.25	4,821	575.54	0.25	0.25	0.00
26.00	0.00	4,285	575.48	0.06	0.06	0.00
28.00	0.00	3,889	575.44	0.05	0.05	0.00
30.00	0.00	3,497	575.39	0.05	0.05	0.00
32.00	0.00	3,108	575.35	0.05	0.05	0.00
34.00	0.00	2,722	575.31	0.05	0.05	0.00
36.00	0.00	2,339	575.27	0.05	0.05	0.00
38.00	0.00	1,960	575.22	0.05	0.05	0.00
40.00	0.00	1,584	575.18	0.05	0.05	0.00
42.00	0.00	1,211	575.14	0.05	0.05	0.00
44.00	0.00	842	575.10	0.05	0.05	0.00
46.00	0.00	475	575.05	0.05	0.05	0.00
48.00	0.00	134	575.02	0.03	0.03	0.00
50.00	0.00	25	575.00	0.01	0.01	0.00
52.00	0.00	5	575.00	0.00	0.00	0.00
54.00	0.00	1	575.00	0.00	0.00	0.00
56.00	0.00	0	575.00	0.00	0.00	0.00
58.00	0.00	0	575.00	0.00	0.00	0.00
60.00	0.00	0	575.00	0.00	0.00	0.00

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Type II 24-hr 25-Year Rainfall=3.87"

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Stage-Discharge for Pond 1P: Bioretention Area 3

Elevation (feet)	Discharge (cfs)	Primary (cfs)	Secondary (cfs)
575.00	0.00	0.00	0.00
575.05	0.05	0.05	0.00
575.10	0.05	0.05	0.00
575.15	0.05	0.05	0.00
575.20	0.05	0.05	0.00
575.25	0.05	0.05	0.00
575.30	0.05	0.05	0.00
575.35	0.05	0.05	0.00
575.40	0.05	0.05	0.00
575.45	0.05	0.05	0.00
575.50	0.06	0.06	0.00
575.55	0.36	0.36	0.00
575.60	0.92	0.92	0.00
575.65	1.65	1.65	0.00
575.70	2.51	2.51	0.00
575.75	2.71	2.71	0.00
575.80	3.71	2.73	0.98
575.85	5.53	2.76	2.77
575.90	7.87	2.78	5.09
575.95	10.64	2.81	7.84
576.00	13.78	2.83	10.95
576.05	17.25	2.86	14.39
576.10	21.02	2.88	18.14
576.15	25.07	2.91	22.16
576.20	29.37	2.93	26.44
576.25	34.02	2.95	31.07
576.30	39.38	2.98	36.41
576.35	45.12	3.00	42.12
576.40	51.24	3.02	48.22
576.45	57.74	3.04	54.69
576.50	64.62	3.07	61.55
576.55	71.88	3.09	68.79
576.60	79.53	3.11	76.42
576.65	87.57	3.13	84.44
576.70	96.00	3.16	92.85
576.75	104.54	3.18	101.36
576.80	112.97	3.20	109.77
576.85	121.69	3.22	118.47
576.90	130.69	3.24	127.45
576.95	139.98	3.26	136.72
577.00	149.56	3.28	146.27
577.05	159.42	3.30	156.11
577.10	169.57	3.33	166.24
577.15	180.00	3.35	176.66
577.20	190.72	3.37	187.36
577.25	201.24	3.39	197.86
577.30	211.24	3.41	207.83
577.35	221.40	3.43	217.97
577.40	231.71	3.45	228.27
577.45	242.19	3.47	238.72
577.50	252.82	3.49	249.33

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Type II 24-hr 25-Year Rainfall=3.87"

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Stage-Area-Storage for Pond 1P: Bioretention Area 3

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
575.00	8,648	0
575.05	8,712	434
575.10	8,776	871
575.15	8,840	1,312
575.20	8,903	1,755
575.25	8,967	2,202
575.30	9,031	2,652
575.35	9,095	3,105
575.40	9,159	3,561
575.45	9,223	4,021
575.50	9,287	4,484
575.55	9,350	4,950
575.60	9,414	5,419
575.65	9,478	5,891
575.70	9,542	6,366
575.75	9,606	6,845
575.80	9,670	7,327
575.85	9,733	7,812
575.90	9,797	8,300
575.95	9,861	8,792
576.00	9,925	9,287
576.05	9,991	9,784
576.10	10,057	10,286
576.15	10,123	10,790
576.20	10,189	11,298
576.25	10,255	11,809
576.30	10,321	12,323
576.35	10,387	12,841
576.40	10,453	13,362
576.45	10,519	13,886
576.50	10,585	14,414
576.55	10,661	14,945
576.60	10,738	15,480
576.65	10,814	16,019
576.70	10,891	16,562
576.75	10,968	17,108
576.80	11,044	17,658
576.85	11,121	18,212
576.90	11,197	18,770
576.95	11,274	19,332
577.00	11,350	19,898
577.05	11,422	20,469
577.10	11,615	21,046
577.15	11,747	21,630
577.20	11,880	22,221
577.25	12,013	22,818
577.30	12,145	23,422
577.35	12,278	24,033
577.40	12,410	24,650
577.45	12,543	25,274
577.50	12,675	25,904

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Type II 24-hr 25-Year Rainfall=3.87"

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Summary for Pond 3P: Detention Basin (SMA #1)

Inflow Area = 4.400 ac, 61.36% Impervious, Inflow Depth = 4.22" for 25-Year event
 Inflow = 34.94 cfs @ 12.07 hrs, Volume= 1.548 af
 Outflow = 0.64 cfs @ 14.10 hrs, Volume= 1.276 af, Atten= 98%, Lag= 121.4 min
 Primary = 0.64 cfs @ 14.10 hrs, Volume= 1.276 af
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
 Peak Elev= 575.83' @ 14.10 hrs Surf.Area= 65,573 sf Storage= 51,963 cf

Plug-Flow detention time= 951.6 min calculated for 1.276 af (82% of inflow)
 Center-of-Mass det. time= 890.6 min (1,667.8 - 777.2)

Volume	Invert	Avail.Storage	Storage Description
#1	575.00'	118,224 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
575.00	59,213	0	0
576.00	66,849	63,031	63,031
576.80	71,134	55,193	118,224

Device	Routing	Invert	Outlet Devices
#1	Primary	574.00'	12.0" Round 12" outlet pipe L= 160.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 574.00' / 573.79' S= 0.0013 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Device 1	575.00'	6.0" Round low flow outlet pipe L= 10.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 575.00' / 574.95' S= 0.0050 '/' Cc= 0.900 n= 0.010 Corrugated PE, smooth interior, Flow Area= 0.20 sf
#3	Device 1	576.50'	30.0" x 30.0" Horiz. Grate C= 0.600 Limited to weir flow at low heads
#4	Secondary	575.95'	20.0' long (Profile 1) Broad-Crested Rectangular Weir X 2.00 Head (feet) 0.49 0.98 1.48 Coef. (English) 2.92 3.37 3.59

Primary OutFlow Max=0.64 cfs @ 14.10 hrs HW=575.83' (Free Discharge)

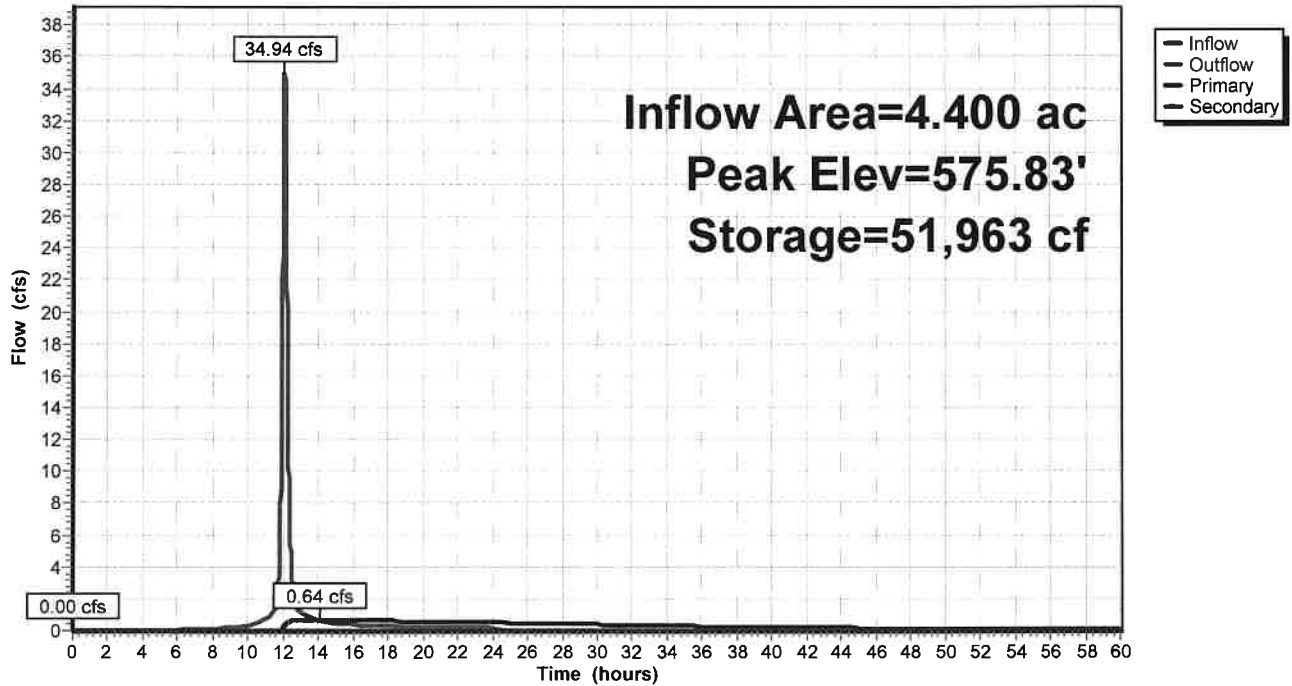
↑ 1=12" outlet pipe (Passes 0.64 cfs of 2.52 cfs potential flow)
 ↑ 2=low flow outlet pipe (Inlet Controls 0.64 cfs @ 3.24 fps)
 ↑ 3=Grate (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=575.00' (Free Discharge)

↑ 4=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

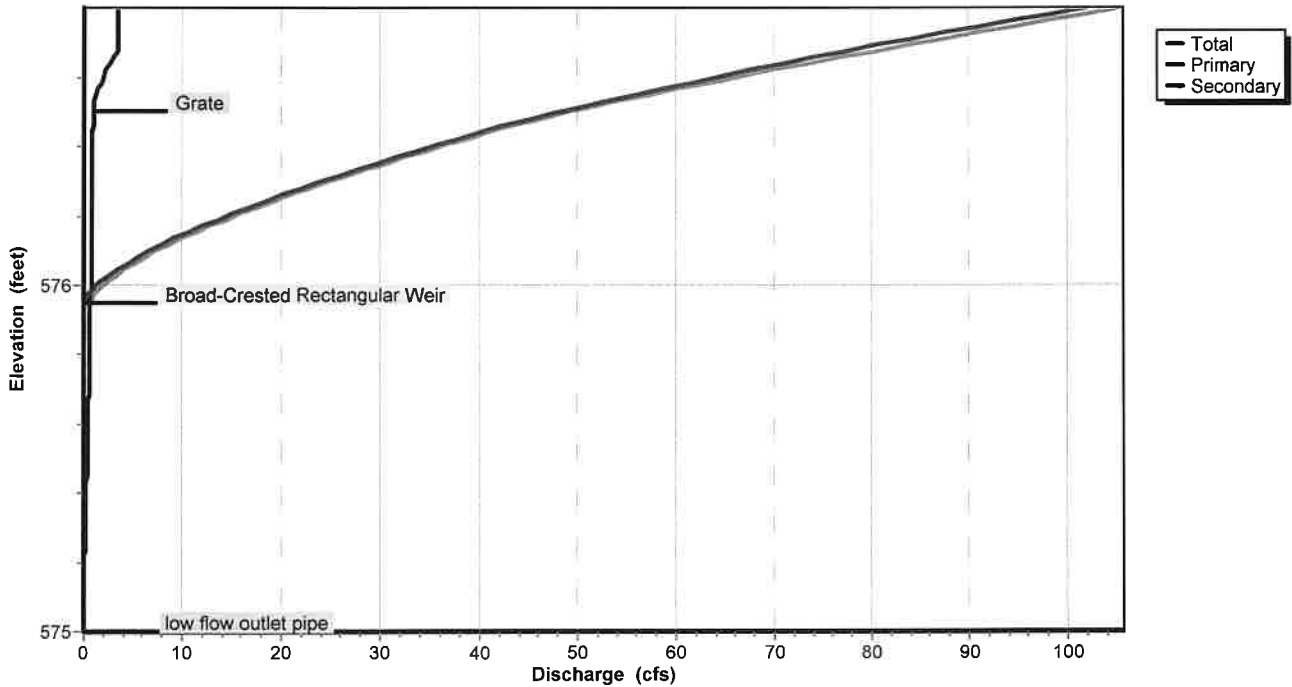
Pond 3P: Detention Basin (SMA #1)

Hydrograph



Pond 3P: Detention Basin (SMA #1)

Stage-Discharge



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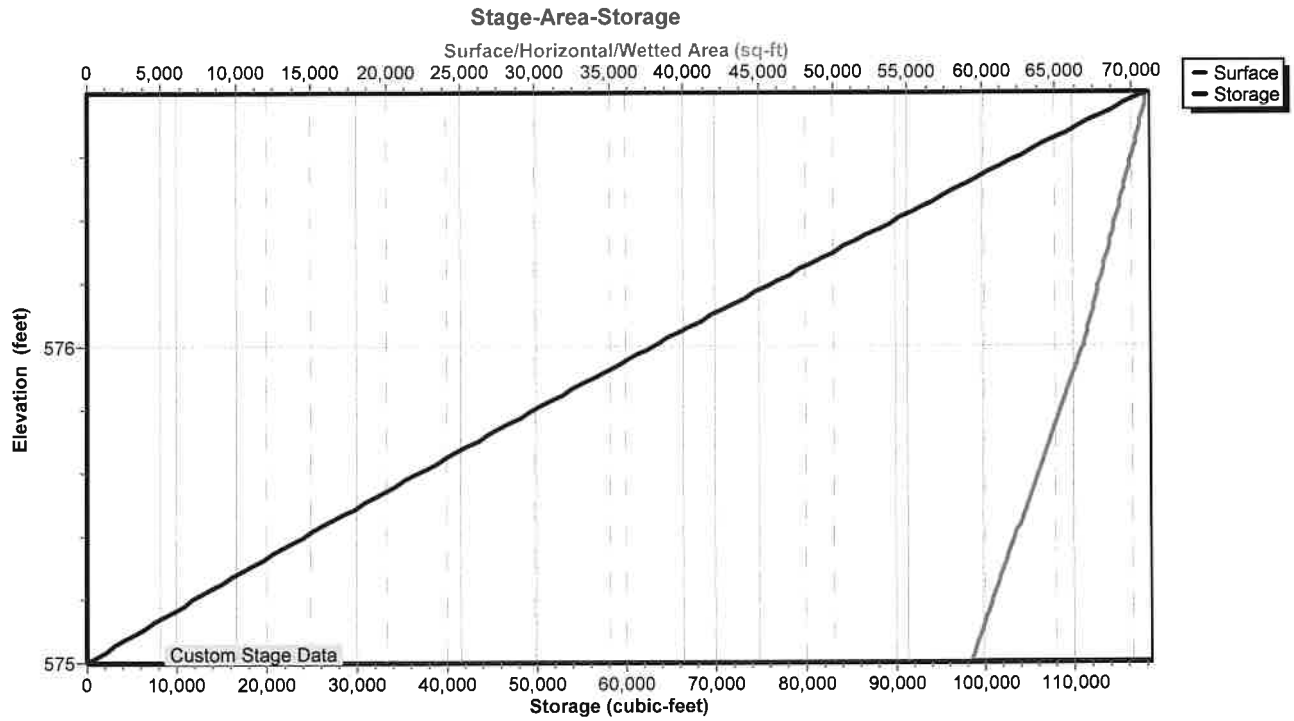
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Pond 3P: Detention Basin (SMA #1)



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Hydrograph for Pond 3P: Detention Basin (SMA #1)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Primary (cfs)	Secondary (cfs)
0.00	0.00	0	575.00	0.00	0.00	0.00
2.00	0.00	0	575.00	0.00	0.00	0.00
4.00	0.00	0	575.00	0.00	0.00	0.00
6.00	0.05	138	575.00	0.00	0.00	0.00
8.00	0.13	792	575.01	0.00	0.00	0.00
10.00	0.34	2,407	575.04	0.00	0.00	0.00
12.00	28.50	18,305	575.30	0.17	0.17	0.00
14.00	0.67	51,959	575.83	0.64	0.64	0.00
16.00	0.40	51,083	575.82	0.63	0.63	0.00
18.00	0.30	49,081	575.79	0.61	0.61	0.00
20.00	0.22	46,637	575.75	0.59	0.59	0.00
22.00	0.20	44,041	575.71	0.55	0.55	0.00
24.00	0.18	41,619	575.67	0.51	0.51	0.00
26.00	0.00	38,209	575.62	0.48	0.48	0.00
28.00	0.00	34,905	575.57	0.44	0.44	0.00
30.00	0.00	31,923	575.52	0.39	0.39	0.00
32.00	0.00	29,266	575.48	0.35	0.35	0.00
34.00	0.00	26,910	575.44	0.31	0.31	0.00
36.00	0.00	24,824	575.41	0.27	0.27	0.00
38.00	0.00	22,978	575.38	0.24	0.24	0.00
40.00	0.00	21,340	575.35	0.21	0.21	0.00
42.00	0.00	19,882	575.33	0.19	0.19	0.00
44.00	0.00	18,582	575.31	0.17	0.17	0.00
46.00	0.00	17,418	575.29	0.15	0.15	0.00
48.00	0.00	16,372	575.27	0.14	0.14	0.00
50.00	0.00	15,429	575.26	0.12	0.12	0.00
52.00	0.00	14,576	575.24	0.11	0.11	0.00
54.00	0.00	13,802	575.23	0.10	0.10	0.00
56.00	0.00	13,098	575.22	0.09	0.09	0.00
58.00	0.00	12,454	575.21	0.09	0.09	0.00
60.00	0.00	11,865	575.20	0.08	0.08	0.00

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Type II 24-hr 25-Year Rainfall=3.87"

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Stage-Discharge for Pond 3P: Detention Basin (SMA #1)

Elevation (feet)	Discharge (cfs)	Primary (cfs)	Secondary (cfs)	Elevation (feet)	Discharge (cfs)	Primary (cfs)	Secondary (cfs)
575.00	0.00	0.00	0.00	576.04	3.90	0.74	3.15
575.02	0.00	0.00	0.00	576.06	5.01	0.75	4.26
575.04	0.00	0.00	0.00	576.08	6.23	0.76	5.47
575.06	0.01	0.01	0.00	576.10	7.55	0.77	6.79
575.08	0.01	0.01	0.00	576.12	8.96	0.78	8.19
575.10	0.02	0.02	0.00	576.14	10.46	0.79	9.67
575.12	0.03	0.03	0.00	576.16	12.04	0.80	11.24
575.14	0.04	0.04	0.00	576.18	13.69	0.80	12.88
575.16	0.05	0.05	0.00	576.20	15.41	0.81	14.60
575.18	0.07	0.07	0.00	576.22	17.21	0.82	16.39
575.20	0.08	0.08	0.00	576.24	19.07	0.83	18.24
575.22	0.09	0.09	0.00	576.26	21.00	0.84	20.16
575.24	0.11	0.11	0.00	576.28	22.99	0.85	22.14
575.26	0.13	0.13	0.00	576.30	25.04	0.85	24.18
575.28	0.15	0.15	0.00	576.32	27.15	0.86	26.29
575.30	0.16	0.16	0.00	576.34	29.32	0.87	28.45
575.32	0.18	0.18	0.00	576.36	31.54	0.88	30.66
575.34	0.20	0.20	0.00	576.38	33.82	0.89	32.93
575.36	0.22	0.22	0.00	576.40	36.15	0.89	35.26
575.38	0.24	0.24	0.00	576.42	38.54	0.90	37.63
575.40	0.26	0.26	0.00	576.44	40.97	0.91	40.06
575.42	0.28	0.28	0.00	576.46	43.73	0.92	42.81
575.44	0.31	0.31	0.00	576.48	46.56	0.93	45.63
575.46	0.33	0.33	0.00	576.50	49.47	0.93	48.54
575.48	0.35	0.35	0.00	576.52	52.56	1.03	51.53
575.50	0.37	0.37	0.00	576.54	55.81	1.21	54.60
575.52	0.39	0.39	0.00	576.56	59.18	1.44	57.75
575.54	0.41	0.41	0.00	576.58	62.68	1.70	60.98
575.56	0.43	0.43	0.00	576.60	66.29	2.00	64.29
575.58	0.45	0.45	0.00	576.62	70.02	2.34	67.68
575.60	0.46	0.46	0.00	576.64	73.85	2.70	71.16
575.62	0.48	0.48	0.00	576.66	77.79	3.08	74.71
575.64	0.49	0.49	0.00	576.68	81.74	3.39	78.35
575.66	0.50	0.50	0.00	576.70	85.48	3.41	82.07
575.68	0.51	0.51	0.00	576.72	89.30	3.43	85.87
575.70	0.54	0.54	0.00	576.74	93.20	3.45	89.75
575.72	0.56	0.56	0.00	576.76	97.18	3.46	93.72
575.74	0.58	0.58	0.00	576.78	101.25	3.48	97.76
575.76	0.60	0.60	0.00	576.80	105.39	3.50	101.90
575.78	0.61	0.61	0.00				
575.80	0.62	0.62	0.00				
575.82	0.63	0.63	0.00				
575.84	0.64	0.64	0.00				
575.86	0.65	0.65	0.00				
575.88	0.66	0.66	0.00				
575.90	0.67	0.67	0.00				
575.92	0.68	0.68	0.00				
575.94	0.69	0.69	0.00				
575.96	0.82	0.70	0.12				
575.98	1.32	0.71	0.61				
576.00	2.03	0.72	1.31				
576.02	2.90	0.73	2.16				

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Type II 24-hr 25-Year Rainfall=3.87"

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Stage-Area-Storage for Pond 3P: Detention Basin (SMA #1)

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
575.00	59,213	0	576.04	67,063	65,709
575.02	59,366	1,186	576.06	67,170	67,052
575.04	59,518	2,375	576.08	67,278	68,396
575.06	59,671	3,567	576.10	67,385	69,743
575.08	59,824	4,761	576.12	67,492	71,091
575.10	59,977	5,959	576.14	67,599	72,442
575.12	60,129	7,161	576.16	67,706	73,795
575.14	60,282	8,365	576.18	67,813	75,151
575.16	60,435	9,572	576.20	67,920	76,508
575.18	60,587	10,782	576.22	68,027	77,867
575.20	60,740	11,995	576.24	68,135	79,229
575.22	60,893	13,212	576.26	68,242	80,593
575.24	61,046	14,431	576.28	68,349	81,959
575.26	61,198	15,653	576.30	68,456	83,327
575.28	61,351	16,879	576.32	68,563	84,697
575.30	61,504	18,108	576.34	68,670	86,069
575.32	61,657	19,339	576.36	68,777	87,444
575.34	61,809	20,574	576.38	68,884	88,820
575.36	61,962	21,811	576.40	68,992	90,199
575.38	62,115	23,052	576.42	69,099	91,580
575.40	62,267	24,296	576.44	69,206	92,963
575.42	62,420	25,543	576.46	69,313	94,348
575.44	62,573	26,793	576.48	69,420	95,736
575.46	62,726	28,046	576.50	69,527	97,125
575.48	62,878	29,302	576.52	69,634	98,517
575.50	63,031	30,561	576.54	69,741	99,910
575.52	63,184	31,823	576.56	69,848	101,306
575.54	63,336	33,088	576.58	69,956	102,704
575.56	63,489	34,357	576.60	70,063	104,105
575.58	63,642	35,628	576.62	70,170	105,507
575.60	63,795	36,902	576.64	70,277	106,911
575.62	63,947	38,180	576.66	70,384	108,318
575.64	64,100	39,460	576.68	70,491	109,727
575.66	64,253	40,744	576.70	70,598	111,138
575.68	64,405	42,030	576.72	70,706	112,551
575.70	64,558	43,320	576.74	70,813	113,966
575.72	64,711	44,613	576.76	70,920	115,383
575.74	64,864	45,908	576.78	71,027	116,803
575.76	65,016	47,207	576.80	71,134	118,224
575.78	65,169	48,509			
575.80	65,322	49,814			
575.82	65,475	51,122			
575.84	65,627	52,433			
575.86	65,780	53,747			
575.88	65,933	55,064			
575.90	66,085	56,384			
575.92	66,238	57,708			
575.94	66,391	59,034			
575.96	66,544	60,363			
575.98	66,696	61,696			
576.00	66,849	63,031			
576.02	66,956	64,369			

21.011 Proposed

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Type II 24-hr 25-Year Rainfall=3.87"

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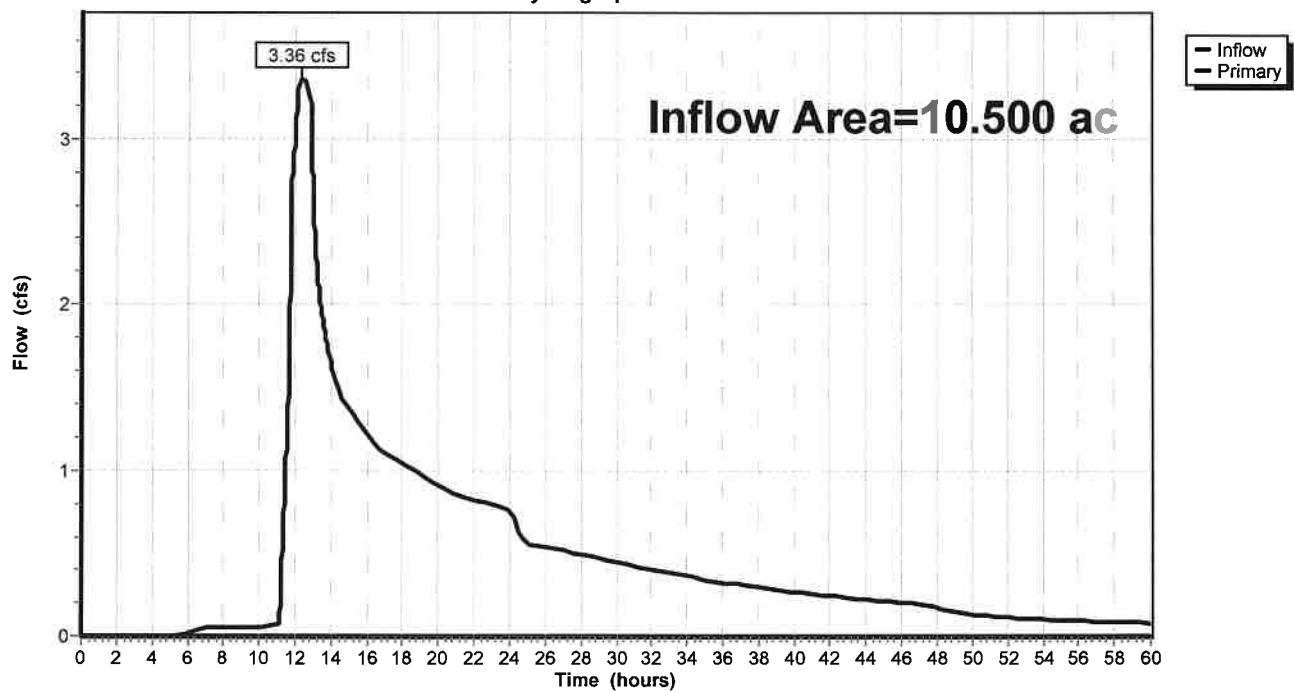
Summary for Link 5L: Outflow (@ CB 54)

Inflow Area = 10.500 ac, 57.14% Impervious, Inflow Depth > 2.53" for 25-Year event
Inflow = 3.36 cfs @ 12.37 hrs, Volume= 2.210 af
Primary = 3.36 cfs @ 12.37 hrs, Volume= 2.210 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs

Link 5L: Outflow (@ CB 54)

Hydrograph



21.011 Proposed

Type II 24-hr 25-Year Rainfall=3.87"

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Hydrograph for Link 5L: Outflow (@ CB 54)

Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)	Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
0.00	0.00	0.00	0.00	52.00	0.11	0.00	0.11
1.00	0.00	0.00	0.00	53.00	0.11	0.00	0.11
2.00	0.00	0.00	0.00	54.00	0.10	0.00	0.10
3.00	0.00	0.00	0.00	55.00	0.10	0.00	0.10
4.00	0.00	0.00	0.00	56.00	0.09	0.00	0.09
5.00	0.00	0.00	0.00	57.00	0.09	0.00	0.09
6.00	0.02	0.00	0.02	58.00	0.09	0.00	0.09
7.00	0.05	0.00	0.05	59.00	0.08	0.00	0.08
8.00	0.05	0.00	0.05	60.00	0.08	0.00	0.08
9.00	0.05	0.00	0.05				
10.00	0.06	0.00	0.06				
11.00	0.07	0.00	0.07				
12.00	3.02	0.00	3.02				
13.00	2.64	0.00	2.64				
14.00	1.63	0.00	1.63				
15.00	1.36	0.00	1.36				
16.00	1.21	0.00	1.21				
17.00	1.10	0.00	1.10				
18.00	1.04	0.00	1.04				
19.00	0.97	0.00	0.97				
20.00	0.91	0.00	0.91				
21.00	0.85	0.00	0.85				
22.00	0.82	0.00	0.82				
23.00	0.79	0.00	0.79				
24.00	0.76	0.00	0.76				
25.00	0.55	0.00	0.55				
26.00	0.53	0.00	0.53				
27.00	0.51	0.00	0.51				
28.00	0.49	0.00	0.49				
29.00	0.47	0.00	0.47				
30.00	0.45	0.00	0.45				
31.00	0.42	0.00	0.42				
32.00	0.40	0.00	0.40				
33.00	0.38	0.00	0.38				
34.00	0.36	0.00	0.36				
35.00	0.34	0.00	0.34				
36.00	0.33	0.00	0.33				
37.00	0.31	0.00	0.31				
38.00	0.29	0.00	0.29				
39.00	0.28	0.00	0.28				
40.00	0.27	0.00	0.27				
41.00	0.25	0.00	0.25				
42.00	0.24	0.00	0.24				
43.00	0.23	0.00	0.23				
44.00	0.22	0.00	0.22				
45.00	0.21	0.00	0.21				
46.00	0.20	0.00	0.20				
47.00	0.20	0.00	0.20				
48.00	0.17	0.00	0.17				
49.00	0.14	0.00	0.14				
50.00	0.13	0.00	0.13				
51.00	0.12	0.00	0.12				

21.011 Proposed

Type II 24-hr 50-Year Rainfall=4.52"

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Time span=0.00-60.00 hrs, dt=0.01 hrs, 6001 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: Front Area 1

Runoff Area=6.100 ac 54.10% Impervious Runoff Depth=3.41"
Flow Length=652' Tc=13.3 min CN=90 Runoff=27.50 cfs 1.736 af

Subcatchment 2S: Rear Area 1

Runoff Area=4.400 ac 61.36% Impervious Runoff Depth=3.52"
Flow Length=683' Tc=14.4 min CN=91 Runoff=19.58 cfs 1.290 af

Pond 1P: Bioretention Area 3

Peak Elev=576.17' Storage=10,953 cf Inflow=27.50 cfs 1.736 af
Primary=2.91 cfs 1.092 af Secondary=23.52 cfs 0.644 af Outflow=26.43 cfs 1.736 af

Pond 3P: Detention Basin (SMA #1)

Peak Elev=576.00' Storage=62,935 cf Inflow=42.93 cfs 1.933 af
Primary=0.72 cfs 1.504 af Secondary=1.25 cfs 0.131 af Outflow=1.97 cfs 1.635 af

Link 5L: Outflow (@ CB 54)

Inflow=3.48 cfs 2.596 af
Primary=3.48 cfs 2.596 af

Total Runoff Area = 10.500 ac Runoff Volume = 3.026 af Average Runoff Depth = 3.46"
42.86% Pervious = 4.500 ac 57.14% Impervious = 6.000 ac

21.011 Proposed

Type II 24-hr 50-Year Rainfall=4.52"

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Summary for Subcatchment 1S: Front Area 1

Runoff = 27.50 cfs @ 12.05 hrs, Volume= 1.736 af, Depth= 3.41"

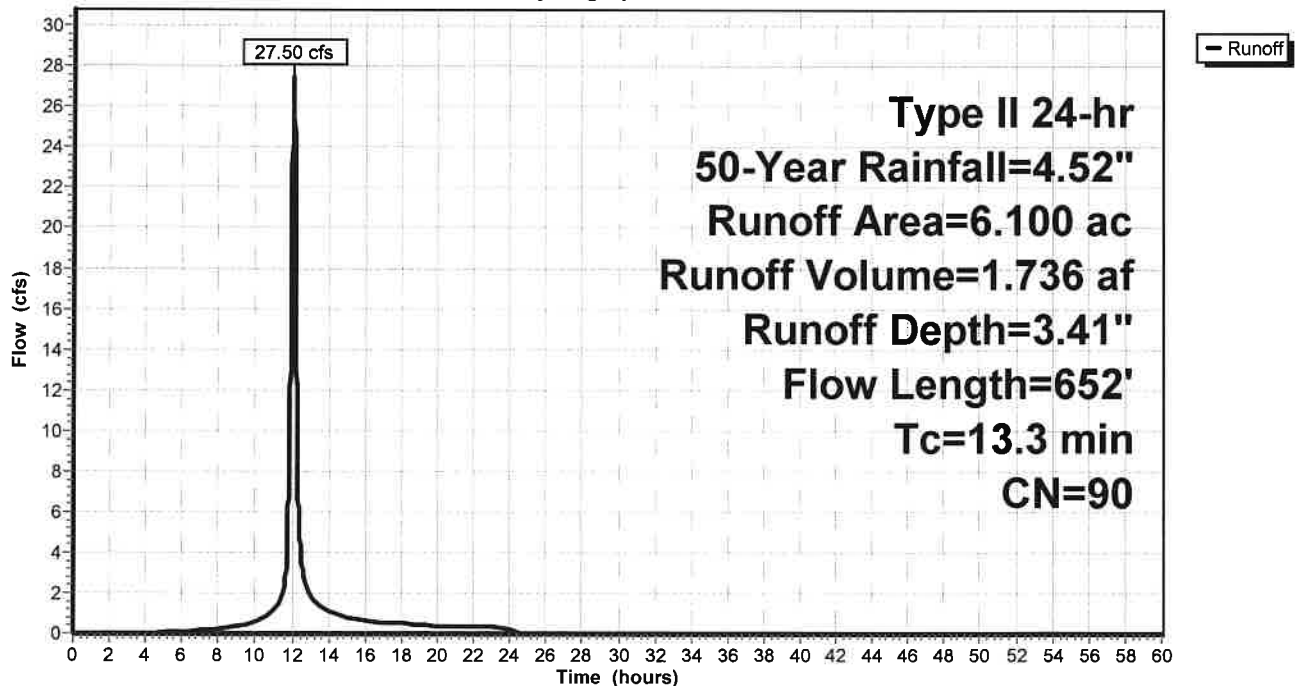
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
Type II 24-hr 50-Year Rainfall=4.52"

Area (ac)	CN	Description
1.800	98	Paved parking, HSG D
1.500	98	Roofs, HSG D
2.800	80	>75% Grass cover, Good, HSG D
6.100	90	Weighted Average
2.800		45.90% Pervious Area
3.300		54.10% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.6	37	0.0100	0.06		Sheet Flow, grass Grass: Dense n= 0.240 P2= 2.50"
0.4	15	0.0120	0.68		Sheet Flow, pavement Smooth surfaces n= 0.011 P2= 2.50"
3.3	600		3.00		Direct Entry, pipe flow
13.3	652	Total			

Subcatchment 1S: Front Area 1

Hydrograph



21.011 Proposed*Type II 24-hr 50-Year Rainfall=4.52"*

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Hydrograph for Subcatchment 1S: Front Area 1

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	52.00	4.52	3.41	0.00
1.00	0.05	0.00	0.00	53.00	4.52	3.41	0.00
2.00	0.10	0.00	0.00	54.00	4.52	3.41	0.00
3.00	0.16	0.00	0.00	55.00	4.52	3.41	0.00
4.00	0.22	0.00	0.00	56.00	4.52	3.41	0.00
5.00	0.28	0.00	0.04	57.00	4.52	3.41	0.00
6.00	0.36	0.02	0.09	58.00	4.52	3.41	0.00
7.00	0.45	0.04	0.16	59.00	4.52	3.41	0.00
8.00	0.54	0.07	0.23	60.00	4.52	3.41	0.00
9.00	0.66	0.13	0.39				
10.00	0.82	0.21	0.57				
11.00	1.06	0.36	1.16				
12.00	3.00	1.98	25.18				
13.00	3.49	2.44	1.87				
14.00	3.71	2.64	1.08				
15.00	3.86	2.78	0.83				
16.00	3.98	2.90	0.64				
17.00	4.08	2.99	0.55				
18.00	4.16	3.07	0.49				
19.00	4.24	3.15	0.42				
20.00	4.30	3.21	0.36				
21.00	4.36	3.26	0.33				
22.00	4.42	3.32	0.32				
23.00	4.47	3.37	0.31				
24.00	4.52	3.41	0.30				
25.00	4.52	3.41	0.00				
26.00	4.52	3.41	0.00				
27.00	4.52	3.41	0.00				
28.00	4.52	3.41	0.00				
29.00	4.52	3.41	0.00				
30.00	4.52	3.41	0.00				
31.00	4.52	3.41	0.00				
32.00	4.52	3.41	0.00				
33.00	4.52	3.41	0.00				
34.00	4.52	3.41	0.00				
35.00	4.52	3.41	0.00				
36.00	4.52	3.41	0.00				
37.00	4.52	3.41	0.00				
38.00	4.52	3.41	0.00				
39.00	4.52	3.41	0.00				
40.00	4.52	3.41	0.00				
41.00	4.52	3.41	0.00				
42.00	4.52	3.41	0.00				
43.00	4.52	3.41	0.00				
44.00	4.52	3.41	0.00				
45.00	4.52	3.41	0.00				
46.00	4.52	3.41	0.00				
47.00	4.52	3.41	0.00				
48.00	4.52	3.41	0.00				
49.00	4.52	3.41	0.00				
50.00	4.52	3.41	0.00				
51.00	4.52	3.41	0.00				

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Type II 24-hr 50-Year Rainfall=4.52"

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Summary for Subcatchment 2S: Rear Area 1

Runoff = 19.58 cfs @ 12.06 hrs, Volume= 1.290 af, Depth= 3.52"

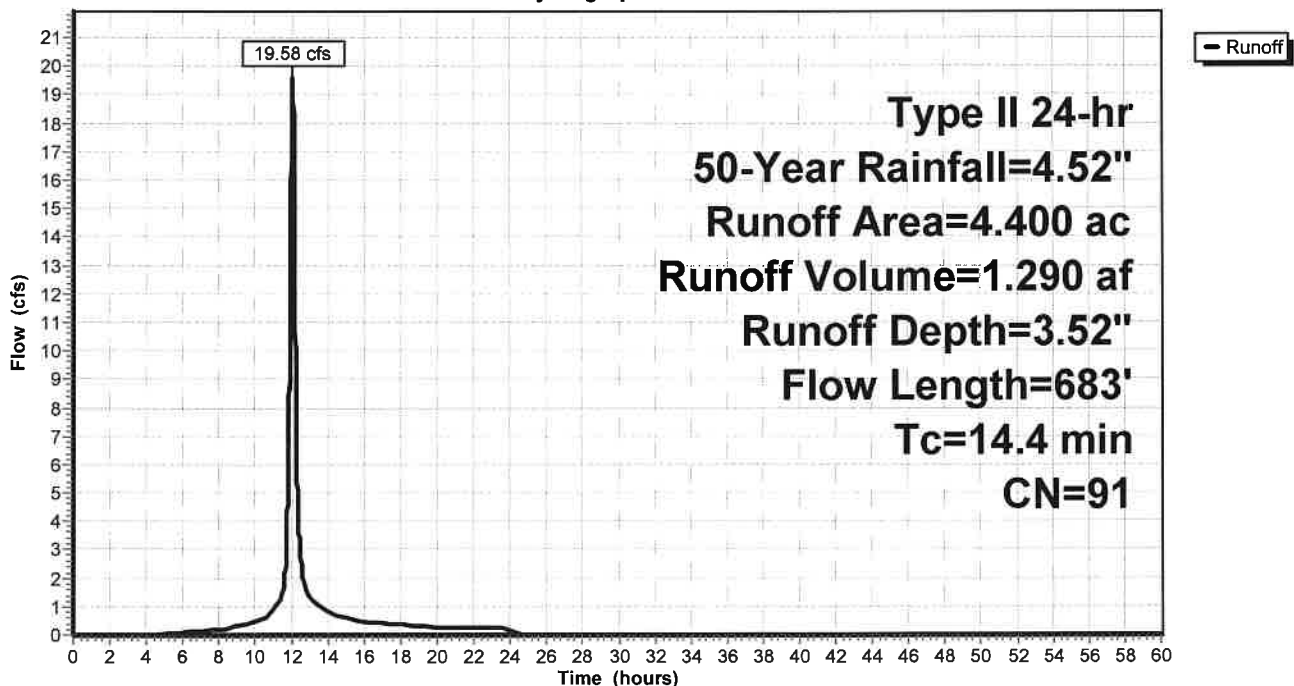
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
 Type II 24-hr 50-Year Rainfall=4.52"

Area (ac)	CN	Description
1.400	98	Paved parking, HSG D
1.300	98	Roofs, HSG D
1.700	80	>75% Grass cover, Good, HSG D
4.400	91	Weighted Average
1.700		38.64% Pervious Area
2.700		61.36% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.2	90	0.0200	0.15		Sheet Flow, grass Grass: Short n= 0.150 P2= 2.50"
1.3	75	0.0130	0.97		Sheet Flow, pavement Smooth surfaces n= 0.011 P2= 2.50"
2.9	518		3.00		Direct Entry, Pipe flow
14.4	683	Total			

Subcatchment 2S: Rear Area 1

Hydrograph



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Type II 24-hr 50-Year Rainfall=4.52"

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Hydrograph for Subcatchment 2S: Rear Area 1

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	52.00	4.52	3.52	0.00
1.00	0.05	0.00	0.00	53.00	4.52	3.52	0.00
2.00	0.10	0.00	0.00	54.00	4.52	3.52	0.00
3.00	0.16	0.00	0.00	55.00	4.52	3.52	0.00
4.00	0.22	0.00	0.00	56.00	4.52	3.52	0.00
5.00	0.28	0.01	0.04	57.00	4.52	3.52	0.00
6.00	0.36	0.02	0.08	58.00	4.52	3.52	0.00
7.00	0.45	0.05	0.13	59.00	4.52	3.52	0.00
8.00	0.54	0.09	0.19	60.00	4.52	3.52	0.00
9.00	0.66	0.15	0.31				
10.00	0.82	0.24	0.44				
11.00	1.06	0.40	0.88				
12.00	3.00	2.07	17.36				
13.00	3.49	2.53	1.38				
14.00	3.71	2.74	0.79				
15.00	3.86	2.88	0.60				
16.00	3.98	3.00	0.47				
17.00	4.08	3.09	0.40				
18.00	4.16	3.17	0.36				
19.00	4.24	3.25	0.31				
20.00	4.30	3.31	0.26				
21.00	4.36	3.36	0.24				
22.00	4.42	3.42	0.23				
23.00	4.47	3.47	0.22				
24.00	4.52	3.52	0.21				
25.00	4.52	3.52	0.00				
26.00	4.52	3.52	0.00				
27.00	4.52	3.52	0.00				
28.00	4.52	3.52	0.00				
29.00	4.52	3.52	0.00				
30.00	4.52	3.52	0.00				
31.00	4.52	3.52	0.00				
32.00	4.52	3.52	0.00				
33.00	4.52	3.52	0.00				
34.00	4.52	3.52	0.00				
35.00	4.52	3.52	0.00				
36.00	4.52	3.52	0.00				
37.00	4.52	3.52	0.00				
38.00	4.52	3.52	0.00				
39.00	4.52	3.52	0.00				
40.00	4.52	3.52	0.00				
41.00	4.52	3.52	0.00				
42.00	4.52	3.52	0.00				
43.00	4.52	3.52	0.00				
44.00	4.52	3.52	0.00				
45.00	4.52	3.52	0.00				
46.00	4.52	3.52	0.00				
47.00	4.52	3.52	0.00				
48.00	4.52	3.52	0.00				
49.00	4.52	3.52	0.00				
50.00	4.52	3.52	0.00				
51.00	4.52	3.52	0.00				

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Type II 24-hr 50-Year Rainfall=4.52"

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Summary for Pond 1P: Bioretention Area 3

Inflow Area = 6.100 ac, 54.10% Impervious, Inflow Depth = 3.41" for 50-Year event
 Inflow = 27.50 cfs @ 12.05 hrs, Volume= 1.736 af
 Outflow = 26.43 cfs @ 12.08 hrs, Volume= 1.736 af, Atten= 4%, Lag= 1.9 min
 Primary = 2.91 cfs @ 12.08 hrs, Volume= 1.092 af
 Secondary = 23.52 cfs @ 12.08 hrs, Volume= 0.644 af

Routing by Stor-Ind method, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
 Peak Elev= 576.17' @ 12.08 hrs Surf.Area= 10,144 sf Storage= 10,953 cf

Plug-Flow detention time= 109.3 min calculated for 1.736 af (100% of inflow)
 Center-of-Mass det. time= 109.3 min (907.1 - 797.8)

Volume	Invert	Avail.Storage	Storage Description
#1	575.00'	25,904 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
575.00	8,648	0	0
576.00	9,925	9,287	9,287
576.50	10,585	5,128	14,414
577.00	11,350	5,484	19,898
577.50	12,675	6,006	25,904

Device	Routing	Invert	Outlet Devices
#1	Primary	572.50'	8.0" Round 8" pipe L= 25.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 572.50' / 572.42' S= 0.0032 ' S= 0.0032 ' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.35 sf
#2	Device 1	575.50'	8.0" Horiz. Grate X 4.00 C= 0.600 Limited to weir flow at low heads
#3	Device 1	575.00'	0.250 in/hr Exfiltration over Surface area Conductivity to Groundwater Elevation = 560.00'
#4	Secondary	575.75'	30.0' long (Profile 1) Broad-Crested Rectangular Weir Head (feet) 0.49 0.98 1.48 Coef. (English) 2.92 3.37 3.59

Primary OutFlow Max=2.91 cfs @ 12.08 hrs HW=576.17' (Free Discharge)

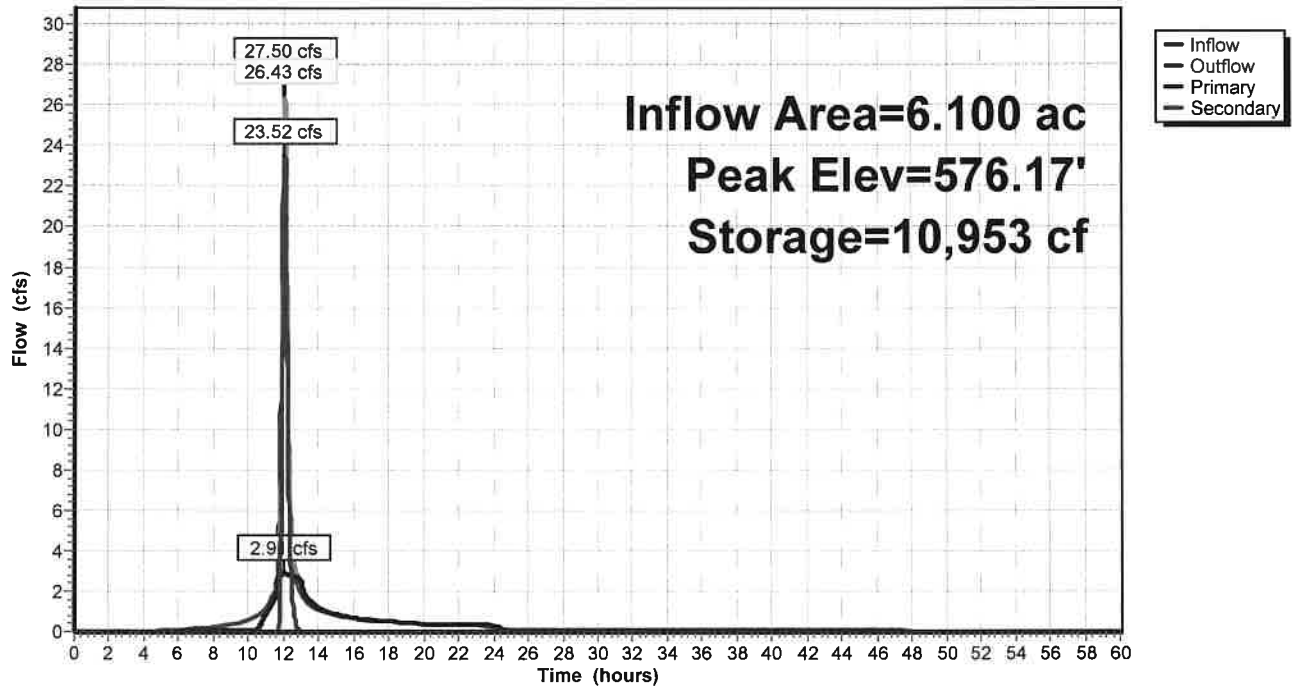
- ↑ 1=8" pipe (Barrel Controls 2.91 cfs @ 8.34 fps)
- ↑ 2=Grate (Passes < 5.49 cfs potential flow)
- ↑ 3=Exfiltration (Passes < 0.06 cfs potential flow)

Secondary OutFlow Max=23.50 cfs @ 12.08 hrs HW=576.17' (Free Discharge)

- ↑ 4=Broad-Crested Rectangular Weir (Weir Controls 23.50 cfs @ 1.88 fps)

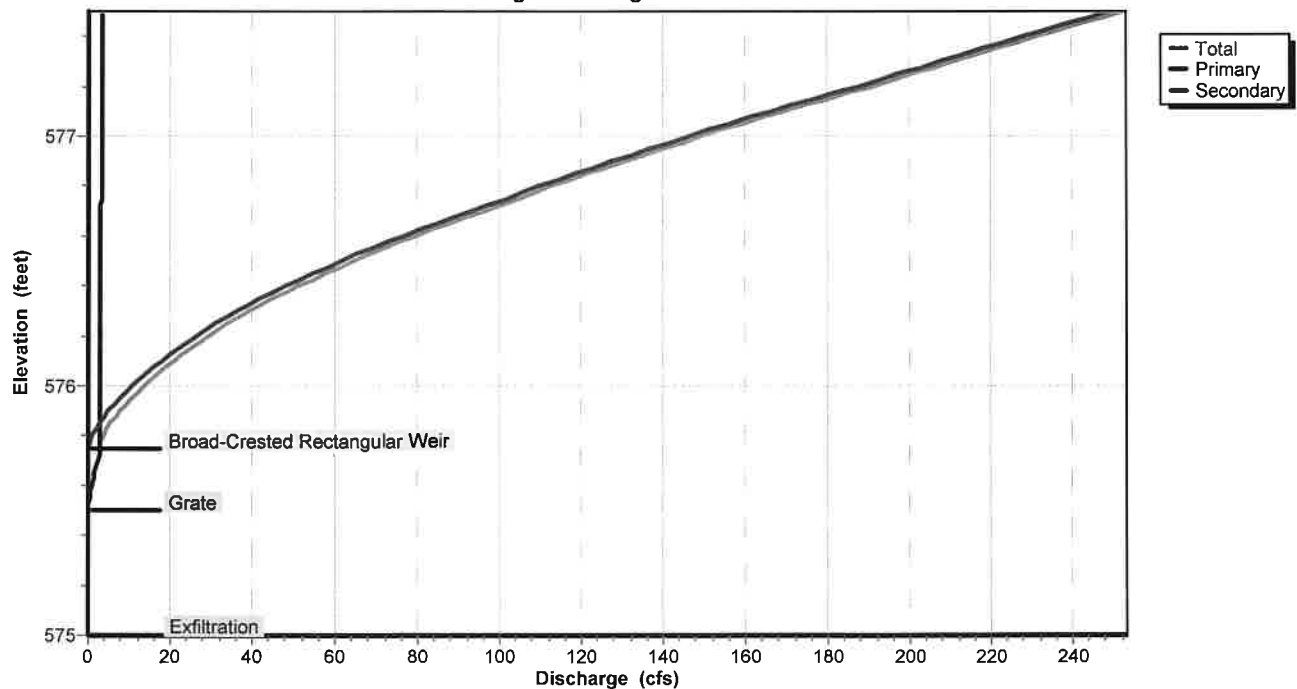
Pond 1P: Bioretention Area 3

Hydrograph

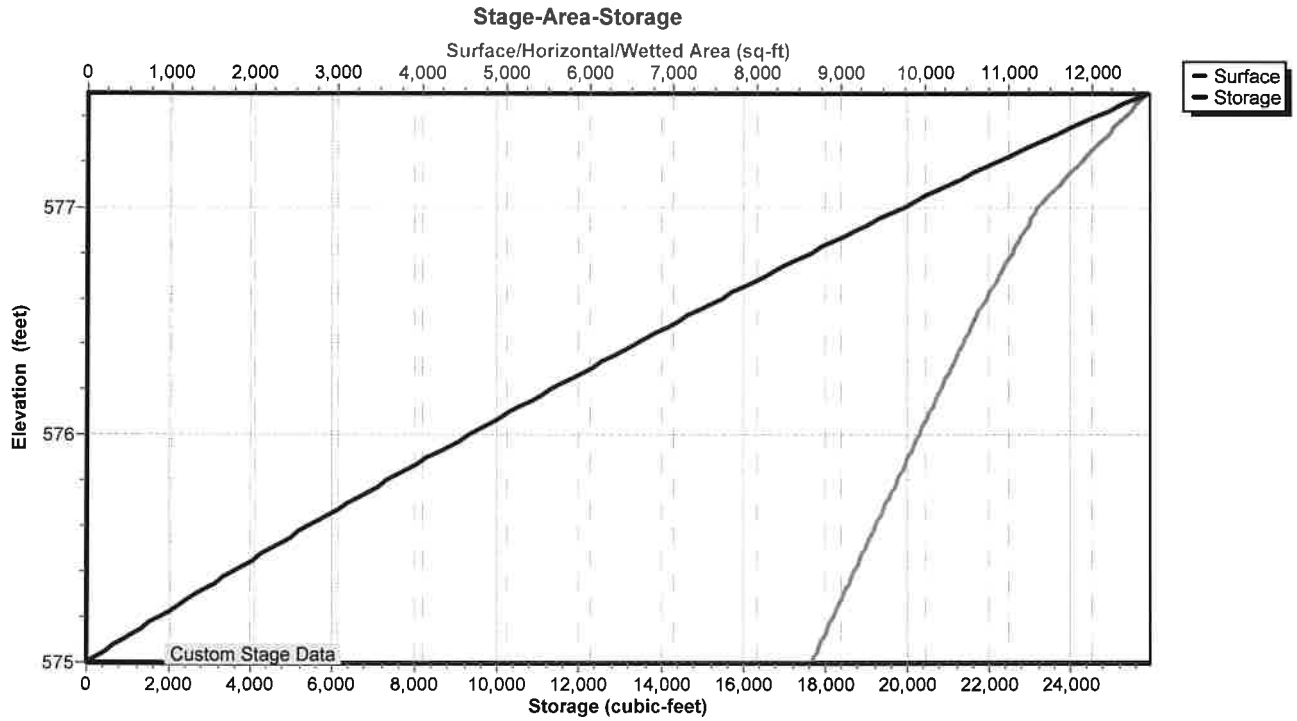


Pond 1P: Bioretention Area 3

Stage-Discharge



Pond 1P: Bioretention Area 3



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Type II 24-hr 50-Year Rainfall=4.52"

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Hydrograph for Pond 1P: Bioretention Area 3

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Primary (cfs)	Secondary (cfs)
0.00	0.00	0	575.00	0.00	0.00	0.00
2.00	0.00	0	575.00	0.00	0.00	0.00
4.00	0.00	0	575.00	0.00	0.00	0.00
6.00	0.09	180	575.02	0.04	0.04	0.00
8.00	0.23	959	575.11	0.05	0.05	0.00
10.00	0.57	3,333	575.38	0.05	0.05	0.00
12.00	25.18	10,302	576.10	21.15	2.88	18.27
14.00	1.08	5,594	575.62	1.18	1.18	0.00
16.00	0.64	5,233	575.58	0.68	0.68	0.00
18.00	0.49	5,081	575.56	0.51	0.51	0.00
20.00	0.36	4,961	575.55	0.38	0.38	0.00
22.00	0.32	4,907	575.55	0.33	0.33	0.00
24.00	0.30	4,876	575.54	0.30	0.30	0.00
26.00	0.00	4,297	575.48	0.06	0.06	0.00
28.00	0.00	3,900	575.44	0.05	0.05	0.00
30.00	0.00	3,508	575.39	0.05	0.05	0.00
32.00	0.00	3,118	575.35	0.05	0.05	0.00
34.00	0.00	2,732	575.31	0.05	0.05	0.00
36.00	0.00	2,350	575.27	0.05	0.05	0.00
38.00	0.00	1,970	575.22	0.05	0.05	0.00
40.00	0.00	1,594	575.18	0.05	0.05	0.00
42.00	0.00	1,221	575.14	0.05	0.05	0.00
44.00	0.00	852	575.10	0.05	0.05	0.00
46.00	0.00	486	575.06	0.05	0.05	0.00
48.00	0.00	140	575.02	0.03	0.03	0.00
50.00	0.00	26	575.00	0.01	0.01	0.00
52.00	0.00	5	575.00	0.00	0.00	0.00
54.00	0.00	1	575.00	0.00	0.00	0.00
56.00	0.00	0	575.00	0.00	0.00	0.00
58.00	0.00	0	575.00	0.00	0.00	0.00
60.00	0.00	0	575.00	0.00	0.00	0.00

21.011 Proposed*Type II 24-hr 50-Year Rainfall=4.52"*

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Stage-Discharge for Pond 1P: Bioretention Area 3

Elevation (feet)	Discharge (cfs)	Primary (cfs)	Secondary (cfs)
575.00	0.00	0.00	0.00
575.05	0.05	0.05	0.00
575.10	0.05	0.05	0.00
575.15	0.05	0.05	0.00
575.20	0.05	0.05	0.00
575.25	0.05	0.05	0.00
575.30	0.05	0.05	0.00
575.35	0.05	0.05	0.00
575.40	0.05	0.05	0.00
575.45	0.05	0.05	0.00
575.50	0.06	0.06	0.00
575.55	0.36	0.36	0.00
575.60	0.92	0.92	0.00
575.65	1.65	1.65	0.00
575.70	2.51	2.51	0.00
575.75	2.71	2.71	0.00
575.80	3.71	2.73	0.98
575.85	5.53	2.76	2.77
575.90	7.87	2.78	5.09
575.95	10.64	2.81	7.84
576.00	13.78	2.83	10.95
576.05	17.25	2.86	14.39
576.10	21.02	2.88	18.14
576.15	25.07	2.91	22.16
576.20	29.37	2.93	26.44
576.25	34.02	2.95	31.07
576.30	39.38	2.98	36.41
576.35	45.12	3.00	42.12
576.40	51.24	3.02	48.22
576.45	57.74	3.04	54.69
576.50	64.62	3.07	61.55
576.55	71.88	3.09	68.79
576.60	79.53	3.11	76.42
576.65	87.57	3.13	84.44
576.70	96.00	3.16	92.85
576.75	104.54	3.18	101.36
576.80	112.97	3.20	109.77
576.85	121.69	3.22	118.47
576.90	130.69	3.24	127.45
576.95	139.98	3.26	136.72
577.00	149.56	3.28	146.27
577.05	159.42	3.30	156.11
577.10	169.57	3.33	166.24
577.15	180.00	3.35	176.66
577.20	190.72	3.37	187.36
577.25	201.24	3.39	197.86
577.30	211.24	3.41	207.83
577.35	221.40	3.43	217.97
577.40	231.71	3.45	228.27
577.45	242.19	3.47	238.72
577.50	252.82	3.49	249.33

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Type II 24-hr 50-Year Rainfall=4.52"

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Stage-Area-Storage for Pond 1P: Bioretention Area 3

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
575.00	8,648	0
575.05	8,712	434
575.10	8,776	871
575.15	8,840	1,312
575.20	8,903	1,755
575.25	8,967	2,202
575.30	9,031	2,652
575.35	9,095	3,105
575.40	9,159	3,561
575.45	9,223	4,021
575.50	9,287	4,484
575.55	9,350	4,950
575.60	9,414	5,419
575.65	9,478	5,891
575.70	9,542	6,366
575.75	9,606	6,845
575.80	9,670	7,327
575.85	9,733	7,812
575.90	9,797	8,300
575.95	9,861	8,792
576.00	9,925	9,287
576.05	9,991	9,784
576.10	10,057	10,286
576.15	10,123	10,790
576.20	10,189	11,298
576.25	10,255	11,809
576.30	10,321	12,323
576.35	10,387	12,841
576.40	10,453	13,362
576.45	10,519	13,886
576.50	10,585	14,414
576.55	10,661	14,945
576.60	10,738	15,480
576.65	10,814	16,019
576.70	10,891	16,562
576.75	10,968	17,108
576.80	11,044	17,658
576.85	11,121	18,212
576.90	11,197	18,770
576.95	11,274	19,332
577.00	11,350	19,898
577.05	11,482	20,469
577.10	11,615	21,046
577.15	11,747	21,630
577.20	11,880	22,221
577.25	12,013	22,818
577.30	12,145	23,422
577.35	12,278	24,033
577.40	12,410	24,650
577.45	12,543	25,274
577.50	12,675	25,904

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Type II 24-hr 50-Year Rainfall=4.52"

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Summary for Pond 3P: Detention Basin (SMA #1)

Inflow Area = 4.400 ac, 61.36% Impervious, Inflow Depth = 5.27" for 50-Year event
 Inflow = 42.93 cfs @ 12.07 hrs, Volume= 1.933 af
 Outflow = 1.97 cfs @ 12.73 hrs, Volume= 1.635 af, Atten= 95%, Lag= 39.8 min
 Primary = 0.72 cfs @ 12.73 hrs, Volume= 1.504 af
 Secondary = 1.25 cfs @ 12.73 hrs, Volume= 0.131 af

Routing by Stor-Ind method, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
 Peak Elev= 576.00' @ 12.73 hrs Surf.Area= 66,838 sf Storage= 62,935 cf

Plug-Flow detention time= 900.4 min calculated for 1.635 af (85% of inflow)
 Center-of-Mass det. time= 844.0 min (1,616.3 - 772.2)

Volume	Invert	Avail.Storage	Storage Description
#1	575.00'	118,224 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
575.00	59,213	0	0
576.00	66,849	63,031	63,031
576.80	71,134	55,193	118,224

Device	Routing	Invert	Outlet Devices
#1	Primary	574.00'	12.0" Round 12" outlet pipe L= 160.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 574.00' / 573.79' S= 0.0013 /' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Device 1	575.00'	6.0" Round low flow outlet pipe L= 10.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 575.00' / 574.95' S= 0.0050 /' Cc= 0.900 n= 0.010 Corrugated PE, smooth interior, Flow Area= 0.20 sf
#3	Device 1	576.50'	30.0" x 30.0" Horiz. Grate C= 0.600 Limited to weir flow at low heads
#4	Secondary	575.95'	20.0' long (Profile 1) Broad-Crested Rectangular Weir X 2.00 Head (feet) 0.49 0.98 1.48 Coef. (English) 2.92 3.37 3.59

Primary OutFlow Max=0.72 cfs @ 12.73 hrs HW=576.00' (Free Discharge)

- 1=12" outlet pipe (Passes 0.72 cfs of 2.71 cfs potential flow)
- 2=low flow outlet pipe (Inlet Controls 0.72 cfs @ 3.68 fps)
- 3=Grate (Controls 0.00 cfs)

Secondary OutFlow Max=1.25 cfs @ 12.73 hrs HW=576.00' (Free Discharge)

- 4=Broad-Crested Rectangular Weir (Weir Controls 1.25 cfs @ 0.64 fps)

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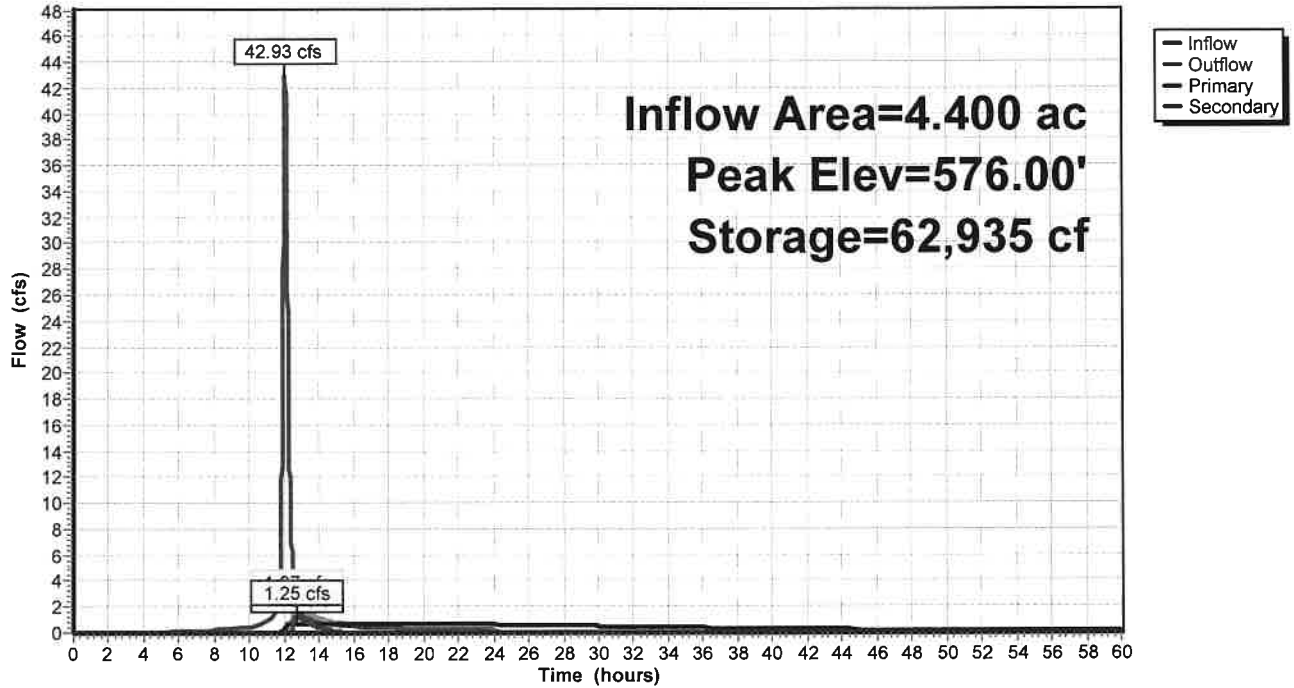
Type II 24-hr 50-Year Rainfall=4.52"

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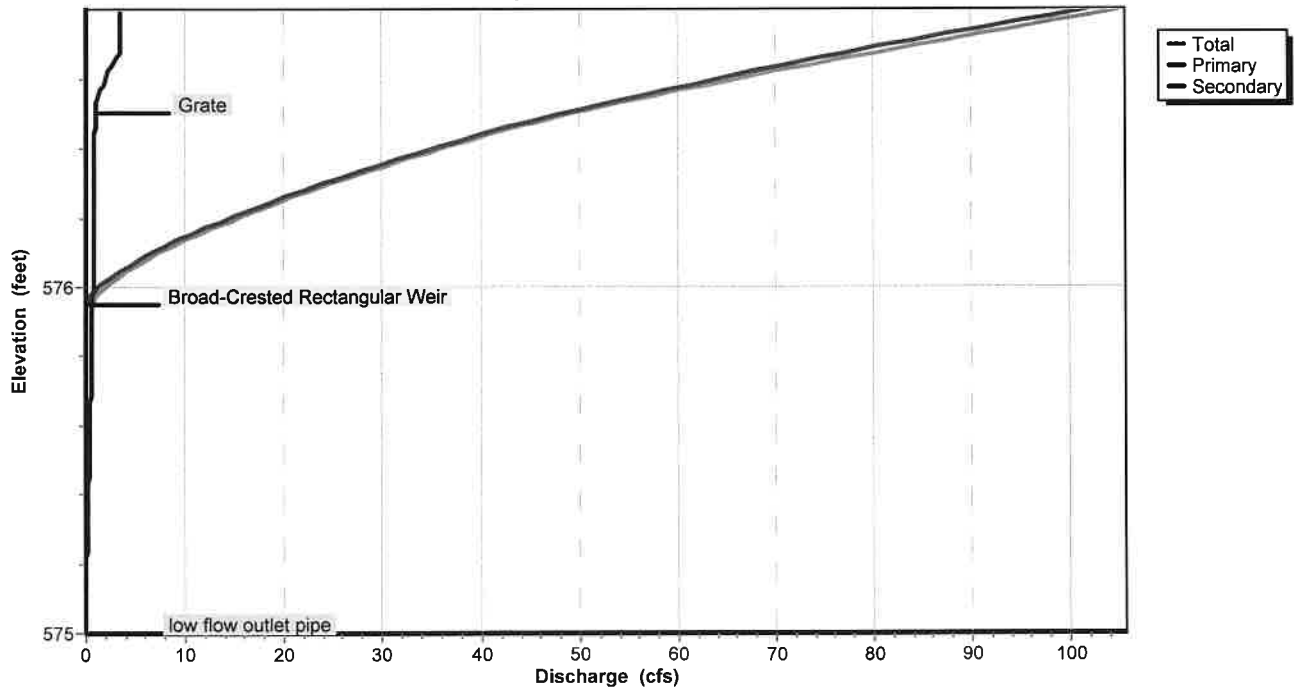
Pond 3P: Detention Basin (SMA #1)

Hydrograph

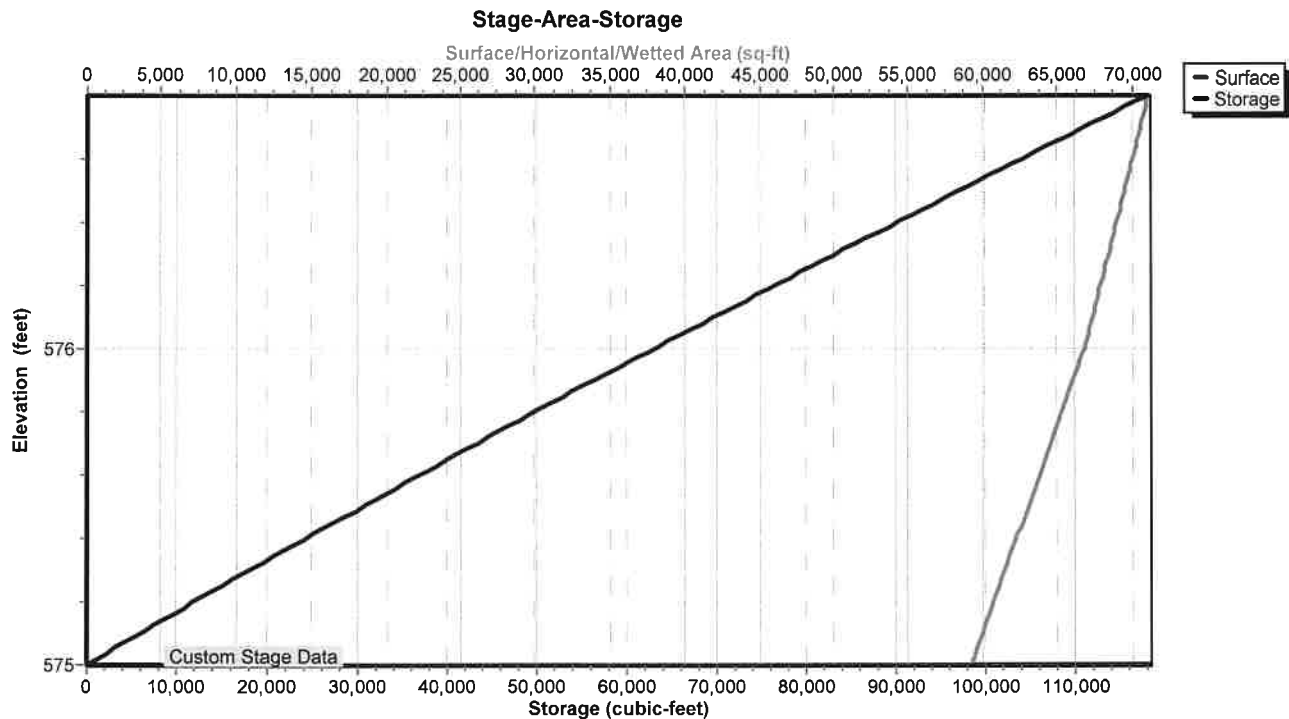


Pond 3P: Detention Basin (SMA #1)

Stage-Discharge



Pond 3P: Detention Basin (SMA #1)



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Hydrograph for Pond 3P: Detention Basin (SMA #1)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Primary (cfs)	Secondary (cfs)
0.00	0.00	0	575.00	0.00	0.00	0.00
2.00	0.00	0	575.00	0.00	0.00	0.00
4.00	0.00	1	575.00	0.00	0.00	0.00
6.00	0.08	300	575.01	0.00	0.00	0.00
8.00	0.19	1,265	575.02	0.00	0.00	0.00
10.00	0.44	3,420	575.06	0.01	0.01	0.00
12.00	35.63	24,163	575.40	0.26	0.26	0.00
14.00	0.79	61,204	575.97	1.11	0.71	0.40
16.00	0.47	59,536	575.95	0.70	0.70	0.00
18.00	0.36	57,495	575.92	0.68	0.68	0.00
20.00	0.26	54,889	575.88	0.66	0.66	0.00
22.00	0.23	51,975	575.83	0.64	0.64	0.00
24.00	0.21	49,094	575.79	0.61	0.61	0.00
26.00	0.00	45,010	575.73	0.56	0.56	0.00
28.00	0.00	41,189	575.67	0.50	0.50	0.00
30.00	0.00	37,665	575.61	0.47	0.47	0.00
32.00	0.00	34,410	575.56	0.43	0.43	0.00
34.00	0.00	31,481	575.51	0.38	0.38	0.00
36.00	0.00	28,873	575.47	0.34	0.34	0.00
38.00	0.00	26,562	575.44	0.30	0.30	0.00
40.00	0.00	24,517	575.40	0.27	0.27	0.00
42.00	0.00	22,705	575.37	0.24	0.24	0.00
44.00	0.00	21,097	575.35	0.21	0.21	0.00
46.00	0.00	19,666	575.33	0.19	0.19	0.00
48.00	0.00	18,389	575.30	0.17	0.17	0.00
50.00	0.00	17,245	575.29	0.15	0.15	0.00
52.00	0.00	16,216	575.27	0.14	0.14	0.00
54.00	0.00	15,288	575.25	0.12	0.12	0.00
56.00	0.00	14,449	575.24	0.11	0.11	0.00
58.00	0.00	13,686	575.23	0.10	0.10	0.00
60.00	0.00	12,992	575.22	0.09	0.09	0.00

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Type II 24-hr 50-Year Rainfall=4.52"

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Stage-Discharge for Pond 3P: Detention Basin (SMA #1)

Elevation (feet)	Discharge (cfs)	Primary (cfs)	Secondary (cfs)	Elevation (feet)	Discharge (cfs)	Primary (cfs)	Secondary (cfs)
575.00	0.00	0.00	0.00	576.04	3.90	0.74	3.15
575.02	0.00	0.00	0.00	576.06	5.01	0.75	4.26
575.04	0.00	0.00	0.00	576.08	6.23	0.76	5.47
575.06	0.01	0.01	0.00	576.10	7.55	0.77	6.79
575.08	0.01	0.01	0.00	576.12	8.96	0.78	8.19
575.10	0.02	0.02	0.00	576.14	10.46	0.79	9.67
575.12	0.03	0.03	0.00	576.16	12.04	0.80	11.24
575.14	0.04	0.04	0.00	576.18	13.69	0.80	12.88
575.16	0.05	0.05	0.00	576.20	15.41	0.81	14.60
575.18	0.07	0.07	0.00	576.22	17.21	0.82	16.39
575.20	0.08	0.08	0.00	576.24	19.07	0.83	18.24
575.22	0.09	0.09	0.00	576.26	21.00	0.84	20.16
575.24	0.11	0.11	0.00	576.28	22.99	0.85	22.14
575.26	0.13	0.13	0.00	576.30	25.04	0.85	24.18
575.28	0.15	0.15	0.00	576.32	27.15	0.86	26.29
575.30	0.16	0.16	0.00	576.34	29.32	0.87	28.45
575.32	0.18	0.18	0.00	576.36	31.54	0.88	30.66
575.34	0.20	0.20	0.00	576.38	33.82	0.89	32.93
575.36	0.22	0.22	0.00	576.40	36.15	0.89	35.26
575.38	0.24	0.24	0.00	576.42	38.54	0.90	37.63
575.40	0.26	0.26	0.00	576.44	40.97	0.91	40.06
575.42	0.28	0.28	0.00	576.46	43.73	0.92	42.81
575.44	0.31	0.31	0.00	576.48	46.56	0.93	45.63
575.46	0.33	0.33	0.00	576.50	49.47	0.93	48.54
575.48	0.35	0.35	0.00	576.52	52.56	1.03	51.53
575.50	0.37	0.37	0.00	576.54	55.81	1.21	54.60
575.52	0.39	0.39	0.00	576.56	59.18	1.44	57.75
575.54	0.41	0.41	0.00	576.58	62.68	1.70	60.98
575.56	0.43	0.43	0.00	576.60	66.29	2.00	64.29
575.58	0.45	0.45	0.00	576.62	70.02	2.34	67.68
575.60	0.46	0.46	0.00	576.64	73.85	2.70	71.16
575.62	0.48	0.48	0.00	576.66	77.79	3.08	74.71
575.64	0.49	0.49	0.00	576.68	81.74	3.39	78.35
575.66	0.50	0.50	0.00	576.70	85.48	3.41	82.07
575.68	0.51	0.51	0.00	576.72	89.30	3.43	85.87
575.70	0.54	0.54	0.00	576.74	93.20	3.45	89.75
575.72	0.56	0.56	0.00	576.76	97.18	3.46	93.72
575.74	0.58	0.58	0.00	576.78	101.25	3.48	97.76
575.76	0.60	0.60	0.00	576.80	105.39	3.50	101.90
575.78	0.61	0.61	0.00				
575.80	0.62	0.62	0.00				
575.82	0.63	0.63	0.00				
575.84	0.64	0.64	0.00				
575.86	0.65	0.65	0.00				
575.88	0.66	0.66	0.00				
575.90	0.67	0.67	0.00				
575.92	0.68	0.68	0.00				
575.94	0.69	0.69	0.00				
575.96	0.82	0.70	0.12				
575.98	1.32	0.71	0.61				
576.00	2.03	0.72	1.31				
576.02	2.90	0.73	2.16				

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Type II 24-hr 50-Year Rainfall=4.52"

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Stage-Area-Storage for Pond 3P: Detention Basin (SMA #1)

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
575.00	59,213	0	576.04	67,063	65,709
575.02	59,366	1,186	576.06	67,170	67,052
575.04	59,518	2,375	576.08	67,278	68,396
575.06	59,671	3,567	576.10	67,385	69,743
575.08	59,824	4,761	576.12	67,492	71,091
575.10	59,977	5,959	576.14	67,599	72,442
575.12	60,129	7,161	576.16	67,706	73,795
575.14	60,282	8,365	576.18	67,813	75,151
575.16	60,435	9,572	576.20	67,920	76,508
575.18	60,587	10,782	576.22	68,027	77,867
575.20	60,740	11,995	576.24	68,135	79,229
575.22	60,893	13,212	576.26	68,242	80,593
575.24	61,046	14,431	576.28	68,349	81,959
575.26	61,198	15,653	576.30	68,456	83,327
575.28	61,351	16,879	576.32	68,563	84,697
575.30	61,504	18,108	576.34	68,670	86,069
575.32	61,657	19,339	576.36	68,777	87,444
575.34	61,809	20,574	576.38	68,884	88,820
575.36	61,962	21,811	576.40	68,992	90,199
575.38	62,115	23,052	576.42	69,099	91,580
575.40	62,267	24,296	576.44	69,206	92,963
575.42	62,420	25,543	576.46	69,313	94,348
575.44	62,573	26,793	576.48	69,420	95,736
575.46	62,726	28,046	576.50	69,527	97,125
575.48	62,878	29,302	576.52	69,634	98,517
575.50	63,031	30,561	576.54	69,741	99,910
575.52	63,184	31,823	576.56	69,848	101,306
575.54	63,336	33,088	576.58	69,956	102,704
575.56	63,489	34,357	576.60	70,063	104,105
575.58	63,642	35,628	576.62	70,170	105,507
575.60	63,795	36,902	576.64	70,277	106,911
575.62	63,947	38,180	576.66	70,384	108,318
575.64	64,100	39,460	576.68	70,491	109,727
575.66	64,253	40,744	576.70	70,598	111,138
575.68	64,405	42,030	576.72	70,706	112,551
575.70	64,558	43,320	576.74	70,813	113,966
575.72	64,711	44,613	576.76	70,920	115,383
575.74	64,864	45,908	576.78	71,027	116,803
575.76	65,016	47,207	576.80	71,134	118,224
575.78	65,169	48,509			
575.80	65,322	49,814			
575.82	65,475	51,122			
575.84	65,627	52,433			
575.86	65,780	53,747			
575.88	65,933	55,064			
575.90	66,085	56,384			
575.92	66,238	57,708			
575.94	66,391	59,034			
575.96	66,544	60,363			
575.98	66,696	61,696			
576.00	66,849	63,031			
576.02	66,956	64,369			

21.011 Proposed

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Type II 24-hr 50-Year Rainfall=4.52"

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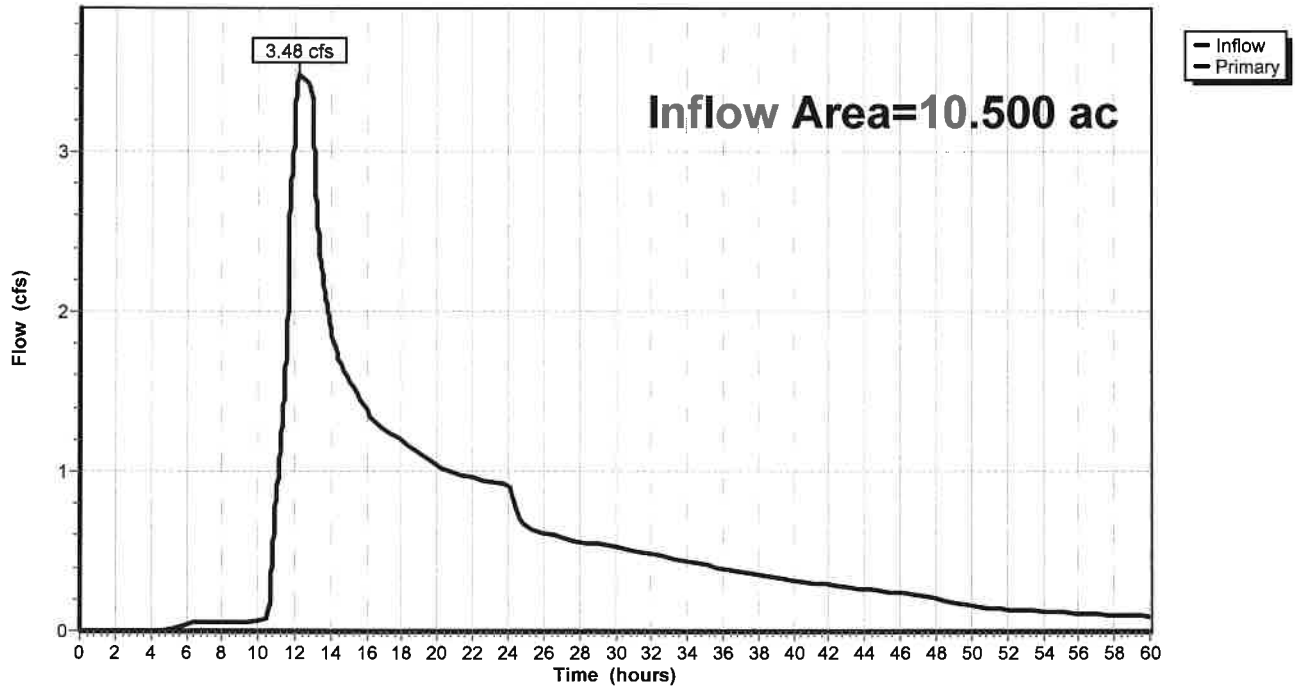
Summary for Link 5L: Outflow (@ CB 54)

Inflow Area = 10.500 ac, 57.14% Impervious, Inflow Depth > 2.97" for 50-Year event
Inflow = 3.48 cfs @ 12.21 hrs, Volume= 2.596 af
Primary = 3.48 cfs @ 12.21 hrs, Volume= 2.596 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs

Link 5L: Outflow (@ CB 54)

Hydrograph



21.011 Proposed

Type II 24-hr 50-Year Rainfall=4.52"

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Hydrograph for Link 5L: Outflow (@ CB 54)

Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)	Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
0.00	0.00	0.00	0.00	52.00	0.14	0.00	0.14
1.00	0.00	0.00	0.00	53.00	0.13	0.00	0.13
2.00	0.00	0.00	0.00	54.00	0.12	0.00	0.12
3.00	0.00	0.00	0.00	55.00	0.12	0.00	0.12
4.00	0.00	0.00	0.00	56.00	0.11	0.00	0.11
5.00	0.01	0.00	0.01	57.00	0.11	0.00	0.11
6.00	0.04	0.00	0.04	58.00	0.10	0.00	0.10
7.00	0.05	0.00	0.05	59.00	0.10	0.00	0.10
8.00	0.05	0.00	0.05	60.00	0.09	0.00	0.09
9.00	0.06	0.00	0.06				
10.00	0.06	0.00	0.06				
11.00	0.88	0.00	0.88				
12.00	3.14	0.00	3.14				
13.00	3.25	0.00	3.25				
14.00	1.89	0.00	1.89				
15.00	1.57	0.00	1.57				
16.00	1.38	0.00	1.38				
17.00	1.26	0.00	1.26				
18.00	1.19	0.00	1.19				
19.00	1.11	0.00	1.11				
20.00	1.04	0.00	1.04				
21.00	0.99	0.00	0.99				
22.00	0.96	0.00	0.96				
23.00	0.94	0.00	0.94				
24.00	0.91	0.00	0.91				
25.00	0.65	0.00	0.65				
26.00	0.62	0.00	0.62				
27.00	0.59	0.00	0.59				
28.00	0.56	0.00	0.56				
29.00	0.55	0.00	0.55				
30.00	0.53	0.00	0.53				
31.00	0.51	0.00	0.51				
32.00	0.48	0.00	0.48				
33.00	0.46	0.00	0.46				
34.00	0.44	0.00	0.44				
35.00	0.42	0.00	0.42				
36.00	0.39	0.00	0.39				
37.00	0.37	0.00	0.37				
38.00	0.35	0.00	0.35				
39.00	0.34	0.00	0.34				
40.00	0.32	0.00	0.32				
41.00	0.30	0.00	0.30				
42.00	0.29	0.00	0.29				
43.00	0.27	0.00	0.27				
44.00	0.26	0.00	0.26				
45.00	0.25	0.00	0.25				
46.00	0.24	0.00	0.24				
47.00	0.23	0.00	0.23				
48.00	0.20	0.00	0.20				
49.00	0.17	0.00	0.17				
50.00	0.16	0.00	0.16				
51.00	0.15	0.00	0.15				

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Type II 24-hr 100-Year Rainfall=5.28"

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Time span=0.00-60.00 hrs, dt=0.01 hrs, 6001 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: Front Area 1

Runoff Area=6.100 ac 54.10% Impervious Runoff Depth=4.15"
Flow Length=652' Tc=13.3 min CN=90 Runoff=33.05 cfs 2.108 af

Subcatchment 2S: Rear Area 1

Runoff Area=4.400 ac 61.36% Impervious Runoff Depth=4.25"
Flow Length=683' Tc=14.4 min CN=91 Runoff=23.44 cfs 1.560 af

Pond 1P: Bioretention Area 3

Peak Elev=576.23' Storage=11,585 cf Inflow=33.05 cfs 2.108 af
Primary=2.94 cfs 1.275 af Secondary=28.98 cfs 0.833 af Outflow=31.92 cfs 2.108 af

Pond 3P: Detention Basin (SMA #1)

Peak Elev=576.11' Storage=70,722 cf Inflow=52.24 cfs 2.392 af
Primary=0.78 cfs 1.554 af Secondary=7.80 cfs 0.534 af Outflow=8.57 cfs 2.088 af

Link 5L: Outflow (@ CB 54)

Inflow=3.60 cfs 2.829 af
Primary=3.60 cfs 2.829 af

Total Runoff Area = 10.500 ac Runoff Volume = 3.668 af Average Runoff Depth = 4.19"
42.86% Pervious = 4.500 ac 57.14% Impervious = 6.000 ac

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Type II 24-hr 100-Year Rainfall=5.28"

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Summary for Subcatchment 1S: Front Area 1

Runoff = 33.05 cfs @ 12.05 hrs, Volume= 2.108 af, Depth= 4.15"

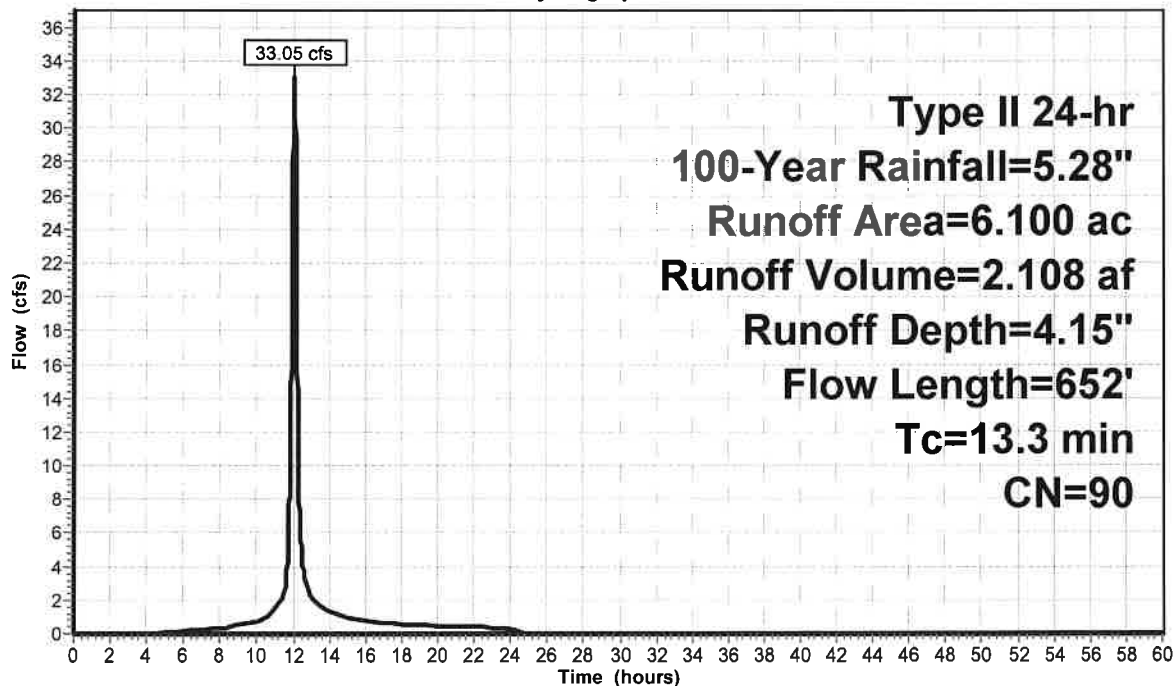
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
Type II 24-hr 100-Year Rainfall=5.28"

Area (ac)	CN	Description
1.800	98	Paved parking, HSG D
1.500	98	Roofs, HSG D
2.800	80	>75% Grass cover, Good, HSG D
6.100	90	Weighted Average
2.800		45.90% Pervious Area
3.300		54.10% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.6	37	0.0100	0.06		Sheet Flow, grass Grass: Dense n= 0.240 P2= 2.50"
0.4	15	0.0120	0.68		Sheet Flow, pavement Smooth surfaces n= 0.011 P2= 2.50"
3.3	600		3.00		Direct Entry, pipe flow
13.3	652	Total			

Subcatchment 1S: Front Area 1

Hydrograph



21.011 Proposed*Type II 24-hr 100-Year Rainfall=5.28"*

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Hydrograph for Subcatchment 1S: Front Area 1

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	52.00	5.28	4.15	0.00
1.00	0.06	0.00	0.00	53.00	5.28	4.15	0.00
2.00	0.12	0.00	0.00	54.00	5.28	4.15	0.00
3.00	0.18	0.00	0.00	55.00	5.28	4.15	0.00
4.00	0.25	0.00	0.01	56.00	5.28	4.15	0.00
5.00	0.33	0.01	0.08	57.00	5.28	4.15	0.00
6.00	0.42	0.03	0.15	58.00	5.28	4.15	0.00
7.00	0.52	0.06	0.23	59.00	5.28	4.15	0.00
8.00	0.63	0.11	0.32	60.00	5.28	4.15	0.00
9.00	0.78	0.18	0.52				
10.00	0.96	0.29	0.74				
11.00	1.24	0.49	1.47				
12.00	3.50	2.45	30.36				
13.00	4.08	2.99	2.21				
14.00	4.33	3.23	1.27				
15.00	4.51	3.40	0.98				
16.00	4.65	3.54	0.76				
17.00	4.76	3.65	0.66				
18.00	4.86	3.74	0.58				
19.00	4.95	3.83	0.50				
20.00	5.03	3.90	0.42				
21.00	5.09	3.97	0.40				
22.00	5.16	4.03	0.38				
23.00	5.22	4.09	0.36				
24.00	5.28	4.15	0.35				
25.00	5.28	4.15	0.00				
26.00	5.28	4.15	0.00				
27.00	5.28	4.15	0.00				
28.00	5.28	4.15	0.00				
29.00	5.28	4.15	0.00				
30.00	5.28	4.15	0.00				
31.00	5.28	4.15	0.00				
32.00	5.28	4.15	0.00				
33.00	5.28	4.15	0.00				
34.00	5.28	4.15	0.00				
35.00	5.28	4.15	0.00				
36.00	5.28	4.15	0.00				
37.00	5.28	4.15	0.00				
38.00	5.28	4.15	0.00				
39.00	5.28	4.15	0.00				
40.00	5.28	4.15	0.00				
41.00	5.28	4.15	0.00				
42.00	5.28	4.15	0.00				
43.00	5.28	4.15	0.00				
44.00	5.28	4.15	0.00				
45.00	5.28	4.15	0.00				
46.00	5.28	4.15	0.00				
47.00	5.28	4.15	0.00				
48.00	5.28	4.15	0.00				
49.00	5.28	4.15	0.00				
50.00	5.28	4.15	0.00				
51.00	5.28	4.15	0.00				

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Type II 24-hr 100-Year Rainfall=5.28"

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Summary for Subcatchment 2S: Rear Area 1

Runoff = 23.44 cfs @ 12.06 hrs, Volume= 1.560 af, Depth= 4.25"

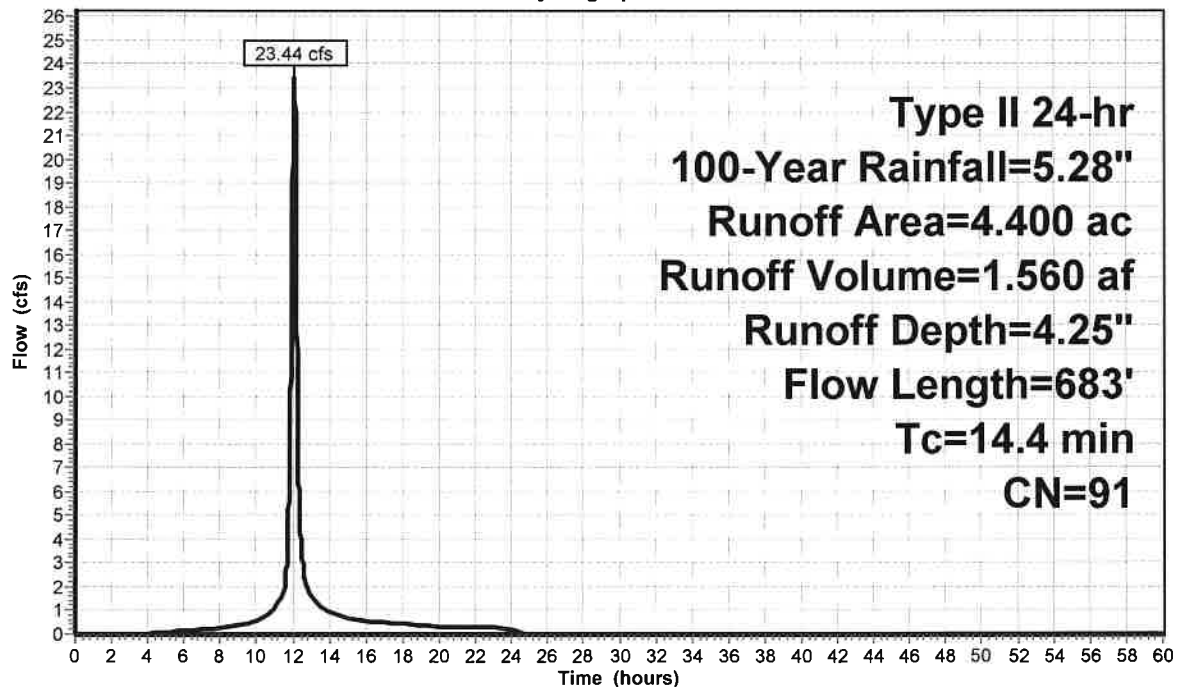
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
Type II 24-hr 100-Year Rainfall=5.28"

Area (ac)	CN	Description
1.400	98	Paved parking, HSG D
1.300	98	Roofs, HSG D
1.700	80	>75% Grass cover, Good, HSG D
4.400	91	Weighted Average
1.700		38.64% Pervious Area
2.700		61.36% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.2	90	0.0200	0.15		Sheet Flow, grass Grass: Short n= 0.150 P2= 2.50"
1.3	75	0.0130	0.97		Sheet Flow, pavement Smooth surfaces n= 0.011 P2= 2.50"
2.9	518		3.00		Direct Entry, Pipe flow
14.4	683	Total			

Subcatchment 2S: Rear Area 1

Hydrograph



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Type II 24-hr 100-Year Rainfall=5.28"

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Hydrograph for Subcatchment 2S: Rear Area 1

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	52.00	5.28	4.25	0.00
1.00	0.06	0.00	0.00	53.00	5.28	4.25	0.00
2.00	0.12	0.00	0.00	54.00	5.28	4.25	0.00
3.00	0.18	0.00	0.00	55.00	5.28	4.25	0.00
4.00	0.25	0.00	0.02	56.00	5.28	4.25	0.00
5.00	0.33	0.02	0.07	57.00	5.28	4.25	0.00
6.00	0.42	0.04	0.13	58.00	5.28	4.25	0.00
7.00	0.52	0.08	0.19	59.00	5.28	4.25	0.00
8.00	0.63	0.13	0.25	60.00	5.28	4.25	0.00
9.00	0.78	0.21	0.41				
10.00	0.96	0.33	0.57				
11.00	1.24	0.54	1.10				
12.00	3.50	2.54	20.85				
13.00	4.08	3.09	1.64				
14.00	4.33	3.33	0.94				
15.00	4.51	3.50	0.71				
16.00	4.65	3.64	0.56				
17.00	4.76	3.75	0.48				
18.00	4.86	3.85	0.42				
19.00	4.95	3.93	0.36				
20.00	5.03	4.01	0.31				
21.00	5.09	4.07	0.29				
22.00	5.16	4.14	0.28				
23.00	5.22	4.20	0.26				
24.00	5.28	4.25	0.25				
25.00	5.28	4.25	0.00				
26.00	5.28	4.25	0.00				
27.00	5.28	4.25	0.00				
28.00	5.28	4.25	0.00				
29.00	5.28	4.25	0.00				
30.00	5.28	4.25	0.00				
31.00	5.28	4.25	0.00				
32.00	5.28	4.25	0.00				
33.00	5.28	4.25	0.00				
34.00	5.28	4.25	0.00				
35.00	5.28	4.25	0.00				
36.00	5.28	4.25	0.00				
37.00	5.28	4.25	0.00				
38.00	5.28	4.25	0.00				
39.00	5.28	4.25	0.00				
40.00	5.28	4.25	0.00				
41.00	5.28	4.25	0.00				
42.00	5.28	4.25	0.00				
43.00	5.28	4.25	0.00				
44.00	5.28	4.25	0.00				
45.00	5.28	4.25	0.00				
46.00	5.28	4.25	0.00				
47.00	5.28	4.25	0.00				
48.00	5.28	4.25	0.00				
49.00	5.28	4.25	0.00				
50.00	5.28	4.25	0.00				
51.00	5.28	4.25	0.00				

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Type II 24-hr 100-Year Rainfall=5.28"

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Summary for Pond 1P: Bioretention Area 3

Inflow Area = 6.100 ac, 54.10% Impervious, Inflow Depth = 4.15" for 100-Year event
 Inflow = 33.05 cfs @ 12.05 hrs, Volume= 2.108 af
 Outflow = 31.92 cfs @ 12.08 hrs, Volume= 2.108 af, Atten= 3%, Lag= 1.8 min
 Primary = 2.94 cfs @ 12.08 hrs, Volume= 1.275 af
 Secondary = 28.98 cfs @ 12.08 hrs, Volume= 0.833 af

Routing by Stor-Ind method, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
 Peak Elev= 576.23' @ 12.08 hrs Surf.Area= 10,226 sf Storage= 11,585 cf

Plug-Flow detention time= 93.7 min calculated for 2.108 af (100% of inflow)
 Center-of-Mass det. time= 93.9 min (886.3 - 792.4)

Volume	Invert	Avail.Storage	Storage Description
#1	575.00'	25,904 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
575.00	8,648	0	0
576.00	9,925	9,287	9,287
576.50	10,585	5,128	14,414
577.00	11,350	5,484	19,898
577.50	12,675	6,006	25,904

Device	Routing	Invert	Outlet Devices
#1	Primary	572.50'	8.0" Round 8" pipe L= 25.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 572.50' / 572.42' S= 0.0032 1' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.35 sf
#2	Device 1	575.50'	8.0" Horiz. Grate X 4.00 C= 0.600 Limited to weir flow at low heads
#3	Device 1	575.00'	0.250 in/hr Exfiltration over Surface area Conductivity to Groundwater Elevation = 560.00'
#4	Secondary	575.75'	30.0' long (Profile 1) Broad-Crested Rectangular Weir Head (feet) 0.49 0.98 1.48 Coef. (English) 2.92 3.37 3.59

Primary OutFlow Max=2.94 cfs @ 12.08 hrs HW=576.23' (Free Discharge)

- ↑ 1=8" pipe (Barrel Controls 2.94 cfs @ 8.43 fps)
- ↑ 2=Grate (Passes < 5.74 cfs potential flow)
- ↑ 3=Exfiltration (Passes < 0.06 cfs potential flow)

Secondary OutFlow Max=28.93 cfs @ 12.08 hrs HW=576.23' (Free Discharge)

- ↑ 4=Broad-Crested Rectangular Weir (Weir Controls 28.93 cfs @ 2.02 fps)

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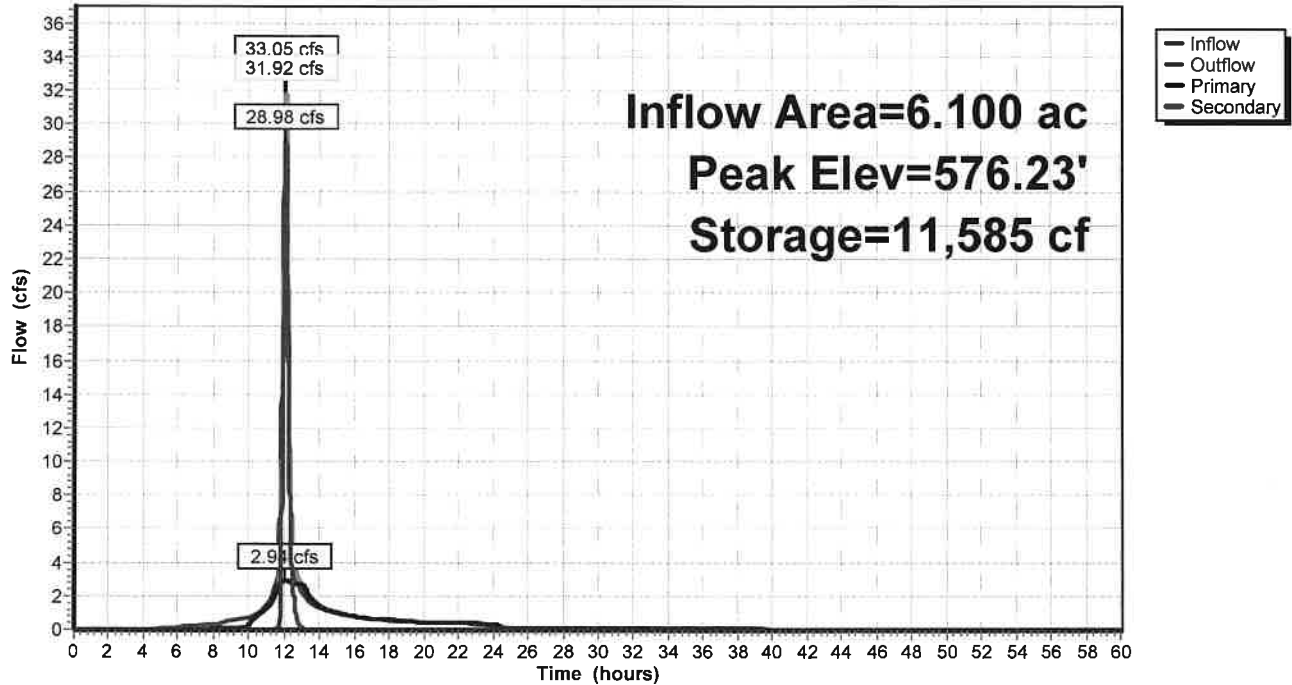
Type II 24-hr 100-Year Rainfall=5.28"

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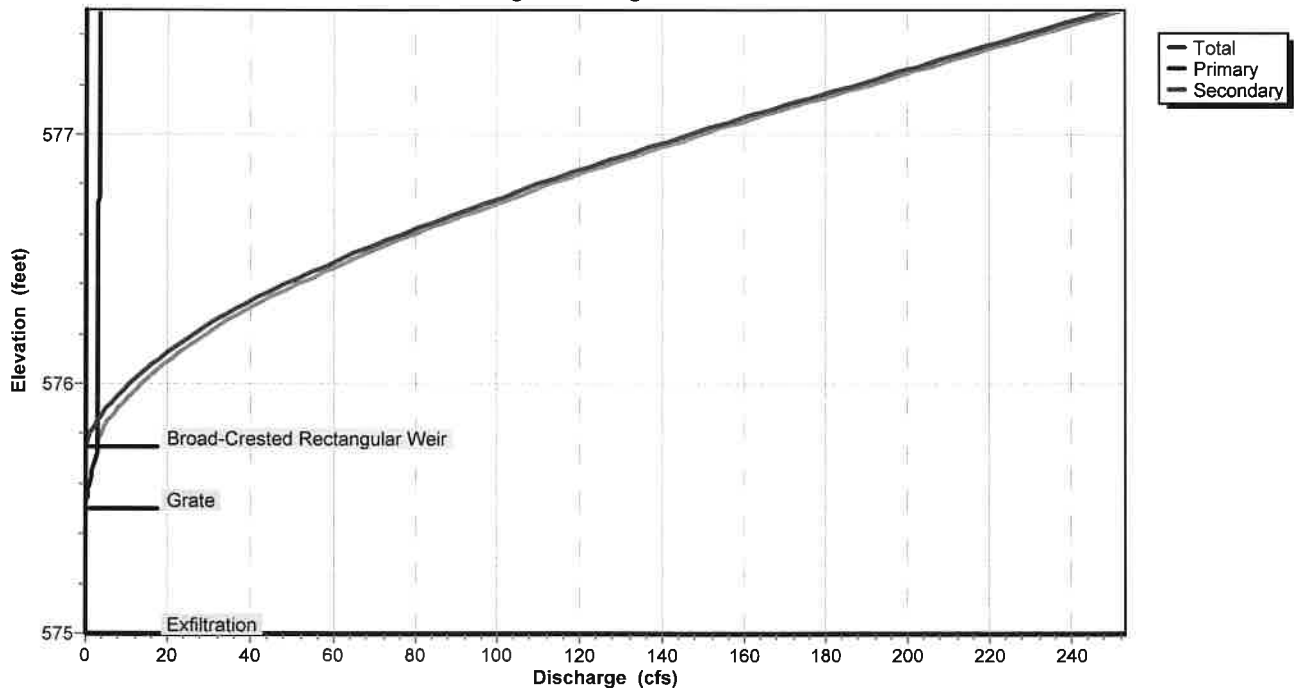
Pond 1P: Bioretention Area 3

Hydrograph



Pond 1P: Bioretention Area 3

Stage-Discharge



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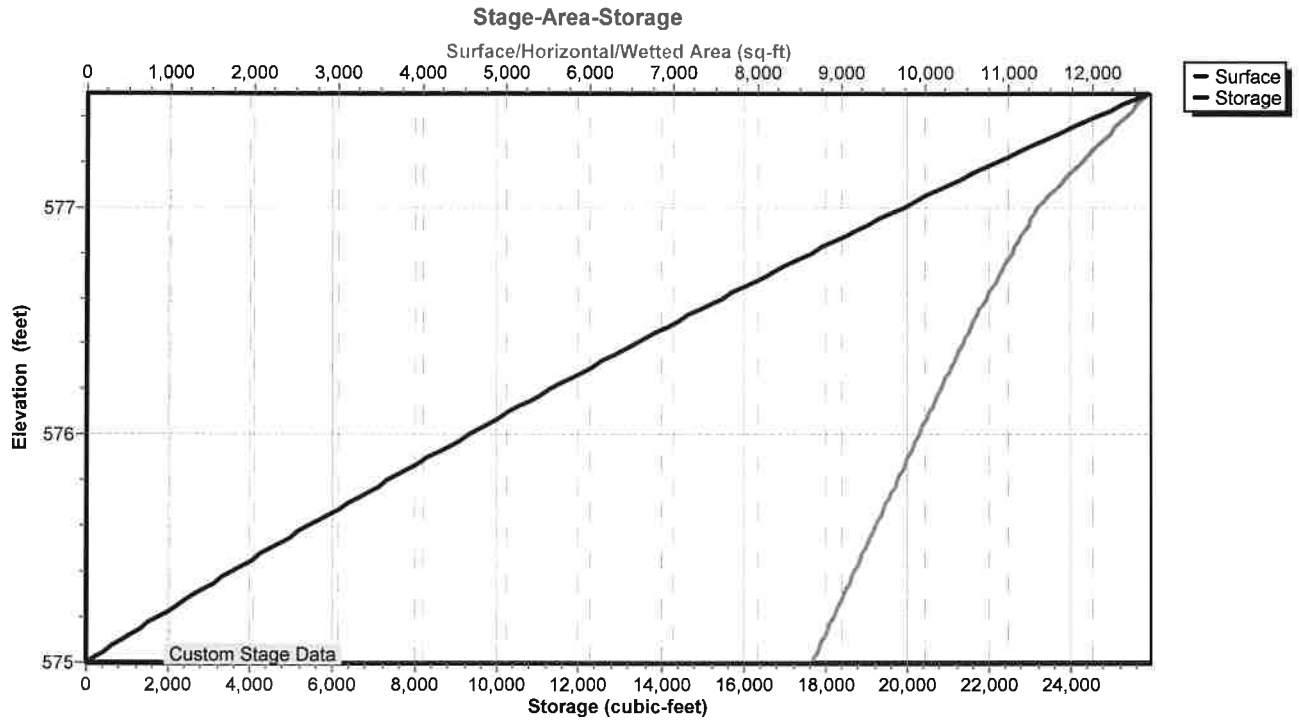
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Pond 1P: Bioretention Area 3



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Hydrograph for Pond 1P: Bioretention Area 3

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Primary (cfs)	Secondary (cfs)
0.00	0.00	0	575.00	0.00	0.00	0.00
2.00	0.00	0	575.00	0.00	0.00	0.00
4.00	0.01	6	575.00	0.00	0.00	0.00
6.00	0.15	359	575.04	0.05	0.05	0.00
8.00	0.32	1,651	575.19	0.05	0.05	0.00
10.00	0.74	4,857	575.54	0.28	0.28	0.00
12.00	30.36	10,896	576.16	25.95	2.91	23.04
14.00	1.27	5,731	575.63	1.39	1.39	0.00
16.00	0.76	5,329	575.59	0.81	0.81	0.00
18.00	0.58	5,164	575.57	0.60	0.60	0.00
20.00	0.42	5,023	575.56	0.44	0.44	0.00
22.00	0.38	4,969	575.55	0.38	0.38	0.00
24.00	0.35	4,939	575.55	0.35	0.35	0.00
26.00	0.00	4,307	575.48	0.06	0.06	0.00
28.00	0.00	3,911	575.44	0.05	0.05	0.00
30.00	0.00	3,518	575.40	0.05	0.05	0.00
32.00	0.00	3,129	575.35	0.05	0.05	0.00
34.00	0.00	2,743	575.31	0.05	0.05	0.00
36.00	0.00	2,360	575.27	0.05	0.05	0.00
38.00	0.00	1,981	575.23	0.05	0.05	0.00
40.00	0.00	1,604	575.18	0.05	0.05	0.00
42.00	0.00	1,232	575.14	0.05	0.05	0.00
44.00	0.00	862	575.10	0.05	0.05	0.00
46.00	0.00	496	575.06	0.05	0.05	0.00
48.00	0.00	147	575.02	0.03	0.03	0.00
50.00	0.00	28	575.00	0.01	0.01	0.00
52.00	0.00	5	575.00	0.00	0.00	0.00
54.00	0.00	1	575.00	0.00	0.00	0.00
56.00	0.00	0	575.00	0.00	0.00	0.00
58.00	0.00	0	575.00	0.00	0.00	0.00
60.00	0.00	0	575.00	0.00	0.00	0.00

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Stage-Discharge for Pond 1P: Bioretention Area 3

Elevation (feet)	Discharge (cfs)	Primary (cfs)	Secondary (cfs)
575.00	0.00	0.00	0.00
575.05	0.05	0.05	0.00
575.10	0.05	0.05	0.00
575.15	0.05	0.05	0.00
575.20	0.05	0.05	0.00
575.25	0.05	0.05	0.00
575.30	0.05	0.05	0.00
575.35	0.05	0.05	0.00
575.40	0.05	0.05	0.00
575.45	0.05	0.05	0.00
575.50	0.06	0.06	0.00
575.55	0.36	0.36	0.00
575.60	0.92	0.92	0.00
575.65	1.65	1.65	0.00
575.70	2.51	2.51	0.00
575.75	2.71	2.71	0.00
575.80	3.71	2.73	0.98
575.85	5.53	2.76	2.77
575.90	7.87	2.78	5.09
575.95	10.64	2.81	7.84
576.00	13.78	2.83	10.95
576.05	17.25	2.86	14.39
576.10	21.02	2.88	18.14
576.15	25.07	2.91	22.16
576.20	29.37	2.93	26.44
576.25	34.02	2.95	31.07
576.30	39.38	2.98	36.41
576.35	45.12	3.00	42.12
576.40	51.24	3.02	48.22
576.45	57.74	3.04	54.69
576.50	64.62	3.07	61.55
576.55	71.88	3.09	68.79
576.60	79.53	3.11	76.42
576.65	87.57	3.13	84.44
576.70	96.00	3.16	92.85
576.75	104.54	3.18	101.36
576.80	112.97	3.20	109.77
576.85	121.69	3.22	118.47
576.90	130.69	3.24	127.45
576.95	139.98	3.26	136.72
577.00	149.56	3.28	146.27
577.05	159.42	3.30	156.11
577.10	169.57	3.33	166.24
577.15	180.00	3.35	176.66
577.20	190.72	3.37	187.36
577.25	201.24	3.39	197.86
577.30	211.24	3.41	207.83
577.35	221.40	3.43	217.97
577.40	231.71	3.45	228.27
577.45	242.19	3.47	238.72
577.50	252.82	3.49	249.33

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Type II 24-hr 100-Year Rainfall=5.28"

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Stage-Area-Storage for Pond 1P: Bioretention Area 3

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
575.00	8,648	0
575.05	8,712	434
575.10	8,776	871
575.15	8,840	1,312
575.20	8,903	1,755
575.25	8,967	2,202
575.30	9,031	2,652
575.35	9,095	3,105
575.40	9,159	3,561
575.45	9,223	4,021
575.50	9,287	4,484
575.55	9,350	4,950
575.60	9,414	5,419
575.65	9,478	5,891
575.70	9,542	6,366
575.75	9,606	6,845
575.80	9,670	7,327
575.85	9,733	7,812
575.90	9,797	8,300
575.95	9,861	8,792
576.00	9,925	9,287
576.05	9,991	9,784
576.10	10,057	10,286
576.15	10,123	10,790
576.20	10,189	11,298
576.25	10,255	11,809
576.30	10,321	12,323
576.35	10,387	12,841
576.40	10,453	13,362
576.45	10,519	13,886
576.50	10,585	14,414
576.55	10,661	14,945
576.60	10,738	15,480
576.65	10,814	16,019
576.70	10,891	16,562
576.75	10,968	17,108
576.80	11,044	17,658
576.85	11,121	18,212
576.90	11,197	18,770
576.95	11,274	19,332
577.00	11,350	19,898
577.05	11,482	20,469
577.10	11,615	21,046
577.15	11,747	21,630
577.20	11,880	22,221
577.25	12,013	22,818
577.30	12,145	23,422
577.35	12,278	24,033
577.40	12,410	24,650
577.45	12,543	25,274
577.50	12,675	25,904

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Type II 24-hr 100-Year Rainfall=5.28"

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Summary for Pond 3P: Detention Basin (SMA #1)

Inflow Area = 4.400 ac, 61.36% Impervious, Inflow Depth = 6.52" for 100-Year event
 Inflow = 52.24 cfs @ 12.07 hrs, Volume= 2.392 af
 Outflow = 8.57 cfs @ 12.41 hrs, Volume= 2.088 af, Atten= 84%, Lag= 20.7 min
 Primary = 0.78 cfs @ 12.41 hrs, Volume= 1.554 af
 Secondary = 7.80 cfs @ 12.41 hrs, Volume= 0.534 af

Routing by Stor-Ind method, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
 Peak Elev= 576.11' @ 12.41 hrs Surf.Area= 67,462 sf Storage= 70,722 cf

Plug-Flow detention time= 739.0 min calculated for 2.088 af (87% of inflow)
 Center-of-Mass det. time= 688.7 min (1,456.5 - 767.8)

Volume	Invert	Avail.Storage	Storage Description
#1	575.00'	118,224 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
575.00	59,213	0	0
576.00	66,849	63,031	63,031
576.80	71,134	55,193	118,224

Device	Routing	Invert	Outlet Devices
#1	Primary	574.00'	12.0" Round 12" outlet pipe L= 160.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 574.00' / 573.79' S= 0.0013 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Device 1	575.00'	6.0" Round low flow outlet pipe L= 10.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 575.00' / 574.95' S= 0.0050 '/' Cc= 0.900 n= 0.010 Corrugated PE, smooth interior, Flow Area= 0.20 sf
#3	Device 1	576.50'	30.0" x 30.0" Horiz. Gate C= 0.600 Limited to weir flow at low heads
#4	Secondary	575.95'	20.0' long (Profile 1) Broad-Crested Rectangular Weir X 2.00 Head (feet) 0.49 0.98 1.48 Coef. (English) 2.92 3.37 3.59

Primary OutFlow Max=0.78 cfs @ 12.41 hrs HW=576.11' (Free Discharge)

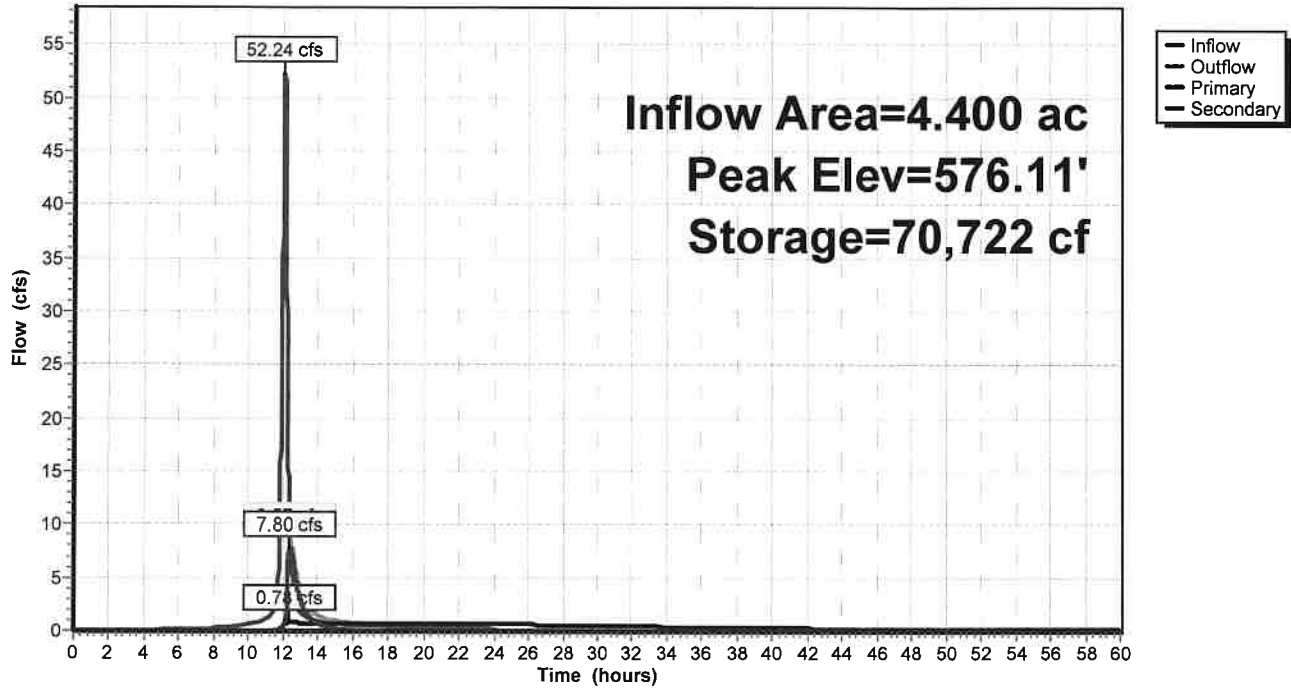
↑ 1=12" outlet pipe (Passes 0.78 cfs of 2.84 cfs potential flow)
 ↑ 2=low flow outlet pipe (Inlet Controls 0.78 cfs @ 3.95 fps)
 ↑ 3=Gate (Controls 0.00 cfs)

Secondary OutFlow Max=7.79 cfs @ 12.41 hrs HW=576.11' (Free Discharge)

↑ 4=Broad-Crested Rectangular Weir (Weir Controls 7.79 cfs @ 1.18 fps)

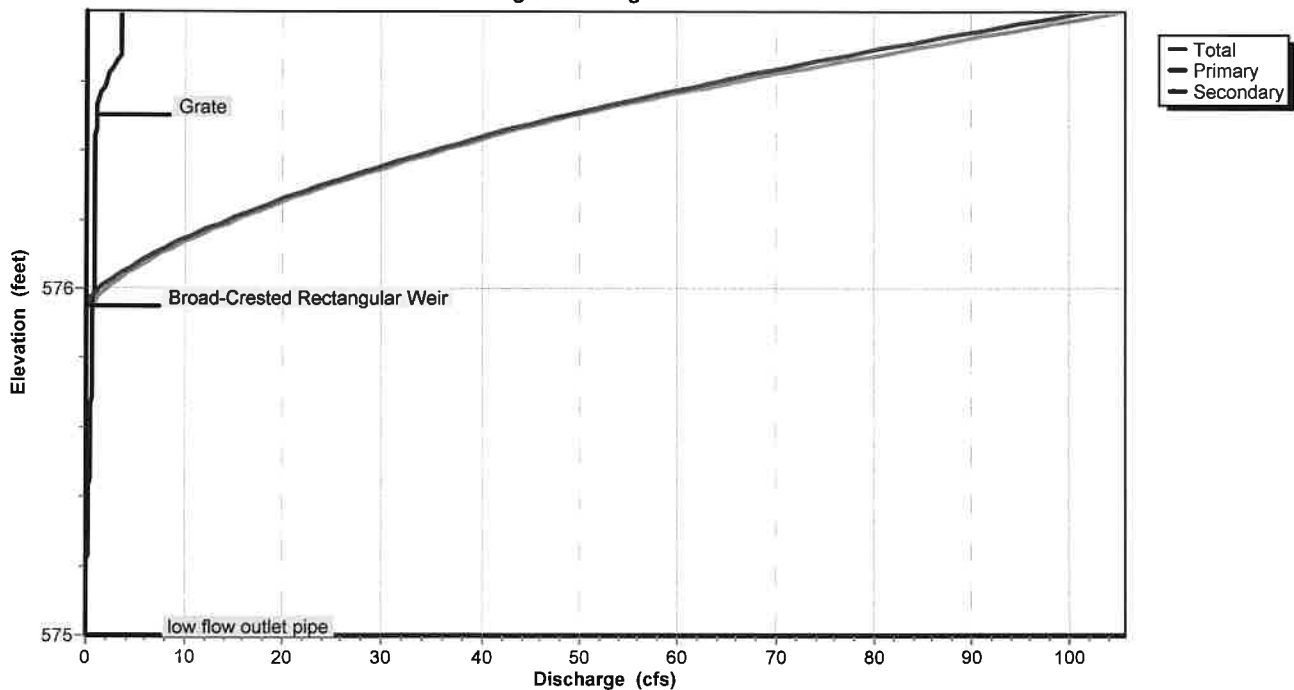
Pond 3P: Detention Basin (SMA #1)

Hydrograph



Pond 3P: Detention Basin (SMA #1)

Stage-Discharge



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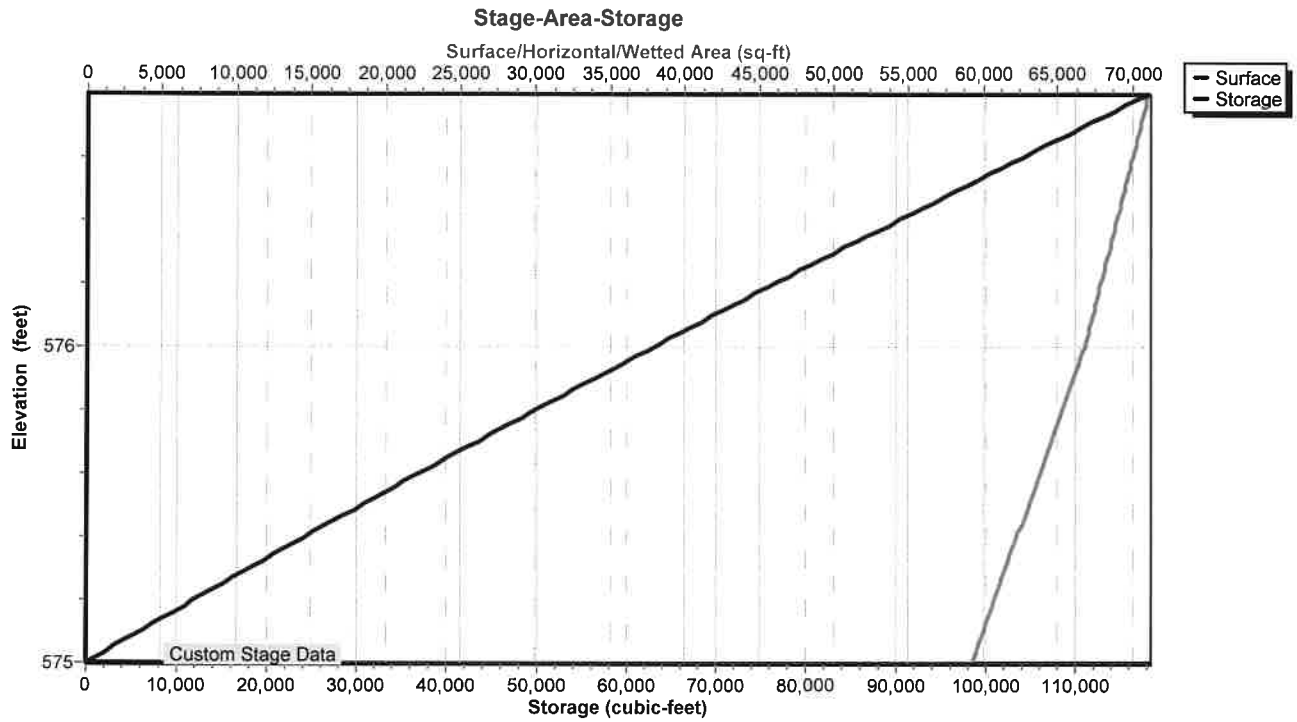
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Pond 3P: Detention Basin (SMA #1)



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Hydrograph for Pond 3P: Detention Basin (SMA #1)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Primary (cfs)	Secondary (cfs)
0.00	0.00	0	575.00	0.00	0.00	0.00
2.00	0.00	0	575.00	0.00	0.00	0.00
4.00	0.02	25	575.00	0.00	0.00	0.00
6.00	0.13	556	575.01	0.00	0.00	0.00
8.00	0.25	1,914	575.03	0.00	0.00	0.00
10.00	0.57	4,720	575.08	0.01	0.01	0.00
12.00	43.89	31,253	575.51	0.38	0.38	0.00
14.00	0.94	61,894	575.98	1.43	0.71	0.72
16.00	0.56	59,972	575.95	0.73	0.70	0.03
18.00	0.42	58,398	575.93	0.69	0.69	0.00
20.00	0.31	56,130	575.90	0.67	0.67	0.00
22.00	0.28	53,450	575.86	0.65	0.65	0.00
24.00	0.25	50,762	575.81	0.63	0.63	0.00
26.00	0.00	46,581	575.75	0.59	0.59	0.00
28.00	0.00	42,588	575.69	0.52	0.52	0.00
30.00	0.00	38,979	575.63	0.49	0.49	0.00
32.00	0.00	35,609	575.58	0.45	0.45	0.00
34.00	0.00	32,555	575.53	0.40	0.40	0.00
36.00	0.00	29,827	575.49	0.36	0.36	0.00
38.00	0.00	27,407	575.45	0.32	0.32	0.00
40.00	0.00	25,264	575.42	0.28	0.28	0.00
42.00	0.00	23,368	575.39	0.25	0.25	0.00
44.00	0.00	21,686	575.36	0.22	0.22	0.00
46.00	0.00	20,191	575.33	0.20	0.20	0.00
48.00	0.00	18,858	575.31	0.17	0.17	0.00
50.00	0.00	17,665	575.29	0.16	0.16	0.00
52.00	0.00	16,594	575.28	0.14	0.14	0.00
54.00	0.00	15,630	575.26	0.13	0.13	0.00
56.00	0.00	14,758	575.25	0.12	0.12	0.00
58.00	0.00	13,967	575.23	0.10	0.10	0.00
60.00	0.00	13,248	575.22	0.10	0.10	0.00

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Stage-Discharge for Pond 3P: Detention Basin (SMA #1)

Elevation (feet)	Discharge (cfs)	Primary (cfs)	Secondary (cfs)	Elevation (feet)	Discharge (cfs)	Primary (cfs)	Secondary (cfs)
575.00	0.00	0.00	0.00	576.04	3.90	0.74	3.15
575.02	0.00	0.00	0.00	576.06	5.01	0.75	4.26
575.04	0.00	0.00	0.00	576.08	6.23	0.76	5.47
575.06	0.01	0.01	0.00	576.10	7.55	0.77	6.79
575.08	0.01	0.01	0.00	576.12	8.96	0.78	8.19
575.10	0.02	0.02	0.00	576.14	10.46	0.79	9.67
575.12	0.03	0.03	0.00	576.16	12.04	0.80	11.24
575.14	0.04	0.04	0.00	576.18	13.69	0.80	12.88
575.16	0.05	0.05	0.00	576.20	15.41	0.81	14.60
575.18	0.07	0.07	0.00	576.22	17.21	0.82	16.39
575.20	0.08	0.08	0.00	576.24	19.07	0.83	18.24
575.22	0.09	0.09	0.00	576.26	21.00	0.84	20.16
575.24	0.11	0.11	0.00	576.28	22.99	0.85	22.14
575.26	0.13	0.13	0.00	576.30	25.04	0.85	24.18
575.28	0.15	0.15	0.00	576.32	27.15	0.86	26.29
575.30	0.16	0.16	0.00	576.34	29.32	0.87	28.45
575.32	0.18	0.18	0.00	576.36	31.54	0.88	30.66
575.34	0.20	0.20	0.00	576.38	33.82	0.89	32.93
575.36	0.22	0.22	0.00	576.40	36.15	0.89	35.26
575.38	0.24	0.24	0.00	576.42	38.54	0.90	37.63
575.40	0.26	0.26	0.00	576.44	40.97	0.91	40.06
575.42	0.28	0.28	0.00	576.46	43.73	0.92	42.81
575.44	0.31	0.31	0.00	576.48	46.56	0.93	45.63
575.46	0.33	0.33	0.00	576.50	49.47	0.93	48.54
575.48	0.35	0.35	0.00	576.52	52.56	1.03	51.53
575.50	0.37	0.37	0.00	576.54	55.81	1.21	54.60
575.52	0.39	0.39	0.00	576.56	59.18	1.44	57.75
575.54	0.41	0.41	0.00	576.58	62.68	1.70	60.98
575.56	0.43	0.43	0.00	576.60	66.29	2.00	64.29
575.58	0.45	0.45	0.00	576.62	70.02	2.34	67.68
575.60	0.46	0.46	0.00	576.64	73.85	2.70	71.16
575.62	0.48	0.48	0.00	576.66	77.79	3.08	74.71
575.64	0.49	0.49	0.00	576.68	81.74	3.39	78.35
575.66	0.50	0.50	0.00	576.70	85.48	3.41	82.07
575.68	0.51	0.51	0.00	576.72	89.30	3.43	85.87
575.70	0.54	0.54	0.00	576.74	93.20	3.45	89.75
575.72	0.56	0.56	0.00	576.76	97.18	3.46	93.72
575.74	0.58	0.58	0.00	576.78	101.25	3.48	97.76
575.76	0.60	0.60	0.00	576.80	105.39	3.50	101.90
575.78	0.61	0.61	0.00				
575.80	0.62	0.62	0.00				
575.82	0.63	0.63	0.00				
575.84	0.64	0.64	0.00				
575.86	0.65	0.65	0.00				
575.88	0.66	0.66	0.00				
575.90	0.67	0.67	0.00				
575.92	0.68	0.68	0.00				
575.94	0.69	0.69	0.00				
575.96	0.82	0.70	0.12				
575.98	1.32	0.71	0.61				
576.00	2.03	0.72	1.31				
576.02	2.90	0.73	2.16				

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Type II 24-hr 100-Year Rainfall=5.28"

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Stage-Area-Storage for Pond 3P: Detention Basin (SMA #1)

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
575.00	59,213	0	576.04	67,063	65,709
575.02	59,366	1,186	576.06	67,170	67,052
575.04	59,518	2,375	576.08	67,278	68,396
575.06	59,671	3,567	576.10	67,385	69,743
575.08	59,824	4,761	576.12	67,492	71,091
575.10	59,977	5,959	576.14	67,599	72,442
575.12	60,129	7,161	576.16	67,706	73,795
575.14	60,282	8,365	576.18	67,813	75,151
575.16	60,435	9,572	576.20	67,920	76,508
575.18	60,587	10,782	576.22	68,027	77,867
575.20	60,740	11,995	576.24	68,135	79,229
575.22	60,893	13,212	576.26	68,242	80,593
575.24	61,046	14,431	576.28	68,349	81,959
575.26	61,198	15,653	576.30	68,456	83,327
575.28	61,351	16,879	576.32	68,563	84,697
575.30	61,504	18,108	576.34	68,670	86,069
575.32	61,657	19,339	576.36	68,777	87,444
575.34	61,809	20,574	576.38	68,884	88,820
575.36	61,962	21,811	576.40	68,992	90,199
575.38	62,115	23,052	576.42	69,099	91,580
575.40	62,267	24,296	576.44	69,206	92,963
575.42	62,420	25,543	576.46	69,313	94,348
575.44	62,573	26,793	576.48	69,420	95,736
575.46	62,726	28,046	576.50	69,527	97,125
575.48	62,878	29,302	576.52	69,634	98,517
575.50	63,031	30,561	576.54	69,741	99,910
575.52	63,184	31,823	576.56	69,848	101,306
575.54	63,336	33,088	576.58	69,956	102,704
575.56	63,489	34,357	576.60	70,063	104,105
575.58	63,642	35,628	576.62	70,170	105,507
575.60	63,795	36,902	576.64	70,277	106,911
575.62	63,947	38,180	576.66	70,384	108,318
575.64	64,100	39,460	576.68	70,491	109,727
575.66	64,253	40,744	576.70	70,598	111,138
575.68	64,405	42,030	576.72	70,706	112,551
575.70	64,558	43,320	576.74	70,813	113,966
575.72	64,711	44,613	576.76	70,920	115,383
575.74	64,864	45,908	576.78	71,027	116,803
575.76	65,016	47,207	576.80	71,134	118,224
575.78	65,169	48,509			
575.80	65,322	49,814			
575.82	65,475	51,122			
575.84	65,627	52,433			
575.86	65,780	53,747			
575.88	65,933	55,064			
575.90	66,085	56,384			
575.92	66,238	57,708			
575.94	66,391	59,034			
575.96	66,544	60,363			
575.98	66,696	61,696			
576.00	66,849	63,031			
576.02	66,956	64,369			

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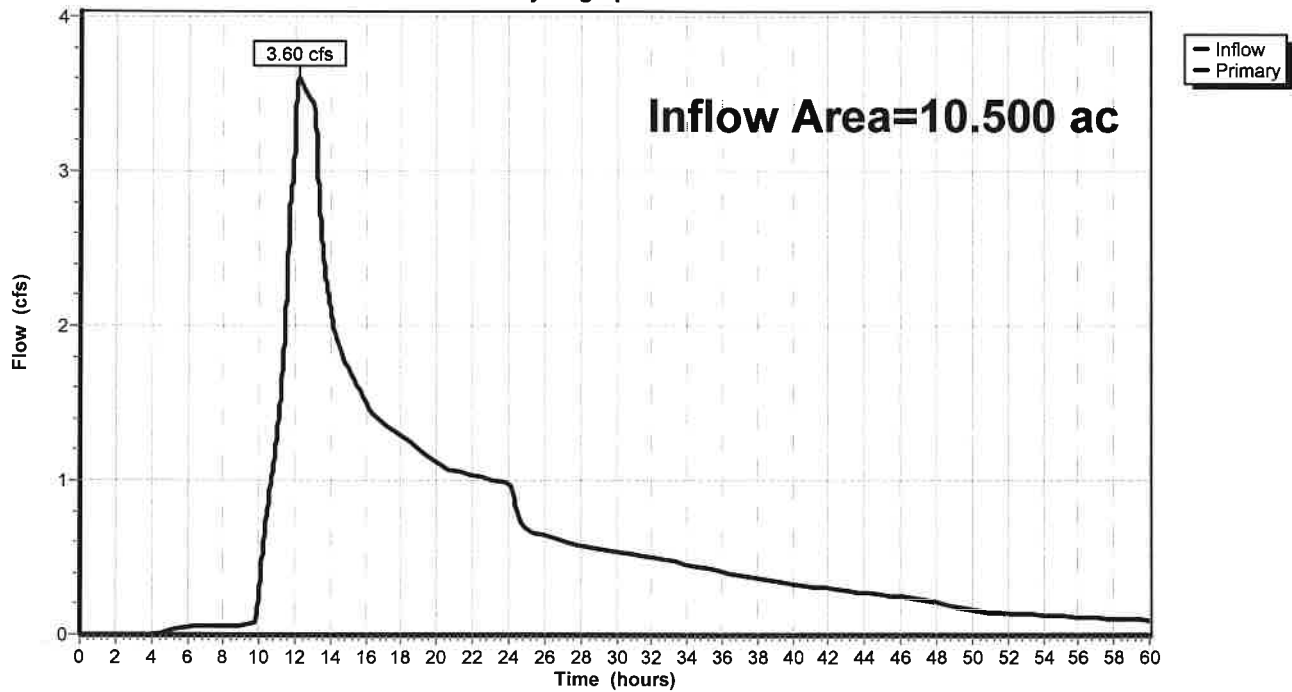
Summary for Link 5L: Outflow (@ CB 54)

Inflow Area = 10.500 ac, 57.14% Impervious, Inflow Depth > 3.23" for 100-Year event
Inflow = 3.60 cfs @ 12.19 hrs, Volume= 2.829 af
Primary = 3.60 cfs @ 12.19 hrs, Volume= 2.829 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs

Link 5L: Outflow (@ CB 54)

Hydrograph



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Hydrograph for Link 5L: Outflow (@ CB 54)

Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)	Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
0.00	0.00	0.00	0.00	52.00	0.14	0.00	0.14
1.00	0.00	0.00	0.00	53.00	0.13	0.00	0.13
2.00	0.00	0.00	0.00	54.00	0.13	0.00	0.13
3.00	0.00	0.00	0.00	55.00	0.12	0.00	0.12
4.00	0.00	0.00	0.00	56.00	0.12	0.00	0.12
5.00	0.03	0.00	0.03	57.00	0.11	0.00	0.11
6.00	0.05	0.00	0.05	58.00	0.10	0.00	0.10
7.00	0.05	0.00	0.05	59.00	0.10	0.00	0.10
8.00	0.05	0.00	0.05	60.00	0.10	0.00	0.10
9.00	0.06	0.00	0.06				
10.00	0.30	0.00	0.30				
11.00	1.31	0.00	1.31				
12.00	3.29	0.00	3.29				
13.00	3.44	0.00	3.44				
14.00	2.10	0.00	2.10				
15.00	1.72	0.00	1.72				
16.00	1.51	0.00	1.51				
17.00	1.37	0.00	1.37				
18.00	1.29	0.00	1.29				
19.00	1.20	0.00	1.20				
20.00	1.11	0.00	1.11				
21.00	1.06	0.00	1.06				
22.00	1.03	0.00	1.03				
23.00	1.01	0.00	1.01				
24.00	0.98	0.00	0.98				
25.00	0.68	0.00	0.68				
26.00	0.64	0.00	0.64				
27.00	0.61	0.00	0.61				
28.00	0.58	0.00	0.58				
29.00	0.55	0.00	0.55				
30.00	0.54	0.00	0.54				
31.00	0.52	0.00	0.52				
32.00	0.50	0.00	0.50				
33.00	0.48	0.00	0.48				
34.00	0.45	0.00	0.45				
35.00	0.43	0.00	0.43				
36.00	0.41	0.00	0.41				
37.00	0.39	0.00	0.39				
38.00	0.37	0.00	0.37				
39.00	0.35	0.00	0.35				
40.00	0.33	0.00	0.33				
41.00	0.32	0.00	0.32				
42.00	0.30	0.00	0.30				
43.00	0.28	0.00	0.28				
44.00	0.27	0.00	0.27				
45.00	0.26	0.00	0.26				
46.00	0.25	0.00	0.25				
47.00	0.24	0.00	0.24				
48.00	0.21	0.00	0.21				
49.00	0.18	0.00	0.18				
50.00	0.16	0.00	0.16				
51.00	0.15	0.00	0.15				

Proposed Runoff - West



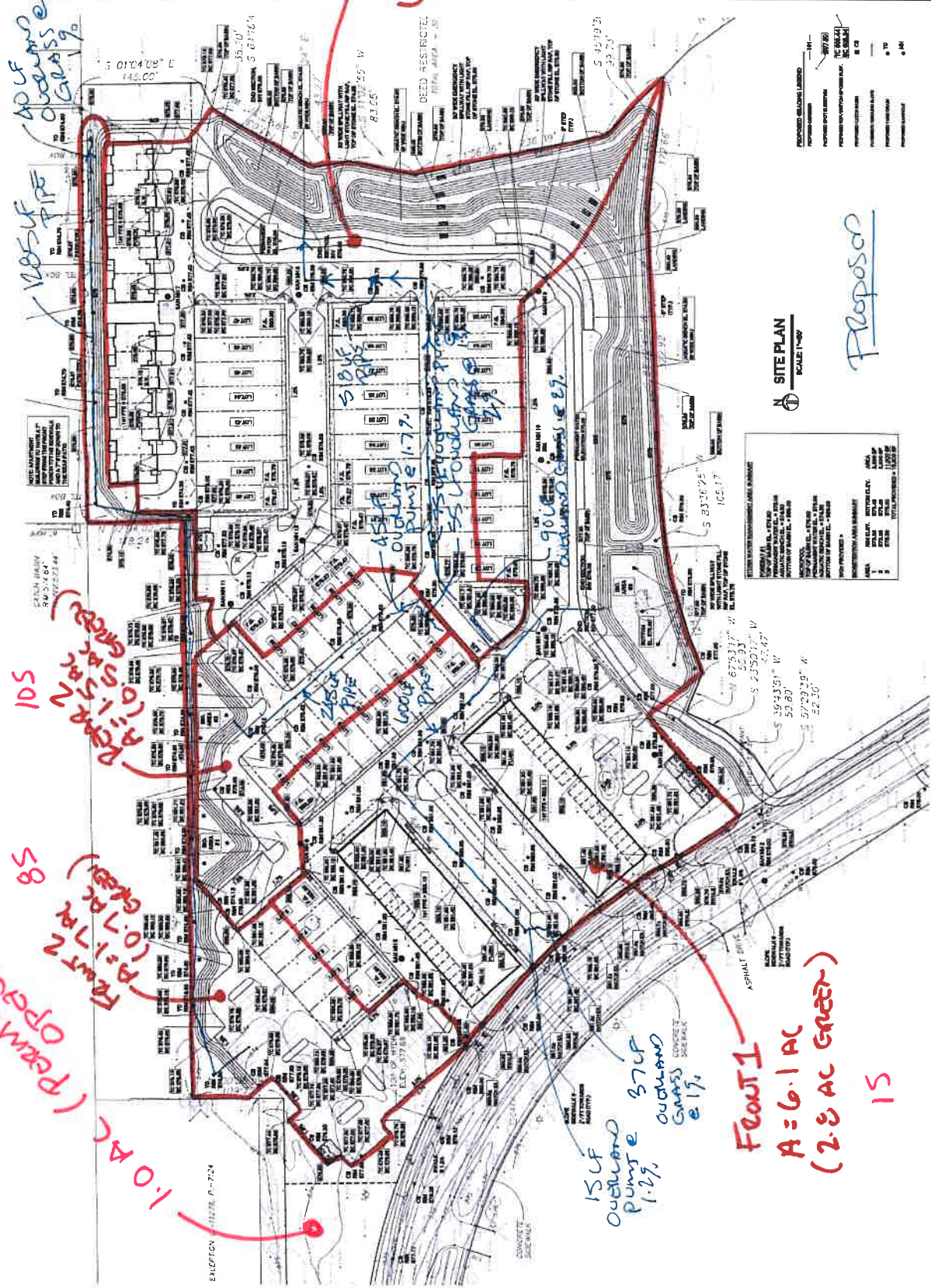
Carmina
Wood
Morris
LLC

Site Development Plans for:
Sawyer's Landing
Portion of 1081 North French Road
Amherst, New York

PROJECT NAME:
DRAWING NO. **C-200**
DATE: 11/10/11
SCALE: AS SHOWN

DRAWING NAME:
Grading Plan
DATE: 11/10/11
SCALE: AS SHOWN

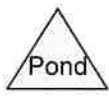
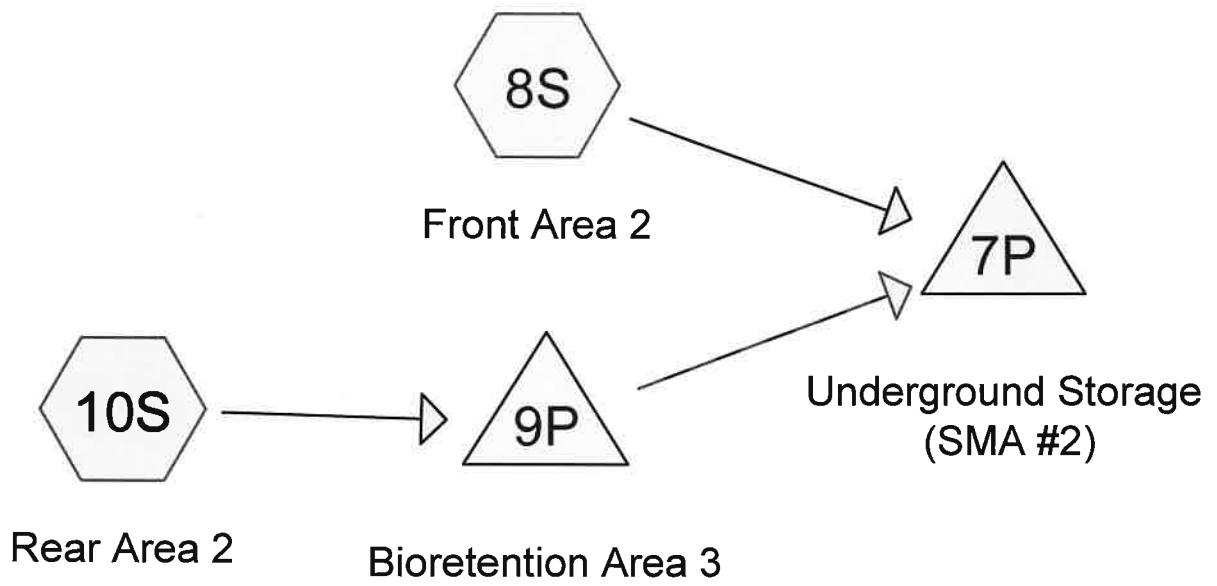
DRAWING NO. **C-200**
Project No.: 21.011



SITE PLAN
SCALE: 1"=40'

TOPOGRAPHY	PERMITTED GRADING	PERMITTED GRADING	PERMITTED GRADING	PERMITTED GRADING
1-10'	0.50'	0.50'	0.50'	0.50'
10-20'	0.75'	0.75'	0.75'	0.75'
20-30'	1.00'	1.00'	1.00'	1.00'
30-40'	1.25'	1.25'	1.25'	1.25'
40-50'	1.50'	1.50'	1.50'	1.50'
50-60'	1.75'	1.75'	1.75'	1.75'
60-70'	2.00'	2.00'	2.00'	2.00'
70-80'	2.25'	2.25'	2.25'	2.25'
80-90'	2.50'	2.50'	2.50'	2.50'
90-100'	2.75'	2.75'	2.75'	2.75'

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Type II 24-hr 100-Year Rainfall=5.28"

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Events for Pond 7P: Underground Storage

Event	Inflow (cfs)	Primary (cfs)	Elevation (feet)	Storage (cubic-feet)
1-Year	2.40	0.33	570.29	4,537
2-Year	4.15	0.68	570.46	5,990
5-Year	7.03	1.05	570.79	8,639
10-Year	9.17	1.28	571.13	11,342
25-Year	11.11	1.61	571.73	15,804
50-Year	12.80	3.61	572.23	18,836
100-Year	14.92	4.83	572.92	21,772

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Area Listing (selected nodes)

Area (acres)	CN	Description (subcatchment-numbers)
1.200	80	>75% Grass cover, Good, HSG D (8S, 10S)
1.200	98	Paved parking, HSG D (8S, 10S)
0.800	98	Roofs, HSG D (8S, 10S)
3.200	91	TOTAL AREA

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Soil Listing (selected nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
0.000	HSG B	
0.000	HSG C	
3.200	HSG D	8S, 10S
0.000	Other	
3.200		TOTAL AREA

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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	1.200	0.000	1.200	>75% Grass cover, Good	8S, 10S
0.000	0.000	0.000	1.200	0.000	1.200	Paved parking	8S, 10S
0.000	0.000	0.000	0.800	0.000	0.800	Roofs	8S, 10S
0.000	0.000	0.000	3.200	0.000	3.200	TOTAL AREA	

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Type II 24-hr 1-Year Rainfall=1.86"

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Time span=0.00-60.00 hrs, dt=0.01 hrs, 6001 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 8S: Front Area 2 Runoff Area=1.700 ac 58.82% Impervious Runoff Depth=1.04"
Flow Length=1,325' Slope=0.0100 '/' Tc=14.1 min CN=91 Runoff=2.36 cfs 0.148 af

Subcatchment 10S: Rear Area 2 Runoff Area=1.500 ac 66.67% Impervious Runoff Depth=1.11"
Flow Length=345' Tc=9.1 min CN=92 Runoff=2.63 cfs 0.139 af

Pond 7P: Underground Storage (SMA #2) Peak Elev=570.29' Storage=4,537 cf Inflow=2.40 cfs 0.287 af
Outflow=0.33 cfs 0.243 af

Pond 9P: Bioretention Area 3 Peak Elev=574.54' Storage=2,922 cf Inflow=2.63 cfs 0.139 af
Outflow=0.43 cfs 0.139 af

Total Runoff Area = 3.200 ac Runoff Volume = 0.287 af Average Runoff Depth = 1.08"
37.50% Pervious = 1.200 ac 62.50% Impervious = 2.000 ac

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Type II 24-hr 1-Year Rainfall=1.86"

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Summary for Subcatchment 8S: Front Area 2

Runoff = 2.36 cfs @ 12.06 hrs, Volume= 0.148 af, Depth= 1.04"

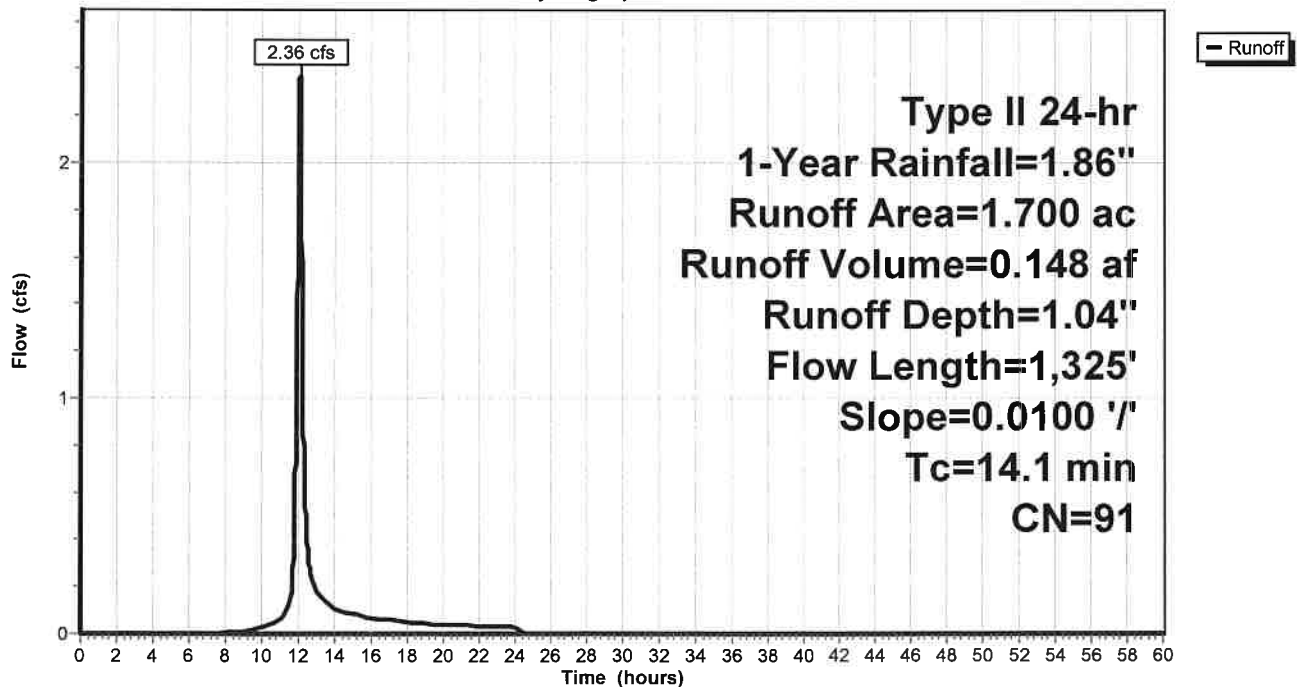
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
Type II 24-hr 1-Year Rainfall=1.86"

Area (ac)	CN	Description
0.700	98	Paved parking, HSG D
0.300	98	Roofs, HSG D
0.700	80	>75% Grass cover, Good, HSG D
1.700	91	Weighted Average
0.700		41.18% Pervious Area
1.000		58.82% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.0	40	0.0100	0.09		Sheet Flow, grass Grass: Short n= 0.150 P2= 2.50"
7.1	1,285		3.00		Direct Entry, Pipe flow
14.1	1,325	Total			

Subcatchment 8S: Front Area 2

Hydrograph



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Type II 24-hr 1-Year Rainfall=1.86"

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Hydrograph for Subcatchment 8S: Front Area 2

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	52.00	1.86	1.04	0.00
1.00	0.02	0.00	0.00	53.00	1.86	1.04	0.00
2.00	0.04	0.00	0.00	54.00	1.86	1.04	0.00
3.00	0.06	0.00	0.00	55.00	1.86	1.04	0.00
4.00	0.09	0.00	0.00	56.00	1.86	1.04	0.00
5.00	0.12	0.00	0.00	57.00	1.86	1.04	0.00
6.00	0.15	0.00	0.00	58.00	1.86	1.04	0.00
7.00	0.18	0.00	0.00	59.00	1.86	1.04	0.00
8.00	0.22	0.00	0.00	60.00	1.86	1.04	0.00
9.00	0.27	0.01	0.01				
10.00	0.34	0.02	0.02				
11.00	0.44	0.05	0.07				
12.00	1.23	0.53	2.04				
13.00	1.44	0.69	0.18				
14.00	1.53	0.76	0.11				
15.00	1.59	0.81	0.08				
16.00	1.64	0.85	0.07				
17.00	1.68	0.89	0.06				
18.00	1.71	0.92	0.05				
19.00	1.74	0.94	0.04				
20.00	1.77	0.97	0.04				
21.00	1.79	0.99	0.03				
22.00	1.82	1.01	0.03				
23.00	1.84	1.02	0.03				
24.00	1.86	1.04	0.03				
25.00	1.86	1.04	0.00				
26.00	1.86	1.04	0.00				
27.00	1.86	1.04	0.00				
28.00	1.86	1.04	0.00				
29.00	1.86	1.04	0.00				
30.00	1.86	1.04	0.00				
31.00	1.86	1.04	0.00				
32.00	1.86	1.04	0.00				
33.00	1.86	1.04	0.00				
34.00	1.86	1.04	0.00				
35.00	1.86	1.04	0.00				
36.00	1.86	1.04	0.00				
37.00	1.86	1.04	0.00				
38.00	1.86	1.04	0.00				
39.00	1.86	1.04	0.00				
40.00	1.86	1.04	0.00				
41.00	1.86	1.04	0.00				
42.00	1.86	1.04	0.00				
43.00	1.86	1.04	0.00				
44.00	1.86	1.04	0.00				
45.00	1.86	1.04	0.00				
46.00	1.86	1.04	0.00				
47.00	1.86	1.04	0.00				
48.00	1.86	1.04	0.00				
49.00	1.86	1.04	0.00				
50.00	1.86	1.04	0.00				
51.00	1.86	1.04	0.00				

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Type II 24-hr 1-Year Rainfall=1.86"

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Summary for Subcatchment 10S: Rear Area 2

Runoff = 2.63 cfs @ 12.01 hrs, Volume= 0.139 af, Depth= 1.11"

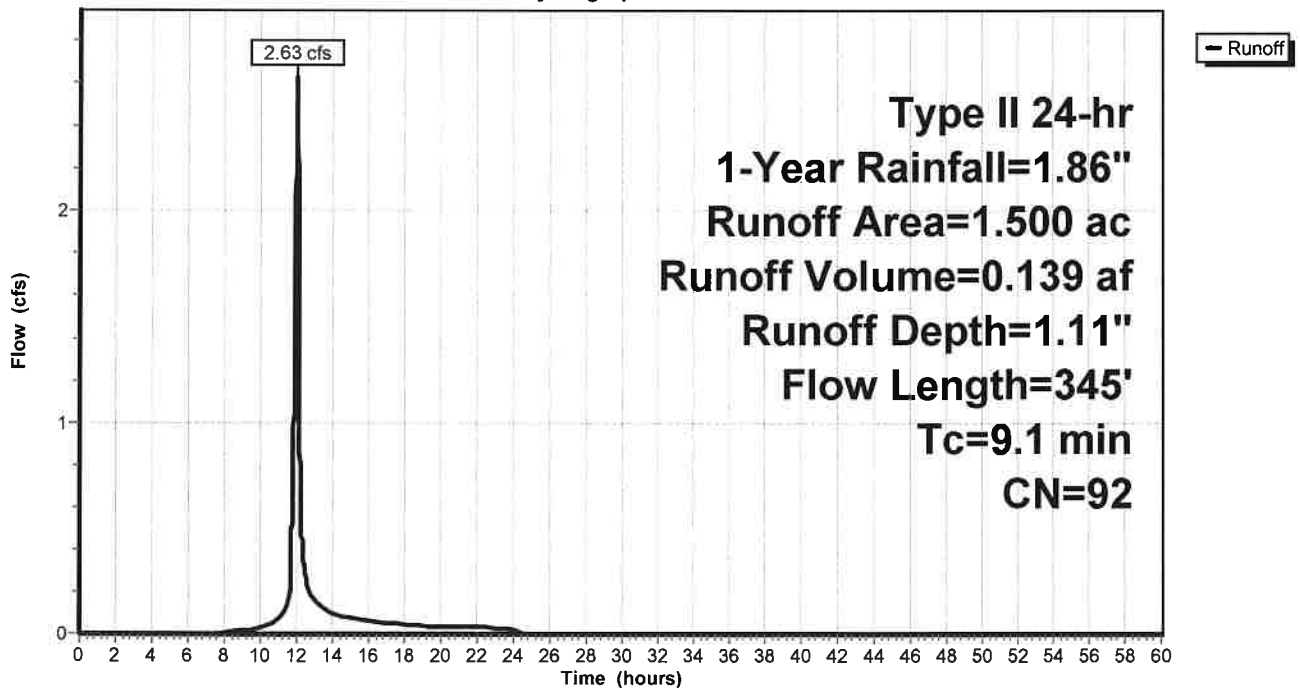
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
Type II 24-hr 1-Year Rainfall=1.86"

Area (ac)	CN	Description
0.500	98	Paved parking, HSG D
0.500	98	Roofs, HSG D
0.500	80	>75% Grass cover, Good, HSG D
1.500	92	Weighted Average
0.500		33.33% Pervious Area
1.000		66.67% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.9	55	0.0200	0.13		Sheet Flow, grass Grass: Short n= 0.150 P2= 2.50"
0.8	45	0.0170	0.97		Sheet Flow, pavement Smooth surfaces n= 0.011 P2= 2.50"
1.4	245		3.00		Direct Entry, Pipe flow
9.1	345	Total			

Subcatchment 10S: Rear Area 2

Hydrograph



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Type II 24-hr 1-Year Rainfall=1.86"

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Hydrograph for Subcatchment 10S: Rear Area 2

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	52.00	1.86	1.11	0.00
1.00	0.02	0.00	0.00	53.00	1.86	1.11	0.00
2.00	0.04	0.00	0.00	54.00	1.86	1.11	0.00
3.00	0.06	0.00	0.00	55.00	1.86	1.11	0.00
4.00	0.09	0.00	0.00	56.00	1.86	1.11	0.00
5.00	0.12	0.00	0.00	57.00	1.86	1.11	0.00
6.00	0.15	0.00	0.00	58.00	1.86	1.11	0.00
7.00	0.18	0.00	0.00	59.00	1.86	1.11	0.00
8.00	0.22	0.00	0.01	60.00	1.86	1.11	0.00
9.00	0.27	0.01	0.02				
10.00	0.34	0.03	0.03				
11.00	0.44	0.06	0.07				
12.00	1.23	0.58	2.63				
13.00	1.44	0.75	0.16				
14.00	1.53	0.82	0.09				
15.00	1.59	0.88	0.07				
16.00	1.64	0.92	0.06				
17.00	1.68	0.95	0.05				
18.00	1.71	0.98	0.04				
19.00	1.74	1.01	0.04				
20.00	1.77	1.03	0.03				
21.00	1.79	1.05	0.03				
22.00	1.82	1.07	0.03				
23.00	1.84	1.09	0.03				
24.00	1.86	1.11	0.03				
25.00	1.86	1.11	0.00				
26.00	1.86	1.11	0.00				
27.00	1.86	1.11	0.00				
28.00	1.86	1.11	0.00				
29.00	1.86	1.11	0.00				
30.00	1.86	1.11	0.00				
31.00	1.86	1.11	0.00				
32.00	1.86	1.11	0.00				
33.00	1.86	1.11	0.00				
34.00	1.86	1.11	0.00				
35.00	1.86	1.11	0.00				
36.00	1.86	1.11	0.00				
37.00	1.86	1.11	0.00				
38.00	1.86	1.11	0.00				
39.00	1.86	1.11	0.00				
40.00	1.86	1.11	0.00				
41.00	1.86	1.11	0.00				
42.00	1.86	1.11	0.00				
43.00	1.86	1.11	0.00				
44.00	1.86	1.11	0.00				
45.00	1.86	1.11	0.00				
46.00	1.86	1.11	0.00				
47.00	1.86	1.11	0.00				
48.00	1.86	1.11	0.00				
49.00	1.86	1.11	0.00				
50.00	1.86	1.11	0.00				
51.00	1.86	1.11	0.00				

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Type II 24-hr 1-Year Rainfall=1.86"

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Summary for Pond 7P: Underground Storage (SMA #2)

Inflow Area = 3.200 ac, 62.50% Impervious, Inflow Depth = 1.08" for 1-Year event
 Inflow = 2.40 cfs @ 12.06 hrs, Volume= 0.287 af
 Outflow = 0.33 cfs @ 13.18 hrs, Volume= 0.243 af, Atten= 86%, Lag= 67.2 min
 Primary = 0.33 cfs @ 13.18 hrs, Volume= 0.243 af

Routing by Stor-Ind method, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
 Peak Elev= 570.29' @ 13.18 hrs Surf.Area= 10,145 sf Storage= 4,537 cf

Plug-Flow detention time= 493.3 min calculated for 0.243 af (85% of inflow)
 Center-of-Mass det. time= 283.3 min (1,405.6 - 1,122.2)

Volume	Invert	Avail.Storage	Storage Description
#1A	569.50'	8,947 cf	53.75'W x 188.74'L x 3.50'H Field A 35,506 cf Overall - 13,139 cf Embedded = 22,367 cf x 40.0% Voids
#2A	570.00'	13,139 cf	ADS_StormTech SC-740 +Cap x 286 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 11 Rows of 26 Chambers
		22,086 cf	Total Available Storage

Storage Group A created with Chamber Wizard

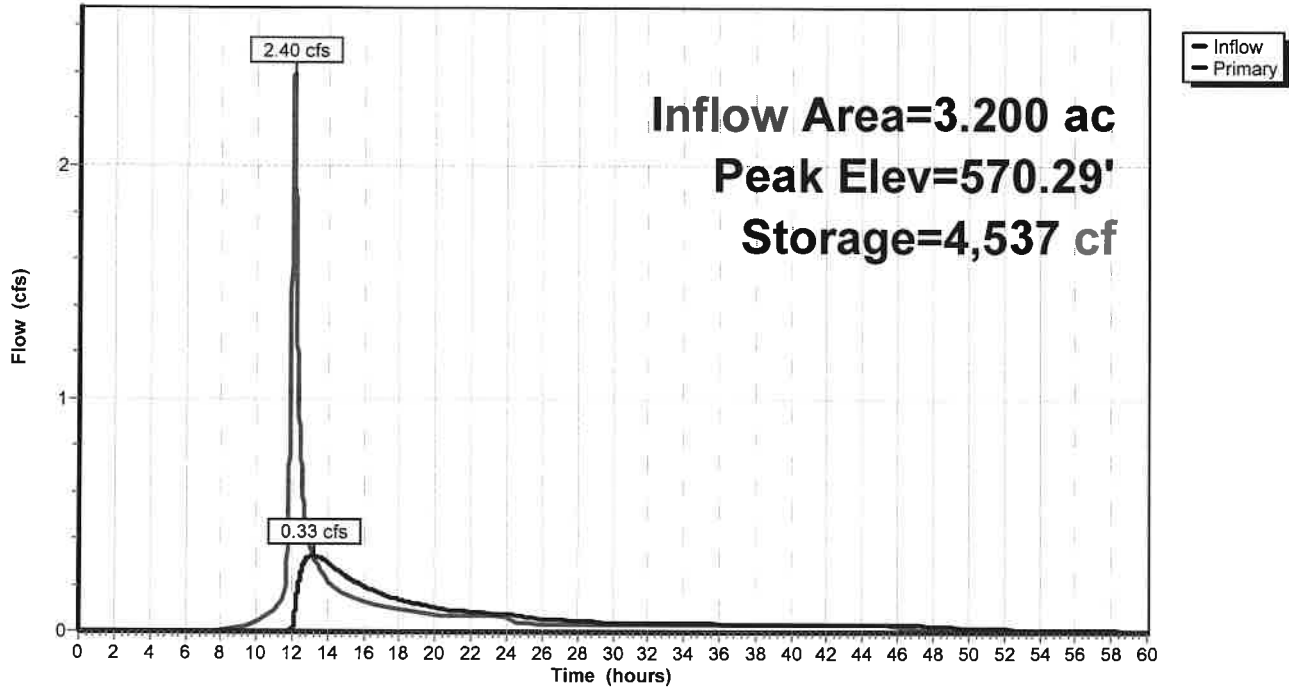
Device	Routing	Invert	Outlet Devices
#1	Primary	569.93'	12.0" Round Culvert L= 72.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 569.93' / 569.71' S= 0.0031 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Device 1	569.93'	4.0" Vert. Orifice X 3.00 C= 0.600
#3	Device 1	572.00'	5.0' long Weir 2 End Contraction(s)

Primary OutFlow Max=0.32 cfs @ 13.18 hrs HW=570.29' (Free Discharge)

- 1=Culvert (Barrel Controls 0.32 cfs @ 1.88 fps)
- 2=Orifice (Passes 0.32 cfs of 0.56 cfs potential flow)
- 3=Weir (Controls 0.00 cfs)

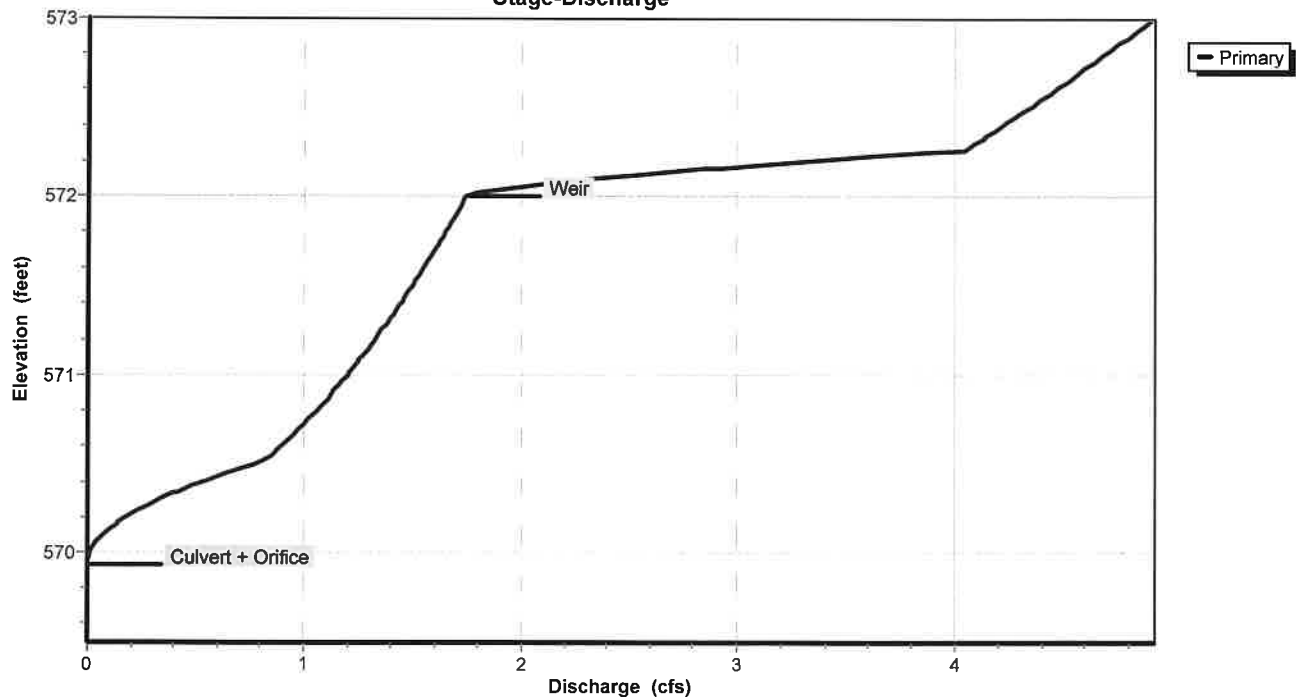
Pond 7P: Underground Storage (SMA #2)

Hydrograph



Pond 7P: Underground Storage (SMA #2)

Stage-Discharge



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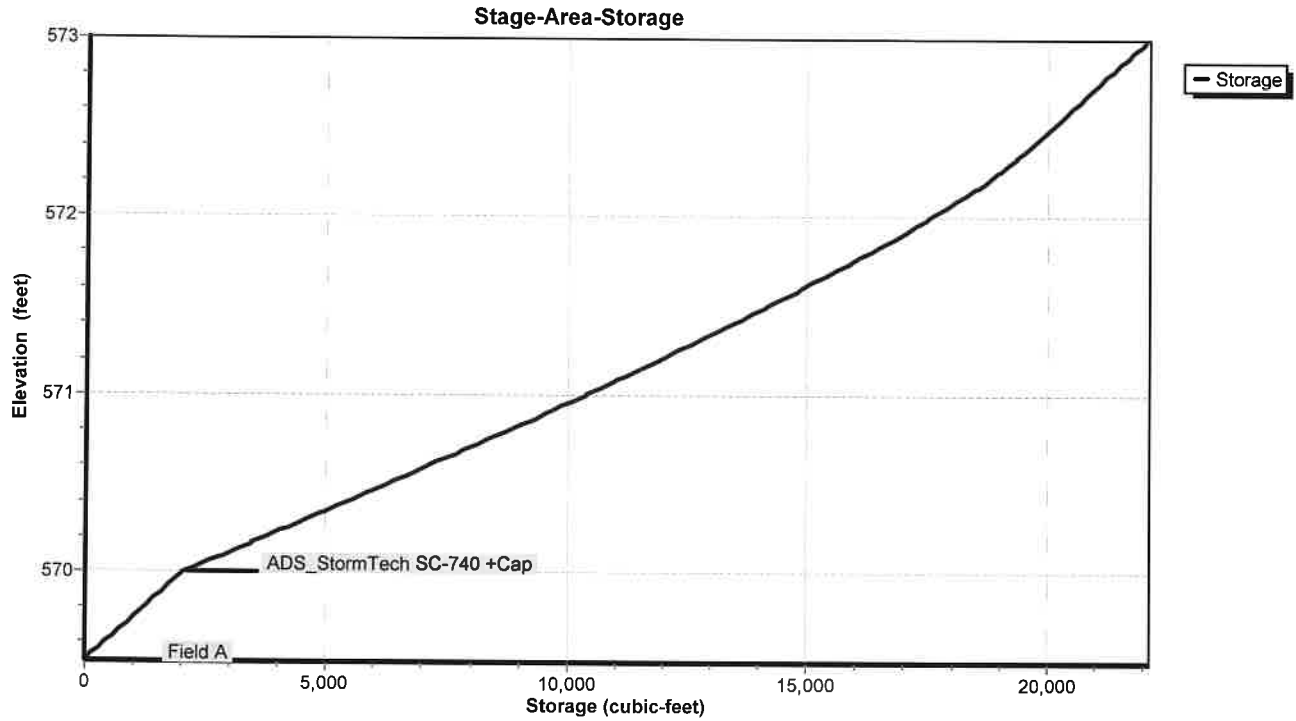
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Pond 7P: Underground Storage (SMA #2)



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Type II 24-hr 1-Year Rainfall=1.86"

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Hydrograph for Pond 7P: Underground Storage (SMA #2)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
0.00	0.00	0	569.50	0.00
2.00	0.00	0	569.50	0.00
4.00	0.00	0	569.50	0.00
6.00	0.00	0	569.50	0.00
8.00	0.00	4	569.50	0.00
10.00	0.04	139	569.53	0.00
12.00	2.08	1,735	569.93	0.00
14.00	0.22	4,393	570.28	0.30
16.00	0.13	3,835	570.21	0.20
18.00	0.10	3,452	570.17	0.14
20.00	0.07	3,194	570.14	0.10
22.00	0.07	3,023	570.12	0.08
24.00	0.06	2,931	570.10	0.07
26.00	0.03	2,737	570.08	0.06
28.00	0.03	2,618	570.07	0.05
30.00	0.03	2,550	570.06	0.04
32.00	0.03	2,506	570.06	0.04
34.00	0.03	2,476	570.05	0.04
36.00	0.03	2,453	570.05	0.03
38.00	0.03	2,436	570.05	0.03
40.00	0.03	2,422	570.05	0.03
42.00	0.03	2,410	570.04	0.03
44.00	0.03	2,399	570.04	0.03
46.00	0.03	2,388	570.04	0.03
48.00	0.01	2,288	570.03	0.02
50.00	0.00	2,166	570.02	0.02
52.00	0.00	2,066	570.00	0.01
54.00	0.00	1,993	569.99	0.01
56.00	0.00	1,945	569.98	0.01
58.00	0.00	1,910	569.97	0.00
60.00	0.00	1,885	569.96	0.00

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Type II 24-hr 1-Year Rainfall=1.86"

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Stage-Discharge for Pond 7P: Underground Storage (SMA #2)

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
569.50	0.00	570.54	0.84	571.58	1.54	572.62	4.49
569.52	0.00	570.56	0.86	571.60	1.55	572.64	4.52
569.54	0.00	570.58	0.88	571.62	1.56	572.66	4.54
569.56	0.00	570.60	0.89	571.64	1.57	572.68	4.56
569.58	0.00	570.62	0.91	571.66	1.58	572.70	4.58
569.60	0.00	570.64	0.93	571.68	1.59	572.72	4.61
569.62	0.00	570.66	0.95	571.70	1.60	572.74	4.63
569.64	0.00	570.68	0.96	571.72	1.61	572.76	4.65
569.66	0.00	570.70	0.98	571.74	1.62	572.78	4.68
569.68	0.00	570.72	1.00	571.76	1.63	572.80	4.70
569.70	0.00	570.74	1.01	571.78	1.64	572.82	4.72
569.72	0.00	570.76	1.03	571.80	1.65	572.84	4.74
569.74	0.00	570.78	1.04	571.82	1.65	572.86	4.77
569.76	0.00	570.80	1.06	571.84	1.66	572.88	4.79
569.78	0.00	570.82	1.07	571.86	1.67	572.90	4.81
569.80	0.00	570.84	1.09	571.88	1.68	572.92	4.83
569.82	0.00	570.86	1.10	571.90	1.69	572.94	4.85
569.84	0.00	570.88	1.12	571.92	1.70	572.96	4.88
569.86	0.00	570.90	1.13	571.94	1.71	572.98	4.90
569.88	0.00	570.92	1.14	571.96	1.72	573.00	4.92
569.90	0.00	570.94	1.16	571.98	1.73		
569.92	0.00	570.96	1.17	572.00	1.74		
569.94	0.00	570.98	1.18	572.02	1.79		
569.96	0.00	571.00	1.20	572.04	1.89		
569.98	0.01	571.02	1.21	572.06	2.01		
570.00	0.01	571.04	1.22	572.08	2.14		
570.02	0.02	571.06	1.24	572.10	2.30		
570.04	0.03	571.08	1.25	572.12	2.47		
570.06	0.04	571.10	1.26	572.14	2.65		
570.08	0.05	571.12	1.28	572.16	2.85		
570.10	0.07	571.14	1.29	572.18	3.06		
570.12	0.09	571.16	1.30	572.20	3.28		
570.14	0.11	571.18	1.31	572.22	3.51		
570.16	0.13	571.20	1.32	572.24	3.75		
570.18	0.15	571.22	1.34	572.26	4.00		
570.20	0.18	571.24	1.35	572.28	4.07		
570.22	0.21	571.26	1.36	572.30	4.10		
570.24	0.24	571.28	1.37	572.32	4.12		
570.26	0.27	571.30	1.38	572.34	4.15		
570.28	0.30	571.32	1.39	572.36	4.17		
570.30	0.34	571.34	1.41	572.38	4.20		
570.32	0.37	571.36	1.42	572.40	4.23		
570.34	0.41	571.38	1.43	572.42	4.25		
570.36	0.45	571.40	1.44	572.44	4.27		
570.38	0.49	571.42	1.45	572.46	4.30		
570.40	0.53	571.44	1.46	572.48	4.32		
570.42	0.58	571.46	1.47	572.50	4.35		
570.44	0.62	571.48	1.48	572.52	4.37		
570.46	0.67	571.50	1.49	572.54	4.40		
570.48	0.72	571.52	1.50	572.56	4.42		
570.50	0.76	571.54	1.51	572.58	4.44		
570.52	0.81	571.56	1.52	572.60	4.47		

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Stage-Area-Storage for Pond 7P: Underground Storage (SMA #2)

Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)
569.50	0	572.10	18,133
569.55	203	572.15	18,417
569.60	406	572.20	18,690
569.65	609	572.25	18,946
569.70	812	572.30	19,188
569.75	1,014	572.35	19,417
569.80	1,217	572.40	19,637
569.85	1,420	572.45	19,850
569.90	1,623	572.50	20,057
569.95	1,826	572.55	20,260
570.00	2,029	572.60	20,463
570.05	2,459	572.65	20,665
570.10	2,889	572.70	20,868
570.15	3,318	572.75	21,071
570.20	3,746	572.80	21,274
570.25	4,173	572.85	21,477
570.30	4,598	572.90	21,680
570.35	5,022	572.95	21,883
570.40	5,444	573.00	22,086
570.45	5,865		
570.50	6,284		
570.55	6,701		
570.60	7,116		
570.65	7,529		
570.70	7,940		
570.75	8,349		
570.80	8,756		
570.85	9,160		
570.90	9,562		
570.95	9,962		
571.00	10,359		
571.05	10,754		
571.10	11,145		
571.15	11,534		
571.20	11,919		
571.25	12,301		
571.30	12,680		
571.35	13,056		
571.40	13,428		
571.45	13,797		
571.50	14,161		
571.55	14,522		
571.60	14,879		
571.65	15,230		
571.70	15,577		
571.75	15,917		
571.80	16,252		
571.85	16,582		
571.90	16,906		
571.95	17,224		
572.00	17,535		
572.05	17,838		

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Summary for Pond 9P: Bioretention Area 3

Inflow Area = 1.500 ac, 66.67% Impervious, Inflow Depth = 1.11" for 1-Year event
 Inflow = 2.63 cfs @ 12.01 hrs, Volume= 0.139 af
 Outflow = 0.43 cfs @ 12.29 hrs, Volume= 0.139 af, Atten= 84%, Lag= 17.0 min
 Primary = 0.43 cfs @ 12.29 hrs, Volume= 0.139 af

Routing by Stor-Ind method, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
 Peak Elev= 574.54' @ 12.29 hrs Surf.Area= 5,881 sf Storage= 2,922 cf

Plug-Flow detention time= 615.0 min calculated for 0.139 af (100% of inflow)
 Center-of-Mass det. time= 615.0 min (1,433.7 - 818.7)

Volume	Invert	Avail.Storage	Storage Description
#1	574.00'	9,318 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
574.00	4,851	0	0
575.00	6,743	5,797	5,797
575.50	7,342	3,521	9,318

Device	Routing	Invert	Outlet Devices
#1	Primary	571.41'	12.0" Round 8" pipe L= 132.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 571.41' / 570.75' S= 0.0050 ' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Device 1	574.50'	8.0" Horiz. Grate X 6.00 C= 0.600 Limited to weir flow at low heads
#3	Device 1	574.00'	0.250 in/hr Exfiltration over Surface area Conductivity to Groundwater Elevation = 560.00'
#4	Primary	574.75'	24.0" W x 24.0" H Vert. grate (overflow) C= 0.600

Primary OutFlow Max=0.42 cfs @ 12.29 hrs HW=574.54' (Free Discharge)

1=8" pipe (Passes 0.42 cfs of 4.43 cfs potential flow)

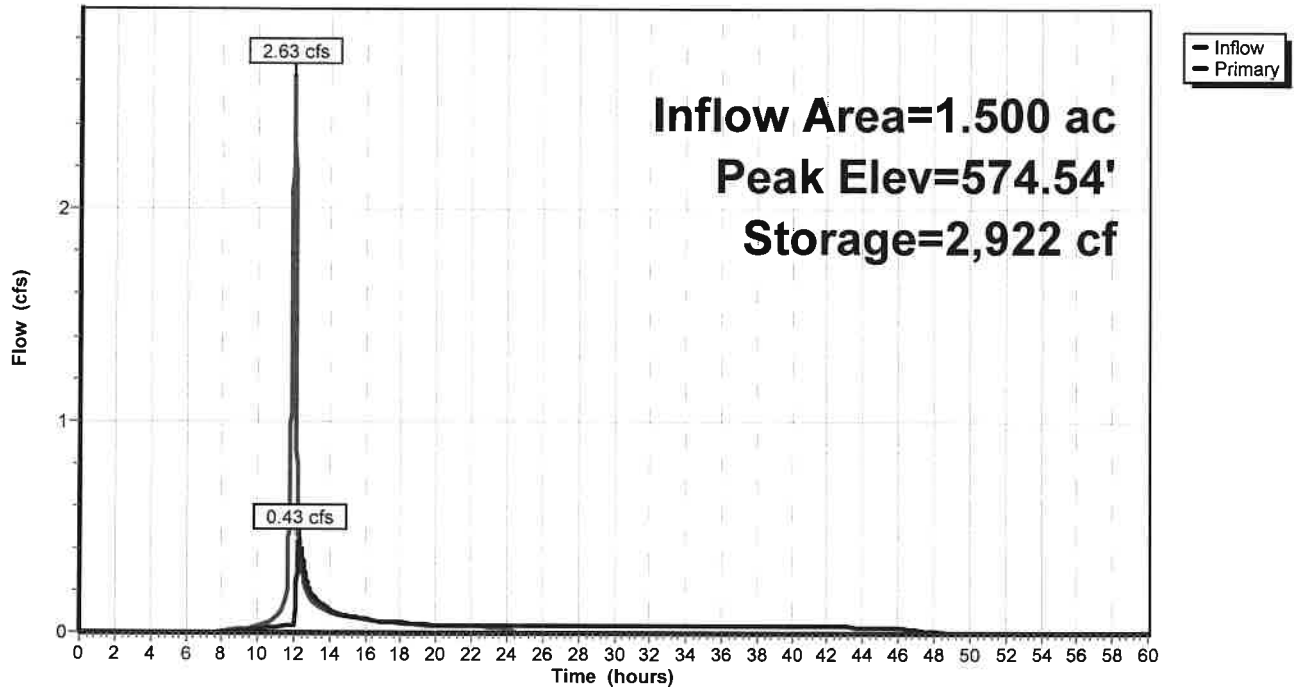
2=Grate (Weir Controls 0.39 cfs @ 0.69 fps)

3=Exfiltration (Controls 0.04 cfs)

4=grate (overflow) (Controls 0.00 cfs)

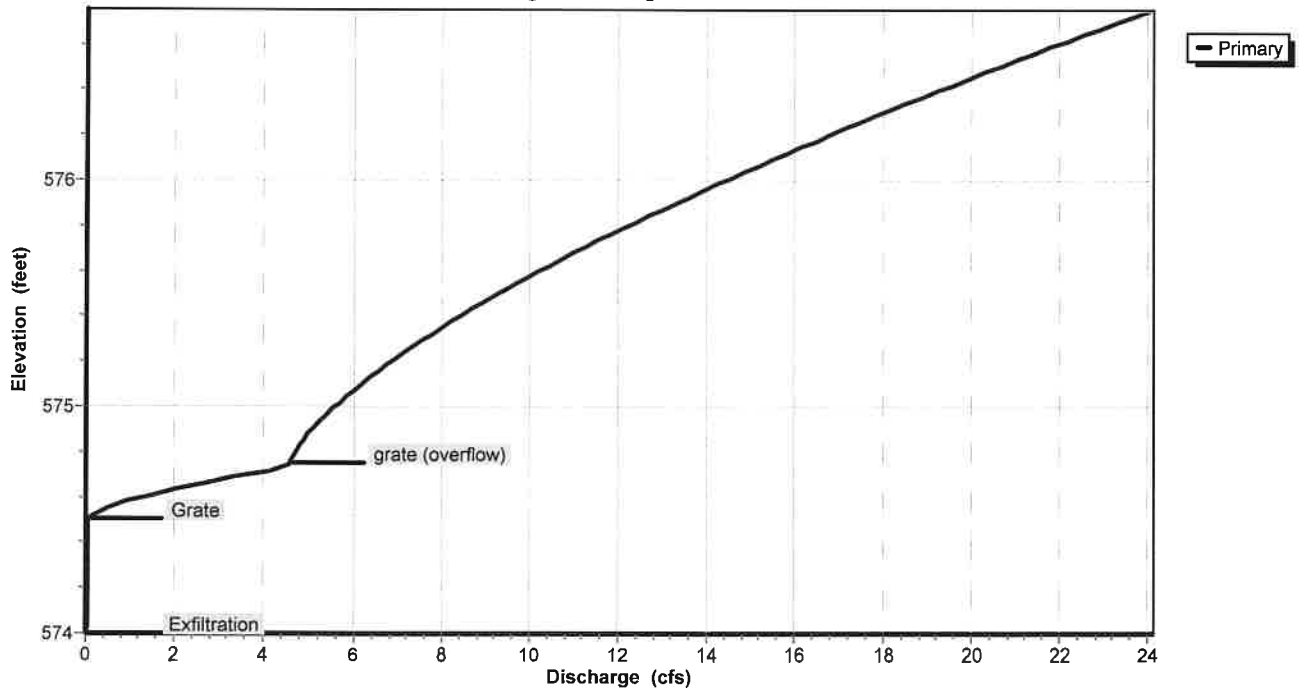
Pond 9P: Bioretention Area 3

Hydrograph

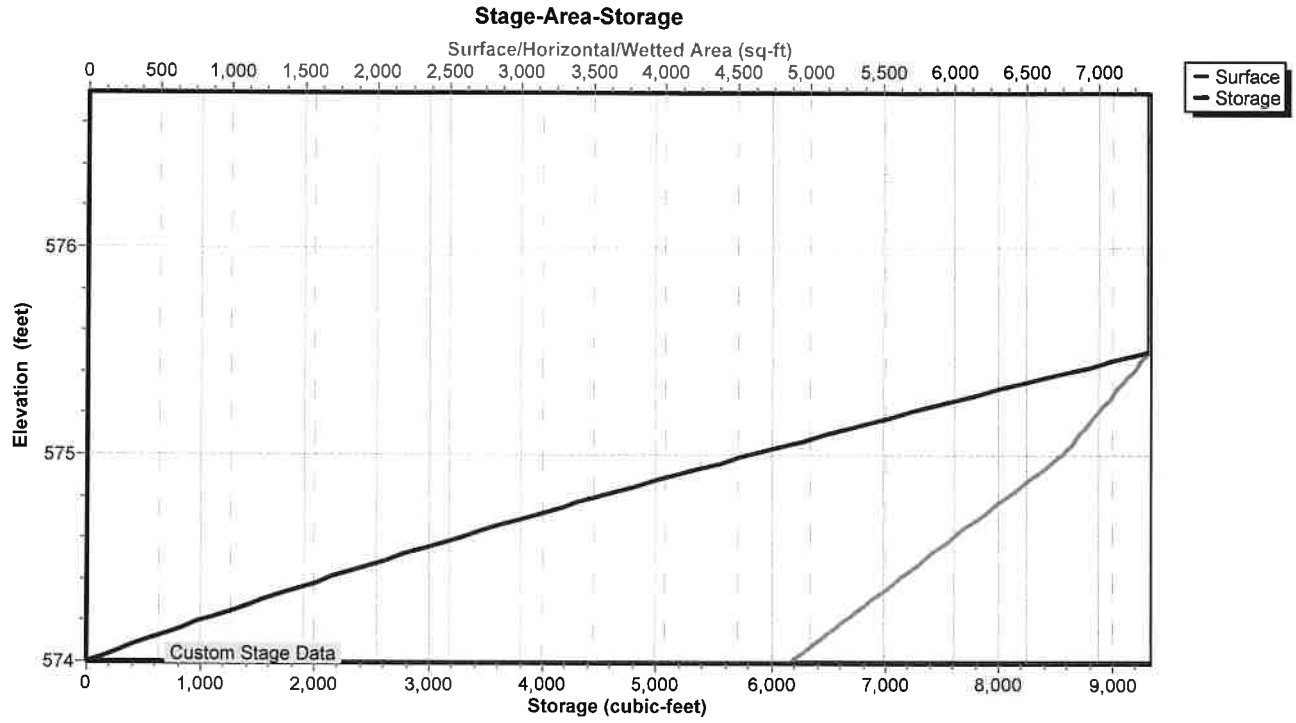


Pond 9P: Bioretention Area 3

Stage-Discharge



Pond 9P: Bioretention Area 3



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Hydrograph for Pond 9P: Bioretention Area 3

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
0.00	0.00	0	574.00	0.00
2.00	0.00	0	574.00	0.00
4.00	0.00	0	574.00	0.00
6.00	0.00	0	574.00	0.00
8.00	0.01	9	574.00	0.00
10.00	0.03	70	574.01	0.01
12.00	2.63	1,806	574.35	0.03
14.00	0.09	2,731	574.51	0.11
16.00	0.06	2,688	574.50	0.06
18.00	0.04	2,673	574.50	0.05
20.00	0.03	2,662	574.50	0.03
22.00	0.03	2,636	574.50	0.03
24.00	0.03	2,594	574.49	0.03
26.00	0.00	2,362	574.45	0.03
28.00	0.00	2,119	574.40	0.03
30.00	0.00	1,881	574.36	0.03
32.00	0.00	1,647	574.32	0.03
34.00	0.00	1,417	574.28	0.03
36.00	0.00	1,190	574.23	0.03
38.00	0.00	968	574.19	0.03
40.00	0.00	750	574.15	0.03
42.00	0.00	536	574.11	0.03
44.00	0.00	326	574.07	0.03
46.00	0.00	120	574.02	0.03
48.00	0.00	26	574.01	0.01
50.00	0.00	6	574.00	0.00
52.00	0.00	1	574.00	0.00
54.00	0.00	0	574.00	0.00
56.00	0.00	0	574.00	0.00
58.00	0.00	0	574.00	0.00
60.00	0.00	0	574.00	0.00

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Stage-Discharge for Pond 9P: Bioretention Area 3

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
574.00	0.00	575.04	5.81	576.08	15.37
574.02	0.03	575.06	5.93	576.10	15.60
574.04	0.03	575.08	6.06	576.12	15.84
574.06	0.03	575.10	6.18	576.14	16.08
574.08	0.03	575.12	6.31	576.16	16.32
574.10	0.03	575.14	6.45	576.18	16.56
574.12	0.03	575.16	6.58	576.20	16.81
574.14	0.03	575.18	6.72	576.22	17.05
574.16	0.03	575.20	6.87	576.24	17.30
574.18	0.03	575.22	7.01	576.26	17.55
574.20	0.03	575.24	7.16	576.28	17.80
574.22	0.03	575.26	7.31	576.30	18.05
574.24	0.03	575.28	7.46	576.32	18.30
574.26	0.03	575.30	7.62	576.34	18.56
574.28	0.03	575.32	7.78	576.36	18.81
574.30	0.03	575.34	7.94	576.38	19.07
574.32	0.03	575.36	8.10	576.40	19.33
574.34	0.03	575.38	8.26	576.42	19.59
574.36	0.03	575.40	8.43	576.44	19.85
574.38	0.03	575.42	8.60	576.46	20.11
574.40	0.03	575.44	8.78	576.48	20.38
574.42	0.03	575.46	8.95	576.50	20.64
574.44	0.03	575.48	9.13	576.52	20.91
574.46	0.03	575.50	9.31	576.54	21.18
574.48	0.03	575.52	9.49	576.56	21.45
574.50	0.03	575.54	9.67	576.58	21.72
574.52	0.15	575.56	9.86	576.60	22.00
574.54	0.36	575.58	10.05	576.62	22.27
574.56	0.64	575.60	10.24	576.64	22.55
574.58	0.97	575.62	10.43	576.66	22.83
574.60	1.34	575.64	10.62	576.68	23.10
574.62	1.74	575.66	10.82	576.70	23.38
574.64	2.19	575.68	11.02	576.72	23.67
574.66	2.67	575.70	11.22	576.74	23.95
574.68	3.18	575.72	11.42		
574.70	3.71	575.74	11.62		
574.72	4.28	575.76	11.83		
574.74	4.59	575.78	12.04		
574.76	4.61	575.80	12.25		
574.78	4.65	575.82	12.46		
574.80	4.70	575.84	12.67		
574.82	4.77	575.86	12.89		
574.84	4.84	575.88	13.10		
574.86	4.91	575.90	13.32		
574.88	4.99	575.92	13.54		
574.90	5.08	575.94	13.76		
574.92	5.17	575.96	13.99		
574.94	5.27	575.98	14.21		
574.96	5.37	576.00	14.44		
574.98	5.48	576.02	14.67		
575.00	5.59	576.04	14.90		
575.02	5.70	576.06	15.13		

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Type II 24-hr 1-Year Rainfall=1.86"

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Stage-Area-Storage for Pond 9P: Bioretention Area 3

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
574.00	4,851	0	576.60	7,342	9,318
574.05	4,946	245	576.65	7,342	9,318
574.10	5,040	495	576.70	7,342	9,318
574.15	5,135	749	576.75	7,342	9,318
574.20	5,229	1,008			
574.25	5,324	1,272			
574.30	5,419	1,540			
574.35	5,513	1,814			
574.40	5,608	2,092			
574.45	5,702	2,375			
574.50	5,797	2,662			
574.55	5,892	2,954			
574.60	5,986	3,251			
574.65	6,081	3,553			
574.70	6,175	3,859			
574.75	6,270	4,170			
574.80	6,365	4,486			
574.85	6,459	4,807			
574.90	6,554	5,132			
574.95	6,648	5,462			
575.00	6,743	5,797			
575.05	6,803	6,136			
575.10	6,863	6,477			
575.15	6,923	6,822			
575.20	6,983	7,170			
575.25	7,043	7,520			
575.30	7,102	7,874			
575.35	7,162	8,230			
575.40	7,222	8,590			
575.45	7,282	8,953			
575.50	7,342	9,318			
575.55	7,342	9,318			
575.60	7,342	9,318			
575.65	7,342	9,318			
575.70	7,342	9,318			
575.75	7,342	9,318			
575.80	7,342	9,318			
575.85	7,342	9,318			
575.90	7,342	9,318			
575.95	7,342	9,318			
576.00	7,342	9,318			
576.05	7,342	9,318			
576.10	7,342	9,318			
576.15	7,342	9,318			
576.20	7,342	9,318			
576.25	7,342	9,318			
576.30	7,342	9,318			
576.35	7,342	9,318			
576.40	7,342	9,318			
576.45	7,342	9,318			
576.50	7,342	9,318			
576.55	7,342	9,318			

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Type II 24-hr 2-Year Rainfall=2.20"

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Time span=0.00-60.00 hrs, dt=0.01 hrs, 6001 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 8S: Front Area 2 Runoff Area=1.700 ac 58.82% Impervious Runoff Depth=1.34"
Flow Length=1,325' Slope=0.0100 '/' Tc=14.1 min CN=91 Runoff=3.03 cfs 0.190 af

Subcatchment 10S: Rear Area 2 Runoff Area=1.500 ac 66.67% Impervious Runoff Depth=1.42"
Flow Length=345' Tc=9.1 min CN=92 Runoff=3.32 cfs 0.177 af

Pond 7P: Underground Storage (SMA #2) Peak Elev=570.46' Storage=5,990 cf Inflow=4.15 cfs 0.367 af
Outflow=0.68 cfs 0.324 af

Pond 9P: Bioretention Area 3 Peak Elev=574.60' Storage=3,274 cf Inflow=3.32 cfs 0.177 af
Outflow=1.41 cfs 0.177 af

Total Runoff Area = 3.200 ac Runoff Volume = 0.367 af Average Runoff Depth = 1.38"
37.50% Pervious = 1.200 ac 62.50% Impervious = 2.000 ac

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Type II 24-hr 2-Year Rainfall=2.20"

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Summary for Subcatchment 8S: Front Area 2

Runoff = 3.03 cfs @ 12.06 hrs, Volume= 0.190 af, Depth= 1.34"

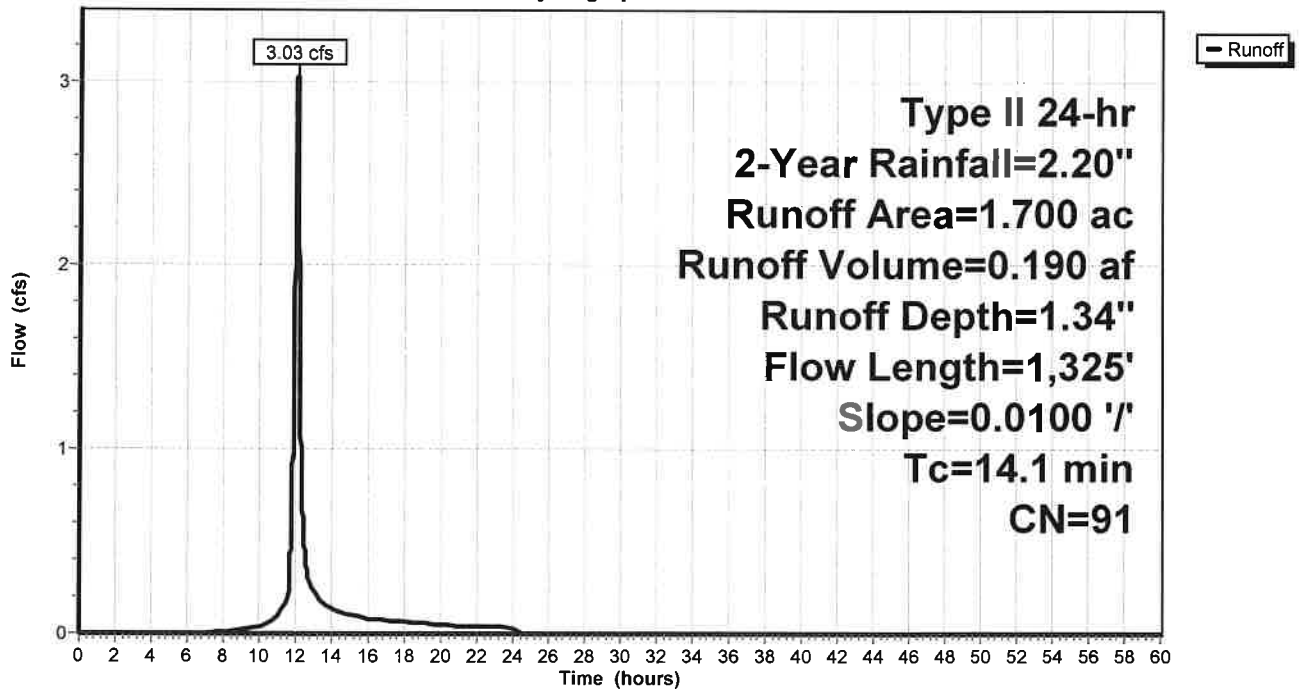
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
Type II 24-hr 2-Year Rainfall=2.20"

Area (ac)	CN	Description
0.700	98	Paved parking, HSG D
0.300	98	Roofs, HSG D
0.700	80	>75% Grass cover, Good, HSG D
1.700	91	Weighted Average
0.700		41.18% Pervious Area
1.000		58.82% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.0	40	0.0100	0.09		Sheet Flow, grass
7.1	1,285		3.00		Grass: Short n= 0.150 P2= 2.50"
14.1	1,325	Total			Direct Entry, Pipe flow

Subcatchment 8S: Front Area 2

Hydrograph



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Hydrograph for Subcatchment 8S: Front Area 2

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	52.00	2.20	1.34	0.00
1.00	0.02	0.00	0.00	53.00	2.20	1.34	0.00
2.00	0.05	0.00	0.00	54.00	2.20	1.34	0.00
3.00	0.08	0.00	0.00	55.00	2.20	1.34	0.00
4.00	0.11	0.00	0.00	56.00	2.20	1.34	0.00
5.00	0.14	0.00	0.00	57.00	2.20	1.34	0.00
6.00	0.18	0.00	0.00	58.00	2.20	1.34	0.00
7.00	0.22	0.00	0.00	59.00	2.20	1.34	0.00
8.00	0.26	0.00	0.01	60.00	2.20	1.34	0.00
9.00	0.32	0.01	0.02				
10.00	0.40	0.03	0.04				
11.00	0.52	0.08	0.10				
12.00	1.46	0.71	2.64				
13.00	1.70	0.90	0.23				
14.00	1.80	0.99	0.13				
15.00	1.88	1.06	0.10				
16.00	1.94	1.11	0.08				
17.00	1.98	1.15	0.07				
18.00	2.03	1.19	0.06				
19.00	2.06	1.22	0.05				
20.00	2.09	1.25	0.05				
21.00	2.12	1.27	0.04				
22.00	2.15	1.30	0.04				
23.00	2.18	1.32	0.04				
24.00	2.20	1.34	0.04				
25.00	2.20	1.34	0.00				
26.00	2.20	1.34	0.00				
27.00	2.20	1.34	0.00				
28.00	2.20	1.34	0.00				
29.00	2.20	1.34	0.00				
30.00	2.20	1.34	0.00				
31.00	2.20	1.34	0.00				
32.00	2.20	1.34	0.00				
33.00	2.20	1.34	0.00				
34.00	2.20	1.34	0.00				
35.00	2.20	1.34	0.00				
36.00	2.20	1.34	0.00				
37.00	2.20	1.34	0.00				
38.00	2.20	1.34	0.00				
39.00	2.20	1.34	0.00				
40.00	2.20	1.34	0.00				
41.00	2.20	1.34	0.00				
42.00	2.20	1.34	0.00				
43.00	2.20	1.34	0.00				
44.00	2.20	1.34	0.00				
45.00	2.20	1.34	0.00				
46.00	2.20	1.34	0.00				
47.00	2.20	1.34	0.00				
48.00	2.20	1.34	0.00				
49.00	2.20	1.34	0.00				
50.00	2.20	1.34	0.00				
51.00	2.20	1.34	0.00				

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Type II 24-hr 2-Year Rainfall=2.20"

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Summary for Subcatchment 10S: Rear Area 2

Runoff = 3.32 cfs @ 12.00 hrs, Volume= 0.177 af, Depth= 1.42"

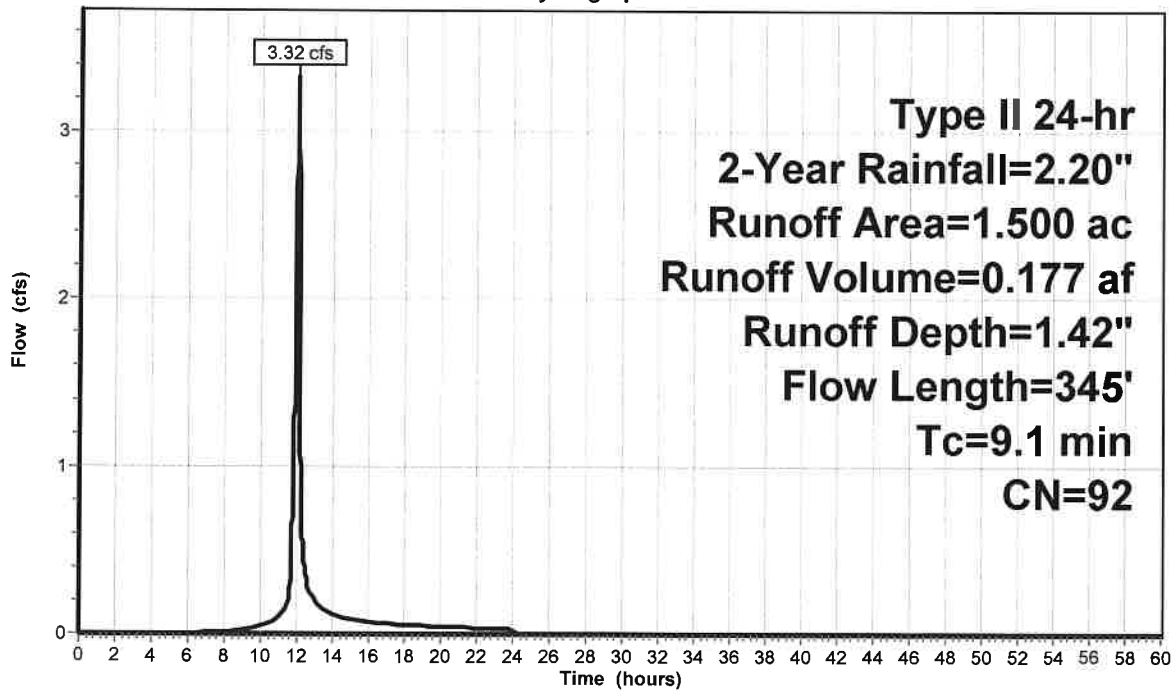
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
Type II 24-hr 2-Year Rainfall=2.20"

Area (ac)	CN	Description
0.500	98	Paved parking, HSG D
0.500	98	Roofs, HSG D
0.500	80	>75% Grass cover, Good, HSG D
1.500	92	Weighted Average
0.500		33.33% Pervious Area
1.000		66.67% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.9	55	0.0200	0.13		Sheet Flow, grass Grass: Short n= 0.150 P2= 2.50"
0.8	45	0.0170	0.97		Sheet Flow, pavement Smooth surfaces n= 0.011 P2= 2.50"
1.4	245		3.00		Direct Entry, Pipe flow
9.1	345	Total			

Subcatchment 10S: Rear Area 2

Hydrograph



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Type II 24-hr 2-Year Rainfall=2.20"

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Hydrograph for Subcatchment 10S: Rear Area 2

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	52.00	2.20	1.42	0.00
1.00	0.02	0.00	0.00	53.00	2.20	1.42	0.00
2.00	0.05	0.00	0.00	54.00	2.20	1.42	0.00
3.00	0.08	0.00	0.00	55.00	2.20	1.42	0.00
4.00	0.11	0.00	0.00	56.00	2.20	1.42	0.00
5.00	0.14	0.00	0.00	57.00	2.20	1.42	0.00
6.00	0.18	0.00	0.00	58.00	2.20	1.42	0.00
7.00	0.22	0.00	0.01	59.00	2.20	1.42	0.00
8.00	0.26	0.01	0.01	60.00	2.20	1.42	0.00
9.00	0.32	0.02	0.03				
10.00	0.40	0.05	0.04				
11.00	0.52	0.10	0.10				
12.00	1.46	0.77	3.32				
13.00	1.70	0.97	0.20				
14.00	1.80	1.06	0.12				
15.00	1.88	1.13	0.09				
16.00	1.94	1.18	0.07				
17.00	1.98	1.22	0.06				
18.00	2.03	1.26	0.05				
19.00	2.06	1.29	0.05				
20.00	2.09	1.32	0.04				
21.00	2.12	1.35	0.04				
22.00	2.15	1.37	0.04				
23.00	2.18	1.40	0.03				
24.00	2.20	1.42	0.03				
25.00	2.20	1.42	0.00				
26.00	2.20	1.42	0.00				
27.00	2.20	1.42	0.00				
28.00	2.20	1.42	0.00				
29.00	2.20	1.42	0.00				
30.00	2.20	1.42	0.00				
31.00	2.20	1.42	0.00				
32.00	2.20	1.42	0.00				
33.00	2.20	1.42	0.00				
34.00	2.20	1.42	0.00				
35.00	2.20	1.42	0.00				
36.00	2.20	1.42	0.00				
37.00	2.20	1.42	0.00				
38.00	2.20	1.42	0.00				
39.00	2.20	1.42	0.00				
40.00	2.20	1.42	0.00				
41.00	2.20	1.42	0.00				
42.00	2.20	1.42	0.00				
43.00	2.20	1.42	0.00				
44.00	2.20	1.42	0.00				
45.00	2.20	1.42	0.00				
46.00	2.20	1.42	0.00				
47.00	2.20	1.42	0.00				
48.00	2.20	1.42	0.00				
49.00	2.20	1.42	0.00				
50.00	2.20	1.42	0.00				
51.00	2.20	1.42	0.00				

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Type II 24-hr 2-Year Rainfall=2.20"

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Summary for Pond 7P: Underground Storage (SMA #2)

Inflow Area = 3.200 ac, 62.50% Impervious, Inflow Depth = 1.38" for 2-Year event
 Inflow = 4.15 cfs @ 12.10 hrs, Volume= 0.367 af
 Outflow = 0.68 cfs @ 12.65 hrs, Volume= 0.324 af, Atten= 84%, Lag= 33.2 min
 Primary = 0.68 cfs @ 12.65 hrs, Volume= 0.324 af

Routing by Stor-Ind method, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
 Peak Elev= 570.46' @ 12.65 hrs Surf.Area= 10,145 sf Storage= 5,990 cf

Plug-Flow detention time= 401.0 min calculated for 0.324 af (88% of inflow)
 Center-of-Mass det. time= 229.7 min (1,287.9 - 1,058.2)

Volume	Invert	Avail.Storage	Storage Description
#1A	569.50'	8,947 cf	53.75'W x 188.74'L x 3.50'H Field A 35,506 cf Overall - 13,139 cf Embedded = 22,367 cf x 40.0% Voids
#2A	570.00'	13,139 cf	ADS_StormTech SC-740 +Cap x 286 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 11 Rows of 26 Chambers
		22,086 cf	Total Available Storage

Storage Group A created with Chamber Wizard

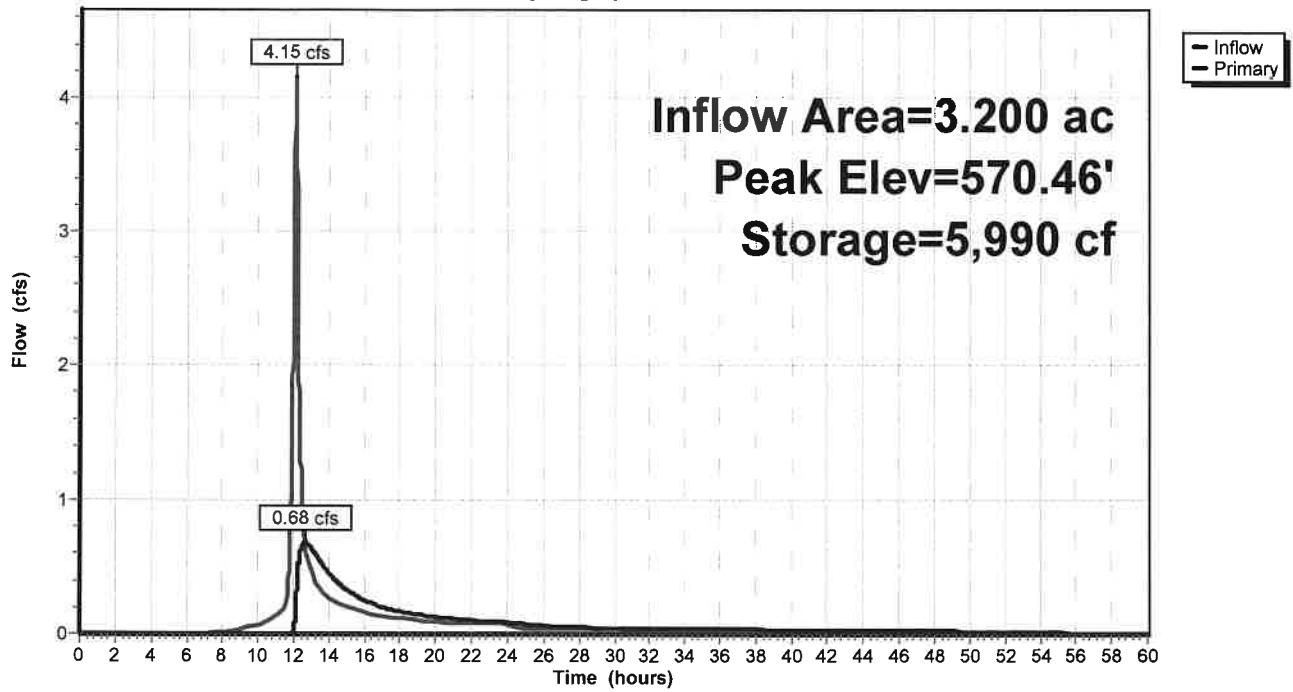
Device	Routing	Invert	Outlet Devices
#1	Primary	569.93'	12.0" Round Culvert L= 72.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 569.93' / 569.71' S= 0.0031 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Device 1	569.93'	4.0" Vert. Orifice X 3.00 C= 0.600
#3	Device 1	572.00'	5.0' long Weir 2 End Contraction(s)

Primary OutFlow Max=0.68 cfs @ 12.65 hrs HW=570.46' (Free Discharge)

1=Culvert (Barrel Controls 0.68 cfs @ 2.31 fps)
 2=Orifice (Passes 0.68 cfs of 0.76 cfs potential flow)
 3=Weir (Controls 0.00 cfs)

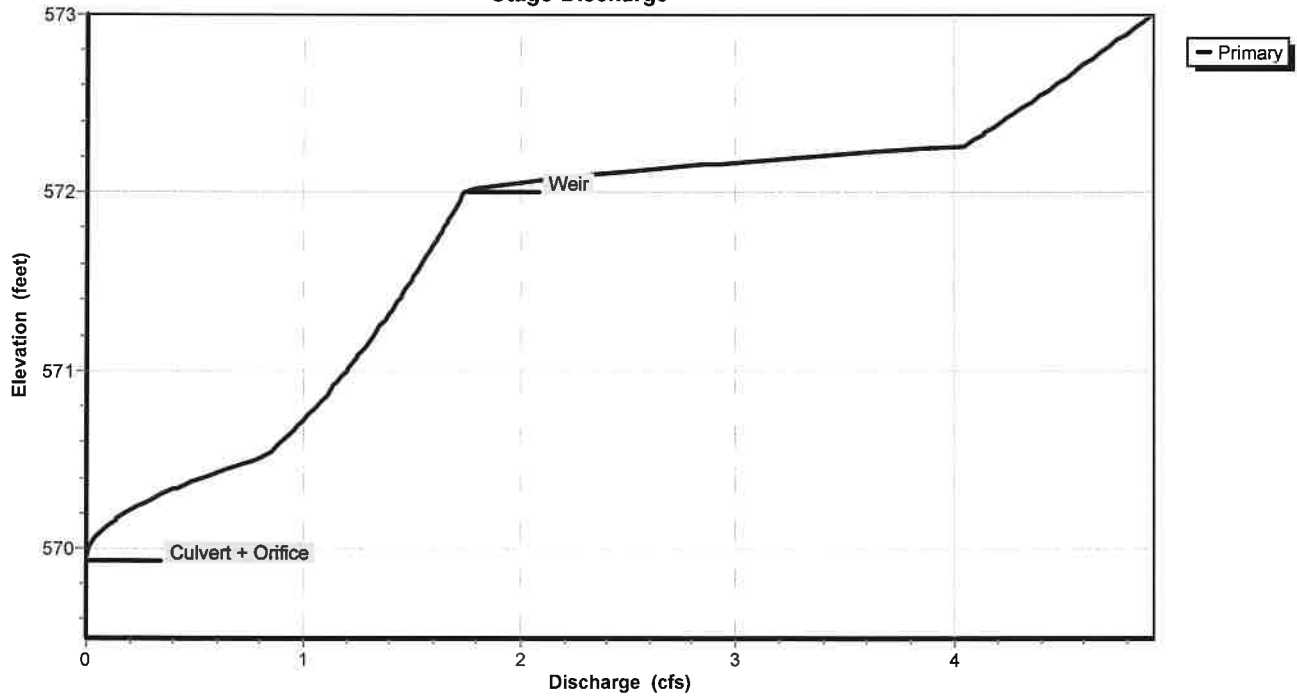
Pond 7P: Underground Storage (SMA #2)

Hydrograph



Pond 7P: Underground Storage (SMA #2)

Stage-Discharge



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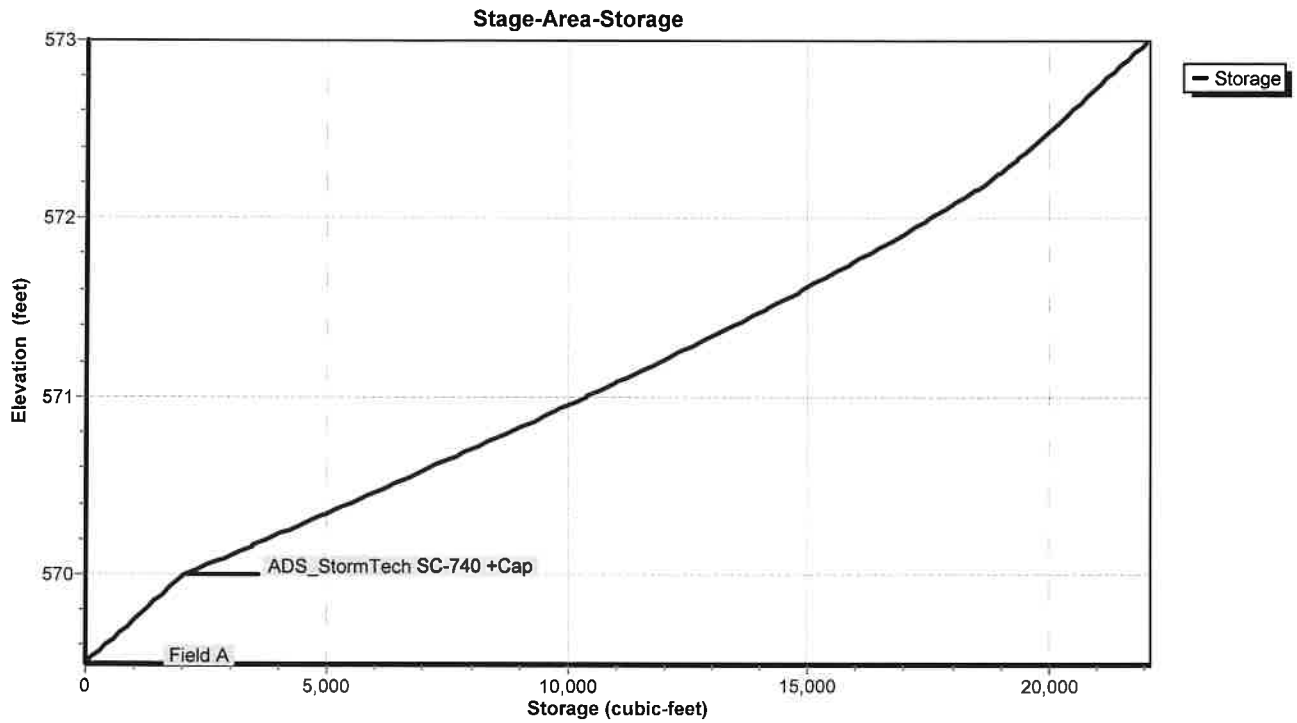
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Type II 24-hr 2-Year Rainfall=2.20"

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Pond 7P: Underground Storage (SMA #2)



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Hydrograph for Pond 7P: Underground Storage (SMA #2)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
0.00	0.00	0	569.50	0.00
2.00	0.00	0	569.50	0.00
4.00	0.00	0	569.50	0.00
6.00	0.00	0	569.50	0.00
8.00	0.01	32	569.51	0.00
10.00	0.06	286	569.57	0.00
12.00	2.68	2,414	570.04	0.03
14.00	0.27	5,111	570.36	0.45
16.00	0.16	4,155	570.25	0.25
18.00	0.12	3,660	570.19	0.17
20.00	0.09	3,359	570.15	0.12
22.00	0.08	3,149	570.13	0.10
24.00	0.07	3,029	570.12	0.09
26.00	0.03	2,788	570.09	0.06
28.00	0.03	2,647	570.07	0.05
30.00	0.03	2,566	570.06	0.04
32.00	0.03	2,517	570.06	0.04
34.00	0.03	2,484	570.05	0.04
36.00	0.03	2,459	570.05	0.03
38.00	0.03	2,441	570.05	0.03
40.00	0.03	2,426	570.05	0.03
42.00	0.03	2,413	570.04	0.03
44.00	0.03	2,402	570.04	0.03
46.00	0.03	2,392	570.04	0.03
48.00	0.01	2,323	570.03	0.03
50.00	0.00	2,199	570.02	0.02
52.00	0.00	2,091	570.01	0.01
54.00	0.00	2,010	570.00	0.01
56.00	0.00	1,957	569.98	0.01
58.00	0.00	1,919	569.97	0.00
60.00	0.00	1,891	569.97	0.00

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Type II 24-hr 2-Year Rainfall=2.20"

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Stage-Discharge for Pond 7P: Underground Storage (SMA #2)

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
569.50	0.00	570.54	0.84	571.58	1.54	572.62	4.49
569.52	0.00	570.56	0.86	571.60	1.55	572.64	4.52
569.54	0.00	570.58	0.88	571.62	1.56	572.66	4.54
569.56	0.00	570.60	0.89	571.64	1.57	572.68	4.56
569.58	0.00	570.62	0.91	571.66	1.58	572.70	4.58
569.60	0.00	570.64	0.93	571.68	1.59	572.72	4.61
569.62	0.00	570.66	0.95	571.70	1.60	572.74	4.63
569.64	0.00	570.68	0.96	571.72	1.61	572.76	4.65
569.66	0.00	570.70	0.98	571.74	1.62	572.78	4.68
569.68	0.00	570.72	1.00	571.76	1.63	572.80	4.70
569.70	0.00	570.74	1.01	571.78	1.64	572.82	4.72
569.72	0.00	570.76	1.03	571.80	1.65	572.84	4.74
569.74	0.00	570.78	1.04	571.82	1.65	572.86	4.77
569.76	0.00	570.80	1.06	571.84	1.66	572.88	4.79
569.78	0.00	570.82	1.07	571.86	1.67	572.90	4.81
569.80	0.00	570.84	1.09	571.88	1.68	572.92	4.83
569.82	0.00	570.86	1.10	571.90	1.69	572.94	4.85
569.84	0.00	570.88	1.12	571.92	1.70	572.96	4.88
569.86	0.00	570.90	1.13	571.94	1.71	572.98	4.90
569.88	0.00	570.92	1.14	571.96	1.72	573.00	4.92
569.90	0.00	570.94	1.16	571.98	1.73		
569.92	0.00	570.96	1.17	572.00	1.74		
569.94	0.00	570.98	1.18	572.02	1.79		
569.96	0.00	571.00	1.20	572.04	1.89		
569.98	0.01	571.02	1.21	572.06	2.01		
570.00	0.01	571.04	1.22	572.08	2.14		
570.02	0.02	571.06	1.24	572.10	2.30		
570.04	0.03	571.08	1.25	572.12	2.47		
570.06	0.04	571.10	1.26	572.14	2.65		
570.08	0.05	571.12	1.28	572.16	2.85		
570.10	0.07	571.14	1.29	572.18	3.06		
570.12	0.09	571.16	1.30	572.20	3.28		
570.14	0.11	571.18	1.31	572.22	3.51		
570.16	0.13	571.20	1.32	572.24	3.75		
570.18	0.15	571.22	1.34	572.26	4.00		
570.20	0.18	571.24	1.35	572.28	4.07		
570.22	0.21	571.26	1.36	572.30	4.10		
570.24	0.24	571.28	1.37	572.32	4.12		
570.26	0.27	571.30	1.38	572.34	4.15		
570.28	0.30	571.32	1.39	572.36	4.17		
570.30	0.34	571.34	1.41	572.38	4.20		
570.32	0.37	571.36	1.42	572.40	4.23		
570.34	0.41	571.38	1.43	572.42	4.25		
570.36	0.45	571.40	1.44	572.44	4.27		
570.38	0.49	571.42	1.45	572.46	4.30		
570.40	0.53	571.44	1.46	572.48	4.32		
570.42	0.58	571.46	1.47	572.50	4.35		
570.44	0.62	571.48	1.48	572.52	4.37		
570.46	0.67	571.50	1.49	572.54	4.40		
570.48	0.72	571.52	1.50	572.56	4.42		
570.50	0.76	571.54	1.51	572.58	4.44		
570.52	0.81	571.56	1.52	572.60	4.47		

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Type II 24-hr 2-Year Rainfall=2.20"

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Stage-Area-Storage for Pond 7P: Underground Storage (SMA #2)

Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)
569.50	0	572.10	18,133
569.55	203	572.15	18,417
569.60	406	572.20	18,690
569.65	609	572.25	18,946
569.70	812	572.30	19,188
569.75	1,014	572.35	19,417
569.80	1,217	572.40	19,637
569.85	1,420	572.45	19,850
569.90	1,623	572.50	20,057
569.95	1,826	572.55	20,260
570.00	2,029	572.60	20,463
570.05	2,459	572.65	20,665
570.10	2,889	572.70	20,868
570.15	3,318	572.75	21,071
570.20	3,746	572.80	21,274
570.25	4,173	572.85	21,477
570.30	4,598	572.90	21,680
570.35	5,022	572.95	21,883
570.40	5,444	573.00	22,086
570.45	5,865		
570.50	6,284		
570.55	6,701		
570.60	7,116		
570.65	7,529		
570.70	7,940		
570.75	8,349		
570.80	8,756		
570.85	9,160		
570.90	9,562		
570.95	9,962		
571.00	10,359		
571.05	10,754		
571.10	11,145		
571.15	11,534		
571.20	11,919		
571.25	12,301		
571.30	12,680		
571.35	13,056		
571.40	13,428		
571.45	13,797		
571.50	14,161		
571.55	14,522		
571.60	14,879		
571.65	15,230		
571.70	15,577		
571.75	15,917		
571.80	16,252		
571.85	16,582		
571.90	16,906		
571.95	17,224		
572.00	17,535		
572.05	17,838		

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Summary for Pond 9P: Bioretention Area 3

Inflow Area = 1.500 ac, 66.67% Impervious, Inflow Depth = 1.42" for 2-Year event
 Inflow = 3.32 cfs @ 12.00 hrs, Volume= 0.177 af
 Outflow = 1.41 cfs @ 12.13 hrs, Volume= 0.177 af, Atten= 58%, Lag= 7.6 min
 Primary = 1.41 cfs @ 12.13 hrs, Volume= 0.177 af

Routing by Stor-Ind method, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
 Peak Elev= 574.60' @ 12.13 hrs Surf.Area= 5,993 sf Storage= 3,274 cf

Plug-Flow detention time= 499.6 min calculated for 0.177 af (100% of inflow)
 Center-of-Mass det. time= 499.8 min (1,311.6 - 811.8)

Volume	Invert	Avail.Storage	Storage Description
#1	574.00'	9,318 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
574.00	4,851	0	0
575.00	6,743	5,797	5,797
575.50	7,342	3,521	9,318

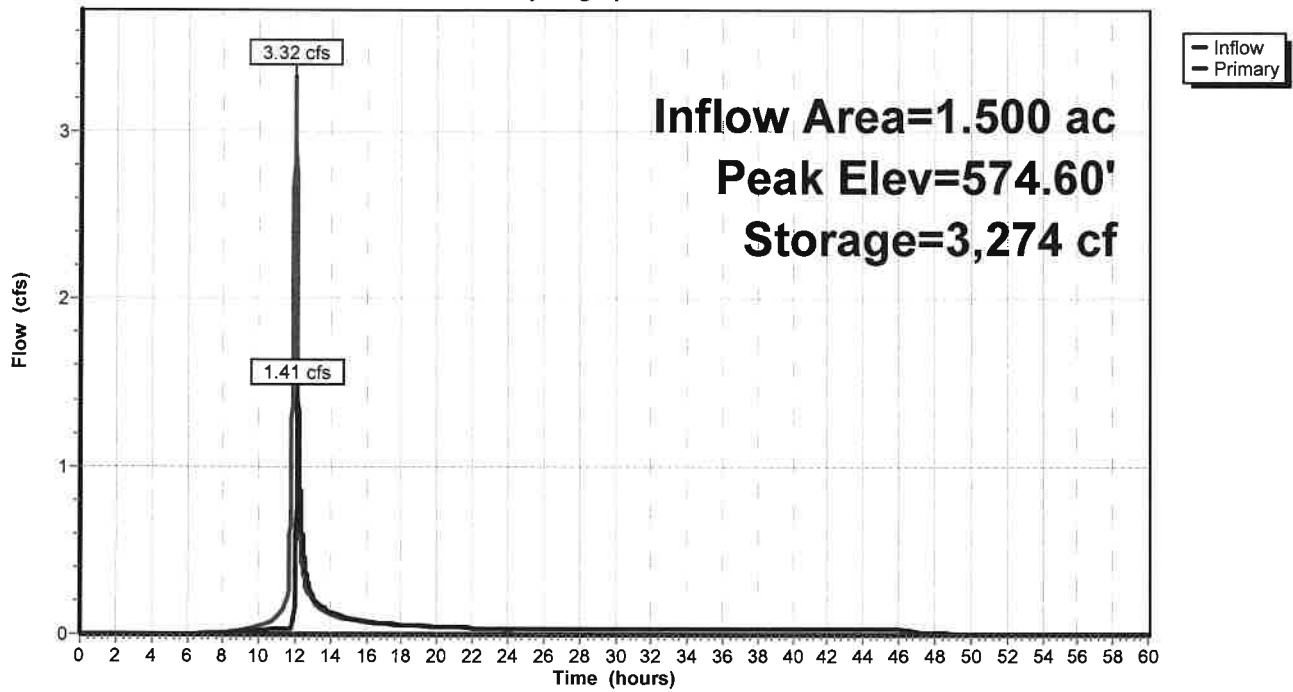
Device	Routing	Invert	Outlet Devices
#1	Primary	571.41'	12.0" Round 8" pipe L= 132.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 571.41' / 570.75' S= 0.0050 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Device 1	574.50'	8.0" Horiz. Grate X 6.00 C= 0.600 Limited to weir flow at low heads
#3	Device 1	574.00'	0.250 in/hr Exfiltration over Surface area Conductivity to Groundwater Elevation = 560.00'
#4	Primary	574.75'	24.0" W x 24.0" H Vert. grate (overflow) C= 0.600

Primary OutFlow Max=1.41 cfs @ 12.13 hrs HW=574.60' (Free Discharge)

- 1=8" pipe (Passes 1.41 cfs of 4.48 cfs potential flow)
- 2=Grate (Weir Controls 1.37 cfs @ 1.05 fps)
- 3=Exfiltration (Controls 0.04 cfs)
- 4=grate (overflow) (Controls 0.00 cfs)

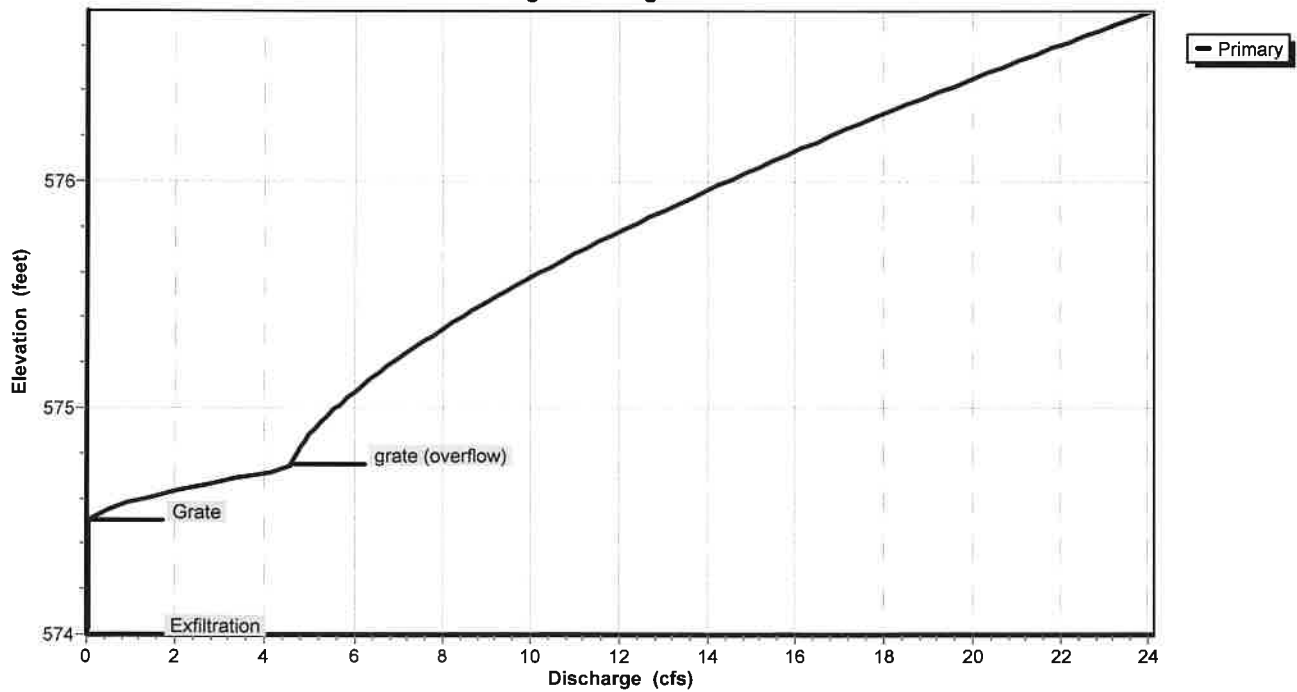
Pond 9P: Bioretention Area 3

Hydrograph

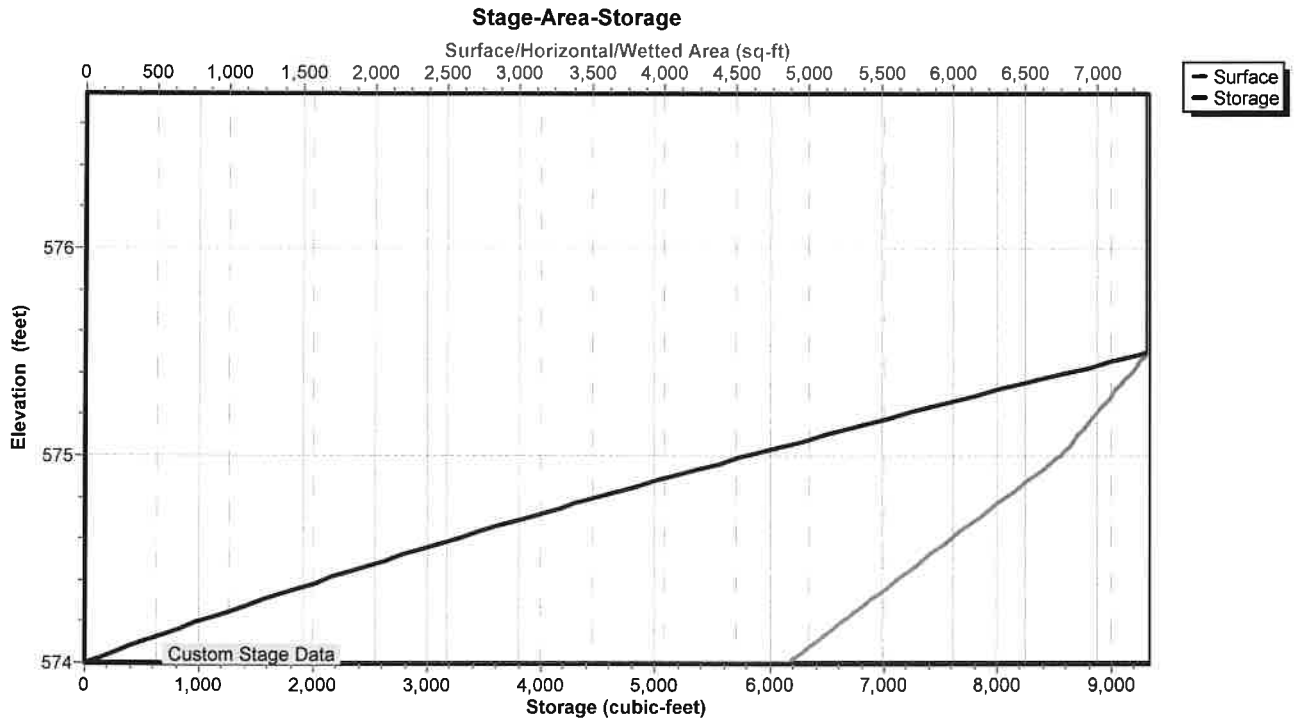


Pond 9P: Bioretention Area 3

Stage-Discharge



Pond 9P: Bioretention Area 3



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Hydrograph for Pond 9P: Bioretention Area 3

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
0.00	0.00	0	574.00	0.00
2.00	0.00	0	574.00	0.00
4.00	0.00	0	574.00	0.00
6.00	0.00	0	574.00	0.00
8.00	0.01	26	574.01	0.01
10.00	0.04	116	574.02	0.02
12.00	3.32	2,442	574.46	0.03
14.00	0.12	2,754	574.52	0.13
16.00	0.07	2,701	574.51	0.08
18.00	0.05	2,683	574.50	0.06
20.00	0.04	2,669	574.50	0.04
22.00	0.04	2,664	574.50	0.04
24.00	0.03	2,661	574.50	0.03
26.00	0.00	2,430	574.46	0.03
28.00	0.00	2,186	574.42	0.03
30.00	0.00	1,947	574.37	0.03
32.00	0.00	1,712	574.33	0.03
34.00	0.00	1,480	574.29	0.03
36.00	0.00	1,253	574.25	0.03
38.00	0.00	1,030	574.20	0.03
40.00	0.00	810	574.16	0.03
42.00	0.00	595	574.12	0.03
44.00	0.00	384	574.08	0.03
46.00	0.00	176	574.04	0.03
48.00	0.00	40	574.01	0.01
50.00	0.00	9	574.00	0.00
52.00	0.00	2	574.00	0.00
54.00	0.00	0	574.00	0.00
56.00	0.00	0	574.00	0.00
58.00	0.00	0	574.00	0.00
60.00	0.00	0	574.00	0.00

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Stage-Discharge for Pond 9P: Bioretention Area 3

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
574.00	0.00	575.04	5.81	576.08	15.37
574.02	0.03	575.06	5.93	576.10	15.60
574.04	0.03	575.08	6.06	576.12	15.84
574.06	0.03	575.10	6.18	576.14	16.08
574.08	0.03	575.12	6.31	576.16	16.32
574.10	0.03	575.14	6.45	576.18	16.56
574.12	0.03	575.16	6.58	576.20	16.81
574.14	0.03	575.18	6.72	576.22	17.05
574.16	0.03	575.20	6.87	576.24	17.30
574.18	0.03	575.22	7.01	576.26	17.55
574.20	0.03	575.24	7.16	576.28	17.80
574.22	0.03	575.26	7.31	576.30	18.05
574.24	0.03	575.28	7.46	576.32	18.30
574.26	0.03	575.30	7.62	576.34	18.56
574.28	0.03	575.32	7.78	576.36	18.81
574.30	0.03	575.34	7.94	576.38	19.07
574.32	0.03	575.36	8.10	576.40	19.33
574.34	0.03	575.38	8.26	576.42	19.59
574.36	0.03	575.40	8.43	576.44	19.85
574.38	0.03	575.42	8.60	576.46	20.11
574.40	0.03	575.44	8.78	576.48	20.38
574.42	0.03	575.46	8.95	576.50	20.64
574.44	0.03	575.48	9.13	576.52	20.91
574.46	0.03	575.50	9.31	576.54	21.18
574.48	0.03	575.52	9.49	576.56	21.45
574.50	0.03	575.54	9.67	576.58	21.72
574.52	0.15	575.56	9.86	576.60	22.00
574.54	0.36	575.58	10.05	576.62	22.27
574.56	0.64	575.60	10.24	576.64	22.55
574.58	0.97	575.62	10.43	576.66	22.83
574.60	1.34	575.64	10.62	576.68	23.10
574.62	1.74	575.66	10.82	576.70	23.38
574.64	2.19	575.68	11.02	576.72	23.67
574.66	2.67	575.70	11.22	576.74	23.95
574.68	3.18	575.72	11.42		
574.70	3.71	575.74	11.62		
574.72	4.28	575.76	11.83		
574.74	4.59	575.78	12.04		
574.76	4.61	575.80	12.25		
574.78	4.65	575.82	12.46		
574.80	4.70	575.84	12.67		
574.82	4.77	575.86	12.89		
574.84	4.84	575.88	13.10		
574.86	4.91	575.90	13.32		
574.88	4.99	575.92	13.54		
574.90	5.08	575.94	13.76		
574.92	5.17	575.96	13.99		
574.94	5.27	575.98	14.21		
574.96	5.37	576.00	14.44		
574.98	5.48	576.02	14.67		
575.00	5.59	576.04	14.90		
575.02	5.70	576.06	15.13		

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Type II 24-hr 2-Year Rainfall=2.20"

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Stage-Area-Storage for Pond 9P: Bioretention Area 3

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
574.00	4,851	0	576.60	7,342	9,318
574.05	4,946	245	576.65	7,342	9,318
574.10	5,040	495	576.70	7,342	9,318
574.15	5,135	749	576.75	7,342	9,318
574.20	5,229	1,008			
574.25	5,324	1,272			
574.30	5,419	1,540			
574.35	5,513	1,814			
574.40	5,608	2,092			
574.45	5,702	2,375			
574.50	5,797	2,662			
574.55	5,892	2,954			
574.60	5,986	3,251			
574.65	6,081	3,553			
574.70	6,175	3,859			
574.75	6,270	4,170			
574.80	6,365	4,486			
574.85	6,459	4,807			
574.90	6,554	5,132			
574.95	6,648	5,462			
575.00	6,743	5,797			
575.05	6,803	6,136			
575.10	6,863	6,477			
575.15	6,923	6,822			
575.20	6,983	7,170			
575.25	7,043	7,520			
575.30	7,102	7,874			
575.35	7,162	8,230			
575.40	7,222	8,590			
575.45	7,282	8,953			
575.50	7,342	9,318			
575.55	7,342	9,318			
575.60	7,342	9,318			
575.65	7,342	9,318			
575.70	7,342	9,318			
575.75	7,342	9,318			
575.80	7,342	9,318			
575.85	7,342	9,318			
575.90	7,342	9,318			
575.95	7,342	9,318			
576.00	7,342	9,318			
576.05	7,342	9,318			
576.10	7,342	9,318			
576.15	7,342	9,318			
576.20	7,342	9,318			
576.25	7,342	9,318			
576.30	7,342	9,318			
576.35	7,342	9,318			
576.40	7,342	9,318			
576.45	7,342	9,318			
576.50	7,342	9,318			
576.55	7,342	9,318			

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Type II 24-hr 5-Year Rainfall=2.70"

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Time span=0.00-60.00 hrs, dt=0.01 hrs, 6001 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 8S: Front Area 2 Runoff Area=1.700 ac 58.82% Impervious Runoff Depth=1.79"
Flow Length=1,325' Slope=0.0100 '/' Tc=14.1 min CN=91 Runoff=4.02 cfs 0.254 af

Subcatchment 10S: Rear Area 2 Runoff Area=1.500 ac 66.67% Impervious Runoff Depth=1.88"
Flow Length=345' Tc=9.1 min CN=92 Runoff=4.35 cfs 0.235 af

Pond 7P: Underground Storage (SMA #2) Peak Elev=570.79' Storage=8,639 cf Inflow=7.03 cfs 0.489 af
Outflow=1.05 cfs 0.446 af

Pond 9P: Bioretention Area 3 Peak Elev=574.68' Storage=3,708 cf Inflow=4.35 cfs 0.235 af
Outflow=3.06 cfs 0.235 af

Total Runoff Area = 3.200 ac Runoff Volume = 0.489 af Average Runoff Depth = 1.83"
37.50% Pervious = 1.200 ac 62.50% Impervious = 2.000 ac

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Type II 24-hr 5-Year Rainfall=2.70"

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Summary for Subcatchment 8S: Front Area 2

Runoff = 4.02 cfs @ 12.06 hrs, Volume= 0.254 af, Depth= 1.79"

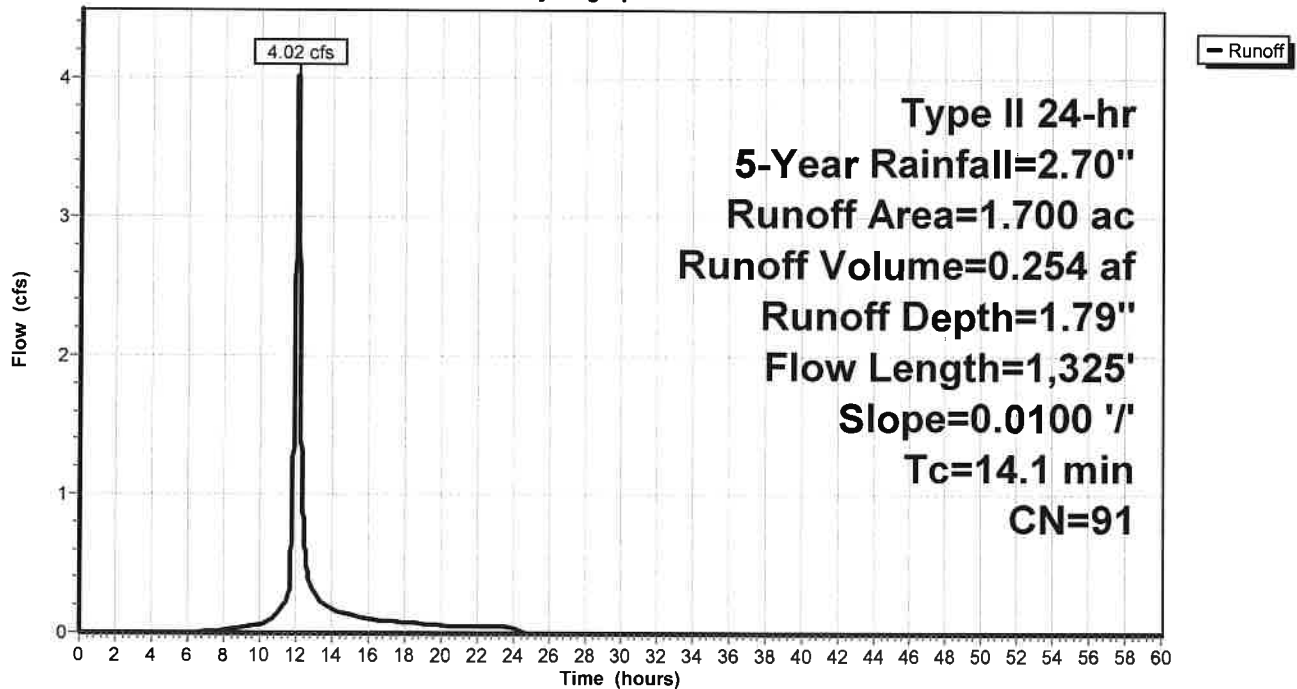
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
Type II 24-hr 5-Year Rainfall=2.70"

Area (ac)	CN	Description
0.700	98	Paved parking, HSG D
0.300	98	Roofs, HSG D
0.700	80	>75% Grass cover, Good, HSG D
1.700	91	Weighted Average
0.700		41.18% Pervious Area
1.000		58.82% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.0	40	0.0100	0.09		Sheet Flow, grass Grass: Short n= 0.150 P2= 2.50"
7.1	1,285		3.00		Direct Entry, Pipe flow
14.1	1,325	Total			

Subcatchment 8S: Front Area 2

Hydrograph



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Type II 24-hr 5-Year Rainfall=2.70"

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Hydrograph for Subcatchment 8S: Front Area 2

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	52.00	2.70	1.79	0.00
1.00	0.03	0.00	0.00	53.00	2.70	1.79	0.00
2.00	0.06	0.00	0.00	54.00	2.70	1.79	0.00
3.00	0.09	0.00	0.00	55.00	2.70	1.79	0.00
4.00	0.13	0.00	0.00	56.00	2.70	1.79	0.00
5.00	0.17	0.00	0.00	57.00	2.70	1.79	0.00
6.00	0.22	0.00	0.00	58.00	2.70	1.79	0.00
7.00	0.27	0.00	0.01	59.00	2.70	1.79	0.00
8.00	0.32	0.01	0.02	60.00	2.70	1.79	0.00
9.00	0.40	0.03	0.04				
10.00	0.49	0.07	0.06				
11.00	0.63	0.13	0.14				
12.00	1.79	0.98	3.54				
13.00	2.08	1.24	0.30				
14.00	2.21	1.35	0.17				
15.00	2.30	1.43	0.13				
16.00	2.38	1.50	0.10				
17.00	2.43	1.55	0.09				
18.00	2.49	1.60	0.08				
19.00	2.53	1.64	0.07				
20.00	2.57	1.67	0.06				
21.00	2.60	1.71	0.05				
22.00	2.64	1.74	0.05				
23.00	2.67	1.77	0.05				
24.00	2.70	1.79	0.05				
25.00	2.70	1.79	0.00				
26.00	2.70	1.79	0.00				
27.00	2.70	1.79	0.00				
28.00	2.70	1.79	0.00				
29.00	2.70	1.79	0.00				
30.00	2.70	1.79	0.00				
31.00	2.70	1.79	0.00				
32.00	2.70	1.79	0.00				
33.00	2.70	1.79	0.00				
34.00	2.70	1.79	0.00				
35.00	2.70	1.79	0.00				
36.00	2.70	1.79	0.00				
37.00	2.70	1.79	0.00				
38.00	2.70	1.79	0.00				
39.00	2.70	1.79	0.00				
40.00	2.70	1.79	0.00				
41.00	2.70	1.79	0.00				
42.00	2.70	1.79	0.00				
43.00	2.70	1.79	0.00				
44.00	2.70	1.79	0.00				
45.00	2.70	1.79	0.00				
46.00	2.70	1.79	0.00				
47.00	2.70	1.79	0.00				
48.00	2.70	1.79	0.00				
49.00	2.70	1.79	0.00				
50.00	2.70	1.79	0.00				
51.00	2.70	1.79	0.00				

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Type II 24-hr 5-Year Rainfall=2.70"

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Summary for Subcatchment 10S: Rear Area 2

Runoff = 4.35 cfs @ 12.00 hrs, Volume= 0.235 af, Depth= 1.88"

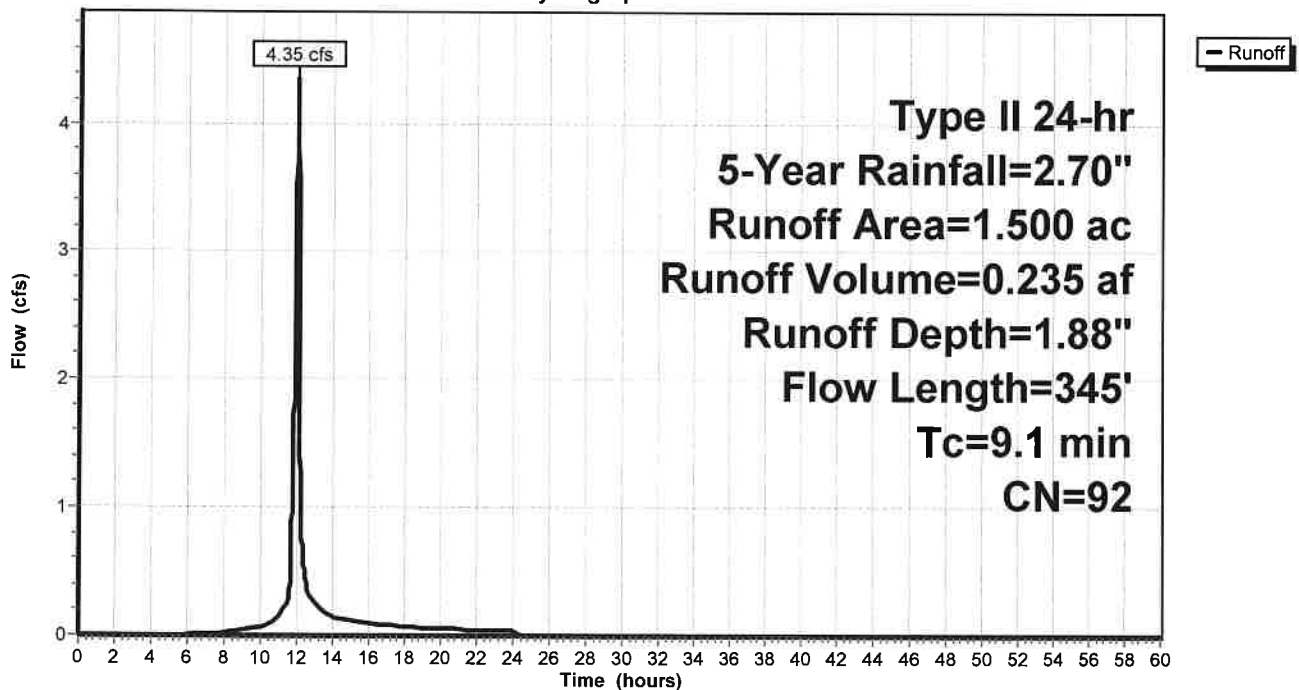
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
Type II 24-hr 5-Year Rainfall=2.70"

Area (ac)	CN	Description
0.500	98	Paved parking, HSG D
0.500	98	Roofs, HSG D
0.500	80	>75% Grass cover, Good, HSG D
1.500	92	Weighted Average
0.500		33.33% Pervious Area
1.000		66.67% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.9	55	0.0200	0.13		Sheet Flow, grass Grass: Short n= 0.150 P2= 2.50"
0.8	45	0.0170	0.97		Sheet Flow, pavement Smooth surfaces n= 0.011 P2= 2.50"
1.4	245		3.00		Direct Entry, Pipe flow
9.1	345	Total			

Subcatchment 10S: Rear Area 2

Hydrograph



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Type II 24-hr 5-Year Rainfall=2.70"

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Hydrograph for Subcatchment 10S: Rear Area 2

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	52.00	2.70	1.88	0.00
1.00	0.03	0.00	0.00	53.00	2.70	1.88	0.00
2.00	0.06	0.00	0.00	54.00	2.70	1.88	0.00
3.00	0.09	0.00	0.00	55.00	2.70	1.88	0.00
4.00	0.13	0.00	0.00	56.00	2.70	1.88	0.00
5.00	0.17	0.00	0.00	57.00	2.70	1.88	0.00
6.00	0.22	0.00	0.01	58.00	2.70	1.88	0.00
7.00	0.27	0.01	0.01	59.00	2.70	1.88	0.00
8.00	0.32	0.02	0.02	60.00	2.70	1.88	0.00
9.00	0.40	0.05	0.04				
10.00	0.49	0.08	0.07				
11.00	0.63	0.16	0.15				
12.00	1.79	1.05	4.35				
13.00	2.08	1.31	0.25				
14.00	2.21	1.43	0.15				
15.00	2.30	1.51	0.12				
16.00	2.38	1.58	0.09				
17.00	2.43	1.63	0.08				
18.00	2.49	1.68	0.07				
19.00	2.53	1.72	0.06				
20.00	2.57	1.76	0.05				
21.00	2.60	1.79	0.05				
22.00	2.64	1.82	0.05				
23.00	2.67	1.85	0.04				
24.00	2.70	1.88	0.04				
25.00	2.70	1.88	0.00				
26.00	2.70	1.88	0.00				
27.00	2.70	1.88	0.00				
28.00	2.70	1.88	0.00				
29.00	2.70	1.88	0.00				
30.00	2.70	1.88	0.00				
31.00	2.70	1.88	0.00				
32.00	2.70	1.88	0.00				
33.00	2.70	1.88	0.00				
34.00	2.70	1.88	0.00				
35.00	2.70	1.88	0.00				
36.00	2.70	1.88	0.00				
37.00	2.70	1.88	0.00				
38.00	2.70	1.88	0.00				
39.00	2.70	1.88	0.00				
40.00	2.70	1.88	0.00				
41.00	2.70	1.88	0.00				
42.00	2.70	1.88	0.00				
43.00	2.70	1.88	0.00				
44.00	2.70	1.88	0.00				
45.00	2.70	1.88	0.00				
46.00	2.70	1.88	0.00				
47.00	2.70	1.88	0.00				
48.00	2.70	1.88	0.00				
49.00	2.70	1.88	0.00				
50.00	2.70	1.88	0.00				
51.00	2.70	1.88	0.00				

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Type II 24-hr 5-Year Rainfall=2.70"

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Summary for Pond 7P: Underground Storage (SMA #2)

Inflow Area = 3.200 ac, 62.50% Impervious, Inflow Depth = 1.83" for 5-Year event
 Inflow = 7.03 cfs @ 12.07 hrs, Volume= 0.489 af
 Outflow = 1.05 cfs @ 12.55 hrs, Volume= 0.446 af, Atten= 85%, Lag= 29.0 min
 Primary = 1.05 cfs @ 12.55 hrs, Volume= 0.446 af

Routing by Stor-Ind method, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
 Peak Elev= 570.79' @ 12.55 hrs Surf.Area= 10,145 sf Storage= 8,639 cf

Plug-Flow detention time= 321.6 min calculated for 0.446 af (91% of inflow)
 Center-of-Mass det. time= 190.4 min (1,183.7 - 993.3)

Volume	Invert	Avail.Storage	Storage Description
#1A	569.50'	8,947 cf	53.75'W x 188.74'L x 3.50'H Field A 35,506 cf Overall - 13,139 cf Embedded = 22,367 cf x 40.0% Voids
#2A	570.00'	13,139 cf	ADS_StormTech SC-740 +Cap x 286 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 11 Rows of 26 Chambers
		22,086 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	569.93'	12.0" Round Culvert L= 72.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 569.93' / 569.71' S= 0.0031 ' /' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Device 1	569.93'	4.0" Vert. Orifice X 3.00 C= 0.600
#3	Device 1	572.00'	5.0' long Weir 2 End Contraction(s)

Primary OutFlow Max=1.05 cfs @ 12.55 hrs HW=570.79' (Free Discharge)

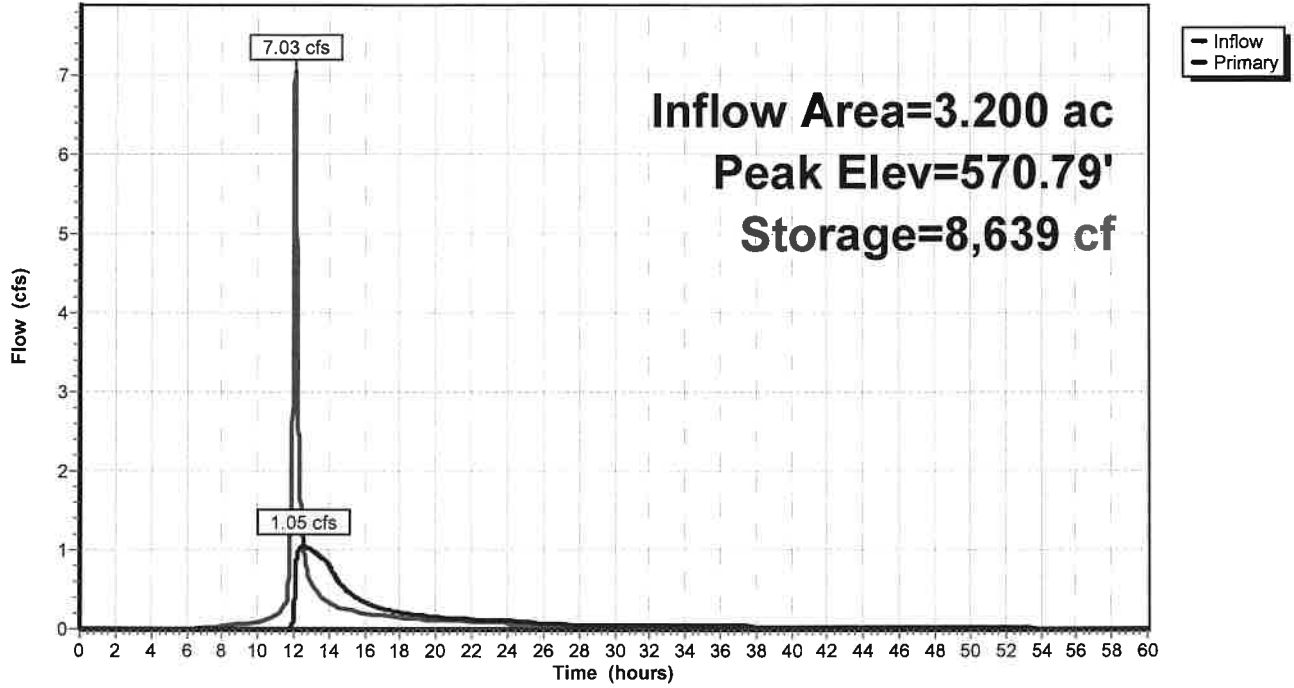
↑ 1=Culvert (Passes 1.05 cfs of 1.53 cfs potential flow)

↑ 2=Orifice (Orifice Controls 1.05 cfs @ 4.00 fps)

↑ 3=Weir (Controls 0.00 cfs)

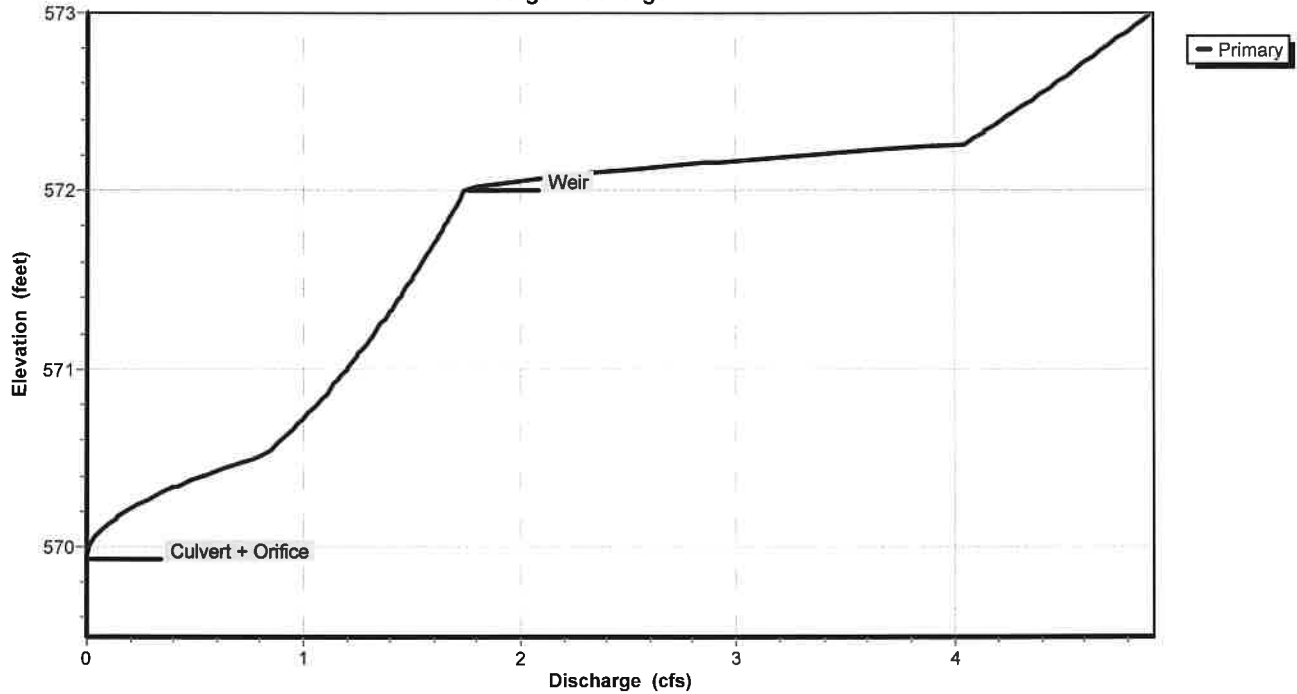
Pond 7P: Underground Storage (SMA #2)

Hydrograph

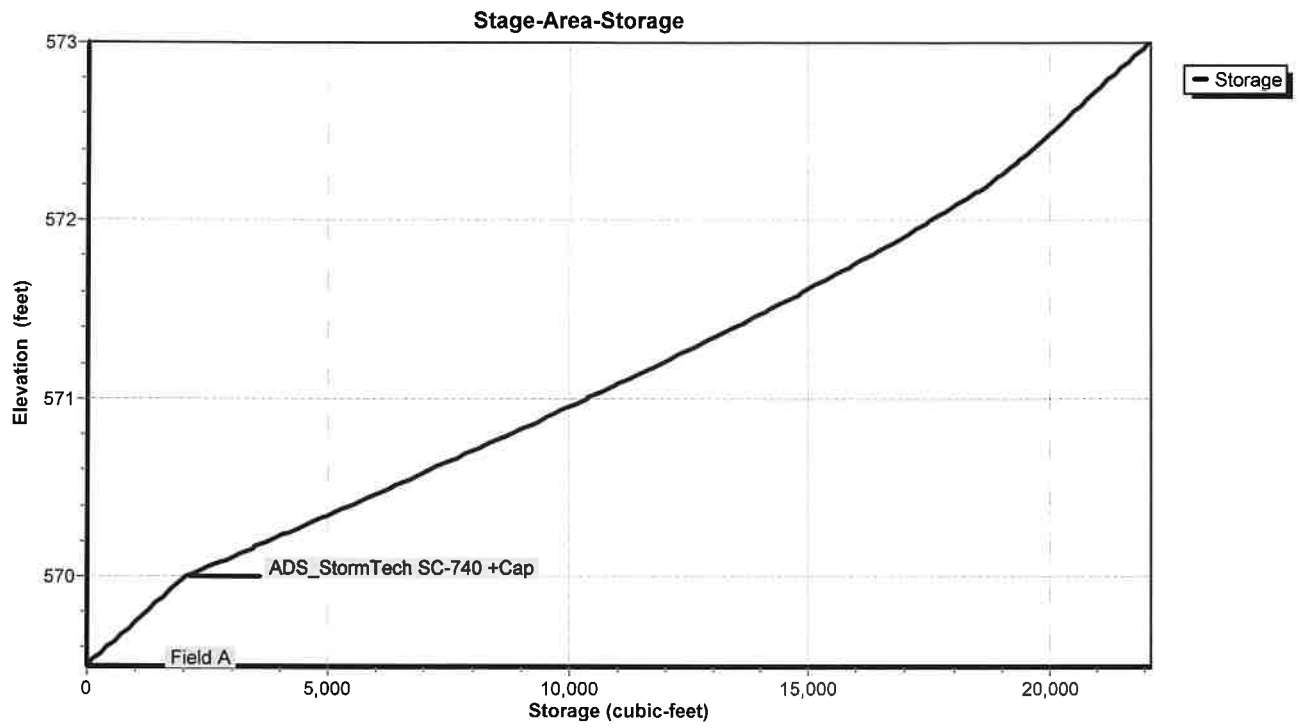


Pond 7P: Underground Storage (SMA #2)

Stage-Discharge



Pond 7P: Underground Storage (SMA #2)



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Type II 24-hr 5-Year Rainfall=2.70"

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Hydrograph for Pond 7P: Underground Storage (SMA #2)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
0.00	0.00	0	569.50	0.00
2.00	0.00	0	569.50	0.00
4.00	0.00	0	569.50	0.00
6.00	0.00	2	569.50	0.00
8.00	0.03	119	569.53	0.00
10.00	0.09	566	569.64	0.00
12.00	5.13	3,593	570.18	0.16
14.00	0.33	6,444	570.52	0.81
16.00	0.20	4,602	570.30	0.34
18.00	0.15	3,932	570.22	0.21
20.00	0.11	3,570	570.18	0.15
22.00	0.10	3,332	570.15	0.12
24.00	0.09	3,200	570.14	0.10
26.00	0.03	2,873	570.10	0.07
28.00	0.03	2,693	570.08	0.05
30.00	0.03	2,592	570.07	0.04
32.00	0.03	2,532	570.06	0.04
34.00	0.03	2,493	570.05	0.04
36.00	0.03	2,465	570.05	0.03
38.00	0.03	2,445	570.05	0.03
40.00	0.03	2,428	570.05	0.03
42.00	0.03	2,415	570.04	0.03
44.00	0.03	2,403	570.04	0.03
46.00	0.03	2,393	570.04	0.03
48.00	0.01	2,328	570.03	0.03
50.00	0.00	2,203	570.02	0.02
52.00	0.00	2,095	570.01	0.01
54.00	0.00	2,013	570.00	0.01
56.00	0.00	1,959	569.98	0.01
58.00	0.00	1,920	569.97	0.00
60.00	0.00	1,892	569.97	0.00

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Stage-Discharge for Pond 7P: Underground Storage (SMA #2)

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
569.50	0.00	570.54	0.84	571.58	1.54	572.62	4.49
569.52	0.00	570.56	0.86	571.60	1.55	572.64	4.52
569.54	0.00	570.58	0.88	571.62	1.56	572.66	4.54
569.56	0.00	570.60	0.89	571.64	1.57	572.68	4.56
569.58	0.00	570.62	0.91	571.66	1.58	572.70	4.58
569.60	0.00	570.64	0.93	571.68	1.59	572.72	4.61
569.62	0.00	570.66	0.95	571.70	1.60	572.74	4.63
569.64	0.00	570.68	0.96	571.72	1.61	572.76	4.65
569.66	0.00	570.70	0.98	571.74	1.62	572.78	4.68
569.68	0.00	570.72	1.00	571.76	1.63	572.80	4.70
569.70	0.00	570.74	1.01	571.78	1.64	572.82	4.72
569.72	0.00	570.76	1.03	571.80	1.65	572.84	4.74
569.74	0.00	570.78	1.04	571.82	1.65	572.86	4.77
569.76	0.00	570.80	1.06	571.84	1.66	572.88	4.79
569.78	0.00	570.82	1.07	571.86	1.67	572.90	4.81
569.80	0.00	570.84	1.09	571.88	1.68	572.92	4.83
569.82	0.00	570.86	1.10	571.90	1.69	572.94	4.85
569.84	0.00	570.88	1.12	571.92	1.70	572.96	4.88
569.86	0.00	570.90	1.13	571.94	1.71	572.98	4.90
569.88	0.00	570.92	1.14	571.96	1.72	573.00	4.92
569.90	0.00	570.94	1.16	571.98	1.73		
569.92	0.00	570.96	1.17	572.00	1.74		
569.94	0.00	570.98	1.18	572.02	1.79		
569.96	0.00	571.00	1.20	572.04	1.89		
569.98	0.01	571.02	1.21	572.06	2.01		
570.00	0.01	571.04	1.22	572.08	2.14		
570.02	0.02	571.06	1.24	572.10	2.30		
570.04	0.03	571.08	1.25	572.12	2.47		
570.06	0.04	571.10	1.26	572.14	2.65		
570.08	0.05	571.12	1.28	572.16	2.85		
570.10	0.07	571.14	1.29	572.18	3.06		
570.12	0.09	571.16	1.30	572.20	3.28		
570.14	0.11	571.18	1.31	572.22	3.51		
570.16	0.13	571.20	1.32	572.24	3.75		
570.18	0.15	571.22	1.34	572.26	4.00		
570.20	0.18	571.24	1.35	572.28	4.07		
570.22	0.21	571.26	1.36	572.30	4.10		
570.24	0.24	571.28	1.37	572.32	4.12		
570.26	0.27	571.30	1.38	572.34	4.15		
570.28	0.30	571.32	1.39	572.36	4.17		
570.30	0.34	571.34	1.41	572.38	4.20		
570.32	0.37	571.36	1.42	572.40	4.23		
570.34	0.41	571.38	1.43	572.42	4.25		
570.36	0.45	571.40	1.44	572.44	4.27		
570.38	0.49	571.42	1.45	572.46	4.30		
570.40	0.53	571.44	1.46	572.48	4.32		
570.42	0.58	571.46	1.47	572.50	4.35		
570.44	0.62	571.48	1.48	572.52	4.37		
570.46	0.67	571.50	1.49	572.54	4.40		
570.48	0.72	571.52	1.50	572.56	4.42		
570.50	0.76	571.54	1.51	572.58	4.44		
570.52	0.81	571.56	1.52	572.60	4.47		

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Type II 24-hr 5-Year Rainfall=2.70"

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Stage-Area-Storage for Pond 7P: Underground Storage (SMA #2)

Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)
569.50	0	572.10	18,133
569.55	203	572.15	18,417
569.60	406	572.20	18,690
569.65	609	572.25	18,946
569.70	812	572.30	19,188
569.75	1,014	572.35	19,417
569.80	1,217	572.40	19,637
569.85	1,420	572.45	19,850
569.90	1,623	572.50	20,057
569.95	1,826	572.55	20,260
570.00	2,029	572.60	20,463
570.05	2,459	572.65	20,665
570.10	2,889	572.70	20,868
570.15	3,318	572.75	21,071
570.20	3,746	572.80	21,274
570.25	4,173	572.85	21,477
570.30	4,598	572.90	21,680
570.35	5,022	572.95	21,883
570.40	5,444	573.00	22,086
570.45	5,865		
570.50	6,284		
570.55	6,701		
570.60	7,116		
570.65	7,529		
570.70	7,940		
570.75	8,349		
570.80	8,756		
570.85	9,160		
570.90	9,562		
570.95	9,962		
571.00	10,359		
571.05	10,754		
571.10	11,145		
571.15	11,534		
571.20	11,919		
571.25	12,301		
571.30	12,680		
571.35	13,056		
571.40	13,428		
571.45	13,797		
571.50	14,161		
571.55	14,522		
571.60	14,879		
571.65	15,230		
571.70	15,577		
571.75	15,917		
571.80	16,252		
571.85	16,582		
571.90	16,906		
571.95	17,224		
572.00	17,535		
572.05	17,838		

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Type II 24-hr 5-Year Rainfall=2.70"

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Summary for Pond 9P: Bioretention Area 3

Inflow Area = 1.500 ac, 66.67% Impervious, Inflow Depth = 1.88" for 5-Year event
 Inflow = 4.35 cfs @ 12.00 hrs, Volume= 0.235 af
 Outflow = 3.06 cfs @ 12.08 hrs, Volume= 0.235 af, Atten= 30%, Lag= 4.6 min
 Primary = 3.06 cfs @ 12.08 hrs, Volume= 0.235 af

Routing by Stor-Ind method, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
 Peak Elev= 574.68' @ 12.08 hrs Surf.Area= 6,129 sf Storage= 3,708 cf

Plug-Flow detention time= 384.2 min calculated for 0.235 af (100% of inflow)
 Center-of-Mass det. time= 384.1 min (1,187.9 - 803.8)

Volume	Invert	Avail.Storage	Storage Description
#1	574.00'	9,318 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
574.00	4,851	0	0
575.00	6,743	5,797	5,797
575.50	7,342	3,521	9,318

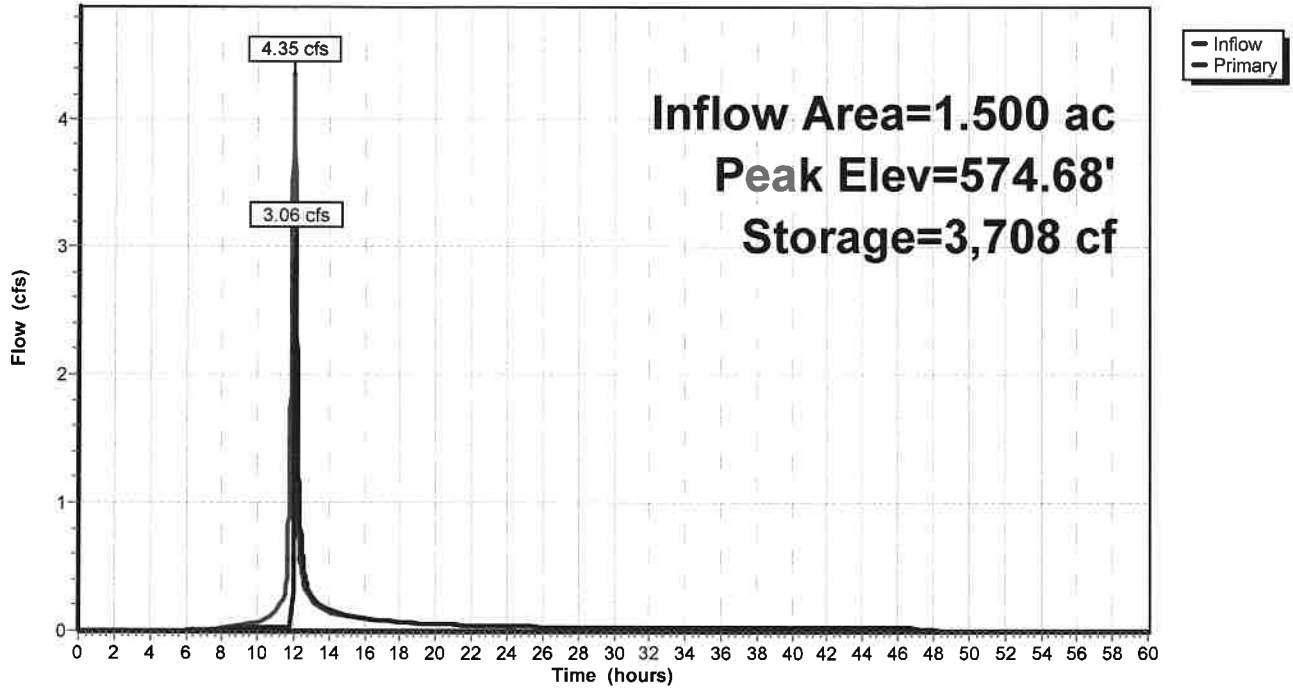
Device	Routing	Invert	Outlet Devices
#1	Primary	571.41'	12.0" Round 8" pipe L= 132.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 571.41' / 570.75' S= 0.0050 '/ Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Device 1	574.50'	8.0" Horiz. Grate X 6.00 C= 0.600 Limited to weir flow at low heads
#3	Device 1	574.00'	0.250 in/hr Exfiltration over Surface area Conductivity to Groundwater Elevation = 560.00'
#4	Primary	574.75'	24.0" W x 24.0" H Vert. grate (overflow) C= 0.600

Primary OutFlow Max=3.05 cfs @ 12.08 hrs HW=574.68' (Free Discharge)

- 1=8" pipe (Passes 3.05 cfs of 4.54 cfs potential flow)
- 2=Grate (Weir Controls 3.02 cfs @ 1.37 fps)
- 3=Exfiltration (Controls 0.04 cfs)
- 4=grate (overflow) (Controls 0.00 cfs)

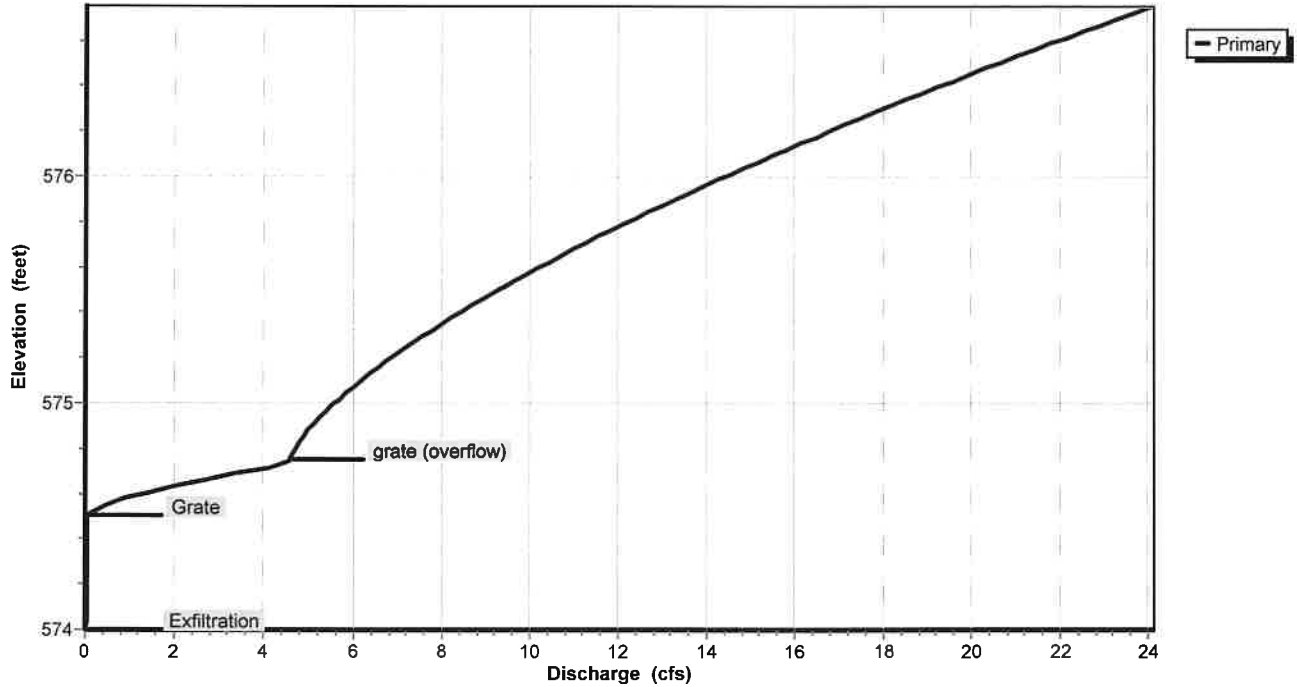
Pond 9P: Bioretention Area 3

Hydrograph



Pond 9P: Bioretention Area 3

Stage-Discharge



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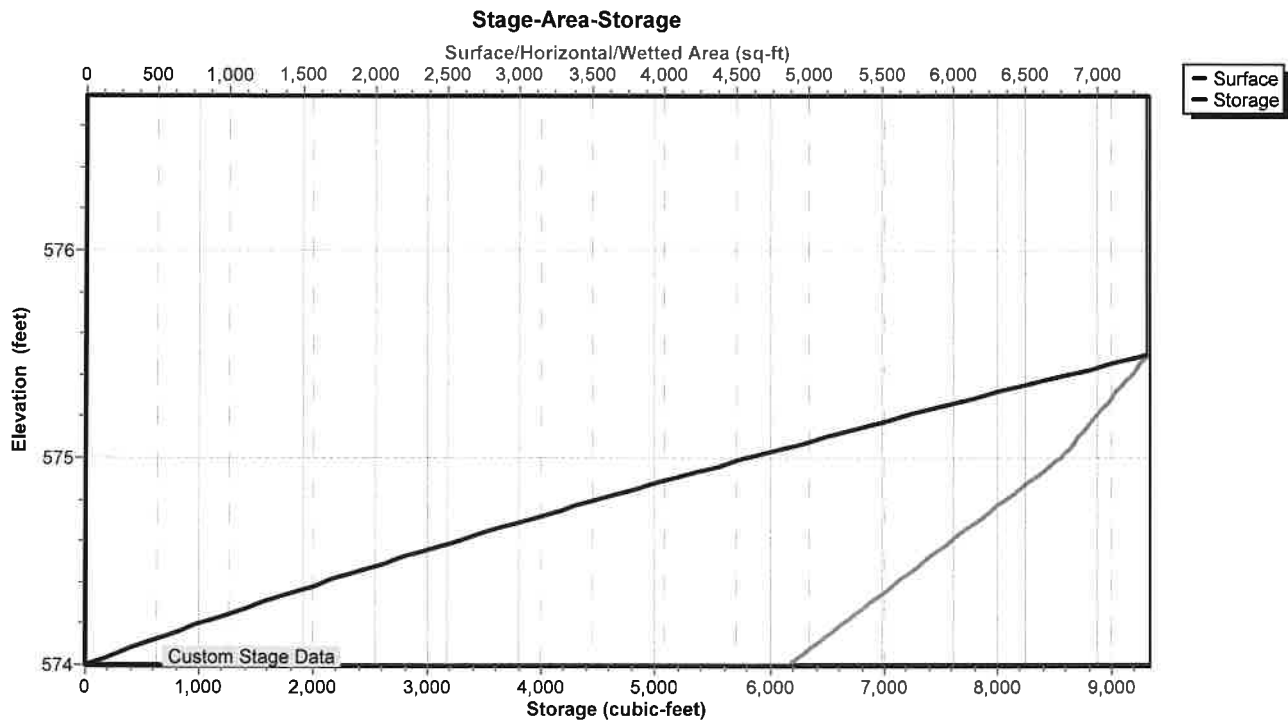
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Type II 24-hr 5-Year Rainfall=2.70"

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Pond 9P: Bioretention Area 3



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Type II 24-hr 5-Year Rainfall=2.70"

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Hydrograph for Pond 9P: Bioretention Area 3

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
0.00	0.00	0	574.00	0.00
2.00	0.00	0	574.00	0.00
4.00	0.00	0	574.00	0.00
6.00	0.01	6	574.00	0.00
8.00	0.02	61	574.01	0.01
10.00	0.07	208	574.04	0.03
12.00	4.35	3,326	574.61	1.59
14.00	0.15	2,783	574.52	0.16
16.00	0.09	2,721	574.51	0.10
18.00	0.07	2,697	574.51	0.07
20.00	0.05	2,679	574.50	0.05
22.00	0.05	2,673	574.50	0.05
24.00	0.04	2,670	574.50	0.04
26.00	0.00	2,439	574.46	0.03
28.00	0.00	2,196	574.42	0.03
30.00	0.00	1,956	574.38	0.03
32.00	0.00	1,720	574.33	0.03
34.00	0.00	1,489	574.29	0.03
36.00	0.00	1,262	574.25	0.03
38.00	0.00	1,038	574.21	0.03
40.00	0.00	819	574.16	0.03
42.00	0.00	603	574.12	0.03
44.00	0.00	392	574.08	0.03
46.00	0.00	184	574.04	0.03
48.00	0.00	42	574.01	0.01
50.00	0.00	9	574.00	0.00
52.00	0.00	2	574.00	0.00
54.00	0.00	0	574.00	0.00
56.00	0.00	0	574.00	0.00
58.00	0.00	0	574.00	0.00
60.00	0.00	0	574.00	0.00

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Type II 24-hr 5-Year Rainfall=2.70"

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Stage-Discharge for Pond 9P: Bioretention Area 3

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
574.00	0.00	575.04	5.81	576.08	15.37
574.02	0.03	575.06	5.93	576.10	15.60
574.04	0.03	575.08	6.06	576.12	15.84
574.06	0.03	575.10	6.18	576.14	16.08
574.08	0.03	575.12	6.31	576.16	16.32
574.10	0.03	575.14	6.45	576.18	16.56
574.12	0.03	575.16	6.58	576.20	16.81
574.14	0.03	575.18	6.72	576.22	17.05
574.16	0.03	575.20	6.87	576.24	17.30
574.18	0.03	575.22	7.01	576.26	17.55
574.20	0.03	575.24	7.16	576.28	17.80
574.22	0.03	575.26	7.31	576.30	18.05
574.24	0.03	575.28	7.46	576.32	18.30
574.26	0.03	575.30	7.62	576.34	18.56
574.28	0.03	575.32	7.78	576.36	18.81
574.30	0.03	575.34	7.94	576.38	19.07
574.32	0.03	575.36	8.10	576.40	19.33
574.34	0.03	575.38	8.26	576.42	19.59
574.36	0.03	575.40	8.43	576.44	19.85
574.38	0.03	575.42	8.60	576.46	20.11
574.40	0.03	575.44	8.78	576.48	20.38
574.42	0.03	575.46	8.95	576.50	20.64
574.44	0.03	575.48	9.13	576.52	20.91
574.46	0.03	575.50	9.31	576.54	21.18
574.48	0.03	575.52	9.49	576.56	21.45
574.50	0.03	575.54	9.67	576.58	21.72
574.52	0.15	575.56	9.86	576.60	22.00
574.54	0.36	575.58	10.05	576.62	22.27
574.56	0.64	575.60	10.24	576.64	22.55
574.58	0.97	575.62	10.43	576.66	22.83
574.60	1.34	575.64	10.62	576.68	23.10
574.62	1.74	575.66	10.82	576.70	23.38
574.64	2.19	575.68	11.02	576.72	23.67
574.66	2.67	575.70	11.22	576.74	23.95
574.68	3.18	575.72	11.42		
574.70	3.71	575.74	11.62		
574.72	4.28	575.76	11.83		
574.74	4.59	575.78	12.04		
574.76	4.61	575.80	12.25		
574.78	4.65	575.82	12.46		
574.80	4.70	575.84	12.67		
574.82	4.77	575.86	12.89		
574.84	4.84	575.88	13.10		
574.86	4.91	575.90	13.32		
574.88	4.99	575.92	13.54		
574.90	5.08	575.94	13.76		
574.92	5.17	575.96	13.99		
574.94	5.27	575.98	14.21		
574.96	5.37	576.00	14.44		
574.98	5.48	576.02	14.67		
575.00	5.59	576.04	14.90		
575.02	5.70	576.06	15.13		

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Type II 24-hr 5-Year Rainfall=2.70"

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Stage-Area-Storage for Pond 9P: Bioretention Area 3

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
574.00	4,851	0	576.60	7,342	9,318
574.05	4,946	245	576.65	7,342	9,318
574.10	5,040	495	576.70	7,342	9,318
574.15	5,135	749	576.75	7,342	9,318
574.20	5,229	1,008			
574.25	5,324	1,272			
574.30	5,419	1,540			
574.35	5,513	1,814			
574.40	5,608	2,092			
574.45	5,702	2,375			
574.50	5,797	2,662			
574.55	5,892	2,954			
574.60	5,986	3,251			
574.65	6,081	3,553			
574.70	6,175	3,859			
574.75	6,270	4,170			
574.80	6,365	4,486			
574.85	6,459	4,807			
574.90	6,554	5,132			
574.95	6,648	5,462			
575.00	6,743	5,797			
575.05	6,803	6,136			
575.10	6,863	6,477			
575.15	6,923	6,822			
575.20	6,983	7,170			
575.25	7,043	7,520			
575.30	7,102	7,874			
575.35	7,162	8,230			
575.40	7,222	8,590			
575.45	7,282	8,953			
575.50	7,342	9,318			
575.55	7,342	9,318			
575.60	7,342	9,318			
575.65	7,342	9,318			
575.70	7,342	9,318			
575.75	7,342	9,318			
575.80	7,342	9,318			
575.85	7,342	9,318			
575.90	7,342	9,318			
575.95	7,342	9,318			
576.00	7,342	9,318			
576.05	7,342	9,318			
576.10	7,342	9,318			
576.15	7,342	9,318			
576.20	7,342	9,318			
576.25	7,342	9,318			
576.30	7,342	9,318			
576.35	7,342	9,318			
576.40	7,342	9,318			
576.45	7,342	9,318			
576.50	7,342	9,318			
576.55	7,342	9,318			

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Type II 24-hr 10-Year Rainfall=3.15"

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Time span=0.00-60.00 hrs, dt=0.01 hrs, 6001 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 8S: Front Area 2 Runoff Area=1.700 ac 58.82% Impervious Runoff Depth=2.21"
Flow Length=1,325' Slope=0.0100 '/' Tc=14.1 min CN=91 Runoff=4.91 cfs 0.313 af

Subcatchment 10S: Rear Area 2 Runoff Area=1.500 ac 66.67% Impervious Runoff Depth=2.30"
Flow Length=345' Tc=9.1 min CN=92 Runoff=5.28 cfs 0.288 af

Pond 7P: Underground Storage (SMA #2) Peak Elev=571.13' Storage=11,342 cf Inflow=9.17 cfs 0.601 af
Outflow=1.28 cfs 0.558 af

Pond 9P: Bioretention Area 3 Peak Elev=574.72' Storage=4,001 cf Inflow=5.28 cfs 0.288 af
Outflow=4.27 cfs 0.288 af

Total Runoff Area = 3.200 ac Runoff Volume = 0.601 af Average Runoff Depth = 2.25"
37.50% Pervious = 1.200 ac 62.50% Impervious = 2.000 ac

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Type II 24-hr 10-Year Rainfall=3.15"

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Summary for Subcatchment 8S: Front Area 2

Runoff = 4.91 cfs @ 12.05 hrs, Volume= 0.313 af, Depth= 2.21"

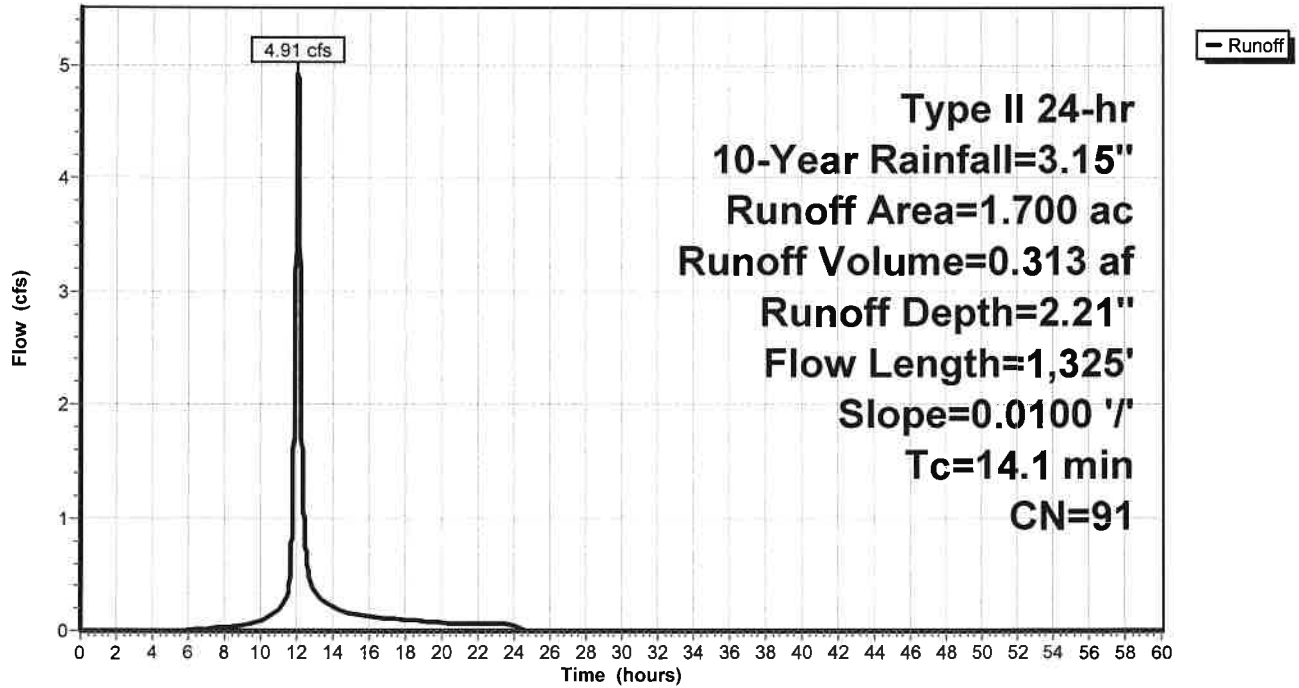
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
Type II 24-hr 10-Year Rainfall=3.15"

Area (ac)	CN	Description
0.700	98	Paved parking, HSG D
0.300	98	Roofs, HSG D
0.700	80	>75% Grass cover, Good, HSG D
1.700	91	Weighted Average
0.700		41.18% Pervious Area
1.000		58.82% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.0	40	0.0100	0.09		Sheet Flow, grass Grass: Short n= 0.150 P2= 2.50"
7.1	1,285		3.00		Direct Entry, Pipe flow
14.1	1,325	Total			

Subcatchment 8S: Front Area 2

Hydrograph



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Type II 24-hr 10-Year Rainfall=3.15"

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Hydrograph for Subcatchment 8S: Front Area 2

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	52.00	3.15	2.21	0.00
1.00	0.03	0.00	0.00	53.00	3.15	2.21	0.00
2.00	0.07	0.00	0.00	54.00	3.15	2.21	0.00
3.00	0.11	0.00	0.00	55.00	3.15	2.21	0.00
4.00	0.15	0.00	0.00	56.00	3.15	2.21	0.00
5.00	0.20	0.00	0.00	57.00	3.15	2.21	0.00
6.00	0.25	0.00	0.01	58.00	3.15	2.21	0.00
7.00	0.31	0.01	0.02	59.00	3.15	2.21	0.00
8.00	0.38	0.03	0.03	60.00	3.15	2.21	0.00
9.00	0.46	0.06	0.06				
10.00	0.57	0.10	0.09				
11.00	0.74	0.19	0.19				
12.00	2.09	1.24	4.35				
13.00	2.43	1.55	0.35				
14.00	2.58	1.69	0.20				
15.00	2.69	1.78	0.16				
16.00	2.77	1.86	0.12				
17.00	2.84	1.92	0.11				
18.00	2.90	1.98	0.09				
19.00	2.95	2.03	0.08				
20.00	3.00	2.07	0.07				
21.00	3.04	2.11	0.06				
22.00	3.08	2.14	0.06				
23.00	3.11	2.18	0.06				
24.00	3.15	2.21	0.06				
25.00	3.15	2.21	0.00				
26.00	3.15	2.21	0.00				
27.00	3.15	2.21	0.00				
28.00	3.15	2.21	0.00				
29.00	3.15	2.21	0.00				
30.00	3.15	2.21	0.00				
31.00	3.15	2.21	0.00				
32.00	3.15	2.21	0.00				
33.00	3.15	2.21	0.00				
34.00	3.15	2.21	0.00				
35.00	3.15	2.21	0.00				
36.00	3.15	2.21	0.00				
37.00	3.15	2.21	0.00				
38.00	3.15	2.21	0.00				
39.00	3.15	2.21	0.00				
40.00	3.15	2.21	0.00				
41.00	3.15	2.21	0.00				
42.00	3.15	2.21	0.00				
43.00	3.15	2.21	0.00				
44.00	3.15	2.21	0.00				
45.00	3.15	2.21	0.00				
46.00	3.15	2.21	0.00				
47.00	3.15	2.21	0.00				
48.00	3.15	2.21	0.00				
49.00	3.15	2.21	0.00				
50.00	3.15	2.21	0.00				
51.00	3.15	2.21	0.00				

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Type II 24-hr 10-Year Rainfall=3.15"

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Summary for Subcatchment 10S: Rear Area 2

Runoff = 5.28 cfs @ 12.00 hrs, Volume= 0.288 af, Depth= 2.30"

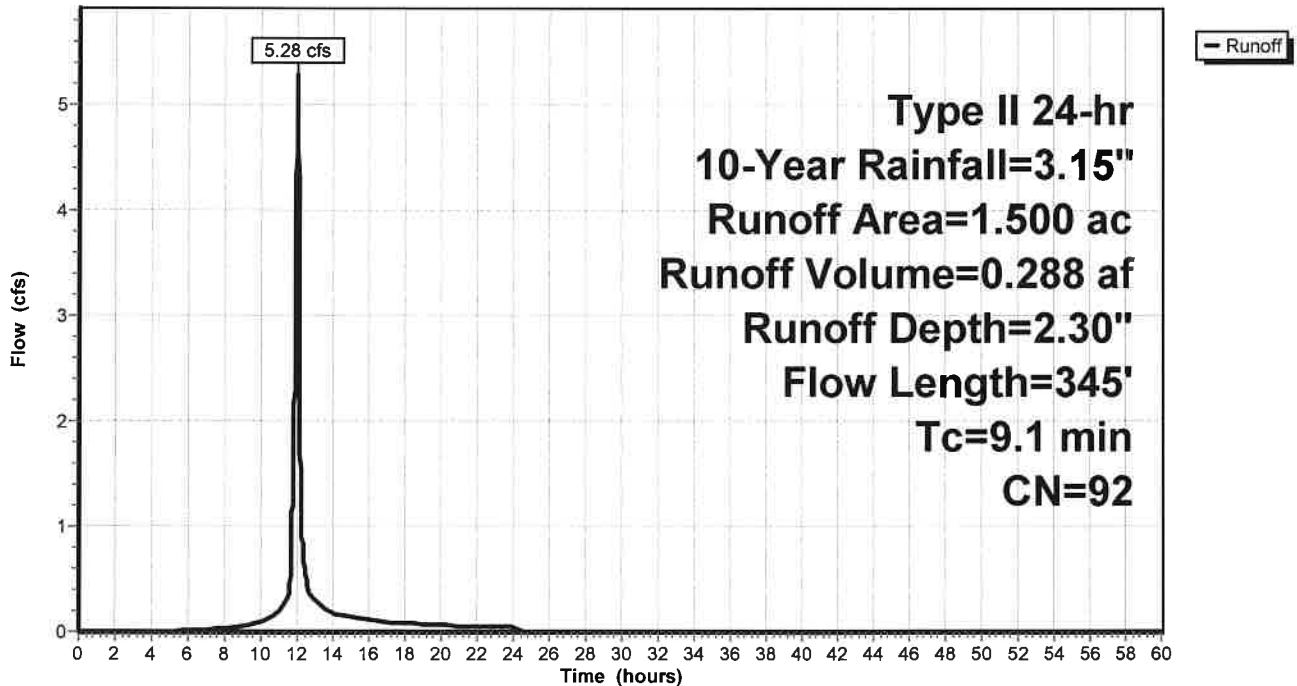
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
Type II 24-hr 10-Year Rainfall=3.15"

Area (ac)	CN	Description
0.500	98	Paved parking, HSG D
0.500	98	Roofs, HSG D
0.500	80	>75% Grass cover, Good, HSG D
1.500	92	Weighted Average
0.500		33.33% Pervious Area
1.000		66.67% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.9	55	0.0200	0.13		Sheet Flow, grass Grass: Short n= 0.150 P2= 2.50"
0.8	45	0.0170	0.97		Sheet Flow, pavement Smooth surfaces n= 0.011 P2= 2.50"
1.4	245		3.00		Direct Entry, Pipe flow
9.1	345	Total			

Subcatchment 10S: Rear Area 2

Hydrograph



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Type II 24-hr 10-Year Rainfall=3.15"

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Hydrograph for Subcatchment 10S: Rear Area 2

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	52.00	3.15	2.30	0.00
1.00	0.03	0.00	0.00	53.00	3.15	2.30	0.00
2.00	0.07	0.00	0.00	54.00	3.15	2.30	0.00
3.00	0.11	0.00	0.00	55.00	3.15	2.30	0.00
4.00	0.15	0.00	0.00	56.00	3.15	2.30	0.00
5.00	0.20	0.00	0.00	57.00	3.15	2.30	0.00
6.00	0.25	0.01	0.01	58.00	3.15	2.30	0.00
7.00	0.31	0.02	0.02	59.00	3.15	2.30	0.00
8.00	0.38	0.04	0.03	60.00	3.15	2.30	0.00
9.00	0.46	0.07	0.06				
10.00	0.57	0.12	0.09				
11.00	0.74	0.22	0.20				
12.00	2.09	1.32	5.27				
13.00	2.43	1.63	0.30				
14.00	2.58	1.77	0.18				
15.00	2.69	1.87	0.14				
16.00	2.77	1.95	0.11				
17.00	2.84	2.01	0.09				
18.00	2.90	2.07	0.08				
19.00	2.95	2.12	0.07				
20.00	3.00	2.16	0.06				
21.00	3.04	2.20	0.06				
22.00	3.08	2.23	0.05				
23.00	3.11	2.27	0.05				
24.00	3.15	2.30	0.05				
25.00	3.15	2.30	0.00				
26.00	3.15	2.30	0.00				
27.00	3.15	2.30	0.00				
28.00	3.15	2.30	0.00				
29.00	3.15	2.30	0.00				
30.00	3.15	2.30	0.00				
31.00	3.15	2.30	0.00				
32.00	3.15	2.30	0.00				
33.00	3.15	2.30	0.00				
34.00	3.15	2.30	0.00				
35.00	3.15	2.30	0.00				
36.00	3.15	2.30	0.00				
37.00	3.15	2.30	0.00				
38.00	3.15	2.30	0.00				
39.00	3.15	2.30	0.00				
40.00	3.15	2.30	0.00				
41.00	3.15	2.30	0.00				
42.00	3.15	2.30	0.00				
43.00	3.15	2.30	0.00				
44.00	3.15	2.30	0.00				
45.00	3.15	2.30	0.00				
46.00	3.15	2.30	0.00				
47.00	3.15	2.30	0.00				
48.00	3.15	2.30	0.00				
49.00	3.15	2.30	0.00				
50.00	3.15	2.30	0.00				
51.00	3.15	2.30	0.00				

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Type II 24-hr 10-Year Rainfall=3.15"

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Summary for Pond 7P: Underground Storage (SMA #2)

Inflow Area = 3.200 ac, 62.50% Impervious, Inflow Depth = 2.25" for 10-Year event
 Inflow = 9.17 cfs @ 12.06 hrs, Volume= 0.601 af
 Outflow = 1.28 cfs @ 12.54 hrs, Volume= 0.558 af, Atten= 86%, Lag= 29.2 min
 Primary = 1.28 cfs @ 12.54 hrs, Volume= 0.558 af

Routing by Stor-Ind method, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
 Peak Elev= 571.13' @ 12.54 hrs Surf.Area= 10,145 sf Storage= 11,342 cf

Plug-Flow detention time= 284.1 min calculated for 0.558 af (93% of inflow)
 Center-of-Mass det. time= 176.3 min (1,132.0 - 955.6)

Volume	Invert	Avail.Storage	Storage Description
#1A	569.50'	8,947 cf	53.75'W x 188.74'L x 3.50'H Field A 35,506 cf Overall - 13,139 cf Embedded = 22,367 cf x 40.0% Voids
#2A	570.00'	13,139 cf	ADS StormTech SC-740 +Cap x 286 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 11 Rows of 26 Chambers
		22,086 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	569.93'	12.0" Round Culvert L= 72.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 569.93' / 569.71' S= 0.0031 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Device 1	569.93'	4.0" Vert. Orifice X 3.00 C= 0.600
#3	Device 1	572.00'	5.0' long Weir 2 End Contraction(s)

Primary OutFlow Max=1.28 cfs @ 12.54 hrs HW=571.13' (Free Discharge)

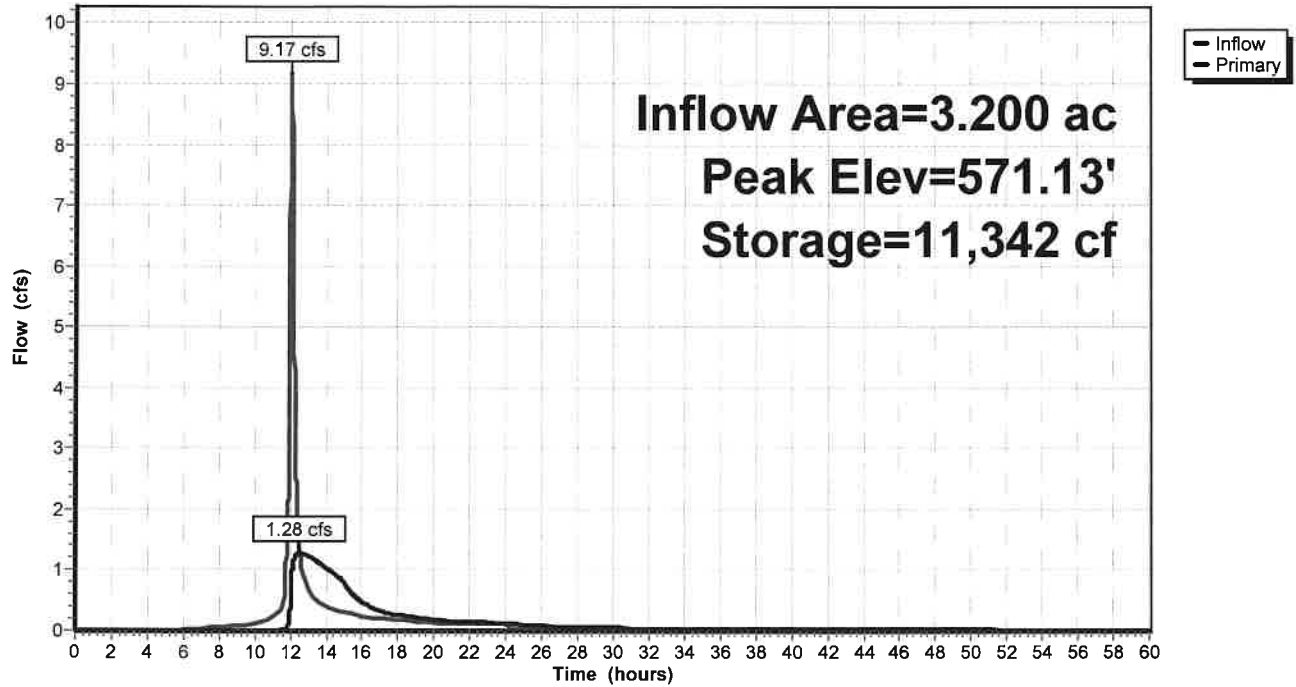
1=Culvert (Passes 1.28 cfs of 2.37 cfs potential flow)

2=Orifice (Orifice Controls 1.28 cfs @ 4.88 fps)

3=Weir (Controls 0.00 cfs)

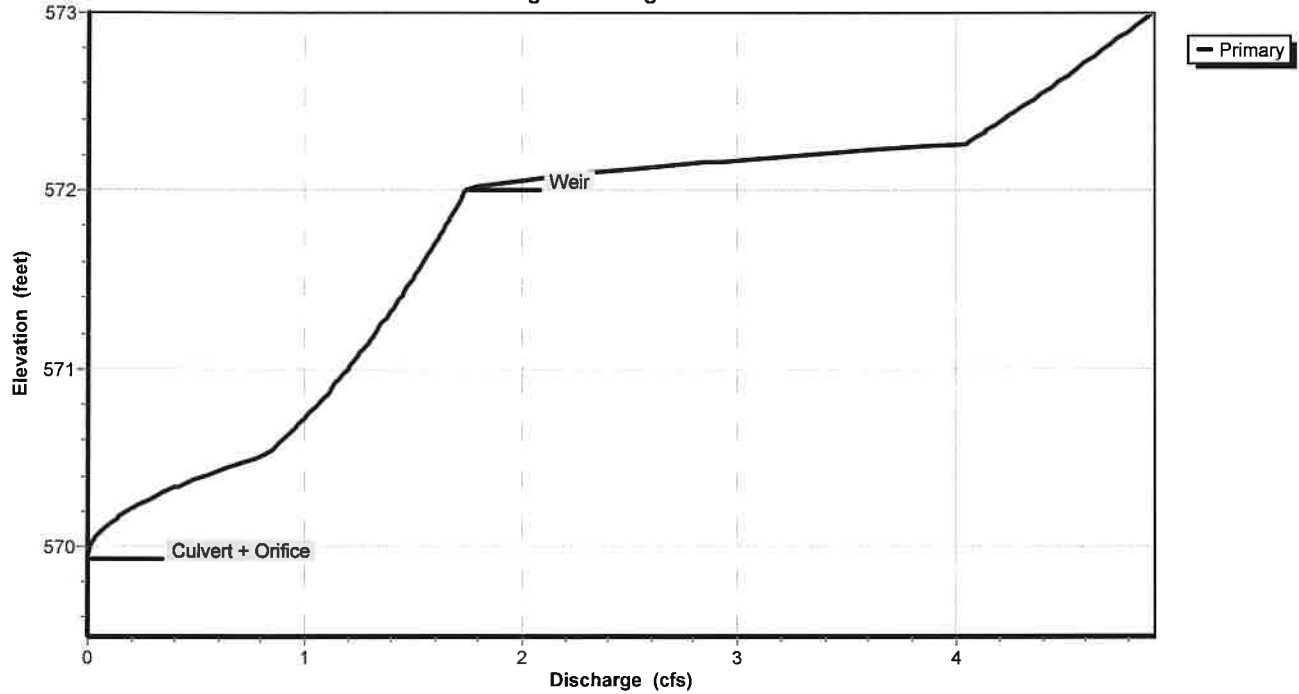
Pond 7P: Underground Storage (SMA #2)

Hydrograph

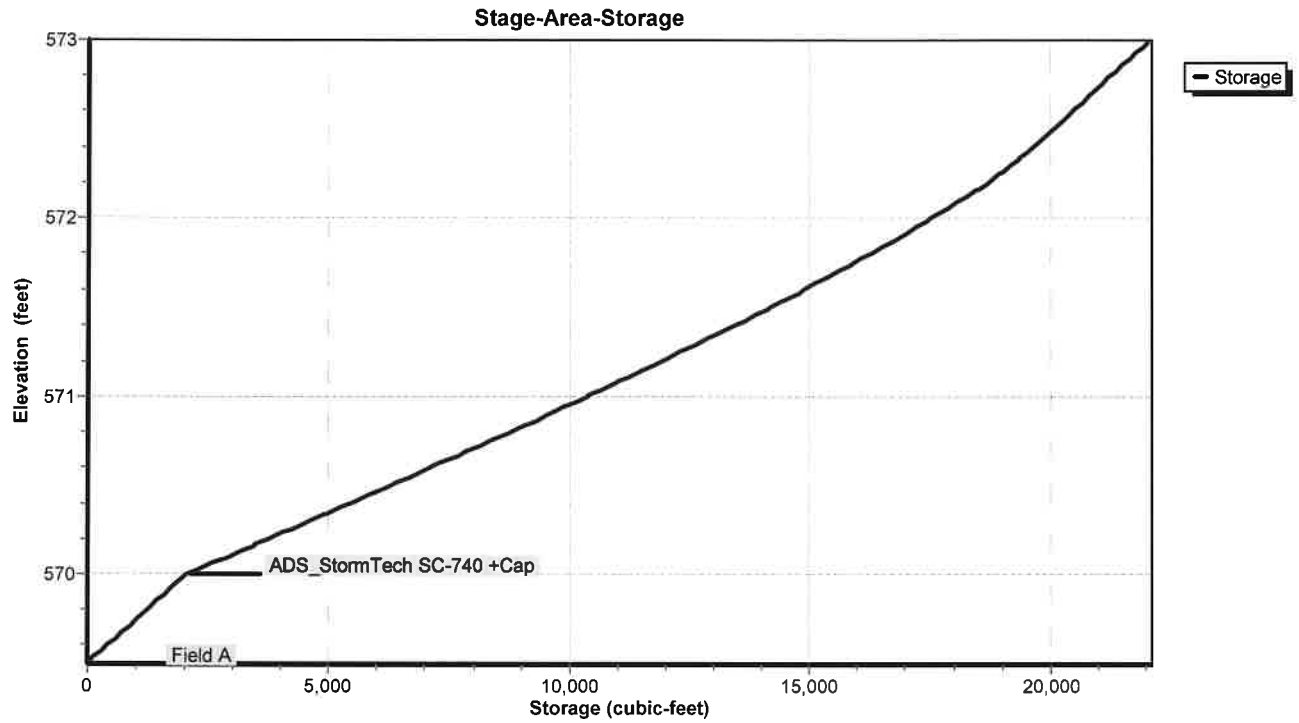


Pond 7P: Underground Storage (SMA #2)

Stage-Discharge



Pond 7P: Underground Storage (SMA #2)



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Type II 24-hr 10-Year Rainfall=3.15"

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Hydrograph for Pond 7P: Underground Storage (SMA #2)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
0.00	0.00	0	569.50	0.00
2.00	0.00	0	569.50	0.00
4.00	0.00	0	569.50	0.00
6.00	0.01	18	569.50	0.00
8.00	0.05	241	569.56	0.00
10.00	0.12	846	569.71	0.00
12.00	7.80	5,030	570.35	0.43
14.00	0.39	8,504	570.77	1.03
16.00	0.24	5,183	570.37	0.47
18.00	0.18	4,195	570.25	0.26
20.00	0.13	3,754	570.20	0.18
22.00	0.12	3,484	570.17	0.14
24.00	0.11	3,343	570.15	0.12
26.00	0.03	2,942	570.11	0.08
28.00	0.03	2,728	570.08	0.05
30.00	0.03	2,611	570.07	0.05
32.00	0.03	2,544	570.06	0.04
34.00	0.03	2,500	570.05	0.04
36.00	0.03	2,470	570.05	0.03
38.00	0.03	2,448	570.05	0.03
40.00	0.03	2,430	570.05	0.03
42.00	0.03	2,416	570.05	0.03
44.00	0.03	2,404	570.04	0.03
46.00	0.03	2,393	570.04	0.03
48.00	0.01	2,331	570.04	0.03
50.00	0.00	2,206	570.02	0.02
52.00	0.00	2,098	570.01	0.01
54.00	0.00	2,015	570.00	0.01
56.00	0.00	1,960	569.98	0.01
58.00	0.00	1,921	569.97	0.00
60.00	0.00	1,893	569.97	0.00

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Stage-Discharge for Pond 7P: Underground Storage (SMA #2)

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
569.50	0.00	570.54	0.84	571.58	1.54	572.62	4.49
569.52	0.00	570.56	0.86	571.60	1.55	572.64	4.52
569.54	0.00	570.58	0.88	571.62	1.56	572.66	4.54
569.56	0.00	570.60	0.89	571.64	1.57	572.68	4.56
569.58	0.00	570.62	0.91	571.66	1.58	572.70	4.58
569.60	0.00	570.64	0.93	571.68	1.59	572.72	4.61
569.62	0.00	570.66	0.95	571.70	1.60	572.74	4.63
569.64	0.00	570.68	0.96	571.72	1.61	572.76	4.65
569.66	0.00	570.70	0.98	571.74	1.62	572.78	4.68
569.68	0.00	570.72	1.00	571.76	1.63	572.80	4.70
569.70	0.00	570.74	1.01	571.78	1.64	572.82	4.72
569.72	0.00	570.76	1.03	571.80	1.65	572.84	4.74
569.74	0.00	570.78	1.04	571.82	1.65	572.86	4.77
569.76	0.00	570.80	1.06	571.84	1.66	572.88	4.79
569.78	0.00	570.82	1.07	571.86	1.67	572.90	4.81
569.80	0.00	570.84	1.09	571.88	1.68	572.92	4.83
569.82	0.00	570.86	1.10	571.90	1.69	572.94	4.85
569.84	0.00	570.88	1.12	571.92	1.70	572.96	4.88
569.86	0.00	570.90	1.13	571.94	1.71	572.98	4.90
569.88	0.00	570.92	1.14	571.96	1.72	573.00	4.92
569.90	0.00	570.94	1.16	571.98	1.73		
569.92	0.00	570.96	1.17	572.00	1.74		
569.94	0.00	570.98	1.18	572.02	1.79		
569.96	0.00	571.00	1.20	572.04	1.89		
569.98	0.01	571.02	1.21	572.06	2.01		
570.00	0.01	571.04	1.22	572.08	2.14		
570.02	0.02	571.06	1.24	572.10	2.30		
570.04	0.03	571.08	1.25	572.12	2.47		
570.06	0.04	571.10	1.26	572.14	2.65		
570.08	0.05	571.12	1.28	572.16	2.85		
570.10	0.07	571.14	1.29	572.18	3.06		
570.12	0.09	571.16	1.30	572.20	3.28		
570.14	0.11	571.18	1.31	572.22	3.51		
570.16	0.13	571.20	1.32	572.24	3.75		
570.18	0.15	571.22	1.34	572.26	4.00		
570.20	0.18	571.24	1.35	572.28	4.07		
570.22	0.21	571.26	1.36	572.30	4.10		
570.24	0.24	571.28	1.37	572.32	4.12		
570.26	0.27	571.30	1.38	572.34	4.15		
570.28	0.30	571.32	1.39	572.36	4.17		
570.30	0.34	571.34	1.41	572.38	4.20		
570.32	0.37	571.36	1.42	572.40	4.23		
570.34	0.41	571.38	1.43	572.42	4.25		
570.36	0.45	571.40	1.44	572.44	4.27		
570.38	0.49	571.42	1.45	572.46	4.30		
570.40	0.53	571.44	1.46	572.48	4.32		
570.42	0.58	571.46	1.47	572.50	4.35		
570.44	0.62	571.48	1.48	572.52	4.37		
570.46	0.67	571.50	1.49	572.54	4.40		
570.48	0.72	571.52	1.50	572.56	4.42		
570.50	0.76	571.54	1.51	572.58	4.44		
570.52	0.81	571.56	1.52	572.60	4.47		

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Type II 24-hr 10-Year Rainfall=3.15"

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Stage-Area-Storage for Pond 7P: Underground Storage (SMA #2)

Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)
569.50	0	572.10	18,133
569.55	203	572.15	18,417
569.60	406	572.20	18,690
569.65	609	572.25	18,946
569.70	812	572.30	19,188
569.75	1,014	572.35	19,417
569.80	1,217	572.40	19,637
569.85	1,420	572.45	19,850
569.90	1,623	572.50	20,057
569.95	1,826	572.55	20,260
570.00	2,029	572.60	20,463
570.05	2,459	572.65	20,665
570.10	2,889	572.70	20,868
570.15	3,318	572.75	21,071
570.20	3,746	572.80	21,274
570.25	4,173	572.85	21,477
570.30	4,598	572.90	21,680
570.35	5,022	572.95	21,883
570.40	5,444	573.00	22,086
570.45	5,865		
570.50	6,284		
570.55	6,701		
570.60	7,116		
570.65	7,529		
570.70	7,940		
570.75	8,349		
570.80	8,756		
570.85	9,160		
570.90	9,562		
570.95	9,962		
571.00	10,359		
571.05	10,754		
571.10	11,145		
571.15	11,534		
571.20	11,919		
571.25	12,301		
571.30	12,680		
571.35	13,056		
571.40	13,428		
571.45	13,797		
571.50	14,161		
571.55	14,522		
571.60	14,879		
571.65	15,230		
571.70	15,577		
571.75	15,917		
571.80	16,252		
571.85	16,582		
571.90	16,906		
571.95	17,224		
572.00	17,535		
572.05	17,838		

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Summary for Pond 9P: Bioretention Area 3

Inflow Area = 1.500 ac, 66.67% Impervious, Inflow Depth = 2.30" for 10-Year event
 Inflow = 5.28 cfs @ 12.00 hrs, Volume= 0.288 af
 Outflow = 4.27 cfs @ 12.06 hrs, Volume= 0.288 af, Atten= 19%, Lag= 3.5 min
 Primary = 4.27 cfs @ 12.06 hrs, Volume= 0.288 af

Routing by Stor-Ind method, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
 Peak Elev= 574.72' @ 12.06 hrs Surf.Area= 6,219 sf Storage= 4,001 cf

Plug-Flow detention time= 318.6 min calculated for 0.288 af (100% of inflow)
 Center-of-Mass det. time= 318.8 min (1,116.8 - 798.1)

Volume	Invert	Avail.Storage	Storage Description
#1	574.00'	9,318 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
574.00	4,851	0	0
575.00	6,743	5,797	5,797
575.50	7,342	3,521	9,318

Device	Routing	Invert	Outlet Devices
#1	Primary	571.41'	12.0" Round 8" pipe L= 132.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 571.41' / 570.75' S= 0.0050 ' / ' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Device 1	574.50'	8.0" Horiz. Grate X 6.00 C= 0.600 Limited to weir flow at low heads
#3	Device 1	574.00'	0.250 in/hr Exfiltration over Surface area Conductivity to Groundwater Elevation = 560.00'
#4	Primary	574.75'	24.0" W x 24.0" H Vert. grate (overflow) C= 0.600

Primary OutFlow Max=4.36 cfs @ 12.06 hrs HW=574.72' (Free Discharge)

- 1=8" pipe (Passes 4.36 cfs of 4.57 cfs potential flow)
- 2=Grate (Weir Controls 4.32 cfs @ 1.54 fps)
- 3=Exfiltration (Controls 0.04 cfs)
- 4=grate (overflow) (Controls 0.00 cfs)

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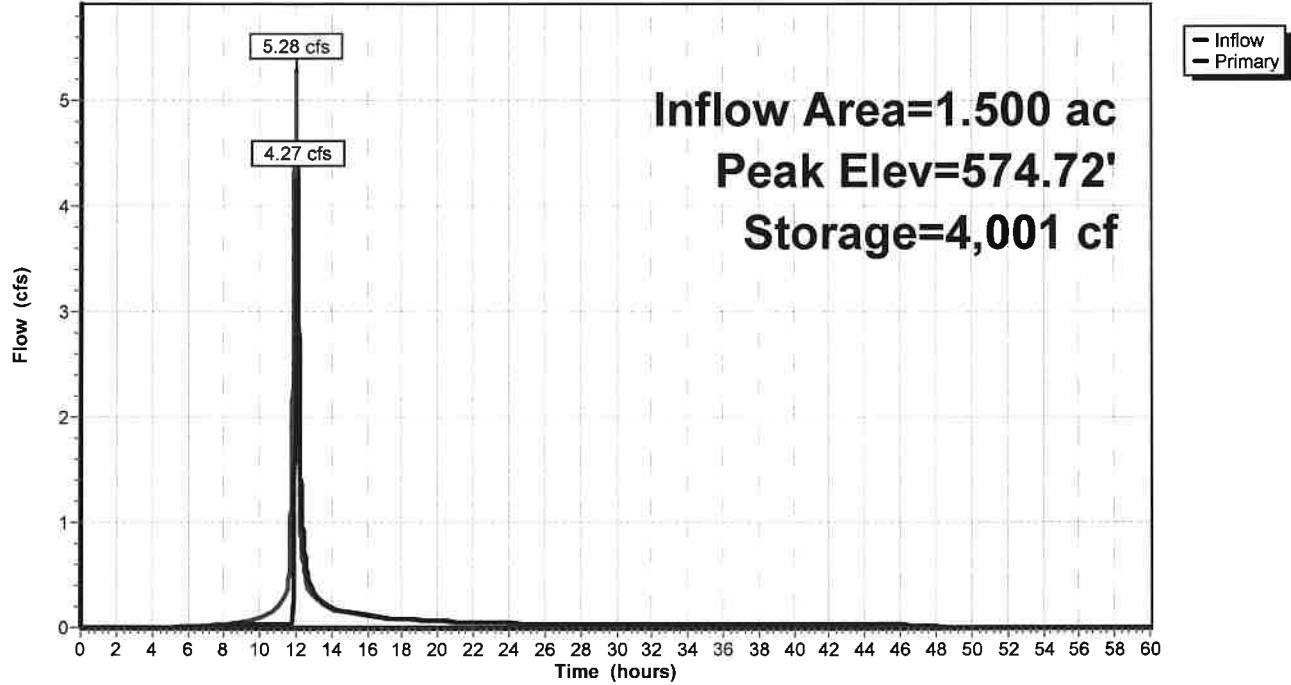
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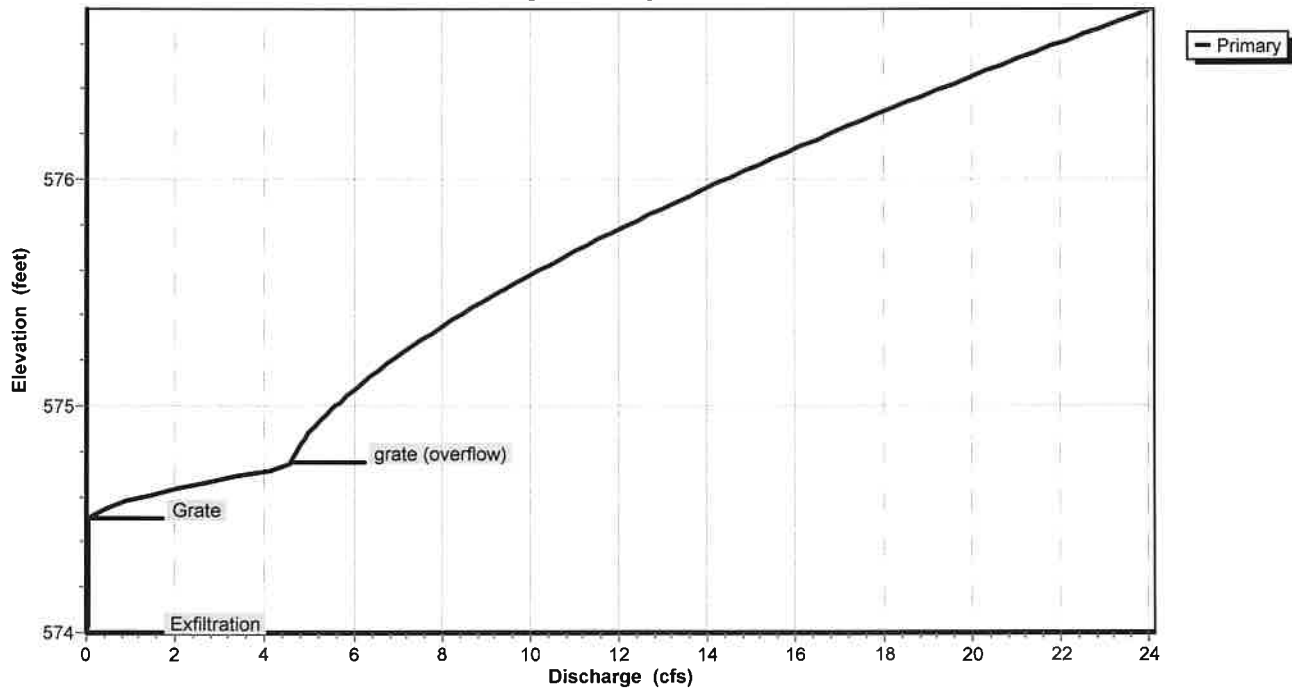
Pond 9P: Bioretention Area 3

Hydrograph



Pond 9P: Bioretention Area 3

Stage-Discharge



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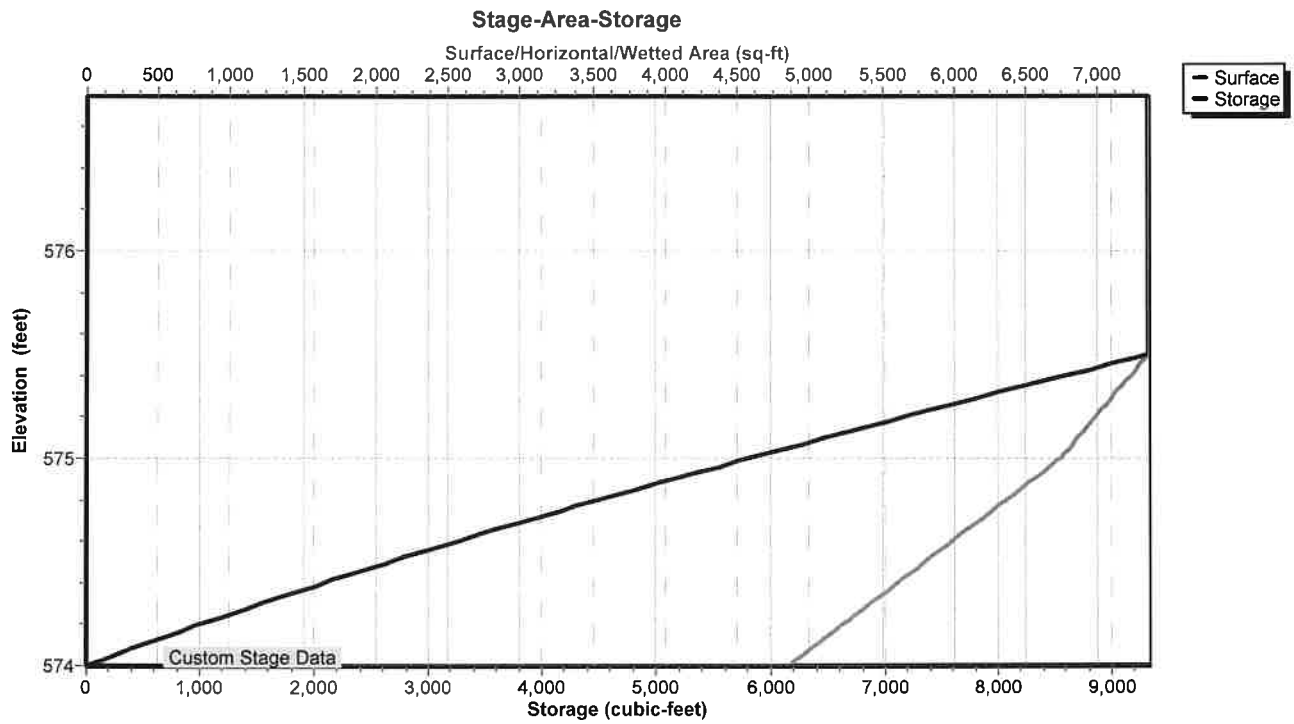
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Pond 9P: Bioretention Area 3



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Hydrograph for Pond 9P: Bioretention Area 3

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
0.00	0.00	0	574.00	0.00
2.00	0.00	0	574.00	0.00
4.00	0.00	0	574.00	0.00
6.00	0.01	21	574.00	0.00
8.00	0.03	99	574.02	0.02
10.00	0.09	335	574.07	0.03
12.00	5.27	3,799	574.69	3.45
14.00	0.18	2,801	574.52	0.19
16.00	0.11	2,738	574.51	0.12
18.00	0.08	2,710	574.51	0.09
20.00	0.06	2,689	574.50	0.06
22.00	0.05	2,681	574.50	0.06
24.00	0.05	2,677	574.50	0.05
26.00	0.00	2,445	574.46	0.03
28.00	0.00	2,201	574.42	0.03
30.00	0.00	1,961	574.38	0.03
32.00	0.00	1,726	574.33	0.03
34.00	0.00	1,494	574.29	0.03
36.00	0.00	1,267	574.25	0.03
38.00	0.00	1,043	574.21	0.03
40.00	0.00	824	574.16	0.03
42.00	0.00	608	574.12	0.03
44.00	0.00	397	574.08	0.03
46.00	0.00	189	574.04	0.03
48.00	0.00	44	574.01	0.01
50.00	0.00	10	574.00	0.00
52.00	0.00	2	574.00	0.00
54.00	0.00	0	574.00	0.00
56.00	0.00	0	574.00	0.00
58.00	0.00	0	574.00	0.00
60.00	0.00	0	574.00	0.00

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Type II 24-hr 10-Year Rainfall=3.15"

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Stage-Discharge for Pond 9P: Bioretention Area 3

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
574.00	0.00	575.04	5.81	576.08	15.37
574.02	0.03	575.06	5.93	576.10	15.60
574.04	0.03	575.08	6.06	576.12	15.84
574.06	0.03	575.10	6.18	576.14	16.08
574.08	0.03	575.12	6.31	576.16	16.32
574.10	0.03	575.14	6.45	576.18	16.56
574.12	0.03	575.16	6.58	576.20	16.81
574.14	0.03	575.18	6.72	576.22	17.05
574.16	0.03	575.20	6.87	576.24	17.30
574.18	0.03	575.22	7.01	576.26	17.55
574.20	0.03	575.24	7.16	576.28	17.80
574.22	0.03	575.26	7.31	576.30	18.05
574.24	0.03	575.28	7.46	576.32	18.30
574.26	0.03	575.30	7.62	576.34	18.56
574.28	0.03	575.32	7.78	576.36	18.81
574.30	0.03	575.34	7.94	576.38	19.07
574.32	0.03	575.36	8.10	576.40	19.33
574.34	0.03	575.38	8.26	576.42	19.59
574.36	0.03	575.40	8.43	576.44	19.85
574.38	0.03	575.42	8.60	576.46	20.11
574.40	0.03	575.44	8.78	576.48	20.38
574.42	0.03	575.46	8.95	576.50	20.64
574.44	0.03	575.48	9.13	576.52	20.91
574.46	0.03	575.50	9.31	576.54	21.18
574.48	0.03	575.52	9.49	576.56	21.45
574.50	0.03	575.54	9.67	576.58	21.72
574.52	0.15	575.56	9.86	576.60	22.00
574.54	0.36	575.58	10.05	576.62	22.27
574.56	0.64	575.60	10.24	576.64	22.55
574.58	0.97	575.62	10.43	576.66	22.83
574.60	1.34	575.64	10.62	576.68	23.10
574.62	1.74	575.66	10.82	576.70	23.38
574.64	2.19	575.68	11.02	576.72	23.67
574.66	2.67	575.70	11.22	576.74	23.95
574.68	3.18	575.72	11.42		
574.70	3.71	575.74	11.62		
574.72	4.28	575.76	11.83		
574.74	4.59	575.78	12.04		
574.76	4.61	575.80	12.25		
574.78	4.65	575.82	12.46		
574.80	4.70	575.84	12.67		
574.82	4.77	575.86	12.89		
574.84	4.84	575.88	13.10		
574.86	4.91	575.90	13.32		
574.88	4.99	575.92	13.54		
574.90	5.08	575.94	13.76		
574.92	5.17	575.96	13.99		
574.94	5.27	575.98	14.21		
574.96	5.37	576.00	14.44		
574.98	5.48	576.02	14.67		
575.00	5.59	576.04	14.90		
575.02	5.70	576.06	15.13		

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Stage-Area-Storage for Pond 9P: Bioretention Area 3

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
574.00	4,851	0	576.60	7,342	9,318
574.05	4,946	245	576.65	7,342	9,318
574.10	5,040	495	576.70	7,342	9,318
574.15	5,135	749	576.75	7,342	9,318
574.20	5,229	1,008			
574.25	5,324	1,272			
574.30	5,419	1,540			
574.35	5,513	1,814			
574.40	5,608	2,092			
574.45	5,702	2,375			
574.50	5,797	2,662			
574.55	5,892	2,954			
574.60	5,986	3,251			
574.65	6,081	3,553			
574.70	6,175	3,859			
574.75	6,270	4,170			
574.80	6,365	4,486			
574.85	6,459	4,807			
574.90	6,554	5,132			
574.95	6,648	5,462			
575.00	6,743	5,797			
575.05	6,803	6,136			
575.10	6,863	6,477			
575.15	6,923	6,822			
575.20	6,983	7,170			
575.25	7,043	7,520			
575.30	7,102	7,874			
575.35	7,162	8,230			
575.40	7,222	8,590			
575.45	7,282	8,953			
575.50	7,342	9,318			
575.55	7,342	9,318			
575.60	7,342	9,318			
575.65	7,342	9,318			
575.70	7,342	9,318			
575.75	7,342	9,318			
575.80	7,342	9,318			
575.85	7,342	9,318			
575.90	7,342	9,318			
575.95	7,342	9,318			
576.00	7,342	9,318			
576.05	7,342	9,318			
576.10	7,342	9,318			
576.15	7,342	9,318			
576.20	7,342	9,318			
576.25	7,342	9,318			
576.30	7,342	9,318			
576.35	7,342	9,318			
576.40	7,342	9,318			
576.45	7,342	9,318			
576.50	7,342	9,318			
576.55	7,342	9,318			

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Type II 24-hr 25-Year Rainfall=3.87"

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Time span=0.00-60.00 hrs, dt=0.01 hrs, 6001 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 8S: Front Area 2 Runoff Area=1.700 ac 58.82% Impervious Runoff Depth=2.89"
Flow Length=1,325' Slope=0.0100 '/' Tc=14.1 min CN=91 Runoff=6.35 cfs 0.410 af

Subcatchment 10S: Rear Area 2 Runoff Area=1.500 ac 66.67% Impervious Runoff Depth=2.99"
Flow Length=345' Tc=9.1 min CN=92 Runoff=6.75 cfs 0.374 af

Pond 7P: Underground Storage (SMA #2) Peak Elev=571.73' Storage=15,804 cf Inflow=11.11 cfs 0.784 af
Outflow=1.61 cfs 0.740 af

Pond 9P: Bioretention Area 3 Peak Elev=574.82' Storage=4,638 cf Inflow=6.75 cfs 0.374 af
Outflow=4.78 cfs 0.374 af

Total Runoff Area = 3.200 ac Runoff Volume = 0.784 af Average Runoff Depth = 2.94"
37.50% Pervious = 1.200 ac 62.50% Impervious = 2.000 ac

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Type II 24-hr 25-Year Rainfall=3.87"

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Summary for Subcatchment 8S: Front Area 2

Runoff = 6.35 cfs @ 12.05 hrs, Volume= 0.410 af, Depth= 2.89"

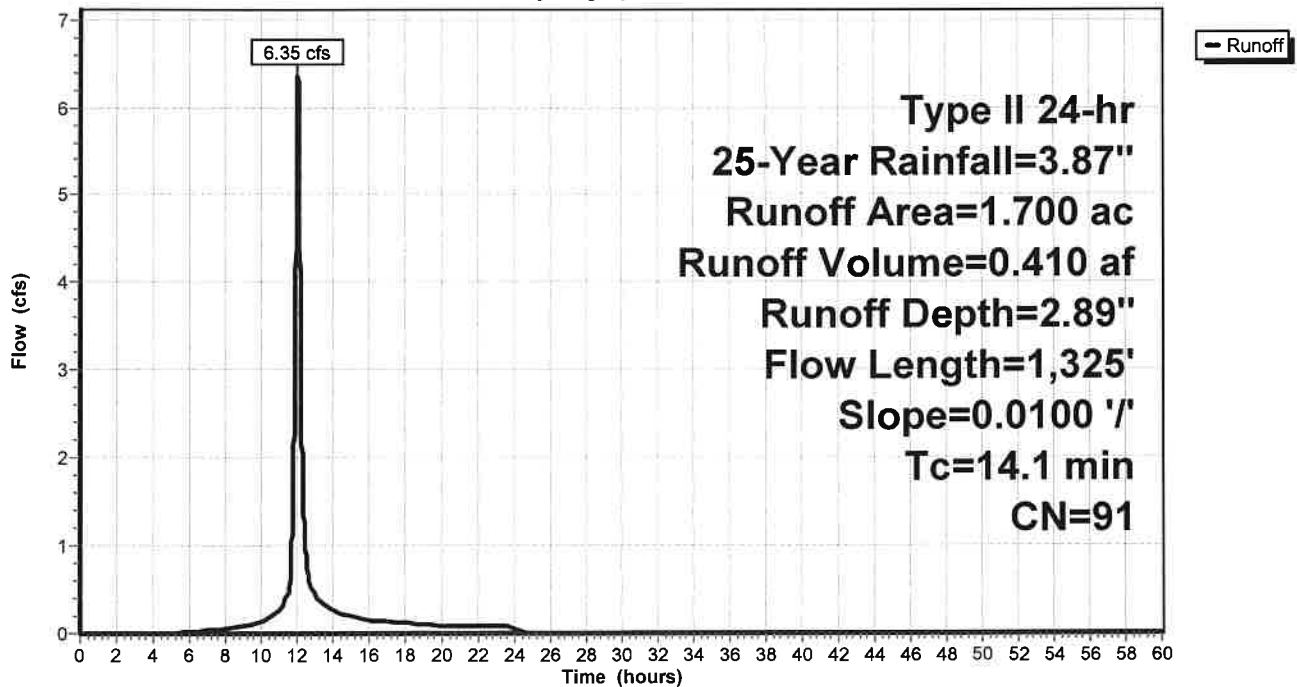
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
Type II 24-hr 25-Year Rainfall=3.87"

Area (ac)	CN	Description
0.700	98	Paved parking, HSG D
0.300	98	Roofs, HSG D
0.700	80	>75% Grass cover, Good, HSG D
1.700	91	Weighted Average
0.700		41.18% Pervious Area
1.000		58.82% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.0	40	0.0100	0.09		Sheet Flow, grass Grass: Short n= 0.150 P2= 2.50"
7.1	1,285		3.00		Direct Entry, Pipe flow
14.1	1,325	Total			

Subcatchment 8S: Front Area 2

Hydrograph



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Type II 24-hr 25-Year Rainfall=3.87"

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Hydrograph for Subcatchment 8S: Front Area 2

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	52.00	3.87	2.89	0.00
1.00	0.04	0.00	0.00	53.00	3.87	2.89	0.00
2.00	0.09	0.00	0.00	54.00	3.87	2.89	0.00
3.00	0.13	0.00	0.00	55.00	3.87	2.89	0.00
4.00	0.19	0.00	0.00	56.00	3.87	2.89	0.00
5.00	0.24	0.00	0.01	57.00	3.87	2.89	0.00
6.00	0.31	0.01	0.02	58.00	3.87	2.89	0.00
7.00	0.38	0.03	0.04	59.00	3.87	2.89	0.00
8.00	0.46	0.06	0.05	60.00	3.87	2.89	0.00
9.00	0.57	0.10	0.09				
10.00	0.70	0.17	0.13				
11.00	0.91	0.30	0.27				
12.00	2.57	1.67	5.66				
13.00	2.99	2.06	0.45				
14.00	3.17	2.23	0.26				
15.00	3.30	2.36	0.20				
16.00	3.41	2.45	0.15				
17.00	3.49	2.53	0.13				
18.00	3.56	2.60	0.12				
19.00	3.63	2.66	0.10				
20.00	3.68	2.72	0.09				
21.00	3.73	2.76	0.08				
22.00	3.78	2.81	0.08				
23.00	3.83	2.85	0.07				
24.00	3.87	2.89	0.07				
25.00	3.87	2.89	0.00				
26.00	3.87	2.89	0.00				
27.00	3.87	2.89	0.00				
28.00	3.87	2.89	0.00				
29.00	3.87	2.89	0.00				
30.00	3.87	2.89	0.00				
31.00	3.87	2.89	0.00				
32.00	3.87	2.89	0.00				
33.00	3.87	2.89	0.00				
34.00	3.87	2.89	0.00				
35.00	3.87	2.89	0.00				
36.00	3.87	2.89	0.00				
37.00	3.87	2.89	0.00				
38.00	3.87	2.89	0.00				
39.00	3.87	2.89	0.00				
40.00	3.87	2.89	0.00				
41.00	3.87	2.89	0.00				
42.00	3.87	2.89	0.00				
43.00	3.87	2.89	0.00				
44.00	3.87	2.89	0.00				
45.00	3.87	2.89	0.00				
46.00	3.87	2.89	0.00				
47.00	3.87	2.89	0.00				
48.00	3.87	2.89	0.00				
49.00	3.87	2.89	0.00				
50.00	3.87	2.89	0.00				
51.00	3.87	2.89	0.00				

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Type II 24-hr 25-Year Rainfall=3.87"

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Summary for Subcatchment 10S: Rear Area 2

Runoff = 6.75 cfs @ 12.00 hrs, Volume= 0.374 af, Depth= 2.99"

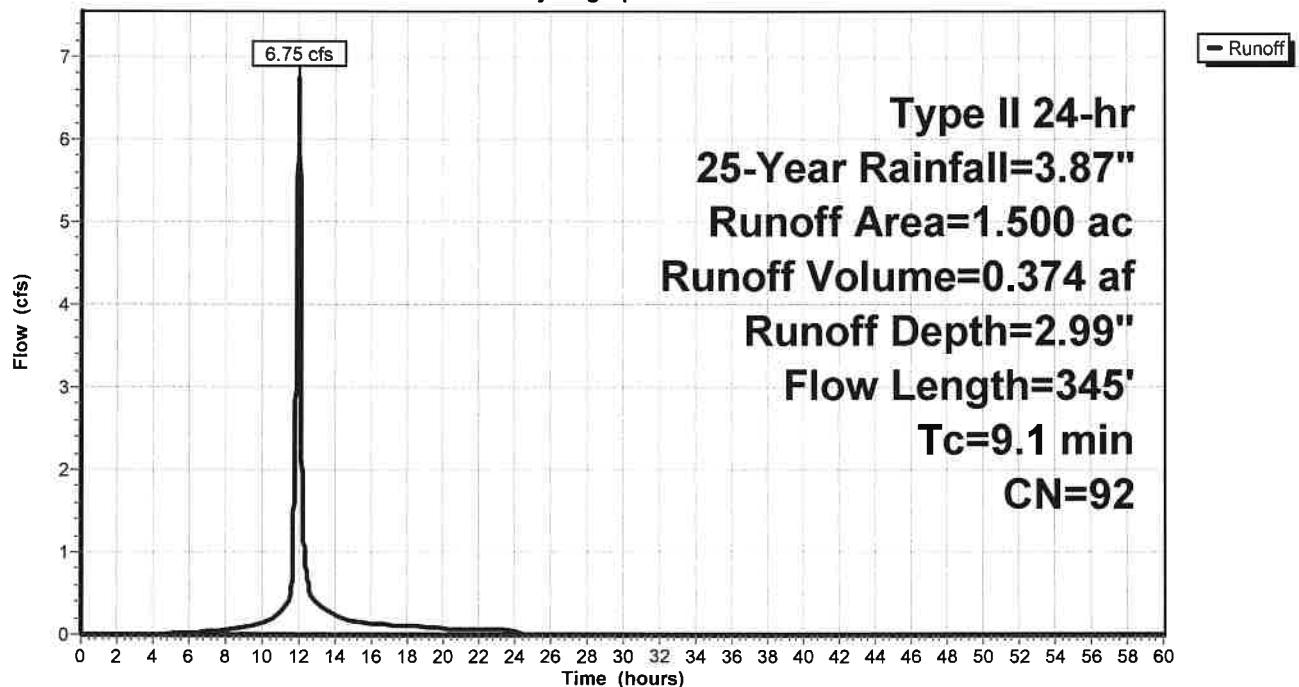
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
Type II 24-hr 25-Year Rainfall=3.87"

Area (ac)	CN	Description
0.500	98	Paved parking, HSG D
0.500	98	Roofs, HSG D
0.500	80	>75% Grass cover, Good, HSG D
1.500	92	Weighted Average
0.500		33.33% Pervious Area
1.000		66.67% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.9	55	0.0200	0.13		Sheet Flow, grass Grass: Short n= 0.150 P2= 2.50"
0.8	45	0.0170	0.97		Sheet Flow, pavement Smooth surfaces n= 0.011 P2= 2.50"
1.4	245		3.00		Direct Entry, Pipe flow
9.1	345	Total			

Subcatchment 10S: Rear Area 2

Hydrograph



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Type II 24-hr 25-Year Rainfall=3.87"

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Hydrograph for Subcatchment 10S: Rear Area 2

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	52.00	3.87	2.99	0.00
1.00	0.04	0.00	0.00	53.00	3.87	2.99	0.00
2.00	0.09	0.00	0.00	54.00	3.87	2.99	0.00
3.00	0.13	0.00	0.00	55.00	3.87	2.99	0.00
4.00	0.19	0.00	0.00	56.00	3.87	2.99	0.00
5.00	0.24	0.01	0.01	57.00	3.87	2.99	0.00
6.00	0.31	0.02	0.02	58.00	3.87	2.99	0.00
7.00	0.38	0.04	0.04	59.00	3.87	2.99	0.00
8.00	0.46	0.07	0.05	60.00	3.87	2.99	0.00
9.00	0.57	0.12	0.09				
10.00	0.70	0.20	0.13				
11.00	0.91	0.34	0.27				
12.00	2.57	1.75	6.75				
13.00	2.99	2.15	0.38				
14.00	3.17	2.33	0.22				
15.00	3.30	2.45	0.17				
16.00	3.41	2.55	0.13				
17.00	3.49	2.63	0.12				
18.00	3.56	2.70	0.10				
19.00	3.63	2.76	0.09				
20.00	3.68	2.81	0.08				
21.00	3.73	2.86	0.07				
22.00	3.78	2.91	0.07				
23.00	3.83	2.95	0.07				
24.00	3.87	2.99	0.06				
25.00	3.87	2.99	0.00				
26.00	3.87	2.99	0.00				
27.00	3.87	2.99	0.00				
28.00	3.87	2.99	0.00				
29.00	3.87	2.99	0.00				
30.00	3.87	2.99	0.00				
31.00	3.87	2.99	0.00				
32.00	3.87	2.99	0.00				
33.00	3.87	2.99	0.00				
34.00	3.87	2.99	0.00				
35.00	3.87	2.99	0.00				
36.00	3.87	2.99	0.00				
37.00	3.87	2.99	0.00				
38.00	3.87	2.99	0.00				
39.00	3.87	2.99	0.00				
40.00	3.87	2.99	0.00				
41.00	3.87	2.99	0.00				
42.00	3.87	2.99	0.00				
43.00	3.87	2.99	0.00				
44.00	3.87	2.99	0.00				
45.00	3.87	2.99	0.00				
46.00	3.87	2.99	0.00				
47.00	3.87	2.99	0.00				
48.00	3.87	2.99	0.00				
49.00	3.87	2.99	0.00				
50.00	3.87	2.99	0.00				
51.00	3.87	2.99	0.00				

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Type II 24-hr 25-Year Rainfall=3.87"

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Summary for Pond 7P: Underground Storage (SMA #2)

Inflow Area = 3.200 ac, 62.50% Impervious, Inflow Depth = 2.94" for 25-Year event
 Inflow = 11.11 cfs @ 12.06 hrs, Volume= 0.784 af
 Outflow = 1.61 cfs @ 12.54 hrs, Volume= 0.740 af, Atten= 85%, Lag= 29.2 min
 Primary = 1.61 cfs @ 12.54 hrs, Volume= 0.740 af

Routing by Stor-Ind method, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
 Peak Elev= 571.73' @ 12.54 hrs Surf.Area= 10,145 sf Storage= 15,804 cf

Plug-Flow detention time= 252.2 min calculated for 0.740 af (94% of inflow)
 Center-of-Mass det. time= 168.6 min (1,084.7 - 916.2)

Volume	Invert	Avail.Storage	Storage Description
#1A	569.50'	8,947 cf	53.75'W x 188.74'L x 3.50'H Field A 35,506 cf Overall - 13,139 cf Embedded = 22,367 cf x 40.0% Voids
#2A	570.00'	13,139 cf	ADS StormTech SC-740 +Cap x 286 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 11 Rows of 26 Chambers
		22,086 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	569.93'	12.0" Round Culvert L= 72.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 569.93' / 569.71' S= 0.0031 ' / Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Device 1	569.93'	4.0" Vert. Orifice X 3.00 C= 0.600
#3	Device 1	572.00'	5.0' long Weir 2 End Contraction(s)

Primary OutFlow Max=1.61 cfs @ 12.54 hrs HW=571.73' (Free Discharge)

1=Culvert (Passes 1.61 cfs of 3.29 cfs potential flow)

2=Orifice (Orifice Controls 1.61 cfs @ 6.16 fps)

3=Weir (Controls 0.00 cfs)

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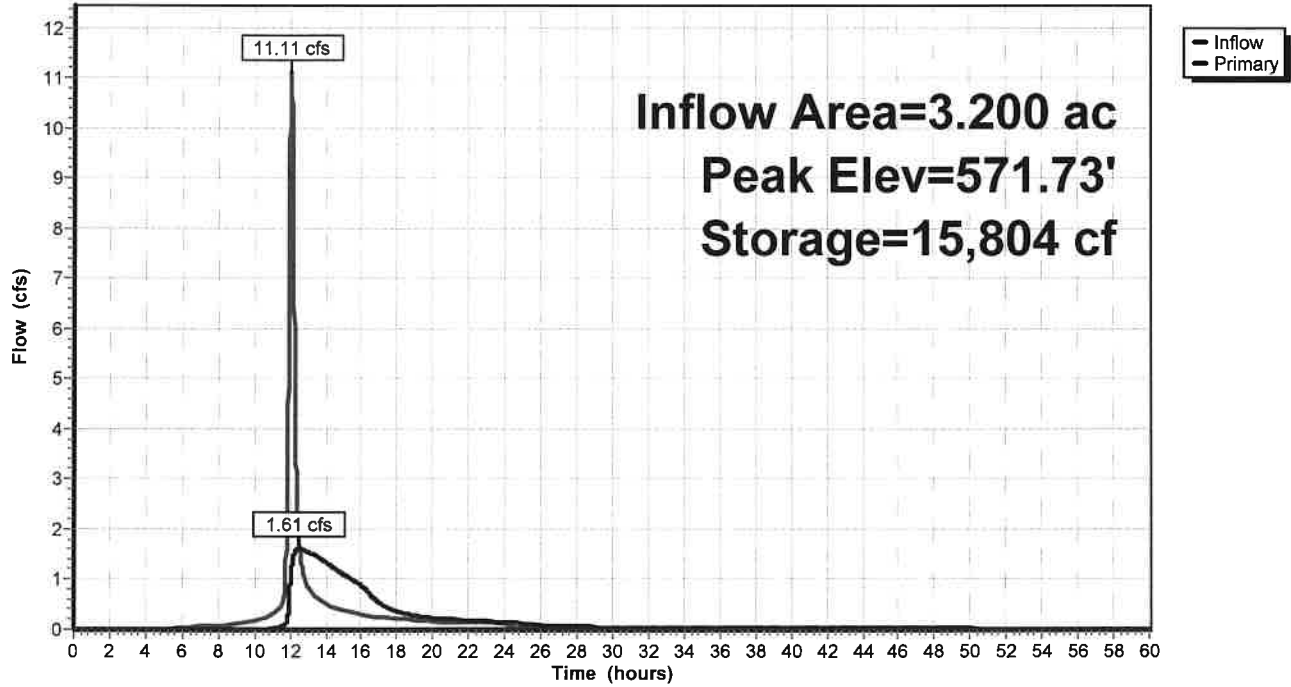
Type II 24-hr 25-Year Rainfall=3.87"

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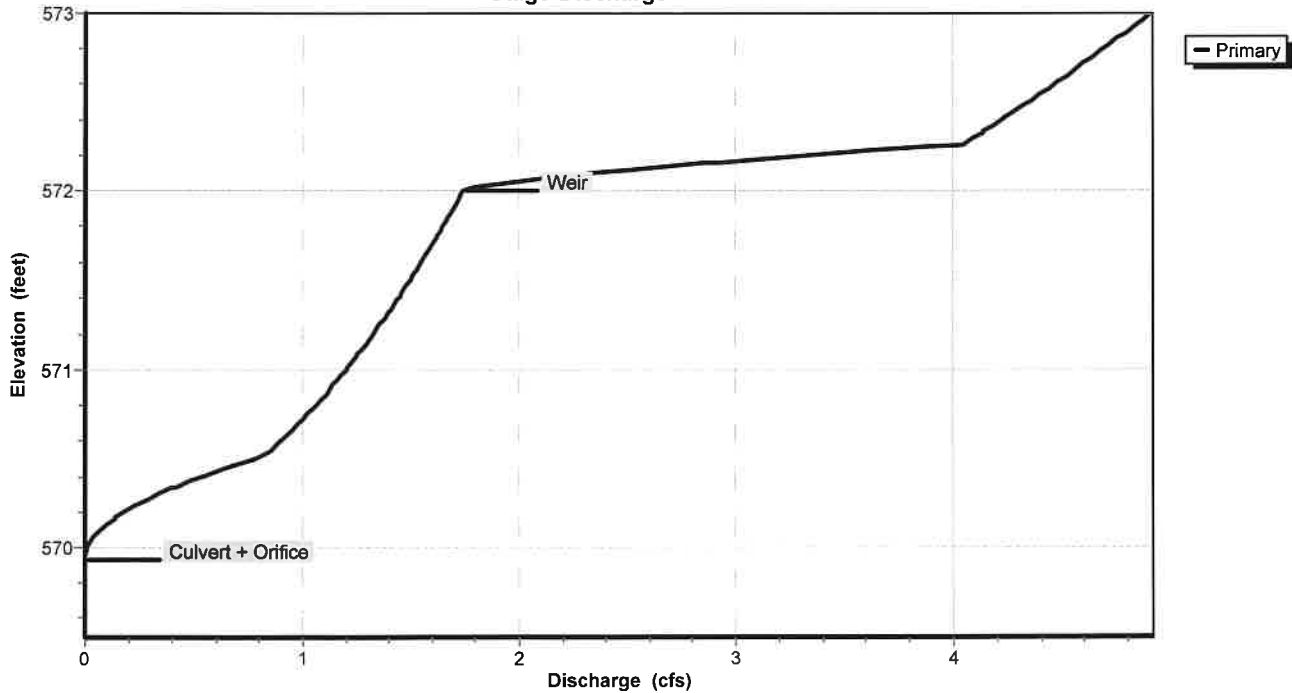
Pond 7P: Underground Storage (SMA #2)

Hydrograph



Pond 7P: Underground Storage (SMA #2)

Stage-Discharge



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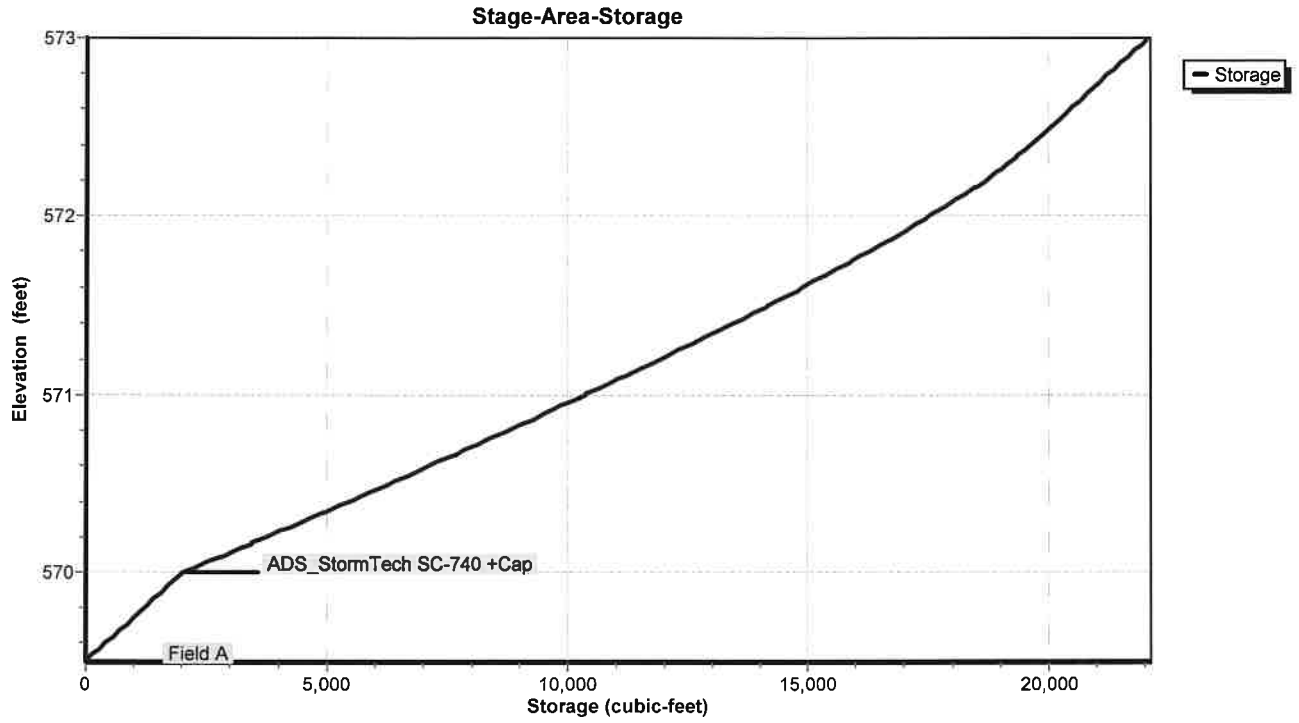
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Pond 7P: Underground Storage (SMA #2)



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Hydrograph for Pond 7P: Underground Storage (SMA #2)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
0.00	0.00	0	569.50	0.00
2.00	0.00	0	569.50	0.00
4.00	0.00	0	569.50	0.00
6.00	0.03	85	569.52	0.00
8.00	0.08	499	569.62	0.00
10.00	0.16	1,337	569.83	0.00
12.00	10.28	7,562	570.65	0.94
14.00	0.49	12,132	571.23	1.34
16.00	0.30	6,914	570.58	0.87
18.00	0.22	4,703	570.31	0.36
20.00	0.16	4,045	570.24	0.23
22.00	0.15	3,711	570.20	0.17
24.00	0.13	3,549	570.18	0.15
26.00	0.03	3,038	570.12	0.09
28.00	0.03	2,775	570.09	0.06
30.00	0.03	2,637	570.07	0.05
32.00	0.03	2,558	570.06	0.04
34.00	0.03	2,510	570.06	0.04
36.00	0.03	2,476	570.05	0.04
38.00	0.03	2,451	570.05	0.03
40.00	0.03	2,433	570.05	0.03
42.00	0.03	2,418	570.05	0.03
44.00	0.03	2,405	570.04	0.03
46.00	0.03	2,394	570.04	0.03
48.00	0.01	2,335	570.04	0.03
50.00	0.00	2,210	570.02	0.02
52.00	0.00	2,101	570.01	0.01
54.00	0.00	2,017	570.00	0.01
56.00	0.00	1,961	569.98	0.01
58.00	0.00	1,922	569.97	0.00
60.00	0.00	1,894	569.97	0.00

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Stage-Discharge for Pond 7P: Underground Storage (SMA #2)

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
569.50	0.00	570.54	0.84	571.58	1.54	572.62	4.49
569.52	0.00	570.56	0.86	571.60	1.55	572.64	4.52
569.54	0.00	570.58	0.88	571.62	1.56	572.66	4.54
569.56	0.00	570.60	0.89	571.64	1.57	572.68	4.56
569.58	0.00	570.62	0.91	571.66	1.58	572.70	4.58
569.60	0.00	570.64	0.93	571.68	1.59	572.72	4.61
569.62	0.00	570.66	0.95	571.70	1.60	572.74	4.63
569.64	0.00	570.68	0.96	571.72	1.61	572.76	4.65
569.66	0.00	570.70	0.98	571.74	1.62	572.78	4.68
569.68	0.00	570.72	1.00	571.76	1.63	572.80	4.70
569.70	0.00	570.74	1.01	571.78	1.64	572.82	4.72
569.72	0.00	570.76	1.03	571.80	1.65	572.84	4.74
569.74	0.00	570.78	1.04	571.82	1.65	572.86	4.77
569.76	0.00	570.80	1.06	571.84	1.66	572.88	4.79
569.78	0.00	570.82	1.07	571.86	1.67	572.90	4.81
569.80	0.00	570.84	1.09	571.88	1.68	572.92	4.83
569.82	0.00	570.86	1.10	571.90	1.69	572.94	4.85
569.84	0.00	570.88	1.12	571.92	1.70	572.96	4.88
569.86	0.00	570.90	1.13	571.94	1.71	572.98	4.90
569.88	0.00	570.92	1.14	571.96	1.72	573.00	4.92
569.90	0.00	570.94	1.16	571.98	1.73		
569.92	0.00	570.96	1.17	572.00	1.74		
569.94	0.00	570.98	1.18	572.02	1.79		
569.96	0.00	571.00	1.20	572.04	1.89		
569.98	0.01	571.02	1.21	572.06	2.01		
570.00	0.01	571.04	1.22	572.08	2.14		
570.02	0.02	571.06	1.24	572.10	2.30		
570.04	0.03	571.08	1.25	572.12	2.47		
570.06	0.04	571.10	1.26	572.14	2.65		
570.08	0.05	571.12	1.28	572.16	2.85		
570.10	0.07	571.14	1.29	572.18	3.06		
570.12	0.09	571.16	1.30	572.20	3.28		
570.14	0.11	571.18	1.31	572.22	3.51		
570.16	0.13	571.20	1.32	572.24	3.75		
570.18	0.15	571.22	1.34	572.26	4.00		
570.20	0.18	571.24	1.35	572.28	4.07		
570.22	0.21	571.26	1.36	572.30	4.10		
570.24	0.24	571.28	1.37	572.32	4.12		
570.26	0.27	571.30	1.38	572.34	4.15		
570.28	0.30	571.32	1.39	572.36	4.17		
570.30	0.34	571.34	1.41	572.38	4.20		
570.32	0.37	571.36	1.42	572.40	4.23		
570.34	0.41	571.38	1.43	572.42	4.25		
570.36	0.45	571.40	1.44	572.44	4.27		
570.38	0.49	571.42	1.45	572.46	4.30		
570.40	0.53	571.44	1.46	572.48	4.32		
570.42	0.58	571.46	1.47	572.50	4.35		
570.44	0.62	571.48	1.48	572.52	4.37		
570.46	0.67	571.50	1.49	572.54	4.40		
570.48	0.72	571.52	1.50	572.56	4.42		
570.50	0.76	571.54	1.51	572.58	4.44		
570.52	0.81	571.56	1.52	572.60	4.47		

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Type II 24-hr 25-Year Rainfall=3.87"

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Stage-Area-Storage for Pond 7P: Underground Storage (SMA #2)

Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)
569.50	0	572.10	18,133
569.55	203	572.15	18,417
569.60	406	572.20	18,690
569.65	609	572.25	18,946
569.70	812	572.30	19,188
569.75	1,014	572.35	19,417
569.80	1,217	572.40	19,637
569.85	1,420	572.45	19,850
569.90	1,623	572.50	20,057
569.95	1,826	572.55	20,260
570.00	2,029	572.60	20,463
570.05	2,459	572.65	20,665
570.10	2,889	572.70	20,868
570.15	3,318	572.75	21,071
570.20	3,746	572.80	21,274
570.25	4,173	572.85	21,477
570.30	4,598	572.90	21,680
570.35	5,022	572.95	21,883
570.40	5,444	573.00	22,086
570.45	5,865		
570.50	6,284		
570.55	6,701		
570.60	7,116		
570.65	7,529		
570.70	7,940		
570.75	8,349		
570.80	8,756		
570.85	9,160		
570.90	9,562		
570.95	9,962		
571.00	10,359		
571.05	10,754		
571.10	11,145		
571.15	11,534		
571.20	11,919		
571.25	12,301		
571.30	12,680		
571.35	13,056		
571.40	13,428		
571.45	13,797		
571.50	14,161		
571.55	14,522		
571.60	14,879		
571.65	15,230		
571.70	15,577		
571.75	15,917		
571.80	16,252		
571.85	16,582		
571.90	16,906		
571.95	17,224		
572.00	17,535		
572.05	17,838		

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Type II 24-hr 25-Year Rainfall=3.87"

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Summary for Pond 9P: Bioretention Area 3

Inflow Area = 1.500 ac, 66.67% Impervious, Inflow Depth = 2.99" for 25-Year event
 Inflow = 6.75 cfs @ 12.00 hrs, Volume= 0.374 af
 Outflow = 4.78 cfs @ 12.08 hrs, Volume= 0.374 af, Atten= 29%, Lag= 4.5 min
 Primary = 4.78 cfs @ 12.08 hrs, Volume= 0.374 af

Routing by Stor-Ind method, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
 Peak Elev= 574.82' @ 12.08 hrs Surf.Area= 6,409 sf Storage= 4,638 cf

Plug-Flow detention time= 252.6 min calculated for 0.374 af (100% of inflow)
 Center-of-Mass det. time= 252.8 min (1,043.6 - 790.7)

Volume	Invert	Avail.Storage	Storage Description
#1	574.00'	9,318 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
574.00	4,851	0	0
575.00	6,743	5,797	5,797
575.50	7,342	3,521	9,318

Device	Routing	Invert	Outlet Devices
#1	Primary	571.41'	12.0" Round 8" pipe L= 132.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 571.41' / 570.75' S= 0.0050 '/ Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Device 1	574.50'	8.0" Horiz. Grate X 6.00 C= 0.600 Limited to weir flow at low heads
#3	Device 1	574.00'	0.250 in/hr Exfiltration over Surface area Conductivity to Groundwater Elevation = 560.00'
#4	Primary	574.75'	24.0" W x 24.0" H Vert. grate (overflow) C= 0.600

Primary OutFlow Max=4.78 cfs @ 12.08 hrs HW=574.82' (Free Discharge)

- 1=8" pipe (Barrel Controls 4.65 cfs @ 5.92 fps)
- 2=Grate (Passes < 5.74 cfs potential flow)
- 3=Exfiltration (Passes < 0.04 cfs potential flow)
- 4=grate (overflow) (Orifice Controls 0.13 cfs @ 0.87 fps)

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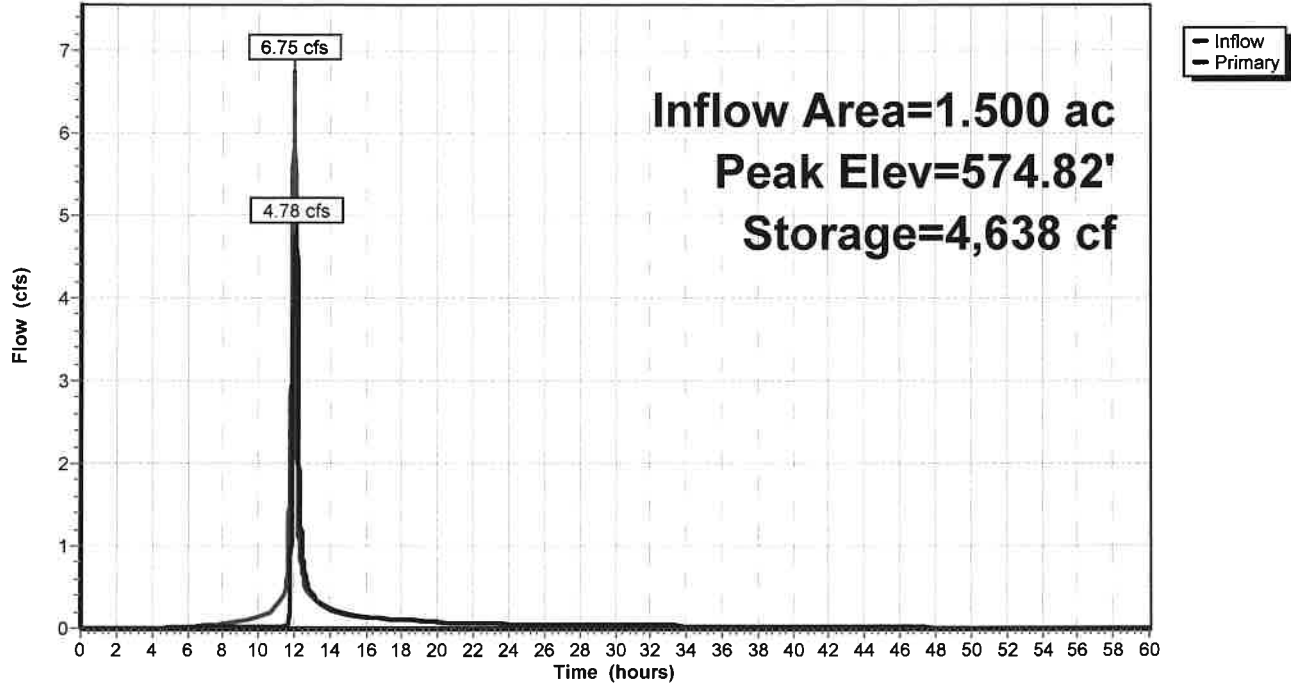
Type II 24-hr 25-Year Rainfall=3.87"

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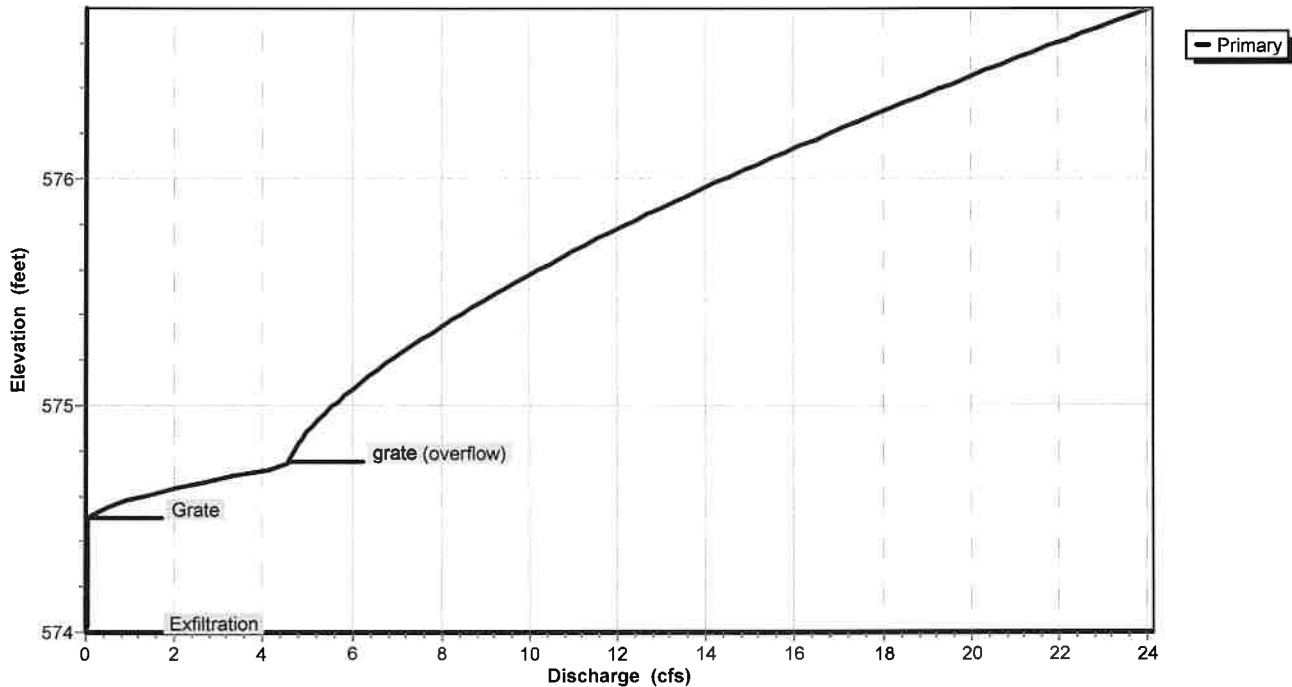
Pond 9P: Bioretention Area 3

Hydrograph

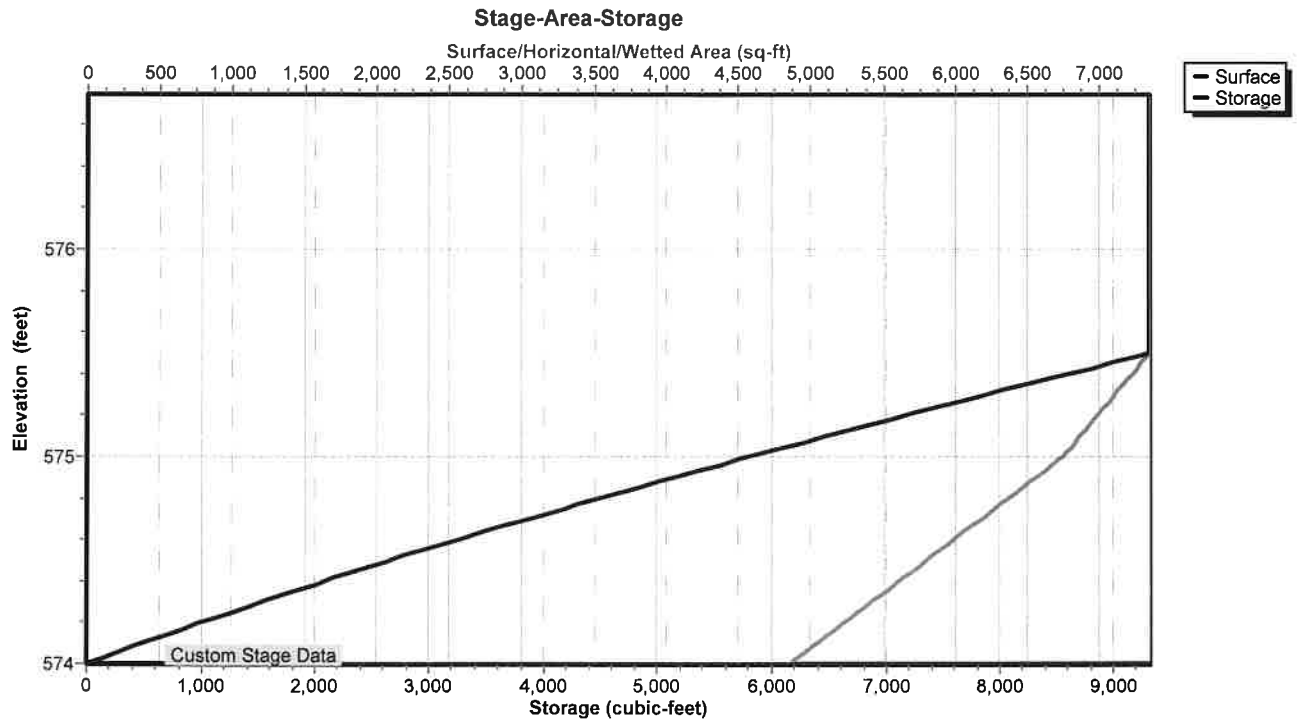


Pond 9P: Bioretention Area 3

Stage-Discharge



Pond 9P: Bioretention Area 3



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Type II 24-hr 25-Year Rainfall=3.87"

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Hydrograph for Pond 9P: Bioretention Area 3

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
0.00	0.00	0	574.00	0.00
2.00	0.00	0	574.00	0.00
4.00	0.00	0	574.00	0.00
6.00	0.02	55	574.01	0.01
8.00	0.05	177	574.04	0.03
10.00	0.13	612	574.12	0.03
12.00	6.75	4,265	574.77	4.62
14.00	0.22	2,825	574.53	0.24
16.00	0.13	2,765	574.52	0.14
18.00	0.10	2,730	574.51	0.11
20.00	0.08	2,704	574.51	0.08
22.00	0.07	2,694	574.51	0.07
24.00	0.06	2,689	574.50	0.06
26.00	0.00	2,452	574.46	0.03
28.00	0.00	2,208	574.42	0.03
30.00	0.00	1,968	574.38	0.03
32.00	0.00	1,733	574.34	0.03
34.00	0.00	1,501	574.29	0.03
36.00	0.00	1,273	574.25	0.03
38.00	0.00	1,050	574.21	0.03
40.00	0.00	830	574.17	0.03
42.00	0.00	614	574.12	0.03
44.00	0.00	403	574.08	0.03
46.00	0.00	195	574.04	0.03
48.00	0.00	46	574.01	0.01
50.00	0.00	10	574.00	0.00
52.00	0.00	2	574.00	0.00
54.00	0.00	0	574.00	0.00
56.00	0.00	0	574.00	0.00
58.00	0.00	0	574.00	0.00
60.00	0.00	0	574.00	0.00

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Type II 24-hr 25-Year Rainfall=3.87"

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Stage-Discharge for Pond 9P: Bioretention Area 3

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
574.00	0.00	575.04	5.81	576.08	15.37
574.02	0.03	575.06	5.93	576.10	15.60
574.04	0.03	575.08	6.06	576.12	15.84
574.06	0.03	575.10	6.18	576.14	16.08
574.08	0.03	575.12	6.31	576.16	16.32
574.10	0.03	575.14	6.45	576.18	16.56
574.12	0.03	575.16	6.58	576.20	16.81
574.14	0.03	575.18	6.72	576.22	17.05
574.16	0.03	575.20	6.87	576.24	17.30
574.18	0.03	575.22	7.01	576.26	17.55
574.20	0.03	575.24	7.16	576.28	17.80
574.22	0.03	575.26	7.31	576.30	18.05
574.24	0.03	575.28	7.46	576.32	18.30
574.26	0.03	575.30	7.62	576.34	18.56
574.28	0.03	575.32	7.78	576.36	18.81
574.30	0.03	575.34	7.94	576.38	19.07
574.32	0.03	575.36	8.10	576.40	19.33
574.34	0.03	575.38	8.26	576.42	19.59
574.36	0.03	575.40	8.43	576.44	19.85
574.38	0.03	575.42	8.60	576.46	20.11
574.40	0.03	575.44	8.78	576.48	20.38
574.42	0.03	575.46	8.95	576.50	20.64
574.44	0.03	575.48	9.13	576.52	20.91
574.46	0.03	575.50	9.31	576.54	21.18
574.48	0.03	575.52	9.49	576.56	21.45
574.50	0.03	575.54	9.67	576.58	21.72
574.52	0.15	575.56	9.86	576.60	22.00
574.54	0.36	575.58	10.05	576.62	22.27
574.56	0.64	575.60	10.24	576.64	22.55
574.58	0.97	575.62	10.43	576.66	22.83
574.60	1.34	575.64	10.62	576.68	23.10
574.62	1.74	575.66	10.82	576.70	23.38
574.64	2.19	575.68	11.02	576.72	23.67
574.66	2.67	575.70	11.22	576.74	23.95
574.68	3.18	575.72	11.42		
574.70	3.71	575.74	11.62		
574.72	4.28	575.76	11.83		
574.74	4.59	575.78	12.04		
574.76	4.61	575.80	12.25		
574.78	4.65	575.82	12.46		
574.80	4.70	575.84	12.67		
574.82	4.77	575.86	12.89		
574.84	4.84	575.88	13.10		
574.86	4.91	575.90	13.32		
574.88	4.99	575.92	13.54		
574.90	5.08	575.94	13.76		
574.92	5.17	575.96	13.99		
574.94	5.27	575.98	14.21		
574.96	5.37	576.00	14.44		
574.98	5.48	576.02	14.67		
575.00	5.59	576.04	14.90		
575.02	5.70	576.06	15.13		

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Type II 24-hr 25-Year Rainfall=3.87"

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Stage-Area-Storage for Pond 9P: Bioretention Area 3

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
574.00	4,851	0	576.60	7,342	9,318
574.05	4,946	245	576.65	7,342	9,318
574.10	5,040	495	576.70	7,342	9,318
574.15	5,135	749	576.75	7,342	9,318
574.20	5,229	1,008			
574.25	5,324	1,272			
574.30	5,419	1,540			
574.35	5,513	1,814			
574.40	5,608	2,092			
574.45	5,702	2,375			
574.50	5,797	2,662			
574.55	5,892	2,954			
574.60	5,986	3,251			
574.65	6,081	3,553			
574.70	6,175	3,859			
574.75	6,270	4,170			
574.80	6,365	4,486			
574.85	6,459	4,807			
574.90	6,554	5,132			
574.95	6,648	5,462			
575.00	6,743	5,797			
575.05	6,803	6,136			
575.10	6,863	6,477			
575.15	6,923	6,822			
575.20	6,983	7,170			
575.25	7,043	7,520			
575.30	7,102	7,874			
575.35	7,162	8,230			
575.40	7,222	8,590			
575.45	7,282	8,953			
575.50	7,342	9,318			
575.55	7,342	9,318			
575.60	7,342	9,318			
575.65	7,342	9,318			
575.70	7,342	9,318			
575.75	7,342	9,318			
575.80	7,342	9,318			
575.85	7,342	9,318			
575.90	7,342	9,318			
575.95	7,342	9,318			
576.00	7,342	9,318			
576.05	7,342	9,318			
576.10	7,342	9,318			
576.15	7,342	9,318			
576.20	7,342	9,318			
576.25	7,342	9,318			
576.30	7,342	9,318			
576.35	7,342	9,318			
576.40	7,342	9,318			
576.45	7,342	9,318			
576.50	7,342	9,318			
576.55	7,342	9,318			

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Type II 24-hr 50-Year Rainfall=4.52"

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Time span=0.00-60.00 hrs, dt=0.01 hrs, 6001 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 8S: Front Area 2 Runoff Area=1.700 ac 58.82% Impervious Runoff Depth=3.52"
Flow Length=1,325' Slope=0.0100 '/' Tc=14.1 min CN=91 Runoff=7.64 cfs 0.498 af

Subcatchment 10S: Rear Area 2 Runoff Area=1.500 ac 66.67% Impervious Runoff Depth=3.62"
Flow Length=345' Tc=9.1 min CN=92 Runoff=8.07 cfs 0.453 af

Pond 7P: Underground Storage (SMA #2) Peak Elev=572.23' Storage=18,837 cf Inflow=12.80 cfs 0.951 af
Outflow=3.61 cfs 0.907 af

Pond 9P: Bioretention Area 3 Peak Elev=574.93' Storage=5,333 cf Inflow=8.07 cfs 0.453 af
Outflow=5.22 cfs 0.453 af

Total Runoff Area = 3.200 ac Runoff Volume = 0.951 af Average Runoff Depth = 3.57"
37.50% Pervious = 1.200 ac 62.50% Impervious = 2.000 ac

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Type II 24-hr 50-Year Rainfall=4.52"

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Summary for Subcatchment 8S: Front Area 2

Runoff = 7.64 cfs @ 12.05 hrs, Volume= 0.498 af, Depth= 3.52"

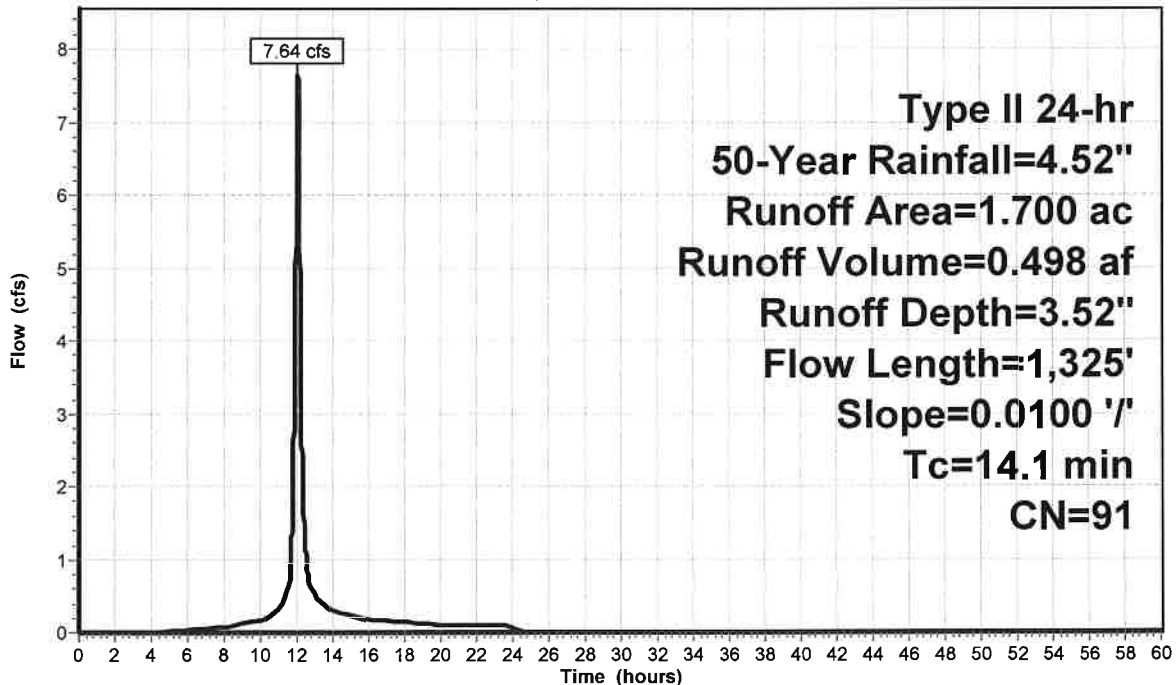
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
Type II 24-hr 50-Year Rainfall=4.52"

Area (ac)	CN	Description
0.700	98	Paved parking, HSG D
0.300	98	Roofs, HSG D
0.700	80	>75% Grass cover, Good, HSG D
1.700	91	Weighted Average
0.700		41.18% Pervious Area
1.000		58.82% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.0	40	0.0100	0.09		Sheet Flow, grass Grass: Short n= 0.150 P2= 2.50"
7.1	1,285		3.00		Direct Entry, Pipe flow
14.1	1,325	Total			

Subcatchment 8S: Front Area 2

Hydrograph



Runoff

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Type II 24-hr 50-Year Rainfall=4.52"

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Hydrograph for Subcatchment 8S: Front Area 2

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	52.00	4.52	3.52	0.00
1.00	0.05	0.00	0.00	53.00	4.52	3.52	0.00
2.00	0.10	0.00	0.00	54.00	4.52	3.52	0.00
3.00	0.16	0.00	0.00	55.00	4.52	3.52	0.00
4.00	0.22	0.00	0.00	56.00	4.52	3.52	0.00
5.00	0.28	0.01	0.02	57.00	4.52	3.52	0.00
6.00	0.36	0.02	0.03	58.00	4.52	3.52	0.00
7.00	0.45	0.05	0.05	59.00	4.52	3.52	0.00
8.00	0.54	0.09	0.07	60.00	4.52	3.52	0.00
9.00	0.66	0.15	0.12				
10.00	0.82	0.24	0.17				
11.00	1.06	0.40	0.34				
12.00	3.00	2.07	6.84				
13.00	3.49	2.53	0.53				
14.00	3.71	2.74	0.30				
15.00	3.86	2.88	0.23				
16.00	3.98	3.00	0.18				
17.00	4.08	3.09	0.16				
18.00	4.16	3.17	0.14				
19.00	4.24	3.25	0.12				
20.00	4.30	3.31	0.10				
21.00	4.36	3.36	0.09				
22.00	4.42	3.42	0.09				
23.00	4.47	3.47	0.09				
24.00	4.52	3.52	0.08				
25.00	4.52	3.52	0.00				
26.00	4.52	3.52	0.00				
27.00	4.52	3.52	0.00				
28.00	4.52	3.52	0.00				
29.00	4.52	3.52	0.00				
30.00	4.52	3.52	0.00				
31.00	4.52	3.52	0.00				
32.00	4.52	3.52	0.00				
33.00	4.52	3.52	0.00				
34.00	4.52	3.52	0.00				
35.00	4.52	3.52	0.00				
36.00	4.52	3.52	0.00				
37.00	4.52	3.52	0.00				
38.00	4.52	3.52	0.00				
39.00	4.52	3.52	0.00				
40.00	4.52	3.52	0.00				
41.00	4.52	3.52	0.00				
42.00	4.52	3.52	0.00				
43.00	4.52	3.52	0.00				
44.00	4.52	3.52	0.00				
45.00	4.52	3.52	0.00				
46.00	4.52	3.52	0.00				
47.00	4.52	3.52	0.00				
48.00	4.52	3.52	0.00				
49.00	4.52	3.52	0.00				
50.00	4.52	3.52	0.00				
51.00	4.52	3.52	0.00				

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Type II 24-hr 50-Year Rainfall=4.52"

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Summary for Subcatchment 10S: Rear Area 2

Runoff = 8.07 cfs @ 12.00 hrs, Volume= 0.453 af, Depth= 3.62"

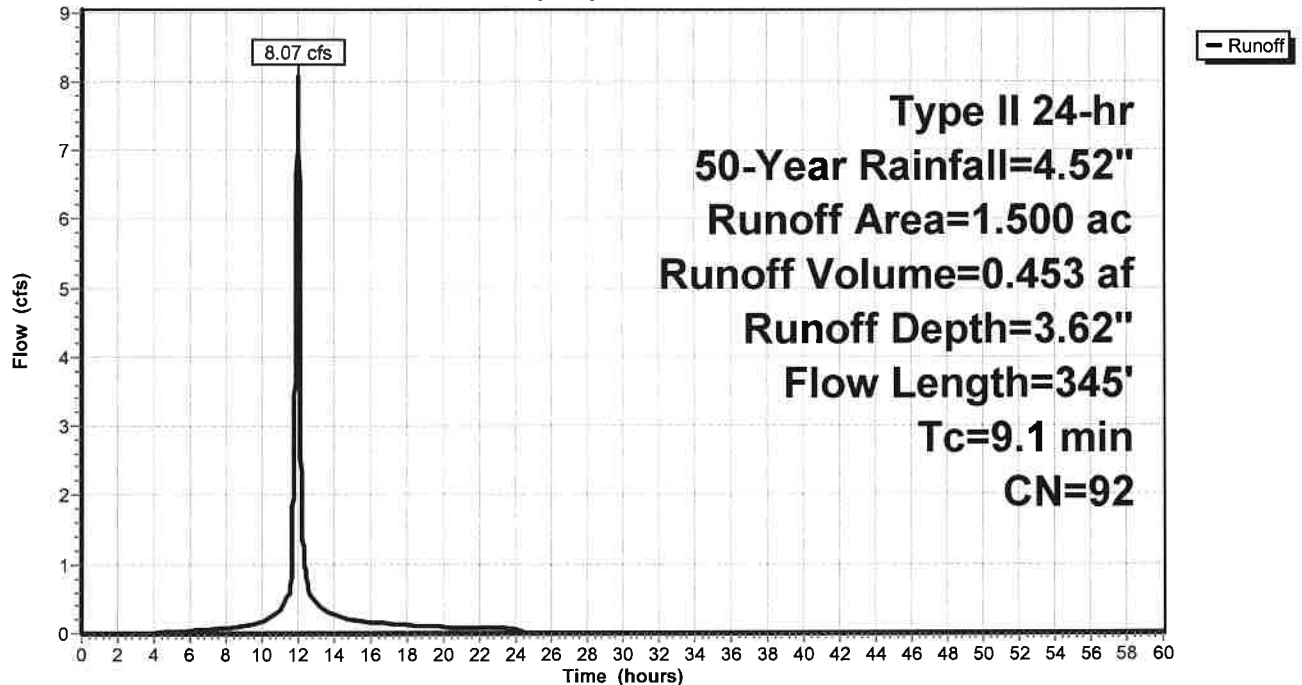
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
Type II 24-hr 50-Year Rainfall=4.52"

Area (ac)	CN	Description
0.500	98	Paved parking, HSG D
0.500	98	Roofs, HSG D
0.500	80	>75% Grass cover, Good, HSG D
1.500	92	Weighted Average
0.500		33.33% Pervious Area
1.000		66.67% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.9	55	0.0200	0.13		Sheet Flow, grass Grass: Short n= 0.150 P2= 2.50"
0.8	45	0.0170	0.97		Sheet Flow, pavement Smooth surfaces n= 0.011 P2= 2.50"
1.4	245		3.00		Direct Entry, Pipe flow
9.1	345	Total			

Subcatchment 10S: Rear Area 2

Hydrograph



21.011 Proposed

Type II 24-hr 50-Year Rainfall=4.52"

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Hydrograph for Subcatchment 10S: Rear Area 2

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	52.00	4.52	3.62	0.00
1.00	0.05	0.00	0.00	53.00	4.52	3.62	0.00
2.00	0.10	0.00	0.00	54.00	4.52	3.62	0.00
3.00	0.16	0.00	0.00	55.00	4.52	3.62	0.00
4.00	0.22	0.00	0.01	56.00	4.52	3.62	0.00
5.00	0.28	0.01	0.02	57.00	4.52	3.62	0.00
6.00	0.36	0.03	0.04	58.00	4.52	3.62	0.00
7.00	0.45	0.07	0.06	59.00	4.52	3.62	0.00
8.00	0.54	0.11	0.07	60.00	4.52	3.62	0.00
9.00	0.66	0.18	0.12				
10.00	0.82	0.27	0.17				
11.00	1.06	0.45	0.34				
12.00	3.00	2.16	8.07				
13.00	3.49	2.63	0.45				
14.00	3.71	2.83	0.26				
15.00	3.86	2.98	0.20				
16.00	3.98	3.10	0.16				
17.00	4.08	3.19	0.14				
18.00	4.16	3.28	0.12				
19.00	4.24	3.35	0.11				
20.00	4.30	3.41	0.09				
21.00	4.36	3.47	0.08				
22.00	4.42	3.52	0.08				
23.00	4.47	3.57	0.08				
24.00	4.52	3.62	0.07				
25.00	4.52	3.62	0.00				
26.00	4.52	3.62	0.00				
27.00	4.52	3.62	0.00				
28.00	4.52	3.62	0.00				
29.00	4.52	3.62	0.00				
30.00	4.52	3.62	0.00				
31.00	4.52	3.62	0.00				
32.00	4.52	3.62	0.00				
33.00	4.52	3.62	0.00				
34.00	4.52	3.62	0.00				
35.00	4.52	3.62	0.00				
36.00	4.52	3.62	0.00				
37.00	4.52	3.62	0.00				
38.00	4.52	3.62	0.00				
39.00	4.52	3.62	0.00				
40.00	4.52	3.62	0.00				
41.00	4.52	3.62	0.00				
42.00	4.52	3.62	0.00				
43.00	4.52	3.62	0.00				
44.00	4.52	3.62	0.00				
45.00	4.52	3.62	0.00				
46.00	4.52	3.62	0.00				
47.00	4.52	3.62	0.00				
48.00	4.52	3.62	0.00				
49.00	4.52	3.62	0.00				
50.00	4.52	3.62	0.00				
51.00	4.52	3.62	0.00				

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Summary for Pond 7P: Underground Storage (SMA #2)

Inflow Area = 3.200 ac, 62.50% Impervious, Inflow Depth = 3.57" for 50-Year event
 Inflow = 12.80 cfs @ 12.06 hrs, Volume= 0.951 af
 Outflow = 3.61 cfs @ 12.36 hrs, Volume= 0.907 af, Atten= 72%, Lag= 17.7 min
 Primary = 3.61 cfs @ 12.36 hrs, Volume= 0.907 af

Routing by Stor-Ind method, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
 Peak Elev= 572.23' @ 12.36 hrs Surf.Area= 10,145 sf Storage= 18,837 cf

Plug-Flow detention time= 228.3 min calculated for 0.907 af (95% of inflow)
 Center-of-Mass det. time= 158.8 min (1,051.4 - 892.6)

Volume	Invert	Avail.Storage	Storage Description
#1A	569.50'	8,947 cf	53.75'W x 188.74'L x 3.50'H Field A 35,506 cf Overall - 13,139 cf Embedded = 22,367 cf x 40.0% Voids
#2A	570.00'	13,139 cf	ADS_StormTech SC-740 +Cap x 286 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 11 Rows of 26 Chambers
		22,086 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	569.93'	12.0" Round Culvert L= 72.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 569.93' / 569.71' S= 0.0031 ' /' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Device 1	569.93'	4.0" Vert. Orifice X 3.00 C= 0.600
#3	Device 1	572.00'	5.0' long Weir 2 End Contraction(s)

Primary OutFlow Max=3.60 cfs @ 12.36 hrs HW=572.23' (Free Discharge)

1=Culvert (Passes 3.60 cfs of 4.00 cfs potential flow)
 2=Orifice (Orifice Controls 1.84 cfs @ 7.03 fps)
 3=Weir (Weir Controls 1.76 cfs @ 1.56 fps)

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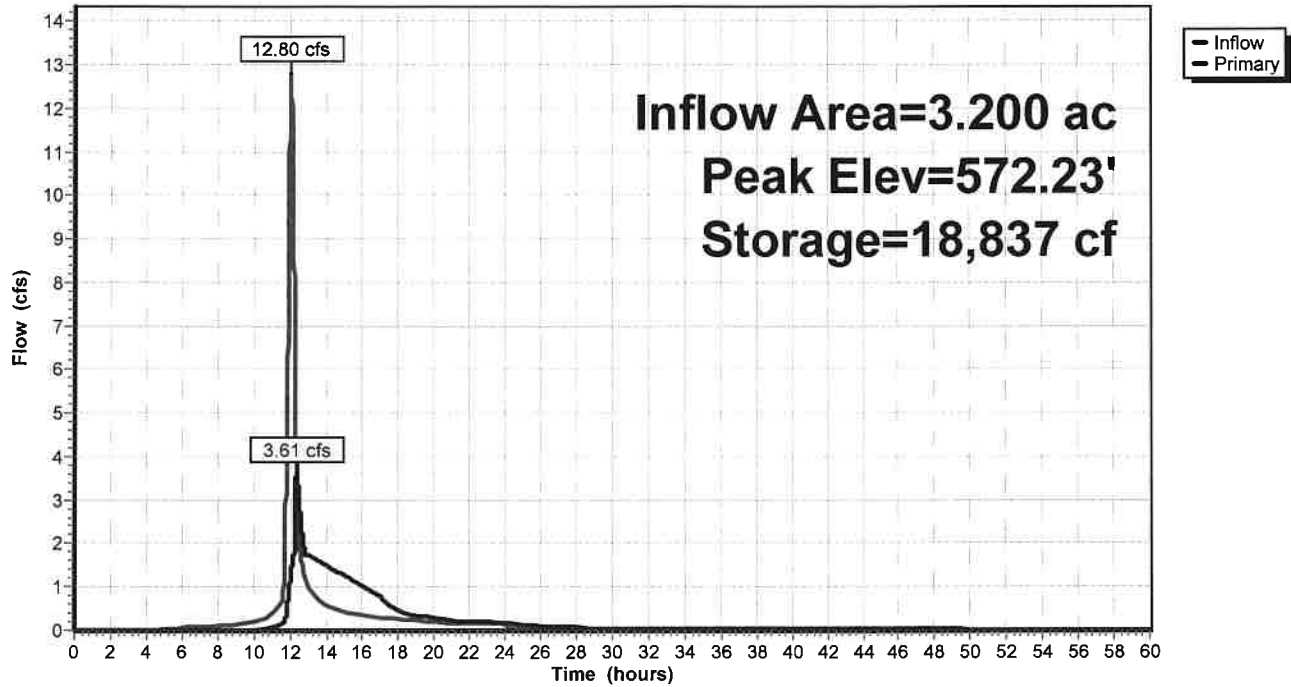
Type II 24-hr 50-Year Rainfall=4.52"

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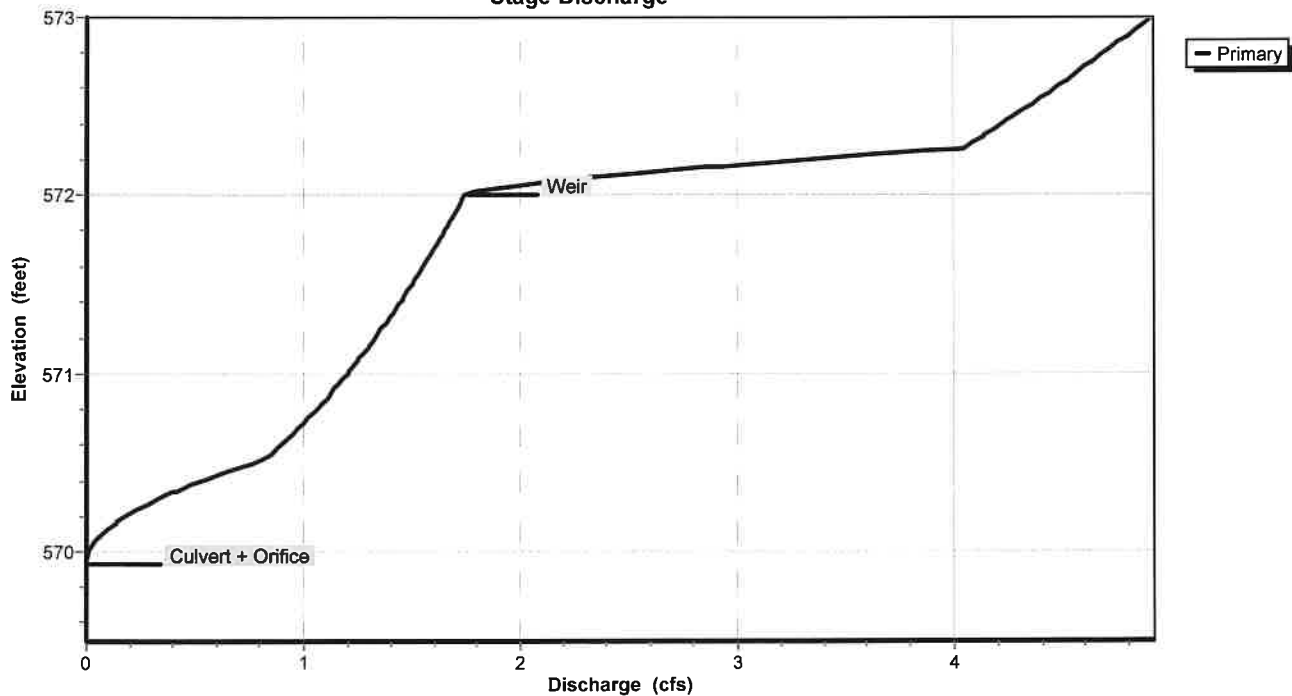
Pond 7P: Underground Storage (SMA #2)

Hydrograph



Pond 7P: Underground Storage (SMA #2)

Stage-Discharge



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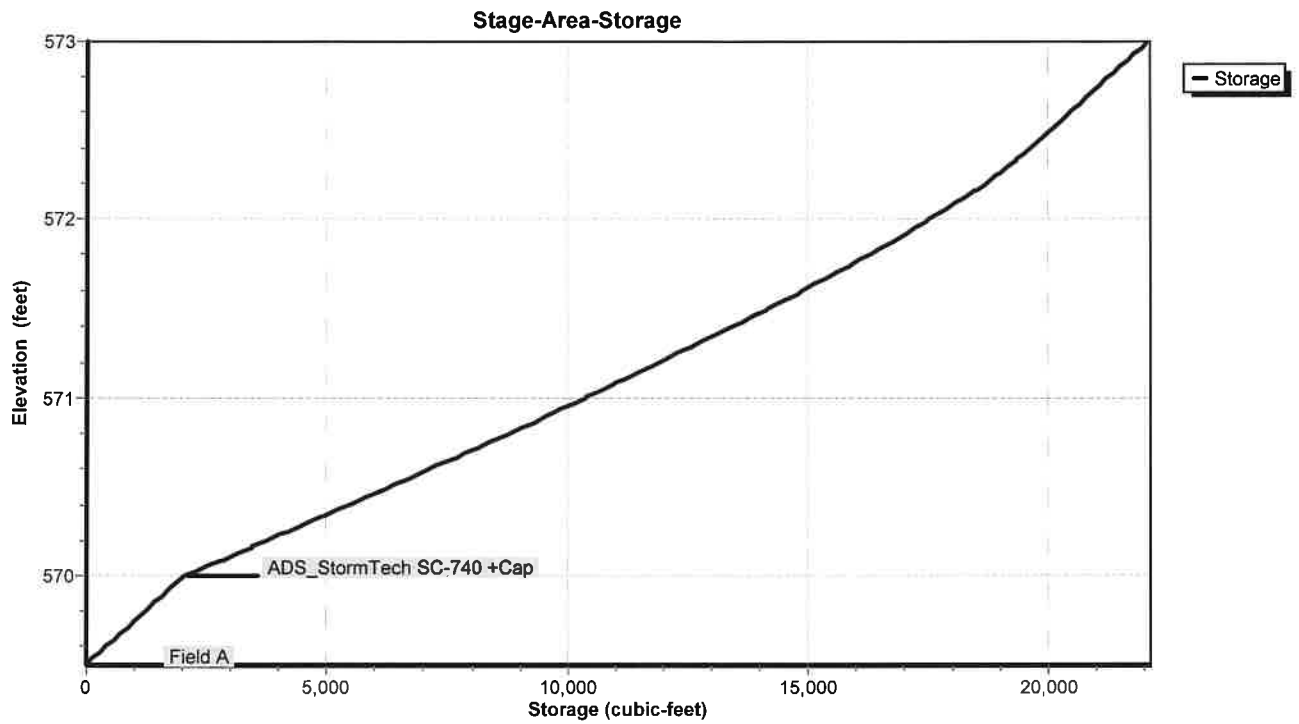
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Pond 7P: Underground Storage (SMA #2)



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Hydrograph for Pond 7P: Underground Storage (SMA #2)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
0.00	0.00	0	569.50	0.00
2.00	0.00	0	569.50	0.00
4.00	0.00	1	569.50	0.00
6.00	0.05	184	569.55	0.00
8.00	0.10	755	569.69	0.00
10.00	0.20	1,811	569.95	0.00
12.00	11.66	9,752	570.92	1.15
14.00	0.59	14,219	571.51	1.50
16.00	0.35	8,385	570.75	1.02
18.00	0.26	5,166	570.37	0.47
20.00	0.19	4,282	570.26	0.27
22.00	0.17	3,893	570.22	0.20
24.00	0.16	3,718	570.20	0.18
26.00	0.03	3,113	570.13	0.09
28.00	0.03	2,810	570.09	0.06
30.00	0.03	2,657	570.07	0.05
32.00	0.03	2,569	570.06	0.04
34.00	0.03	2,516	570.06	0.04
36.00	0.03	2,480	570.05	0.04
38.00	0.03	2,454	570.05	0.03
40.00	0.03	2,435	570.05	0.03
42.00	0.03	2,419	570.05	0.03
44.00	0.03	2,406	570.04	0.03
46.00	0.03	2,395	570.04	0.03
48.00	0.01	2,338	570.04	0.03
50.00	0.00	2,213	570.02	0.02
52.00	0.00	2,103	570.01	0.01
54.00	0.00	2,018	570.00	0.01
56.00	0.00	1,962	569.98	0.01
58.00	0.00	1,923	569.97	0.00
60.00	0.00	1,894	569.97	0.00

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Stage-Discharge for Pond 7P: Underground Storage (SMA #2)

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
569.50	0.00	570.54	0.84	571.58	1.54	572.62	4.49
569.52	0.00	570.56	0.86	571.60	1.55	572.64	4.52
569.54	0.00	570.58	0.88	571.62	1.56	572.66	4.54
569.56	0.00	570.60	0.89	571.64	1.57	572.68	4.56
569.58	0.00	570.62	0.91	571.66	1.58	572.70	4.58
569.60	0.00	570.64	0.93	571.68	1.59	572.72	4.61
569.62	0.00	570.66	0.95	571.70	1.60	572.74	4.63
569.64	0.00	570.68	0.96	571.72	1.61	572.76	4.65
569.66	0.00	570.70	0.98	571.74	1.62	572.78	4.68
569.68	0.00	570.72	1.00	571.76	1.63	572.80	4.70
569.70	0.00	570.74	1.01	571.78	1.64	572.82	4.72
569.72	0.00	570.76	1.03	571.80	1.65	572.84	4.74
569.74	0.00	570.78	1.04	571.82	1.65	572.86	4.77
569.76	0.00	570.80	1.06	571.84	1.66	572.88	4.79
569.78	0.00	570.82	1.07	571.86	1.67	572.90	4.81
569.80	0.00	570.84	1.09	571.88	1.68	572.92	4.83
569.82	0.00	570.86	1.10	571.90	1.69	572.94	4.85
569.84	0.00	570.88	1.12	571.92	1.70	572.96	4.88
569.86	0.00	570.90	1.13	571.94	1.71	572.98	4.90
569.88	0.00	570.92	1.14	571.96	1.72	573.00	4.92
569.90	0.00	570.94	1.16	571.98	1.73		
569.92	0.00	570.96	1.17	572.00	1.74		
569.94	0.00	570.98	1.18	572.02	1.79		
569.96	0.00	571.00	1.20	572.04	1.89		
569.98	0.01	571.02	1.21	572.06	2.01		
570.00	0.01	571.04	1.22	572.08	2.14		
570.02	0.02	571.06	1.24	572.10	2.30		
570.04	0.03	571.08	1.25	572.12	2.47		
570.06	0.04	571.10	1.26	572.14	2.65		
570.08	0.05	571.12	1.28	572.16	2.85		
570.10	0.07	571.14	1.29	572.18	3.06		
570.12	0.09	571.16	1.30	572.20	3.28		
570.14	0.11	571.18	1.31	572.22	3.51		
570.16	0.13	571.20	1.32	572.24	3.75		
570.18	0.15	571.22	1.34	572.26	4.00		
570.20	0.18	571.24	1.35	572.28	4.07		
570.22	0.21	571.26	1.36	572.30	4.10		
570.24	0.24	571.28	1.37	572.32	4.12		
570.26	0.27	571.30	1.38	572.34	4.15		
570.28	0.30	571.32	1.39	572.36	4.17		
570.30	0.34	571.34	1.41	572.38	4.20		
570.32	0.37	571.36	1.42	572.40	4.23		
570.34	0.41	571.38	1.43	572.42	4.25		
570.36	0.45	571.40	1.44	572.44	4.27		
570.38	0.49	571.42	1.45	572.46	4.30		
570.40	0.53	571.44	1.46	572.48	4.32		
570.42	0.58	571.46	1.47	572.50	4.35		
570.44	0.62	571.48	1.48	572.52	4.37		
570.46	0.67	571.50	1.49	572.54	4.40		
570.48	0.72	571.52	1.50	572.56	4.42		
570.50	0.76	571.54	1.51	572.58	4.44		
570.52	0.81	571.56	1.52	572.60	4.47		

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Stage-Area-Storage for Pond 7P: Underground Storage (SMA #2)

Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)
569.50	0	572.10	18,133
569.55	203	572.15	18,417
569.60	406	572.20	18,690
569.65	609	572.25	18,946
569.70	812	572.30	19,188
569.75	1,014	572.35	19,417
569.80	1,217	572.40	19,637
569.85	1,420	572.45	19,850
569.90	1,623	572.50	20,057
569.95	1,826	572.55	20,260
570.00	2,029	572.60	20,463
570.05	2,459	572.65	20,665
570.10	2,889	572.70	20,868
570.15	3,318	572.75	21,071
570.20	3,746	572.80	21,274
570.25	4,173	572.85	21,477
570.30	4,598	572.90	21,680
570.35	5,022	572.95	21,883
570.40	5,444	573.00	22,086
570.45	5,865		
570.50	6,284		
570.55	6,701		
570.60	7,116		
570.65	7,529		
570.70	7,940		
570.75	8,349		
570.80	8,756		
570.85	9,160		
570.90	9,562		
570.95	9,962		
571.00	10,359		
571.05	10,754		
571.10	11,145		
571.15	11,534		
571.20	11,919		
571.25	12,301		
571.30	12,680		
571.35	13,056		
571.40	13,428		
571.45	13,797		
571.50	14,161		
571.55	14,522		
571.60	14,879		
571.65	15,230		
571.70	15,577		
571.75	15,917		
571.80	16,252		
571.85	16,582		
571.90	16,906		
571.95	17,224		
572.00	17,535		
572.05	17,838		

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Type II 24-hr 50-Year Rainfall=4.52"

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Summary for Pond 9P: Bioretention Area 3

Inflow Area = 1.500 ac, 66.67% Impervious, Inflow Depth = 3.62" for 50-Year event
 Inflow = 8.07 cfs @ 12.00 hrs, Volume= 0.453 af
 Outflow = 5.22 cfs @ 12.09 hrs, Volume= 0.453 af, Atten= 35%, Lag= 5.1 min
 Primary = 5.22 cfs @ 12.09 hrs, Volume= 0.453 af

Routing by Stor-Ind method, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
 Peak Elev= 574.93' @ 12.09 hrs Surf.Area= 6,611 sf Storage= 5,333 cf

Plug-Flow detention time= 214.9 min calculated for 0.453 af (100% of inflow)
 Center-of-Mass det. time= 215.2 min (1,000.7 - 785.5)

Volume	Invert	Avail.Storage	Storage Description
#1	574.00'	9,318 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
574.00	4,851	0	0
575.00	6,743	5,797	5,797
575.50	7,342	3,521	9,318

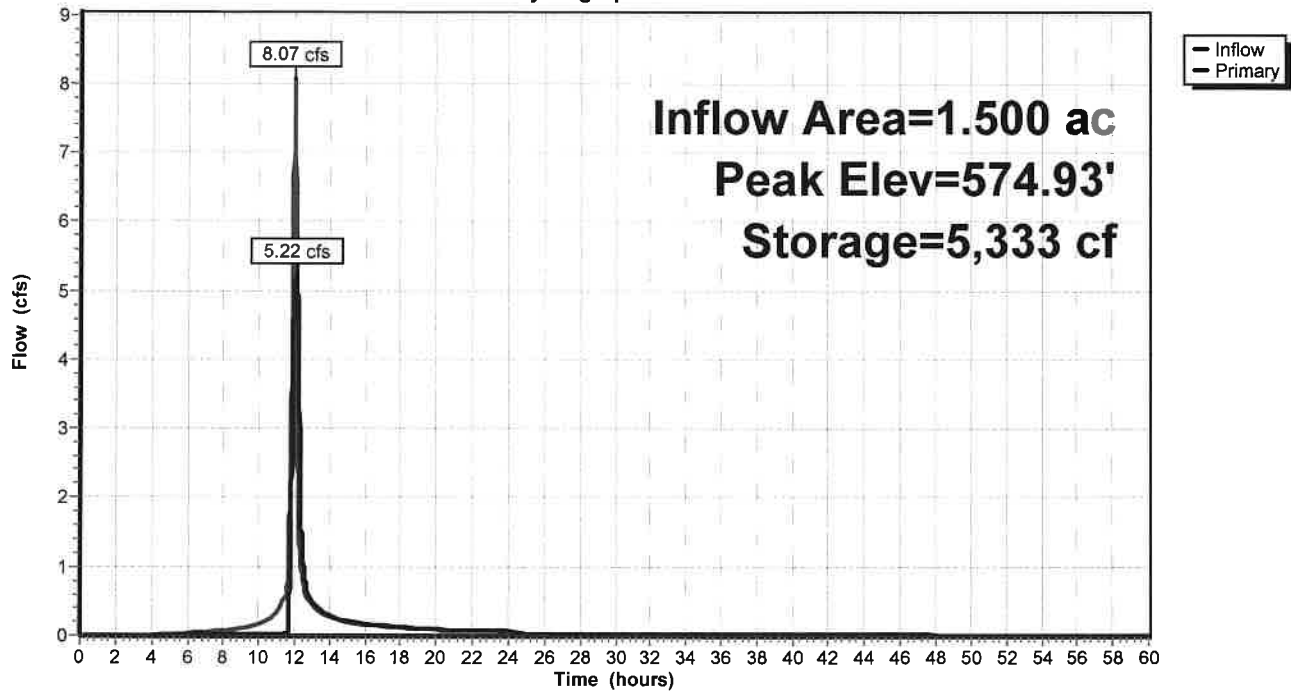
Device	Routing	Invert	Outlet Devices
#1	Primary	571.41'	12.0" Round 8" pipe L= 132.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 571.41' / 570.75' S= 0.0050 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Device 1	574.50'	8.0" Horiz. Grate X 6.00 C= 0.600 Limited to weir flow at low heads
#3	Device 1	574.00'	0.250 in/hr Exfiltration over Surface area Conductivity to Groundwater Elevation = 560.00'
#4	Primary	574.75'	24.0" W x 24.0" H Vert. grate (overflow) C= 0.600

Primary OutFlow Max=5.22 cfs @ 12.09 hrs HW=574.93' (Free Discharge)

- 1=8" pipe (Barrel Controls 4.73 cfs @ 6.02 fps)
- 2=Grate (Passes < 6.61 cfs potential flow)
- 3=Exfiltration (Passes < 0.04 cfs potential flow)
- 4=grate (overflow) (Orifice Controls 0.49 cfs @ 1.36 fps)

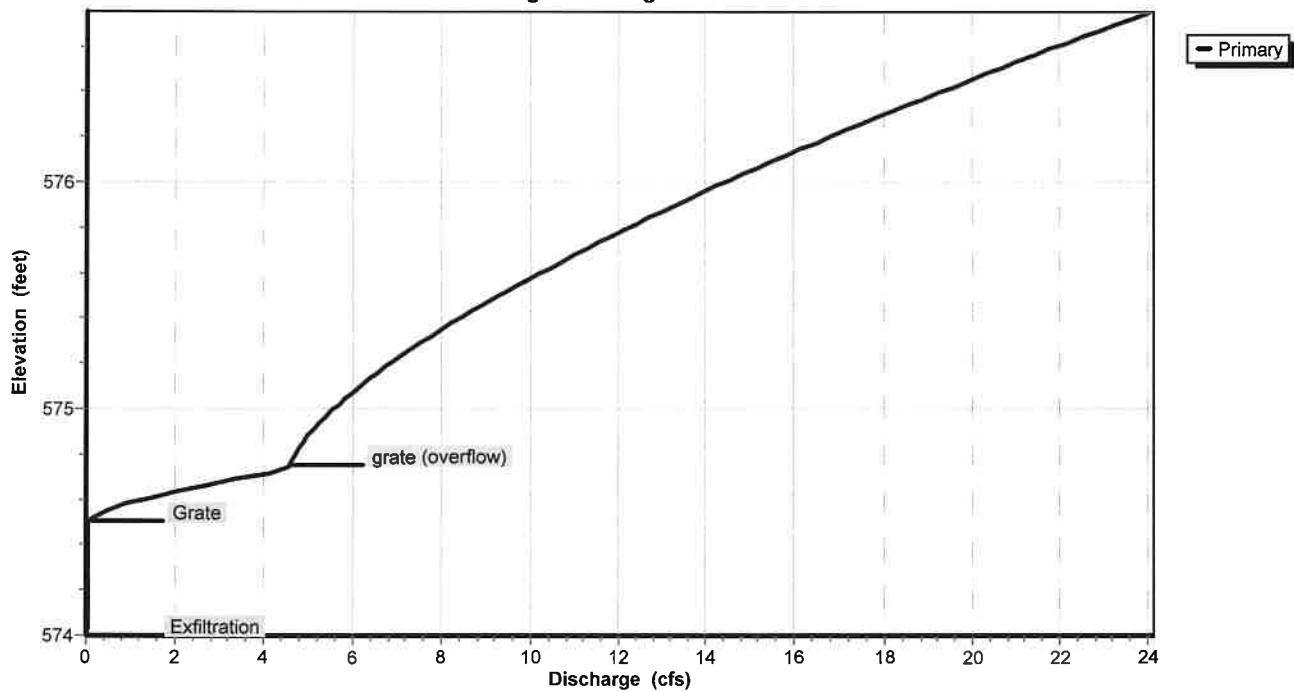
Pond 9P: Bioretention Area 3

Hydrograph



Pond 9P: Bioretention Area 3

Stage-Discharge



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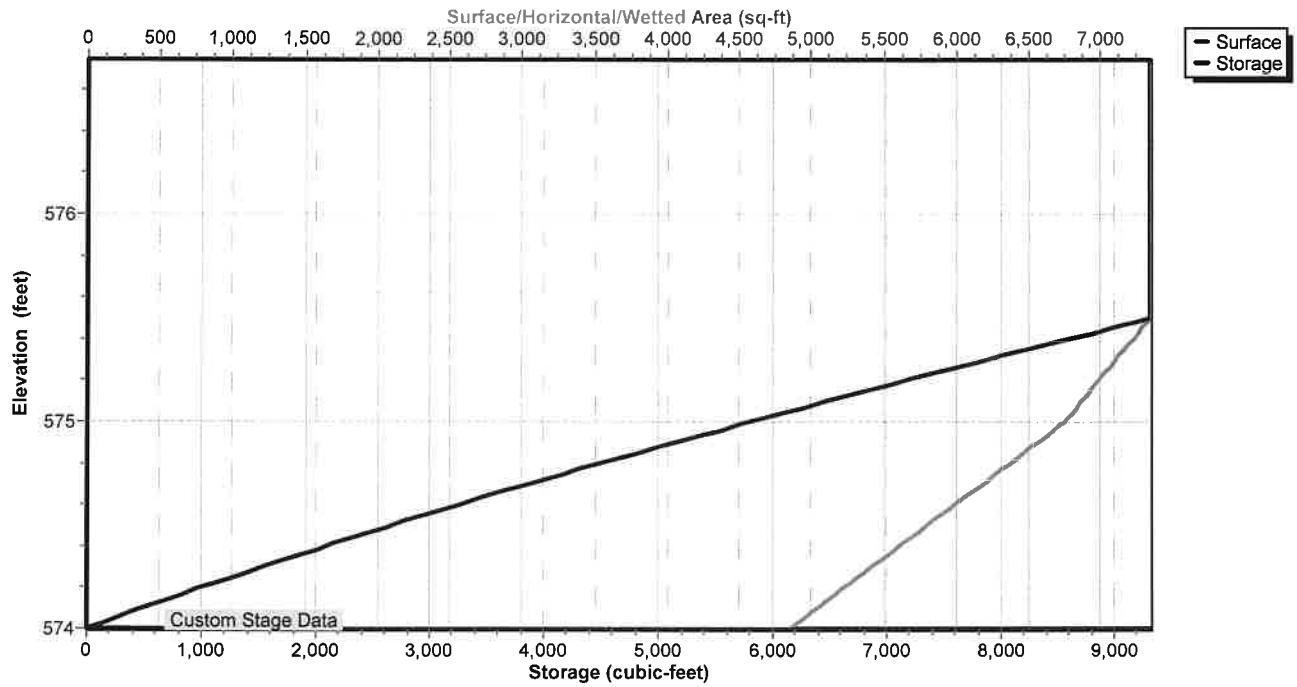
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Pond 9P: Bioretention Area 3

Stage-Area-Storage



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Hydrograph for Pond 9P: Bioretention Area 3

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
0.00	0.00	0	574.00	0.00
2.00	0.00	0	574.00	0.00
4.00	0.01	6	574.00	0.00
6.00	0.04	95	574.02	0.02
8.00	0.07	296	574.06	0.03
10.00	0.17	928	574.18	0.03
12.00	8.07	4,720	574.84	4.83
14.00	0.26	2,846	574.53	0.28
16.00	0.16	2,787	574.52	0.17
18.00	0.12	2,748	574.51	0.13
20.00	0.09	2,717	574.51	0.09
22.00	0.08	2,706	574.51	0.08
24.00	0.07	2,699	574.51	0.07
26.00	0.00	2,457	574.46	0.03
28.00	0.00	2,213	574.42	0.03
30.00	0.00	1,974	574.38	0.03
32.00	0.00	1,738	574.34	0.03
34.00	0.00	1,506	574.29	0.03
36.00	0.00	1,278	574.25	0.03
38.00	0.00	1,055	574.21	0.03
40.00	0.00	835	574.17	0.03
42.00	0.00	619	574.12	0.03
44.00	0.00	407	574.08	0.03
46.00	0.00	199	574.04	0.03
48.00	0.00	47	574.01	0.01
50.00	0.00	10	574.00	0.00
52.00	0.00	2	574.00	0.00
54.00	0.00	0	574.00	0.00
56.00	0.00	0	574.00	0.00
58.00	0.00	0	574.00	0.00
60.00	0.00	0	574.00	0.00

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Stage-Discharge for Pond 9P: Bioretention Area 3

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
574.00	0.00	575.04	5.81	576.08	15.37
574.02	0.03	575.06	5.93	576.10	15.60
574.04	0.03	575.08	6.06	576.12	15.84
574.06	0.03	575.10	6.18	576.14	16.08
574.08	0.03	575.12	6.31	576.16	16.32
574.10	0.03	575.14	6.45	576.18	16.56
574.12	0.03	575.16	6.58	576.20	16.81
574.14	0.03	575.18	6.72	576.22	17.05
574.16	0.03	575.20	6.87	576.24	17.30
574.18	0.03	575.22	7.01	576.26	17.55
574.20	0.03	575.24	7.16	576.28	17.80
574.22	0.03	575.26	7.31	576.30	18.05
574.24	0.03	575.28	7.46	576.32	18.30
574.26	0.03	575.30	7.62	576.34	18.56
574.28	0.03	575.32	7.78	576.36	18.81
574.30	0.03	575.34	7.94	576.38	19.07
574.32	0.03	575.36	8.10	576.40	19.33
574.34	0.03	575.38	8.26	576.42	19.59
574.36	0.03	575.40	8.43	576.44	19.85
574.38	0.03	575.42	8.60	576.46	20.11
574.40	0.03	575.44	8.78	576.48	20.38
574.42	0.03	575.46	8.95	576.50	20.64
574.44	0.03	575.48	9.13	576.52	20.91
574.46	0.03	575.50	9.31	576.54	21.18
574.48	0.03	575.52	9.49	576.56	21.45
574.50	0.03	575.54	9.67	576.58	21.72
574.52	0.15	575.56	9.86	576.60	22.00
574.54	0.36	575.58	10.05	576.62	22.27
574.56	0.64	575.60	10.24	576.64	22.55
574.58	0.97	575.62	10.43	576.66	22.83
574.60	1.34	575.64	10.62	576.68	23.10
574.62	1.74	575.66	10.82	576.70	23.38
574.64	2.19	575.68	11.02	576.72	23.67
574.66	2.67	575.70	11.22	576.74	23.95
574.68	3.18	575.72	11.42		
574.70	3.71	575.74	11.62		
574.72	4.28	575.76	11.83		
574.74	4.59	575.78	12.04		
574.76	4.61	575.80	12.25		
574.78	4.65	575.82	12.46		
574.80	4.70	575.84	12.67		
574.82	4.77	575.86	12.89		
574.84	4.84	575.88	13.10		
574.86	4.91	575.90	13.32		
574.88	4.99	575.92	13.54		
574.90	5.08	575.94	13.76		
574.92	5.17	575.96	13.99		
574.94	5.27	575.98	14.21		
574.96	5.37	576.00	14.44		
574.98	5.48	576.02	14.67		
575.00	5.59	576.04	14.90		
575.02	5.70	576.06	15.13		

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Type II 24-hr 50-Year Rainfall=4.52"

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Stage-Area-Storage for Pond 9P: Bioretention Area 3

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
574.00	4,851	0	576.60	7,342	9,318
574.05	4,946	245	576.65	7,342	9,318
574.10	5,040	495	576.70	7,342	9,318
574.15	5,135	749	576.75	7,342	9,318
574.20	5,229	1,008			
574.25	5,324	1,272			
574.30	5,419	1,540			
574.35	5,513	1,814			
574.40	5,608	2,092			
574.45	5,702	2,375			
574.50	5,797	2,662			
574.55	5,892	2,954			
574.60	5,986	3,251			
574.65	6,081	3,553			
574.70	6,175	3,859			
574.75	6,270	4,170			
574.80	6,365	4,486			
574.85	6,459	4,807			
574.90	6,554	5,132			
574.95	6,648	5,462			
575.00	6,743	5,797			
575.05	6,803	6,136			
575.10	6,863	6,477			
575.15	6,923	6,822			
575.20	6,983	7,170			
575.25	7,043	7,520			
575.30	7,102	7,874			
575.35	7,162	8,230			
575.40	7,222	8,590			
575.45	7,282	8,953			
575.50	7,342	9,318			
575.55	7,342	9,318			
575.60	7,342	9,318			
575.65	7,342	9,318			
575.70	7,342	9,318			
575.75	7,342	9,318			
575.80	7,342	9,318			
575.85	7,342	9,318			
575.90	7,342	9,318			
575.95	7,342	9,318			
576.00	7,342	9,318			
576.05	7,342	9,318			
576.10	7,342	9,318			
576.15	7,342	9,318			
576.20	7,342	9,318			
576.25	7,342	9,318			
576.30	7,342	9,318			
576.35	7,342	9,318			
576.40	7,342	9,318			
576.45	7,342	9,318			
576.50	7,342	9,318			
576.55	7,342	9,318			

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Type II 24-hr 100-Year Rainfall=5.28"

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Time span=0.00-60.00 hrs, dt=0.01 hrs, 6001 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 8S: Front Area 2 Runoff Area=1.700 ac 58.82% Impervious Runoff Depth=4.25"
Flow Length=1,325' Slope=0.0100 '/' Tc=14.1 min CN=91 Runoff=9.15 cfs 0.603 af

Subcatchment 10S: Rear Area 2 Runoff Area=1.500 ac 66.67% Impervious Runoff Depth=4.36"
Flow Length=345' Tc=9.1 min CN=92 Runoff=9.61 cfs 0.545 af

Pond 7P: Underground Storage (SMA #2) Peak Elev=572.92' Storage=21,772 cf Inflow=14.92 cfs 1.148 af
Outflow=4.83 cfs 1.105 af

Pond 9P: Bioretention Area 3 Peak Elev=575.05' Storage=6,150 cf Inflow=9.61 cfs 0.545 af
Outflow=5.89 cfs 0.545 af

Total Runoff Area = 3.200 ac Runoff Volume = 1.148 af Average Runoff Depth = 4.31"
37.50% Pervious = 1.200 ac 62.50% Impervious = 2.000 ac

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Type II 24-hr 100-Year Rainfall=5.28"

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Summary for Subcatchment 8S: Front Area 2

Runoff = 9.15 cfs @ 12.05 hrs, Volume= 0.603 af, Depth= 4.25"

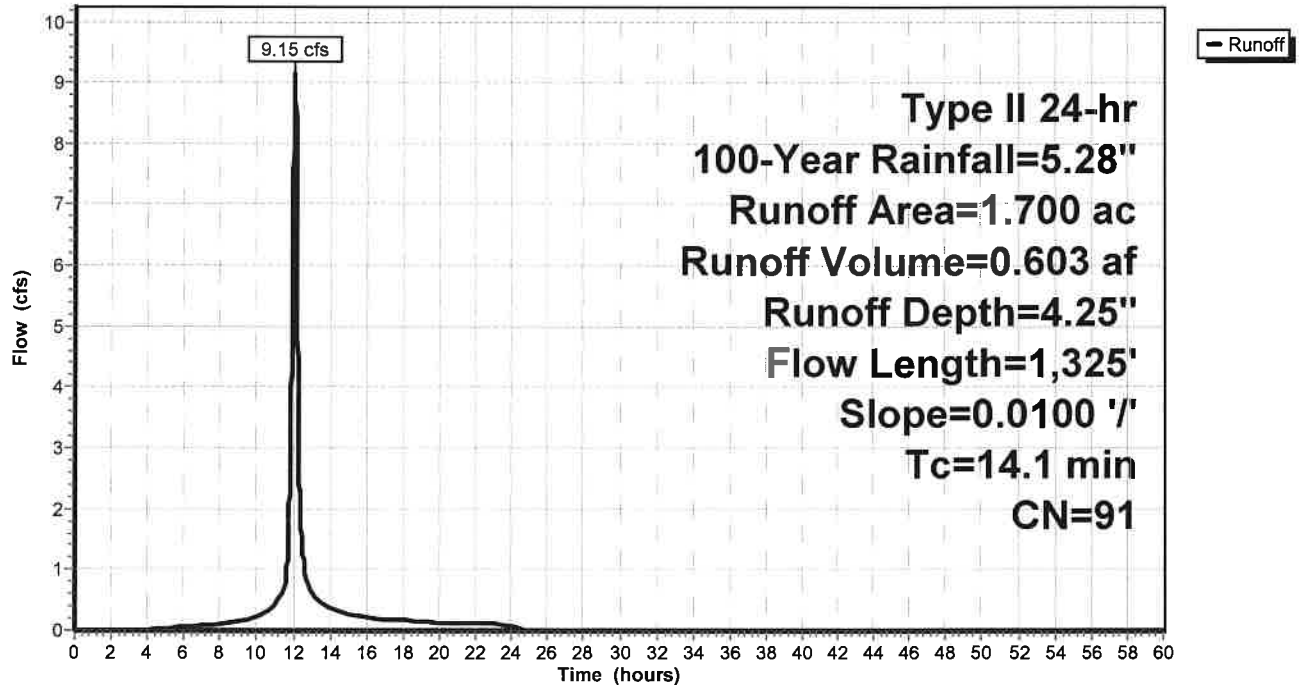
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
Type II 24-hr 100-Year Rainfall=5.28"

Area (ac)	CN	Description
0.700	98	Paved parking, HSG D
0.300	98	Roofs, HSG D
0.700	80	>75% Grass cover, Good, HSG D
1.700	91	Weighted Average
0.700		41.18% Pervious Area
1.000		58.82% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.0	40	0.0100	0.09		Sheet Flow, grass Grass: Short n= 0.150 P2= 2.50"
7.1	1,285		3.00		Direct Entry, Pipe flow
14.1	1,325	Total			

Subcatchment 8S: Front Area 2

Hydrograph



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Type II 24-hr 100-Year Rainfall=5.28"

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Hydrograph for Subcatchment 8S: Front Area 2

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	52.00	5.28	4.25	0.00
1.00	0.06	0.00	0.00	53.00	5.28	4.25	0.00
2.00	0.12	0.00	0.00	54.00	5.28	4.25	0.00
3.00	0.18	0.00	0.00	55.00	5.28	4.25	0.00
4.00	0.25	0.00	0.01	56.00	5.28	4.25	0.00
5.00	0.33	0.02	0.03	57.00	5.28	4.25	0.00
6.00	0.42	0.04	0.05	58.00	5.28	4.25	0.00
7.00	0.52	0.08	0.07	59.00	5.28	4.25	0.00
8.00	0.63	0.13	0.10	60.00	5.28	4.25	0.00
9.00	0.78	0.21	0.16				
10.00	0.96	0.33	0.22				
11.00	1.24	0.54	0.43				
12.00	3.50	2.54	8.21				
13.00	4.08	3.09	0.63				
14.00	4.33	3.33	0.36				
15.00	4.51	3.50	0.28				
16.00	4.65	3.64	0.21				
17.00	4.76	3.75	0.18				
18.00	4.86	3.85	0.16				
19.00	4.95	3.93	0.14				
20.00	5.03	4.01	0.12				
21.00	5.09	4.07	0.11				
22.00	5.16	4.14	0.11				
23.00	5.22	4.20	0.10				
24.00	5.28	4.25	0.10				
25.00	5.28	4.25	0.00				
26.00	5.28	4.25	0.00				
27.00	5.28	4.25	0.00				
28.00	5.28	4.25	0.00				
29.00	5.28	4.25	0.00				
30.00	5.28	4.25	0.00				
31.00	5.28	4.25	0.00				
32.00	5.28	4.25	0.00				
33.00	5.28	4.25	0.00				
34.00	5.28	4.25	0.00				
35.00	5.28	4.25	0.00				
36.00	5.28	4.25	0.00				
37.00	5.28	4.25	0.00				
38.00	5.28	4.25	0.00				
39.00	5.28	4.25	0.00				
40.00	5.28	4.25	0.00				
41.00	5.28	4.25	0.00				
42.00	5.28	4.25	0.00				
43.00	5.28	4.25	0.00				
44.00	5.28	4.25	0.00				
45.00	5.28	4.25	0.00				
46.00	5.28	4.25	0.00				
47.00	5.28	4.25	0.00				
48.00	5.28	4.25	0.00				
49.00	5.28	4.25	0.00				
50.00	5.28	4.25	0.00				
51.00	5.28	4.25	0.00				

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Type II 24-hr 100-Year Rainfall=5.28"

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Summary for Subcatchment 10S: Rear Area 2

Runoff = 9.61 cfs @ 12.00 hrs, Volume= 0.545 af, Depth= 4.36"

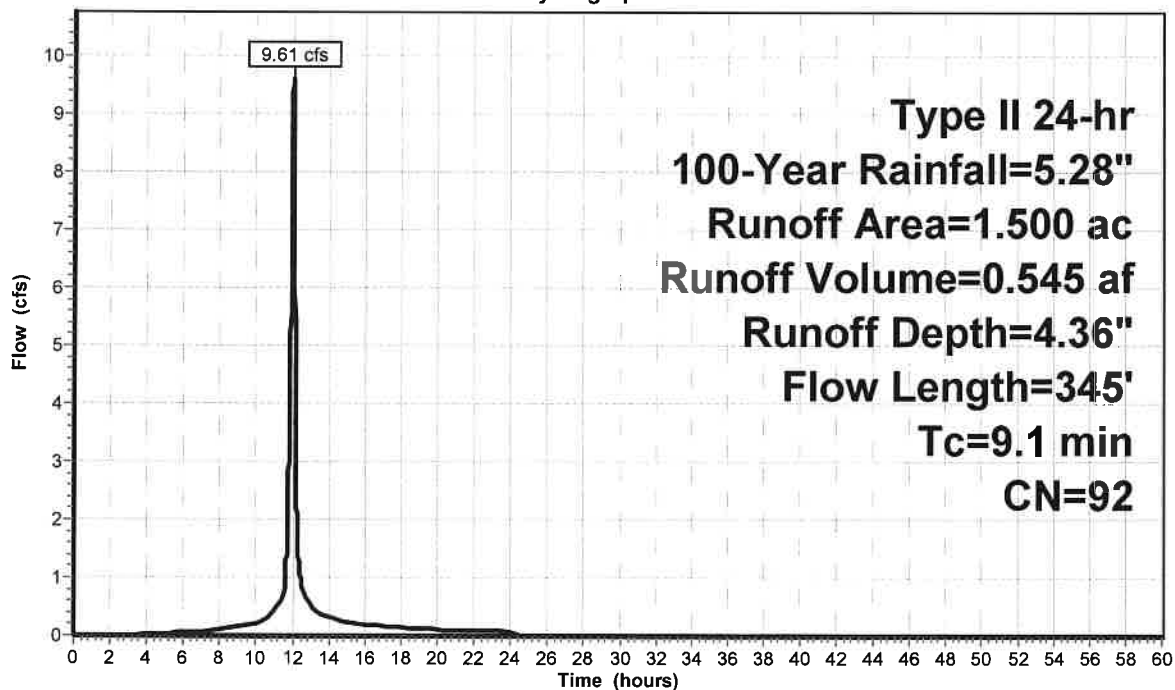
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
Type II 24-hr 100-Year Rainfall=5.28"

Area (ac)	CN	Description
0.500	98	Paved parking, HSG D
0.500	98	Roofs, HSG D
0.500	80	>75% Grass cover, Good, HSG D
1.500	92	Weighted Average
0.500		33.33% Pervious Area
1.000		66.67% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.9	55	0.0200	0.13		Sheet Flow, grass Grass: Short n= 0.150 P2= 2.50"
0.8	45	0.0170	0.97		Sheet Flow, pavement Smooth surfaces n= 0.011 P2= 2.50"
1.4	245		3.00		Direct Entry, Pipe flow
9.1	345	Total			

Subcatchment 10S: Rear Area 2

Hydrograph



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Type II 24-hr 100-Year Rainfall=5.28"

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Hydrograph for Subcatchment 10S: Rear Area 2

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	52.00	5.28	4.36	0.00
1.00	0.06	0.00	0.00	53.00	5.28	4.36	0.00
2.00	0.12	0.00	0.00	54.00	5.28	4.36	0.00
3.00	0.18	0.00	0.00	55.00	5.28	4.36	0.00
4.00	0.25	0.01	0.02	56.00	5.28	4.36	0.00
5.00	0.33	0.02	0.03	57.00	5.28	4.36	0.00
6.00	0.42	0.06	0.05	58.00	5.28	4.36	0.00
7.00	0.52	0.10	0.08	59.00	5.28	4.36	0.00
8.00	0.63	0.16	0.10	60.00	5.28	4.36	0.00
9.00	0.78	0.25	0.16				
10.00	0.96	0.37	0.22				
11.00	1.24	0.59	0.42				
12.00	3.50	2.64	9.61				
13.00	4.08	3.19	0.53				
14.00	4.33	3.44	0.31				
15.00	4.51	3.61	0.24				
16.00	4.65	3.74	0.19				
17.00	4.76	3.86	0.16				
18.00	4.86	3.96	0.14				
19.00	4.95	4.04	0.12				
20.00	5.03	4.12	0.10				
21.00	5.09	4.18	0.10				
22.00	5.16	4.24	0.09				
23.00	5.22	4.30	0.09				
24.00	5.28	4.36	0.09				
25.00	5.28	4.36	0.00				
26.00	5.28	4.36	0.00				
27.00	5.28	4.36	0.00				
28.00	5.28	4.36	0.00				
29.00	5.28	4.36	0.00				
30.00	5.28	4.36	0.00				
31.00	5.28	4.36	0.00				
32.00	5.28	4.36	0.00				
33.00	5.28	4.36	0.00				
34.00	5.28	4.36	0.00				
35.00	5.28	4.36	0.00				
36.00	5.28	4.36	0.00				
37.00	5.28	4.36	0.00				
38.00	5.28	4.36	0.00				
39.00	5.28	4.36	0.00				
40.00	5.28	4.36	0.00				
41.00	5.28	4.36	0.00				
42.00	5.28	4.36	0.00				
43.00	5.28	4.36	0.00				
44.00	5.28	4.36	0.00				
45.00	5.28	4.36	0.00				
46.00	5.28	4.36	0.00				
47.00	5.28	4.36	0.00				
48.00	5.28	4.36	0.00				
49.00	5.28	4.36	0.00				
50.00	5.28	4.36	0.00				
51.00	5.28	4.36	0.00				

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Type II 24-hr 100-Year Rainfall=5.28"

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Summary for Pond 7P: Underground Storage (SMA #2)

Inflow Area = 3.200 ac, 62.50% Impervious, Inflow Depth = 4.31" for 100-Year event
 Inflow = 14.92 cfs @ 12.06 hrs, Volume= 1.148 af
 Outflow = 4.83 cfs @ 12.36 hrs, Volume= 1.105 af, Atten= 68%, Lag= 18.1 min
 Primary = 4.83 cfs @ 12.36 hrs, Volume= 1.105 af

Routing by Stor-Ind method, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
 Peak Elev= 572.92' @ 12.36 hrs Surf.Area= 10,145 sf Storage= 21,772 cf

Plug-Flow detention time= 201.7 min calculated for 1.105 af (96% of inflow)
 Center-of-Mass det. time= 143.6 min (1,016.5 - 873.0)

Volume	Invert	Avail.Storage	Storage Description
#1A	569.50'	8,947 cf	53.75'W x 188.74'L x 3.50'H Field A 35,506 cf Overall - 13,139 cf Embedded = 22,367 cf x 40.0% Voids
#2A	570.00'	13,139 cf	ADS_StormTech SC-740 +Cap x 286 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 11 Rows of 26 Chambers
		22,086 cf	Total Available Storage

Storage Group A created with Chamber Wizard

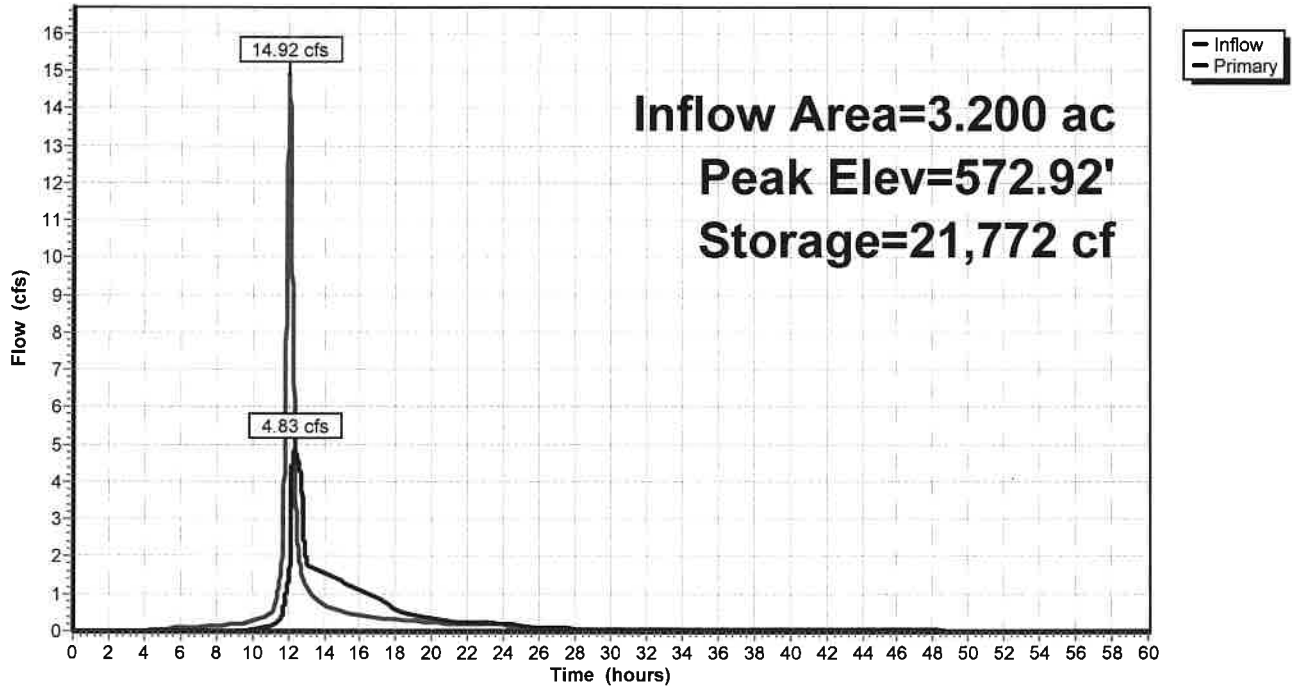
Device	Routing	Invert	Outlet Devices
#1	Primary	569.93'	12.0" Round Culvert L= 72.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 569.93' / 569.71' S= 0.0031 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Device 1	569.93'	4.0" Vert. Orifice X 3.00 C= 0.600
#3	Device 1	572.00'	5.0' long Weir 2 End Contraction(s)

Primary OutFlow Max=4.83 cfs @ 12.36 hrs HW=572.92' (Free Discharge)

↑ 1=Culvert (Barrel Controls 4.83 cfs @ 6.16 fps)
 ↑ 2=Orifice (Passes < 2.12 cfs potential flow)
 ↑ 3=Weir (Passes < 13.95 cfs potential flow)

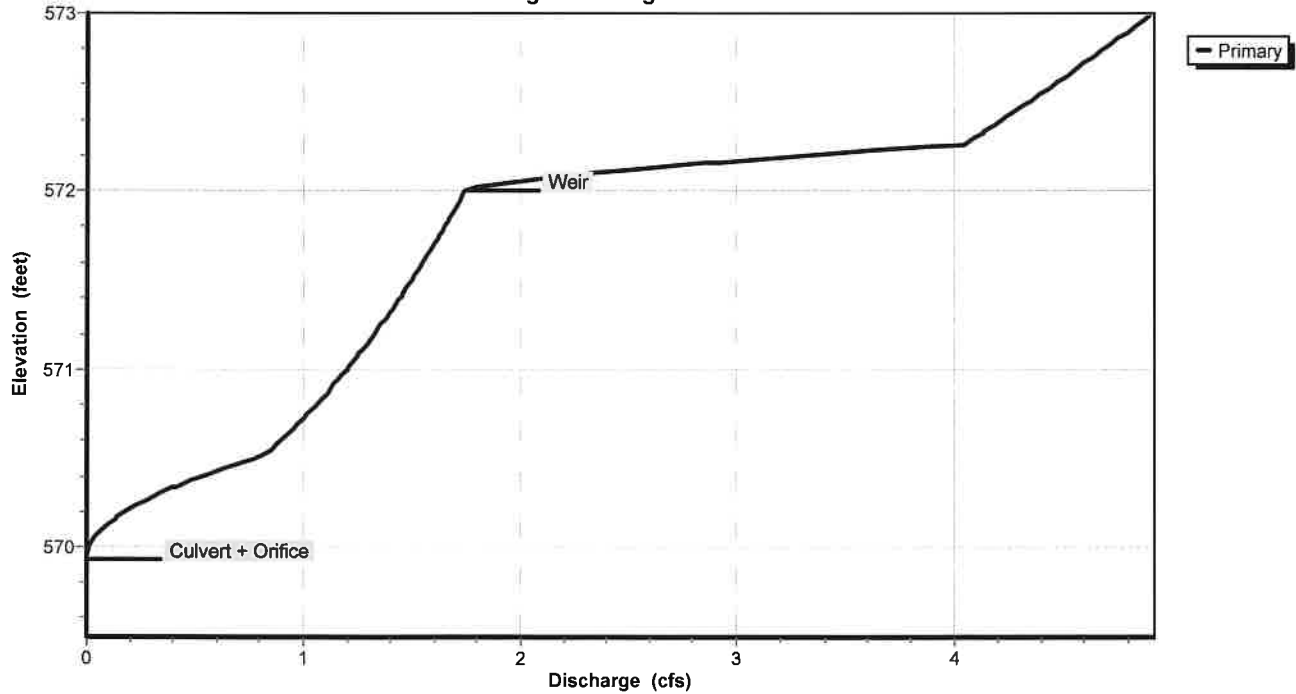
Pond 7P: Underground Storage (SMA #2)

Hydrograph

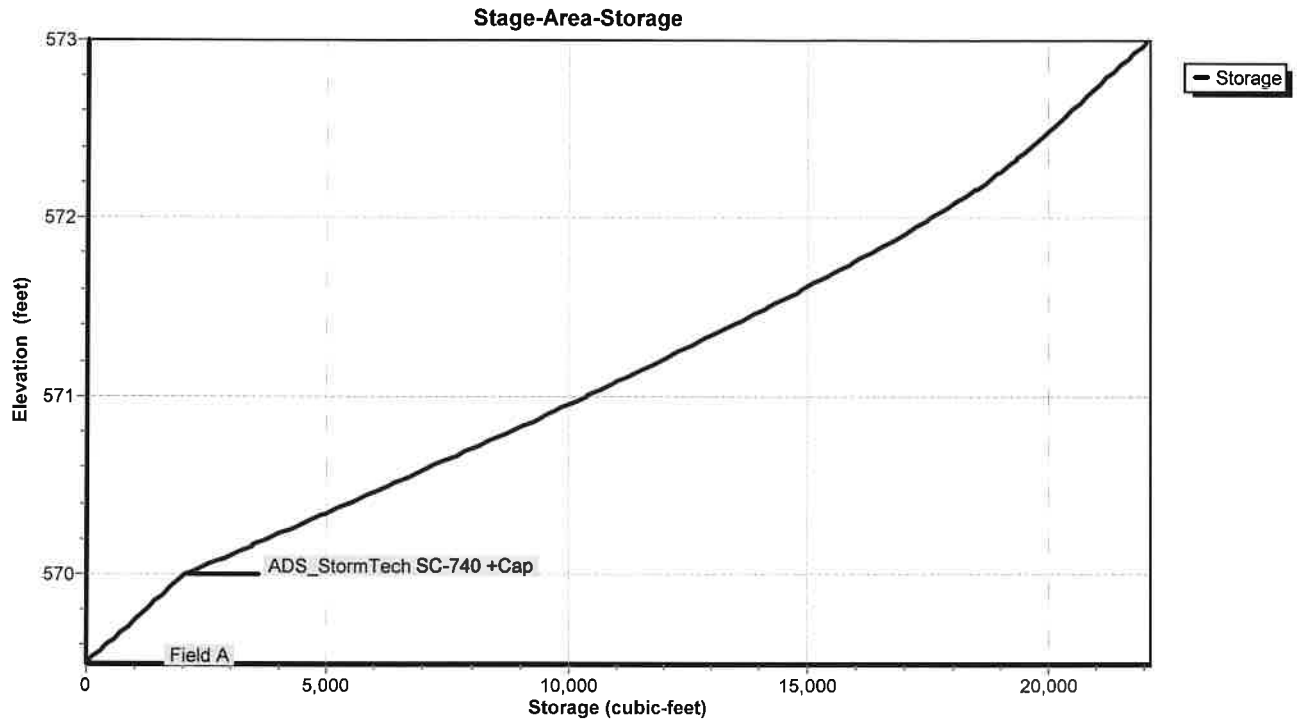


Pond 7P: Underground Storage (SMA #2)

Stage-Discharge



Pond 7P: Underground Storage (SMA #2)



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Type II 24-hr 100-Year Rainfall=5.28"

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Hydrograph for Pond 7P: Underground Storage (SMA #2)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
0.00	0.00	0	569.50	0.00
2.00	0.00	0	569.50	0.00
4.00	0.01	16	569.50	0.00
6.00	0.08	340	569.58	0.00
8.00	0.13	1,076	569.77	0.00
10.00	0.25	2,364	570.04	0.03
12.00	13.40	12,150	571.23	1.34
14.00	0.69	15,059	571.63	1.56
16.00	0.41	9,280	570.86	1.10
18.00	0.31	5,592	570.42	0.57
20.00	0.23	4,514	570.29	0.32
22.00	0.20	4,084	570.24	0.24
24.00	0.19	3,896	570.22	0.21
26.00	0.03	3,188	570.13	0.10
28.00	0.03	2,846	570.09	0.07
30.00	0.03	2,675	570.08	0.05
32.00	0.03	2,579	570.06	0.04
34.00	0.03	2,522	570.06	0.04
36.00	0.03	2,484	570.05	0.04
38.00	0.03	2,457	570.05	0.03
40.00	0.03	2,436	570.05	0.03
42.00	0.03	2,420	570.05	0.03
44.00	0.03	2,407	570.04	0.03
46.00	0.03	2,395	570.04	0.03
48.00	0.01	2,341	570.04	0.03
50.00	0.00	2,216	570.02	0.02
52.00	0.00	2,105	570.01	0.01
54.00	0.00	2,020	570.00	0.01
56.00	0.00	1,963	569.98	0.01
58.00	0.00	1,923	569.97	0.00
60.00	0.00	1,895	569.97	0.00

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Stage-Discharge for Pond 7P: Underground Storage (SMA #2)

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
569.50	0.00	570.54	0.84	571.58	1.54	572.62	4.49
569.52	0.00	570.56	0.86	571.60	1.55	572.64	4.52
569.54	0.00	570.58	0.88	571.62	1.56	572.66	4.54
569.56	0.00	570.60	0.89	571.64	1.57	572.68	4.56
569.58	0.00	570.62	0.91	571.66	1.58	572.70	4.58
569.60	0.00	570.64	0.93	571.68	1.59	572.72	4.61
569.62	0.00	570.66	0.95	571.70	1.60	572.74	4.63
569.64	0.00	570.68	0.96	571.72	1.61	572.76	4.65
569.66	0.00	570.70	0.98	571.74	1.62	572.78	4.68
569.68	0.00	570.72	1.00	571.76	1.63	572.80	4.70
569.70	0.00	570.74	1.01	571.78	1.64	572.82	4.72
569.72	0.00	570.76	1.03	571.80	1.65	572.84	4.74
569.74	0.00	570.78	1.04	571.82	1.65	572.86	4.77
569.76	0.00	570.80	1.06	571.84	1.66	572.88	4.79
569.78	0.00	570.82	1.07	571.86	1.67	572.90	4.81
569.80	0.00	570.84	1.09	571.88	1.68	572.92	4.83
569.82	0.00	570.86	1.10	571.90	1.69	572.94	4.85
569.84	0.00	570.88	1.12	571.92	1.70	572.96	4.88
569.86	0.00	570.90	1.13	571.94	1.71	572.98	4.90
569.88	0.00	570.92	1.14	571.96	1.72	573.00	4.92
569.90	0.00	570.94	1.16	571.98	1.73		
569.92	0.00	570.96	1.17	572.00	1.74		
569.94	0.00	570.98	1.18	572.02	1.79		
569.96	0.00	571.00	1.20	572.04	1.89		
569.98	0.01	571.02	1.21	572.06	2.01		
570.00	0.01	571.04	1.22	572.08	2.14		
570.02	0.02	571.06	1.24	572.10	2.30		
570.04	0.03	571.08	1.25	572.12	2.47		
570.06	0.04	571.10	1.26	572.14	2.65		
570.08	0.05	571.12	1.28	572.16	2.85		
570.10	0.07	571.14	1.29	572.18	3.06		
570.12	0.09	571.16	1.30	572.20	3.28		
570.14	0.11	571.18	1.31	572.22	3.51		
570.16	0.13	571.20	1.32	572.24	3.75		
570.18	0.15	571.22	1.34	572.26	4.00		
570.20	0.18	571.24	1.35	572.28	4.07		
570.22	0.21	571.26	1.36	572.30	4.10		
570.24	0.24	571.28	1.37	572.32	4.12		
570.26	0.27	571.30	1.38	572.34	4.15		
570.28	0.30	571.32	1.39	572.36	4.17		
570.30	0.34	571.34	1.41	572.38	4.20		
570.32	0.37	571.36	1.42	572.40	4.23		
570.34	0.41	571.38	1.43	572.42	4.25		
570.36	0.45	571.40	1.44	572.44	4.27		
570.38	0.49	571.42	1.45	572.46	4.30		
570.40	0.53	571.44	1.46	572.48	4.32		
570.42	0.58	571.46	1.47	572.50	4.35		
570.44	0.62	571.48	1.48	572.52	4.37		
570.46	0.67	571.50	1.49	572.54	4.40		
570.48	0.72	571.52	1.50	572.56	4.42		
570.50	0.76	571.54	1.51	572.58	4.44		
570.52	0.81	571.56	1.52	572.60	4.47		

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Stage-Area-Storage for Pond 7P: Underground Storage (SMA #2)

Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)
569.50	0	572.10	18,133
569.55	203	572.15	18,417
569.60	406	572.20	18,690
569.65	609	572.25	18,946
569.70	812	572.30	19,188
569.75	1,014	572.35	19,417
569.80	1,217	572.40	19,637
569.85	1,420	572.45	19,850
569.90	1,623	572.50	20,057
569.95	1,826	572.55	20,260
570.00	2,029	572.60	20,463
570.05	2,459	572.65	20,665
570.10	2,889	572.70	20,868
570.15	3,318	572.75	21,071
570.20	3,746	572.80	21,274
570.25	4,173	572.85	21,477
570.30	4,598	572.90	21,680
570.35	5,022	572.95	21,883
570.40	5,444	573.00	22,086
570.45	5,865		
570.50	6,284		
570.55	6,701		
570.60	7,116		
570.65	7,529		
570.70	7,940		
570.75	8,349		
570.80	8,756		
570.85	9,160		
570.90	9,562		
570.95	9,962		
571.00	10,359		
571.05	10,754		
571.10	11,145		
571.15	11,534		
571.20	11,919		
571.25	12,301		
571.30	12,680		
571.35	13,056		
571.40	13,428		
571.45	13,797		
571.50	14,161		
571.55	14,522		
571.60	14,879		
571.65	15,230		
571.70	15,577		
571.75	15,917		
571.80	16,252		
571.85	16,582		
571.90	16,906		
571.95	17,224		
572.00	17,535		
572.05	17,838		

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Summary for Pond 9P: Bioretention Area 3

Inflow Area = 1.500 ac, 66.67% Impervious, Inflow Depth = 4.36" for 100-Year event
 Inflow = 9.61 cfs @ 12.00 hrs, Volume= 0.545 af
 Outflow = 5.89 cfs @ 12.09 hrs, Volume= 0.545 af, Atten= 39%, Lag= 5.5 min
 Primary = 5.89 cfs @ 12.09 hrs, Volume= 0.545 af

Routing by Stor-Ind method, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
 Peak Elev= 575.05' @ 12.09 hrs Surf.Area= 6,805 sf Storage= 6,150 cf

Plug-Flow detention time= 184.7 min calculated for 0.545 af (100% of inflow)
 Center-of-Mass det. time= 185.0 min (965.5 - 780.5)

Volume #1	Invert 574.00'	Avail.Storage 9,318 cf	Storage Description
Custom Stage Data (Prismatic) Listed below (Recalc)			
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
574.00	4,851	0	0
575.00	6,743	5,797	5,797
575.50	7,342	3,521	9,318

Device	Routing	Invert	Outlet Devices
#1	Primary	571.41'	12.0" Round 8" pipe L= 132.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 571.41' / 570.75' S= 0.0050 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Device 1	574.50'	8.0" Horiz. Grate X 6.00 C= 0.600 Limited to weir flow at low heads
#3	Device 1	574.00'	0.250 in/hr Exfiltration over Surface area Conductivity to Groundwater Elevation = 560.00'
#4	Primary	574.75'	24.0" W x 24.0" H Vert. grate (overflow) C= 0.600

Primary OutFlow Max=5.88 cfs @ 12.09 hrs HW=575.05' (Free Discharge)

- 1=8" pipe (Barrel Controls 4.82 cfs @ 6.14 fps)
- 2=Grate (Passes < 7.49 cfs potential flow)
- 3=Exfiltration (Passes < 0.04 cfs potential flow)
- 4=grate (overflow) (Orifice Controls 1.06 cfs @ 1.76 fps)

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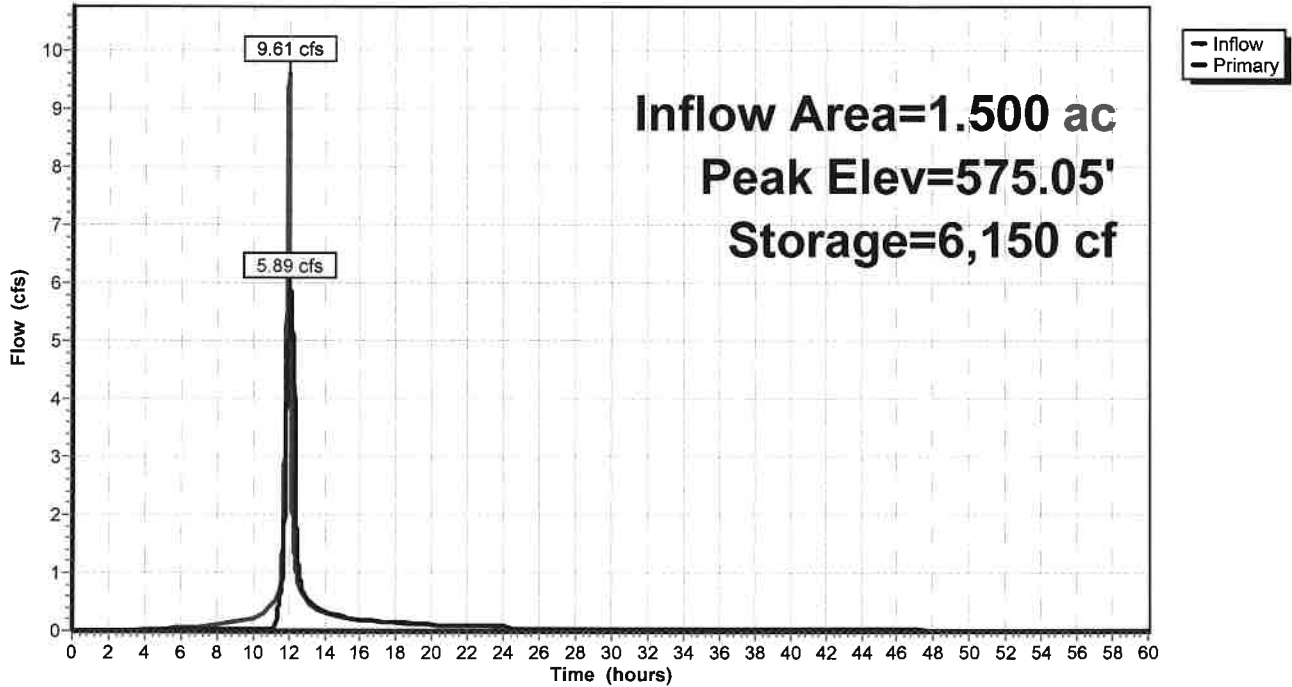
Type II 24-hr 100-Year Rainfall=5.28"

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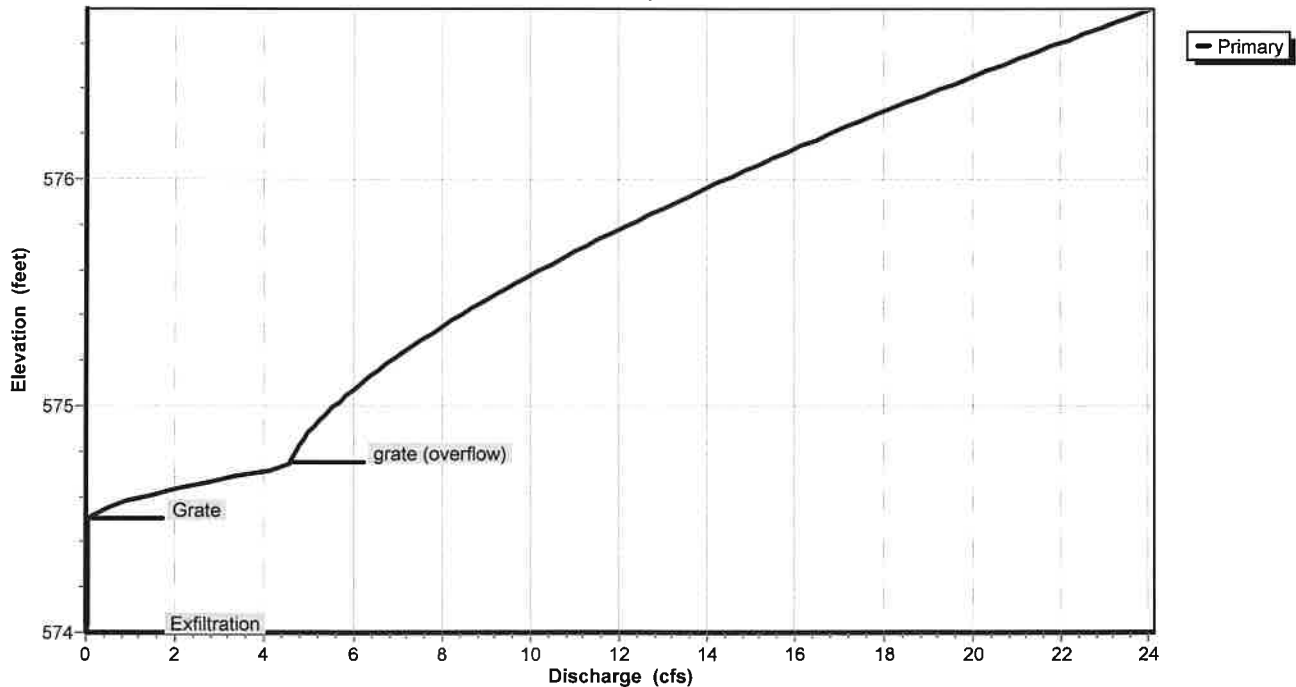
Pond 9P: Bioretention Area 3

Hydrograph

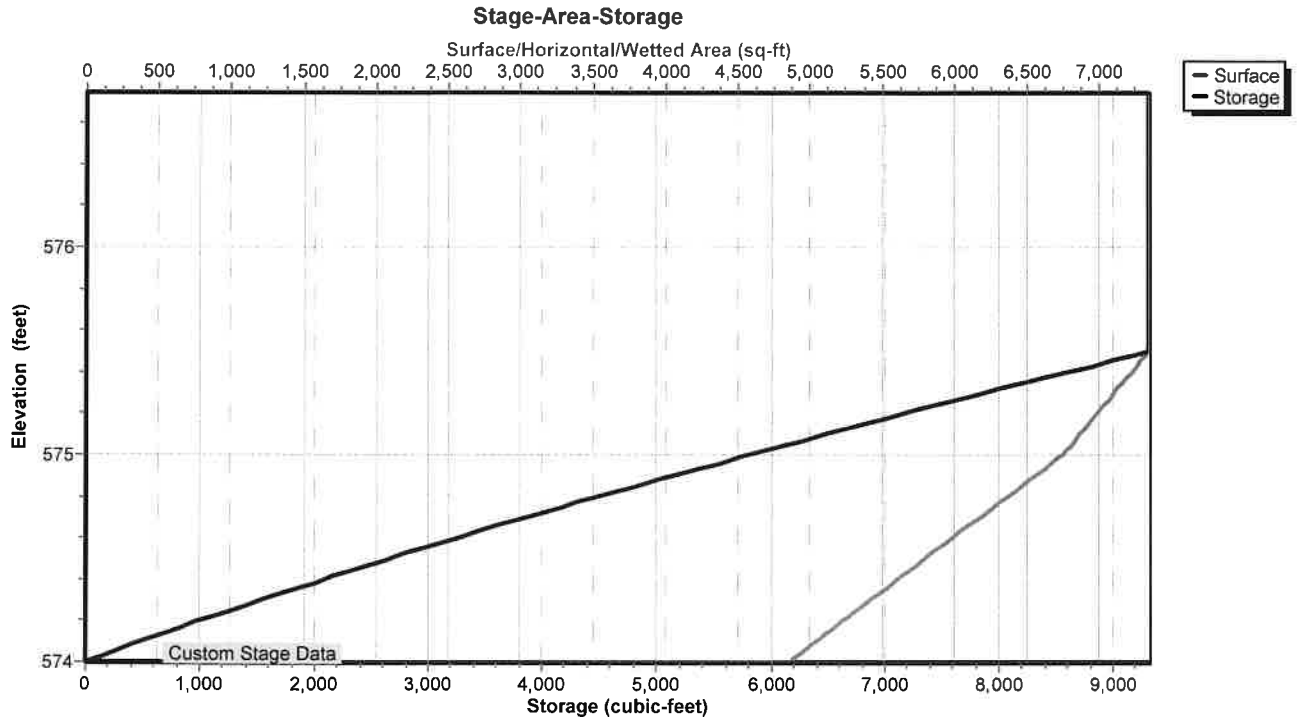


Pond 9P: Bioretention Area 3

Stage-Discharge



Pond 9P: Bioretention Area 3



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Hydrograph for Pond 9P: Bioretention Area 3

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
0.00	0.00	0	574.00	0.00
2.00	0.00	0	574.00	0.00
4.00	0.02	22	574.00	0.00
6.00	0.05	149	574.03	0.03
8.00	0.10	484	574.10	0.03
10.00	0.22	1,353	574.27	0.03
12.00	9.61	5,288	574.92	5.19
14.00	0.31	2,872	574.54	0.33
16.00	0.19	2,803	574.52	0.19
18.00	0.14	2,769	574.52	0.15
20.00	0.10	2,732	574.51	0.11
22.00	0.09	2,719	574.51	0.10
24.00	0.09	2,712	574.51	0.09
26.00	0.00	2,463	574.47	0.03
28.00	0.00	2,219	574.42	0.03
30.00	0.00	1,979	574.38	0.03
32.00	0.00	1,743	574.34	0.03
34.00	0.00	1,511	574.29	0.03
36.00	0.00	1,283	574.25	0.03
38.00	0.00	1,059	574.21	0.03
40.00	0.00	839	574.17	0.03
42.00	0.00	624	574.13	0.03
44.00	0.00	412	574.08	0.03
46.00	0.00	204	574.04	0.03
48.00	0.00	49	574.01	0.01
50.00	0.00	11	574.00	0.00
52.00	0.00	2	574.00	0.00
54.00	0.00	1	574.00	0.00
56.00	0.00	0	574.00	0.00
58.00	0.00	0	574.00	0.00
60.00	0.00	0	574.00	0.00

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Stage-Discharge for Pond 9P: Bioretention Area 3

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
574.00	0.00	575.04	5.81	576.08	15.37
574.02	0.03	575.06	5.93	576.10	15.60
574.04	0.03	575.08	6.06	576.12	15.84
574.06	0.03	575.10	6.18	576.14	16.08
574.08	0.03	575.12	6.31	576.16	16.32
574.10	0.03	575.14	6.45	576.18	16.56
574.12	0.03	575.16	6.58	576.20	16.81
574.14	0.03	575.18	6.72	576.22	17.05
574.16	0.03	575.20	6.87	576.24	17.30
574.18	0.03	575.22	7.01	576.26	17.55
574.20	0.03	575.24	7.16	576.28	17.80
574.22	0.03	575.26	7.31	576.30	18.05
574.24	0.03	575.28	7.46	576.32	18.30
574.26	0.03	575.30	7.62	576.34	18.56
574.28	0.03	575.32	7.78	576.36	18.81
574.30	0.03	575.34	7.94	576.38	19.07
574.32	0.03	575.36	8.10	576.40	19.33
574.34	0.03	575.38	8.26	576.42	19.59
574.36	0.03	575.40	8.43	576.44	19.85
574.38	0.03	575.42	8.60	576.46	20.11
574.40	0.03	575.44	8.78	576.48	20.38
574.42	0.03	575.46	8.95	576.50	20.64
574.44	0.03	575.48	9.13	576.52	20.91
574.46	0.03	575.50	9.31	576.54	21.18
574.48	0.03	575.52	9.49	576.56	21.45
574.50	0.03	575.54	9.67	576.58	21.72
574.52	0.15	575.56	9.86	576.60	22.00
574.54	0.36	575.58	10.05	576.62	22.27
574.56	0.64	575.60	10.24	576.64	22.55
574.58	0.97	575.62	10.43	576.66	22.83
574.60	1.34	575.64	10.62	576.68	23.10
574.62	1.74	575.66	10.82	576.70	23.38
574.64	2.19	575.68	11.02	576.72	23.67
574.66	2.67	575.70	11.22	576.74	23.95
574.68	3.18	575.72	11.42		
574.70	3.71	575.74	11.62		
574.72	4.28	575.76	11.83		
574.74	4.59	575.78	12.04		
574.76	4.61	575.80	12.25		
574.78	4.65	575.82	12.46		
574.80	4.70	575.84	12.67		
574.82	4.77	575.86	12.89		
574.84	4.84	575.88	13.10		
574.86	4.91	575.90	13.32		
574.88	4.99	575.92	13.54		
574.90	5.08	575.94	13.76		
574.92	5.17	575.96	13.99		
574.94	5.27	575.98	14.21		
574.96	5.37	576.00	14.44		
574.98	5.48	576.02	14.67		
575.00	5.59	576.04	14.90		
575.02	5.70	576.06	15.13		

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Stage-Area-Storage for Pond 9P: Bioretention Area 3

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
574.00	4,851	0	576.60	7,342	9,318
574.05	4,946	245	576.65	7,342	9,318
574.10	5,040	495	576.70	7,342	9,318
574.15	5,135	749	576.75	7,342	9,318
574.20	5,229	1,008			
574.25	5,324	1,272			
574.30	5,419	1,540			
574.35	5,513	1,814			
574.40	5,608	2,092			
574.45	5,702	2,375			
574.50	5,797	2,662			
574.55	5,892	2,954			
574.60	5,986	3,251			
574.65	6,081	3,553			
574.70	6,175	3,859			
574.75	6,270	4,170			
574.80	6,365	4,486			
574.85	6,459	4,807			
574.90	6,554	5,132			
574.95	6,648	5,462			
575.00	6,743	5,797			
575.05	6,803	6,136			
575.10	6,863	6,477			
575.15	6,923	6,822			
575.20	6,983	7,170			
575.25	7,043	7,520			
575.30	7,102	7,874			
575.35	7,162	8,230			
575.40	7,222	8,590			
575.45	7,282	8,953			
575.50	7,342	9,318			
575.55	7,342	9,318			
575.60	7,342	9,318			
575.65	7,342	9,318			
575.70	7,342	9,318			
575.75	7,342	9,318			
575.80	7,342	9,318			
575.85	7,342	9,318			
575.90	7,342	9,318			
575.95	7,342	9,318			
576.00	7,342	9,318			
576.05	7,342	9,318			
576.10	7,342	9,318			
576.15	7,342	9,318			
576.20	7,342	9,318			
576.25	7,342	9,318			
576.30	7,342	9,318			
576.35	7,342	9,318			
576.40	7,342	9,318			
576.45	7,342	9,318			
576.50	7,342	9,318			
576.55	7,342	9,318			

Green Infrastructure & Water Quality Calculations

Is this project subject to Chapter 10 of the NYS Design Manual (i.e. WQv is equal to post-development 1 year runoff volume)?.....

Design Point:	1	
P=	1.00	inch

Breakdown of Subcatchments						
Catchment Number	Total Area (Acres)	Impervious Area (Acres)	Percent Impervious %	Rv	WQv (ft ³)	Description
1	6.10	3.30	54%	0.54	11,888	
2	1.00	0.00	0%	0.05	182	
3	4.40	2.70	61%	0.60	9,620	
4	1.70	1.00	59%	0.58	3,576	
5	1.50	1.00	67%	0.65	3,539	
6						
7						
8						
9						
10						
Subtotal (1-30)	14.70	8.00	54%	0.54	28,804	Subtotal 1
Total	14.70	8.00	54%	0.54	28,804	Initial WQv

Identify Runoff Reduction Techniques By Area			
Technique	Total Contributing Area	Contributing Impervious Area	Notes
	(Acre)	(Acre)	
Conservation of Natural Areas	1.00	0.00	minimum 10,000 sf
Riparian Buffers	0.00	0.00	maximum contributing length 75 feet to 150 feet
Filter Strips	0.00	0.00	
Tree Planting	0.00	0.00	Up to 100 sf directly connected impervious area may be subtracted per tree
Total	1.00	0.00	

Recalculate WQv after application of Area Reduction Techniques					
	Total Area (Acres)	Impervious Area (Acres)	Percent Impervious %	Runoff Coefficient Rv	WQv (ft ³)
"<<Initial WQv"	14.70	8.00	54%	0.54	28,804
Subtract Area	-1.00	0.00			
WQv adjusted after Area Reductions	13.70	8.00	58%	0.58	28,623
Disconnection of Rooftops		0.00			
Adjusted WQv after Area Reduction and Rooftop Disconnect	13.70	8.00	58%	0.58	28,623
WQv reduced by Area Reduction techniques					182

Total Water Quality Volume Calculation

$$WQv(\text{acre-feet}) = [(P)(Rv)(A)] / 12$$

All Subcatchments						
Catchment	Total Area (Acres)	Impervious Cover (Acres)	Percent Impervious %	Runoff Coefficient Rv	WQv (ft ³)	Description
1	6.10	3.30	0.54	0.54	11888.25	
2	1.00	0.00	0.00	0.05	182	
3	4.40	2.70	0.61	0.60	9619.50	
4	1.70	1.00	0.59	0.58	3575.55	
5	1.50	1.00	0.67	0.65	3539.25	
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						

Bioretention Worksheet

(For use on HSG C or D Soils with underdrains)

$$Af = WQv * (df) / [k * (hf + df)(tf)]$$

<p><i>Af</i> Required Surface Area (ft²)</p> <p><i>WQv</i> Water Quality Volume (ft³)</p> <p><i>df</i> Depth of the Soil Medium (feet)</p> <p><i>hf</i> Average height of water above the planter bed</p> <p><i>tf</i> Volume Through the Filter Media (days)</p>	<p>The hydraulic conductivity [ft/day], can be varied depending on the properties of the soil media. Some reported conductivity values are: Sand - 3.5 ft/day (City of Austin 1988); Peat - 2.0 ft/day (Galli 1990); Leaf Compost - 8.7 ft/day (Claytor and Schueler, 1996); Bioretention Soil (0.5 ft/day (Claytor &</p>
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Design Point:	1						
Enter Site Data For Drainage Area to be Treated by Practice							
Catchment Number	Total Area (Acres)	Impervious Area (Acres)	Percent Impervious %	Rv	WQv (ft ³)	Precipitation (in)	Description
1	6.10	3.30	0.54	0.54	11888.25	1.00	
Enter Impervious Area Reduced by Disconnection of Rooftops		0.00	54%	0.54	11,888	<<WQv after adjusting for Disconnected Rooftops	
Enter the portion of the WQv that is not reduced for all practices routed to this practice.						ft ³	
Soil Information							
Soil Group	D						
Soil Infiltration Rate	0.00	in/hour	Okay				
Using Underdrains?	Yes		Okay				
Calculate the Minimum Filter Area							
				Value	Units	Notes	
WQv				11,888	ft ³		
Enter Depth of Soil Media			<i>df</i>	1.5	ft	2.5-4 ft	
Enter Hydraulic Conductivity			<i>k</i>	0.5	ft/day		
Enter Average Height of Ponding			<i>hf</i>	0.5	ft	6 inches max.	
Enter Filter Time			<i>tf</i>	2	days		
Required Filter Area			<i>Af</i>	8916	ft²		
Determine Actual Bio-Retention Area							
Filter Width	100	ft					
Filter Length	110	ft					
Filter Area	11000	ft ²					
Actual Volume Provided	14667	ft ³					
Determine Runoff Reduction							
Is the Bioretention contributing flow to another practice?				Select Practice			
RRv	5,867						
RRv applied	5,867	ft³	<i>This is 40% of the storage provided or WQv whichever is less.</i>				
Volume Treated	6,022	ft ³	<i>This is the portion of the WQv that is not reduced in the practice.</i>				
Volume Directed	0	ft ³	This volume is directed another practice				
Sizing v	OK			Check to be sure Area provided ≥ Af			

Bioretention Worksheet

$$A_f = WQ_v * (df) / [k * (hf + df)(tf)]$$

A_f	Required Surface Area (ft ²)		
WQ_v	Water Quality Volume (ft ³)		
df	Depth of the Soil Medium (feet)	k	The hydraulic conductivity [ft/day], can be varied depending on the properties of the soil media. Some reported conductivity values are: Sand - 3.5 ft/day (City of Austin 1988); Peat - 2.0 ft/day (Galli 1990); Leaf Compost - 8.7 ft/day (Claytor and Schueler, 1996); Bioretention Soil (0.5 ft/day (Claytor & Schueler, 1996)
hf	Average height of water above the planter bed		
tf	Volume Through the Filter Media (days)		

Design Point:		1					
Enter Site Data For Drainage Area to be Treated by Practice							
Catchment Number	Total Area (Acres)	Impervious Area (Acres)	Percent Impervious %	Rv	WQv (ft ³)	Precipitation (in)	Description
5	1.50	1.00	0.67	0.65	3539.25	1.00	
Enter Impervious Area Reduced by Disconnection of Rooftops		0.00	67%	0.65	3,539	<<WQv after adjusting for Disconnected Rooftops	
Enter the portion of the WQv that is not reduced for all practices routed to this practice.						ft ³	
Soil Information							
Soil Group		D					
Soil Infiltration Rate		0.00	in/hour	Okay			
Using Underdrains?		Yes	Okay				
Calculate the Minimum Filter Area							
			Value	Units	Notes		
WQv			3,539	ft ³			
Enter Depth of Soil Media			df	1.5	ft	2.5-4 ft	
Enter Hydraulic Conductivity			k	0.5	ft/day		
Enter Average Height of Ponding			hf	0.5	ft	6 inches max.	
Enter Filter Time			tf	2	days		
Required Filter Area			A_f	2654	ft²		
Determine Actual Bio-Retention Area							
Filter Width		49	ft				
Filter Length		100	ft				
Filter Area		4900	ft ²				
Actual Volume Provided		6533	ft ³				
Determine Runoff Reduction							
Is the Bioretention contributing flow to another practice?			No	Select Practice			
RRv		2,613					
RRv applied		2,613	ft³	This is 40% of the storage provided or WQv whichever is less.			
Volume Treated		926	ft ³	This is the portion of the WQv that is not reduced in the practice.			
Volume Directed		0	ft ³	This volume is directed another practice			
Sizing v		OK	Check to be sure Area provided ≥ A_f				

(For use on HSG C or D Soils with underdrains)

Conservation of Natural Areas

Design Point:	1						
Enter Site Data For Drainage Area to be Treated by Practice							
Catchment Number	Total Area (Acres)	Impervious Area (Acres)	Percent Impervious %	Rv	WQv (ft ³)	Precipitation (in)	Description
2	1.00	0.00	0.00	0.05	181.50	1.00	
Design Elements							
Is Contiguous Area ≥ 10,000 ft ² ?						Yes	
Will limits of disturbance be clearly shown on all construction drawings and marked in field/project development site with structural barriers?						Yes	
Is the Conservation area located in an acceptable conservation easement instrument that ensures perpetual protection of proposed area?						Yes	
Does the easement specify how the natural area vegetation will be managed and boundaries will be marked?						Yes	
Does the conservation area receive runoff from other contributing areas?						No	
Does Conservation Area drain to a Design Point?						No	
Is Sheet Flow to Riparian Buffer or another area based practice already being Used for this area?						No	
Are All Criteria in Section 5.3.1 Met?				Yes			
Area Reduction Adjustments							
<i>Subtract</i>	1.00	<i>Acres from Total Area</i>					
<i>Subtract</i>	0.00	<i>Acres from Total Impervious Area</i>					

Minimum RRv

Enter the Soils Data for the site

Soil Group	Acres	S
A		55%
B		40%
C		30%
D	17.40	20%
Total Area	17.4	

Calculate the Minimum RRv

S =	0.20	
Impervious =	8.00	<i>acre</i>
Precipitation	1	<i>in</i>
Rv	0.95	
Minimum RRv	5,518	<i>ft3</i>
	0.13	<i>af</i>

NOI QUESTIONS

#	NOI Question	Reported Value	
		cf	af
28	Total Water Quality Volume (WQv) Required	28804	0.661
30	Total RRV Provided	8662	0.199
31	Is RRV Provided \geq WQv Required?	No	
32	Minimum RRV	5518	0.127
32a	Is RRV Provided \geq Minimum RRV Required?	Yes	
33a	Total WQv Treated	159626	3.664
34	Sum of Volume Reduced & Treated	168287	3.863
34	Sum of Volume Reduced and Treated	168287	3.863
35	Is Sum RRV Provided and WQv Provided \geq WQv Required?	Yes	

Apply Peak Flow Attenuation			
36	Channel Protection	<i>C_{pv}</i>	
37	Overbank	<i>Q_p</i>	
37	Extreme Flood Control	<i>Q_f</i>	
	Are Quantity Control requirements met?		

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
Area/Volume Reduction	Conservation of Natural Areas	RR-1	1.00	0.00		
	Sheetflow to Riparian Buffers/Filter Strips	RR-2	0.00	0.00		
	Tree Planting/Tree Pit	RR-3	0.00	0.00		
	Disconnection of Rooftop Runoff	RR-4		0.00		
	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	
	Rain Barrel/Cistern	RR-8	0.00	0.00	0	
	Porous Pavement	RR-9	0.00	0.00	0	
	Green Roof (Intensive & Extensive)	RR-10	0.00	0.00	0	
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			
	Bioretention & Infiltration Bioretention	F-5	7.60	4.30	8480	6948
	Dry swale	O-1	0.00	0.00	0	0
Standard SMPs	Micropool Extended Detention (P-1)	P-1				
	Wet Pond (P-2)	P-2				
	Wet Extended Detention (P-3)	P-3				
	Multiple Pond system (P-4)	P-4				
	Pocket Pond (p-5)	P-5	9.8	3.40		152678.000
	Surface Sand filter (F-1)	F-1				
	Underground Sand filter (F-2)	F-2				
	Perimeter Sand Filter (F-3)	F-3				
	Organic Filter (F-4)	F-4				
	Shallow Wetland (W-1)	W-1				
	Extended Detention Wetland (W-2)	W-2				
	Pond/Wetland System (W-3)	W-3				
	Pocket Wetland (W-4)	W-4				
Wet Swale (O-2)	O-2					
Totals by Area Reduction →			1.00	0.00	182	
Totals by Volume Reduction →			0.00	0.00	0	
Totals by Standard SMP w/RRV →			7.60	4.30	8480	6948
Totals by Standard SMP →			9.80	3.40		152678
Totals (Area + Volume + all SMPs) →			18.40	7.70	8,662	159,626
Impervious Cover v		error				

← SEE ATTACHED SHEET

21.011 Proposed

Prepared by Hewlett-Packard Company

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Type II 24-hr 100-Year Rainfall=5.28"

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Stage-Area-Storage for Pond 6P: WQv

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
563.00	710	0	570.80	14,804	37,546
563.15	776	111	570.95	15,406	39,812
563.30	843	233	571.10	16,056	42,170
563.45	909	364	571.25	16,731	44,629
563.60	975	506	571.40	17,406	47,189
563.75	1,042	657	571.55	18,081	49,851
563.90	1,108	818	571.70	18,756	52,614
564.05	1,181	989	571.85	19,431	55,478
564.20	1,267	1,173	572.00	20,106	58,443
564.35	1,353	1,369	572.15	20,820	61,512
564.50	1,439	1,579	572.30	21,534	64,689
564.65	1,524	1,801	572.45	22,248	67,973
564.80	1,610	2,036	572.60	22,961	71,363
564.95	1,696	2,284	572.75	23,675	74,861
565.10	1,796	2,546	572.90	24,389	78,466
565.25	1,901	2,823	573.05	25,107	82,178
565.40	2,007	3,116	573.20	25,834	85,998
565.55	2,113	3,425	573.35	26,561	89,928
565.70	2,219	3,750	573.50	27,288	93,967
565.85	2,324	4,090	573.65	28,014	98,114
566.00	2,430	4,447	573.80	28,741	102,371
566.15	2,561	4,821	573.95	29,468	106,737
566.30	2,692	5,215	574.10	32,660	111,335
566.45	2,822	5,629	574.25	37,086	116,565
566.60	2,953	6,062	574.40	41,511	122,460
566.75	3,084	6,515	574.55	45,937	129,019
566.90	3,215	6,987	574.70	50,362	136,241
567.05	3,356	7,479	574.85	54,788	144,127
567.20	3,519	7,995	575.00	59,213	152,678
567.35	3,681	8,535			
567.50	3,844	9,100			
567.65	4,007	9,688			
567.80	4,169	10,301			
567.95	4,332	10,939			
568.10	4,731	11,613			
568.25	5,249	12,361			
568.40	5,767	13,188			
568.55	6,285	14,091			
568.70	6,802	15,073			
568.85	7,320	16,132			
569.00	7,838	17,269			
569.15	8,402	18,487			
569.30	8,965	19,790			
569.45	9,529	21,177			
569.60	10,093	22,648			
569.75	10,657	24,204			
569.90	11,220	25,845			
570.05	11,796	27,571			
570.20	12,398	29,385			
570.35	13,000	31,290			
570.50	13,601	33,285			
570.65	14,202	35,371			

152,678	WQv
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