April 3, 2023

Winchendon Conservation Commission
% Matthew Marro – Conservation Agent
Town Hall
109 Front Street, Dept 11
Winchendon, MA 01475

Subject: Former Mabardy Landfill, Winchendon, MA
Request to Amend the Order of Conditions
MassDEP File No. 345-0675
CEC Project 306-000

Dear Commission Board Members:

On behalf of 580 River Street LLC (the Applicant), Civil & Environmental Consultants, Inc. (CEC) is pleased to submit this Request to Amend the Order of Conditions (MassDEP File # 345-0675) with supporting information for the final closure of the former Mabardy Landfill located on River Street (Map 17 - Lot 42 and Map 17 – Lot 41) in Winchendon, Massachusetts (Site). This Request to Amend the Order of Conditions is submitted in accordance with the Massachusetts Wetlands Program Policy 85-4: Amended Orders and in accordance with Condition number 29 from the Order of Conditions that was issued for the project.

Background

The permitted and approved limit of shaping and grading materials placement and limit of final cap is based upon the documented extents of landfilled C&D waste at the Facility. The edge of landfilled waste had initially been delineated based on a series of test pit investigations performed in April 2018 (TP-1 through TP-30) and October 2018 (TP-31 through TP-42).

Test pits previously conducted on the eastern side of the site inconsistently found landfilled waste in this area. On October 11, 2022, MassDEP approved a test pit program to investigate this area (Authorization No. SW45-0000182), and subsequently additional test pits (TP-43 through TP-54) were excavated on the eastern side of the site to further define the extents of landfilled waste. These test pits were observed by representatives of CEC, W.L. French, and the MassDEP. In-place C&D debris was encountered at 10 of the 12 test pit locations. In accordance with the approved authorization, a summary report was prepared and submitted to MassDEP on November 15, 2022. The summary report described the test pit investigation and presented the revised final cover limit based on the depth of waste at the test pits and the surrounding topography.

Purpose

The Applicant submits this Request to Amend the Order of Conditions to incorporate modifications to the site grading and layout of the stormwater management system resulting from revisions made to the final cover limit. Condition number 29 of the Order of Conditions that was issued for the project requires that revised plans are submitted to the Commission for review.

This request for an Amended Order is reflected within the modified permit plans, and documents the modifications from the original approved permitted plans. The changes generally consist of alterations to the site grading and revisions to the layout of the stormwater management system. All of the proposed modifications are located outside of the 100-foot wetland buffer zone. Furthermore, there are no additional disturbances proposed within the 200-foot riverfront area. It should be noted that the permitted rip-rap apron outlet protection for the south basin outlet structure and portions of the sideslope diversion swales were partially located within the 200-foot riverfront area, and that this condition is also present under the proposed modifications. These modifications do not result in any adverse impacts on the interests protected by the Wetlands Protection Act, M.G.L. c. 131, § 40 (Act). To allow for the smooth operation of the permitting procedure and to avoid unnecessary and unproductive duplication of regulatory effort, we respectfully request that the Commission review the minor revisions as an Amendment to the Order of Conditions.

Proposed Modifications

The proposed modifications involve altering the site grading and layout of the stormwater management system.

The modified stormwater design uses the same design basis as the permitted conditions. Stormwater runoff from the landfill final cover is intercepted and conveyed off the landfill through a series of vegetated sideslope drainage swales and rip-rap lined downchute channels. To the greatest extent practical, stormwater runoff from the final cover slopes is conveyed to the stormwater basins for treatment and flow attenuation prior to discharging off-site in a controlled manner. Modifications to the stormwater basins were necessitated by the revised site grading and layout of stormwater controls. The storage capacity of the south basin has been increased to adequately manage the larger contributing drainage area that is directed to this basin under the proposed conditions. The location of the outlet pipe for stormwater discharges from the south basin remains unchanged and the peak discharge rates during the design storm events are less than the permitted pre-development conditions.

Two stormwater basins are proposed on the northern side of the site to capture and control the stormwater runoff from this area. The two basins are hydraulically connected, as the stormwater discharge from the upstream basin, basin 'N2', flows into the downstream basin 'N1', before ultimately discharging off-site. The outlet for stormwater discharges from the north side of the site, the outlet pipe from basin 'N1', is located farther to the north as compared to the permitted design conditions. Despite the adjusted outlet positioning, the discharge of stormwater from the north side of the site is consistent with the permitted design conditions as the ultimate receiving waterbody for the discharges, the nearby wetlands adjacent to the Miller's River, is the same for both the proposed conditions and the permitted design. Furthermore, the peak discharge rates from the north basin are less than the permitted pre-development conditions.

The modified stormwater management system will function in the same manner as the previous design, and the modifications will not result in increased peak stormwater discharges from the Site for the 2-year, 10-year, 25-year, or 100-year, 24-hour design storm events.

Stormwater Analysis

The proposed stormwater modifications have been analyzed using the computer software program HydroCAD. This program analyzes site hydrology by the graphic peak discharge method documented in Technical Release No. 20 and Technical Release No. 55 published by the United States Department of Agriculture (USDA) Soil Conservation Service (SCS).

The permitted conditions of the stormwater management system for the Facility were described in the 2019 CAD application and design plans. The pre-development and post-development peak stormwater discharge rates were presented in the Stormwater Management Report developed by Langdon Environmental, LLC, dated May 13, 2019, and included in the Notice of Intent (NOI) dated July 24, 2019 submitted to the Winchendon Conservation Commission and Massachusetts Department of Environmental Protection (MassDEP). The pre-development analysis represented the site conditions prior to any disturbances related to the acceptance of grading and shaping materials. The post-development analysis represented the site conditions upon final closure, including the installation of the final cap and establishment of stormwater conveyance and control structures. The pre- and post-development peak-stormwater discharge rates from the original design are included below in Table 1.

The stormwater analyses were performed for the 24-hour, 2-year, 10-year, 25-year, and 100-year design storm events in order to verify that there will be no increase in peak stormwater discharge rates a result of the proposed modifications as compared to permitted pre-development flow rates. The rainfall depths used in the analysis are the same as those presented in the 2019 CAD

application, and are based on data from the National Oceanic and Atmospheric Administration (NOAA) Precipitation Frequency Data Server for Milford Massachusetts for the storm events identified. Detailed calculations are provided within Appendix A. The points of interest for the post-development conditions (the conditions as previously permitted and the conditions upon implementation of the proposed modifications) are both to the west of the landfill, with one being to the north and one to the south (POI-N and POI-S). Summaries of the permitted pre-development peak stormwater discharge rates and post-development proposed stormwater discharge rates are provided in Table 1 below.

Table 1: Summary of Proposed Peak Discharge Rates

Discharge Location	Permitted Pre-Development Conditions (cfs)	Proposed Post-Development Conditions (cfs)
2-Year, 24-Hour Storm Peak Discharge Rates		
POI-N	22.22	2.27
POI-S	12.66	1.78
10-Year, 24-Hour Storm Peak Discharge Rate		
POI-N	37.31	5.38
POI-S	22.69	3.10
25-Year, 24-Hour Storm Peak Discharge Rate		
POI-N	49.19	9.80
POI-S	30.80	9.14
100-Year, 24-Hour Storm Peak Discharge Rate		
POI-N	73.24	30.66
POI-S	47.43	31.87

As shown in Table 1, the peak discharge rates from the Facility do not increase as a result of the proposed modifications.

Summary

The existing resource areas located on and adjacent to the property include Bordering Vegetated Wetlands and Riverfront Area. The overall limits of work will continue to be located on the same parcels of land included on the original Notice of Intent. No additional disturbances are proposed within the 100-foot wetland buffer zone or within the 200-foot riverfront area. In general, the design and function of the proposed stormwater management system is consistent with the permitted design.

Pursuant to Massachusetts Wetlands Program Policy 85-4: Amended Orders, an Amended Order of Conditions is appropriate if the purpose of the project has not changed, the scope of the project has not increased, if the project meets relevant performance standards, and if the potential for adverse impacts to the protected statutory interests will be not increased. Indeed, changes which result in the same or decreased impact on the interests protected by the Act are appropriate for amendments. By every measure, the proposed changes meet these criteria.

The proposed design achieves the goals of the Applicant, while being sensitive to adjacent regulated resource areas. Accordingly, the Applicant respectfully requests that the Conservation Commission find that the proposed design is adequately protective of the interests identified in the Act and issue an Amended Order of Conditions approving the project as described in this letter and as shown on the attached Plans (Appendix B).

We respectfully request that you place this matter on your next available agenda for the Public Hearing. Please contact us at (774) 501-2176 or via email at khampton@cecinc.com if you have any questions. Thank you for your consideration of this matter.

Sincerely,

CIVIL & ENVIRONMENTAL CONSULTANTS, INC.

Amy J. Knight, P.E.
Vice President

Kyle F. Hampton
Project Manager

Attachments: Appendix A - Revised HydroCAD analysis
Appendix B - Revised Plans

Cc: MassDEP – Central Region
Nicole Roberts – Winchendon Planning Board
Justin Sultzbach – Winchendon Town Manager

APPENDIX A

REVISED HYDROCAD ANALYSIS

NORTH

REFERENCE

1. EXISTING TOPOGRAPHIC CONTOURS SHOWN ON THIS PLAN WERE PRODUCED BY A DRONE FLIGHT COMPLETED ON DECEMBER 28, 2022, AND PROVIDED ELECTRONICALLY TO CEC, AND ARE SUPPLEMENTED WITH A SURVEY PERFORMED BY EXISTING GRADE, INC. OF DOUGLAS, MASSACHUSETTS DATED JANUARY 2019.
2. EXISTING TOPOGRAPHIC FEATURES ARE BASED ON AN AERIAL IMAGE DATED JULY 5, 2021, WHICH WAS PROVIDED ELECTRONICALLY TO CEC. CEC HAS NOT VERIFIED THE ACCURACY OF THE TOPOGRAPHIC INFORMATION SHOWN ON THE PLAN.
3. SITE PROPERTY BOUNDARY WAS PROVIDED BY W.L. FRENCH. CEC HAS NOT VERIFIED THE ACCURACY OF THE INFORMATION.
4. ADJACENT PROPERTY BOUNDARIES AND INFORMATION WERE OBTAINED FROM THE MASSACHUSETTS OFFICE OF INFORMATION TECHNOLOGY, OFFICE OF GEOGRAPHIC INFORMATION (MASSGIS) ONLINE RESOURCES. LAST UPDATED OCTOBER 2022 FOR WINCHENDON MA. PROPERTY BOUNDARIES SHOULD BE CONSIDERED APPROXIMATE.
5. EXISTING WETLAND DELINEATIONS WERE FLAGGED BY EPSILON ASSOCIATES, INC. ON MAY 11, 2018. CEC HAS NOT VERIFIED THE ACCURACY OF THIS INFORMATION.
6. PERMITTED FINAL CLOSURE CONDITIONS SHOWN ON THIS PLAN WERE OBTAINED FROM THE PLAN SET TITLED "FORMER MABARDY LANDFILL – CORRECTIVE ACTION DESIGN" DATED JUNE 2019, REVISED OCTOBER 2019, PREPARED BY LANGDON ENVIRONMENTAL LLC.

LEGEND

- EXISTING PROPERTY LINE
- EXISTING ADJACENT PROPERTY LINE
- PERMITTED LIMIT OF FINAL CAP
- PROPOSED LIMIT OF FINAL CAP
- 100-FOOT WETLAND BUFFER
- 200-FOOT RIVERFRONT BUFFER
- BORDERING LAND SUBJECT TO FLOODING
- EXISTING INDEX (MAJOR) CONTOUR
- EXISTING INTERMEDIATE (MINOR) CONTOUR
- EXISTING WETLAND
- EXISTING PAVED ROAD
- EXISTING UNPAVED ROAD
- EXISTING TREE LINE
- EXISTING STRUCTURE
- MW-2 EXISTING ENVIRONMENTAL MONITORING WELL
- 860 PROPOSED INDEX (MAJOR) CONTOUR
- PROPOSED INTERMEDIATE (MINOR) CONTOUR
- 925.0 PROPOSED SPOT ELEVATION
- PROPOSED ACCESS ROAD
- PROPOSED PERIMETER STORMWATER SWALE
- PROPOSED SIDESLOPE DIVERSION BERM
- PROPOSED PERFORATED HDPE PIPE
- PROPOSED STORMWATER CULVERT
- PROPOSED RIP-RAP
- PROPOSED STORMWATER BASIN
- SUBCATCHMENT BOUNDARY
- TIME OF CONCENTRATION (T_C) PATH
- 4 / 0.66 / 74 SUBCATCHMENT ID / SUBCATCHMENT AREA (ACRES) / WEIGHTED CURVE NUMBER

MILLERS RIVER

200-FT RIVERFRONT BUFFER

100-FT BUFFER FROM BVW

100 FOOT WETLAND BUFFER ZONE

BORDERING LAND SUBJECT TO FLOODING (ELEV. 852.26 NAVD88)

PERMITTED MONITORING WELL LOCATION (TYP.)

EXISTING MONITORING WELL (TYP.)

PERMITTED EDGE OF FINAL CAP

SP 0.74 91

S1 0.26 74

S2 1.81 74

S3 1.32 78

S4 1.63 74

S5 0.92 75

S6 2.06 75

N1 2.80 62

N2 1.04 74

N3 3.23 78

N4 1.83 74

N5 1.35 74

N6 0.65 74

N7 1.23 65

N8 0.94 74

N9 1.82 75

N10 0.44 72

N11 0.80 79

NP 0.69 57

768,291.7 sf

STORMWATER SWALES DISCHARGE INTO SOUTH BASIN

PROPOSED ON-LANDFILL ACCESS ROAD

PROPOSED SIDESLOPE DIVERSION BERM (SLOPE=1%)

PROPOSED SIDESLOPE DIVERSION BERM (SLOPE=2%)(TYP.)

PROPOSED SIDESLOPE DIVERSION BERM (TYP.) (SLOPE=1% MIN.)

PROPOSED SIDESLOPE DIVERSION BERM (SLOPE=2% MIN.)

CULVERT C-1 30" DIA. HDPE INV. IN=878.7 INV.OUT=876.0

PROPOSED PERFORATED HDPE PIPE (TYP.)

PROPOSED RIP-RAP LINED DOWNCHUTE

TRANSITION FROM PERIMETER SWALE TO SIDESLOPE SWALE (INV.=882)

STORMWATER BASIN OUTLET CONTROL STRUCTURE

PROPOSED STORMWATER BASIN "N2" TOP ELEV.=879.0 BOT. ELEV.=875.0

CULVERT C-3A 24" DIA. HDPE INV.IN=877.6 INV.OUT=876.9 (S=1% MIN.)

CULVERT C-3 24" DIA. HDPE INV.IN=876.9 INV.OUT=876.3 (S=1% MIN.)

DMH-2 RIM=886.0 INV.=876.9

CULVERT C-2A 30" DIA. HDPE INV.IN=870.3 INV.OUT=869.6 (S=1% MIN.)

DMH-1 RIM=878.0 INV.=869.6

CULVERT C-2 30" DIA. HDPE INV.IN=869.6 INV.OUT=867.6 (S=1% MIN.)

CLEARING LIMITS

SLOPE

EXISTING ACCESS ROAD

RIVER STREET

SITE PROPERTY BOUNDARY

EXISTING SCALE

EXISTING SCALE HOUSE

EXISTING GARAGE

N/F UNITED STATES OF AMERICA 109 FRONT STREET WINCHENDON, MA

N/F 580 RIVER STREET LLC 359 MAIN ST SUITE 2N WOBURN, MA

N/F LUNDIN, ROBERT D. III 596 RIVER STREET WINCHENDON, MA

N/F JORDAN, KEVIN J. 608 RIVER STREET WINCHENDON, MA

N/F ALLEN, JENNIFER M. 582 RIVER STREET WINCHENDON, MA

N/F HOWLETT, MELISSA A. 630 RIVER STREET WINCHENDON, MA

N/F BOWLER, CAROL 607 RIVER STREET WINCHENDON, MA

N/F COCTA, AUGUSTO M. 605 RIVER STREET WINCHENDON, MA

N/F 280 RIVER LAND NG LLC 280 WATER STREET 2ND FLOOR WARREN, RI

SCALE IN FEET
0 80 160

REVISION RECORD

NO	DATE	DESCRIPTION

Civil & Environmental Consultants, Inc.
31 Bellows Road · Raynham, MA 02767
Ph: 774.501.2176 · 866.312.2024 · Fax: 774.501.2669
www.cecinc.com

PERMIT MODIFICATION PLANS
FORMER MABARDY LANDFILL
W.L. FRENCH EXCAVATING CORPORATION
RIVER ROAD
WINCHENDON, MA

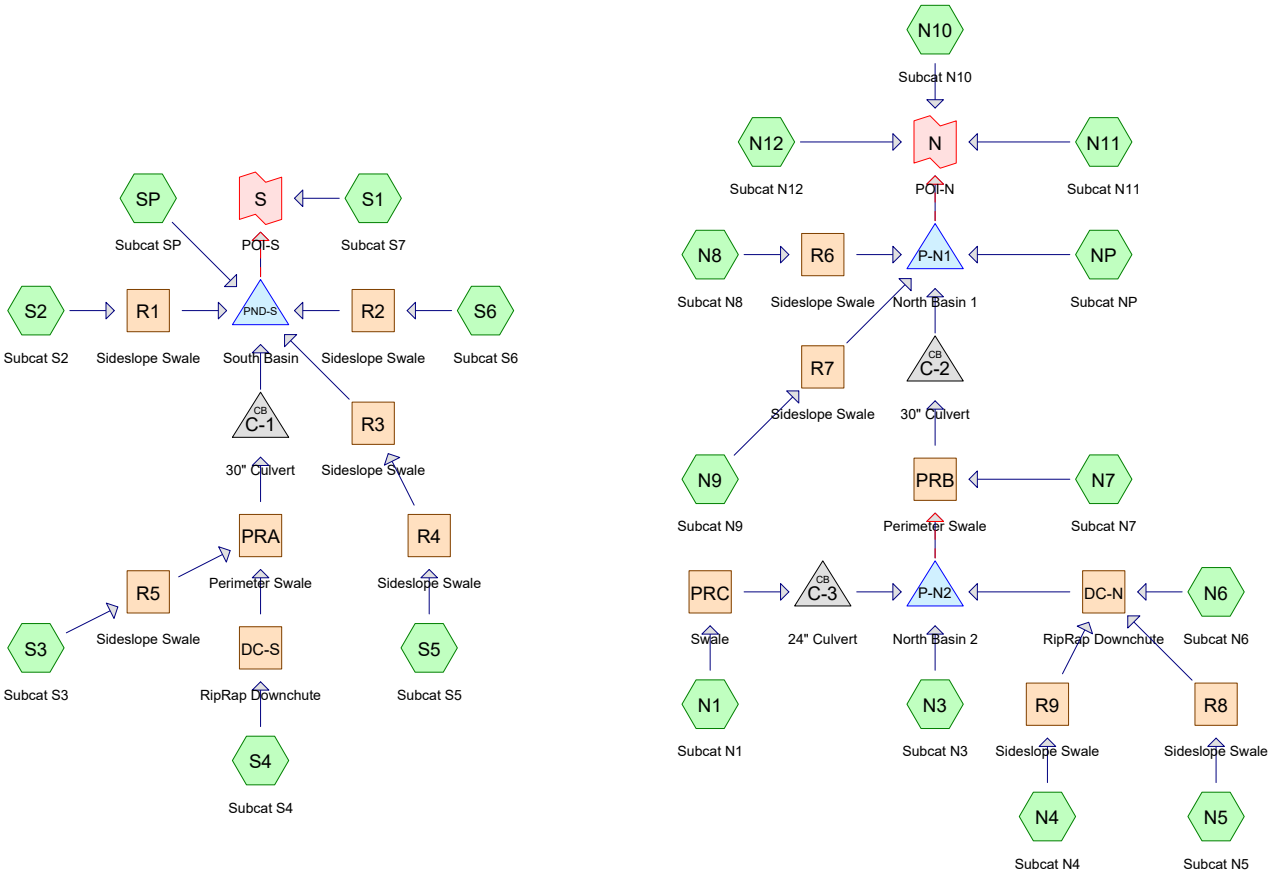
POST-DEVELOPMENT DRAINAGE AREAS MAP

DATE:	MARCH 2023
DRAWN BY:	DGB
CHECKED BY:	KFH
DWG SCALE:	1" = 80'
PROJECT NO:	306-000
APPROVED BY:	DRAFT

FIGURE NO.: **HYD-1**

SHEET 1 OF 1

P:\300-000\306-000\1-CAD\Dwg\SW03 - SW45 Permit - Text Filing\306000-SW03-HYD-P-Drainage Area Map.dwg(HYD1) LS(2/24/2023 - Animation) - LP: 3/8/2023 9:27 AM



Routing Diagram for 306-000 Post-Development HydroCAD
Prepared by CEC Inc, Printed 3/7/2023

Rainfall Events Listing

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	2-yr 24-hr	Type III 24-hr		Default	24.00	1	3.20	2
2	10-yr 24-hr	Type III 24-hr		Default	24.00	1	4.84	2
3	25-yr 24-hr	Type III 24-hr		Default	24.00	1	6.14	2
4	100-yr 24-hr	Type III 24-hr		Default	24.00	1	8.80	2

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
2.961	49	50-75% Grass cover, Fair, HSG A (N1, N10, N12, N3, N7, NP, S3)
4.555	79	50-75% Grass cover, Fair, HSG C (N1, N10, N11, N12, N3, N7, N8, NP, S1, S3)
0.001	39	>75% Grass cover, Good, HSG A (N10)
16.926	74	>75% Grass cover, Good, HSG C (N1, N10, N11, N12, N3, N4, N5, N6, N7, N8, N9, NP, S1, S2, S3, S4, S5, S6, SP)
0.799	91	Fallow, bare soil, HSG C (S3, SP)
0.638	96	Gravel surface, HSG C (N10, N11, N3, N4, N7, N8, N9, S2, S3, S5, S6)
0.001	98	Roofs, HSG C (S3)
0.002	30	Woods, Good, HSG A (N1)
0.011	70	Woods, Good, HSG C (N1)
25.894	**73**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
2.964	HSG A	N1, N10, N12, N3, N7, NP, S3
0.000	HSG B	
22.930	HSG C	N1, N10, N11, N12, N3, N4, N5, N6, N7, N8, N9, NP, S1, S2, S3, S4, S5, S6, SP
0.000	HSG D	
0.000	Other	
25.894		**TOTAL AREA**

Pipe Listing (all nodes)

Line#	Node Number	In-Invert (feet)	Out-Invert (feet)	Length (feet)	Slope (ft/ft)	n	Width (inches)	Diam/Height (inches)	Inside-Fill (inches)
1	C-1	878.70	876.00	188.0	0.0144	0.013	0.0	30.0	0.0
2	C-2	870.30	867.60	270.0	0.0100	0.013	0.0	30.0	0.0
3	C-3	877.60	876.30	130.0	0.0100	0.013	0.0	24.0	0.0
4	P-N1	858.00	857.00	100.0	0.0100	0.013	0.0	24.0	0.0
5	P-N2	875.00	874.00	100.0	0.0100	0.013	0.0	24.0	0.0
6	PND-S	858.50	858.00	50.0	0.0100	0.013	0.0	30.0	0.0

Time span=0.00-48.00 hrs, dt=0.05 hrs, 961 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

SubcatchmentN1: Subcat N1 Runoff Area=3.568 ac 0.00% Impervious Runoff Depth=0.56"
Flow Length=630' Tc=20.1 min CN=64 Runoff=1.18 cfs 0.166 af

SubcatchmentN10: Subcat N10 Runoff Area=0.445 ac 0.00% Impervious Runoff Depth=0.98"
Flow Length=62' Slope=0.3300 '/' Tc=6.0 min CN=73 Runoff=0.47 cfs 0.036 af

SubcatchmentN11: Subcat N11 Runoff Area=0.309 ac 0.00% Impervious Runoff Depth=1.15"
Flow Length=164' Slope=0.3300 '/' Tc=6.0 min CN=76 Runoff=0.40 cfs 0.030 af

SubcatchmentN12: Subcat N12 Runoff Area=1.039 ac 0.00% Impervious Runoff Depth=1.04"
Flow Length=60' Slope=0.3300 '/' Tc=6.0 min CN=74 Runoff=1.18 cfs 0.090 af

SubcatchmentN3: Subcat N3 Runoff Area=3.233 ac 0.00% Impervious Runoff Depth=1.27"
Flow Length=121' Slope=0.0100 '/' Tc=19.2 min CN=78 Runoff=3.21 cfs 0.343 af

SubcatchmentN4: Subcat N4 Runoff Area=1.834 ac 0.00% Impervious Runoff Depth=1.04"
Flow Length=155' Tc=9.6 min CN=74 Runoff=1.84 cfs 0.159 af

SubcatchmentN5: Subcat N5 Runoff Area=1.354 ac 0.00% Impervious Runoff Depth=1.04"
Flow Length=141' Slope=0.0500 '/' Tc=10.2 min CN=74 Runoff=1.34 cfs 0.117 af

SubcatchmentN6: Subcat N6 Runoff Area=0.654 ac 0.00% Impervious Runoff Depth=1.04"
Flow Length=114' Slope=0.0500 '/' Tc=9.9 min CN=74 Runoff=0.65 cfs 0.057 af

SubcatchmentN7: Subcat N7 Runoff Area=1.354 ac 0.00% Impervious Runoff Depth=0.64"
Flow Length=172' Slope=0.1400 '/' Tc=10.4 min CN=66 Runoff=0.70 cfs 0.073 af

SubcatchmentN8: Subcat N8 Runoff Area=0.943 ac 0.00% Impervious Runoff Depth=1.04"
Flow Length=94' Tc=9.2 min CN=74 Runoff=0.96 cfs 0.081 af

SubcatchmentN9: Subcat N9 Runoff Area=1.817 ac 0.00% Impervious Runoff Depth=1.09"
Flow Length=760' Tc=11.4 min CN=75 Runoff=1.84 cfs 0.166 af

SubcatchmentNP: Subcat NP Runoff Area=0.690 ac 0.00% Impervious Runoff Depth=0.31"
Flow Length=134' Slope=0.0200 '/' Tc=14.8 min CN=57 Runoff=0.09 cfs 0.018 af

SubcatchmentS1: Subcat S7 Runoff Area=0.263 ac 0.00% Impervious Runoff Depth=1.04"
Flow Length=60' Slope=0.3300 '/' Tc=6.0 min CN=74 Runoff=0.30 cfs 0.023 af

SubcatchmentS2: Subcat S2 Runoff Area=1.813 ac 0.00% Impervious Runoff Depth=1.04"
Flow Length=97' Tc=6.0 min CN=74 Runoff=2.06 cfs 0.157 af

SubcatchmentS3: Subcat S3 Runoff Area=1.322 ac 0.11% Impervious Runoff Depth=1.27"
Flow Length=64' Slope=0.3300 '/' Tc=6.0 min CN=78 Runoff=1.90 cfs 0.140 af

SubcatchmentS4: Subcat S4 Runoff Area=1.628 ac 0.00% Impervious Runoff Depth=1.04"
Flow Length=143' Slope=0.0500 '/' Tc=10.3 min CN=74 Runoff=1.60 cfs 0.141 af

Subcatchment S5: Subcat S5 Runoff Area=0.922 ac 0.00% Impervious Runoff Depth=1.09"
Flow Length=118' Tc=9.9 min CN=75 Runoff=0.98 cfs 0.084 af

Subcatchment S6: Subcat S6 Runoff Area=2.064 ac 0.00% Impervious Runoff Depth=1.09"
Flow Length=163' Tc=10.1 min CN=75 Runoff=2.18 cfs 0.188 af

Subcatchment SP: Subcat SP Runoff Area=0.642 ac 0.00% Impervious Runoff Depth=2.26"
Tc=0.0 min CN=91 Runoff=1.92 cfs 0.121 af

Reach DC-N: RipRap Downchute Avg. Flow Depth=0.23' Max Vel=4.07 fps Inflow=3.52 cfs 0.332 af
n=0.070 L=120.0' S=0.3300 '/' Capacity=127.98 cfs Outflow=3.49 cfs 0.332 af

Reach DC-S: RipRap Downchute Avg. Flow Depth=0.15' Max Vel=3.13 fps Inflow=1.60 cfs 0.141 af
n=0.070 L=100.0' S=0.3333 '/' Capacity=128.61 cfs Outflow=1.58 cfs 0.141 af

Reach PRA: Perimeter Swale Avg. Flow Depth=0.45' Max Vel=2.35 fps Inflow=3.34 cfs 0.281 af
n=0.030 L=500.0' S=0.0100 '/' Capacity=63.20 cfs Outflow=3.07 cfs 0.281 af

Reach PRB: Perimeter Swale Avg. Flow Depth=0.23' Max Vel=1.61 fps Inflow=0.92 cfs 0.897 af
n=0.030 L=700.0' S=0.0100 '/' Capacity=33.63 cfs Outflow=0.89 cfs 0.896 af

Reach PRC: Swale Avg. Flow Depth=0.18' Max Vel=1.49 fps Inflow=1.18 cfs 0.166 af
n=0.030 L=140.0' S=0.0100 '/' Capacity=23.61 cfs Outflow=1.17 cfs 0.166 af

Reach R1: Sideslope Swale Avg. Flow Depth=0.53' Max Vel=1.93 fps Inflow=2.06 cfs 0.157 af
n=0.030 L=1,380.0' S=0.0100 '/' Capacity=47.07 cfs Outflow=1.33 cfs 0.157 af

Reach R2: Sideslope Swale Avg. Flow Depth=0.52' Max Vel=2.70 fps Inflow=2.18 cfs 0.188 af
n=0.030 L=1,143.0' S=0.0200 '/' Capacity=66.56 cfs Outflow=1.78 cfs 0.188 af

Reach R3: Sideslope Swale Avg. Flow Depth=0.27' Max Vel=4.37 fps Inflow=0.92 cfs 0.084 af
n=0.030 L=300.0' S=0.1233 '/' Capacity=201.54 cfs Outflow=0.91 cfs 0.084 af

Reach R4: Sideslope Swale Avg. Flow Depth=0.40' Max Vel=2.29 fps Inflow=0.98 cfs 0.084 af
n=0.030 L=348.0' S=0.0200 '/' Capacity=66.56 cfs Outflow=0.92 cfs 0.084 af

Reach R5: Sideslope Swale Avg. Flow Depth=0.52' Max Vel=2.69 fps Inflow=1.90 cfs 0.140 af
n=0.030 L=309.0' S=0.0200 '/' Capacity=66.56 cfs Outflow=1.77 cfs 0.140 af

Reach R6: Sideslope Swale Avg. Flow Depth=0.39' Max Vel=2.24 fps Inflow=0.96 cfs 0.081 af
n=0.030 L=589.0' S=0.0200 '/' Capacity=66.56 cfs Outflow=0.84 cfs 0.081 af

Reach R7: Sideslope Swale Avg. Flow Depth=0.56' Max Vel=2.01 fps Inflow=1.84 cfs 0.166 af
n=0.030 L=800.0' S=0.0100 '/' Capacity=47.07 cfs Outflow=1.56 cfs 0.166 af

Reach R8: Sideslope Swale Avg. Flow Depth=0.45' Max Vel=2.48 fps Inflow=1.34 cfs 0.117 af
n=0.030 L=354.0' S=0.0200 '/' Capacity=66.56 cfs Outflow=1.26 cfs 0.117 af

Reach R9: Sideslope Swale Avg. Flow Depth=0.51' Max Vel=2.67 fps Inflow=1.84 cfs 0.159 af
n=0.030 L=495.0' S=0.0200 '/' Capacity=66.56 cfs Outflow=1.72 cfs 0.159 af

Pond C-1: 30" Culvert Peak Elev=879.38' Inflow=3.07 cfs 0.281 af
30.0" Round Culvert n=0.013 L=188.0' S=0.0144 '/' Outflow=3.07 cfs 0.281 af

Pond C-2: 30" Culvert Peak Elev=870.66' Inflow=0.89 cfs 0.896 af
30.0" Round Culvert n=0.013 L=270.0' S=0.0100 '/' Outflow=0.89 cfs 0.896 af

Pond C-3: 24" Culvert Peak Elev=878.04' Inflow=1.17 cfs 0.166 af
24.0" Round Culvert n=0.013 L=130.0' S=0.0100 '/' Outflow=1.17 cfs 0.166 af

Pond P-N1: North Basin 1 Peak Elev=860.05' Storage=6,977 cf Inflow=3.10 cfs 1.161 af
Primary=1.61 cfs 1.159 af Secondary=0.00 cfs 0.000 af Outflow=1.61 cfs 1.159 af

Pond P-N2: North Basin 2 Peak Elev=876.52' Storage=51,937 cf Inflow=7.57 cfs 0.841 af
Primary=0.70 cfs 0.824 af Secondary=0.00 cfs 0.000 af Outflow=0.70 cfs 0.824 af

Pond PND-S: South Basin Peak Elev=860.15' Storage=23,852 cf Inflow=7.07 cfs 0.831 af
Primary=1.74 cfs 0.830 af Secondary=0.00 cfs 0.000 af Outflow=1.74 cfs 0.830 af

Link N: POI-N Inflow=2.27 cfs 1.315 af
Primary=2.27 cfs 1.315 af

Link S: POI-S Inflow=1.78 cfs 0.853 af
Primary=1.78 cfs 0.853 af

Total Runoff Area = 25.894 ac Runoff Volume = 2.189 af Average Runoff Depth = 1.01"
99.99% Pervious = 25.893 ac 0.01% Impervious = 0.001 ac

Summary for Subcatchment N1: Subcat N1

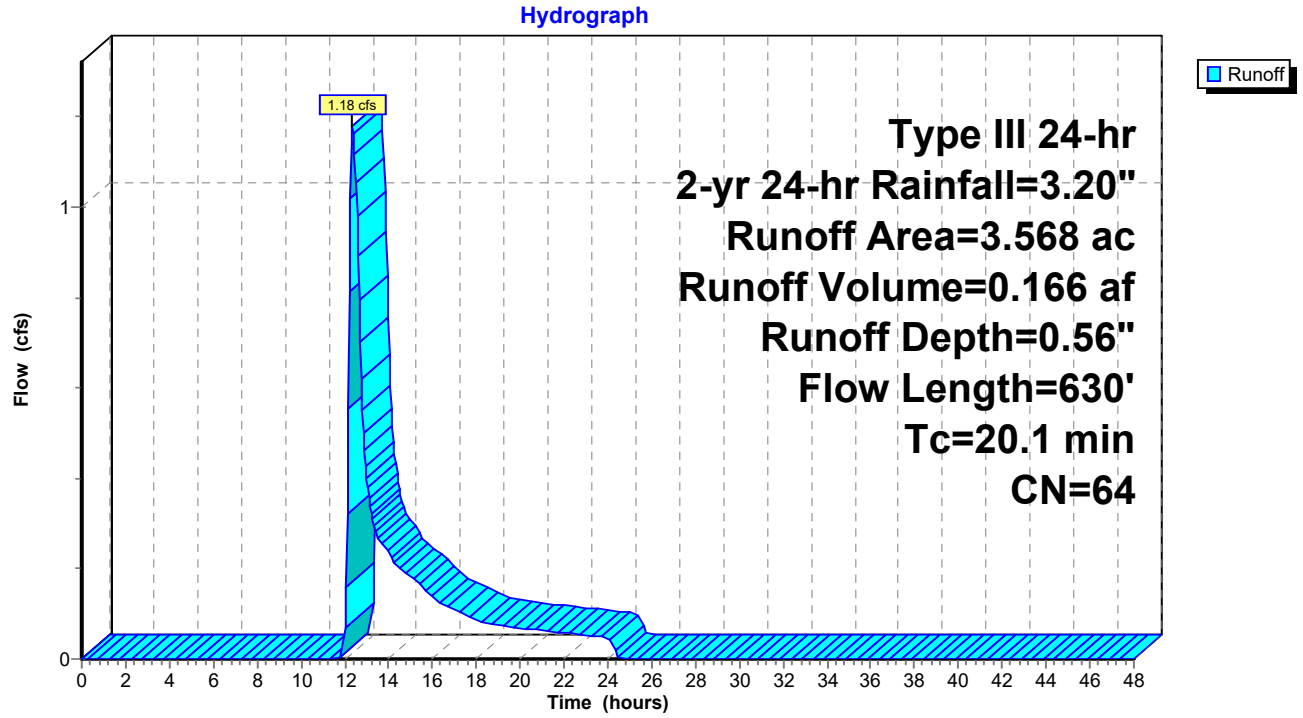
Runoff = 1.18 cfs @ 12.36 hrs, Volume= 0.166 af, Depth= 0.56"
Routed to Reach PRC : Swale

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-yr 24-hr Rainfall=3.20"

Area (ac)	CN	Description
0.073	79	50-75% Grass cover, Fair, HSG C
1.264	79	50-75% Grass cover, Fair, HSG C
1.678	49	50-75% Grass cover, Fair, HSG A
0.011	70	Woods, Good, HSG C
0.000	70	Woods, Good, HSG C
0.002	30	Woods, Good, HSG A
0.540	74	>75% Grass cover, Good, HSG C
3.568	64	Weighted Average
3.568		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.5	100	0.1000	0.22		**Sheet Flow, Grass** Grass: Dense n= 0.240 P2= 3.23"
12.6	530	0.0100	0.70		**Shallow Concentrated Flow, Grass** Short Grass Pasture Kv= 7.0 fps
20.1	630	Total			

Subcatchment N1: Subcat N1



Summary for Subcatchment N10: Subcat N10

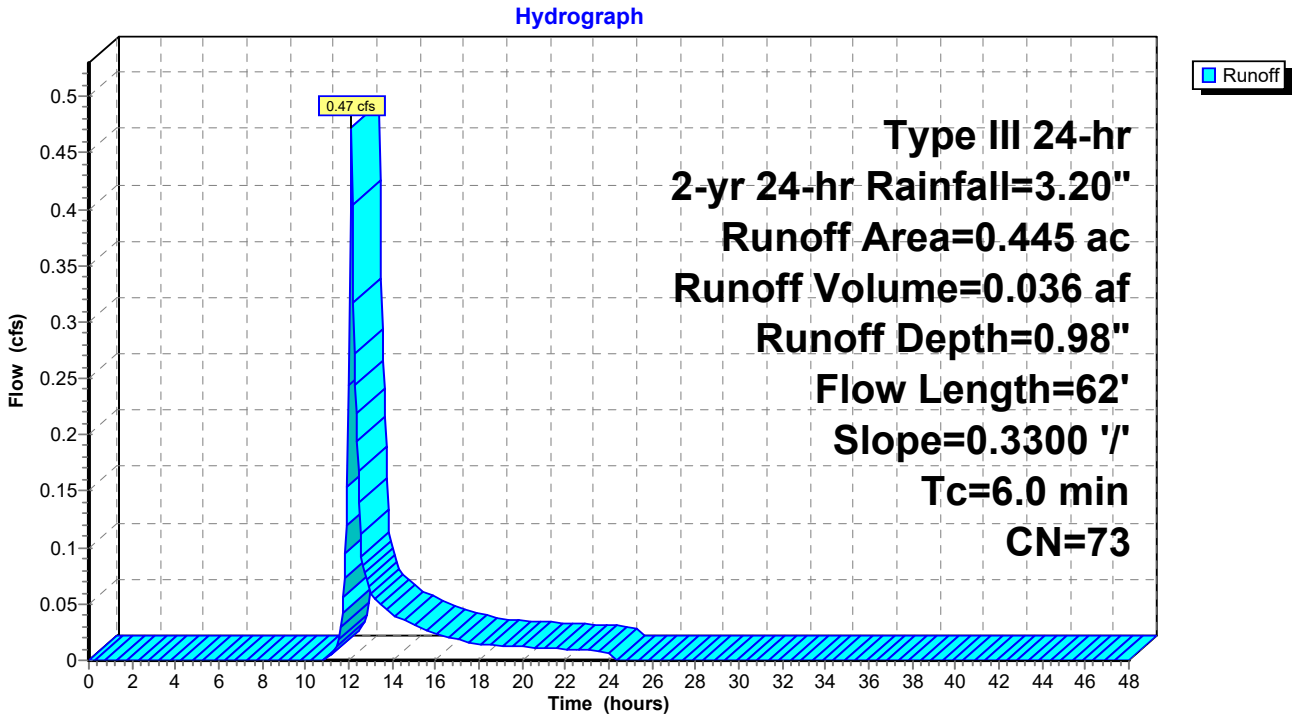
Runoff = 0.47 cfs @ 12.10 hrs, Volume= 0.036 af, Depth= 0.98"
Routed to Link N : POI-N

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-yr 24-hr Rainfall=3.20"

Area (ac)	CN	Description
0.029	49	50-75% Grass cover, Fair, HSG A
0.001	39	>75% Grass cover, Good, HSG A
0.000	96	Gravel surface, HSG C
0.396	74	>75% Grass cover, Good, HSG C
0.018	79	50-75% Grass cover, Fair, HSG C
0.445	73	Weighted Average
0.445		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.2	62	0.3300	0.33		**Sheet Flow, Landfill Slope** Grass: Dense n= 0.240 P2= 3.23"
3.2	62	Total, Increased to minimum Tc = 6.0 min			

Subcatchment N10: Subcat N10



Summary for Subcatchment N11: Subcat N11

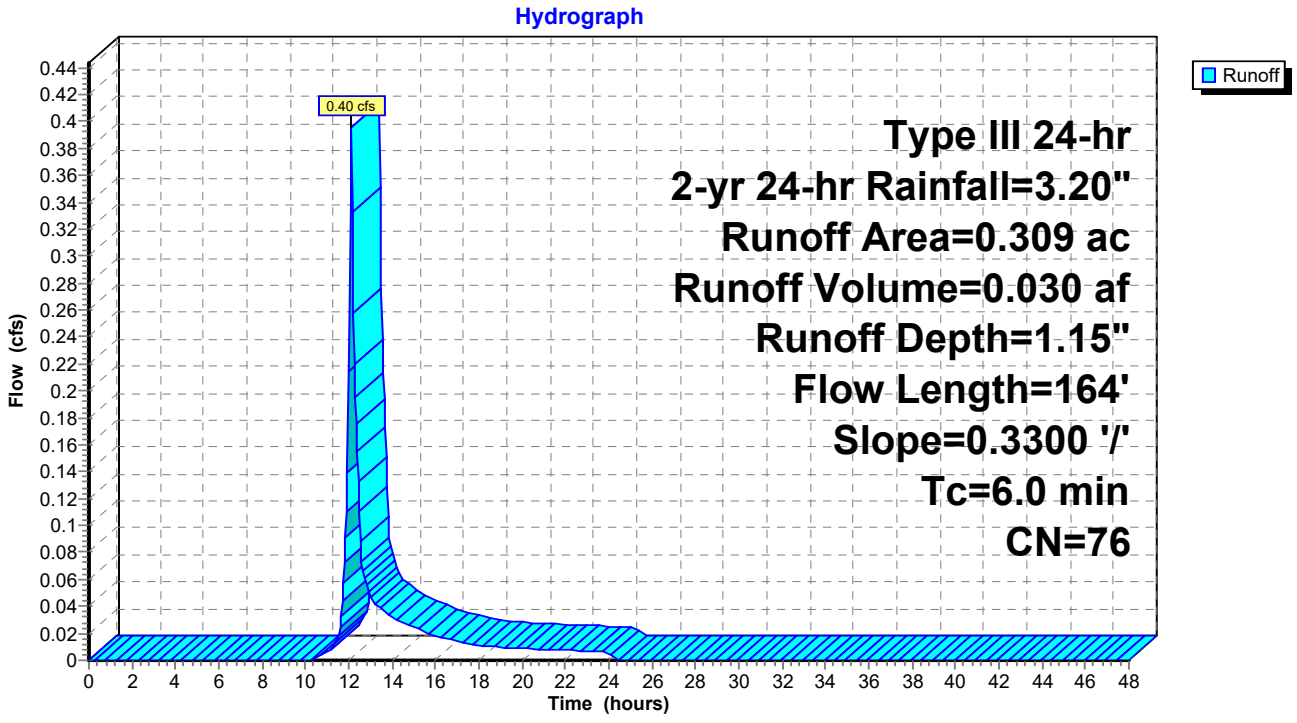
Runoff = 0.40 cfs @ 12.10 hrs, Volume= 0.030 af, Depth= 1.15"
Routed to Link N : POI-N

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-yr 24-hr Rainfall=3.20"

Area (ac)	CN	Description
0.027	96	Gravel surface, HSG C
0.276	74	>75% Grass cover, Good, HSG C
0.006	79	50-75% Grass cover, Fair, HSG C
0.309	76	Weighted Average
0.309		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.6	100	0.3300	0.36		**Sheet Flow, Landfill Slope** Grass: Dense n= 0.240 P2= 3.23"
0.3	64	0.3300	4.02		**Shallow Concentrated Flow, Landfill Slope** Short Grass Pasture Kv= 7.0 fps
4.9	164	Total, Increased to minimum Tc = 6.0 min			

Subcatchment N11: Subcat N11



Summary for Subcatchment N12: Subcat N12

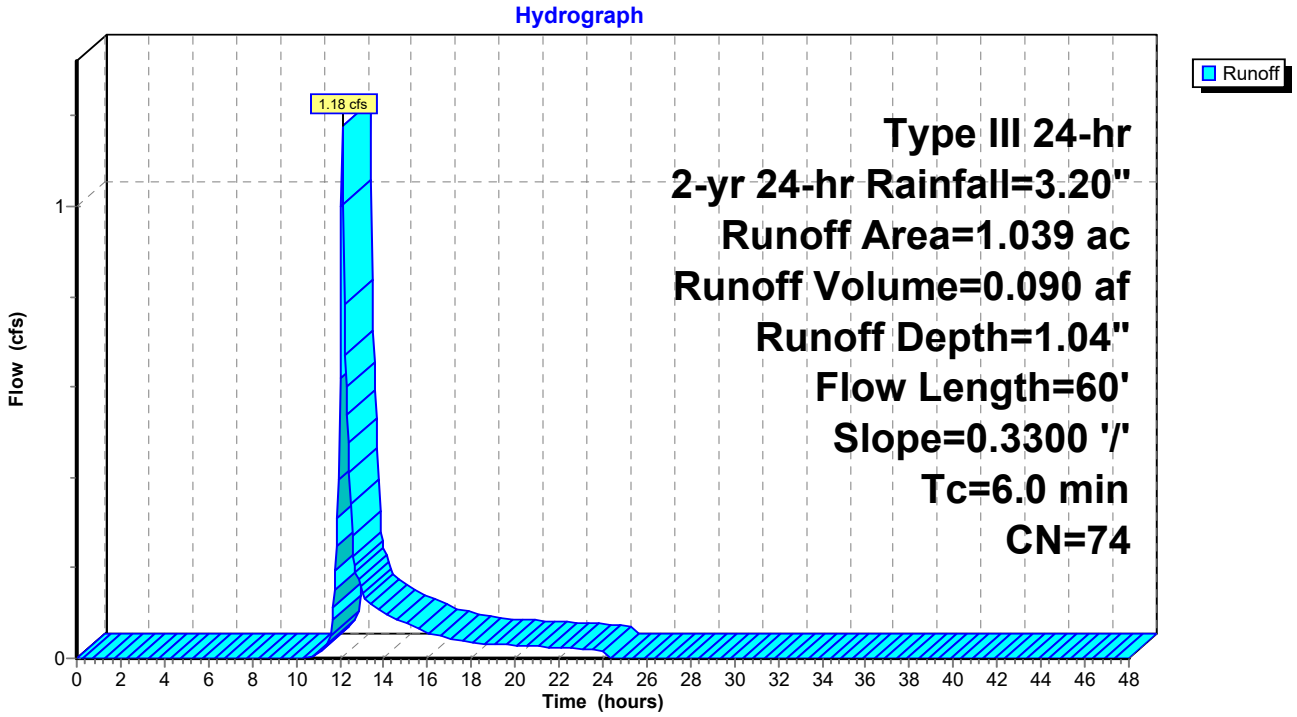
Runoff = 1.18 cfs @ 12.10 hrs, Volume= 0.090 af, Depth= 1.04"
Routed to Link N : POI-N

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-yr 24-hr Rainfall=3.20"

Area (ac)	CN	Description
0.000	49	50-75% Grass cover, Fair, HSG A
0.000	49	50-75% Grass cover, Fair, HSG A
0.000	79	50-75% Grass cover, Fair, HSG C
0.001	79	50-75% Grass cover, Fair, HSG C
0.001	79	50-75% Grass cover, Fair, HSG C
0.001	79	50-75% Grass cover, Fair, HSG C
0.000	79	50-75% Grass cover, Fair, HSG C
0.009	79	50-75% Grass cover, Fair, HSG C
0.003	79	50-75% Grass cover, Fair, HSG C
1.024	74	>75% Grass cover, Good, HSG C
1.039	74	Weighted Average
1.039		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.1	60	0.3300	0.33		**Sheet Flow, Landfill Slope** Grass: Dense n= 0.240 P2= 3.23"
3.1	60	Total, Increased to minimum Tc = 6.0 min			

Subcatchment N12: Subcat N12



Summary for Subcatchment N3: Subcat N3

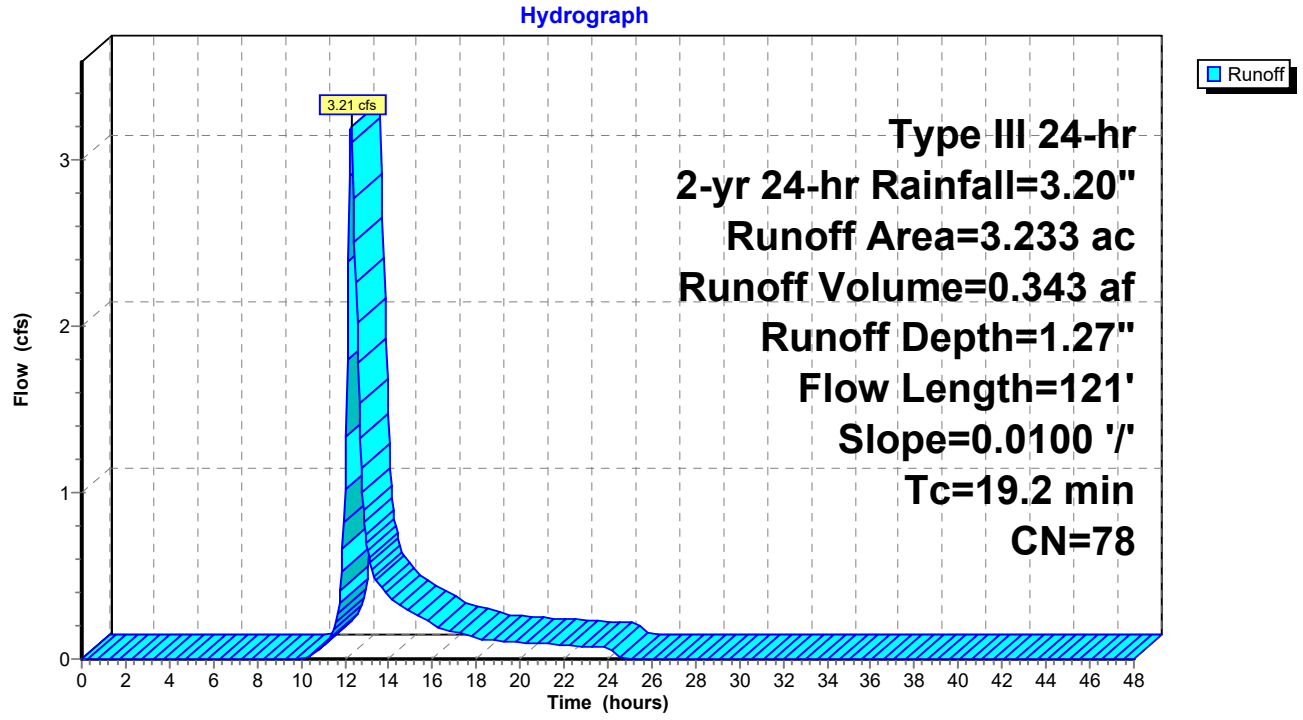
Runoff = 3.21 cfs @ 12.28 hrs, Volume= 0.343 af, Depth= 1.27"
Routed to Pond P-N2 : North Basin 2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-yr 24-hr Rainfall=3.20"

Area (ac)	CN	Description
0.166	49	50-75% Grass cover, Fair, HSG A
2.016	79	50-75% Grass cover, Fair, HSG C
0.654	79	50-75% Grass cover, Fair, HSG C
0.087	96	Gravel surface, HSG C
0.000	74	>75% Grass cover, Good, HSG C
0.021	96	Gravel surface, HSG C
0.289	74	>75% Grass cover, Good, HSG C
3.233	78	Weighted Average
3.233		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
18.7	100	0.0100	0.09		**Sheet Flow, Grass** Grass: Dense n= 0.240 P2= 3.23"
0.5	21	0.0100	0.70		**Shallow Concentrated Flow, Grass** Short Grass Pasture Kv= 7.0 fps
19.2	121	Total			

Subcatchment N3: Subcat N3



Summary for Subcatchment N4: Subcat N4

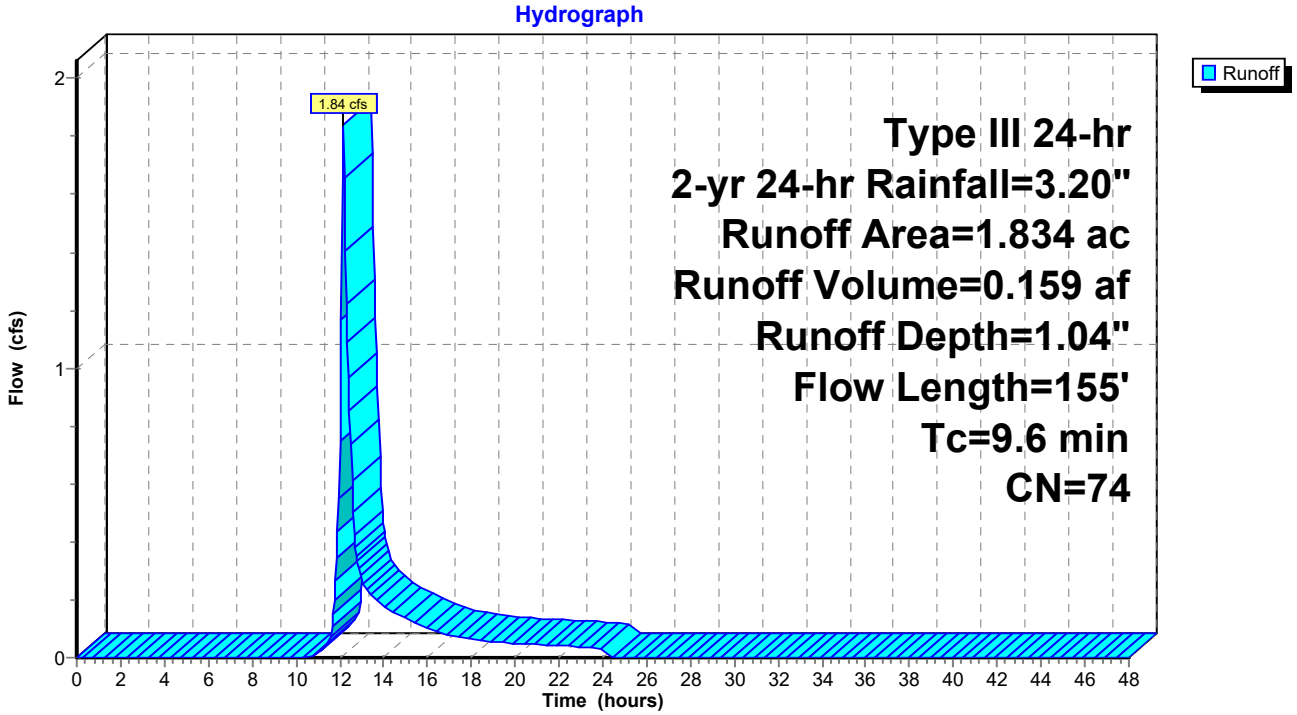
Runoff = 1.84 cfs @ 12.15 hrs, Volume= 0.159 af, Depth= 1.04"
Routed to Reach R9 : Sideslope Swale

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-yr 24-hr Rainfall=3.20"

Area (ac)	CN	Description
0.002	96	Gravel surface, HSG C
1.832	74	>75% Grass cover, Good, HSG C
1.834	74	Weighted Average
1.834		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.0	77	0.0500	0.16		**Sheet Flow, Landfill Deck** Grass: Dense n= 0.240 P2= 3.23"
1.4	23	0.3300	0.27		**Sheet Flow, Landfill Slope** Grass: Dense n= 0.240 P2= 3.23"
0.2	55	0.3300	4.02		**Shallow Concentrated Flow, Landfill Slope** Short Grass Pasture Kv= 7.0 fps
9.6	155	Total			

Subcatchment N4: Subcat N4



Summary for Subcatchment N5: Subcat N5

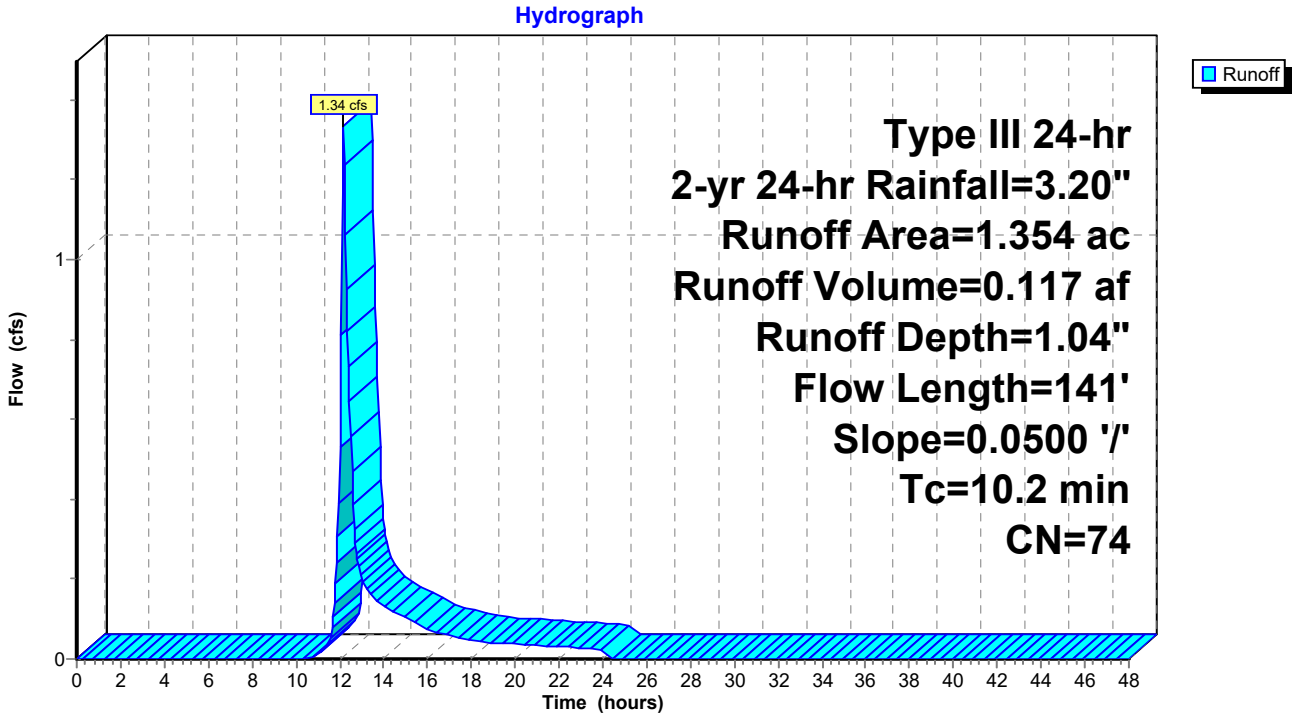
Runoff = 1.34 cfs @ 12.16 hrs, Volume= 0.117 af, Depth= 1.04"
Routed to Reach R8 : Sideslope Swale

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-yr 24-hr Rainfall=3.20"

Area (ac)	CN	Description
1.354	74	>75% Grass cover, Good, HSG C
1.354		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.8	100	0.0500	0.17		**Sheet Flow, Landfill Deck** Grass: Dense n= 0.240 P2= 3.23"
0.4	41	0.0500	1.57		**Shallow Concentrated Flow, Landfill Deck** Short Grass Pasture Kv= 7.0 fps
10.2	141	Total			

Subcatchment N5: Subcat N5



Summary for Subcatchment N6: Subcat N6

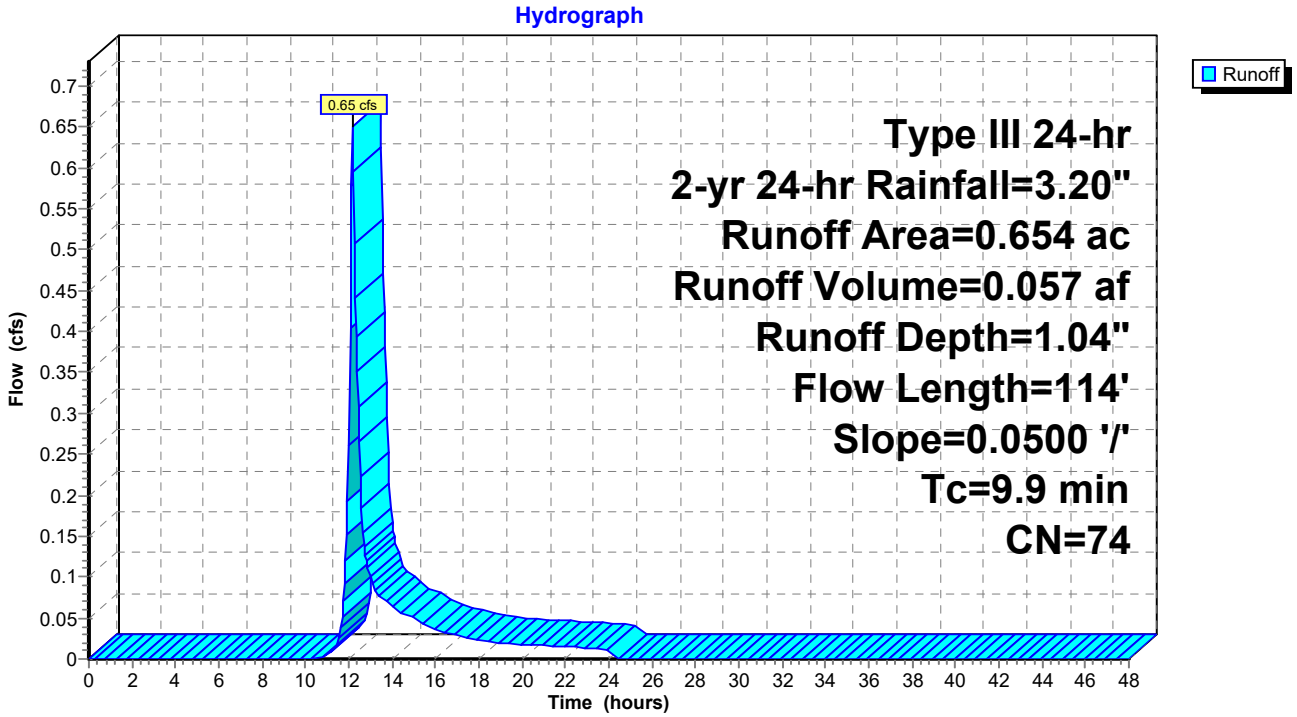
Runoff = 0.65 cfs @ 12.15 hrs, Volume= 0.057 af, Depth= 1.04"
Routed to Reach DC-N : RipRap Downchute

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-yr 24-hr Rainfall=3.20"

Area (ac)	CN	Description
0.654	74	>75% Grass cover, Good, HSG C
0.654		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.8	100	0.0500	0.17		**Sheet Flow, Landfill Deck** Grass: Dense n= 0.240 P2= 3.23"
0.1	14	0.0500	1.57		**Shallow Concentrated Flow, Landfill Deck** Short Grass Pasture Kv= 7.0 fps
9.9	114	Total			

Subcatchment N6: Subcat N6



Summary for Subcatchment N7: Subcat N7

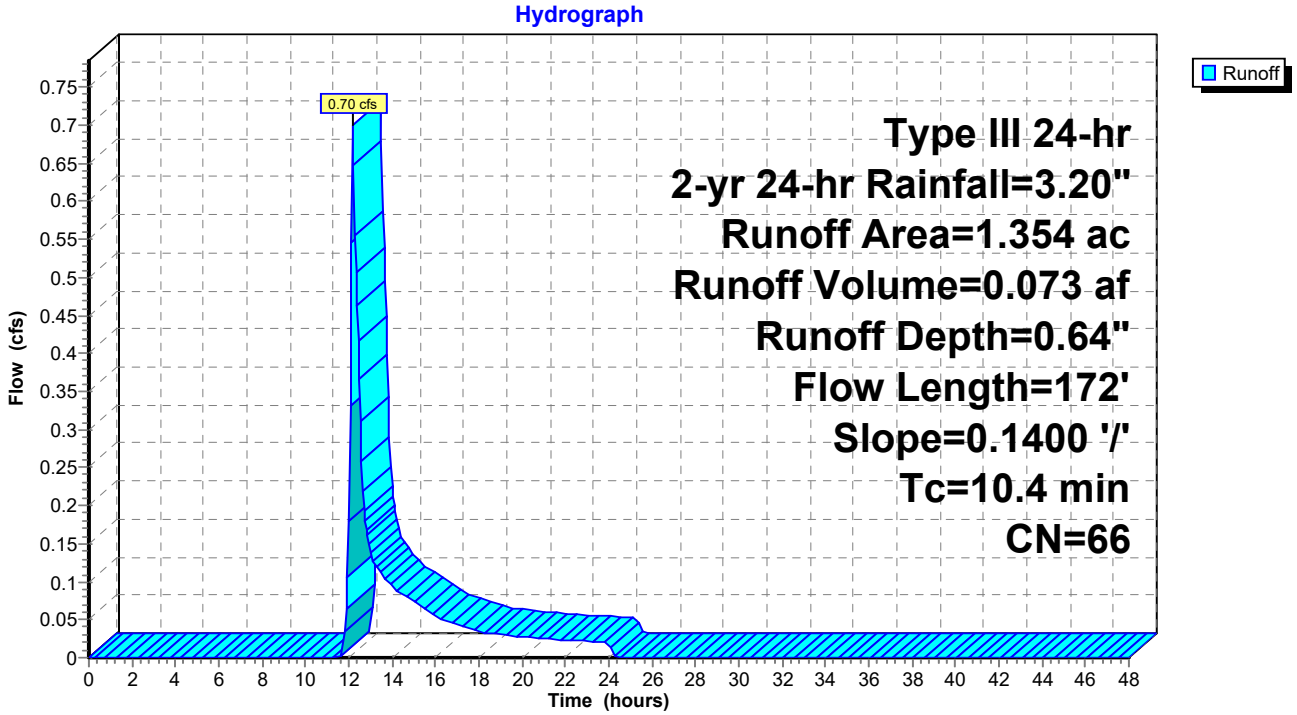
Runoff = 0.70 cfs @ 12.17 hrs, Volume= 0.073 af, Depth= 0.64"
Routed to Reach PRB : Perimeter Swale

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-yr 24-hr Rainfall=3.20"

Area (ac)	CN	Description
0.531	49	50-75% Grass cover, Fair, HSG A
0.045	96	Gravel surface, HSG C
0.430	74	>75% Grass cover, Good, HSG C
0.349	79	50-75% Grass cover, Fair, HSG C
1.354	66	Weighted Average
1.354		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.8	100	0.1400	0.17		**Sheet Flow, Woods** Woods: Light underbrush n= 0.400 P2= 3.23"
0.6	72	0.1400	1.87		**Shallow Concentrated Flow, Woods** Woodland Kv= 5.0 fps
10.4	172	Total			

Subcatchment N7: Subcat N7



Summary for Subcatchment N8: Subcat N8

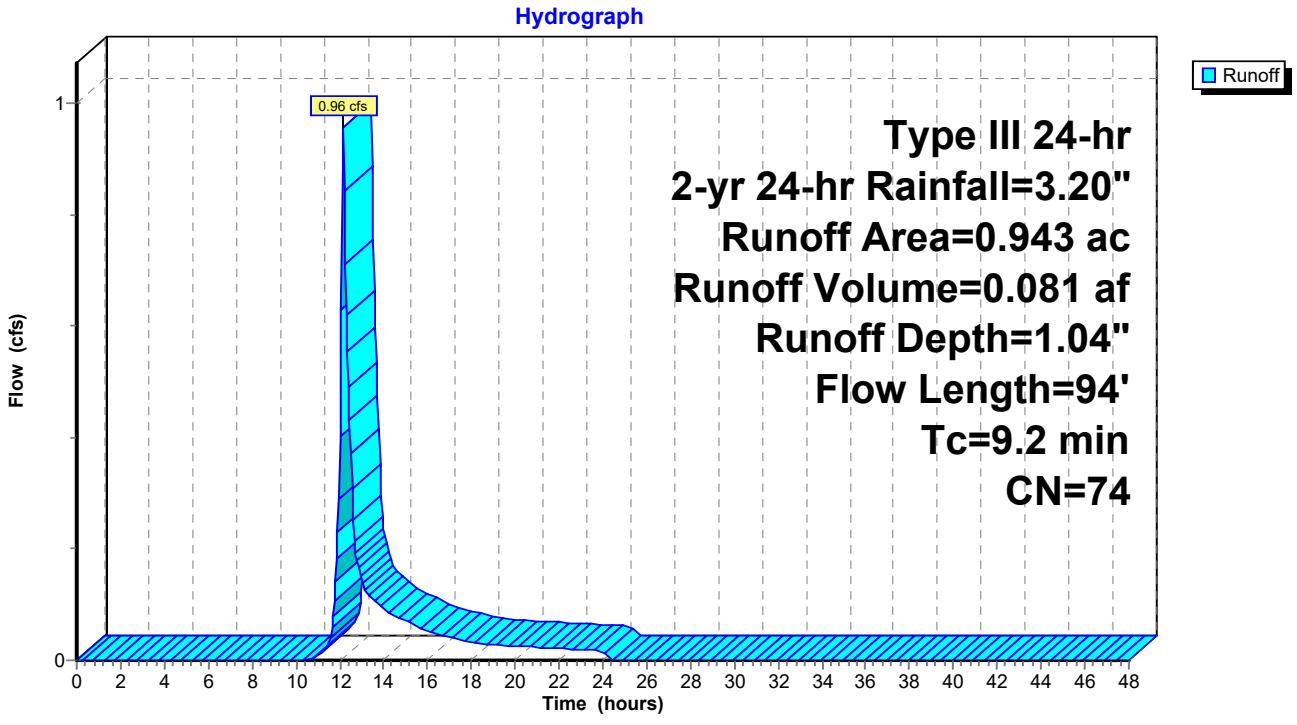
Runoff = 0.96 cfs @ 12.14 hrs, Volume= 0.081 af, Depth= 1.04"
Routed to Reach R6 : Sideslope Swale

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-yr 24-hr Rainfall=3.20"

Area (ac)	CN	Description
0.008	96	Gravel surface, HSG C
0.934	74	>75% Grass cover, Good, HSG C
0.000	79	50-75% Grass cover, Fair, HSG C
0.943	74	Weighted Average
0.943		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.2	80	0.0500	0.16		**Sheet Flow, Landfill Deck** Grass: Dense n= 0.240 P2= 3.23"
1.0	14	0.3300	0.24		**Sheet Flow, Landfill Slope** Grass: Dense n= 0.240 P2= 3.23"
9.2	94	Total			

Subcatchment N8: Subcat N8



Summary for Subcatchment N9: Subcat N9

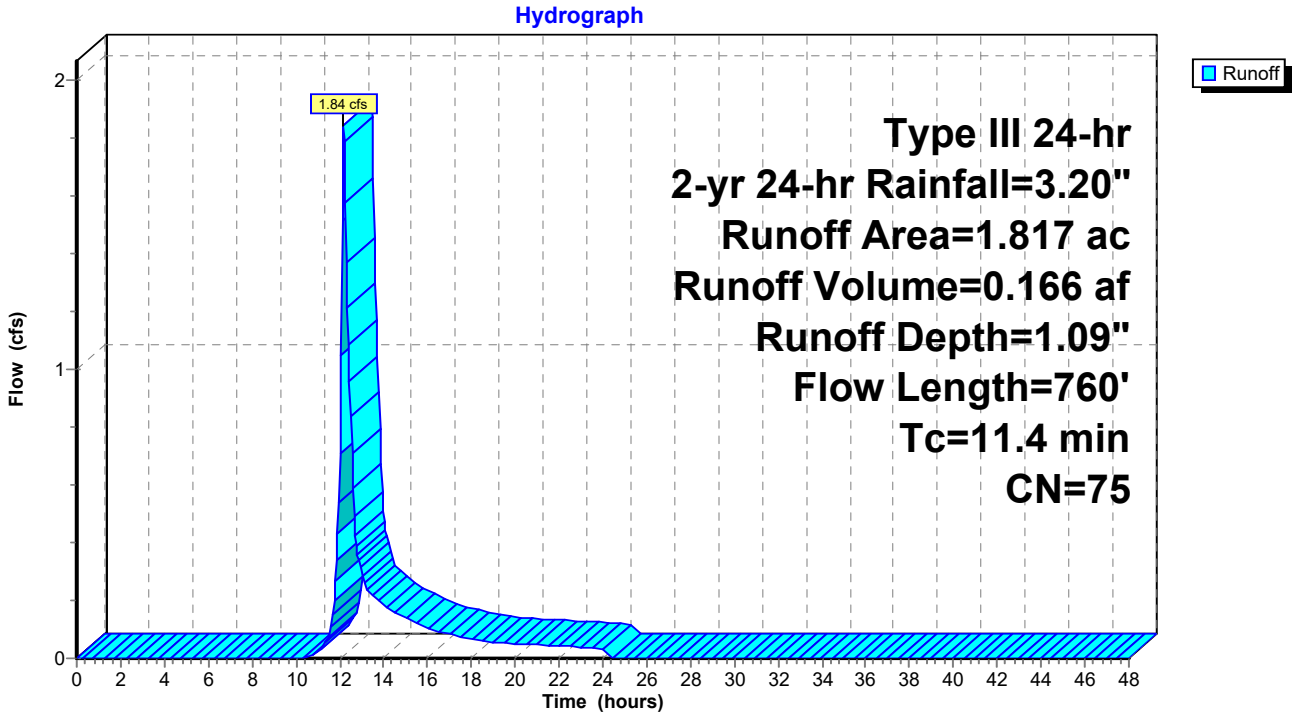
Runoff = 1.84 cfs @ 12.17 hrs, Volume= 0.166 af, Depth= 1.09"
Routed to Reach R7 : Sideslope Swale

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-yr 24-hr Rainfall=3.20"

Area (ac)	CN	Description
0.025	96	Gravel surface, HSG C
0.075	96	Gravel surface, HSG C
1.718	74	>75% Grass cover, Good, HSG C
0.000	74	>75% Grass cover, Good, HSG C
1.817	75	Weighted Average
1.817		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.2	56	0.0500	0.15		**Sheet Flow, Landfill Deck** Grass: Dense n= 0.240 P2= 3.23"
2.4	44	0.3300	0.31		**Sheet Flow, Landfill Slope** Grass: Dense n= 0.240 P2= 3.23"
0.0	10	0.3300	5.17		**Shallow Concentrated Flow, Landfill Slope** Cultivated Straight Rows Kv= 9.0 fps
2.8	650	0.0100	3.89	21.85	**Trap/Vee/Rect Channel Flow, Sideslope Swale** Bot.W=0.00' D=1.50' Z= 2.0 & 3.0 '/' Top.W=7.50' n= 0.030 Earth, grassed & winding
11.4	760	Total			

Subcatchment N9: Subcat N9



Summary for Subcatchment NP: Subcat NP

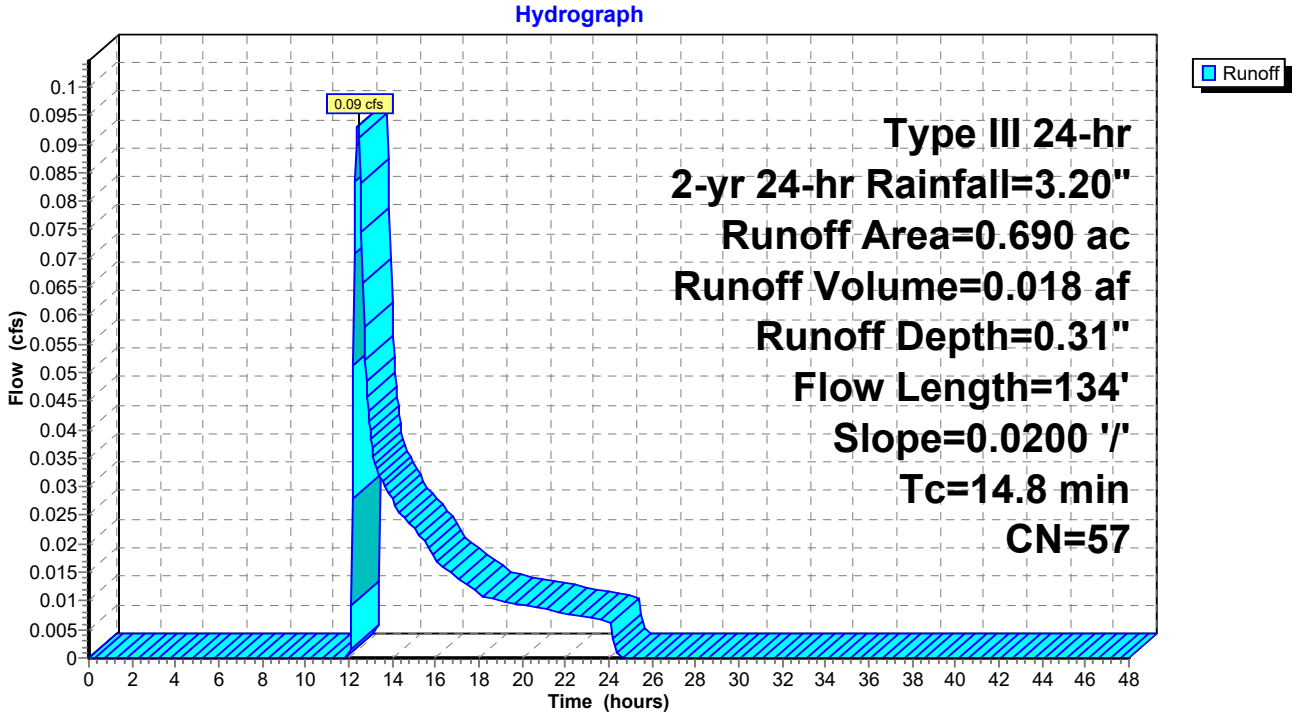
Runoff = 0.09 cfs @ 12.42 hrs, Volume= 0.018 af, Depth= 0.31"
Routed to Pond P-N1 : North Basin 1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-yr 24-hr Rainfall=3.20"

Area (ac)	CN	Description
0.056	49	50-75% Grass cover, Fair, HSG A
0.143	79	50-75% Grass cover, Fair, HSG C
0.004	79	50-75% Grass cover, Fair, HSG C
0.431	49	50-75% Grass cover, Fair, HSG A
0.056	74	>75% Grass cover, Good, HSG C
0.690	57	Weighted Average
0.690		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.2	100	0.0200	0.12		**Sheet Flow, Valley** Grass: Dense n= 0.240 P2= 3.23"
0.6	34	0.0200	0.99		**Shallow Concentrated Flow, Valley** Short Grass Pasture Kv= 7.0 fps
14.8	134	Total			

Subcatchment NP: Subcat NP



Summary for Subcatchment S1: Subcat S7

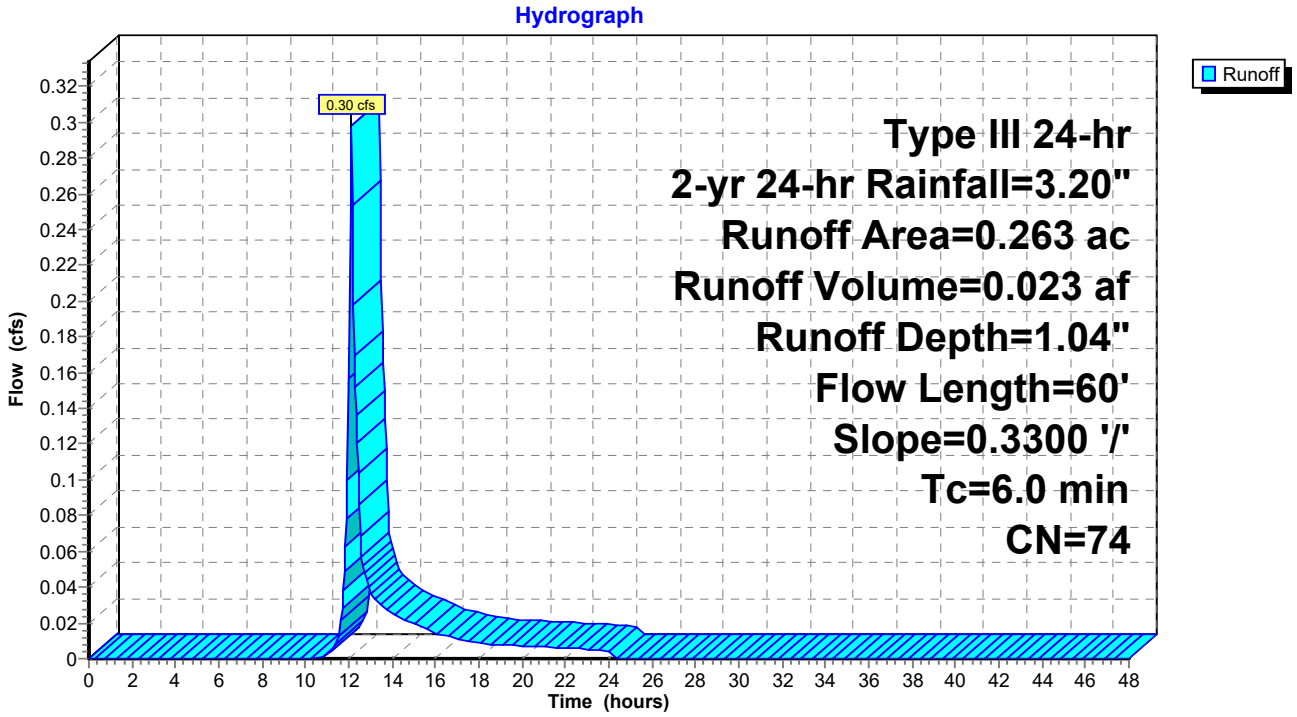
Runoff = 0.30 cfs @ 12.10 hrs, Volume= 0.023 af, Depth= 1.04"
Routed to Link S : POI-S

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-yr 24-hr Rainfall=3.20"

Area (ac)	CN	Description
0.002	79	50-75% Grass cover, Fair, HSG C
0.001	79	50-75% Grass cover, Fair, HSG C
0.163	74	>75% Grass cover, Good, HSG C
0.097	74	>75% Grass cover, Good, HSG C
0.263	74	Weighted Average
0.263		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.1	60	0.3300	0.33		**Sheet Flow, Landfill Slope** Grass: Dense n= 0.240 P2= 3.23"
3.1	60	Total, Increased to minimum Tc = 6.0 min			

Subcatchment S1: Subcat S7



Summary for Subcatchment S2: Subcat S2

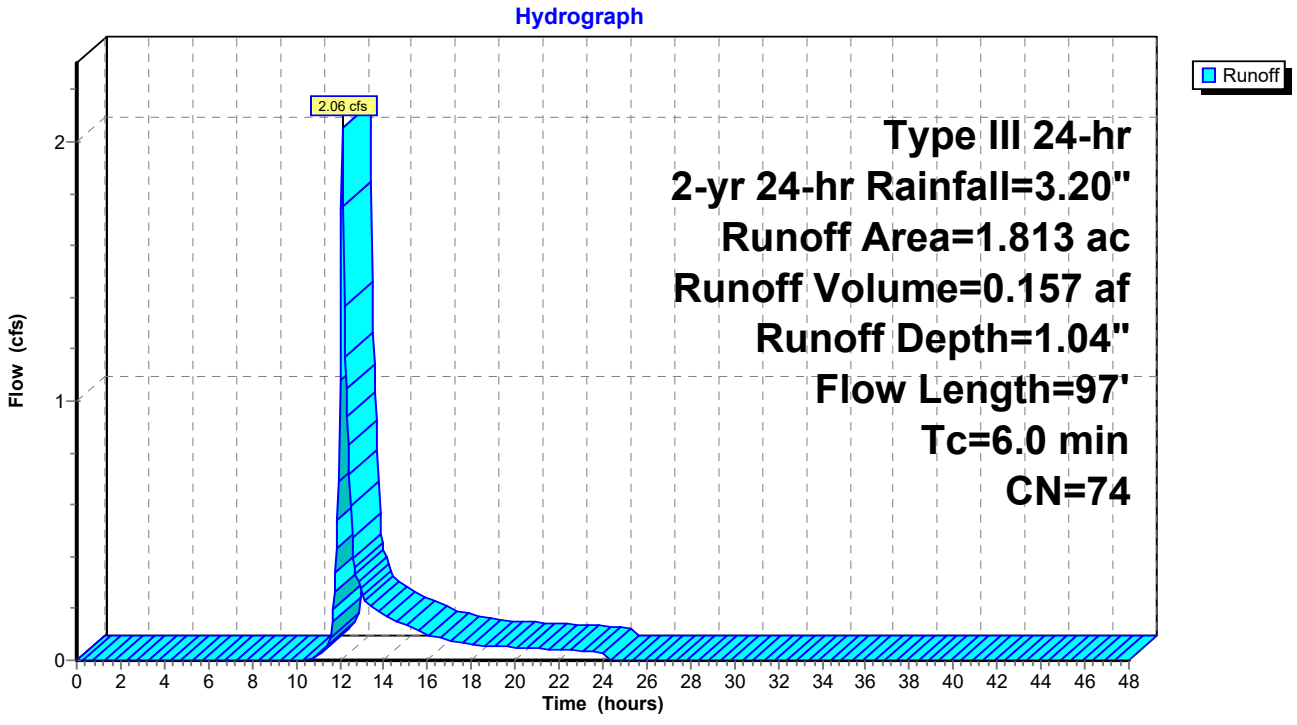
Runoff = 2.06 cfs @ 12.10 hrs, Volume= 0.157 af, Depth= 1.04"
Routed to Reach R1 : Sideslope Swale

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-yr 24-hr Rainfall=3.20"

Area (ac)	CN	Description
0.098	74	>75% Grass cover, Good, HSG C
0.039	96	Gravel surface, HSG C
1.676	74	>75% Grass cover, Good, HSG C
1.813	74	Weighted Average
1.813		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	31	0.1300	0.69		**Sheet Flow, Landfill Access Road** Fallow n= 0.050 P2= 3.23"
3.3	66	0.3300	0.33		**Sheet Flow, Landfill Slope** Grass: Dense n= 0.240 P2= 3.23"
4.1	97	Total, Increased to minimum Tc = 6.0 min			

Subcatchment S2: Subcat S2



Summary for Subcatchment S3: Subcat S3

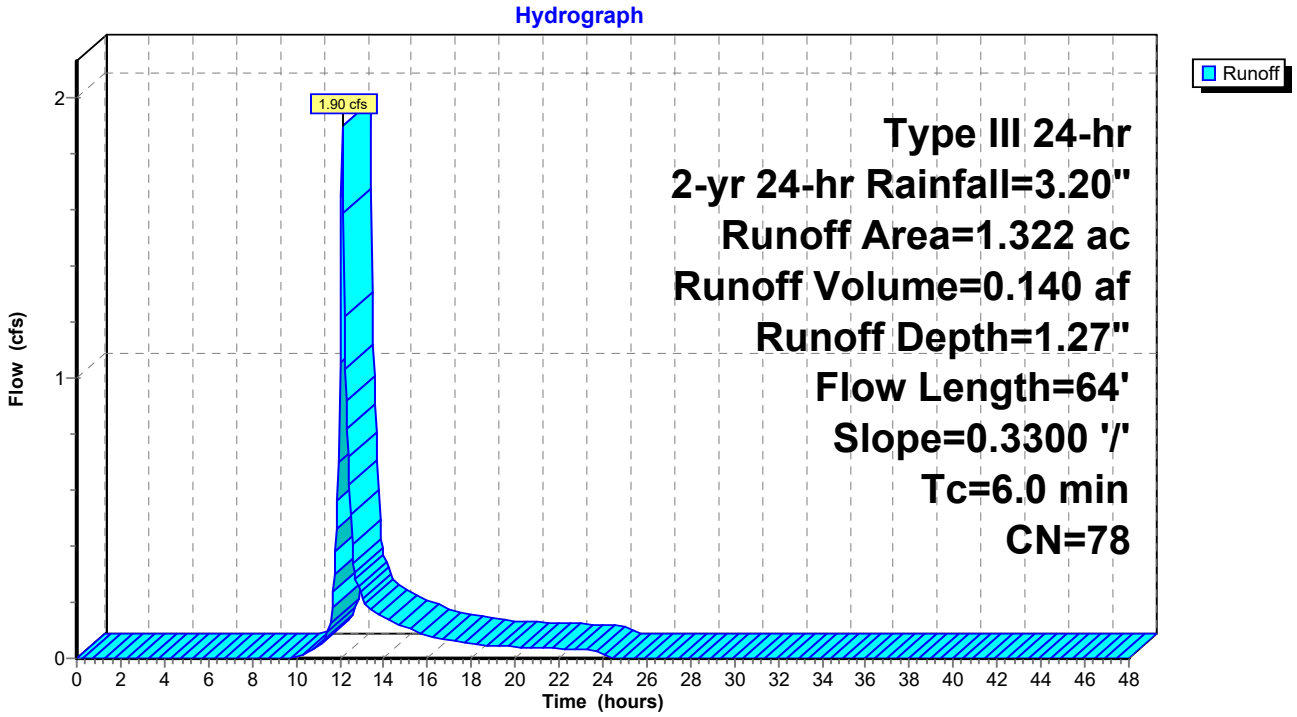
Runoff = 1.90 cfs @ 12.10 hrs, Volume= 0.140 af, Depth= 1.27"
Routed to Reach R5 : Sideslope Swale

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-yr 24-hr Rainfall=3.20"

Area (ac)	CN	Description
0.008	79	50-75% Grass cover, Fair, HSG C
0.003	79	50-75% Grass cover, Fair, HSG C
0.069	49	50-75% Grass cover, Fair, HSG A
0.164	91	Fallow, bare soil, HSG C
0.066	74	>75% Grass cover, Good, HSG C
0.016	96	Gravel surface, HSG C
0.071	96	Gravel surface, HSG C
0.025	96	Gravel surface, HSG C
0.087	96	Gravel surface, HSG C
0.001	98	Roofs, HSG C
0.033	74	>75% Grass cover, Good, HSG C
0.779	74	>75% Grass cover, Good, HSG C
1.322	78	Weighted Average
1.321		99.89% Pervious Area
0.001		0.11% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.2	64	0.3300	0.33		**Sheet Flow, Landfill Slope** Grass: Dense n= 0.240 P2= 3.23"
3.2	64	Total, Increased to minimum Tc = 6.0 min			

Subcatchment S3: Subcat S3



Summary for Subcatchment S4: Subcat S4

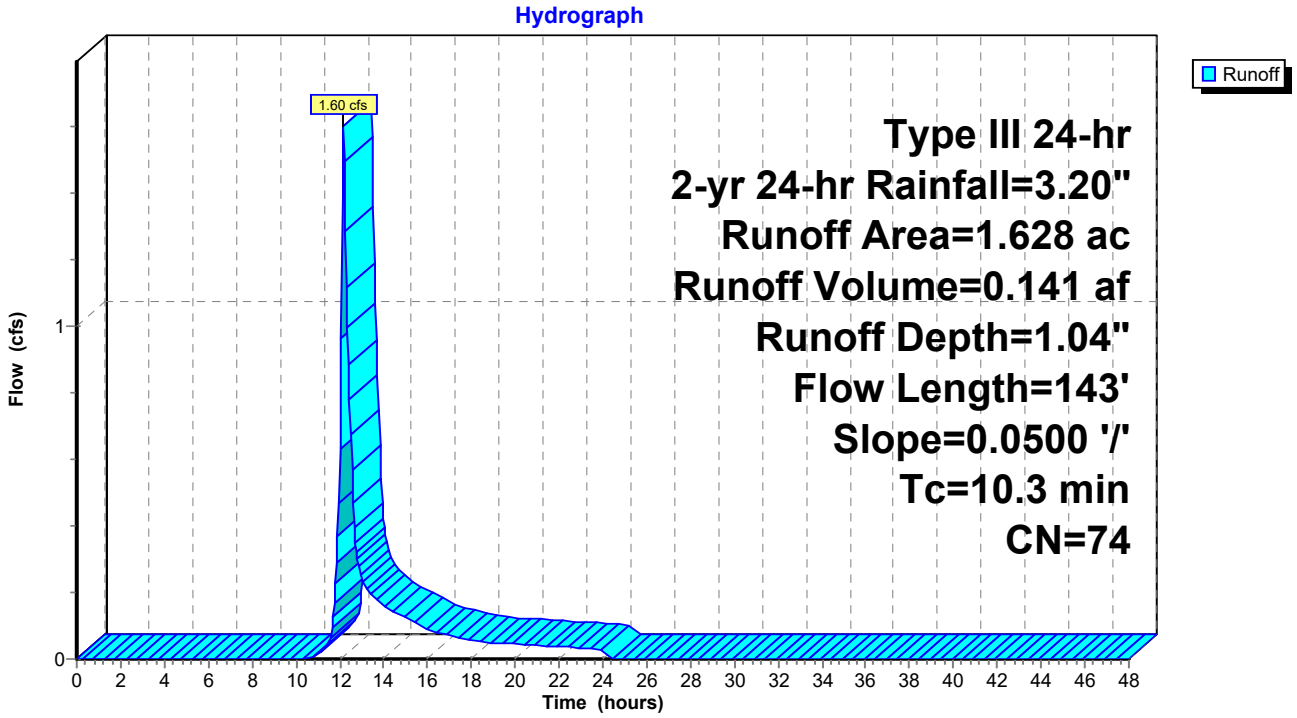
Runoff = 1.60 cfs @ 12.16 hrs, Volume= 0.141 af, Depth= 1.04"
Routed to Reach DC-S : RipRap Downchute

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-yr 24-hr Rainfall=3.20"

Area (ac)	CN	Description
1.628	74	>75% Grass cover, Good, HSG C
1.628		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.8	100	0.0500	0.17		**Sheet Flow, Landfill Deck** Grass: Dense n= 0.240 P2= 3.23"
0.5	43	0.0500	1.57		**Shallow Concentrated Flow, Landfill Deck** Short Grass Pasture Kv= 7.0 fps
10.3	143	Total			

Subcatchment S4: Subcat S4



Summary for Subcatchment S5: Subcat S5

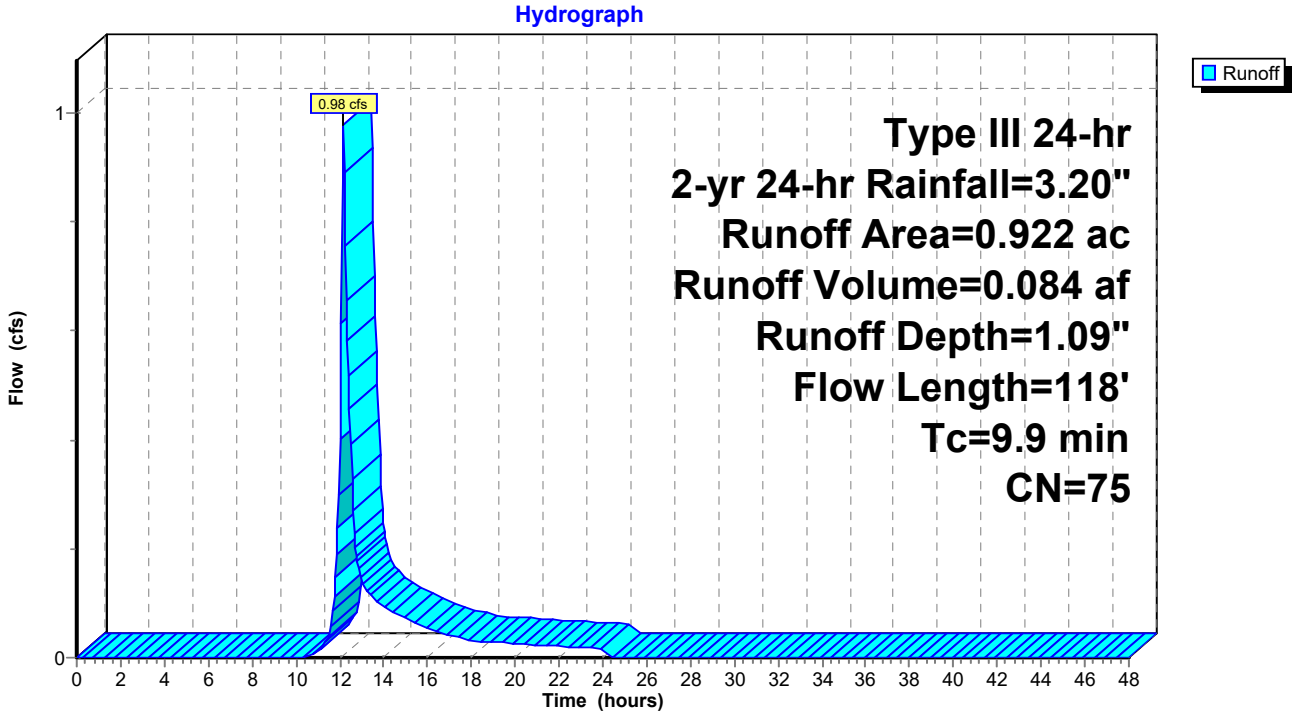
Runoff = 0.98 cfs @ 12.15 hrs, Volume= 0.084 af, Depth= 1.09"
Routed to Reach R4 : Sideslope Swale

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-yr 24-hr Rainfall=3.20"

Area (ac)	CN	Description
0.045	96	Gravel surface, HSG C
0.877	74	>75% Grass cover, Good, HSG C
0.922	75	Weighted Average
0.922		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.8	100	0.0500	0.17		**Sheet Flow, Landfill Deck** Grass: Dense n= 0.240 P2= 3.23"
0.1	12	0.0500	1.57		**Shallow Concentrated Flow, Landfill Deck** Short Grass Pasture Kv= 7.0 fps
0.0	6	0.3300	4.02		**Shallow Concentrated Flow, Landfill Slope** Short Grass Pasture Kv= 7.0 fps
9.9	118	Total			

Subcatchment S5: Subcat S5



Summary for Subcatchment S6: Subcat S6

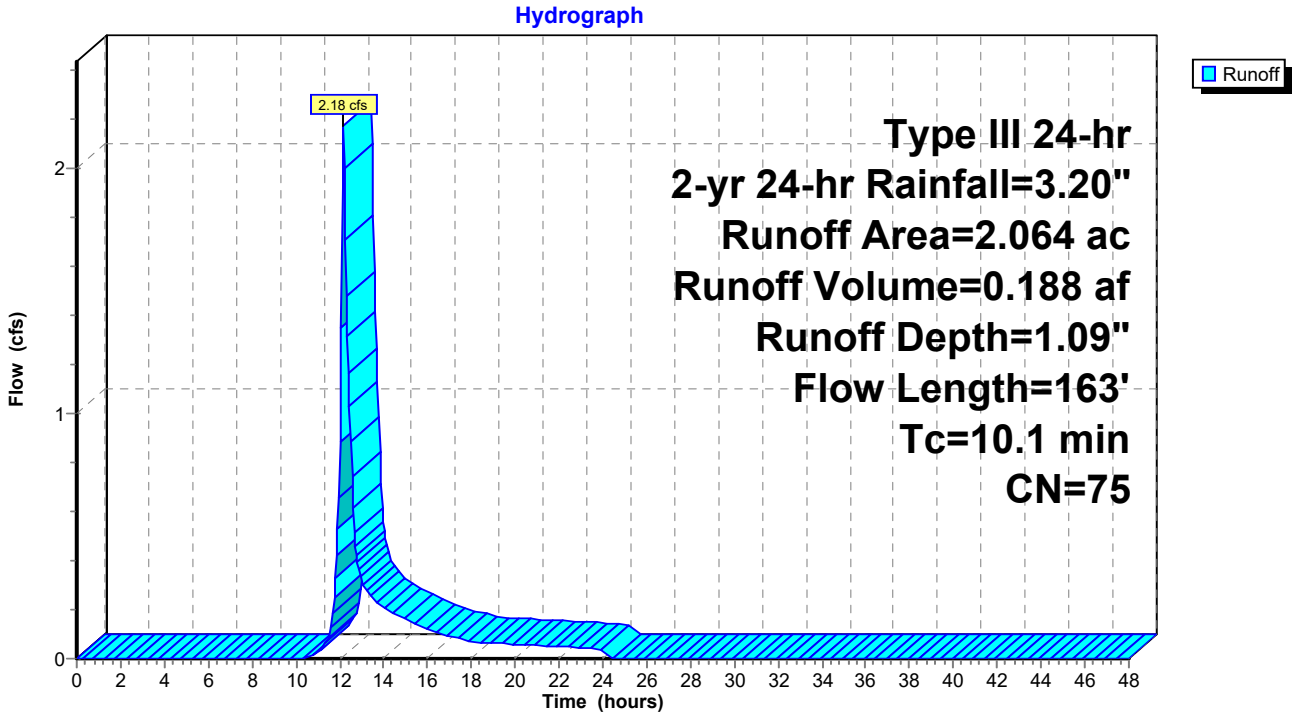
Runoff = 2.18 cfs @ 12.15 hrs, Volume= 0.188 af, Depth= 1.09"
Routed to Reach R2 : Sideslope Swale

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-yr 24-hr Rainfall=3.20"

Area (ac)	CN	Description
1.998	74	>75% Grass cover, Good, HSG C
0.066	96	Gravel surface, HSG C
2.064	75	Weighted Average
2.064		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.8	100	0.0500	0.17		**Sheet Flow, Landfill Deck** Grass: Dense n= 0.240 P2= 3.23"
0.3	63	0.3300	4.02		**Shallow Concentrated Flow, Landfill Slope** Short Grass Pasture Kv= 7.0 fps
10.1	163	Total			

Subcatchment S6: Subcat S6



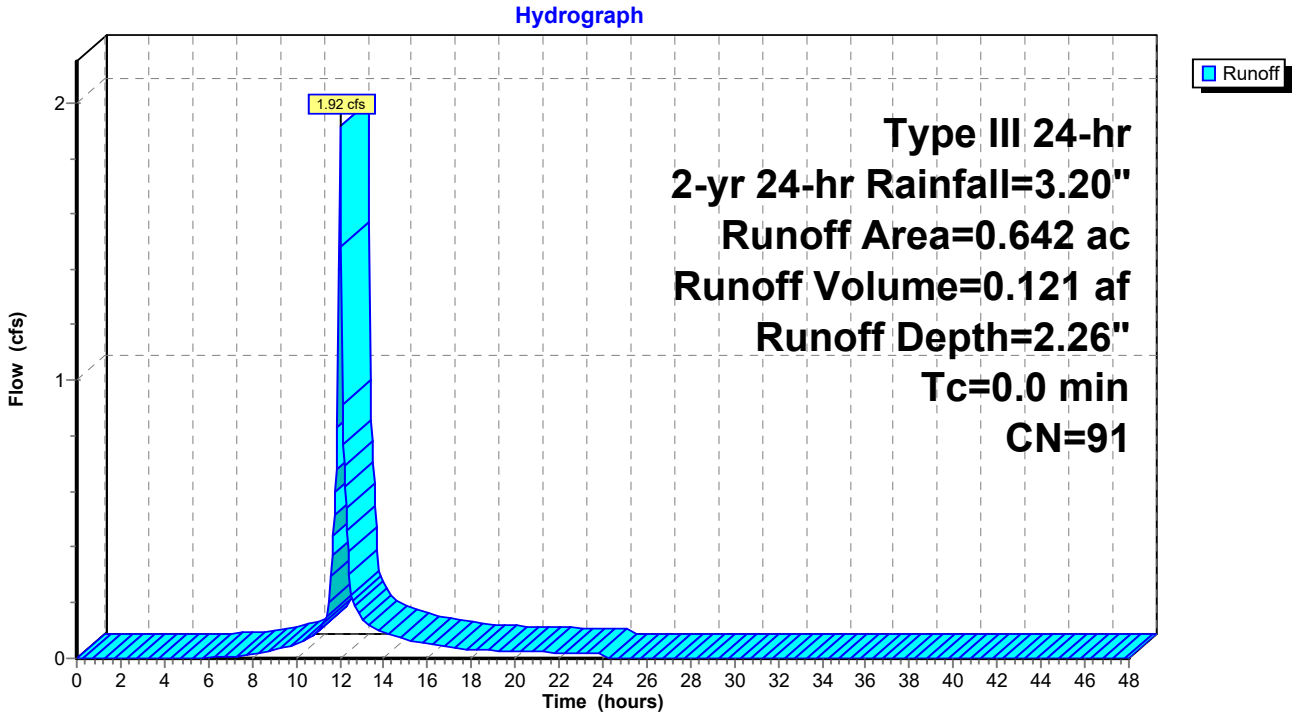
Summary for Subcatchment SP: Subcat SP

Runoff = 1.92 cfs @ 12.00 hrs, Volume= 0.121 af, Depth= 2.26"
Routed to Pond PND-S : South Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-yr 24-hr Rainfall=3.20"

Area (ac)	CN	Description
0.008	74	>75% Grass cover, Good, HSG C
0.635	91	Fallow, bare soil, HSG C
0.642	91	Weighted Average
0.642		100.00% Pervious Area

Subcatchment SP: Subcat SP



Summary for Reach DC-N: RipRap Downchute

Inflow Area = 3.841 ac, 0.00% Impervious, Inflow Depth = 1.04" for 2-yr 24-hr event
Inflow = 3.52 cfs @ 12.23 hrs, Volume= 0.332 af
Outflow = 3.49 cfs @ 12.25 hrs, Volume= 0.332 af, Atten= 1%, Lag= 1.0 min
Routed to Pond P-N2 : North Basin 2

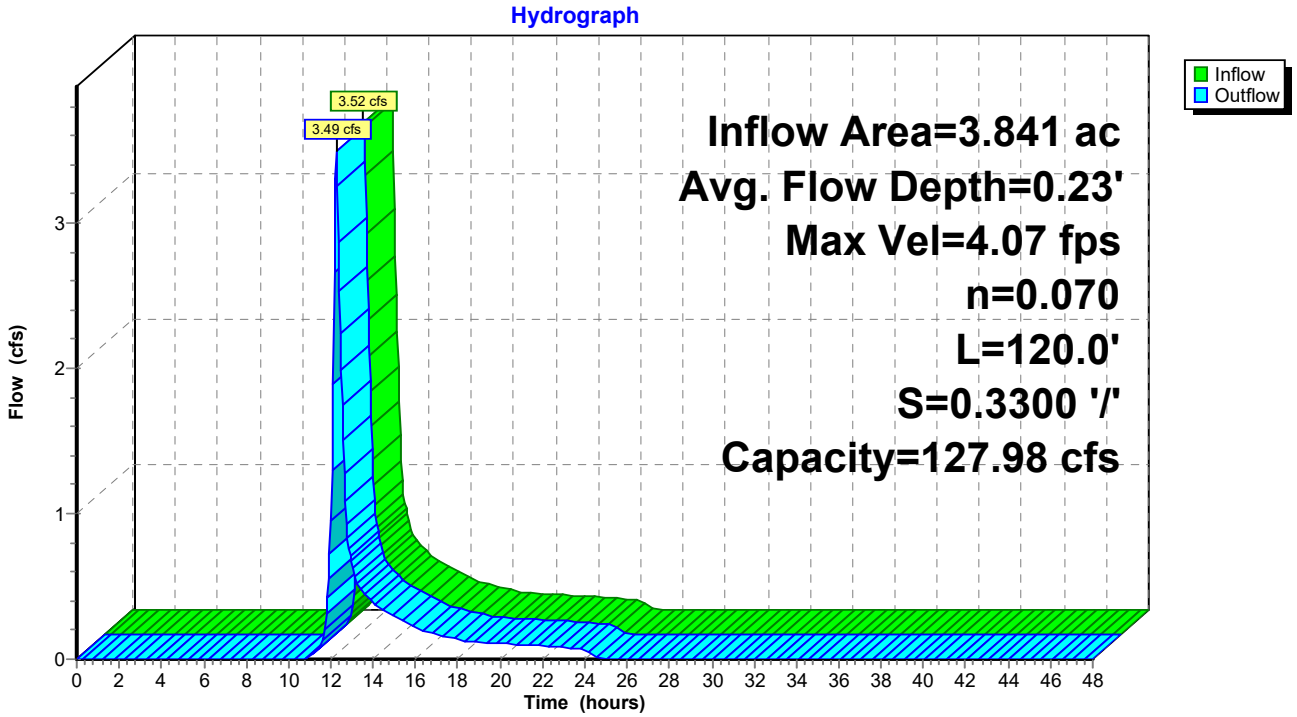
Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 4.07 fps, Min. Travel Time= 0.5 min
Avg. Velocity = 1.39 fps, Avg. Travel Time= 1.4 min

Peak Storage= 104 cf @ 12.24 hrs
Average Depth at Peak Storage= 0.23' , Surface Width= 4.40'
Bank-Full Depth= 1.50' Flow Area= 11.3 sf, Capacity= 127.98 cfs

3.00' x 1.50' deep channel, n= 0.070
Side Slope Z-value= 3.0 '/' Top Width= 12.00'
Length= 120.0' Slope= 0.3300 '/'
Inlet Invert= 919.60', Outlet Invert= 880.00'

‡

Reach DC-N: RipRap Downchute



Summary for Reach DC-S: RipRap Downchute

Inflow Area = 1.628 ac, 0.00% Impervious, Inflow Depth = 1.04" for 2-yr 24-hr event
Inflow = 1.60 cfs @ 12.16 hrs, Volume= 0.141 af
Outflow = 1.58 cfs @ 12.17 hrs, Volume= 0.141 af, Atten= 2%, Lag= 0.9 min
Routed to Reach PRA : Perimeter Swale

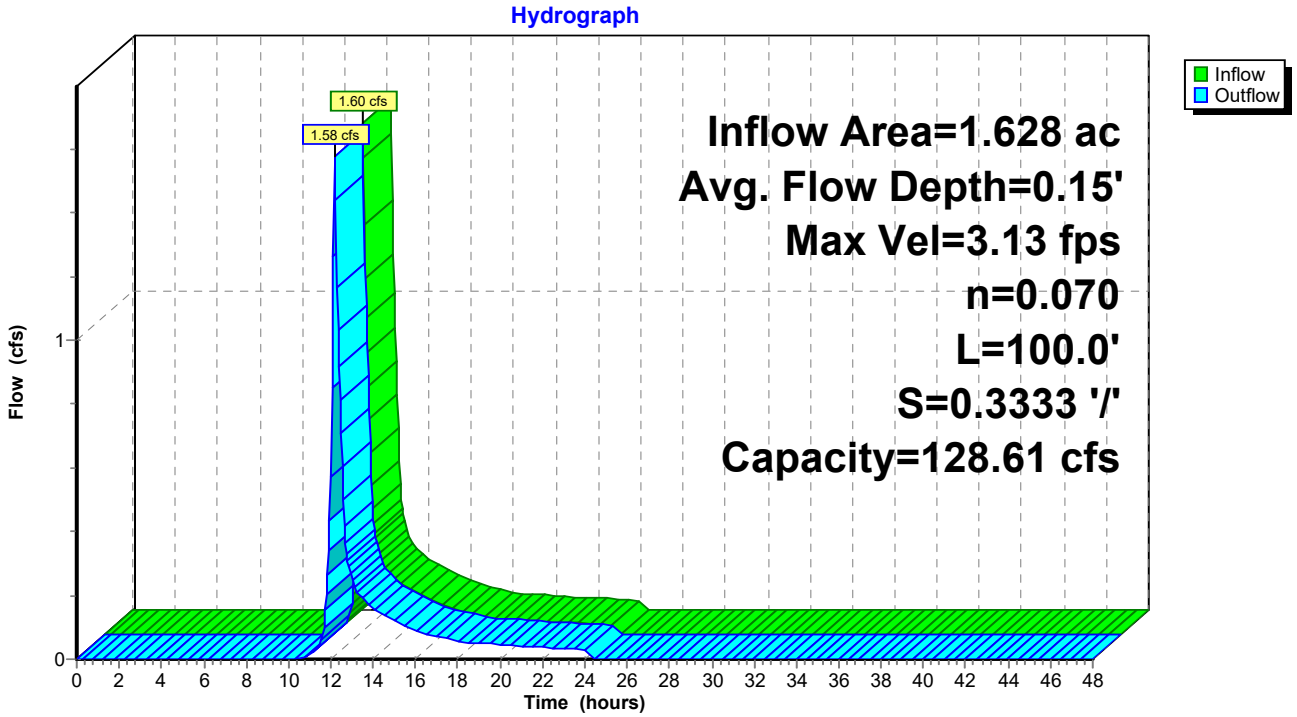
Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.13 fps, Min. Travel Time= 0.5 min
Avg. Velocity = 1.07 fps, Avg. Travel Time= 1.6 min

Peak Storage= 51 cf @ 12.16 hrs
Average Depth at Peak Storage= 0.15' , Surface Width= 3.89'
Bank-Full Depth= 1.50' Flow Area= 11.3 sf, Capacity= 128.61 cfs

3.00' x 1.50' deep channel, n= 0.070
Side Slope Z-value= 3.0 '/' Top Width= 12.00'
Length= 100.0' Slope= 0.3333 '/'
Inlet Invert= 915.33', Outlet Invert= 882.00'

‡

Reach DC-S: RipRap Downchute



Summary for Reach PRA: Perimeter Swale

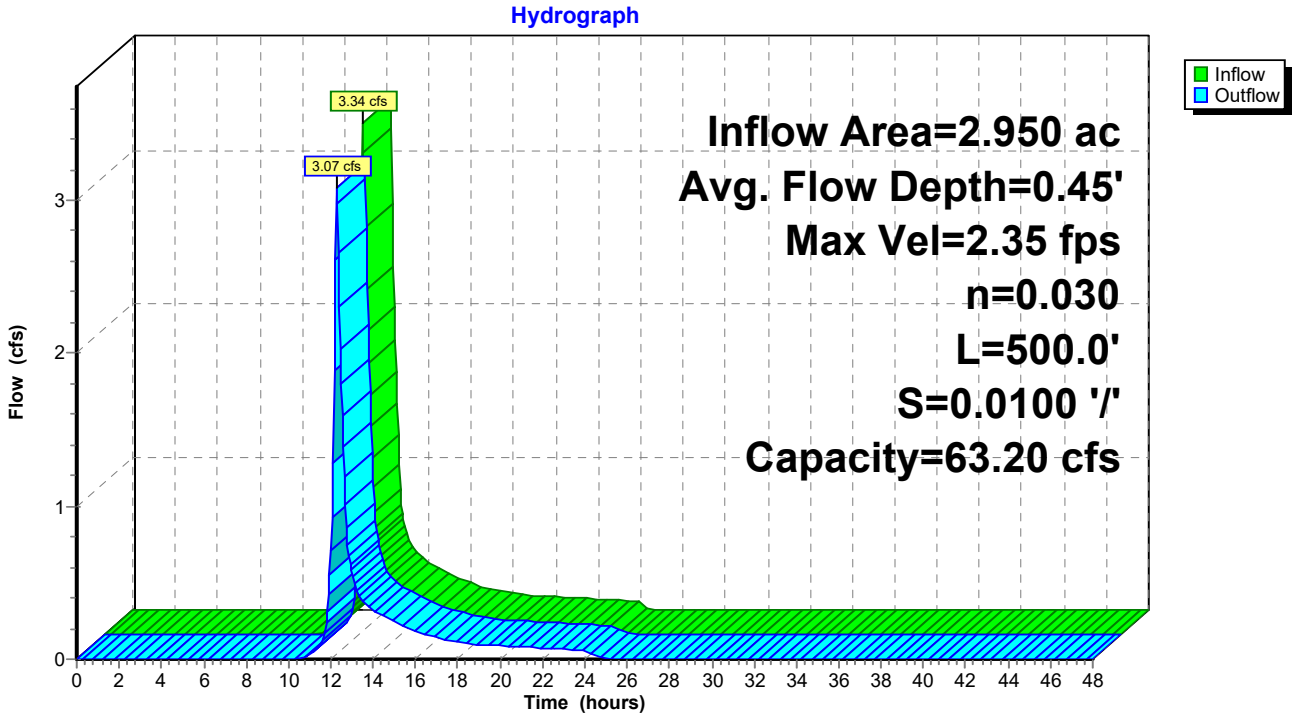
Inflow Area = 2.950 ac, 0.05% Impervious, Inflow Depth = 1.14" for 2-yr 24-hr event
Inflow = 3.34 cfs @ 12.16 hrs, Volume= 0.281 af
Outflow = 3.07 cfs @ 12.27 hrs, Volume= 0.281 af, Atten= 8%, Lag= 6.3 min
Routed to Pond C-1 : 30" Culvert

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.35 fps, Min. Travel Time= 3.5 min
Avg. Velocity = 0.79 fps, Avg. Travel Time= 10.6 min

Peak Storage= 661 cf @ 12.21 hrs
Average Depth at Peak Storage= 0.45' , Surface Width= 3.82'
Bank-Full Depth= 2.00' Flow Area= 12.0 sf, Capacity= 63.20 cfs

2.00' x 2.00' deep channel, n= 0.030 Earth, grassed & winding
Side Slope Z-value= 2.0 '/' Top Width= 10.00'
Length= 500.0' Slope= 0.0100 '/'
Inlet Invert= 882.00', Outlet Invert= 877.00'

Reach PRA: Perimeter Swale



Summary for Reach PRB: Perimeter Swale

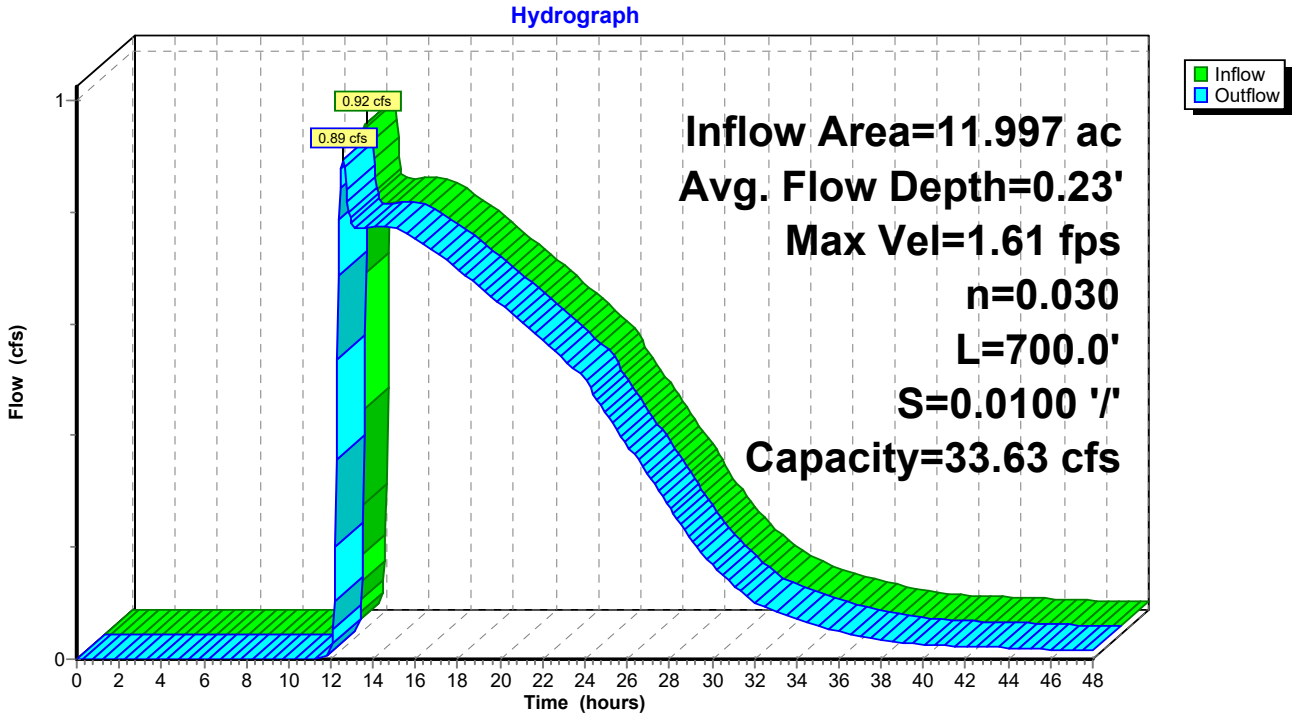
Inflow Area = 11.997 ac, 0.00% Impervious, Inflow Depth > 0.90" for 2-yr 24-hr event
Inflow = 0.92 cfs @ 12.34 hrs, Volume= 0.897 af
Outflow = 0.89 cfs @ 12.58 hrs, Volume= 0.896 af, Atten= 2%, Lag= 14.3 min
Routed to Pond C-2 : 30" Culvert

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 1.61 fps, Min. Travel Time= 7.3 min
Avg. Velocity = 0.91 fps, Avg. Travel Time= 12.8 min

Peak Storage= 390 cf @ 12.46 hrs
Average Depth at Peak Storage= 0.23' , Surface Width= 2.91'
Bank-Full Depth= 1.50' Flow Area= 7.5 sf, Capacity= 33.63 cfs

2.00' x 1.50' deep channel, n= 0.030 Earth, grassed & winding
Side Slope Z-value= 2.0 '/' Top Width= 8.00'
Length= 700.0' Slope= 0.0100 '/'
Inlet Invert= 872.00', Outlet Invert= 865.00'

Reach PRB: Perimeter Swale



Summary for Reach PRC: Swale

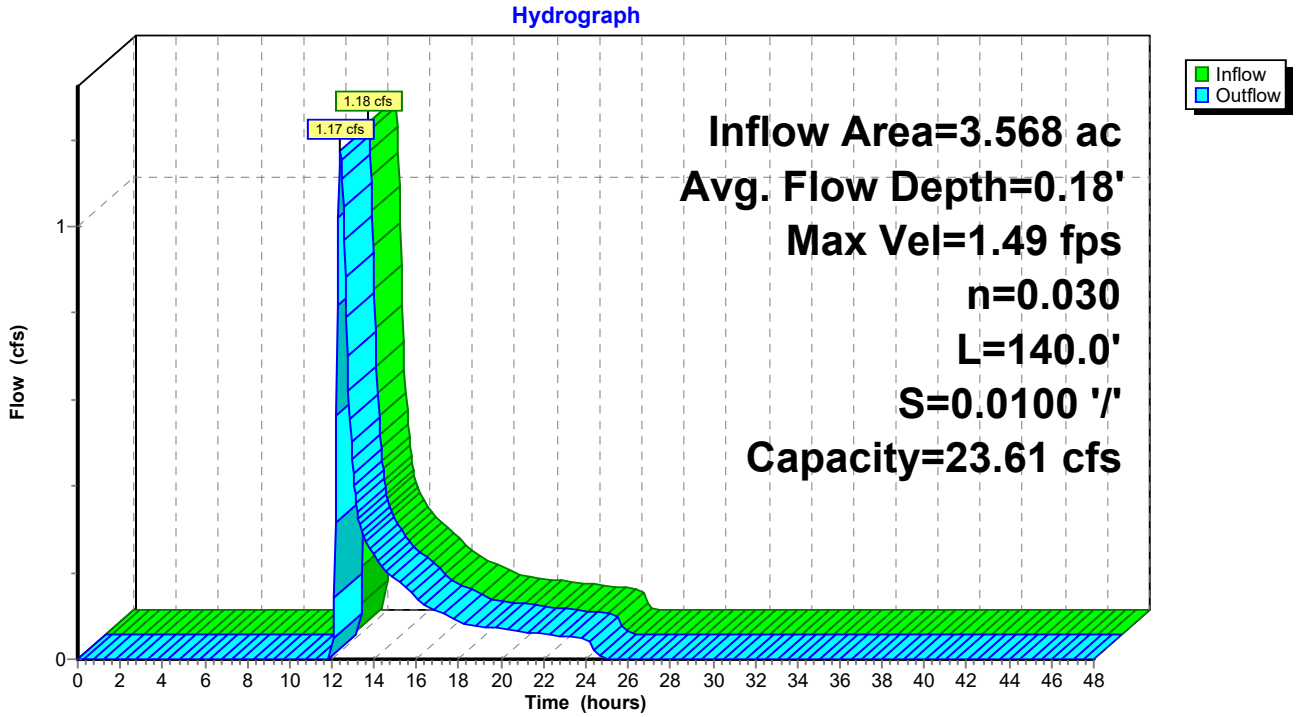
Inflow Area = 3.568 ac, 0.00% Impervious, Inflow Depth = 0.56" for 2-yr 24-hr event
Inflow = 1.18 cfs @ 12.36 hrs, Volume= 0.166 af
Outflow = 1.17 cfs @ 12.41 hrs, Volume= 0.166 af, Atten= 1%, Lag= 2.9 min
Routed to Pond C-3 : 24" Culvert

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 1.49 fps, Min. Travel Time= 1.6 min
Avg. Velocity = 0.60 fps, Avg. Travel Time= 3.9 min

Peak Storage= 111 cf @ 12.38 hrs
Average Depth at Peak Storage= 0.18' , Surface Width= 4.73'
Bank-Full Depth= 1.00' Flow Area= 6.0 sf, Capacity= 23.61 cfs

4.00' x 1.00' deep channel, n= 0.030 Earth, grassed & winding
Side Slope Z-value= 2.0 '/' Top Width= 8.00'
Length= 140.0' Slope= 0.0100 '/'
Inlet Invert= 879.00', Outlet Invert= 877.60'

‡



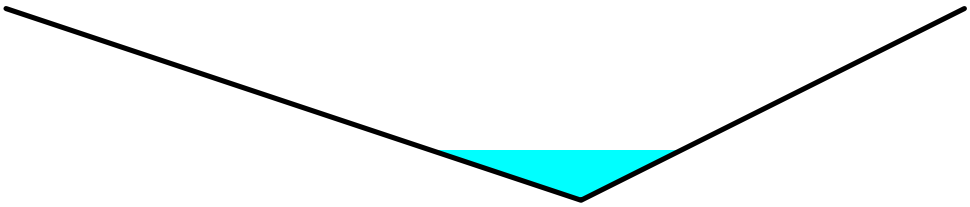
Summary for Reach R1: Sideslope Swale

Inflow Area = 1.813 ac, 0.00% Impervious, Inflow Depth = 1.04" for 2-yr 24-hr event
Inflow = 2.06 cfs @ 12.10 hrs, Volume= 0.157 af
Outflow = 1.33 cfs @ 12.42 hrs, Volume= 0.157 af, Atten= 35%, Lag= 18.9 min
Routed to Pond PND-S : South Basin

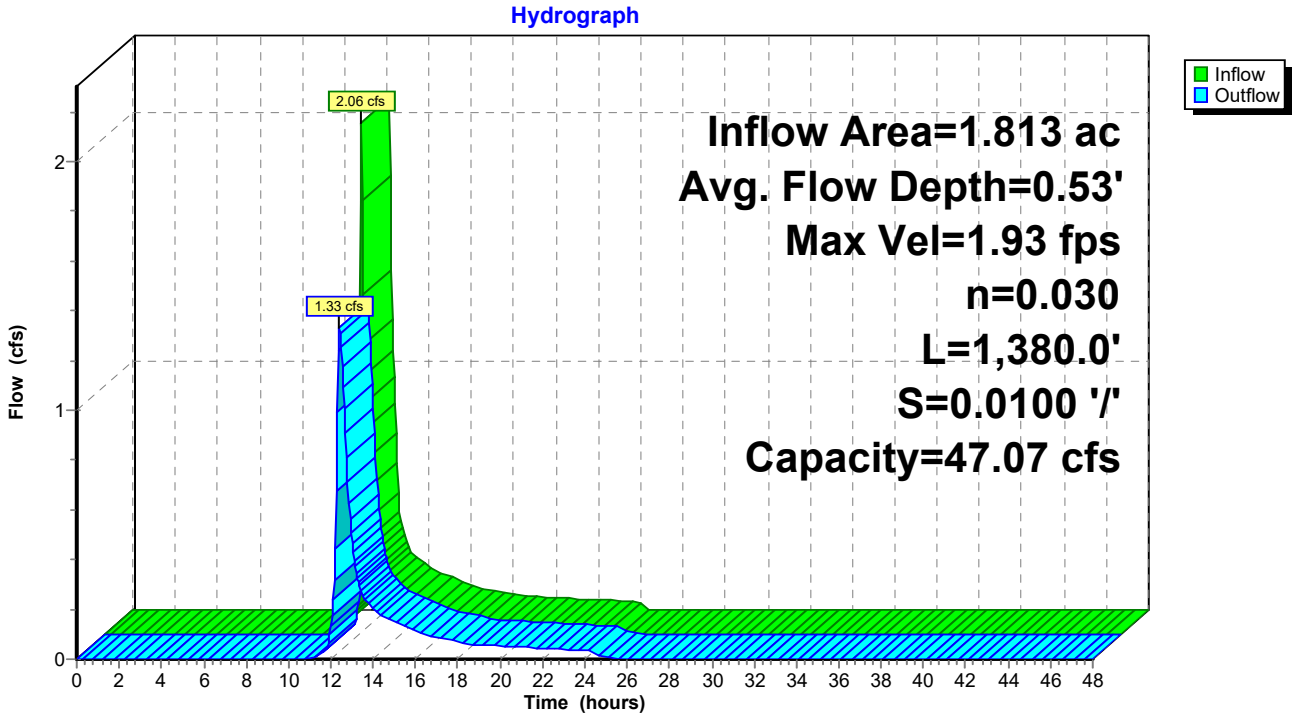
Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 1.93 fps, Min. Travel Time= 11.9 min
Avg. Velocity = 0.73 fps, Avg. Travel Time= 31.4 min

Peak Storage= 954 cf @ 12.22 hrs
Average Depth at Peak Storage= 0.53' , Surface Width= 2.63'
Bank-Full Depth= 2.00' Flow Area= 10.0 sf, Capacity= 47.07 cfs

0.00' x 2.00' deep channel, n= 0.030 Earth, grassed & winding
Side Slope Z-value= 3.0 2.0 '/' Top Width= 10.00'
Length= 1,380.0' Slope= 0.0100 '/'
Inlet Invert= 879.80', Outlet Invert= 866.00'



Reach R1: Sideslope Swale



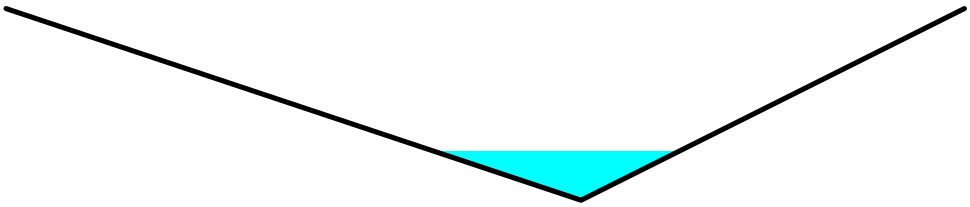
Summary for Reach R2: Sideslope Swale

Inflow Area = 2.064 ac, 0.00% Impervious, Inflow Depth = 1.09" for 2-yr 24-hr event
Inflow = 2.18 cfs @ 12.15 hrs, Volume= 0.188 af
Outflow = 1.78 cfs @ 12.36 hrs, Volume= 0.188 af, Atten= 18%, Lag= 12.5 min
Routed to Pond PND-S : South Basin

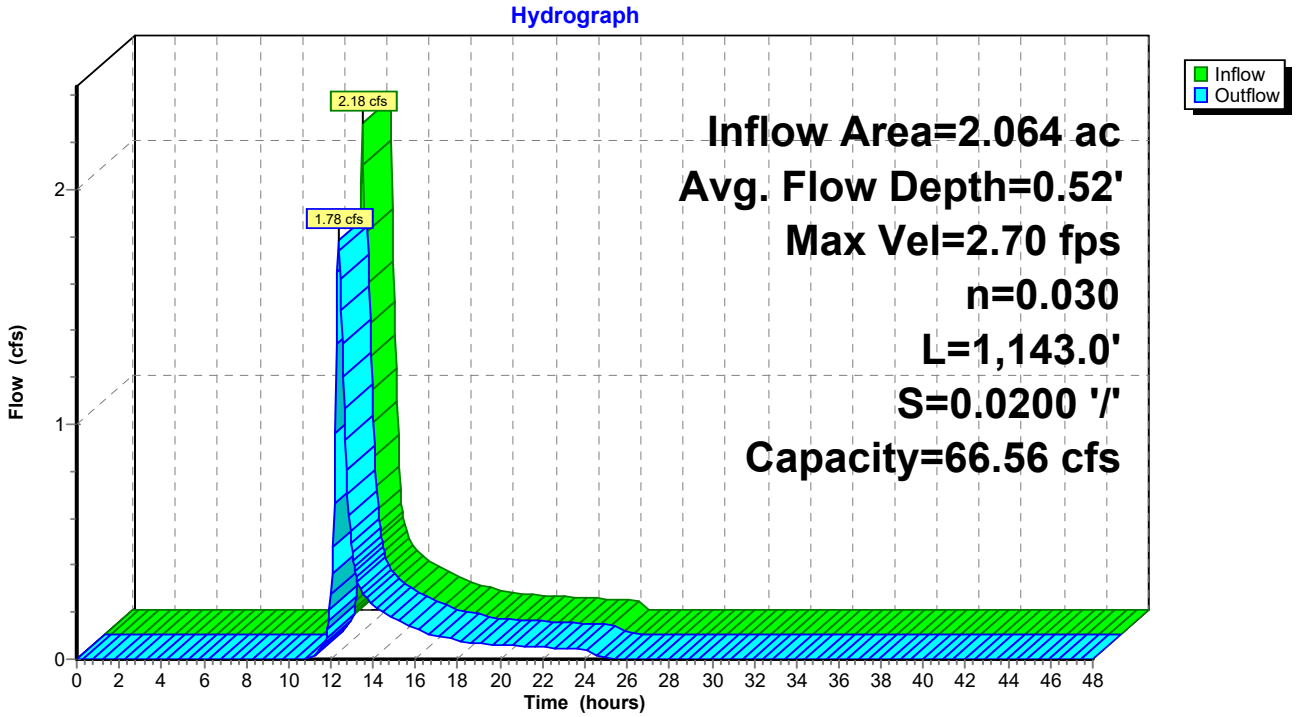
Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.70 fps, Min. Travel Time= 7.1 min
Avg. Velocity = 1.10 fps, Avg. Travel Time= 17.4 min

Peak Storage= 760 cf @ 12.24 hrs
Average Depth at Peak Storage= 0.52' , Surface Width= 2.58'
Bank-Full Depth= 2.00' Flow Area= 10.0 sf, Capacity= 66.56 cfs

0.00' x 2.00' deep channel, n= 0.030 Earth, grassed & winding
Side Slope Z-value= 3.0 2.0 '/' Top Width= 10.00'
Length= 1,143.0' Slope= 0.0200 '/'
Inlet Invert= 902.86', Outlet Invert= 880.00'



Reach R2: Sideslope Swale



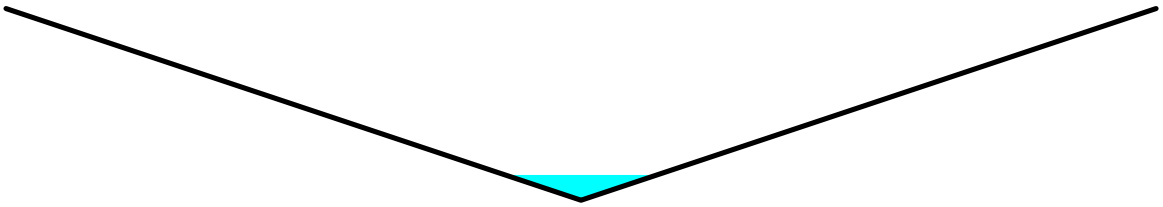
Summary for Reach R3: Sideslope Swale

Inflow Area = 0.922 ac, 0.00% Impervious, Inflow Depth = 1.09" for 2-yr 24-hr event
Inflow = 0.92 cfs @ 12.23 hrs, Volume= 0.084 af
Outflow = 0.91 cfs @ 12.27 hrs, Volume= 0.084 af, Atten= 2%, Lag= 2.2 min
Routed to Pond PND-S : South Basin

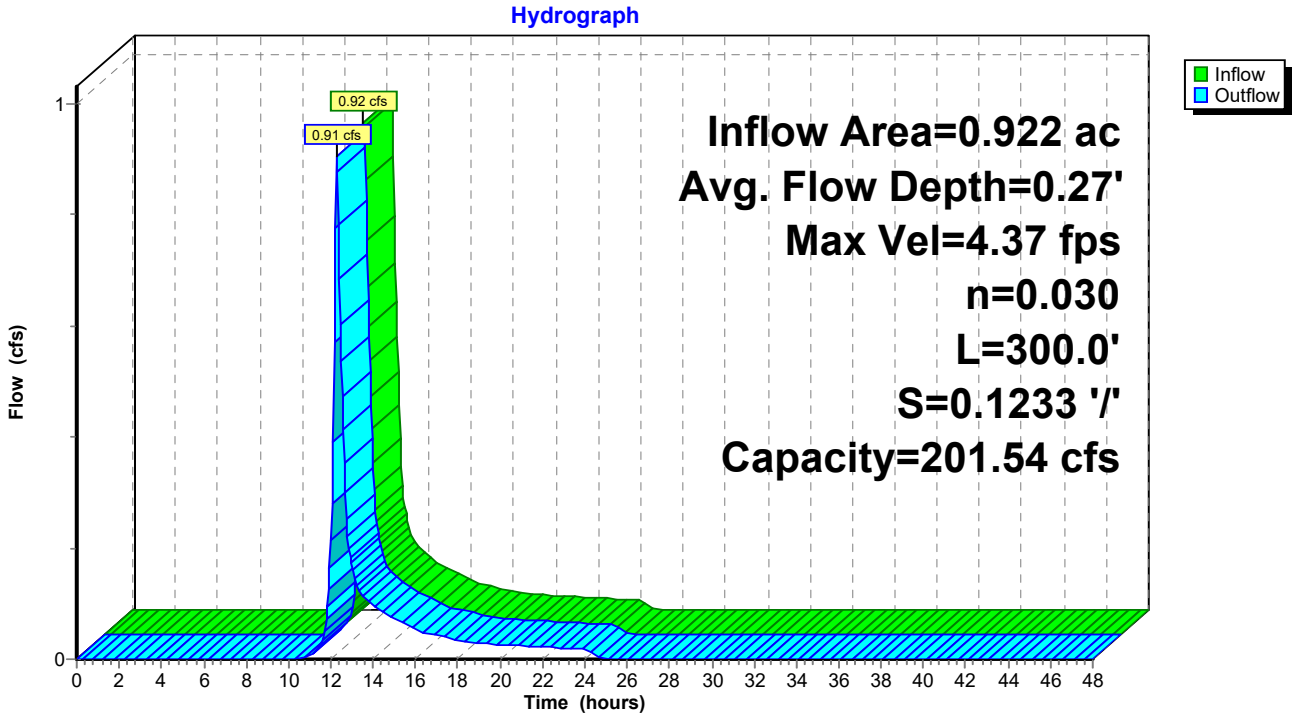
Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 4.37 fps, Min. Travel Time= 1.1 min
Avg. Velocity = 1.99 fps, Avg. Travel Time= 2.5 min

Peak Storage= 63 cf @ 12.25 hrs
Average Depth at Peak Storage= 0.27' , Surface Width= 1.59'
Bank-Full Depth= 2.00' Flow Area= 12.0 sf, Capacity= 201.54 cfs

0.00' x 2.00' deep channel, n= 0.030 Earth, grassed & winding
Side Slope Z-value= 3.0 '/' Top Width= 12.00'
Length= 300.0' Slope= 0.1233 '/'
Inlet Invert= 913.00', Outlet Invert= 876.00'



Reach R3: Sideslope Swale



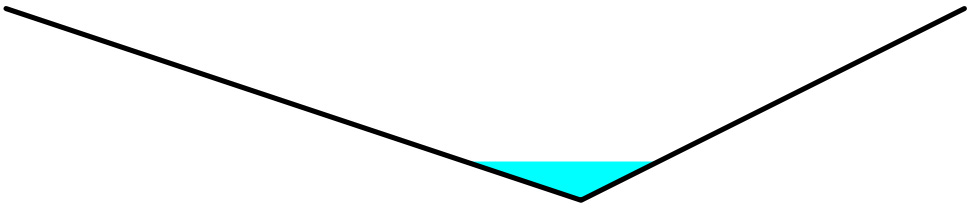
Summary for Reach R4: Sideslope Swale

Inflow Area = 0.922 ac, 0.00% Impervious, Inflow Depth = 1.09" for 2-yr 24-hr event
Inflow = 0.98 cfs @ 12.15 hrs, Volume= 0.084 af
Outflow = 0.92 cfs @ 12.23 hrs, Volume= 0.084 af, Atten= 6%, Lag= 4.8 min
Routed to Reach R3 : Sideslope Swale

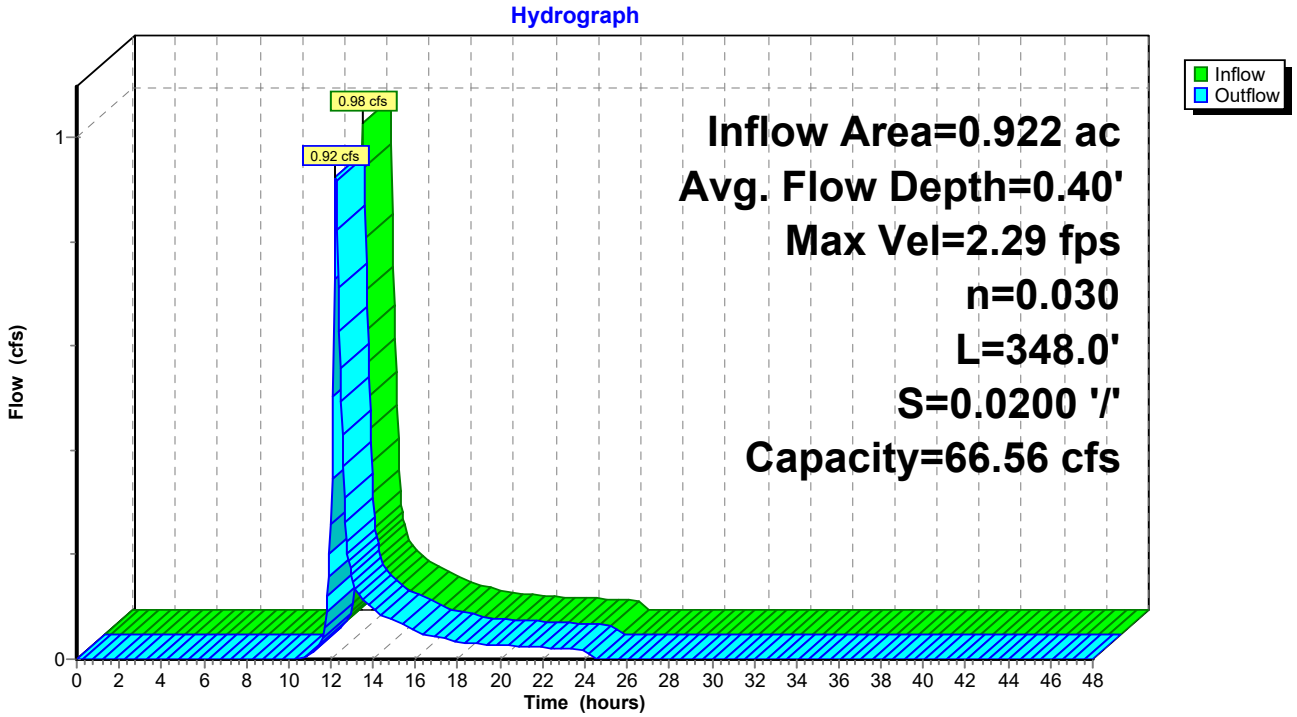
Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.29 fps, Min. Travel Time= 2.5 min
Avg. Velocity = 1.02 fps, Avg. Travel Time= 5.7 min

Peak Storage= 142 cf @ 12.19 hrs
Average Depth at Peak Storage= 0.40' , Surface Width= 2.02'
Bank-Full Depth= 2.00' Flow Area= 10.0 sf, Capacity= 66.56 cfs

0.00' x 2.00' deep channel, n= 0.030 Earth, grassed & winding
Side Slope Z-value= 3.0 2.0 '/' Top Width= 10.00'
Length= 348.0' Slope= 0.0200 '/'
Inlet Invert= 920.00', Outlet Invert= 913.04'



Reach R4: Sideslope Swale



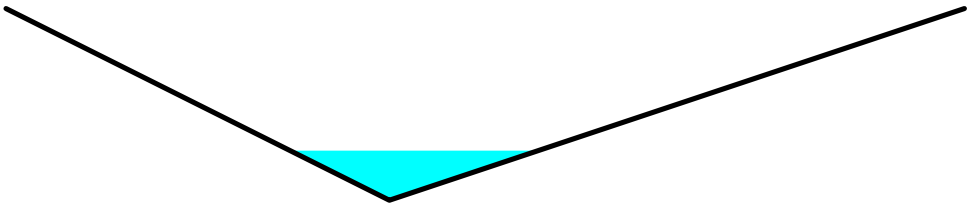
Summary for Reach R5: Sideslope Swale

Inflow Area = 1.322 ac, 0.11% Impervious, Inflow Depth = 1.27" for 2-yr 24-hr event
Inflow = 1.90 cfs @ 12.10 hrs, Volume= 0.140 af
Outflow = 1.77 cfs @ 12.16 hrs, Volume= 0.140 af, Atten= 7%, Lag= 3.6 min
Routed to Reach PRA : Perimeter Swale

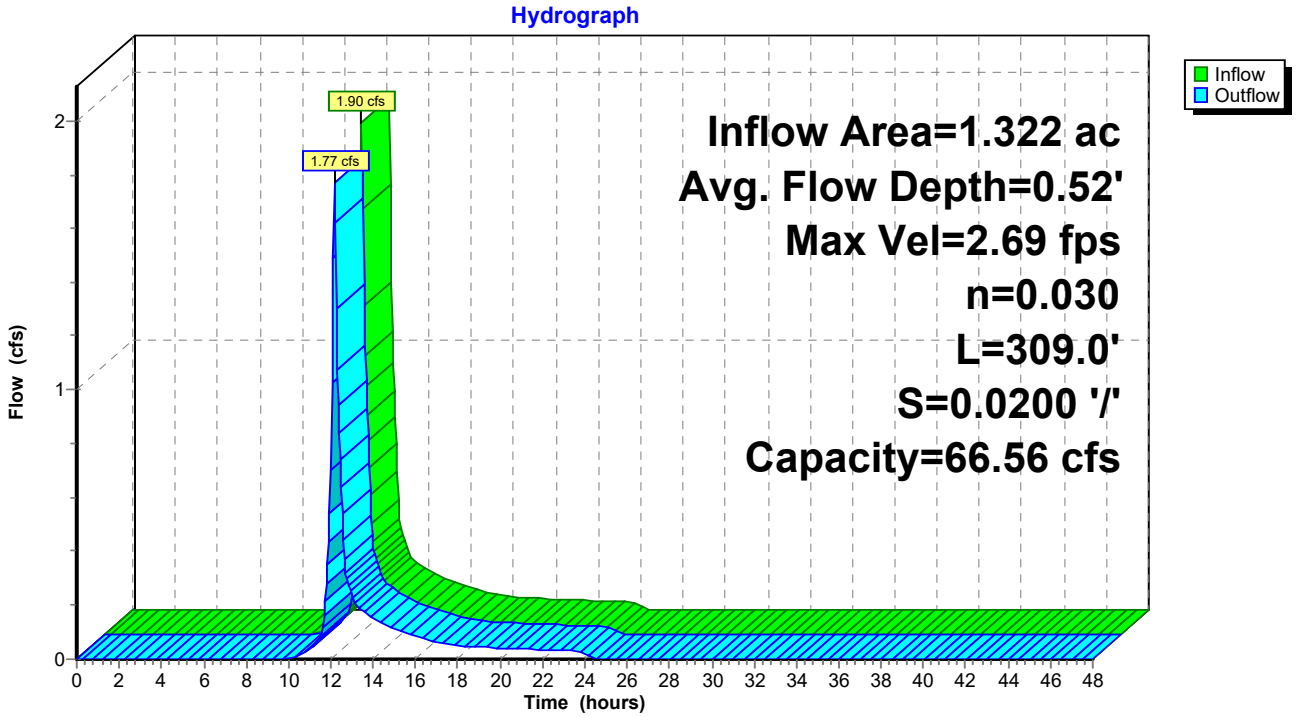
Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.69 fps, Min. Travel Time= 1.9 min
Avg. Velocity = 1.14 fps, Avg. Travel Time= 4.5 min

Peak Storage= 208 cf @ 12.12 hrs
Average Depth at Peak Storage= 0.52' , Surface Width= 2.59'
Bank-Full Depth= 2.00' Flow Area= 10.0 sf, Capacity= 66.56 cfs

0.00' x 2.00' deep channel, n= 0.030 Earth, grassed & winding
Side Slope Z-value= 2.0 3.0 '/' Top Width= 10.00'
Length= 309.0' Slope= 0.0200 '/'
Inlet Invert= 890.18', Outlet Invert= 884.00'



Reach R5: Sideslope Swale



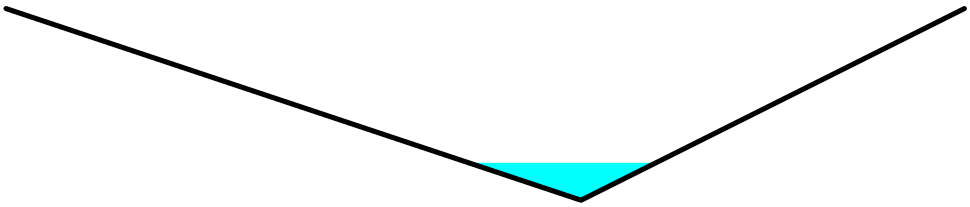
Summary for Reach R6: Sideslope Swale

Inflow Area = 0.943 ac, 0.00% Impervious, Inflow Depth = 1.04" for 2-yr 24-hr event
Inflow = 0.96 cfs @ 12.14 hrs, Volume= 0.081 af
Outflow = 0.84 cfs @ 12.28 hrs, Volume= 0.081 af, Atten= 12%, Lag= 7.9 min
Routed to Pond P-N1 : North Basin 1

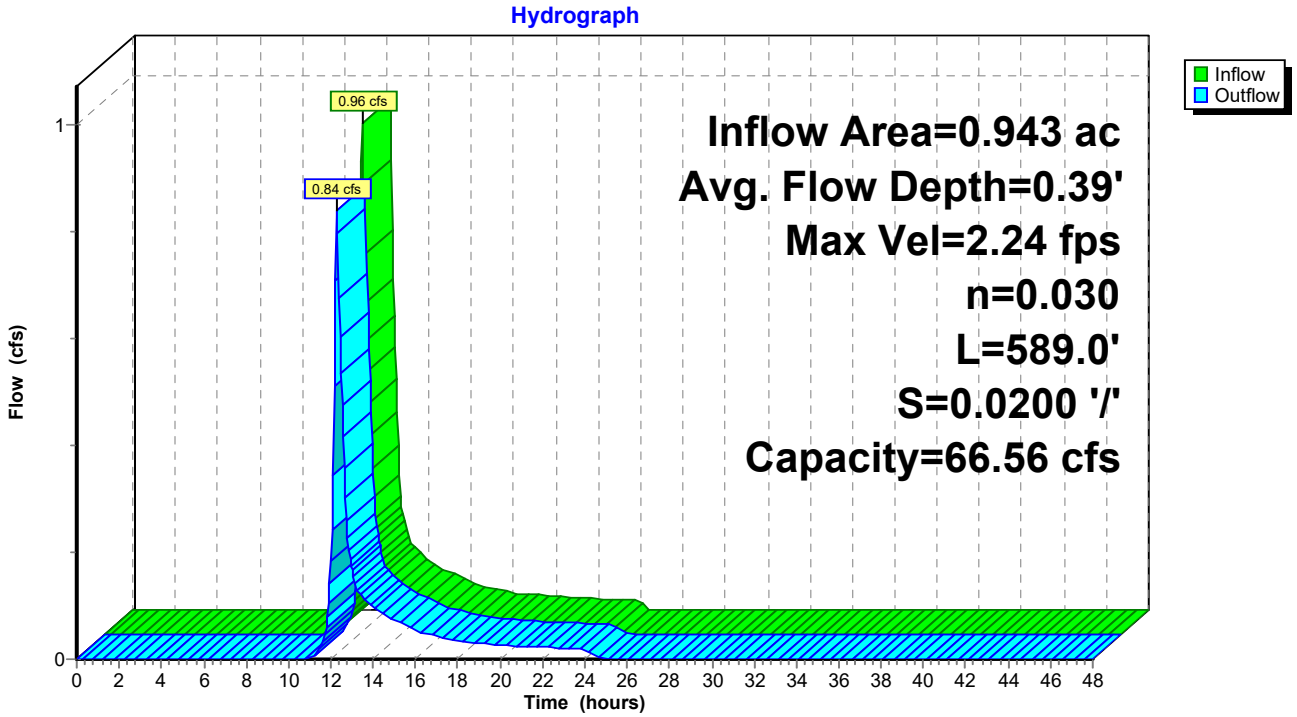
Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.24 fps, Min. Travel Time= 4.4 min
Avg. Velocity = 0.98 fps, Avg. Travel Time= 10.0 min

Peak Storage= 226 cf @ 12.20 hrs
Average Depth at Peak Storage= 0.39' , Surface Width= 1.96'
Bank-Full Depth= 2.00' Flow Area= 10.0 sf, Capacity= 66.56 cfs

0.00' x 2.00' deep channel, n= 0.030 Earth, grassed & winding
Side Slope Z-value= 3.0 2.0 '/' Top Width= 10.00'
Length= 589.0' Slope= 0.0200 '/'
Inlet Invert= 888.00', Outlet Invert= 876.22'



Reach R6: Sideslope Swale



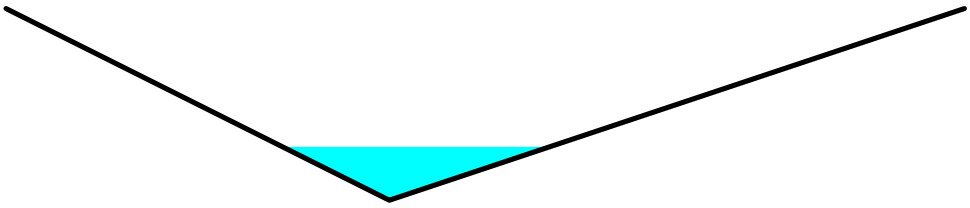
Summary for Reach R7: Sideslope Swale

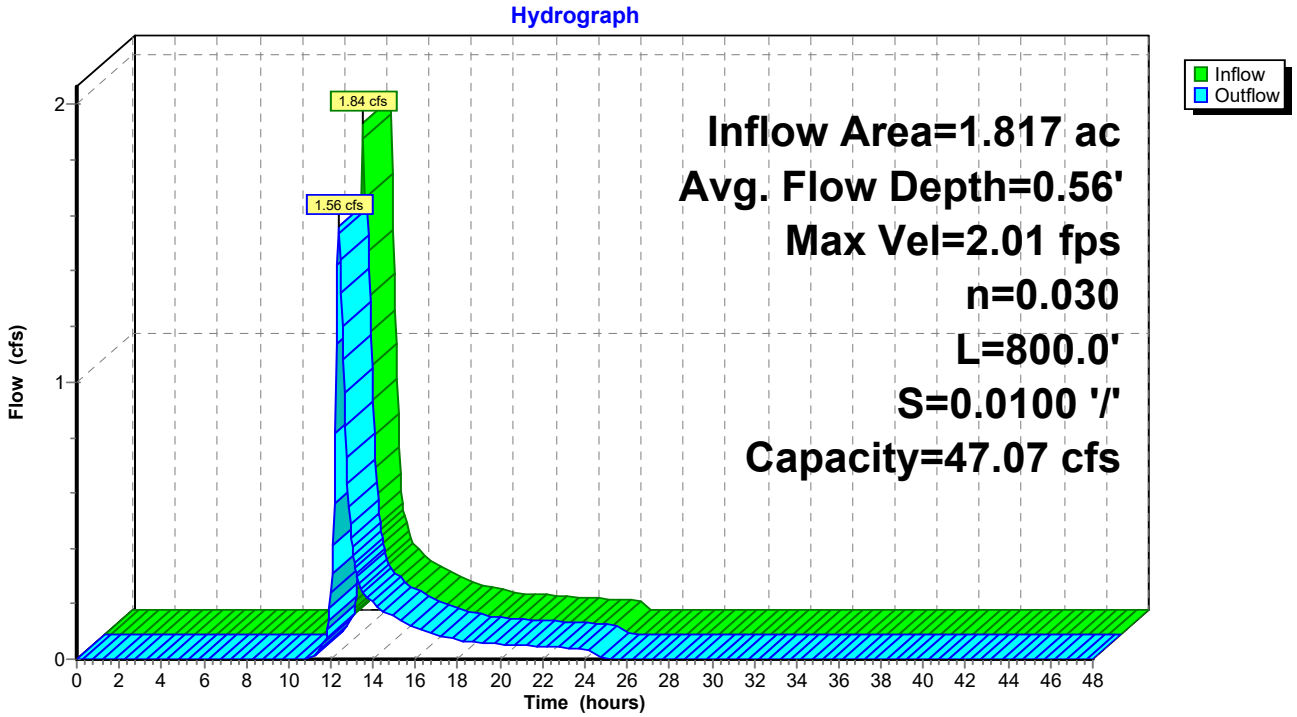
Inflow Area = 1.817 ac, 0.00% Impervious, Inflow Depth = 1.09" for 2-yr 24-hr event
Inflow = 1.84 cfs @ 12.17 hrs, Volume= 0.166 af
Outflow = 1.56 cfs @ 12.37 hrs, Volume= 0.166 af, Atten= 15%, Lag= 12.0 min
Routed to Pond P-N1 : North Basin 1

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.01 fps, Min. Travel Time= 6.6 min
Avg. Velocity = 0.82 fps, Avg. Travel Time= 16.3 min

Peak Storage= 625 cf @ 12.26 hrs
Average Depth at Peak Storage= 0.56' , Surface Width= 2.79'
Bank-Full Depth= 2.00' Flow Area= 10.0 sf, Capacity= 47.07 cfs

0.00' x 2.00' deep channel, n= 0.030 Earth, grassed & winding
Side Slope Z-value= 2.0 3.0 '/' Top Width= 10.00'
Length= 800.0' Slope= 0.0100 '/'
Inlet Invert= 872.00', Outlet Invert= 864.00'





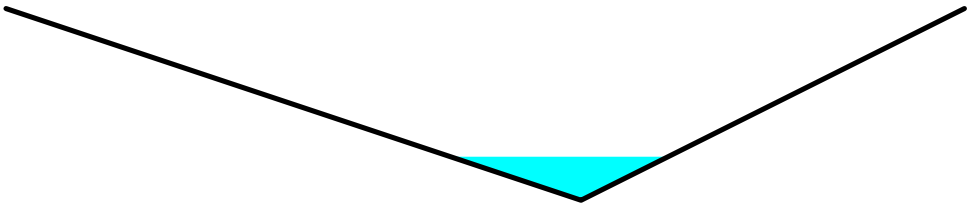
Summary for Reach R8: Sideslope Swale

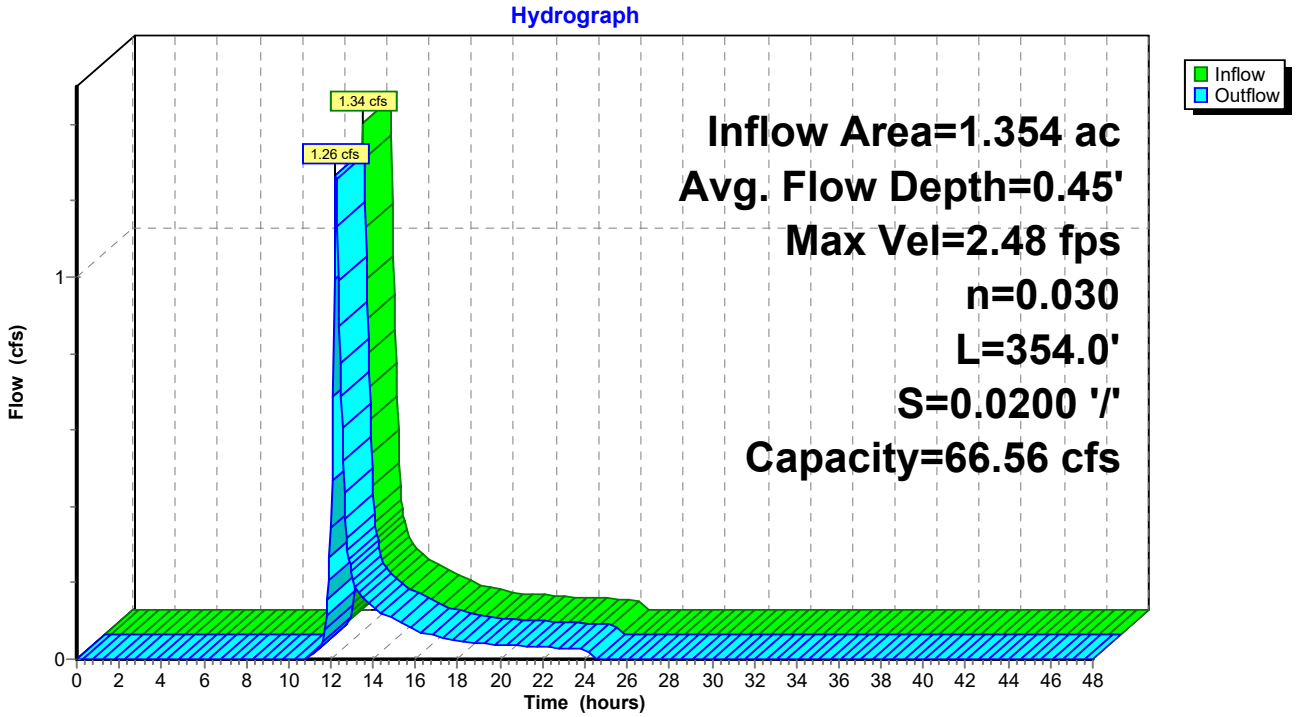
Inflow Area = 1.354 ac, 0.00% Impervious, Inflow Depth = 1.04" for 2-yr 24-hr event
Inflow = 1.34 cfs @ 12.16 hrs, Volume= 0.117 af
Outflow = 1.26 cfs @ 12.23 hrs, Volume= 0.117 af, Atten= 5%, Lag= 4.6 min
Routed to Reach DC-N : RipRap Downchute

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.48 fps, Min. Travel Time= 2.4 min
Avg. Velocity = 1.11 fps, Avg. Travel Time= 5.3 min

Peak Storage= 183 cf @ 12.19 hrs
Average Depth at Peak Storage= 0.45' , Surface Width= 2.27'
Bank-Full Depth= 2.00' Flow Area= 10.0 sf, Capacity= 66.56 cfs

0.00' x 2.00' deep channel, n= 0.030 Earth, grassed & winding
Side Slope Z-value= 3.0 2.0 '/' Top Width= 10.00'
Length= 354.0' Slope= 0.0200 '/'
Inlet Invert= 917.08', Outlet Invert= 910.00'





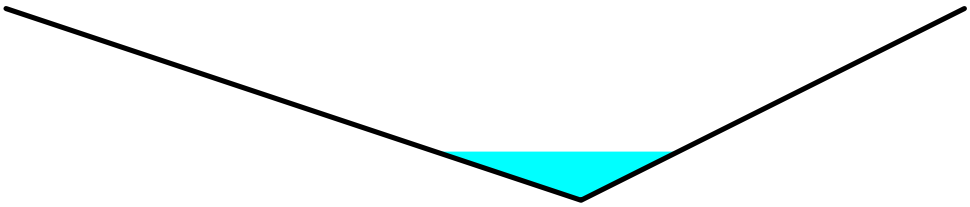
Summary for Reach R9: Sideslope Swale

Inflow Area = 1.834 ac, 0.00% Impervious, Inflow Depth = 1.04" for 2-yr 24-hr event
Inflow = 1.84 cfs @ 12.15 hrs, Volume= 0.159 af
Outflow = 1.72 cfs @ 12.25 hrs, Volume= 0.159 af, Atten= 6%, Lag= 5.7 min
Routed to Reach DC-N : RipRap Downchute

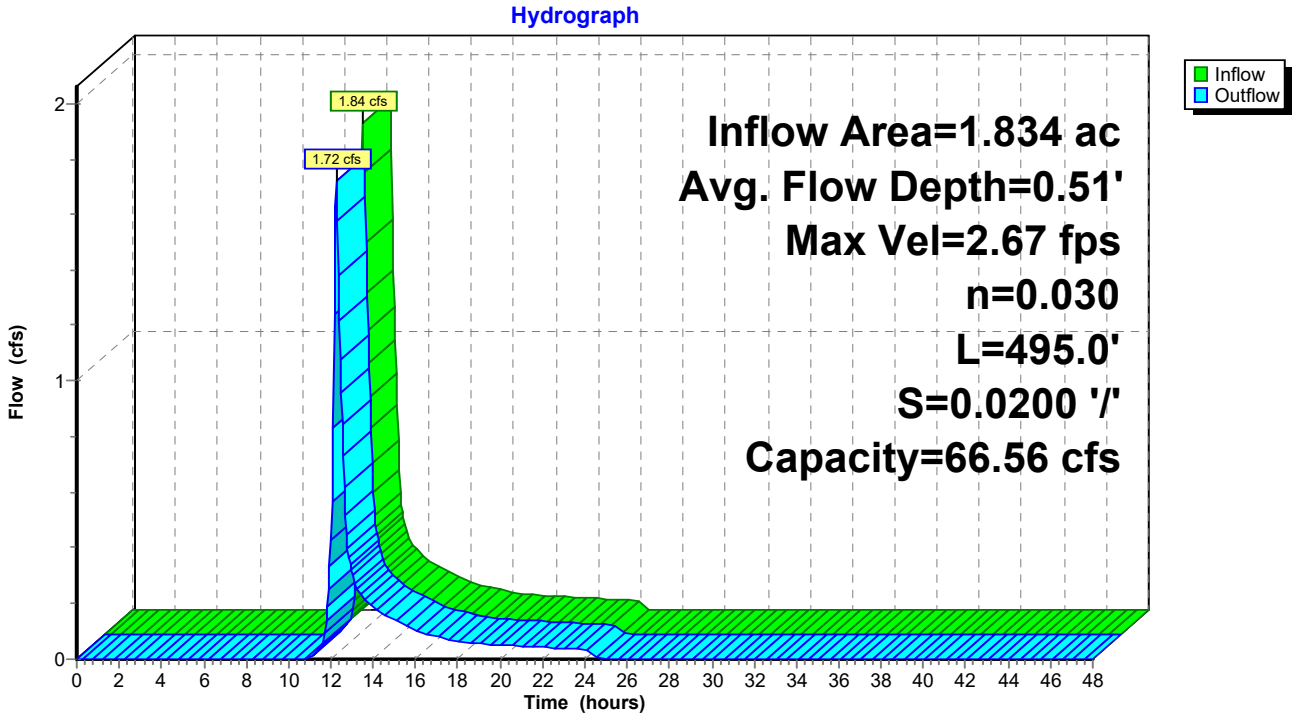
Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.67 fps, Min. Travel Time= 3.1 min
Avg. Velocity = 1.16 fps, Avg. Travel Time= 7.1 min

Peak Storage= 320 cf @ 12.19 hrs
Average Depth at Peak Storage= 0.51' , Surface Width= 2.54'
Bank-Full Depth= 2.00' Flow Area= 10.0 sf, Capacity= 66.56 cfs

0.00' x 2.00' deep channel, n= 0.030 Earth, grassed & winding
Side Slope Z-value= 3.0 2.0 '/' Top Width= 10.00'
Length= 495.0' Slope= 0.0200 '/'
Inlet Invert= 895.90', Outlet Invert= 886.00'



Reach R9: Sideslope Swale



Summary for Pond C-1: 30" Culvert

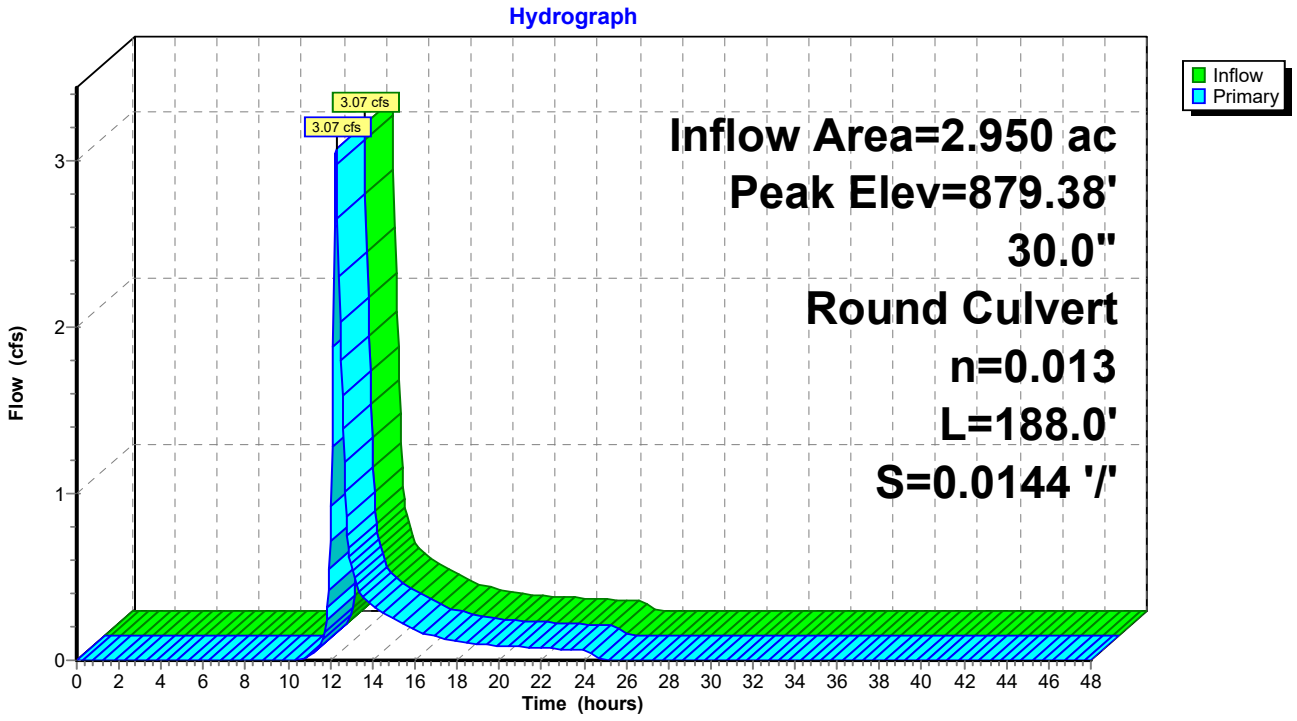
Inflow Area = 2.950 ac, 0.05% Impervious, Inflow Depth = 1.14" for 2-yr 24-hr event
Inflow = 3.07 cfs @ 12.27 hrs, Volume= 0.281 af
Outflow = 3.07 cfs @ 12.27 hrs, Volume= 0.281 af, Atten= 0%, Lag= 0.0 min
Primary = 3.07 cfs @ 12.27 hrs, Volume= 0.281 af
Routed to Pond PND-S : South Basin

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 879.38' @ 12.27 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	878.70'	**30.0" Round Culvert** L= 188.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 878.70' / 876.00' S= 0.0144 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 4.91 sf

Primary OutFlow Max=3.01 cfs @ 12.27 hrs HW=879.38' (Free Discharge)
1=Culvert (Inlet Controls 3.01 cfs @ 2.80 fps)

Pond C-1: 30" Culvert



Summary for Pond C-2: 30" Culvert

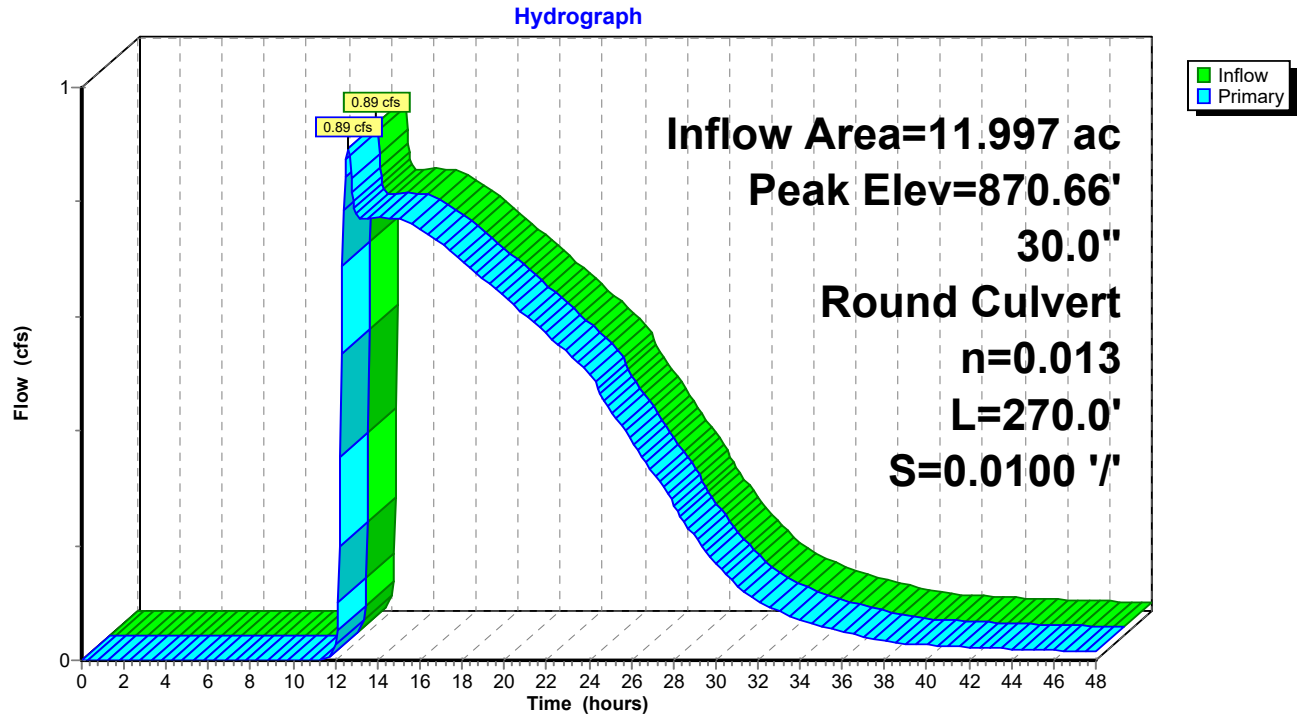
Inflow Area = 11.997 ac, 0.00% Impervious, Inflow Depth > 0.90" for 2-yr 24-hr event
Inflow = 0.89 cfs @ 12.58 hrs, Volume= 0.896 af
Outflow = 0.89 cfs @ 12.58 hrs, Volume= 0.896 af, Atten= 0%, Lag= 0.0 min
Primary = 0.89 cfs @ 12.58 hrs, Volume= 0.896 af
Routed to Pond P-N1 : North Basin 1

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 870.66' @ 12.58 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	870.30'	**30.0" Round Culvert** L= 270.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 870.30' / 867.60' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 4.91 sf

Primary OutFlow Max=0.89 cfs @ 12.58 hrs HW=870.66' (Free Discharge)
1=Culvert (Inlet Controls 0.89 cfs @ 2.04 fps)

Pond C-2: 30" Culvert



Summary for Pond C-3: 24" Culvert

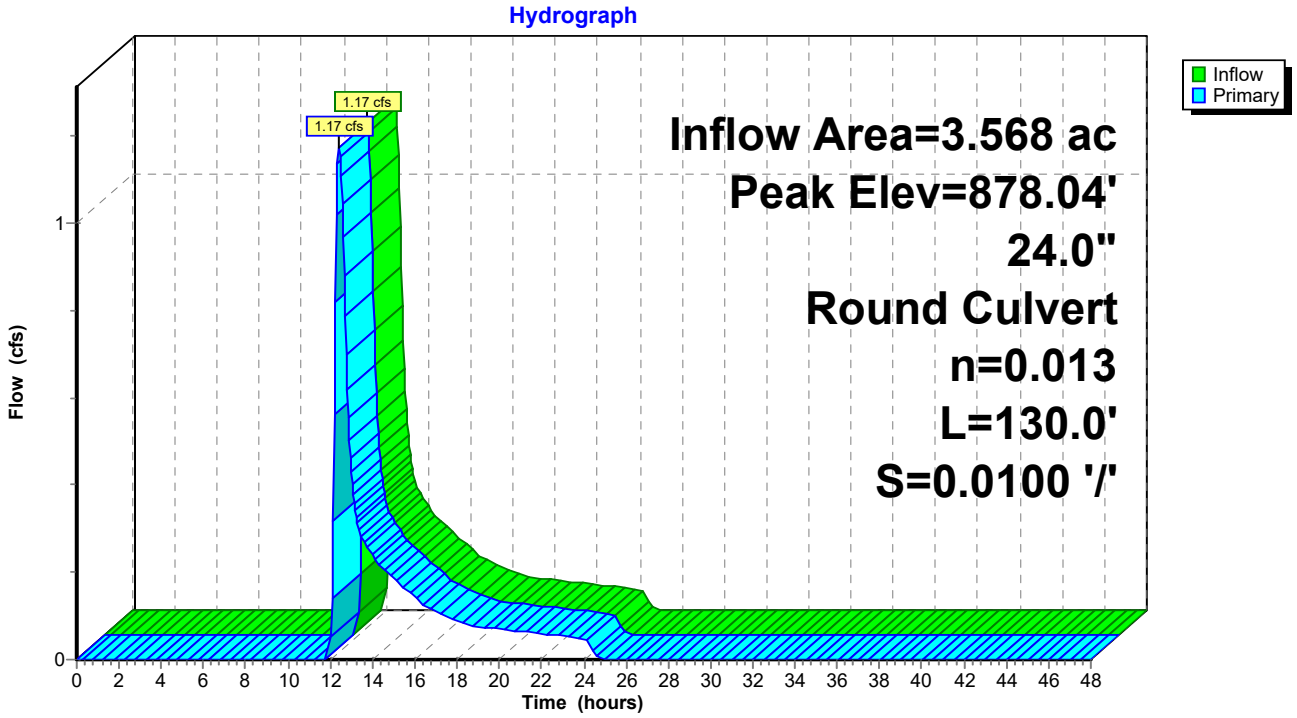
Inflow Area = 3.568 ac, 0.00% Impervious, Inflow Depth = 0.56" for 2-yr 24-hr event
Inflow = 1.17 cfs @ 12.41 hrs, Volume= 0.166 af
Outflow = 1.17 cfs @ 12.41 hrs, Volume= 0.166 af, Atten= 0%, Lag= 0.0 min
Primary = 1.17 cfs @ 12.41 hrs, Volume= 0.166 af
Routed to Pond P-N2 : North Basin 2

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 878.04' @ 12.41 hrs
Flood Elev= 880.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	877.60'	**24.0" Round Culvert** L= 130.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 877.60' / 876.30' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf

Primary OutFlow Max=1.17 cfs @ 12.41 hrs HW=878.04' (Free Discharge)
1=Culvert (Inlet Controls 1.17 cfs @ 2.26 fps)

Pond C-3: 24" Culvert



Summary for Pond P-N1: North Basin 1

Inflow Area = 15.447 ac, 0.00% Impervious, Inflow Depth > 0.90" for 2-yr 24-hr event
Inflow = 3.10 cfs @ 12.38 hrs, Volume= 1.161 af
Outflow = 1.61 cfs @ 12.85 hrs, Volume= 1.159 af, Atten= 48%, Lag= 28.2 min
Primary = 1.61 cfs @ 12.85 hrs, Volume= 1.159 af
Routed to Link N : POI-N
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Link N : POI-N

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Starting Elev= 859.00' Surf.Area= 3,382 sf Storage= 3,127 cf
Peak Elev= 860.05' @ 12.85 hrs Surf.Area= 3,921 sf Storage= 6,977 cf (3,850 cf above start)
Flood Elev= 863.00' Surf.Area= 5,635 sf Storage= 21,001 cf (17,873 cf above start)

Plug-Flow detention time= 134.8 min calculated for 1.087 af (94% of inflow)
Center-of-Mass det. time= 40.4 min (1,200.0 - 1,159.6)

Volume	Invert	Avail.Storage	Storage Description
#1	858.00'	26,943 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

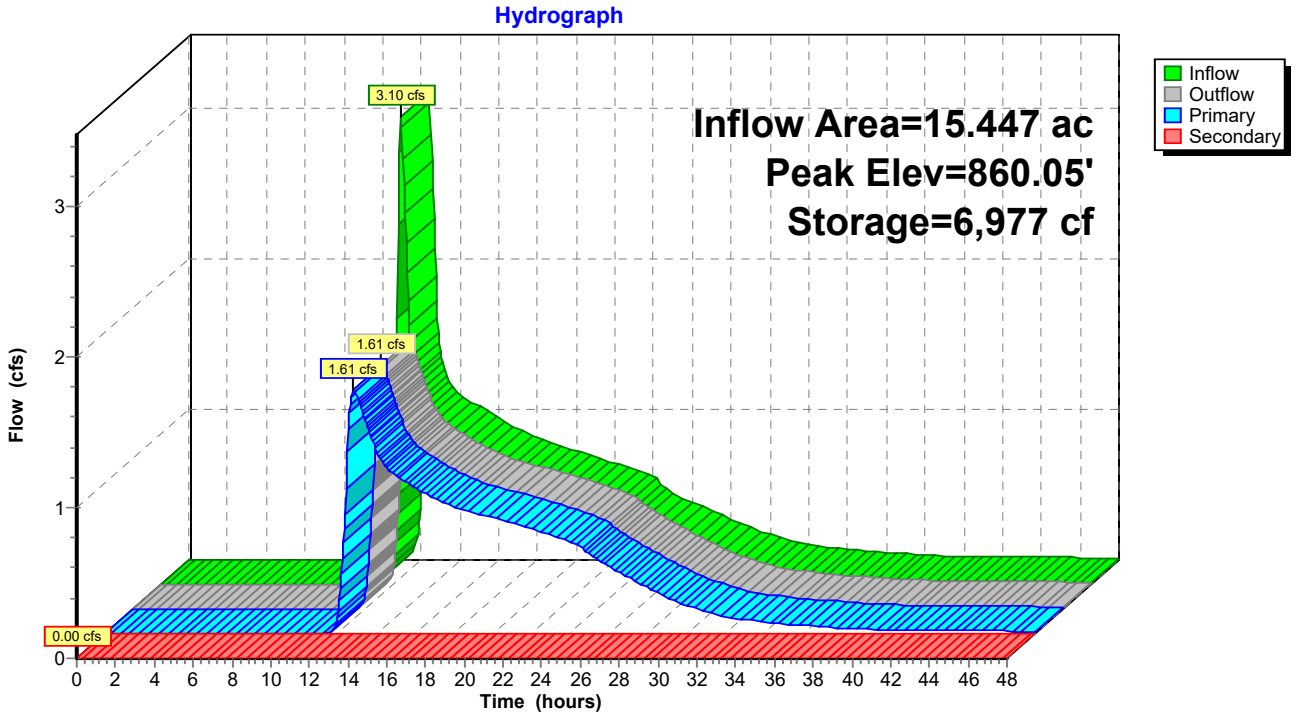
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
858.00	2,873	0	0
860.00	3,890	6,763	6,763
862.00	5,020	8,910	15,673
864.00	6,250	11,270	26,943

Device	Routing	Invert	Outlet Devices
#1	Primary	858.00'	**24.0" Round Culvert** L= 100.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 858.00' / 857.00' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf
#2	Device 1	859.00'	**2.0" Vert. Perforations X 10.00 columns** X 3 rows with 8.0" cc spacing C= 0.600 Limited to weir flow at low heads
#3	Device 1	862.00'	**36.0" Horiz. Top of Standpipe** C= 0.600 Limited to weir flow at low heads
#4	Secondary	863.00'	**10.0' long x 8.0' breadth Spillway** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.43 2.54 2.70 2.69 2.68 2.68 2.66 2.64 2.64 2.64 2.65 2.65 2.66 2.66 2.68 2.70 2.74

Primary OutFlow Max=1.62 cfs @ 12.85 hrs HW=860.05' (Free Discharge)
└**1=Culvert** (Passes 1.62 cfs of 15.53 cfs potential flow)
├**2=Perforations** (Orifice Controls 1.62 cfs @ 3.70 fps)
└**3=Top of Standpipe** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=859.00' (Free Discharge)
└**4=Spillway** (Controls 0.00 cfs)

Pond P-N1: North Basin 1



Summary for Pond P-N2: North Basin 2

Inflow Area = 10.643 ac, 0.00% Impervious, Inflow Depth = 0.95" for 2-yr 24-hr event
Inflow = 7.57 cfs @ 12.27 hrs, Volume= 0.841 af
Outflow = 0.70 cfs @ 15.40 hrs, Volume= 0.824 af, Atten= 91%, Lag= 187.4 min
Primary = 0.70 cfs @ 15.40 hrs, Volume= 0.824 af
Routed to Reach PRB : Perimeter Swale
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Reach PRB : Perimeter Swale

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Starting Elev= 876.00' Surf.Area= 35,250 sf Storage= 33,125 cf
Peak Elev= 876.52' @ 15.40 hrs Surf.Area= 36,752 sf Storage= 51,937 cf (18,812 cf above start)
Flood Elev= 879.00' Surf.Area= 44,000 sf Storage= 151,875 cf (118,750 cf above start)

Plug-Flow detention time= 1,434.6 min calculated for 0.064 af (8% of inflow)
Center-of-Mass det. time= 378.0 min (1,255.1 - 877.2)

Volume	Invert	Avail.Storage	Storage Description
#1	875.00'	151,875 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

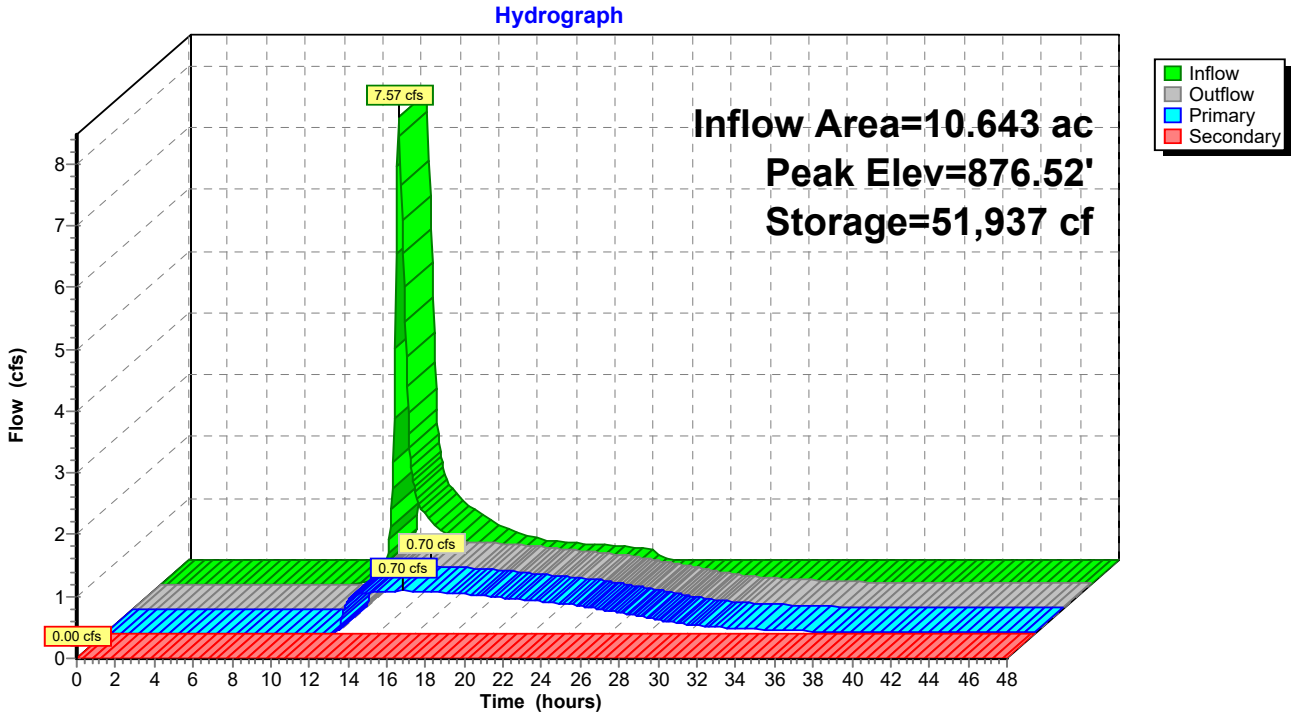
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
875.00	31,000	0	0
876.00	35,250	33,125	33,125
878.00	41,000	76,250	109,375
879.00	44,000	42,500	151,875

Device	Routing	Invert	Outlet Devices
#1	Primary	875.00'	**24.0" Round Culvert** L= 100.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 875.00' / 874.00' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf
#2	Device 1	876.00'	**2.0" Vert. Perforations X 10.00** C= 0.600 Limited to weir flow at low heads
#3	Device 1	877.50'	**36.0" Horiz. Top of Standpipe** C= 0.600 Limited to weir flow at low heads
#4	Secondary	878.00'	**6.0' long x 20.0' breadth Spillway** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=0.70 cfs @ 15.40 hrs HW=876.52' (Free Discharge)
└**1=Culvert** (Passes 0.70 cfs of 10.78 cfs potential flow)
├**2=Perforations** (Orifice Controls 0.70 cfs @ 3.19 fps)
└**3=Top of Standpipe** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=876.00' (Free Discharge)
└**4=Spillway** (Controls 0.00 cfs)

Pond P-N2: North Basin 2



Summary for Pond PND-S: South Basin

Inflow Area = 8.392 ac, 0.02% Impervious, Inflow Depth = 1.19" for 2-yr 24-hr event
Inflow = 7.07 cfs @ 12.31 hrs, Volume= 0.831 af
Outflow = 1.74 cfs @ 13.01 hrs, Volume= 0.830 af, Atten= 75%, Lag= 42.0 min
Primary = 1.74 cfs @ 13.01 hrs, Volume= 0.830 af
Routed to Link S : POI-S
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Link S : POI-S

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Starting Elev= 859.00' Surf.Area= 11,031 sf Storage= 10,489 cf
Peak Elev= 860.15' @ 13.01 hrs Surf.Area= 12,282 sf Storage= 23,852 cf (13,363 cf above start)
Flood Elev= 863.00' Surf.Area= 15,584 sf Storage= 63,560 cf (53,071 cf above start)

Plug-Flow detention time= 323.4 min calculated for 0.589 af (71% of inflow)
Center-of-Mass det. time= 131.9 min (998.8 - 866.9)

Volume	Invert	Avail.Storage	Storage Description
#1	858.00'	79,739 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

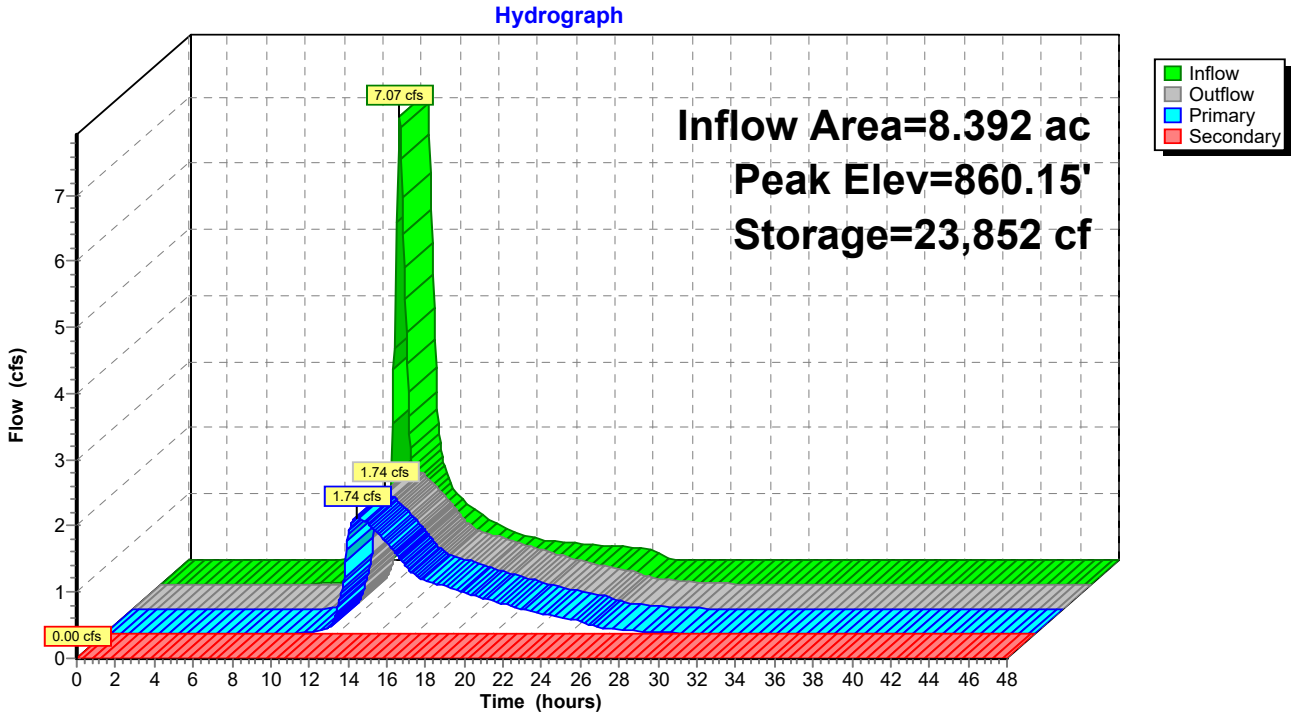
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
858.00	9,947	0	0
860.00	12,115	22,062	22,062
862.00	14,394	26,509	48,571
864.00	16,774	31,168	79,739

Device	Routing	Invert	Outlet Devices
#1	Primary	858.50'	**30.0" Round Culvert** L= 50.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 858.50' / 858.00' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 4.91 sf
#2	Device 1	859.00'	**2.0" Vert. Perforations X 10.00 columns** X 2 rows with 8.0" cc spacing C= 0.600 Limited to weir flow at low heads
#3	Device 1	862.00'	**36.0" Horiz. Top of Standpipe** C= 0.600 Limited to weir flow at low heads
#4	Secondary	863.00'	**10.0' long x 8.0' breadth Spillway** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.43 2.54 2.70 2.69 2.68 2.68 2.66 2.64 2.64 2.64 2.65 2.65 2.66 2.66 2.68 2.70 2.74

Primary OutFlow Max=1.74 cfs @ 13.01 hrs HW=860.15' (Free Discharge)
└**1=Culvert** (Passes 1.74 cfs of 12.58 cfs potential flow)
└**2=Perforations** (Orifice Controls 1.74 cfs @ 4.00 fps)
└**3=Top of Standpipe** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=859.00' (Free Discharge)
└**4=Spillway** (Controls 0.00 cfs)

Pond PND-S: South Basin

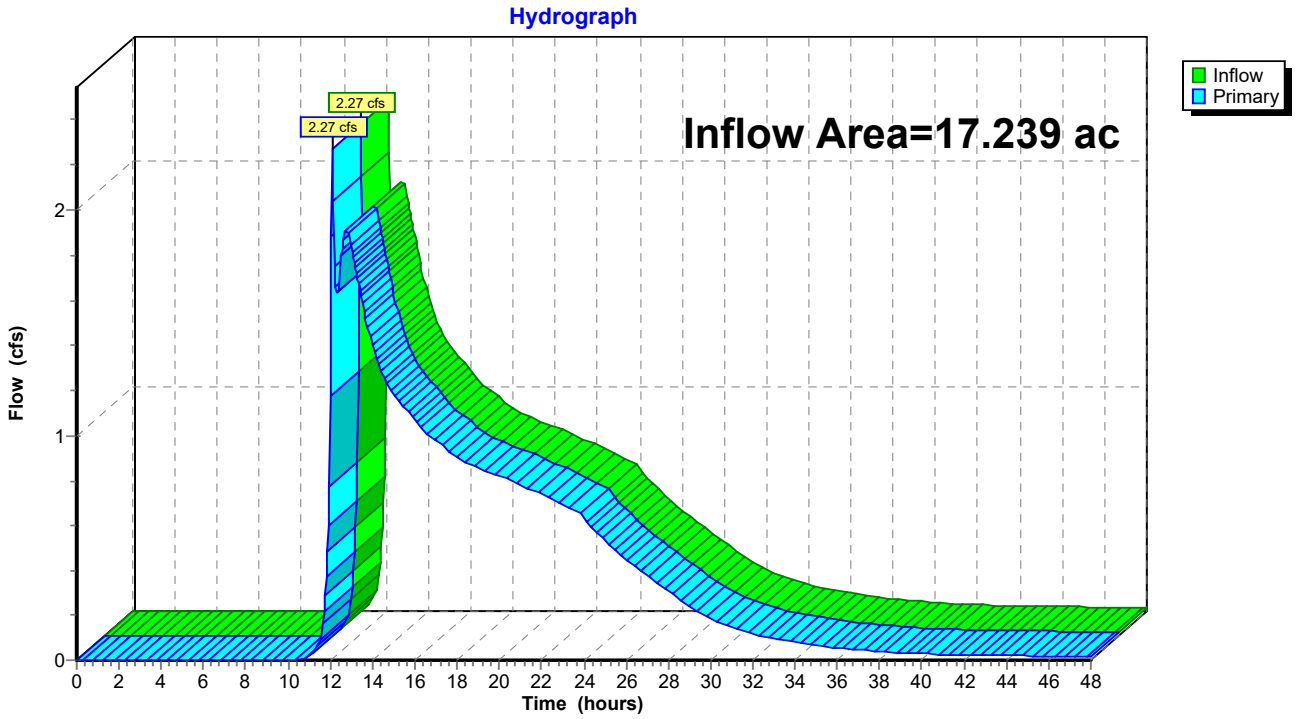


Summary for Link N: POI-N

Inflow Area = 17.239 ac, 0.00% Impervious, Inflow Depth > 0.92" for 2-yr 24-hr event
Inflow = 2.27 cfs @ 12.11 hrs, Volume= 1.315 af
Primary = 2.27 cfs @ 12.11 hrs, Volume= 1.315 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Link N: POI-N

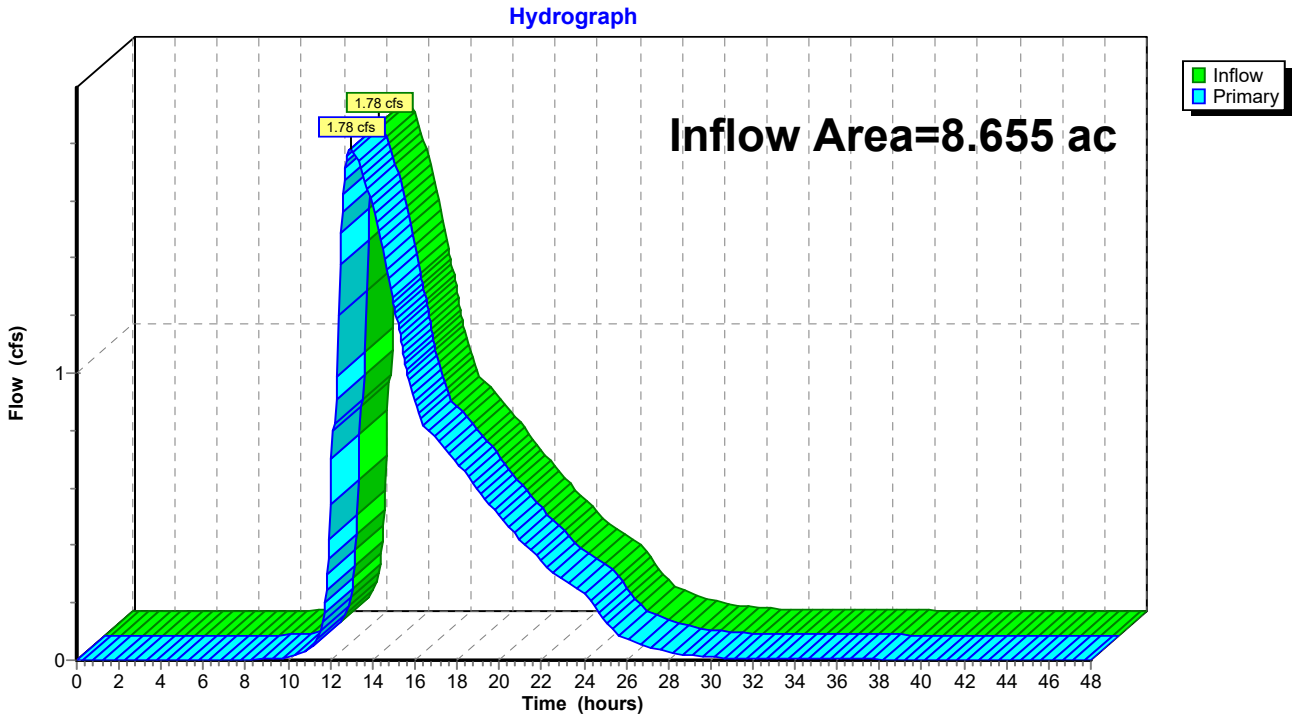


Summary for Link S: POI-S

Inflow Area = 8.655 ac, 0.02% Impervious, Inflow Depth > 1.18" for 2-yr 24-hr event
Inflow = 1.78 cfs @ 12.97 hrs, Volume= 0.853 af
Primary = 1.78 cfs @ 12.97 hrs, Volume= 0.853 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Link S: POI-S



Time span=0.00-48.00 hrs, dt=0.05 hrs, 961 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

SubcatchmentN1: Subcat N1 Runoff Area=3.568 ac 0.00% Impervious Runoff Depth=1.48"
Flow Length=630' Tc=20.1 min CN=64 Runoff=3.85 cfs 0.439 af

SubcatchmentN10: Subcat N10 Runoff Area=0.445 ac 0.00% Impervious Runoff Depth=2.16"
Flow Length=62' Slope=0.3300 '/' Tc=6.0 min CN=73 Runoff=1.09 cfs 0.080 af

SubcatchmentN11: Subcat N11 Runoff Area=0.309 ac 0.00% Impervious Runoff Depth=2.40"
Flow Length=164' Slope=0.3300 '/' Tc=6.0 min CN=76 Runoff=0.85 cfs 0.062 af

SubcatchmentN12: Subcat N12 Runoff Area=1.039 ac 0.00% Impervious Runoff Depth=2.24"
Flow Length=60' Slope=0.3300 '/' Tc=6.0 min CN=74 Runoff=2.66 cfs 0.194 af

SubcatchmentN3: Subcat N3 Runoff Area=3.233 ac 0.00% Impervious Runoff Depth=2.58"
Flow Length=121' Slope=0.0100 '/' Tc=19.2 min CN=78 Runoff=6.68 cfs 0.694 af

SubcatchmentN4: Subcat N4 Runoff Area=1.834 ac 0.00% Impervious Runoff Depth=2.24"
Flow Length=155' Tc=9.6 min CN=74 Runoff=4.17 cfs 0.342 af

SubcatchmentN5: Subcat N5 Runoff Area=1.354 ac 0.00% Impervious Runoff Depth=2.24"
Flow Length=141' Slope=0.0500 '/' Tc=10.2 min CN=74 Runoff=3.03 cfs 0.252 af

SubcatchmentN6: Subcat N6 Runoff Area=0.654 ac 0.00% Impervious Runoff Depth=2.24"
Flow Length=114' Slope=0.0500 '/' Tc=9.9 min CN=74 Runoff=1.47 cfs 0.122 af

SubcatchmentN7: Subcat N7 Runoff Area=1.354 ac 0.00% Impervious Runoff Depth=1.62"
Flow Length=172' Slope=0.1400 '/' Tc=10.4 min CN=66 Runoff=2.09 cfs 0.183 af

SubcatchmentN8: Subcat N8 Runoff Area=0.943 ac 0.00% Impervious Runoff Depth=2.24"
Flow Length=94' Tc=9.2 min CN=74 Runoff=2.16 cfs 0.176 af

SubcatchmentN9: Subcat N9 Runoff Area=1.817 ac 0.00% Impervious Runoff Depth=2.32"
Flow Length=760' Tc=11.4 min CN=75 Runoff=4.09 cfs 0.351 af

SubcatchmentNP: Subcat NP Runoff Area=0.690 ac 0.00% Impervious Runoff Depth=1.02"
Flow Length=134' Slope=0.0200 '/' Tc=14.8 min CN=57 Runoff=0.51 cfs 0.059 af

SubcatchmentS1: Subcat S7 Runoff Area=0.263 ac 0.00% Impervious Runoff Depth=2.24"
Flow Length=60' Slope=0.3300 '/' Tc=6.0 min CN=74 Runoff=0.67 cfs 0.049 af

SubcatchmentS2: Subcat S2 Runoff Area=1.813 ac 0.00% Impervious Runoff Depth=2.24"
Flow Length=97' Tc=6.0 min CN=74 Runoff=4.64 cfs 0.338 af

SubcatchmentS3: Subcat S3 Runoff Area=1.322 ac 0.11% Impervious Runoff Depth=2.58"
Flow Length=64' Slope=0.3300 '/' Tc=6.0 min CN=78 Runoff=3.92 cfs 0.284 af

SubcatchmentS4: Subcat S4 Runoff Area=1.628 ac 0.00% Impervious Runoff Depth=2.24"
Flow Length=143' Slope=0.0500 '/' Tc=10.3 min CN=74 Runoff=3.63 cfs 0.304 af

Subcatchment S5: Subcat S5 Runoff Area=0.922 ac 0.00% Impervious Runoff Depth=2.32"
Flow Length=118' Tc=9.9 min CN=75 Runoff=2.16 cfs 0.178 af

Subcatchment S6: Subcat S6 Runoff Area=2.064 ac 0.00% Impervious Runoff Depth=2.32"
Flow Length=163' Tc=10.1 min CN=75 Runoff=4.81 cfs 0.399 af

Subcatchment SP: Subcat SP Runoff Area=0.642 ac 0.00% Impervious Runoff Depth=3.83"
Tc=0.0 min CN=91 Runoff=3.17 cfs 0.205 af

Reach DC-N: RipRap Downchute Avg. Flow Depth=0.37' Max Vel=5.29 fps Inflow=8.13 cfs 0.716 af
n=0.070 L=120.0' S=0.3300 '/' Capacity=127.98 cfs Outflow=8.05 cfs 0.716 af

Reach DC-S: RipRap Downchute Avg. Flow Depth=0.24' Max Vel=4.13 fps Inflow=3.63 cfs 0.304 af
n=0.070 L=100.0' S=0.3333 '/' Capacity=128.61 cfs Outflow=3.59 cfs 0.304 af

Reach PRA: Perimeter Swale Avg. Flow Depth=0.69' Max Vel=2.94 fps Inflow=7.23 cfs 0.587 af
n=0.030 L=500.0' S=0.0100 '/' Capacity=63.20 cfs Outflow=6.82 cfs 0.587 af

Reach PRB: Perimeter Swale Avg. Flow Depth=0.40' Max Vel=2.18 fps Inflow=2.64 cfs 2.000 af
n=0.030 L=700.0' S=0.0100 '/' Capacity=33.63 cfs Outflow=2.39 cfs 1.999 af

Reach PRC: Swale Avg. Flow Depth=0.36' Max Vel=2.24 fps Inflow=3.85 cfs 0.439 af
n=0.030 L=140.0' S=0.0100 '/' Capacity=23.61 cfs Outflow=3.81 cfs 0.439 af

Reach R1: Sideslope Swale Avg. Flow Depth=0.74' Max Vel=2.42 fps Inflow=4.64 cfs 0.338 af
n=0.030 L=1,380.0' S=0.0100 '/' Capacity=47.07 cfs Outflow=3.29 cfs 0.338 af

Reach R2: Sideslope Swale Avg. Flow Depth=0.71' Max Vel=3.33 fps Inflow=4.81 cfs 0.399 af
n=0.030 L=1,143.0' S=0.0200 '/' Capacity=66.56 cfs Outflow=4.17 cfs 0.399 af

Reach R3: Sideslope Swale Avg. Flow Depth=0.36' Max Vel=5.31 fps Inflow=2.06 cfs 0.178 af
n=0.030 L=300.0' S=0.1233 '/' Capacity=201.54 cfs Outflow=2.01 cfs 0.178 af

Reach R4: Sideslope Swale Avg. Flow Depth=0.55' Max Vel=2.79 fps Inflow=2.16 cfs 0.178 af
n=0.030 L=348.0' S=0.0200 '/' Capacity=66.56 cfs Outflow=2.06 cfs 0.178 af

Reach R5: Sideslope Swale Avg. Flow Depth=0.68' Max Vel=3.25 fps Inflow=3.92 cfs 0.284 af
n=0.030 L=309.0' S=0.0200 '/' Capacity=66.56 cfs Outflow=3.66 cfs 0.284 af

Reach R6: Sideslope Swale Avg. Flow Depth=0.54' Max Vel=2.77 fps Inflow=2.16 cfs 0.176 af
n=0.030 L=589.0' S=0.0200 '/' Capacity=66.56 cfs Outflow=1.98 cfs 0.176 af

Reach R7: Sideslope Swale Avg. Flow Depth=0.76' Max Vel=2.47 fps Inflow=4.09 cfs 0.351 af
n=0.030 L=800.0' S=0.0100 '/' Capacity=47.07 cfs Outflow=3.60 cfs 0.351 af

Reach R8: Sideslope Swale Avg. Flow Depth=0.62' Max Vel=3.04 fps Inflow=3.03 cfs 0.252 af
n=0.030 L=354.0' S=0.0200 '/' Capacity=66.56 cfs Outflow=2.90 cfs 0.252 af

Reach R9: Sideslope Swale Avg. Flow Depth=0.70' Max Vel=3.28 fps Inflow=4.17 cfs 0.342 af
n=0.030 L=495.0' S=0.0200 '/' Capacity=66.56 cfs Outflow=3.96 cfs 0.342 af

Pond C-1: 30" Culvert Peak Elev=879.75' Inflow=6.82 cfs 0.587 af
30.0" Round Culvert n=0.013 L=188.0' S=0.0144 '/' Outflow=6.82 cfs 0.587 af

Pond C-2: 30" Culvert Peak Elev=870.90' Inflow=2.39 cfs 1.999 af
30.0" Round Culvert n=0.013 L=270.0' S=0.0100 '/' Outflow=2.39 cfs 1.999 af

Pond C-3: 24" Culvert Peak Elev=878.43' Inflow=3.81 cfs 0.439 af
24.0" Round Culvert n=0.013 L=130.0' S=0.0100 '/' Outflow=3.81 cfs 0.439 af

Pond P-N1: North Basin 1 Peak Elev=861.35' Storage=12,536 cf Inflow=8.22 cfs 2.585 af
Primary=3.93 cfs 2.582 af Secondary=0.00 cfs 0.000 af Outflow=3.93 cfs 2.582 af

Pond P-N2: North Basin 2 Peak Elev=877.29' Storage=81,099 cf Inflow=17.87 cfs 1.850 af
Primary=1.16 cfs 1.818 af Secondary=0.00 cfs 0.000 af Outflow=1.16 cfs 1.818 af

Pond PND-S: South Basin Peak Elev=861.50' Storage=41,582 cf Inflow=16.38 cfs 1.708 af
Primary=3.03 cfs 1.707 af Secondary=0.00 cfs 0.000 af Outflow=3.03 cfs 1.707 af

Link N: POI-N Inflow=5.38 cfs 2.918 af
Primary=5.38 cfs 2.918 af

Link S: POI-S Inflow=3.10 cfs 1.756 af
Primary=3.10 cfs 1.756 af

Total Runoff Area = 25.894 ac Runoff Volume = 4.710 af Average Runoff Depth = 2.18"
99.99% Pervious = 25.893 ac 0.01% Impervious = 0.001 ac

Summary for Subcatchment N1: Subcat N1

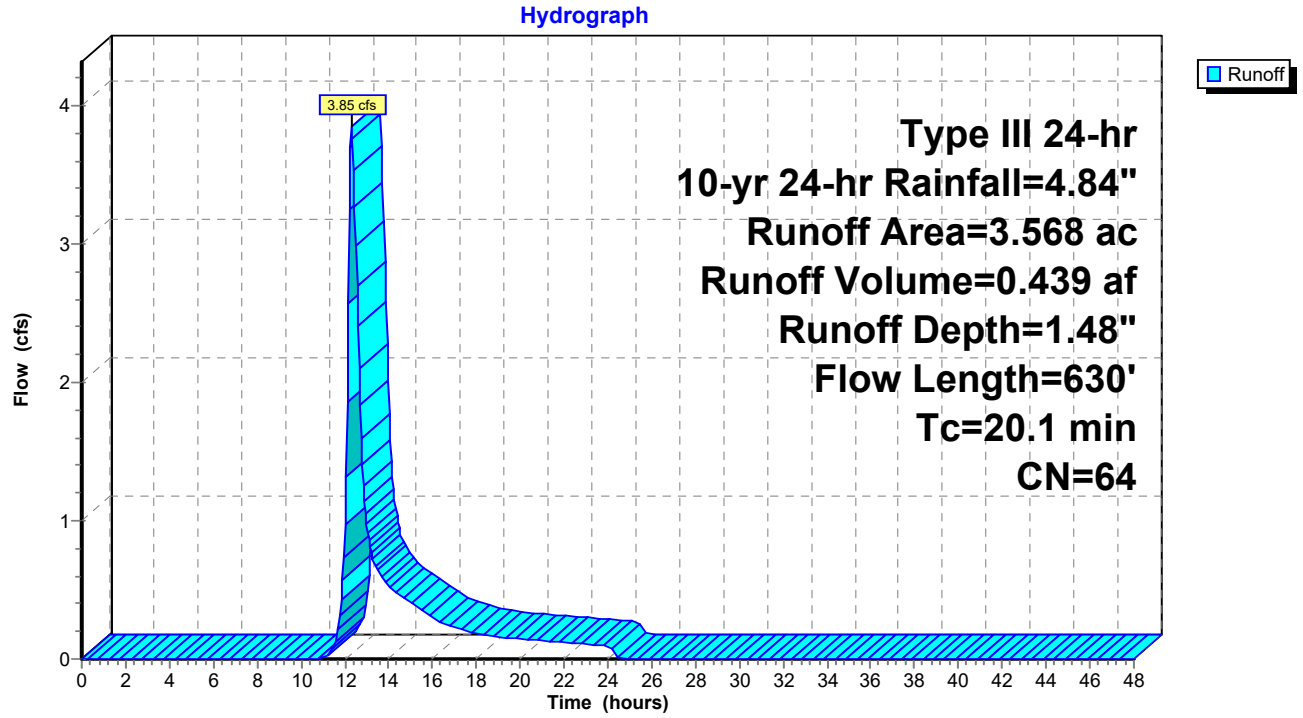
Runoff = 3.85 cfs @ 12.31 hrs, Volume= 0.439 af, Depth= 1.48"
Routed to Reach PRC : Swale

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-yr 24-hr Rainfall=4.84"

Area (ac)	CN	Description
0.073	79	50-75% Grass cover, Fair, HSG C
1.264	79	50-75% Grass cover, Fair, HSG C
1.678	49	50-75% Grass cover, Fair, HSG A
0.011	70	Woods, Good, HSG C
0.000	70	Woods, Good, HSG C
0.002	30	Woods, Good, HSG A
0.540	74	>75% Grass cover, Good, HSG C
3.568	64	Weighted Average
3.568		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.5	100	0.1000	0.22		**Sheet Flow, Grass** Grass: Dense n= 0.240 P2= 3.23"
12.6	530	0.0100	0.70		**Shallow Concentrated Flow, Grass** Short Grass Pasture Kv= 7.0 fps
20.1	630	Total			

Subcatchment N1: Subcat N1



Summary for Subcatchment N10: Subcat N10

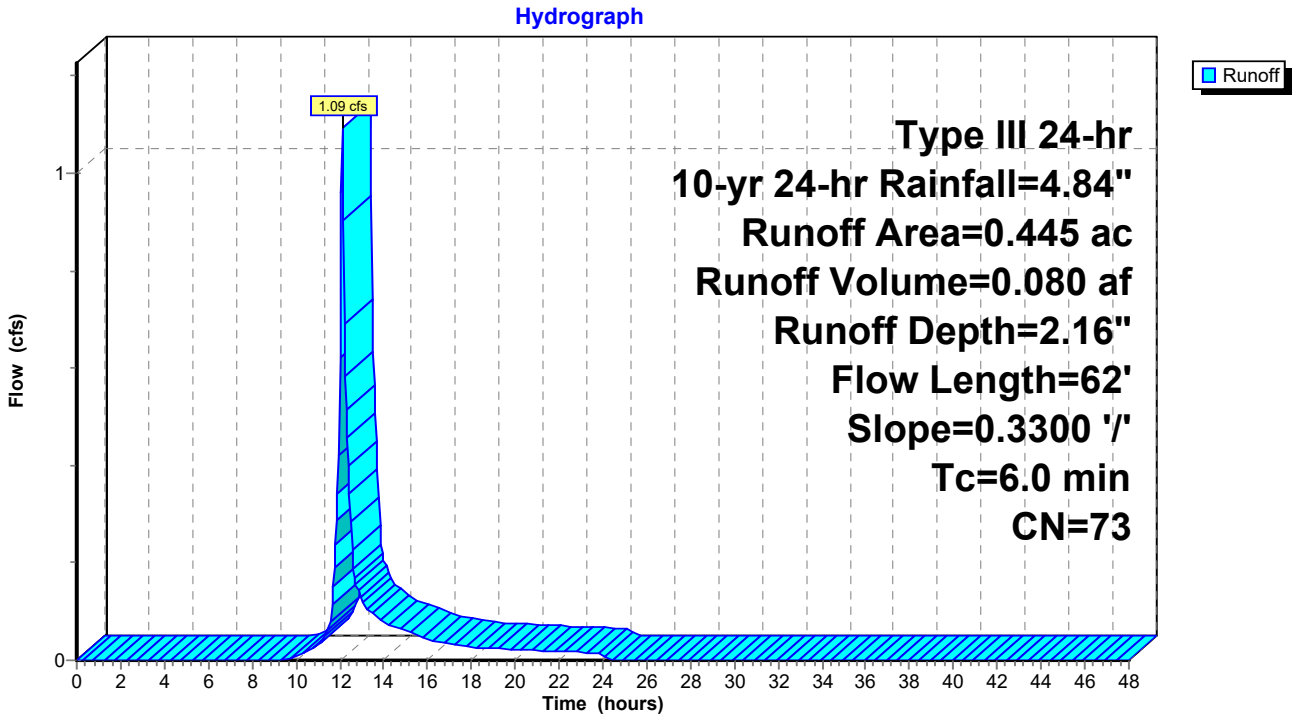
Runoff = 1.09 cfs @ 12.10 hrs, Volume= 0.080 af, Depth= 2.16"
Routed to Link N : POI-N

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-yr 24-hr Rainfall=4.84"

Area (ac)	CN	Description
0.029	49	50-75% Grass cover, Fair, HSG A
0.001	39	>75% Grass cover, Good, HSG A
0.000	96	Gravel surface, HSG C
0.396	74	>75% Grass cover, Good, HSG C
0.018	79	50-75% Grass cover, Fair, HSG C
0.445	73	Weighted Average
0.445		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.2	62	0.3300	0.33		**Sheet Flow, Landfill Slope** Grass: Dense n= 0.240 P2= 3.23"
3.2	62	Total, Increased to minimum Tc = 6.0 min			

Subcatchment N10: Subcat N10



Summary for Subcatchment N11: Subcat N11

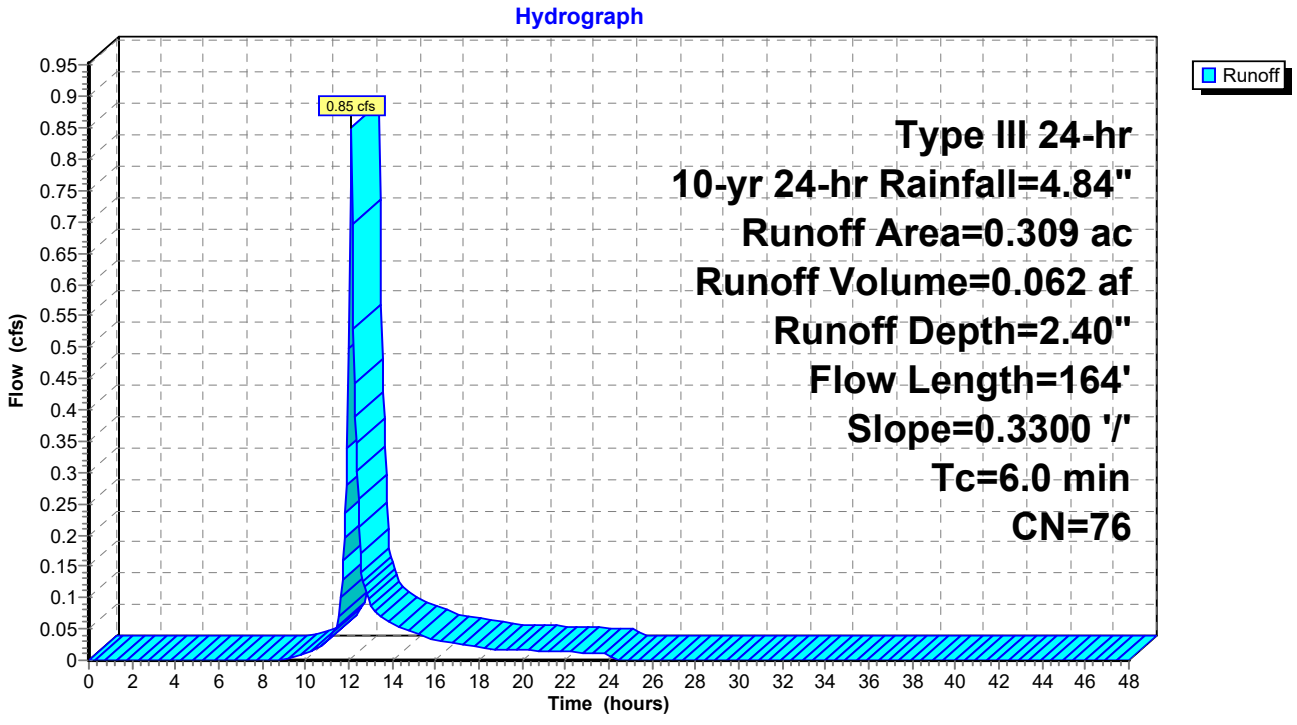
Runoff = 0.85 cfs @ 12.09 hrs, Volume= 0.062 af, Depth= 2.40"
Routed to Link N : POI-N

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-yr 24-hr Rainfall=4.84"

Area (ac)	CN	Description
0.027	96	Gravel surface, HSG C
0.276	74	>75% Grass cover, Good, HSG C
0.006	79	50-75% Grass cover, Fair, HSG C
0.309	76	Weighted Average
0.309		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.6	100	0.3300	0.36		**Sheet Flow, Landfill Slope** Grass: Dense n= 0.240 P2= 3.23"
0.3	64	0.3300	4.02		**Shallow Concentrated Flow, Landfill Slope** Short Grass Pasture Kv= 7.0 fps
4.9	164	Total, Increased to minimum Tc = 6.0 min			

Subcatchment N11: Subcat N11



Summary for Subcatchment N12: Subcat N12

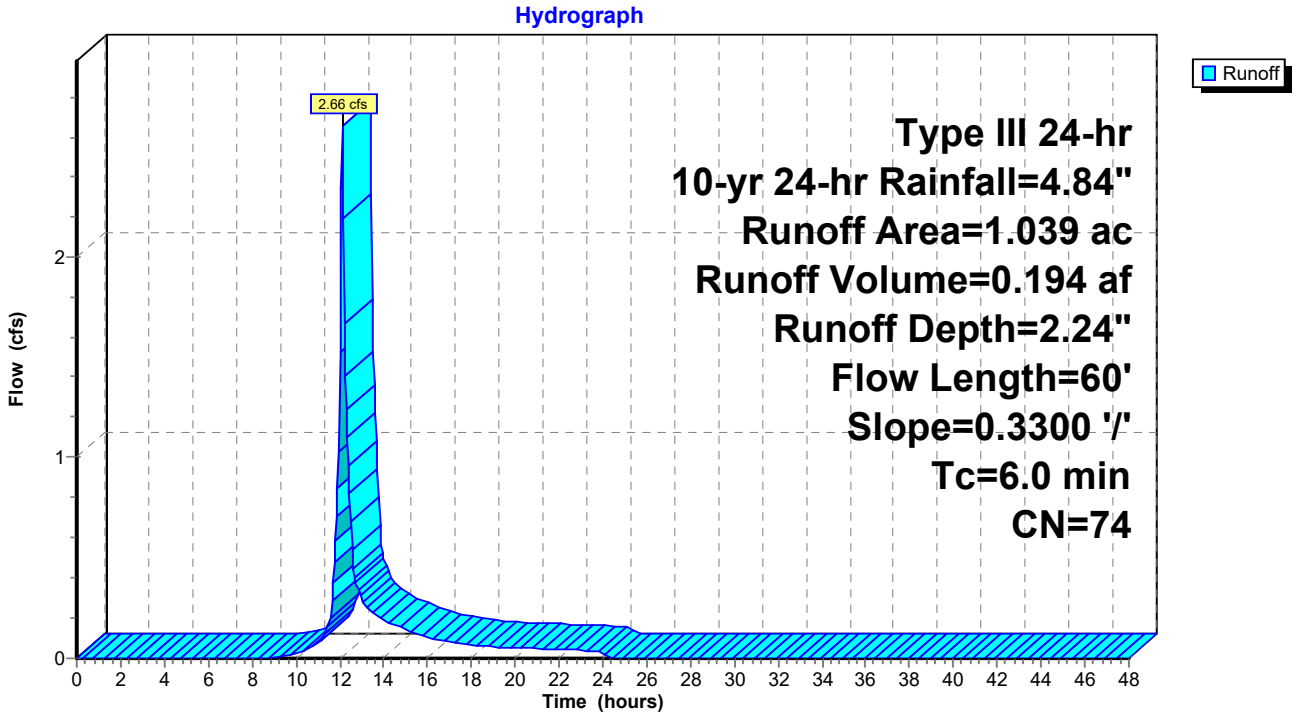
Runoff = 2.66 cfs @ 12.10 hrs, Volume= 0.194 af, Depth= 2.24"
Routed to Link N : POI-N

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-yr 24-hr Rainfall=4.84"

Area (ac)	CN	Description
0.000	49	50-75% Grass cover, Fair, HSG A
0.000	49	50-75% Grass cover, Fair, HSG A
0.000	79	50-75% Grass cover, Fair, HSG C
0.001	79	50-75% Grass cover, Fair, HSG C
0.001	79	50-75% Grass cover, Fair, HSG C
0.001	79	50-75% Grass cover, Fair, HSG C
0.000	79	50-75% Grass cover, Fair, HSG C
0.009	79	50-75% Grass cover, Fair, HSG C
0.003	79	50-75% Grass cover, Fair, HSG C
1.024	74	>75% Grass cover, Good, HSG C
1.039	74	Weighted Average
1.039		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.1	60	0.3300	0.33		**Sheet Flow, Landfill Slope** Grass: Dense n= 0.240 P2= 3.23"
3.1	60	Total, Increased to minimum Tc = 6.0 min			

Subcatchment N12: Subcat N12



Summary for Subcatchment N3: Subcat N3

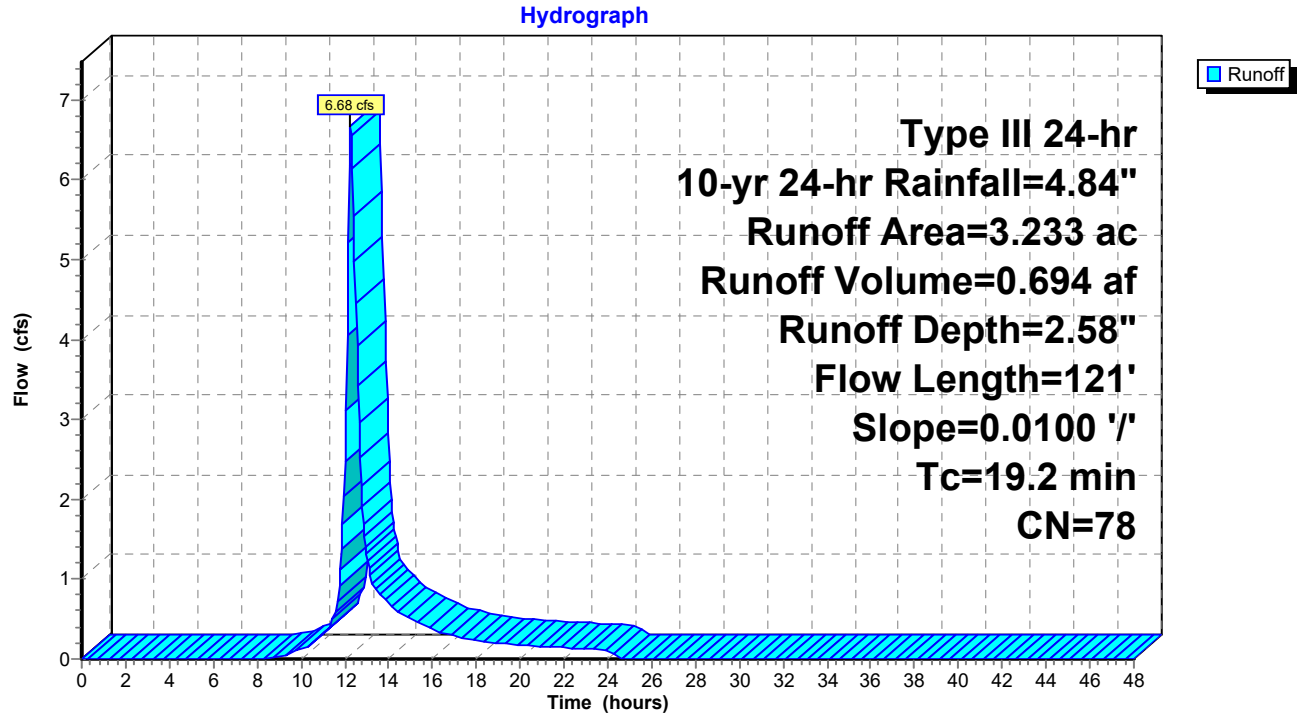
Runoff = 6.68 cfs @ 12.27 hrs, Volume= 0.694 af, Depth= 2.58"
Routed to Pond P-N2 : North Basin 2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-yr 24-hr Rainfall=4.84"

Area (ac)	CN	Description
0.166	49	50-75% Grass cover, Fair, HSG A
2.016	79	50-75% Grass cover, Fair, HSG C
0.654	79	50-75% Grass cover, Fair, HSG C
0.087	96	Gravel surface, HSG C
0.000	74	>75% Grass cover, Good, HSG C
0.021	96	Gravel surface, HSG C
0.289	74	>75% Grass cover, Good, HSG C
3.233	78	Weighted Average
3.233		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
18.7	100	0.0100	0.09		**Sheet Flow, Grass** Grass: Dense n= 0.240 P2= 3.23"
0.5	21	0.0100	0.70		**Shallow Concentrated Flow, Grass** Short Grass Pasture Kv= 7.0 fps
19.2	121	Total			

Subcatchment N3: Subcat N3



Summary for Subcatchment N4: Subcat N4

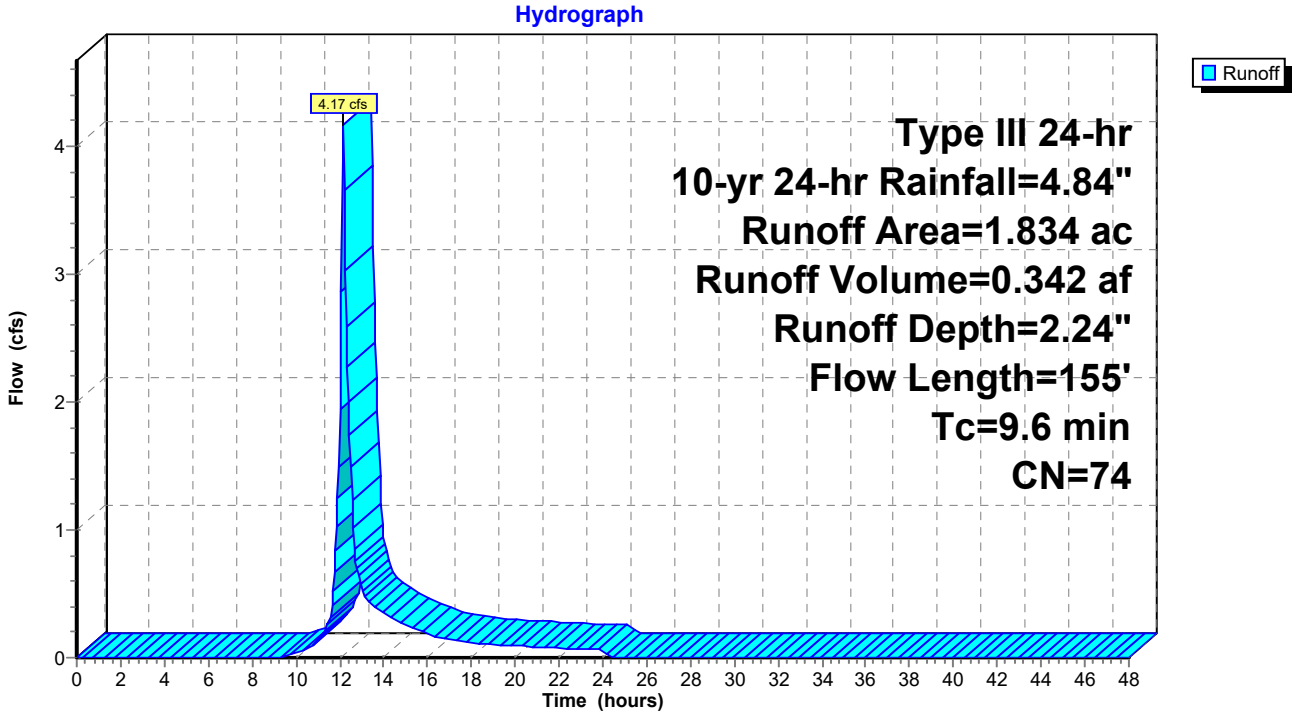
Runoff = 4.17 cfs @ 12.14 hrs, Volume= 0.342 af, Depth= 2.24"
Routed to Reach R9 : Sideslope Swale

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-yr 24-hr Rainfall=4.84"

Area (ac)	CN	Description
0.002	96	Gravel surface, HSG C
1.832	74	>75% Grass cover, Good, HSG C
1.834	74	Weighted Average
1.834		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.0	77	0.0500	0.16		**Sheet Flow, Landfill Deck** Grass: Dense n= 0.240 P2= 3.23"
1.4	23	0.3300	0.27		**Sheet Flow, Landfill Slope** Grass: Dense n= 0.240 P2= 3.23"
0.2	55	0.3300	4.02		**Shallow Concentrated Flow, Landfill Slope** Short Grass Pasture Kv= 7.0 fps
9.6	155	Total			

Subcatchment N4: Subcat N4



Summary for Subcatchment N5: Subcat N5

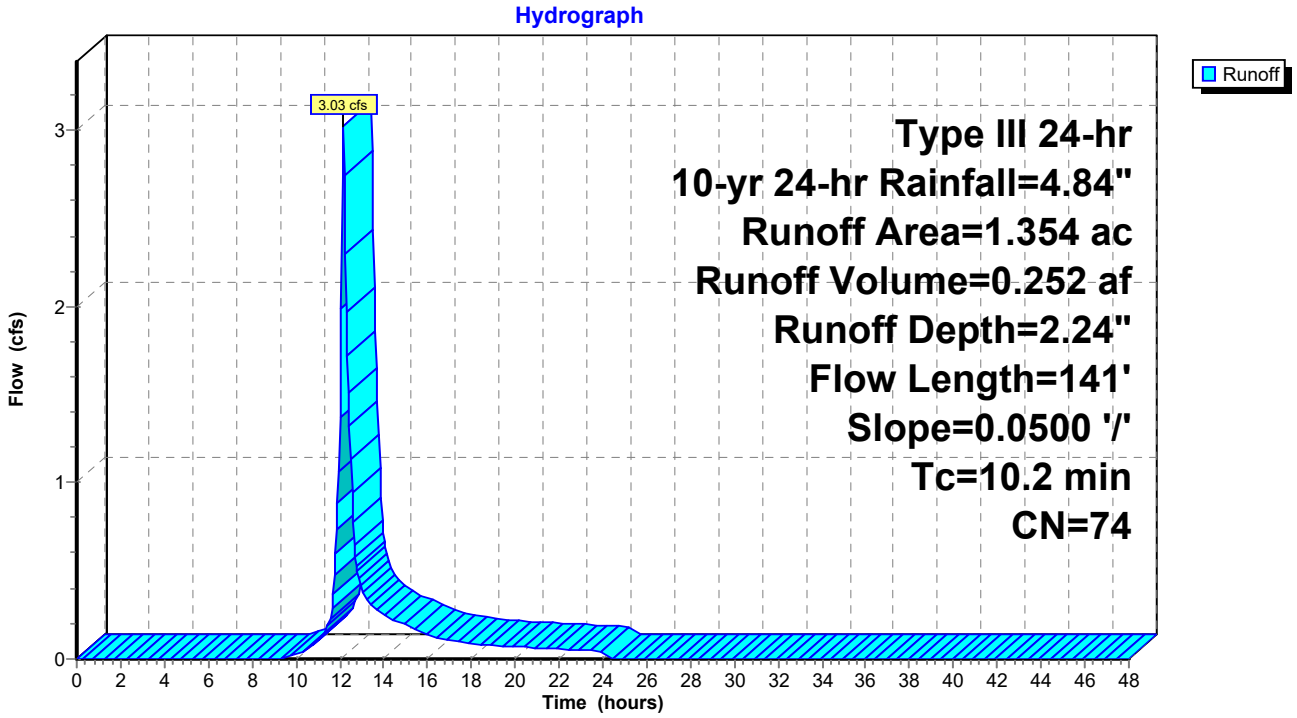
Runoff = 3.03 cfs @ 12.15 hrs, Volume= 0.252 af, Depth= 2.24"
Routed to Reach R8 : Sideslope Swale

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-yr 24-hr Rainfall=4.84"

Area (ac)	CN	Description
1.354	74	>75% Grass cover, Good, HSG C
1.354		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.8	100	0.0500	0.17		**Sheet Flow, Landfill Deck** Grass: Dense n= 0.240 P2= 3.23"
0.4	41	0.0500	1.57		**Shallow Concentrated Flow, Landfill Deck** Short Grass Pasture Kv= 7.0 fps
10.2	141	Total			

Subcatchment N5: Subcat N5



Summary for Subcatchment N6: Subcat N6

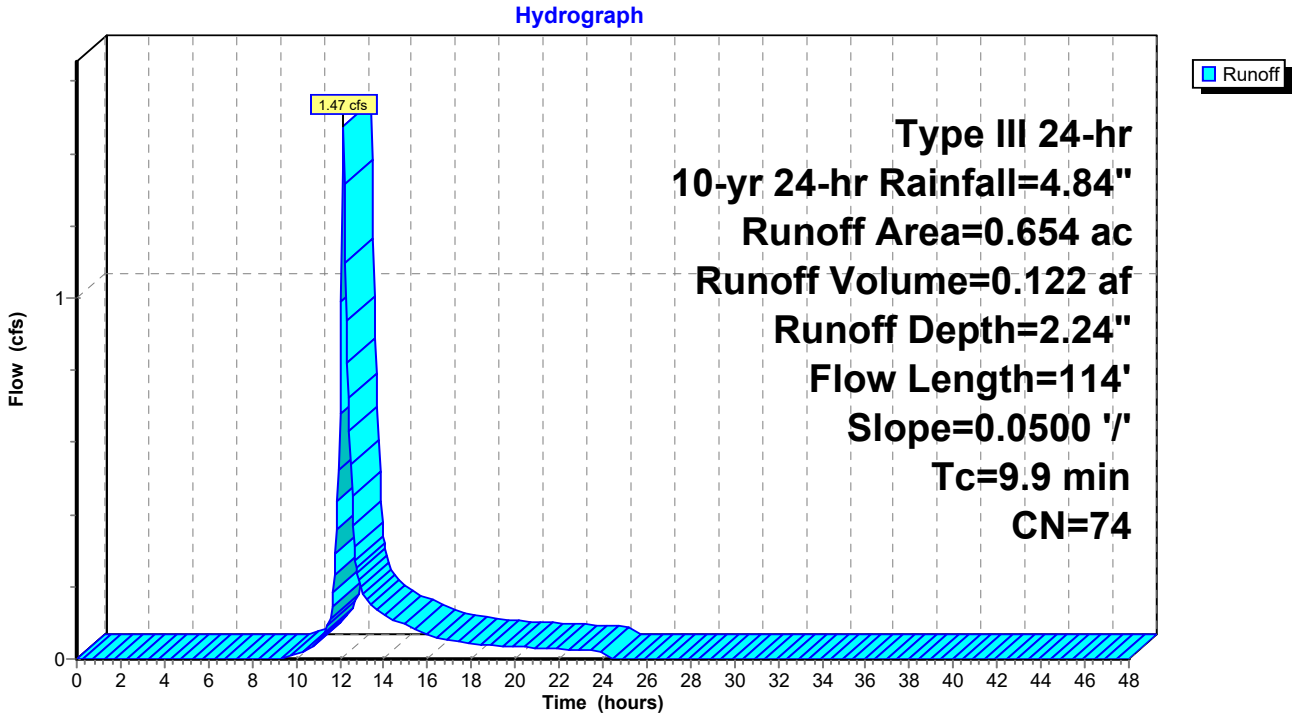
Runoff = 1.47 cfs @ 12.15 hrs, Volume= 0.122 af, Depth= 2.24"
Routed to Reach DC-N : RipRap Downchute

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-yr 24-hr Rainfall=4.84"

Area (ac)	CN	Description
0.654	74	>75% Grass cover, Good, HSG C
0.654		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.8	100	0.0500	0.17		**Sheet Flow, Landfill Deck** Grass: Dense n= 0.240 P2= 3.23"
0.1	14	0.0500	1.57		**Shallow Concentrated Flow, Landfill Deck** Short Grass Pasture Kv= 7.0 fps
9.9	114	Total			

Subcatchment N6: Subcat N6



Summary for Subcatchment N7: Subcat N7

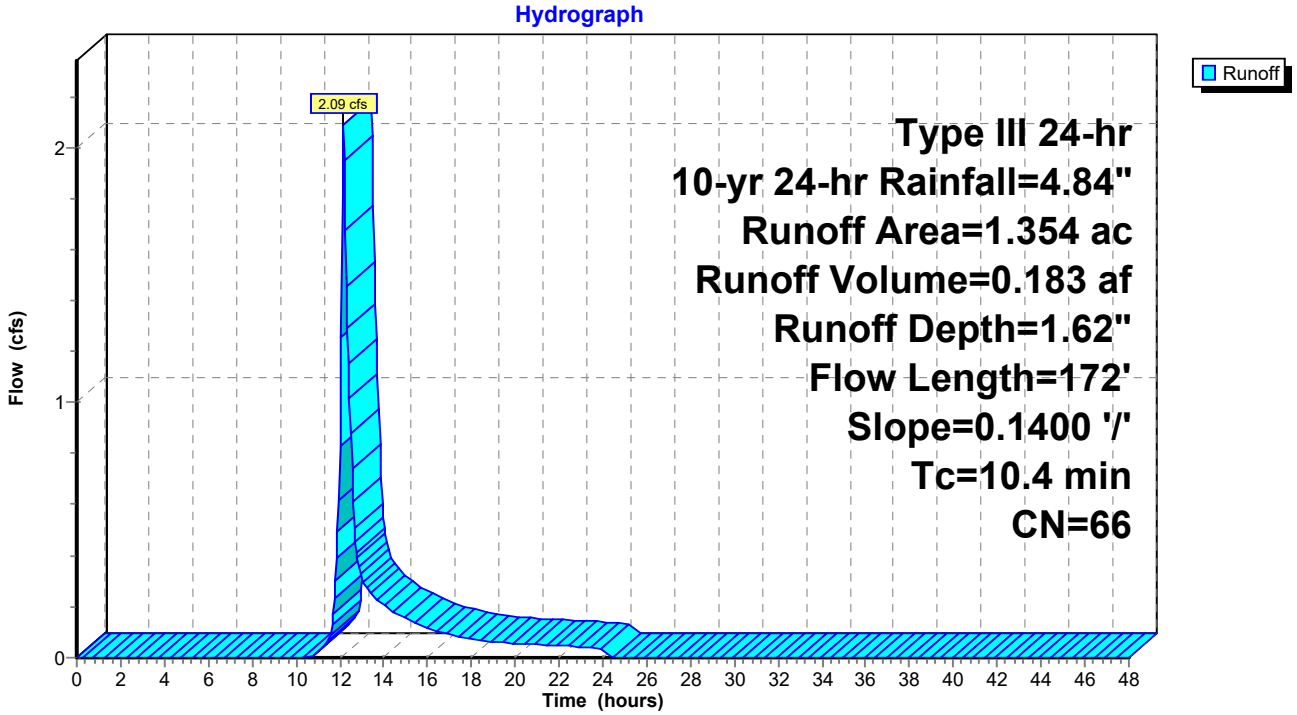
Runoff = 2.09 cfs @ 12.16 hrs, Volume= 0.183 af, Depth= 1.62"
Routed to Reach PRB : Perimeter Swale

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-yr 24-hr Rainfall=4.84"

Area (ac)	CN	Description
0.531	49	50-75% Grass cover, Fair, HSG A
0.045	96	Gravel surface, HSG C
0.430	74	>75% Grass cover, Good, HSG C
0.349	79	50-75% Grass cover, Fair, HSG C
1.354	66	Weighted Average
1.354		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.8	100	0.1400	0.17		**Sheet Flow, Woods** Woods: Light underbrush n= 0.400 P2= 3.23"
0.6	72	0.1400	1.87		**Shallow Concentrated Flow, Woods** Woodland Kv= 5.0 fps
10.4	172	Total			

Subcatchment N7: Subcat N7



Summary for Subcatchment N8: Subcat N8

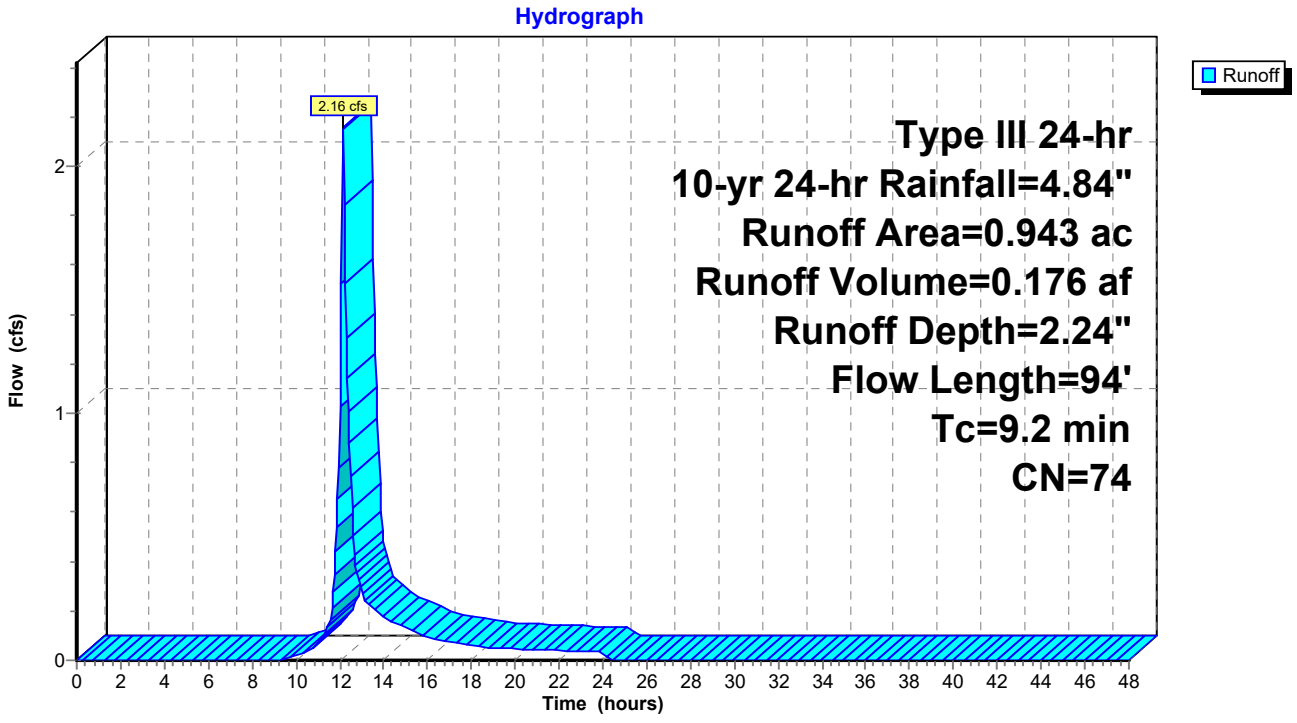
Runoff = 2.16 cfs @ 12.14 hrs, Volume= 0.176 af, Depth= 2.24"
Routed to Reach R6 : Sideslope Swale

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-yr 24-hr Rainfall=4.84"

Area (ac)	CN	Description
0.008	96	Gravel surface, HSG C
0.934	74	>75% Grass cover, Good, HSG C
0.000	79	50-75% Grass cover, Fair, HSG C
0.943	74	Weighted Average
0.943		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.2	80	0.0500	0.16		**Sheet Flow, Landfill Deck** Grass: Dense n= 0.240 P2= 3.23"
1.0	14	0.3300	0.24		**Sheet Flow, Landfill Slope** Grass: Dense n= 0.240 P2= 3.23"
9.2	94	Total			

Subcatchment N8: Subcat N8



Summary for Subcatchment N9: Subcat N9

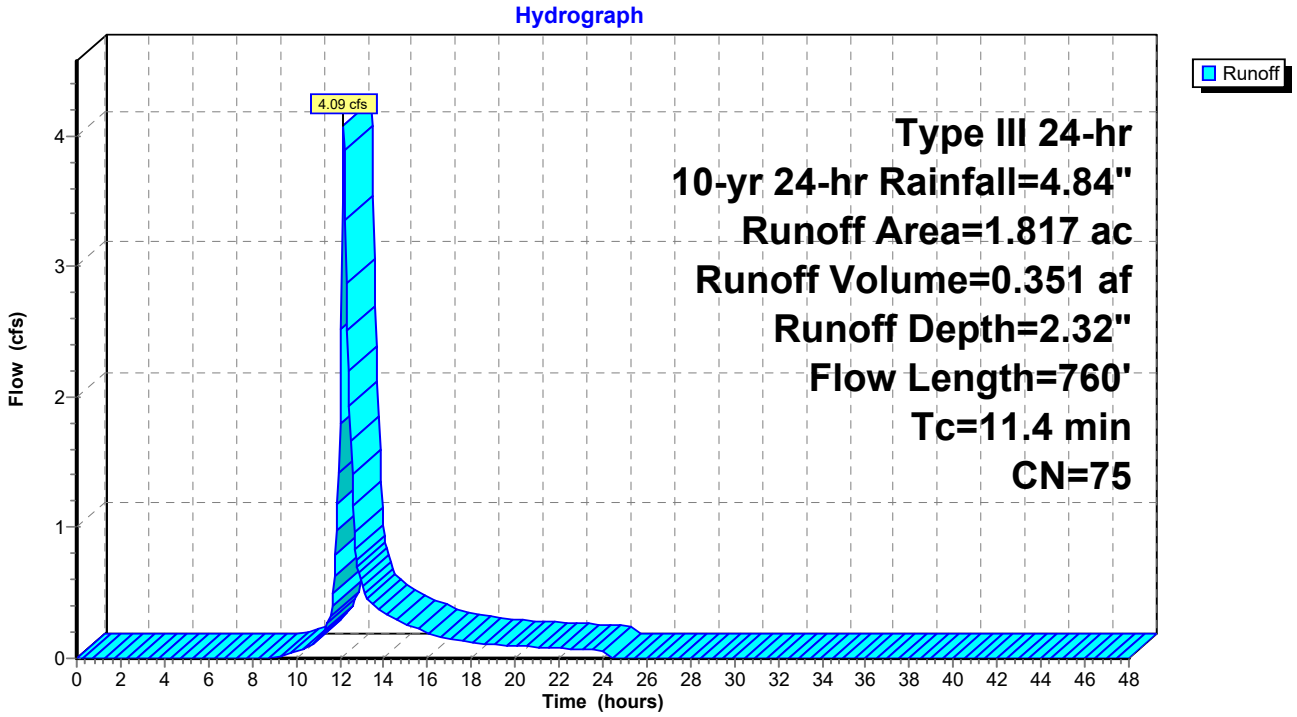
Runoff = 4.09 cfs @ 12.16 hrs, Volume= 0.351 af, Depth= 2.32"
Routed to Reach R7 : Sideslope Swale

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-yr 24-hr Rainfall=4.84"

Area (ac)	CN	Description
0.025	96	Gravel surface, HSG C
0.075	96	Gravel surface, HSG C
1.718	74	>75% Grass cover, Good, HSG C
0.000	74	>75% Grass cover, Good, HSG C
1.817	75	Weighted Average
1.817		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.2	56	0.0500	0.15		**Sheet Flow, Landfill Deck** Grass: Dense n= 0.240 P2= 3.23"
2.4	44	0.3300	0.31		**Sheet Flow, Landfill Slope** Grass: Dense n= 0.240 P2= 3.23"
0.0	10	0.3300	5.17		**Shallow Concentrated Flow, Landfill Slope** Cultivated Straight Rows Kv= 9.0 fps
2.8	650	0.0100	3.89	21.85	**Trap/Vee/Rect Channel Flow, Sideslope Swale** Bot.W=0.00' D=1.50' Z= 2.0 & 3.0 '/' Top.W=7.50' n= 0.030 Earth, grassed & winding
11.4	760	Total			

Subcatchment N9: Subcat N9



Summary for Subcatchment NP: Subcat NP

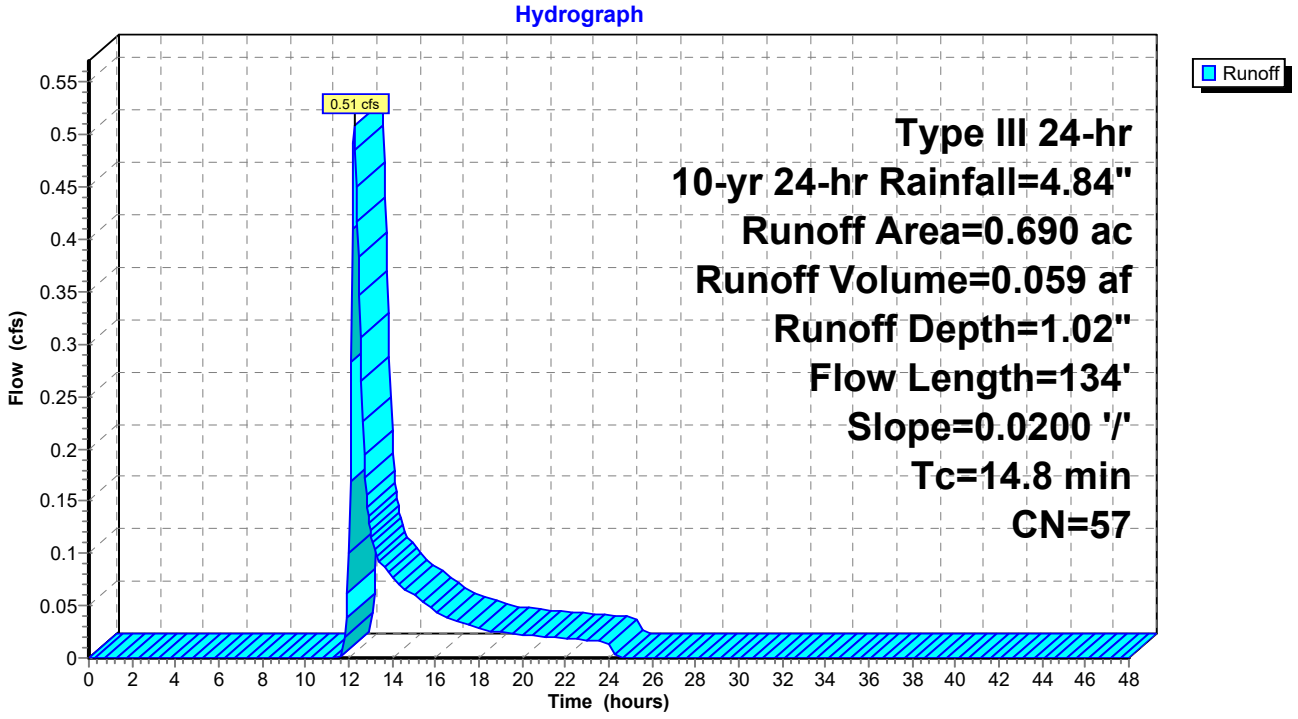
Runoff = 0.51 cfs @ 12.25 hrs, Volume= 0.059 af, Depth= 1.02"
Routed to Pond P-N1 : North Basin 1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-yr 24-hr Rainfall=4.84"

Area (ac)	CN	Description
0.056	49	50-75% Grass cover, Fair, HSG A
0.143	79	50-75% Grass cover, Fair, HSG C
0.004	79	50-75% Grass cover, Fair, HSG C
0.431	49	50-75% Grass cover, Fair, HSG A
0.056	74	>75% Grass cover, Good, HSG C
0.690	57	Weighted Average
0.690		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.2	100	0.0200	0.12		**Sheet Flow, Valley** Grass: Dense n= 0.240 P2= 3.23"
0.6	34	0.0200	0.99		**Shallow Concentrated Flow, Valley** Short Grass Pasture Kv= 7.0 fps
14.8	134	Total			

Subcatchment NP: Subcat NP



Summary for Subcatchment S1: Subcat S7

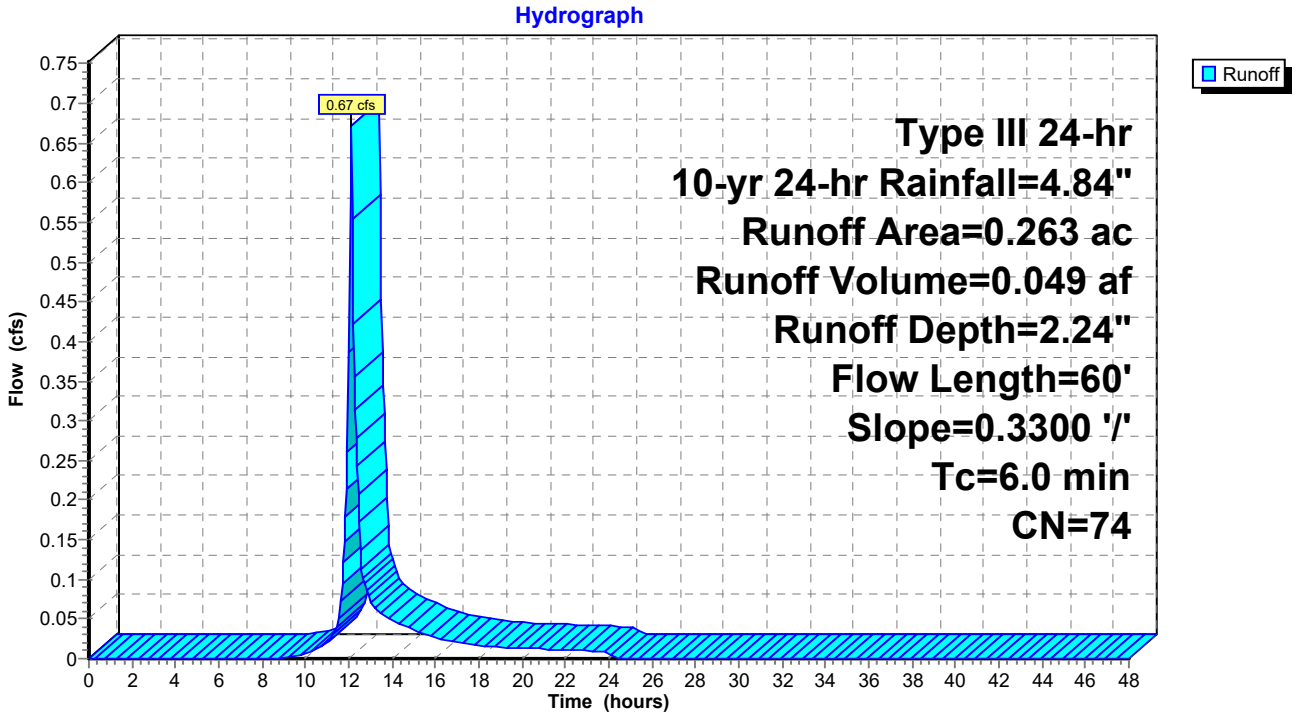
Runoff = 0.67 cfs @ 12.10 hrs, Volume= 0.049 af, Depth= 2.24"
Routed to Link S : POI-S

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-yr 24-hr Rainfall=4.84"

Area (ac)	CN	Description
0.002	79	50-75% Grass cover, Fair, HSG C
0.001	79	50-75% Grass cover, Fair, HSG C
0.163	74	>75% Grass cover, Good, HSG C
0.097	74	>75% Grass cover, Good, HSG C
0.263	74	Weighted Average
0.263		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.1	60	0.3300	0.33		**Sheet Flow, Landfill Slope** Grass: Dense n= 0.240 P2= 3.23"
3.1	60	Total, Increased to minimum Tc = 6.0 min			

Subcatchment S1: Subcat S7



Summary for Subcatchment S2: Subcat S2

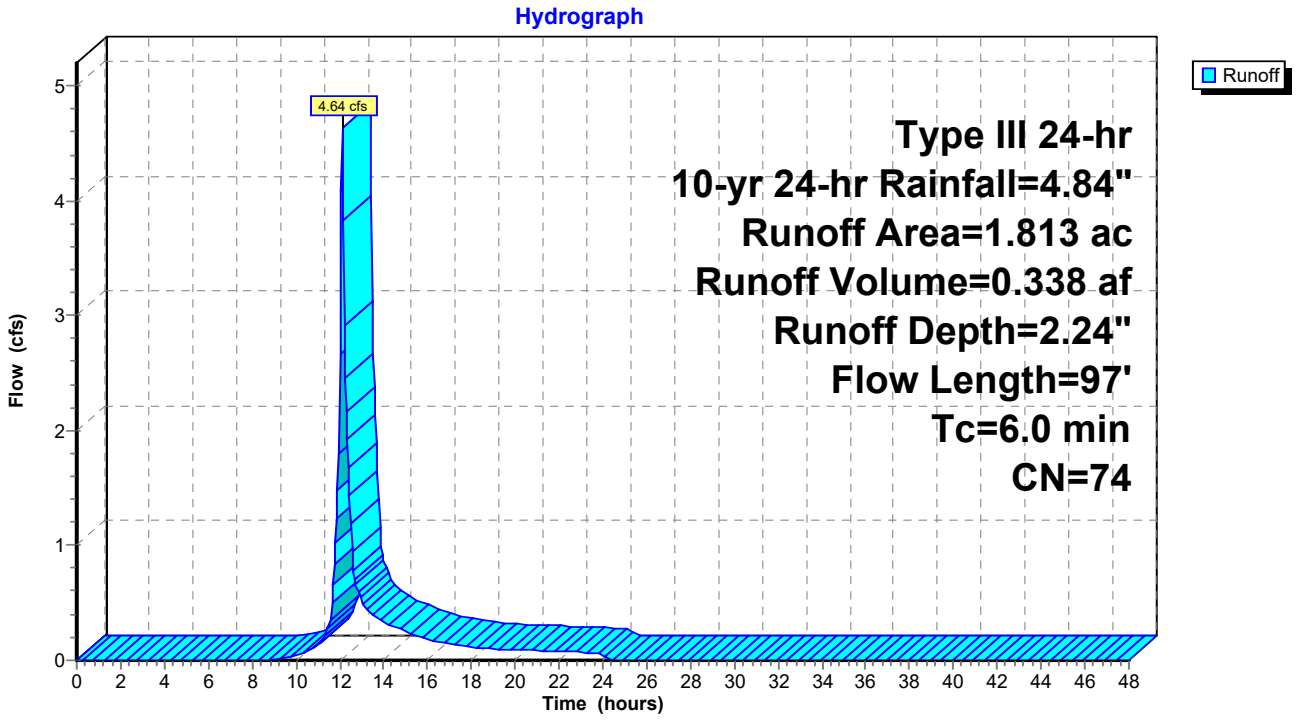
Runoff = 4.64 cfs @ 12.10 hrs, Volume= 0.338 af, Depth= 2.24"
Routed to Reach R1 : Sideslope Swale

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-yr 24-hr Rainfall=4.84"

Area (ac)	CN	Description
0.098	74	>75% Grass cover, Good, HSG C
0.039	96	Gravel surface, HSG C
1.676	74	>75% Grass cover, Good, HSG C
1.813	74	Weighted Average
1.813		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	31	0.1300	0.69		**Sheet Flow, Landfill Access Road** Fallow n= 0.050 P2= 3.23"
3.3	66	0.3300	0.33		**Sheet Flow, Landfill Slope** Grass: Dense n= 0.240 P2= 3.23"
4.1	97	Total, Increased to minimum Tc = 6.0 min			

Subcatchment S2: Subcat S2



Summary for Subcatchment S3: Subcat S3

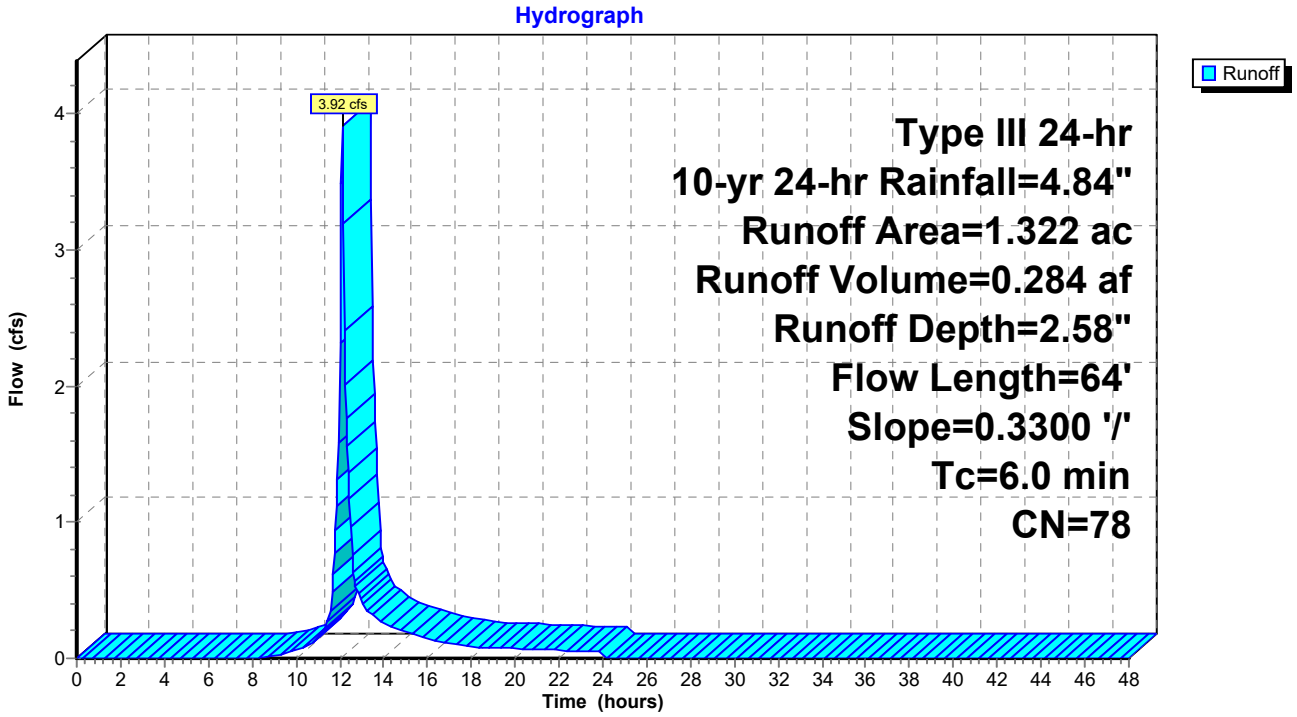
Runoff = 3.92 cfs @ 12.09 hrs, Volume= 0.284 af, Depth= 2.58"
Routed to Reach R5 : Sideslope Swale

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-yr 24-hr Rainfall=4.84"

Area (ac)	CN	Description
0.008	79	50-75% Grass cover, Fair, HSG C
0.003	79	50-75% Grass cover, Fair, HSG C
0.069	49	50-75% Grass cover, Fair, HSG A
0.164	91	Fallow, bare soil, HSG C
0.066	74	>75% Grass cover, Good, HSG C
0.016	96	Gravel surface, HSG C
0.071	96	Gravel surface, HSG C
0.025	96	Gravel surface, HSG C
0.087	96	Gravel surface, HSG C
0.001	98	Roofs, HSG C
0.033	74	>75% Grass cover, Good, HSG C
0.779	74	>75% Grass cover, Good, HSG C
1.322	78	Weighted Average
1.321		99.89% Pervious Area
0.001		0.11% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.2	64	0.3300	0.33		**Sheet Flow, Landfill Slope** Grass: Dense n= 0.240 P2= 3.23"
3.2	64	Total, Increased to minimum Tc = 6.0 min			

Subcatchment S3: Subcat S3



Summary for Subcatchment S4: Subcat S4

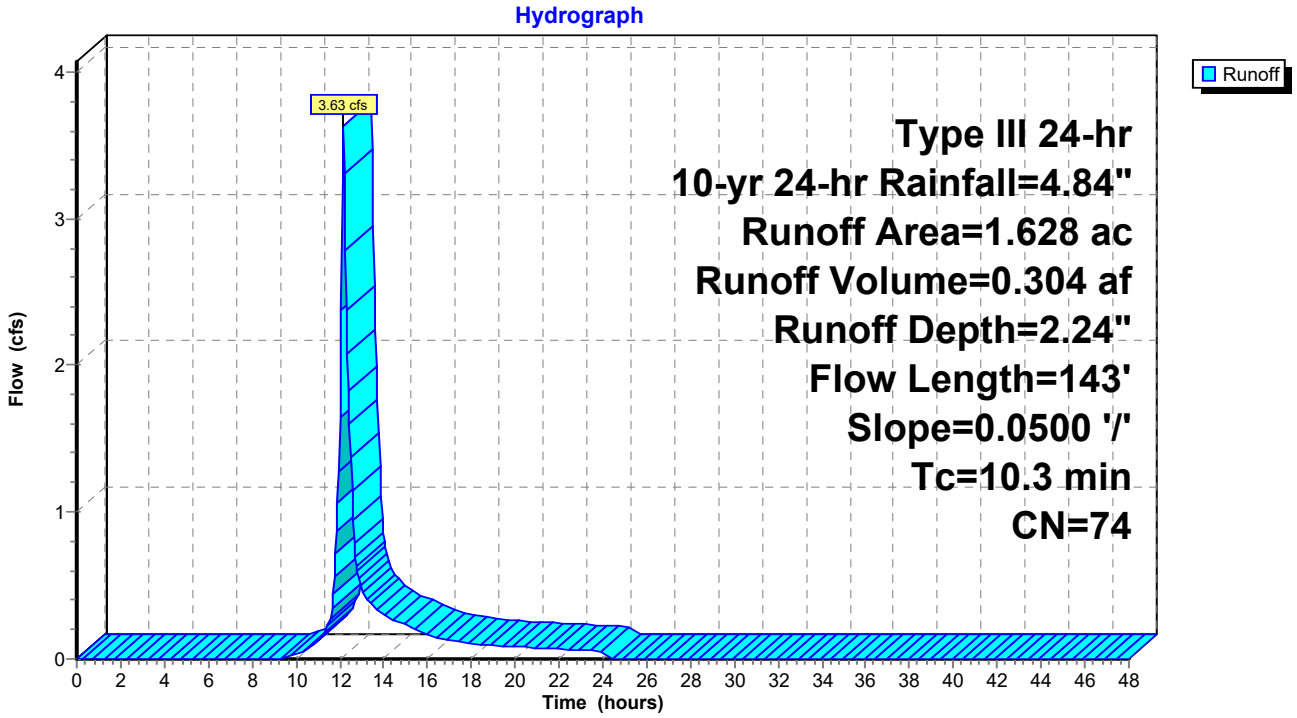
Runoff = 3.63 cfs @ 12.15 hrs, Volume= 0.304 af, Depth= 2.24"
Routed to Reach DC-S : RipRap Downchute

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-yr 24-hr Rainfall=4.84"

Area (ac)	CN	Description
1.628	74	>75% Grass cover, Good, HSG C
1.628		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.8	100	0.0500	0.17		**Sheet Flow, Landfill Deck** Grass: Dense n= 0.240 P2= 3.23"
0.5	43	0.0500	1.57		**Shallow Concentrated Flow, Landfill Deck** Short Grass Pasture Kv= 7.0 fps
10.3	143	Total			

Subcatchment S4: Subcat S4



Summary for Subcatchment S5: Subcat S5

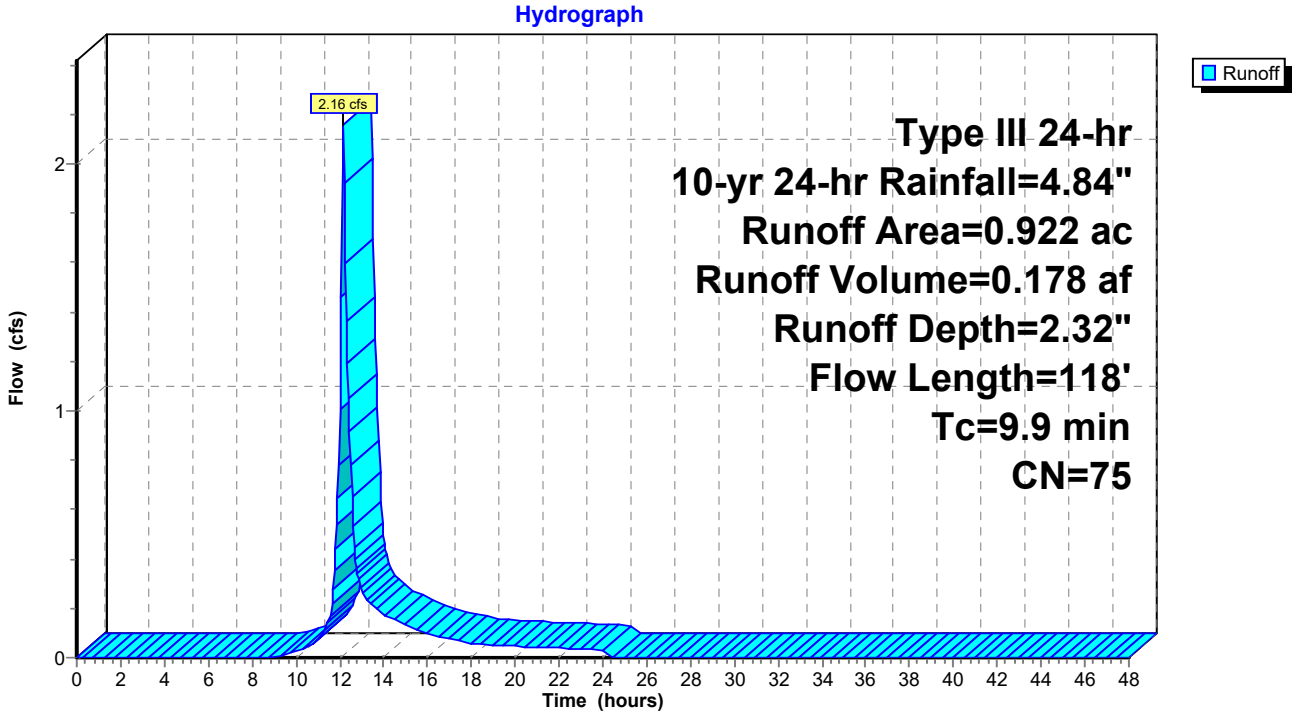
Runoff = 2.16 cfs @ 12.15 hrs, Volume= 0.178 af, Depth= 2.32"
Routed to Reach R4 : Sideslope Swale

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-yr 24-hr Rainfall=4.84"

Area (ac)	CN	Description
0.045	96	Gravel surface, HSG C
0.877	74	>75% Grass cover, Good, HSG C
0.922	75	Weighted Average
0.922		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.8	100	0.0500	0.17		**Sheet Flow, Landfill Deck** Grass: Dense n= 0.240 P2= 3.23"
0.1	12	0.0500	1.57		**Shallow Concentrated Flow, Landfill Deck** Short Grass Pasture Kv= 7.0 fps
0.0	6	0.3300	4.02		**Shallow Concentrated Flow, Landfill Slope** Short Grass Pasture Kv= 7.0 fps
9.9	118	Total			

Subcatchment S5: Subcat S5



Summary for Subcatchment S6: Subcat S6

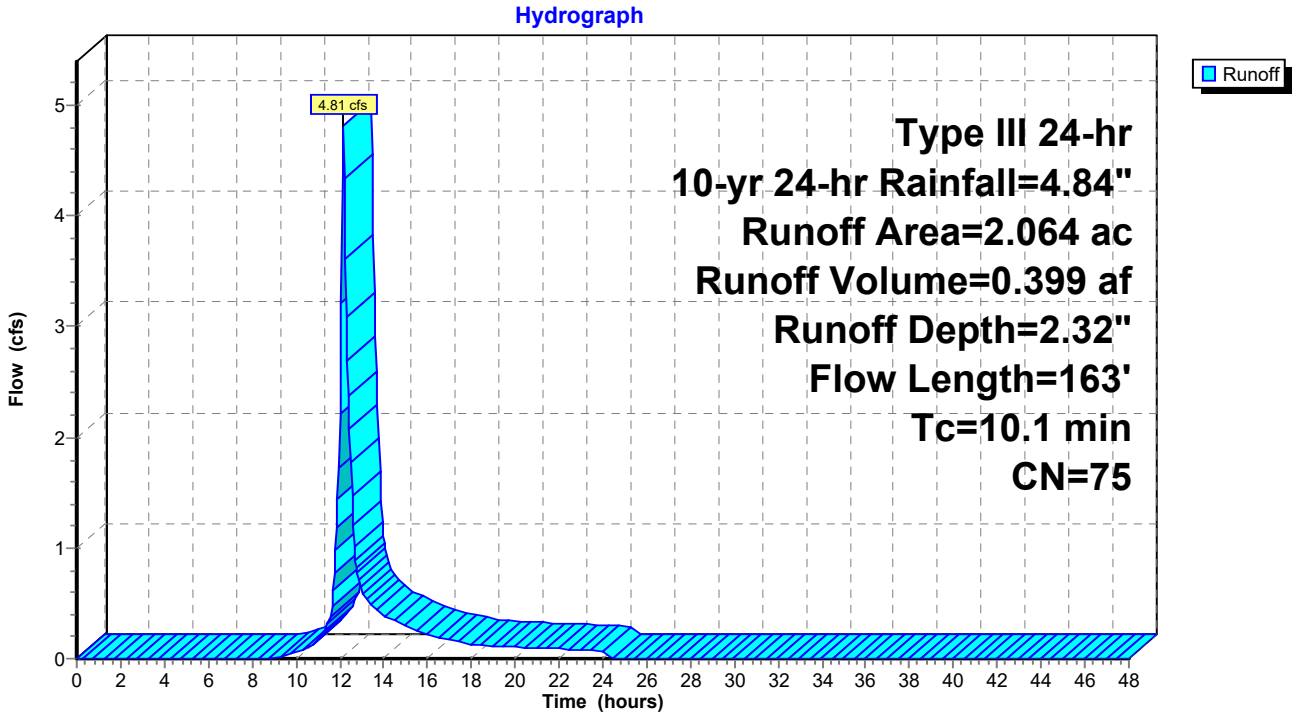
Runoff = 4.81 cfs @ 12.15 hrs, Volume= 0.399 af, Depth= 2.32"
Routed to Reach R2 : Sideslope Swale

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-yr 24-hr Rainfall=4.84"

Area (ac)	CN	Description
1.998	74	>75% Grass cover, Good, HSG C
0.066	96	Gravel surface, HSG C
2.064	75	Weighted Average
2.064		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.8	100	0.0500	0.17		**Sheet Flow, Landfill Deck** Grass: Dense n= 0.240 P2= 3.23"
0.3	63	0.3300	4.02		**Shallow Concentrated Flow, Landfill Slope** Short Grass Pasture Kv= 7.0 fps
10.1	163	Total			

Subcatchment S6: Subcat S6



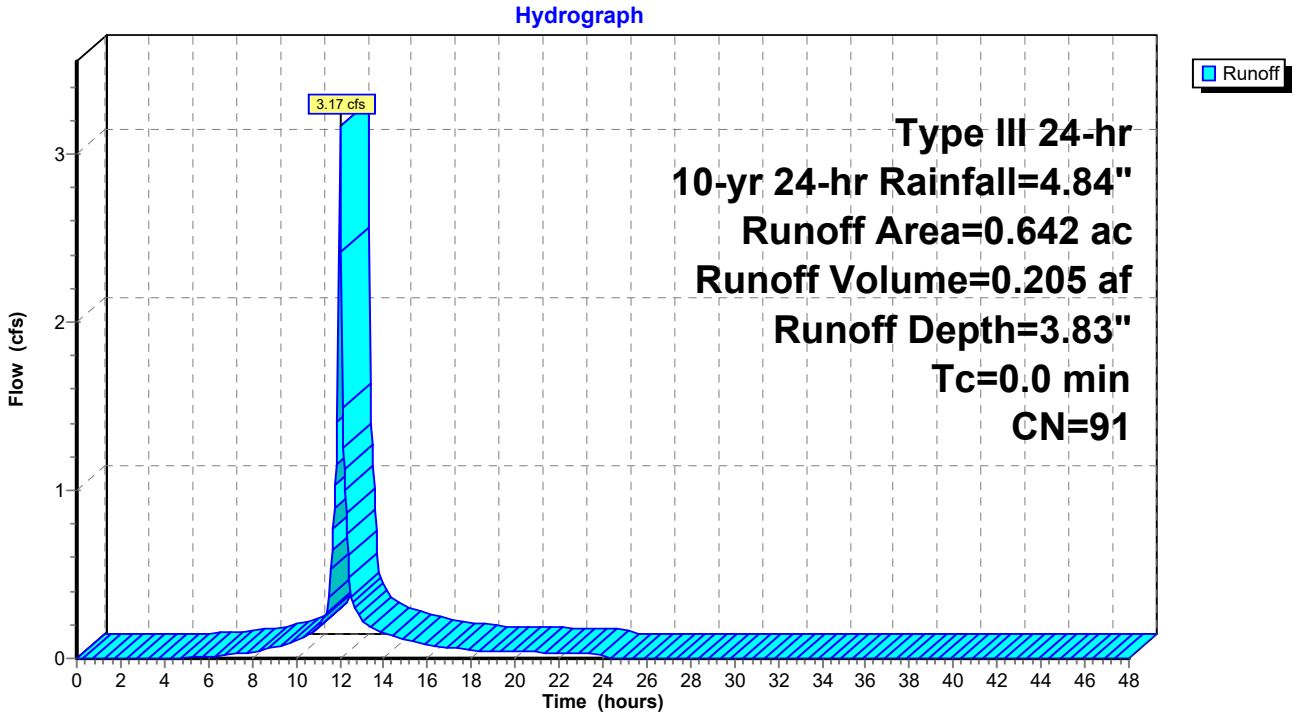
Summary for Subcatchment SP: Subcat SP

Runoff = 3.17 cfs @ 12.00 hrs, Volume= 0.205 af, Depth= 3.83"
Routed to Pond PND-S : South Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-yr 24-hr Rainfall=4.84"

Area (ac)	CN	Description
0.008	74	>75% Grass cover, Good, HSG C
0.635	91	Fallow, bare soil, HSG C
0.642	91	Weighted Average
0.642		100.00% Pervious Area

Subcatchment SP: Subcat SP



Summary for Reach DC-N: RipRap Downchute

Inflow Area = 3.841 ac, 0.00% Impervious, Inflow Depth = 2.24" for 10-yr 24-hr event
Inflow = 8.13 cfs @ 12.21 hrs, Volume= 0.716 af
Outflow = 8.05 cfs @ 12.22 hrs, Volume= 0.716 af, Atten= 1%, Lag= 0.6 min
Routed to Pond P-N2 : North Basin 2

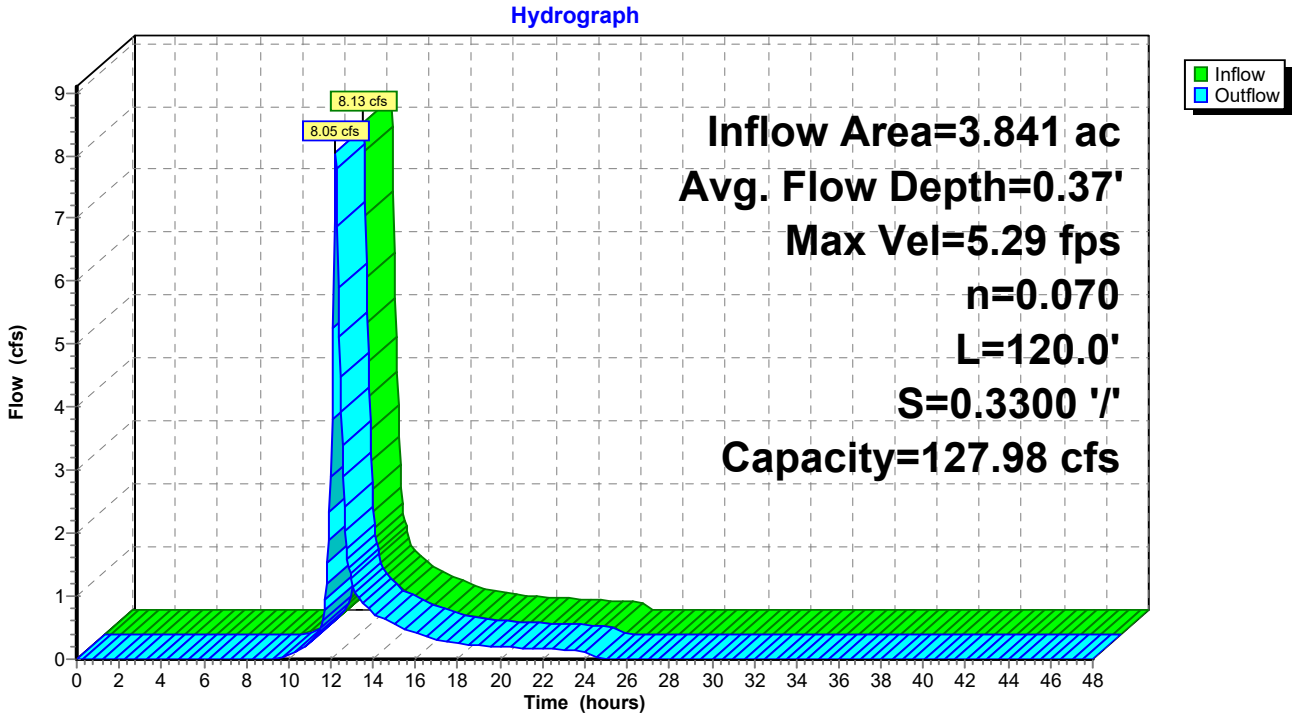
Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 5.29 fps, Min. Travel Time= 0.4 min
Avg. Velocity = 1.71 fps, Avg. Travel Time= 1.2 min

Peak Storage= 184 cf @ 12.21 hrs
Average Depth at Peak Storage= 0.37' , Surface Width= 5.23'
Bank-Full Depth= 1.50' Flow Area= 11.3 sf, Capacity= 127.98 cfs

3.00' x 1.50' deep channel, n= 0.070
Side Slope Z-value= 3.0 '/' Top Width= 12.00'
Length= 120.0' Slope= 0.3300 '/'
Inlet Invert= 919.60', Outlet Invert= 880.00'

‡

Reach DC-N: RipRap Downchute



Summary for Reach DC-S: RipRap Downchute

Inflow Area = 1.628 ac, 0.00% Impervious, Inflow Depth = 2.24" for 10-yr 24-hr event
Inflow = 3.63 cfs @ 12.15 hrs, Volume= 0.304 af
Outflow = 3.59 cfs @ 12.16 hrs, Volume= 0.304 af, Atten= 1%, Lag= 0.6 min
Routed to Reach PRA : Perimeter Swale

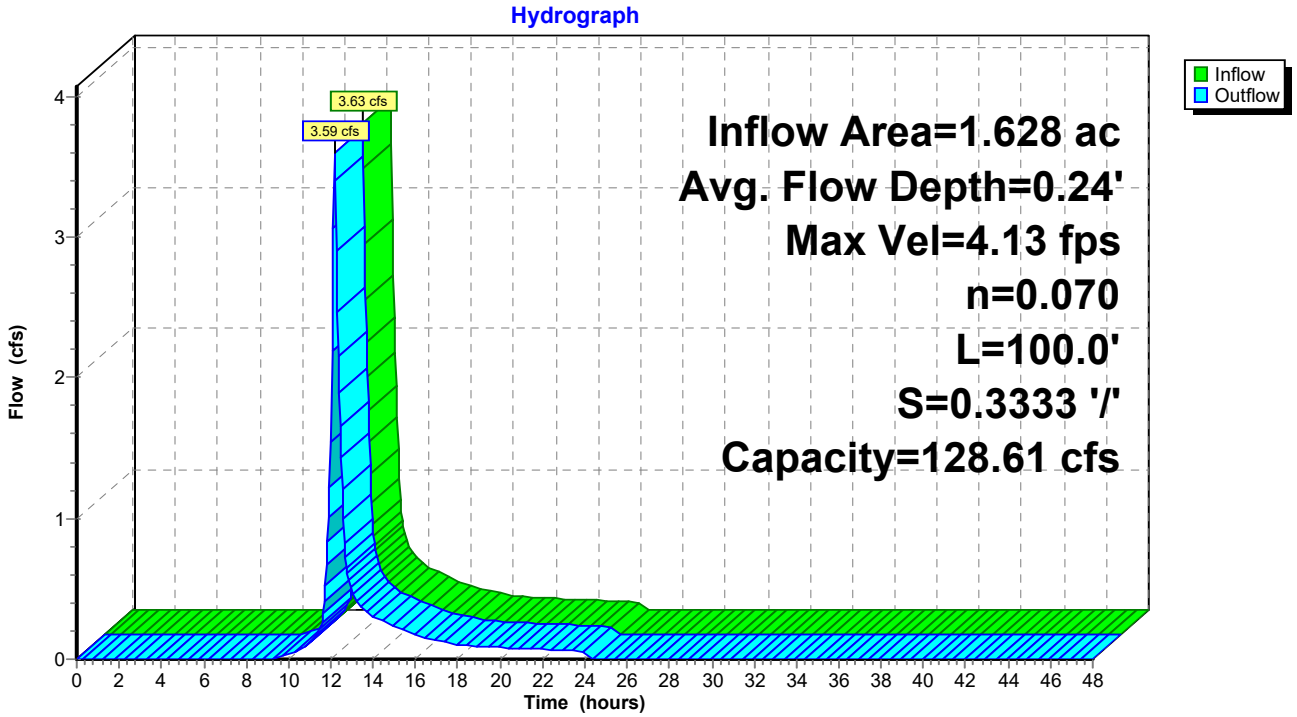
Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 4.13 fps, Min. Travel Time= 0.4 min
Avg. Velocity = 1.33 fps, Avg. Travel Time= 1.3 min

Peak Storage= 88 cf @ 12.16 hrs
Average Depth at Peak Storage= 0.24' , Surface Width= 4.42'
Bank-Full Depth= 1.50' Flow Area= 11.3 sf, Capacity= 128.61 cfs

3.00' x 1.50' deep channel, n= 0.070
Side Slope Z-value= 3.0 '/' Top Width= 12.00'
Length= 100.0' Slope= 0.3333 '/'
Inlet Invert= 915.33', Outlet Invert= 882.00'

‡

Reach DC-S: RipRap Downchute



Summary for Reach PRA: Perimeter Swale

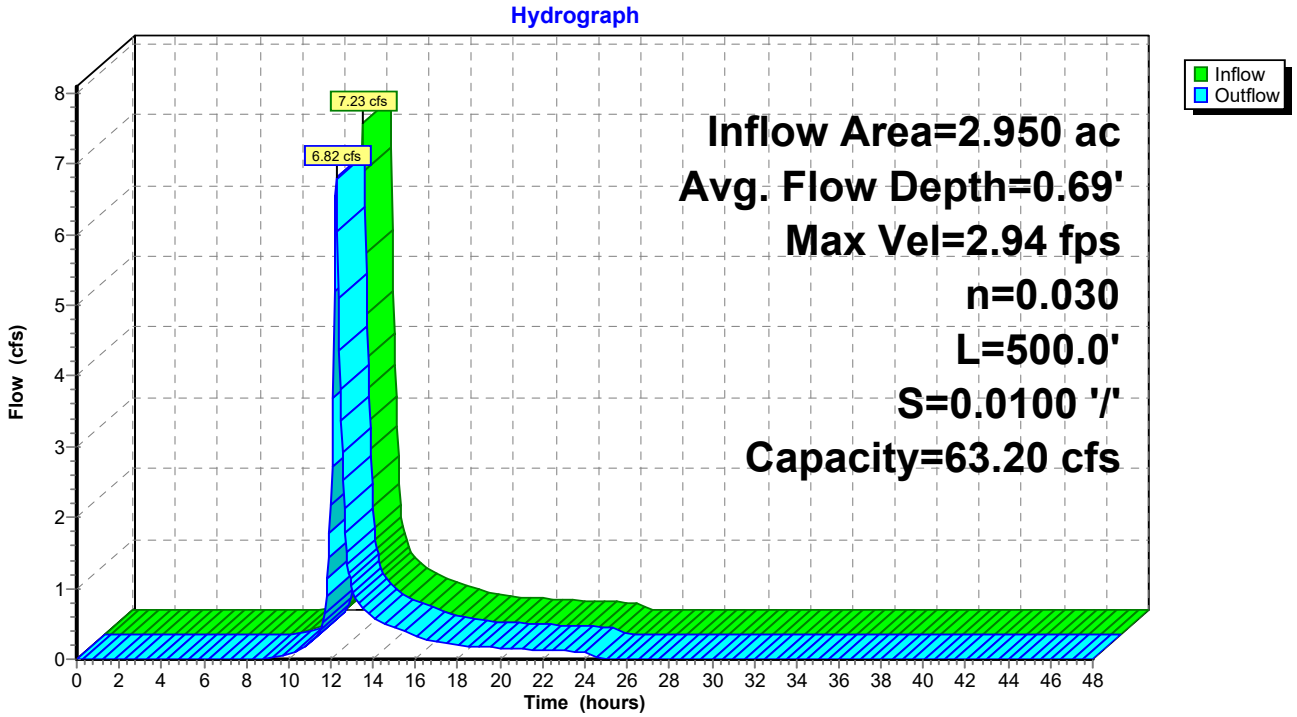
Inflow Area = 2.950 ac, 0.05% Impervious, Inflow Depth = 2.39" for 10-yr 24-hr event
Inflow = 7.23 cfs @ 12.15 hrs, Volume= 0.587 af
Outflow = 6.82 cfs @ 12.24 hrs, Volume= 0.587 af, Atten= 6%, Lag= 5.1 min
Routed to Pond C-1 : 30" Culvert

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.94 fps, Min. Travel Time= 2.8 min
Avg. Velocity = 0.95 fps, Avg. Travel Time= 8.8 min

Peak Storage= 1,163 cf @ 12.19 hrs
Average Depth at Peak Storage= 0.69' , Surface Width= 4.76'
Bank-Full Depth= 2.00' Flow Area= 12.0 sf, Capacity= 63.20 cfs

2.00' x 2.00' deep channel, n= 0.030 Earth, grassed & winding
Side Slope Z-value= 2.0 '/' Top Width= 10.00'
Length= 500.0' Slope= 0.0100 '/'
Inlet Invert= 882.00', Outlet Invert= 877.00'

Reach PRA: Perimeter Swale



Summary for Reach PRB: Perimeter Swale

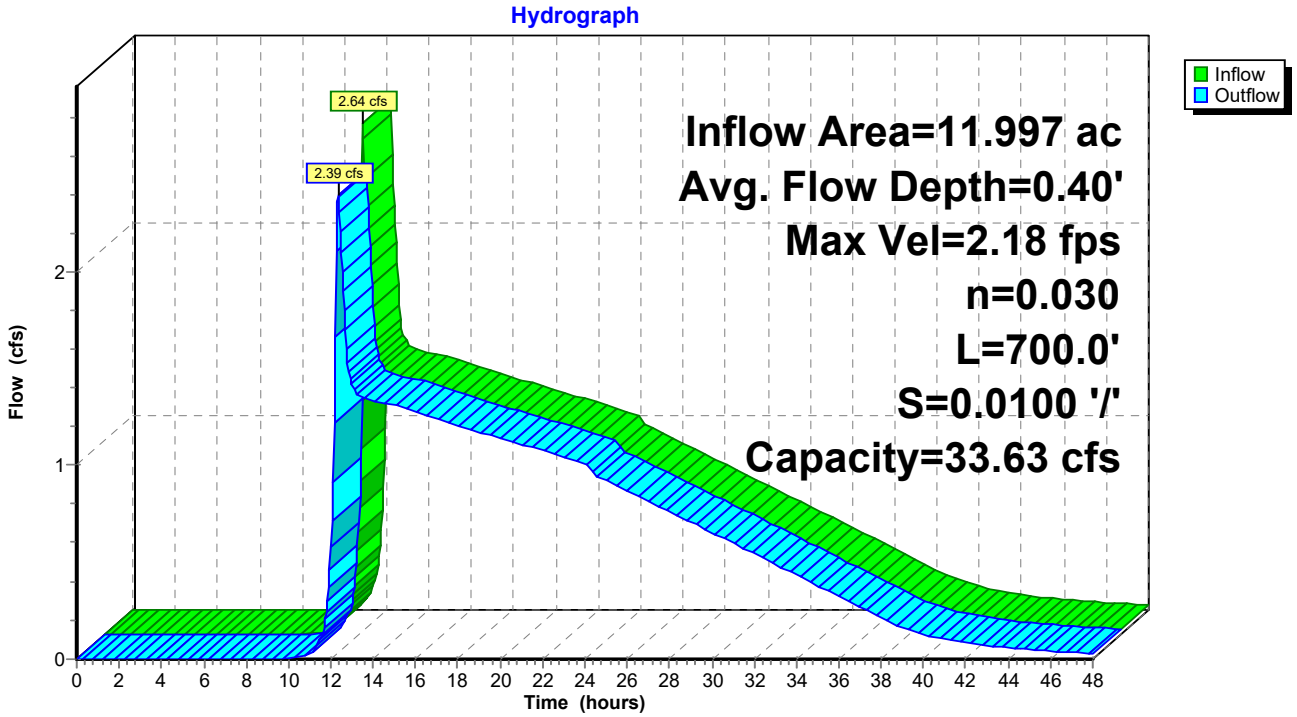
Inflow Area = 11.997 ac, 0.00% Impervious, Inflow Depth > 2.00" for 10-yr 24-hr event
Inflow = 2.64 cfs @ 12.17 hrs, Volume= 2.000 af
Outflow = 2.39 cfs @ 12.34 hrs, Volume= 1.999 af, Atten= 9%, Lag= 10.3 min
Routed to Pond C-2 : 30" Culvert

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.18 fps, Min. Travel Time= 5.3 min
Avg. Velocity = 1.24 fps, Avg. Travel Time= 9.4 min

Peak Storage= 772 cf @ 12.25 hrs
Average Depth at Peak Storage= 0.40' , Surface Width= 3.58'
Bank-Full Depth= 1.50' Flow Area= 7.5 sf, Capacity= 33.63 cfs

2.00' x 1.50' deep channel, n= 0.030 Earth, grassed & winding
Side Slope Z-value= 2.0 '/' Top Width= 8.00'
Length= 700.0' Slope= 0.0100 '/'
Inlet Invert= 872.00', Outlet Invert= 865.00'

Reach PRB: Perimeter Swale



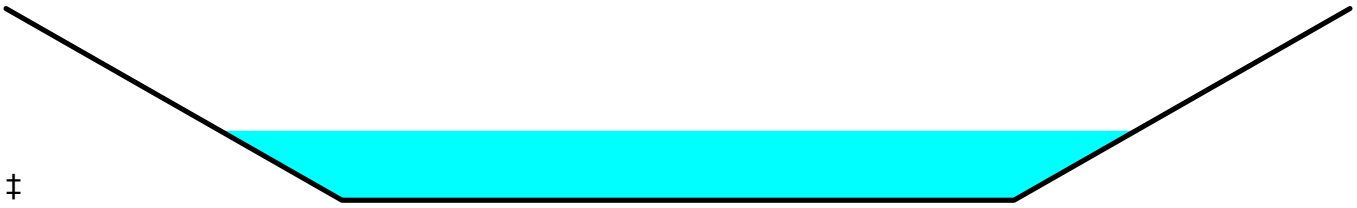
Summary for Reach PRC: Swale

Inflow Area = 3.568 ac, 0.00% Impervious, Inflow Depth = 1.48" for 10-yr 24-hr event
Inflow = 3.85 cfs @ 12.31 hrs, Volume= 0.439 af
Outflow = 3.81 cfs @ 12.34 hrs, Volume= 0.439 af, Atten= 1%, Lag= 1.9 min
Routed to Pond C-3 : 24" Culvert

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.24 fps, Min. Travel Time= 1.0 min
Avg. Velocity = 0.80 fps, Avg. Travel Time= 2.9 min

Peak Storage= 240 cf @ 12.32 hrs
Average Depth at Peak Storage= 0.36' , Surface Width= 5.45'
Bank-Full Depth= 1.00' Flow Area= 6.0 sf, Capacity= 23.61 cfs

4.00' x 1.00' deep channel, n= 0.030 Earth, grassed & winding
Side Slope Z-value= 2.0 '/' Top Width= 8.00'
Length= 140.0' Slope= 0.0100 '/'
Inlet Invert= 879.00', Outlet Invert= 877.60'



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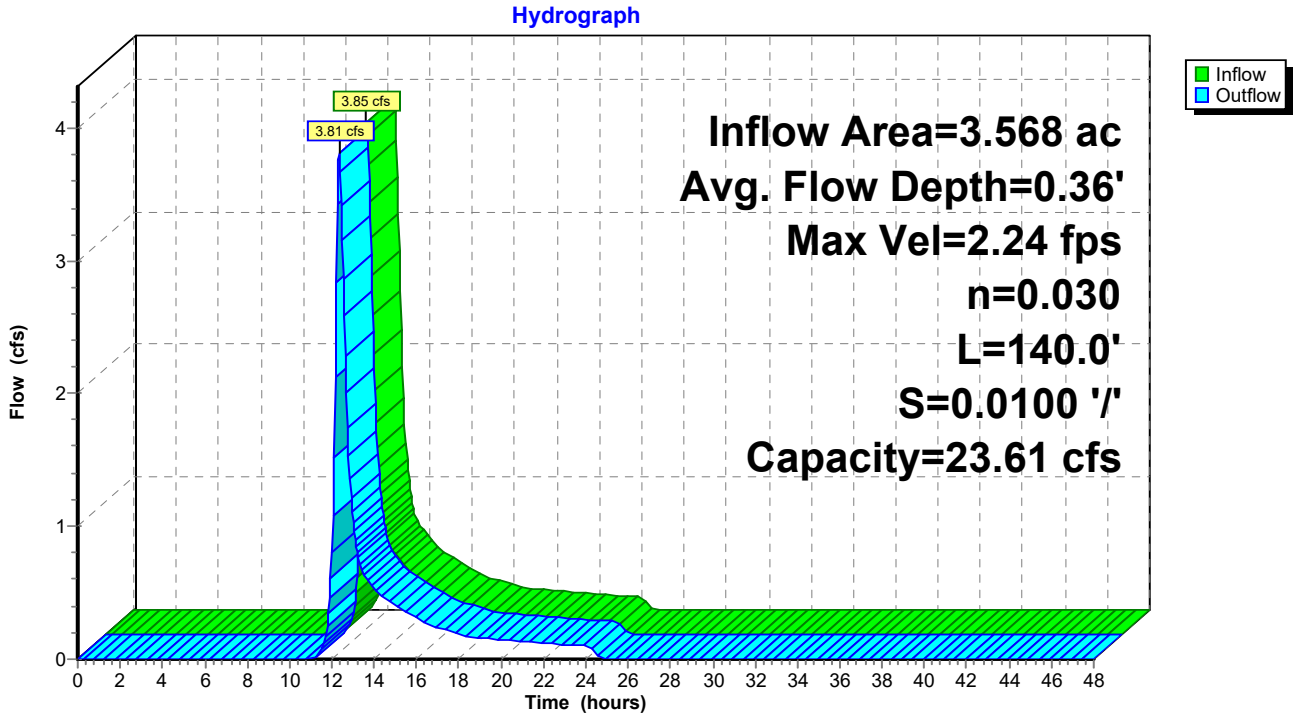


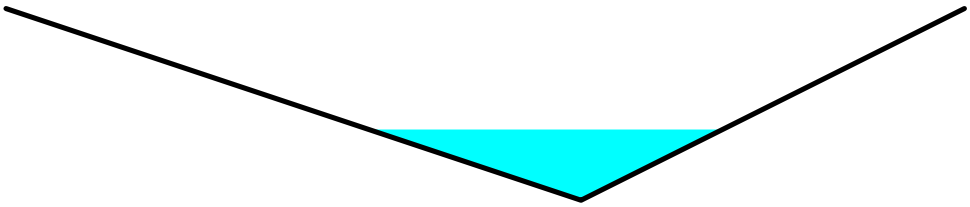
Summary for Reach R1: Sideslope Swale

Inflow Area = 1.813 ac, 0.00% Impervious, Inflow Depth = 2.24" for 10-yr 24-hr event
Inflow = 4.64 cfs @ 12.10 hrs, Volume= 0.338 af
Outflow = 3.29 cfs @ 12.34 hrs, Volume= 0.338 af, Atten= 29%, Lag= 15.0 min
Routed to Pond PND-S : South Basin

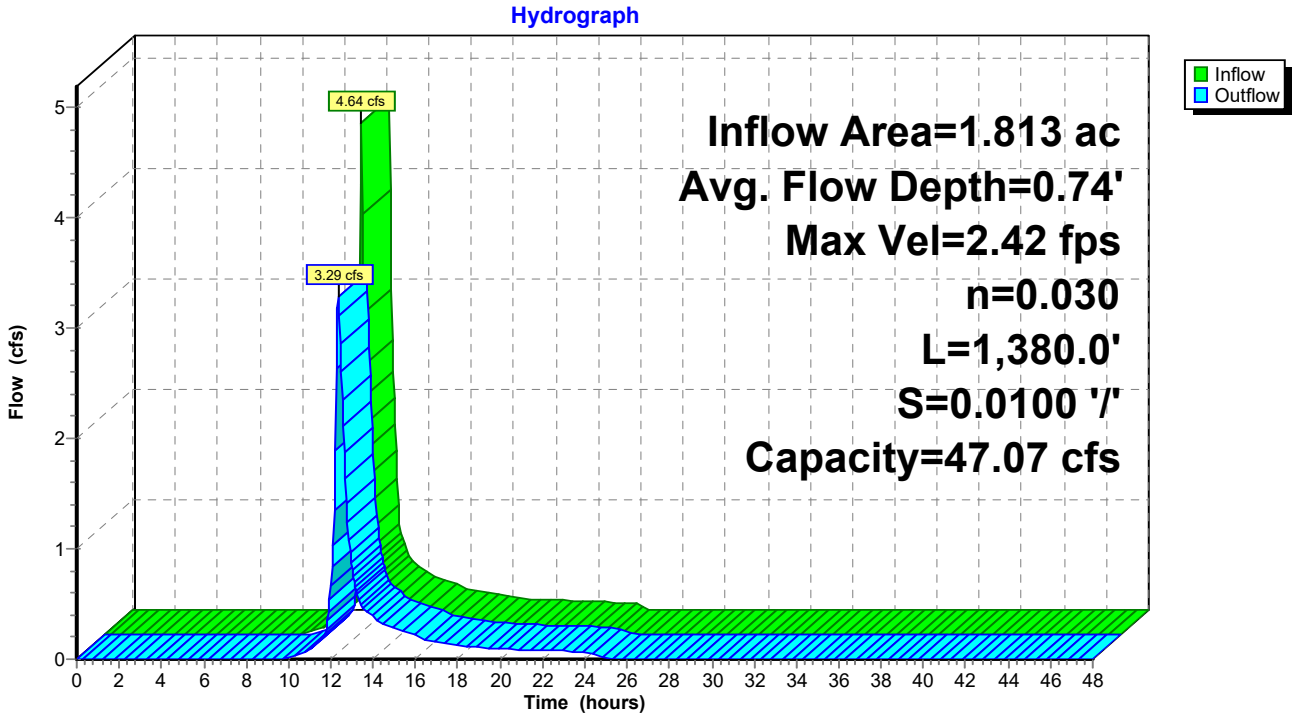
Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.42 fps, Min. Travel Time= 9.5 min
Avg. Velocity = 0.85 fps, Avg. Travel Time= 27.1 min

Peak Storage= 1,886 cf @ 12.18 hrs
Average Depth at Peak Storage= 0.74' , Surface Width= 3.70'
Bank-Full Depth= 2.00' Flow Area= 10.0 sf, Capacity= 47.07 cfs

0.00' x 2.00' deep channel, n= 0.030 Earth, grassed & winding
Side Slope Z-value= 3.0 2.0 '/' Top Width= 10.00'
Length= 1,380.0' Slope= 0.0100 '/'
Inlet Invert= 879.80', Outlet Invert= 866.00'



Reach R1: Sideslope Swale



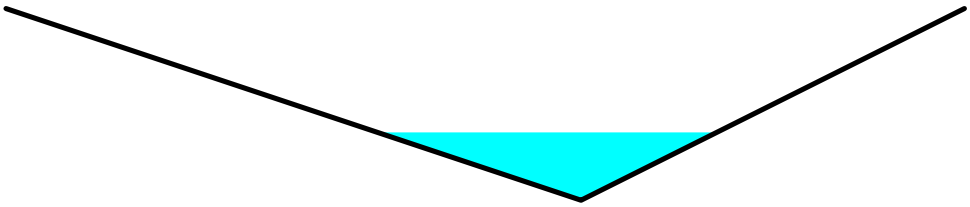
Summary for Reach R2: Sideslope Swale

Inflow Area = 2.064 ac, 0.00% Impervious, Inflow Depth = 2.32" for 10-yr 24-hr event
Inflow = 4.81 cfs @ 12.15 hrs, Volume= 0.399 af
Outflow = 4.17 cfs @ 12.31 hrs, Volume= 0.399 af, Atten= 13%, Lag= 9.9 min
Routed to Pond PND-S : South Basin

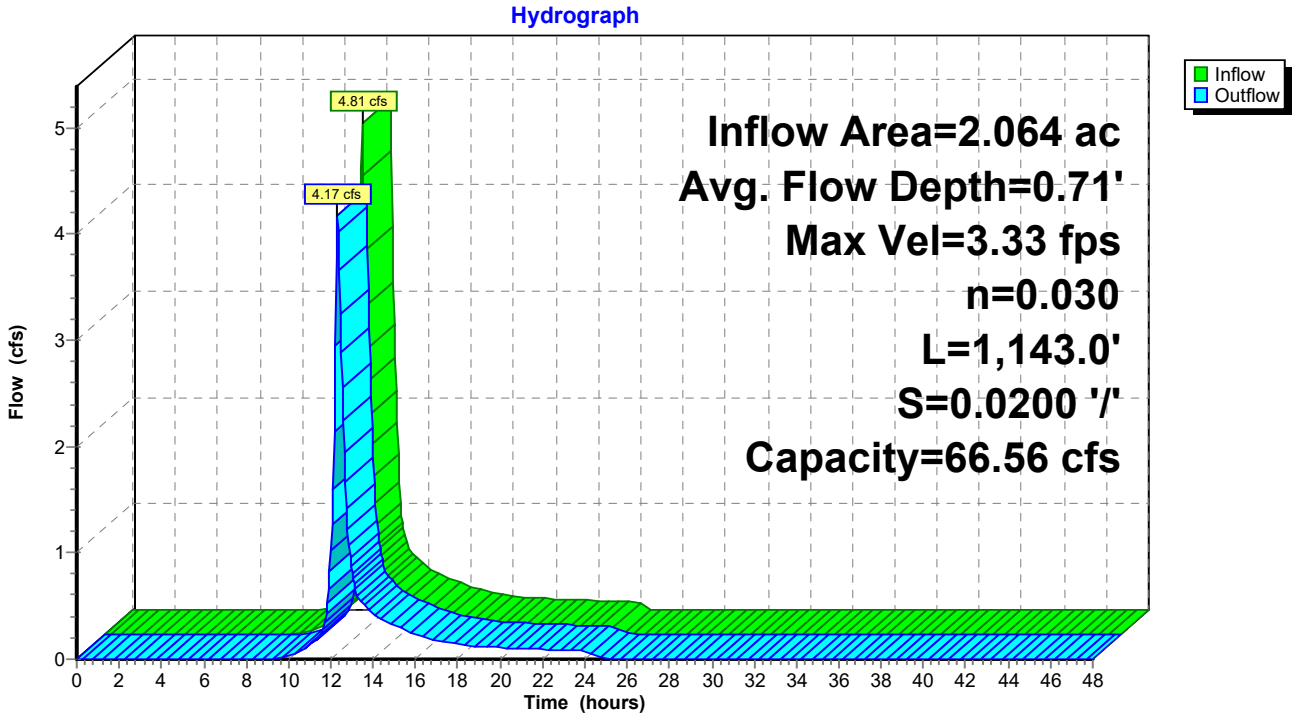
Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.33 fps, Min. Travel Time= 5.7 min
Avg. Velocity = 1.27 fps, Avg. Travel Time= 15.0 min

Peak Storage= 1,436 cf @ 12.22 hrs
Average Depth at Peak Storage= 0.71' , Surface Width= 3.54'
Bank-Full Depth= 2.00' Flow Area= 10.0 sf, Capacity= 66.56 cfs

0.00' x 2.00' deep channel, n= 0.030 Earth, grassed & winding
Side Slope Z-value= 3.0 2.0 '/' Top Width= 10.00'
Length= 1,143.0' Slope= 0.0200 '/'
Inlet Invert= 902.86', Outlet Invert= 880.00'



Reach R2: Sideslope Swale



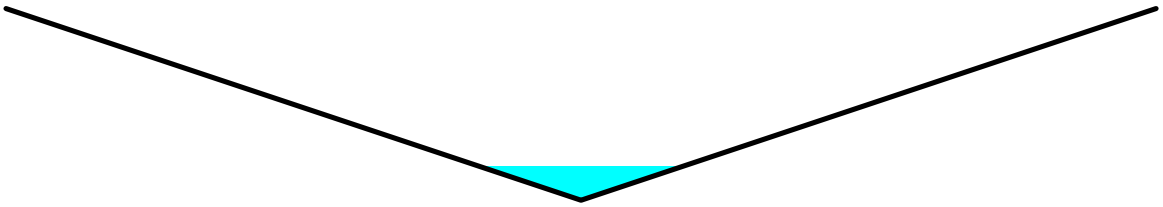
Summary for Reach R3: Sideslope Swale

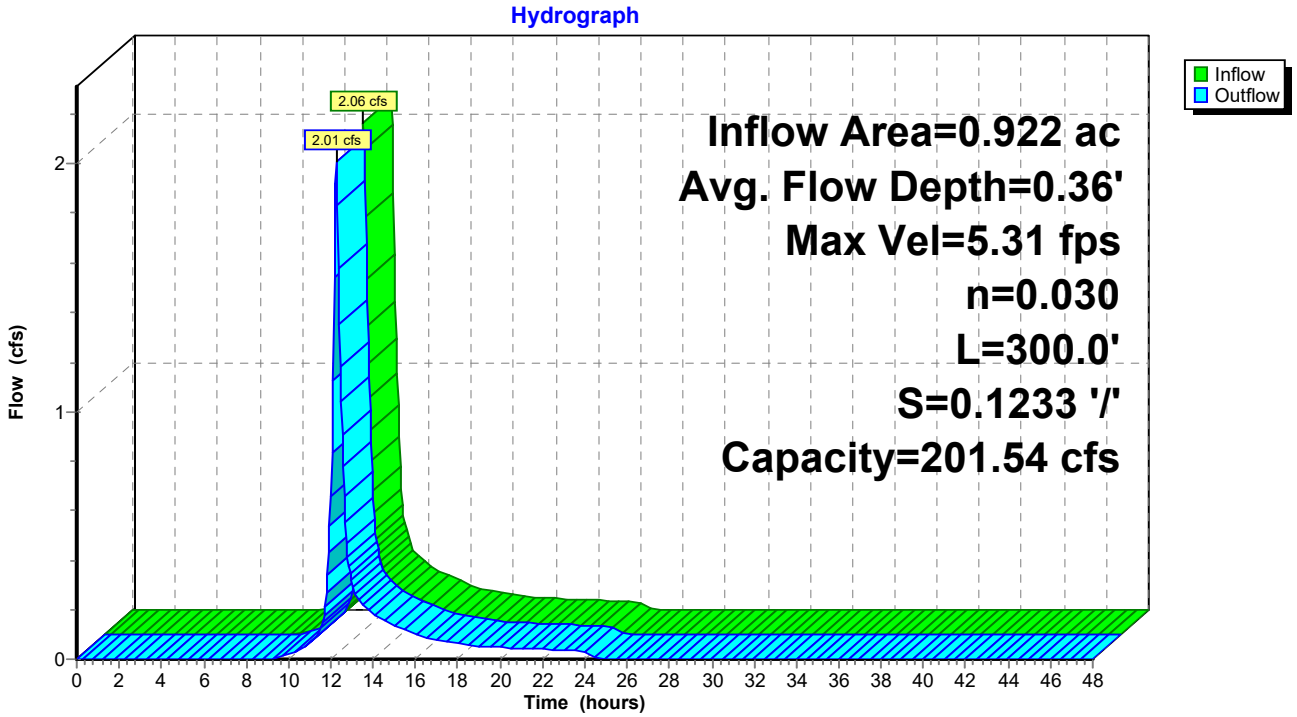
Inflow Area = 0.922 ac, 0.00% Impervious, Inflow Depth = 2.32" for 10-yr 24-hr event
Inflow = 2.06 cfs @ 12.21 hrs, Volume= 0.178 af
Outflow = 2.01 cfs @ 12.24 hrs, Volume= 0.178 af, Atten= 3%, Lag= 1.9 min
Routed to Pond PND-S : South Basin

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 5.31 fps, Min. Travel Time= 0.9 min
Avg. Velocity = 2.28 fps, Avg. Travel Time= 2.2 min

Peak Storage= 115 cf @ 12.22 hrs
Average Depth at Peak Storage= 0.36' , Surface Width= 2.15'
Bank-Full Depth= 2.00' Flow Area= 12.0 sf, Capacity= 201.54 cfs

0.00' x 2.00' deep channel, n= 0.030 Earth, grassed & winding
Side Slope Z-value= 3.0 '/' Top Width= 12.00'
Length= 300.0' Slope= 0.1233 '/'
Inlet Invert= 913.00', Outlet Invert= 876.00'





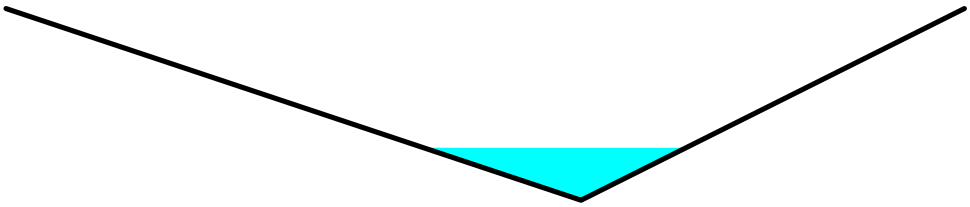
Summary for Reach R4: Sideslope Swale

Inflow Area = 0.922 ac, 0.00% Impervious, Inflow Depth = 2.32" for 10-yr 24-hr event
Inflow = 2.16 cfs @ 12.15 hrs, Volume= 0.178 af
Outflow = 2.06 cfs @ 12.21 hrs, Volume= 0.178 af, Atten= 4%, Lag= 3.9 min
Routed to Reach R3 : Sideslope Swale

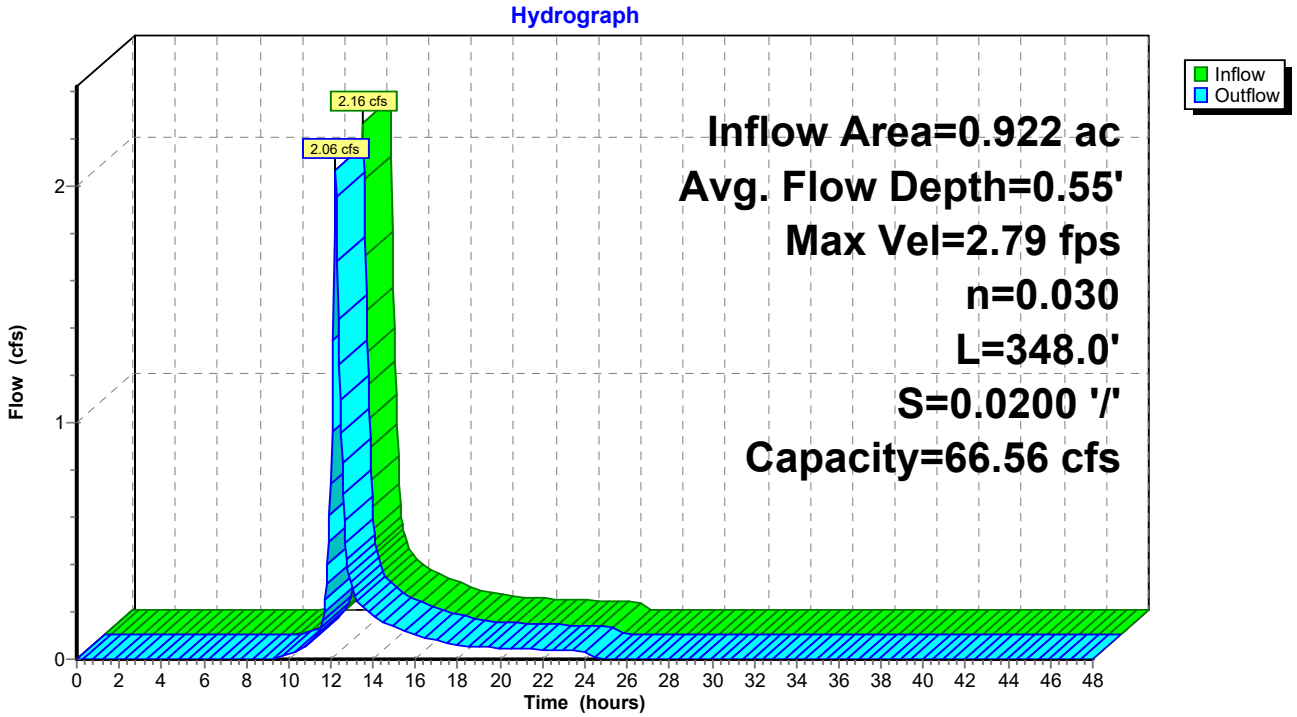
Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.79 fps, Min. Travel Time= 2.1 min
Avg. Velocity = 1.18 fps, Avg. Travel Time= 4.9 min

Peak Storage= 261 cf @ 12.17 hrs
Average Depth at Peak Storage= 0.55' , Surface Width= 2.74'
Bank-Full Depth= 2.00' Flow Area= 10.0 sf, Capacity= 66.56 cfs

0.00' x 2.00' deep channel, n= 0.030 Earth, grassed & winding
Side Slope Z-value= 3.0 2.0 '/' Top Width= 10.00'
Length= 348.0' Slope= 0.0200 '/'
Inlet Invert= 920.00', Outlet Invert= 913.04'



Reach R4: Sideslope Swale



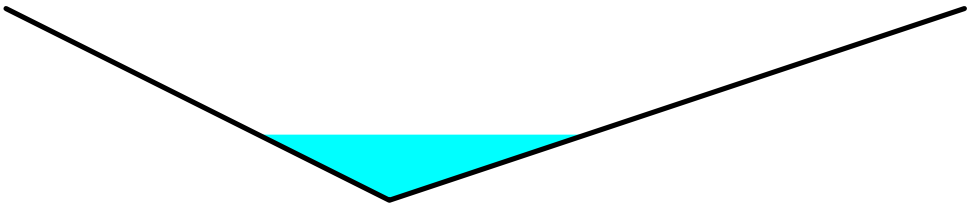
Summary for Reach R5: Sideslope Swale

Inflow Area = 1.322 ac, 0.11% Impervious, Inflow Depth = 2.58" for 10-yr 24-hr event
Inflow = 3.92 cfs @ 12.09 hrs, Volume= 0.284 af
Outflow = 3.66 cfs @ 12.14 hrs, Volume= 0.284 af, Atten= 7%, Lag= 3.0 min
Routed to Reach PRA : Perimeter Swale

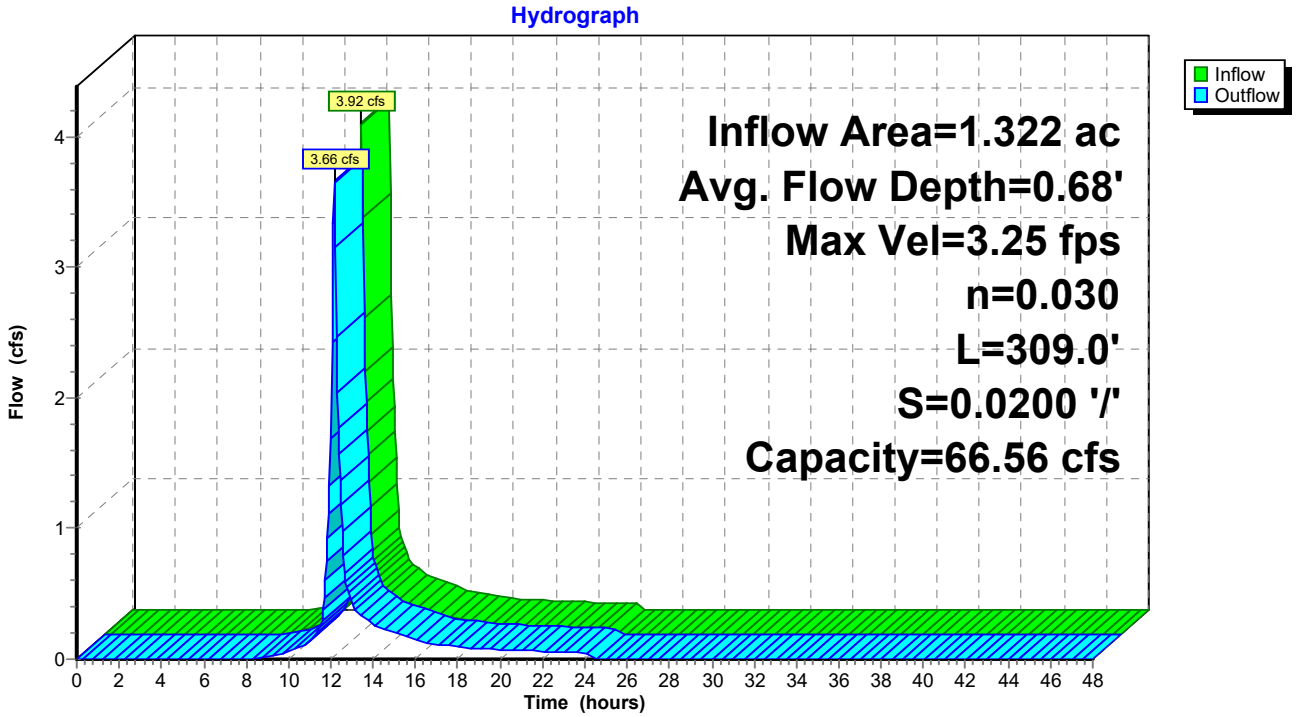
Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.25 fps, Min. Travel Time= 1.6 min
Avg. Velocity = 1.30 fps, Avg. Travel Time= 3.9 min

Peak Storage= 362 cf @ 12.11 hrs
Average Depth at Peak Storage= 0.68' , Surface Width= 3.42'
Bank-Full Depth= 2.00' Flow Area= 10.0 sf, Capacity= 66.56 cfs

0.00' x 2.00' deep channel, n= 0.030 Earth, grassed & winding
Side Slope Z-value= 2.0 3.0 '/' Top Width= 10.00'
Length= 309.0' Slope= 0.0200 '/'
Inlet Invert= 890.18', Outlet Invert= 884.00'



Reach R5: Sideslope Swale



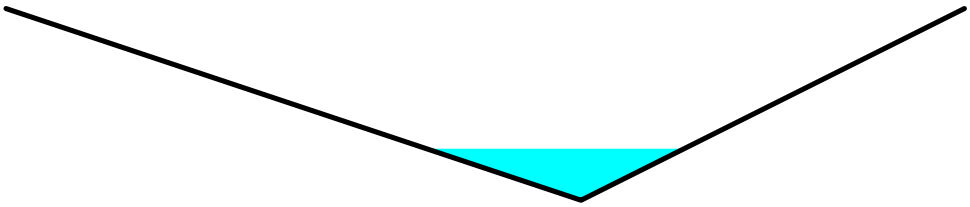
Summary for Reach R6: Sideslope Swale

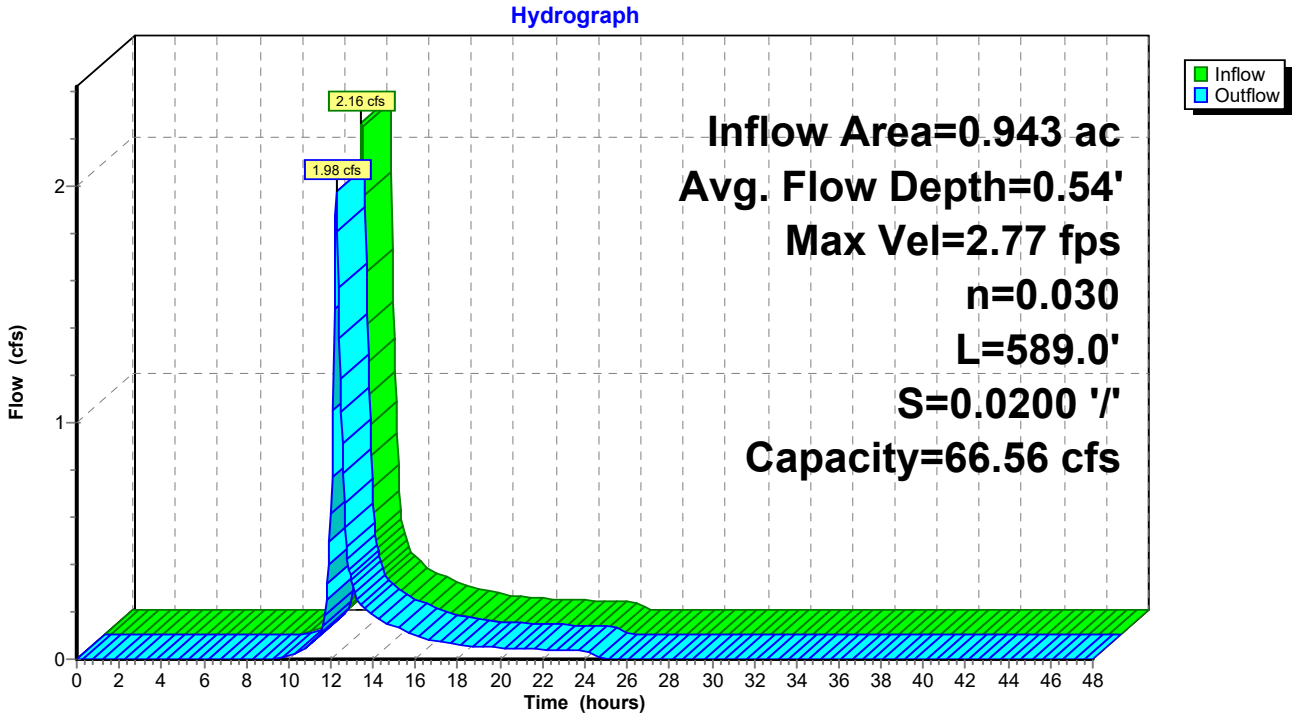
Inflow Area = 0.943 ac, 0.00% Impervious, Inflow Depth = 2.24" for 10-yr 24-hr event
Inflow = 2.16 cfs @ 12.14 hrs, Volume= 0.176 af
Outflow = 1.98 cfs @ 12.24 hrs, Volume= 0.176 af, Atten= 9%, Lag= 6.4 min
Routed to Pond P-N1 : North Basin 1

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.77 fps, Min. Travel Time= 3.5 min
Avg. Velocity = 1.13 fps, Avg. Travel Time= 8.6 min

Peak Storage= 425 cf @ 12.18 hrs
Average Depth at Peak Storage= 0.54' , Surface Width= 2.69'
Bank-Full Depth= 2.00' Flow Area= 10.0 sf, Capacity= 66.56 cfs

0.00' x 2.00' deep channel, n= 0.030 Earth, grassed & winding
Side Slope Z-value= 3.0 2.0 '/' Top Width= 10.00'
Length= 589.0' Slope= 0.0200 '/'
Inlet Invert= 888.00', Outlet Invert= 876.22'





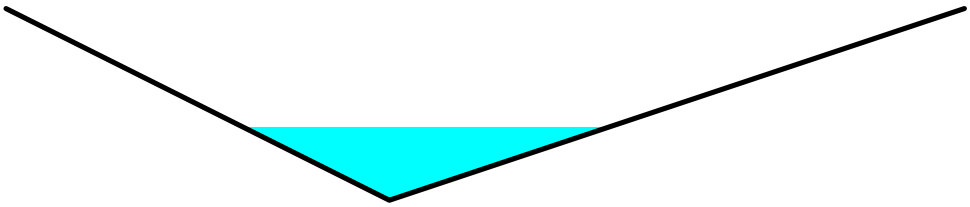
Summary for Reach R7: Sideslope Swale

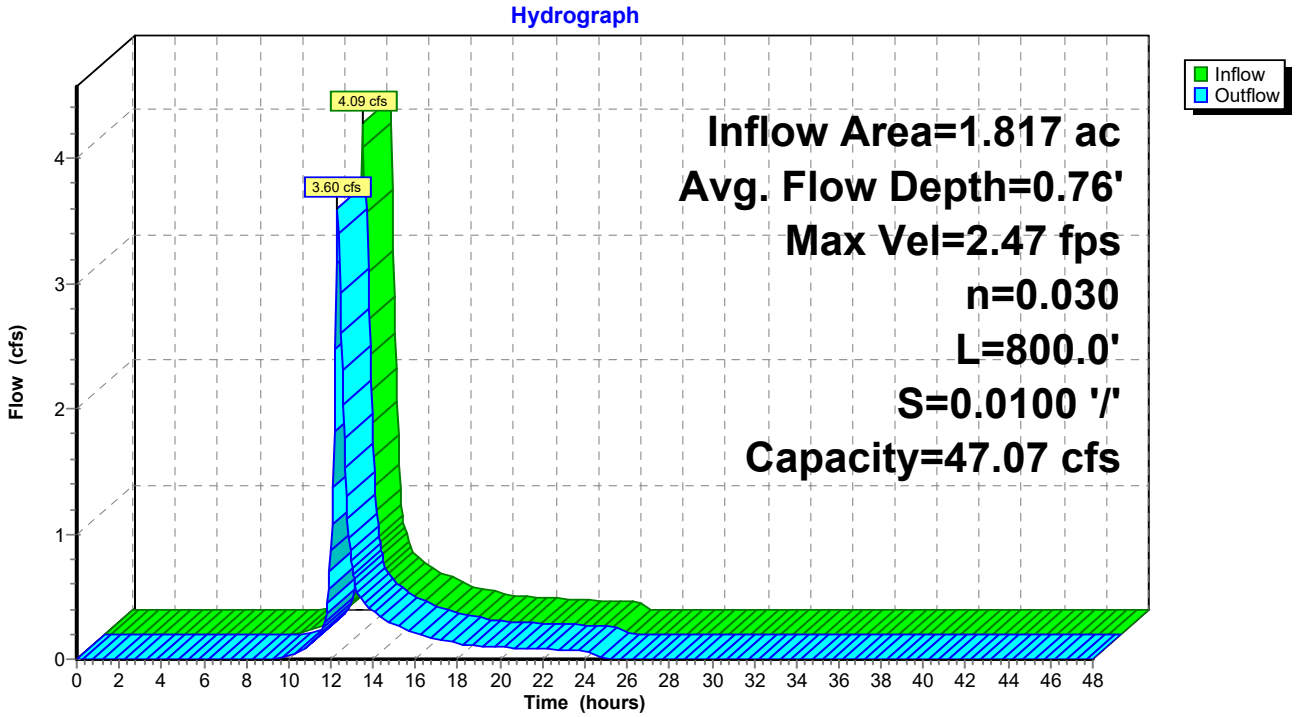
Inflow Area = 1.817 ac, 0.00% Impervious, Inflow Depth = 2.32" for 10-yr 24-hr event
Inflow = 4.09 cfs @ 12.16 hrs, Volume= 0.351 af
Outflow = 3.60 cfs @ 12.32 hrs, Volume= 0.351 af, Atten= 12%, Lag= 9.5 min
Routed to Pond P-N1 : North Basin 1

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.47 fps, Min. Travel Time= 5.4 min
Avg. Velocity = 0.94 fps, Avg. Travel Time= 14.2 min

Peak Storage= 1,166 cf @ 12.23 hrs
Average Depth at Peak Storage= 0.76' , Surface Width= 3.82'
Bank-Full Depth= 2.00' Flow Area= 10.0 sf, Capacity= 47.07 cfs

0.00' x 2.00' deep channel, n= 0.030 Earth, grassed & winding
Side Slope Z-value= 2.0 3.0 '/' Top Width= 10.00'
Length= 800.0' Slope= 0.0100 '/'
Inlet Invert= 872.00', Outlet Invert= 864.00'





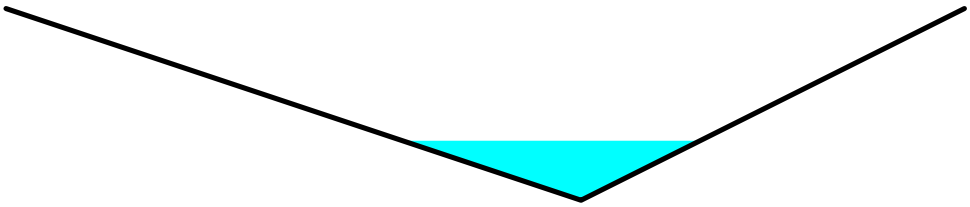
Summary for Reach R8: Sideslope Swale

Inflow Area = 1.354 ac, 0.00% Impervious, Inflow Depth = 2.24" for 10-yr 24-hr event
Inflow = 3.03 cfs @ 12.15 hrs, Volume= 0.252 af
Outflow = 2.90 cfs @ 12.21 hrs, Volume= 0.252 af, Atten= 4%, Lag= 3.7 min
Routed to Reach DC-N : RipRap Downchute

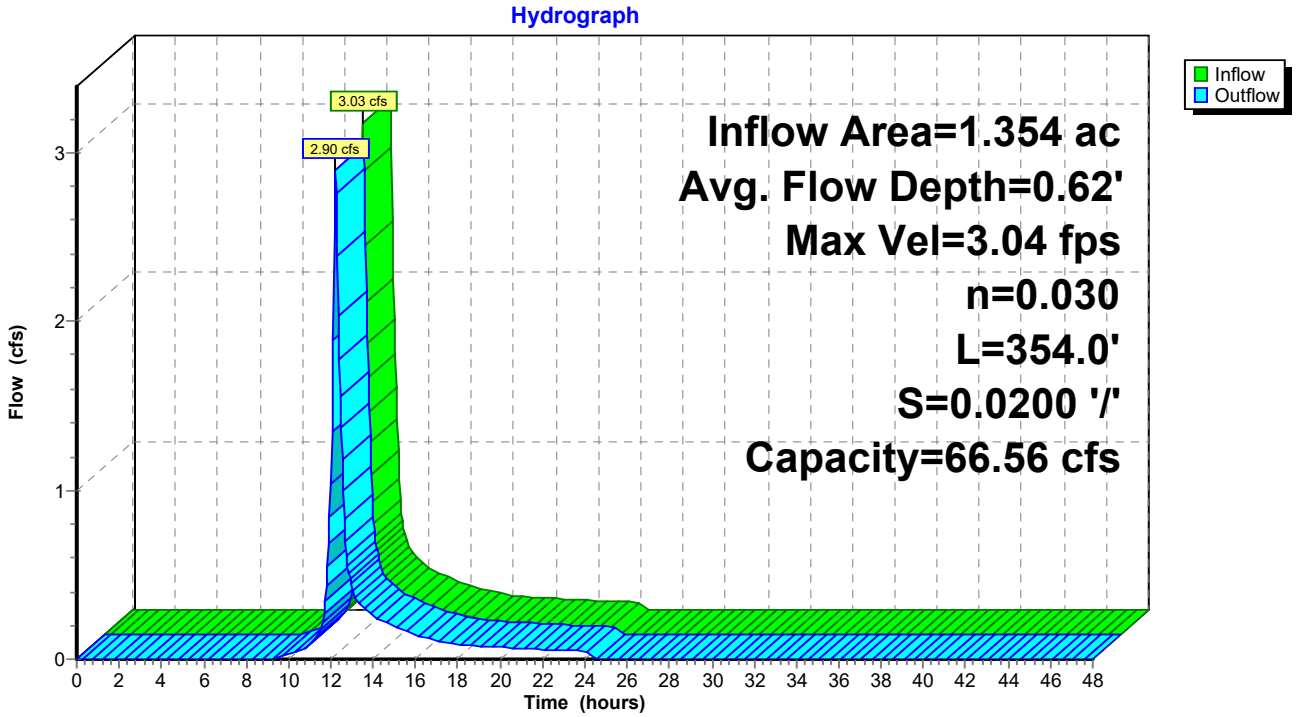
Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.04 fps, Min. Travel Time= 1.9 min
Avg. Velocity = 1.28 fps, Avg. Travel Time= 4.6 min

Peak Storage= 340 cf @ 12.18 hrs
Average Depth at Peak Storage= 0.62' , Surface Width= 3.10'
Bank-Full Depth= 2.00' Flow Area= 10.0 sf, Capacity= 66.56 cfs

0.00' x 2.00' deep channel, n= 0.030 Earth, grassed & winding
Side Slope Z-value= 3.0 2.0 '/' Top Width= 10.00'
Length= 354.0' Slope= 0.0200 '/'
Inlet Invert= 917.08', Outlet Invert= 910.00'



Reach R8: Sideslope Swale



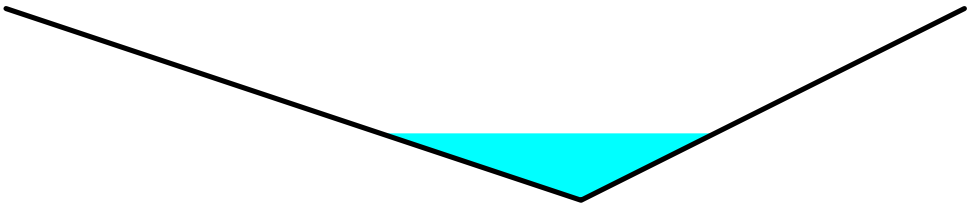
Summary for Reach R9: Sideslope Swale

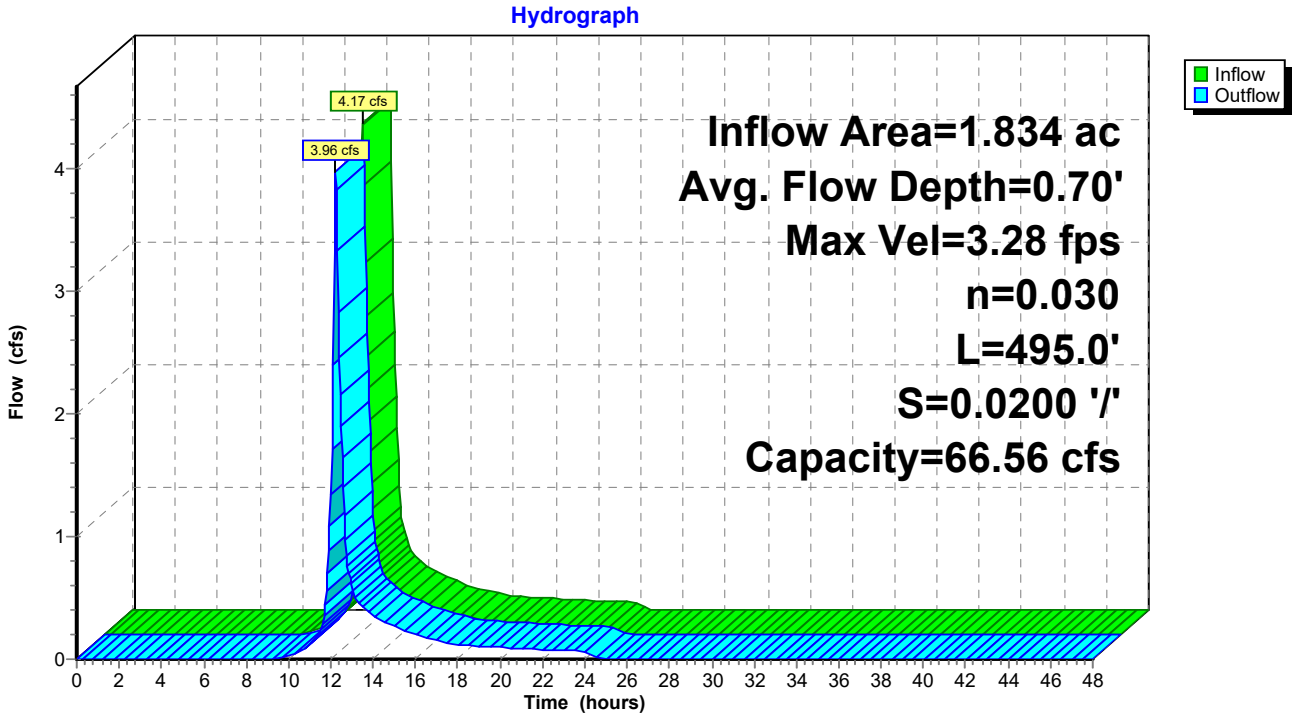
Inflow Area = 1.834 ac, 0.00% Impervious, Inflow Depth = 2.24" for 10-yr 24-hr event
Inflow = 4.17 cfs @ 12.14 hrs, Volume= 0.342 af
Outflow = 3.96 cfs @ 12.22 hrs, Volume= 0.342 af, Atten= 5%, Lag= 4.6 min
Routed to Reach DC-N : RipRap Downchute

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.28 fps, Min. Travel Time= 2.5 min
Avg. Velocity = 1.35 fps, Avg. Travel Time= 6.1 min

Peak Storage= 601 cf @ 12.17 hrs
Average Depth at Peak Storage= 0.70' , Surface Width= 3.49'
Bank-Full Depth= 2.00' Flow Area= 10.0 sf, Capacity= 66.56 cfs

0.00' x 2.00' deep channel, n= 0.030 Earth, grassed & winding
Side Slope Z-value= 3.0 2.0 '/' Top Width= 10.00'
Length= 495.0' Slope= 0.0200 '/'
Inlet Invert= 895.90', Outlet Invert= 886.00'





Summary for Pond C-1: 30" Culvert

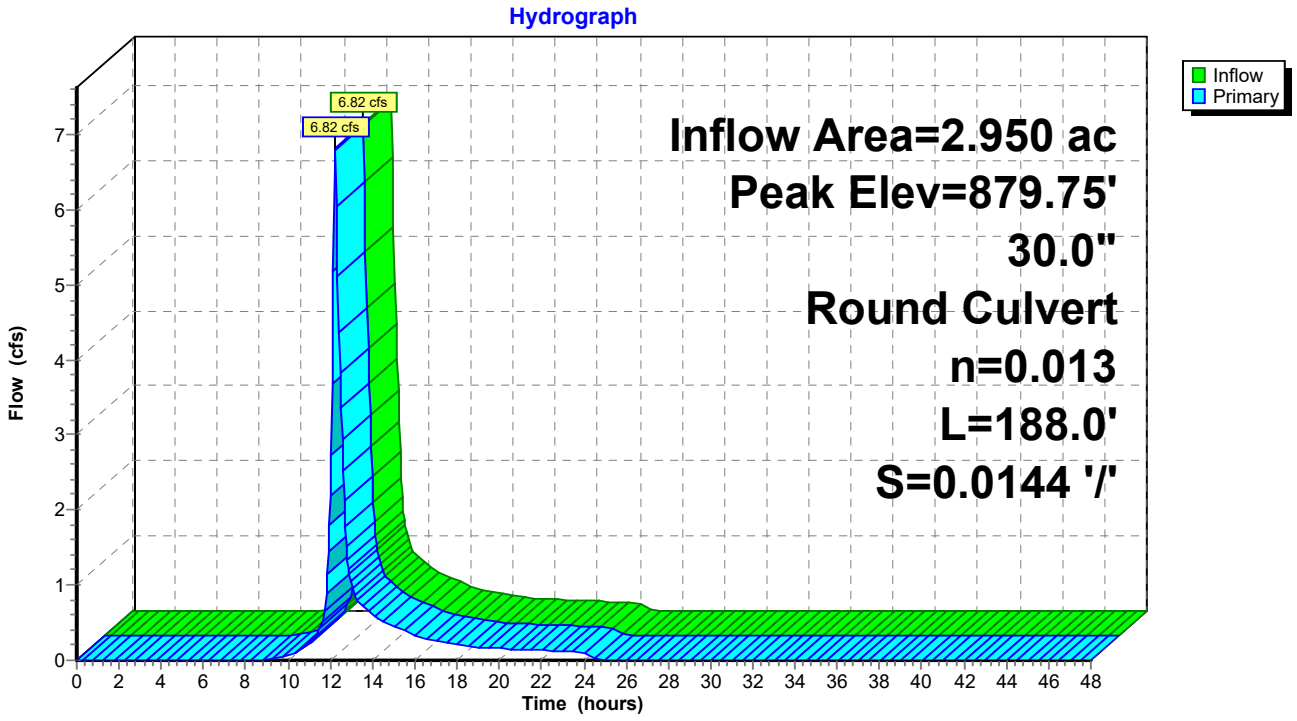
Inflow Area = 2.950 ac, 0.05% Impervious, Inflow Depth = 2.39" for 10-yr 24-hr event
Inflow = 6.82 cfs @ 12.24 hrs, Volume= 0.587 af
Outflow = 6.82 cfs @ 12.24 hrs, Volume= 0.587 af, Atten= 0%, Lag= 0.0 min
Primary = 6.82 cfs @ 12.24 hrs, Volume= 0.587 af
Routed to Pond PND-S : South Basin

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 879.75' @ 12.24 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	878.70'	**30.0" Round Culvert** L= 188.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 878.70' / 876.00' S= 0.0144 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 4.91 sf

Primary OutFlow Max=6.72 cfs @ 12.24 hrs HW=879.74' (Free Discharge)
1=Culvert (Inlet Controls 6.72 cfs @ 3.47 fps)

Pond C-1: 30" Culvert



Summary for Pond C-2: 30" Culvert

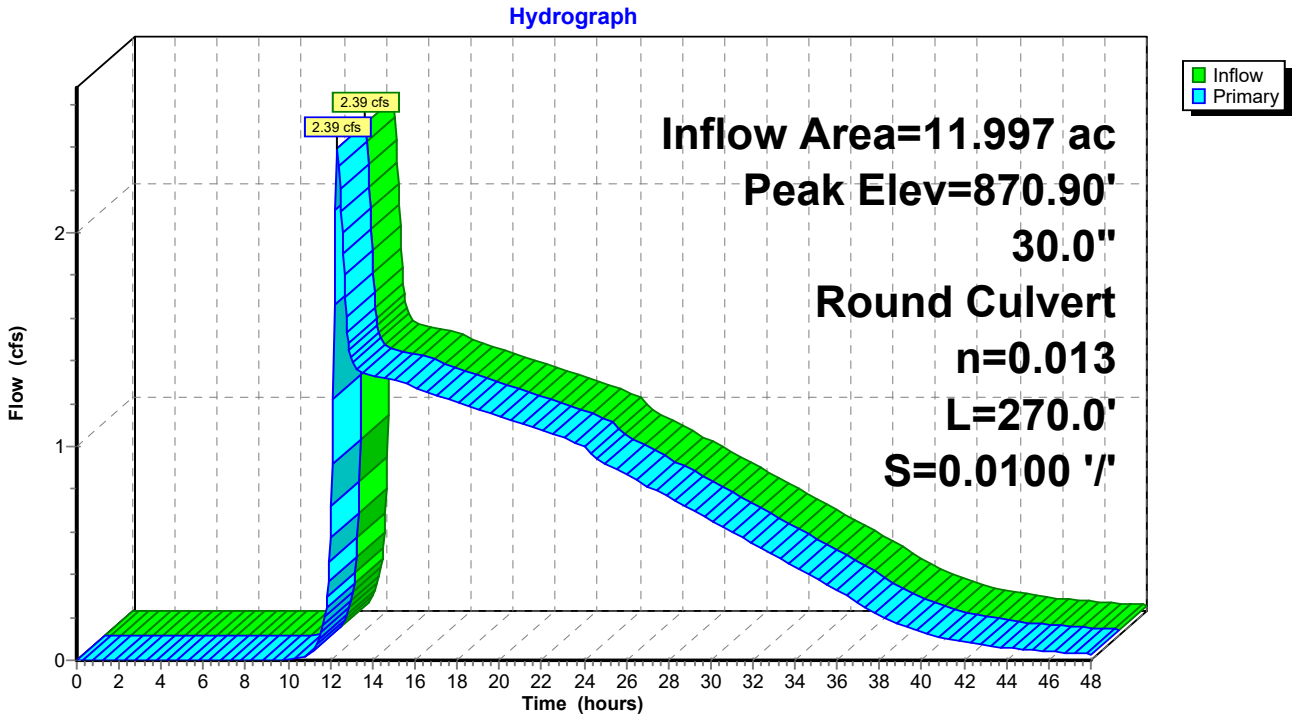
Inflow Area = 11.997 ac, 0.00% Impervious, Inflow Depth > 2.00" for 10-yr 24-hr event
Inflow = 2.39 cfs @ 12.34 hrs, Volume= 1.999 af
Outflow = 2.39 cfs @ 12.34 hrs, Volume= 1.999 af, Atten= 0%, Lag= 0.0 min
Primary = 2.39 cfs @ 12.34 hrs, Volume= 1.999 af
Routed to Pond P-N1 : North Basin 1

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 870.90' @ 12.34 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	870.30'	**30.0" Round Culvert** L= 270.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 870.30' / 867.60' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 4.91 sf

Primary OutFlow Max=2.38 cfs @ 12.34 hrs HW=870.90' (Free Discharge)
1=Culvert (Inlet Controls 2.38 cfs @ 2.64 fps)

Pond C-2: 30" Culvert



Summary for Pond C-3: 24" Culvert

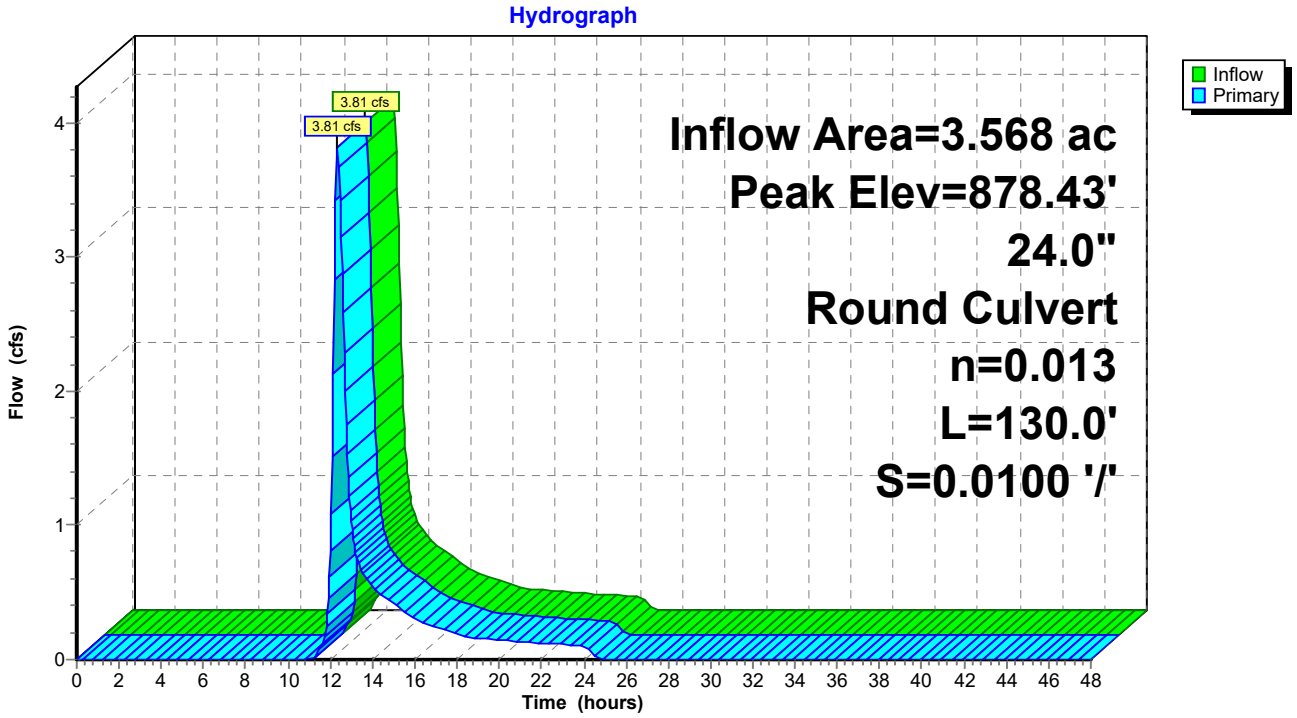
Inflow Area = 3.568 ac, 0.00% Impervious, Inflow Depth = 1.48" for 10-yr 24-hr event
Inflow = 3.81 cfs @ 12.34 hrs, Volume= 0.439 af
Outflow = 3.81 cfs @ 12.34 hrs, Volume= 0.439 af, Atten= 0%, Lag= 0.0 min
Primary = 3.81 cfs @ 12.34 hrs, Volume= 0.439 af
Routed to Pond P-N2 : North Basin 2

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 878.43' @ 12.34 hrs
Flood Elev= 880.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	877.60'	**24.0" Round Culvert** L= 130.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 877.60' / 876.30' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf

Primary OutFlow Max=3.80 cfs @ 12.34 hrs HW=878.43' (Free Discharge)
1=Culvert (Inlet Controls 3.80 cfs @ 3.10 fps)

Pond C-3: 24" Culvert



Summary for Pond P-N1: North Basin 1

Inflow Area = 15.447 ac, 0.00% Impervious, Inflow Depth > 2.01" for 10-yr 24-hr event
Inflow = 8.22 cfs @ 12.31 hrs, Volume= 2.585 af
Outflow = 3.93 cfs @ 12.71 hrs, Volume= 2.582 af, Atten= 52%, Lag= 24.0 min
Primary = 3.93 cfs @ 12.71 hrs, Volume= 2.582 af
Routed to Link N : POI-N
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Link N : POI-N

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Starting Elev= 859.00' Surf.Area= 3,382 sf Storage= 3,127 cf
Peak Elev= 861.35' @ 12.71 hrs Surf.Area= 4,654 sf Storage= 12,536 cf (9,409 cf above start)
Flood Elev= 863.00' Surf.Area= 5,635 sf Storage= 21,001 cf (17,873 cf above start)

Plug-Flow detention time= 91.7 min calculated for 2.508 af (97% of inflow)
Center-of-Mass det. time= 39.2 min (1,277.9 - 1,238.8)

Volume	Invert	Avail.Storage	Storage Description
#1	858.00'	26,943 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

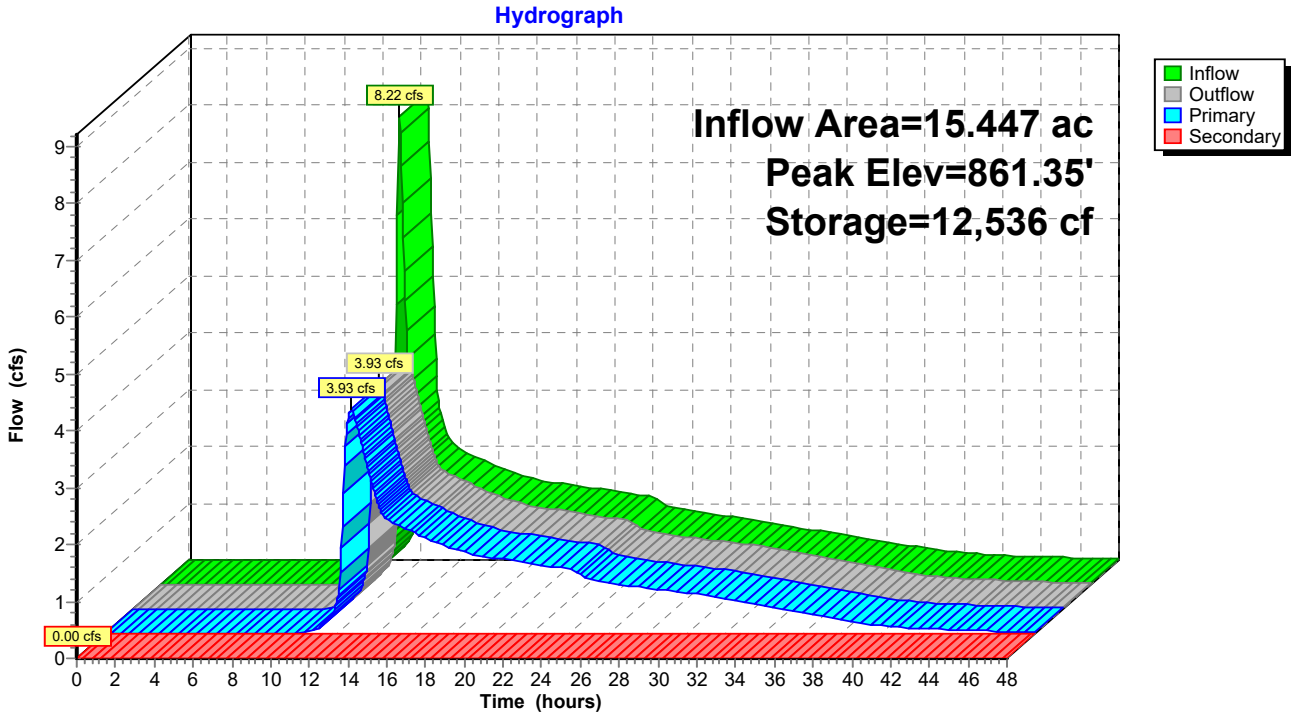
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
858.00	2,873	0	0
860.00	3,890	6,763	6,763
862.00	5,020	8,910	15,673
864.00	6,250	11,270	26,943

Device	Routing	Invert	Outlet Devices
#1	Primary	858.00'	**24.0" Round Culvert** L= 100.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 858.00' / 857.00' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf
#2	Device 1	859.00'	**2.0" Vert. Perforations X 10.00 columns** X 3 rows with 8.0" cc spacing C= 0.600 Limited to weir flow at low heads
#3	Device 1	862.00'	**36.0" Horiz. Top of Standpipe** C= 0.600 Limited to weir flow at low heads
#4	Secondary	863.00'	**10.0' long x 8.0' breadth Spillway** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.43 2.54 2.70 2.69 2.68 2.68 2.66 2.64 2.64 2.64 2.65 2.65 2.66 2.66 2.68 2.70 2.74

Primary OutFlow Max=3.93 cfs @ 12.71 hrs HW=861.35' (Free Discharge)
└**1=Culvert** (Passes 3.93 cfs of 23.19 cfs potential flow)
├**2=Perforations** (Orifice Controls 3.93 cfs @ 6.00 fps)
└**3=Top of Standpipe** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=859.00' (Free Discharge)
└**4=Spillway** (Controls 0.00 cfs)

Pond P-N1: North Basin 1



Summary for Pond P-N2: North Basin 2

Inflow Area = 10.643 ac, 0.00% Impervious, Inflow Depth = 2.09" for 10-yr 24-hr event
Inflow = 17.87 cfs @ 12.25 hrs, Volume= 1.850 af
Outflow = 1.16 cfs @ 15.84 hrs, Volume= 1.818 af, Atten= 94%, Lag= 215.3 min
Primary = 1.16 cfs @ 15.84 hrs, Volume= 1.818 af
Routed to Reach PRB : Perimeter Swale
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Reach PRB : Perimeter Swale

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Starting Elev= 876.00' Surf.Area= 35,250 sf Storage= 33,125 cf
Peak Elev= 877.29' @ 15.84 hrs Surf.Area= 38,967 sf Storage= 81,099 cf (47,974 cf above start)
Flood Elev= 879.00' Surf.Area= 44,000 sf Storage= 151,875 cf (118,750 cf above start)

Plug-Flow detention time= 948.6 min calculated for 1.057 af (57% of inflow)
Center-of-Mass det. time= 532.2 min (1,385.9 - 853.7)

Volume	Invert	Avail.Storage	Storage Description
#1	875.00'	151,875 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

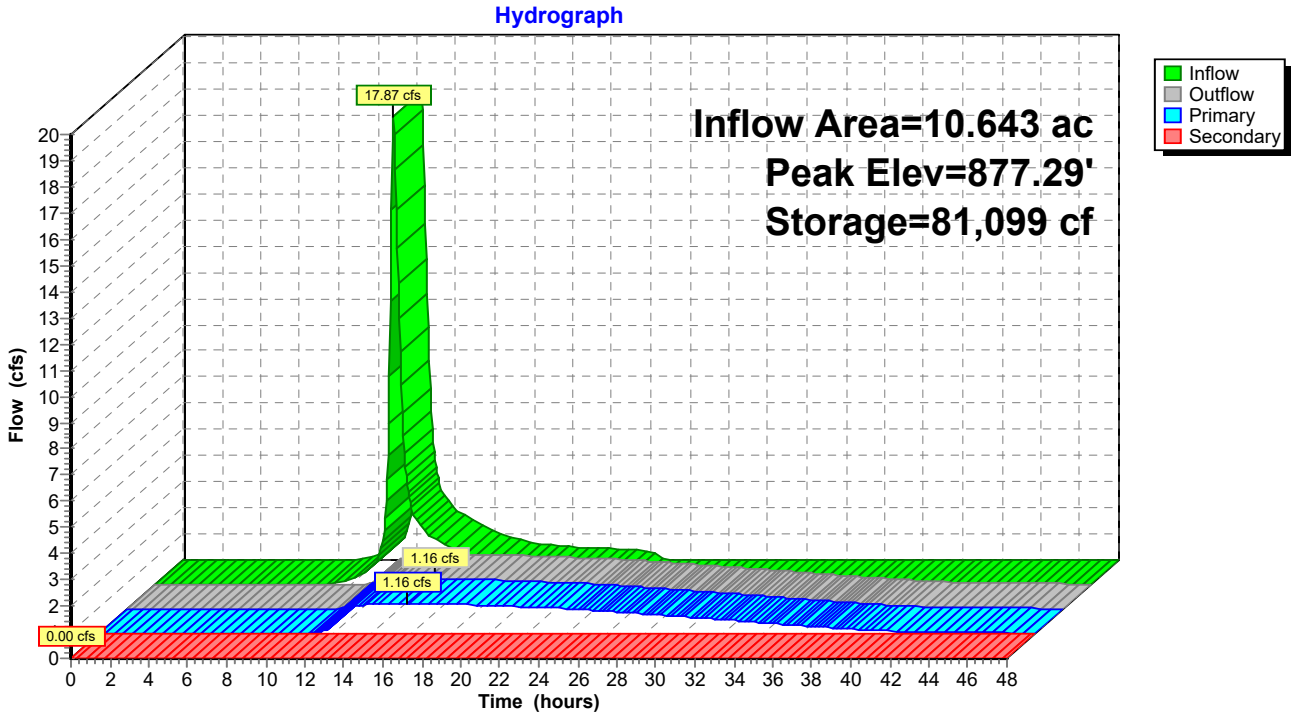
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
875.00	31,000	0	0
876.00	35,250	33,125	33,125
878.00	41,000	76,250	109,375
879.00	44,000	42,500	151,875

Device	Routing	Invert	Outlet Devices
#1	Primary	875.00'	**24.0" Round Culvert** L= 100.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 875.00' / 874.00' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf
#2	Device 1	876.00'	**2.0" Vert. Perforations X 10.00** C= 0.600 Limited to weir flow at low heads
#3	Device 1	877.50'	**36.0" Horiz. Top of Standpipe** C= 0.600 Limited to weir flow at low heads
#4	Secondary	878.00'	**6.0' long x 20.0' breadth Spillway** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=1.16 cfs @ 15.84 hrs HW=877.29' (Free Discharge)
└**1=Culvert** (Passes 1.16 cfs of 17.20 cfs potential flow)
└**2=Perforations** (Orifice Controls 1.16 cfs @ 5.30 fps)
└**3=Top of Standpipe** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=876.00' (Free Discharge)
└**4=Spillway** (Controls 0.00 cfs)

Pond P-N2: North Basin 2



Summary for Pond PND-S: South Basin

Inflow Area = 8.392 ac, 0.02% Impervious, Inflow Depth = 2.44" for 10-yr 24-hr event
Inflow = 16.38 cfs @ 12.27 hrs, Volume= 1.708 af
Outflow = 3.03 cfs @ 13.04 hrs, Volume= 1.707 af, Atten= 82%, Lag= 46.2 min
Primary = 3.03 cfs @ 13.04 hrs, Volume= 1.707 af
Routed to Link S : POI-S
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Link S : POI-S

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Starting Elev= 859.00' Surf.Area= 11,031 sf Storage= 10,489 cf
Peak Elev= 861.50' @ 13.04 hrs Surf.Area= 13,830 sf Storage= 41,582 cf (31,093 cf above start)
Flood Elev= 863.00' Surf.Area= 15,584 sf Storage= 63,560 cf (53,071 cf above start)

Plug-Flow detention time= 252.0 min calculated for 1.465 af (86% of inflow)
Center-of-Mass det. time= 146.7 min (991.4 - 844.7)

Volume	Invert	Avail.Storage	Storage Description
#1	858.00'	79,739 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

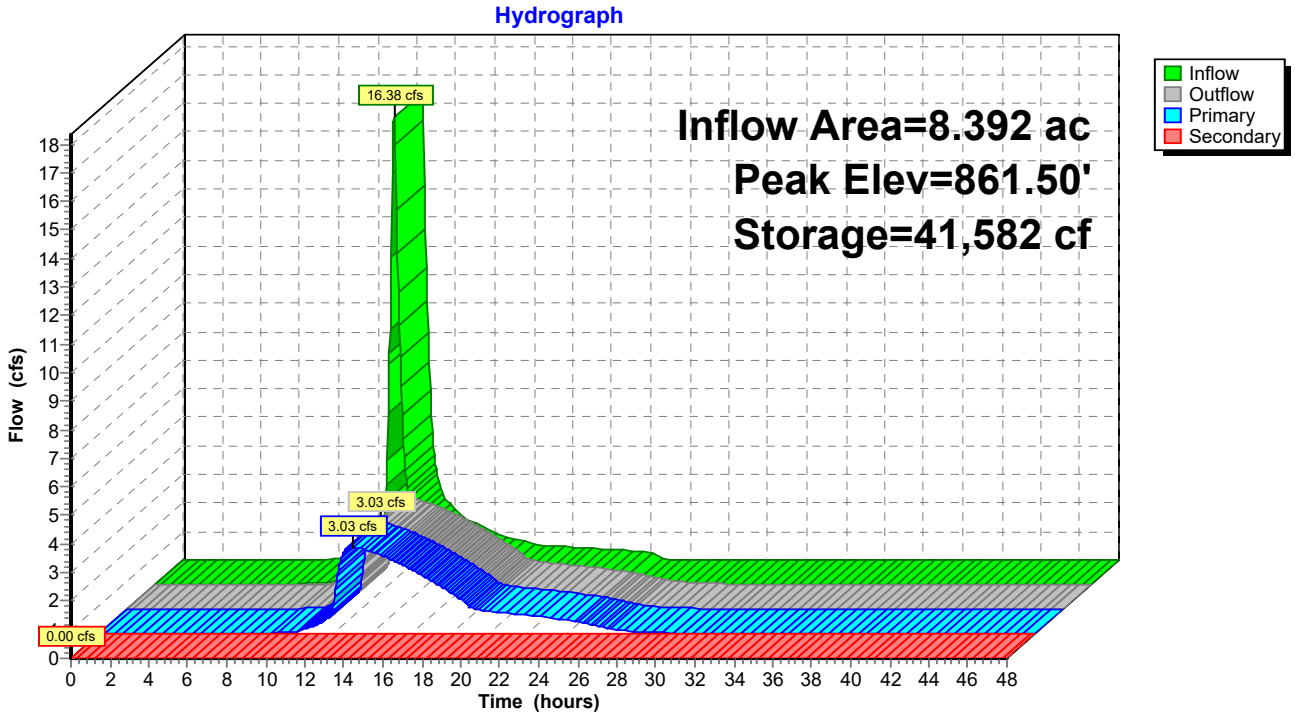
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
858.00	9,947	0	0
860.00	12,115	22,062	22,062
862.00	14,394	26,509	48,571
864.00	16,774	31,168	79,739

Device	Routing	Invert	Outlet Devices
#1	Primary	858.50'	**30.0" Round Culvert** L= 50.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 858.50' / 858.00' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 4.91 sf
#2	Device 1	859.00'	**2.0" Vert. Perforations X 10.00 columns** X 2 rows with 8.0" cc spacing C= 0.600 Limited to weir flow at low heads
#3	Device 1	862.00'	**36.0" Horiz. Top of Standpipe** C= 0.600 Limited to weir flow at low heads
#4	Secondary	863.00'	**10.0' long x 8.0' breadth Spillway** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.43 2.54 2.70 2.69 2.68 2.68 2.66 2.64 2.64 2.64 2.65 2.65 2.66 2.66 2.68 2.70 2.74

Primary OutFlow Max=3.03 cfs @ 13.04 hrs HW=861.50' (Free Discharge)
└**1=Culvert** (Passes 3.03 cfs of 27.62 cfs potential flow)
├**2=Perforations** (Orifice Controls 3.03 cfs @ 6.94 fps)
└**3=Top of Standpipe** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=859.00' (Free Discharge)
└**4=Spillway** (Controls 0.00 cfs)

Pond PND-S: South Basin

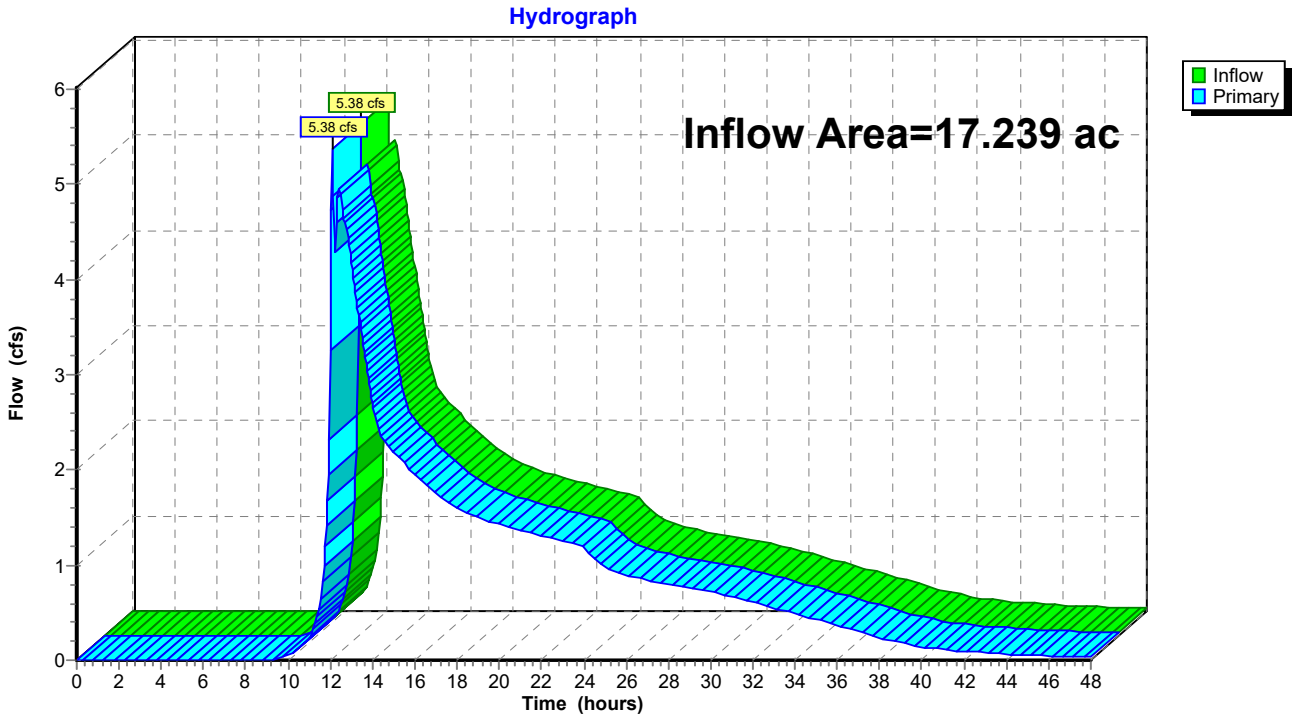


Summary for Link N: POI-N

Inflow Area = 17.239 ac, 0.00% Impervious, Inflow Depth > 2.03" for 10-yr 24-hr event
Inflow = 5.38 cfs @ 12.10 hrs, Volume= 2.918 af
Primary = 5.38 cfs @ 12.10 hrs, Volume= 2.918 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Link N: POI-N

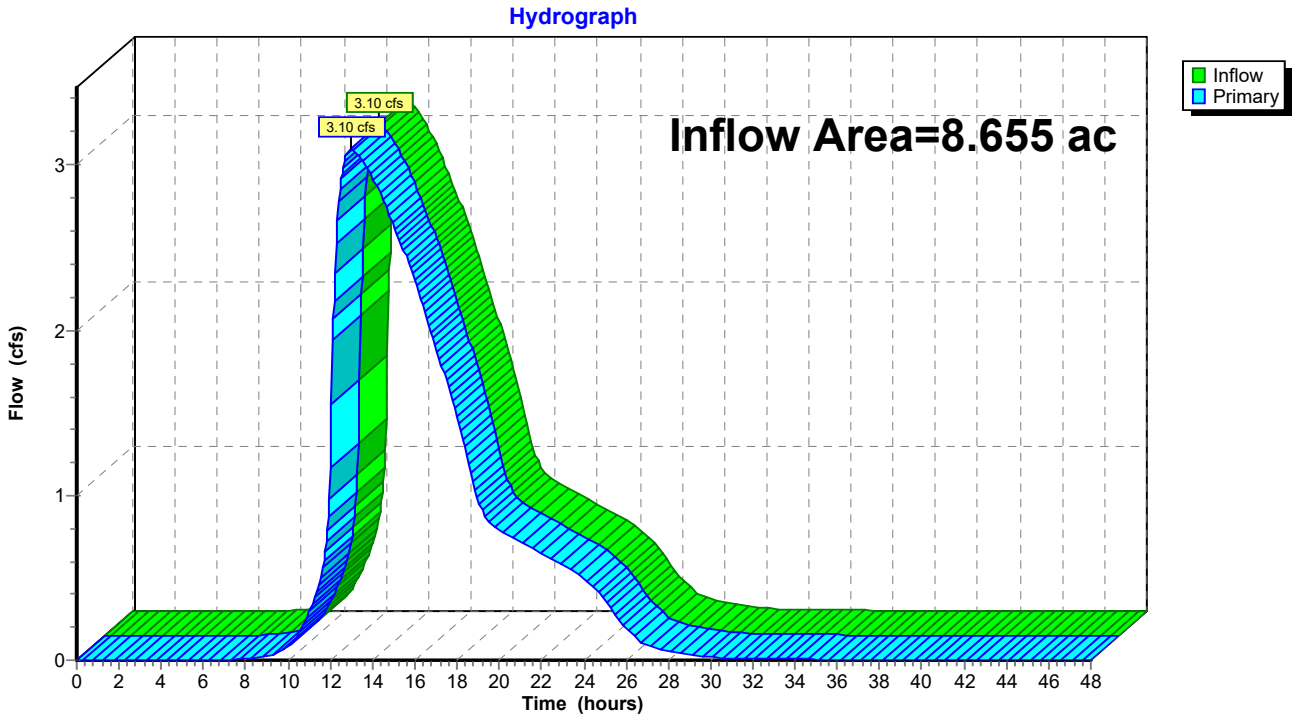


Summary for Link S: POI-S

Inflow Area = 8.655 ac, 0.02% Impervious, Inflow Depth > 2.43" for 10-yr 24-hr event
Inflow = 3.10 cfs @ 12.94 hrs, Volume= 1.756 af
Primary = 3.10 cfs @ 12.94 hrs, Volume= 1.756 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Link S: POI-S



Time span=0.00-48.00 hrs, dt=0.05 hrs, 961 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

SubcatchmentN1: Subcat N1 Runoff Area=3.568 ac 0.00% Impervious Runoff Depth=2.36"
Flow Length=630' Tc=20.1 min CN=64 Runoff=6.43 cfs 0.703 af

SubcatchmentN10: Subcat N10 Runoff Area=0.445 ac 0.00% Impervious Runoff Depth=3.21"
Flow Length=62' Slope=0.3300 '/' Tc=6.0 min CN=73 Runoff=1.64 cfs 0.119 af

SubcatchmentN11: Subcat N11 Runoff Area=0.309 ac 0.00% Impervious Runoff Depth=3.50"
Flow Length=164' Slope=0.3300 '/' Tc=6.0 min CN=76 Runoff=1.24 cfs 0.090 af

SubcatchmentN12: Subcat N12 Runoff Area=1.039 ac 0.00% Impervious Runoff Depth=3.30"
Flow Length=60' Slope=0.3300 '/' Tc=6.0 min CN=74 Runoff=3.95 cfs 0.286 af

SubcatchmentN3: Subcat N3 Runoff Area=3.233 ac 0.00% Impervious Runoff Depth=3.70"
Flow Length=121' Slope=0.0100 '/' Tc=19.2 min CN=78 Runoff=9.60 cfs 0.998 af

SubcatchmentN4: Subcat N4 Runoff Area=1.834 ac 0.00% Impervious Runoff Depth=3.30"
Flow Length=155' Tc=9.6 min CN=74 Runoff=6.19 cfs 0.505 af

SubcatchmentN5: Subcat N5 Runoff Area=1.354 ac 0.00% Impervious Runoff Depth=3.30"
Flow Length=141' Slope=0.0500 '/' Tc=10.2 min CN=74 Runoff=4.50 cfs 0.373 af

SubcatchmentN6: Subcat N6 Runoff Area=0.654 ac 0.00% Impervious Runoff Depth=3.30"
Flow Length=114' Slope=0.0500 '/' Tc=9.9 min CN=74 Runoff=2.19 cfs 0.180 af

SubcatchmentN7: Subcat N7 Runoff Area=1.354 ac 0.00% Impervious Runoff Depth=2.54"
Flow Length=172' Slope=0.1400 '/' Tc=10.4 min CN=66 Runoff=3.39 cfs 0.287 af

SubcatchmentN8: Subcat N8 Runoff Area=0.943 ac 0.00% Impervious Runoff Depth=3.30"
Flow Length=94' Tc=9.2 min CN=74 Runoff=3.21 cfs 0.259 af

SubcatchmentN9: Subcat N9 Runoff Area=1.817 ac 0.00% Impervious Runoff Depth=3.40"
Flow Length=760' Tc=11.4 min CN=75 Runoff=6.02 cfs 0.515 af

SubcatchmentNP: Subcat NP Runoff Area=0.690 ac 0.00% Impervious Runoff Depth=1.76"
Flow Length=134' Slope=0.0200 '/' Tc=14.8 min CN=57 Runoff=0.99 cfs 0.101 af

SubcatchmentS1: Subcat S7 Runoff Area=0.263 ac 0.00% Impervious Runoff Depth=3.30"
Flow Length=60' Slope=0.3300 '/' Tc=6.0 min CN=74 Runoff=1.00 cfs 0.072 af

SubcatchmentS2: Subcat S2 Runoff Area=1.813 ac 0.00% Impervious Runoff Depth=3.30"
Flow Length=97' Tc=6.0 min CN=74 Runoff=6.89 cfs 0.499 af

SubcatchmentS3: Subcat S3 Runoff Area=1.322 ac 0.11% Impervious Runoff Depth=3.70"
Flow Length=64' Slope=0.3300 '/' Tc=6.0 min CN=78 Runoff=5.61 cfs 0.408 af

SubcatchmentS4: Subcat S4 Runoff Area=1.628 ac 0.00% Impervious Runoff Depth=3.30"
Flow Length=143' Slope=0.0500 '/' Tc=10.3 min CN=74 Runoff=5.40 cfs 0.448 af

Subcatchment S5: Subcat S5 Runoff Area=0.922 ac 0.00% Impervious Runoff Depth=3.40"
Flow Length=118' Tc=9.9 min CN=75 Runoff=3.18 cfs 0.261 af

Subcatchment S6: Subcat S6 Runoff Area=2.064 ac 0.00% Impervious Runoff Depth=3.40"
Flow Length=163' Tc=10.1 min CN=75 Runoff=7.09 cfs 0.585 af

Subcatchment SP: Subcat SP Runoff Area=0.642 ac 0.00% Impervious Runoff Depth=5.09"
Tc=0.0 min CN=91 Runoff=4.15 cfs 0.273 af

Reach DC-N: RipRap Downchute Avg. Flow Depth=0.46' Max Vel=5.97 fps Inflow=12.13 cfs 1.057 af
n=0.070 L=120.0' S=0.3300 '/' Capacity=127.98 cfs Outflow=12.04 cfs 1.057 af

Reach DC-S: RipRap Downchute Avg. Flow Depth=0.30' Max Vel=4.69 fps Inflow=5.40 cfs 0.448 af
n=0.070 L=100.0' S=0.3333 '/' Capacity=128.61 cfs Outflow=5.35 cfs 0.448 af

Reach PRA: Perimeter Swale Avg. Flow Depth=0.84' Max Vel=3.26 fps Inflow=10.56 cfs 0.856 af
n=0.030 L=500.0' S=0.0100 '/' Capacity=63.20 cfs Outflow=10.01 cfs 0.856 af

Reach PRB: Perimeter Swale Avg. Flow Depth=0.52' Max Vel=2.53 fps Inflow=4.16 cfs 3.004 af
n=0.030 L=700.0' S=0.0100 '/' Capacity=33.63 cfs Outflow=4.02 cfs 3.002 af

Reach PRC: Swale Avg. Flow Depth=0.49' Max Vel=2.65 fps Inflow=6.43 cfs 0.703 af
n=0.030 L=140.0' S=0.0100 '/' Capacity=23.61 cfs Outflow=6.39 cfs 0.703 af

Reach R1: Sideslope Swale Avg. Flow Depth=0.87' Max Vel=2.70 fps Inflow=6.89 cfs 0.499 af
n=0.030 L=1,380.0' S=0.0100 '/' Capacity=47.07 cfs Outflow=5.12 cfs 0.499 af

Reach R2: Sideslope Swale Avg. Flow Depth=0.83' Max Vel=3.69 fps Inflow=7.09 cfs 0.585 af
n=0.030 L=1,143.0' S=0.0200 '/' Capacity=66.56 cfs Outflow=6.20 cfs 0.585 af

Reach R3: Sideslope Swale Avg. Flow Depth=0.41' Max Vel=5.88 fps Inflow=3.04 cfs 0.261 af
n=0.030 L=300.0' S=0.1233 '/' Capacity=201.54 cfs Outflow=2.96 cfs 0.261 af

Reach R4: Sideslope Swale Avg. Flow Depth=0.63' Max Vel=3.09 fps Inflow=3.18 cfs 0.261 af
n=0.030 L=348.0' S=0.0200 '/' Capacity=66.56 cfs Outflow=3.04 cfs 0.261 af

Reach R5: Sideslope Swale Avg. Flow Depth=0.79' Max Vel=3.56 fps Inflow=5.61 cfs 0.408 af
n=0.030 L=309.0' S=0.0200 '/' Capacity=66.56 cfs Outflow=5.25 cfs 0.408 af

Reach R6: Sideslope Swale Avg. Flow Depth=0.63' Max Vel=3.06 fps Inflow=3.21 cfs 0.259 af
n=0.030 L=589.0' S=0.0200 '/' Capacity=66.56 cfs Outflow=2.99 cfs 0.259 af

Reach R7: Sideslope Swale Avg. Flow Depth=0.89' Max Vel=2.74 fps Inflow=6.02 cfs 0.515 af
n=0.030 L=800.0' S=0.0100 '/' Capacity=47.07 cfs Outflow=5.36 cfs 0.515 af

Reach R8: Sideslope Swale Avg. Flow Depth=0.72' Max Vel=3.37 fps Inflow=4.50 cfs 0.373 af
n=0.030 L=354.0' S=0.0200 '/' Capacity=66.56 cfs Outflow=4.32 cfs 0.373 af

Reach R9: Sideslope Swale Avg. Flow Depth=0.81' Max Vel=3.64 fps Inflow=6.19 cfs 0.505 af
n=0.030 L=495.0' S=0.0200 '/' Capacity=66.56 cfs Outflow=5.90 cfs 0.505 af

Pond C-1: 30" Culvert Peak Elev=880.00' Inflow=10.01 cfs 0.856 af
30.0" Round Culvert n=0.013 L=188.0' S=0.0144 '/' Outflow=10.01 cfs 0.856 af

Pond C-2: 30" Culvert Peak Elev=871.09' Inflow=4.02 cfs 3.002 af
30.0" Round Culvert n=0.013 L=270.0' S=0.0100 '/' Outflow=4.02 cfs 3.002 af

Pond C-3: 24" Culvert Peak Elev=878.71' Inflow=6.39 cfs 0.703 af
24.0" Round Culvert n=0.013 L=130.0' S=0.0100 '/' Outflow=6.39 cfs 0.703 af

Pond P-N1: North Basin 1 Peak Elev=862.22' Storage=16,810 cf Inflow=12.72 cfs 3.878 af
Primary=8.20 cfs 3.874 af Secondary=0.00 cfs 0.000 af Outflow=8.20 cfs 3.874 af

Pond P-N2: North Basin 2 Peak Elev=877.68' Storage=96,321 cf Inflow=26.94 cfs 2.758 af
Primary=3.64 cfs 2.717 af Secondary=0.00 cfs 0.000 af Outflow=3.64 cfs 2.717 af

Pond PND-S: South Basin Peak Elev=862.31' Storage=53,150 cf Inflow=24.46 cfs 2.474 af
Primary=9.00 cfs 2.474 af Secondary=0.00 cfs 0.000 af Outflow=9.00 cfs 2.474 af

Link N: POI-N Inflow=9.80 cfs 4.369 af
Primary=9.80 cfs 4.369 af

Link S: POI-S Inflow=9.14 cfs 2.546 af
Primary=9.14 cfs 2.546 af

Total Runoff Area = 25.894 ac Runoff Volume = 6.962 af Average Runoff Depth = 3.23"
99.99% Pervious = 25.893 ac 0.01% Impervious = 0.001 ac

Summary for Subcatchment N1: Subcat N1

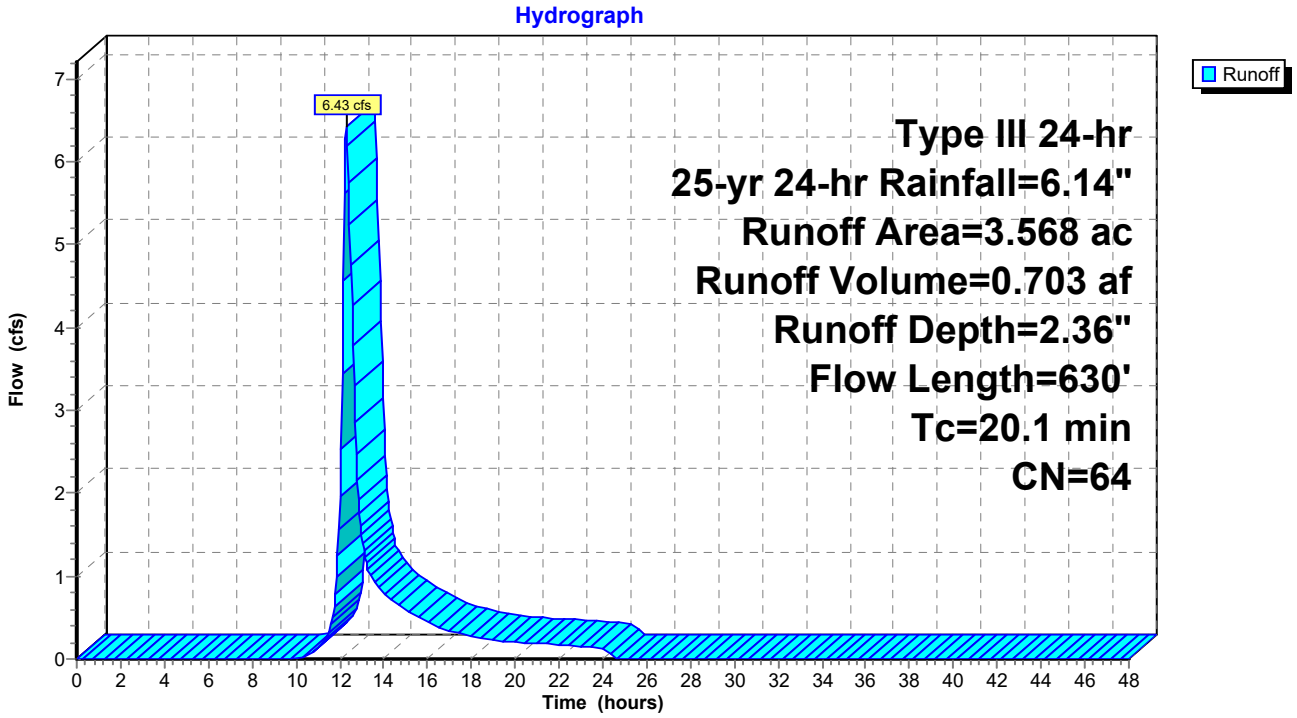
Runoff = 6.43 cfs @ 12.30 hrs, Volume= 0.703 af, Depth= 2.36"
Routed to Reach PRC : Swale

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-yr 24-hr Rainfall=6.14"

Area (ac)	CN	Description
0.073	79	50-75% Grass cover, Fair, HSG C
1.264	79	50-75% Grass cover, Fair, HSG C
1.678	49	50-75% Grass cover, Fair, HSG A
0.011	70	Woods, Good, HSG C
0.000	70	Woods, Good, HSG C
0.002	30	Woods, Good, HSG A
0.540	74	>75% Grass cover, Good, HSG C
3.568	64	Weighted Average
3.568		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.5	100	0.1000	0.22		**Sheet Flow, Grass** Grass: Dense n= 0.240 P2= 3.23"
12.6	530	0.0100	0.70		**Shallow Concentrated Flow, Grass** Short Grass Pasture Kv= 7.0 fps
20.1	630	Total			

Subcatchment N1: Subcat N1



Summary for Subcatchment N10: Subcat N10

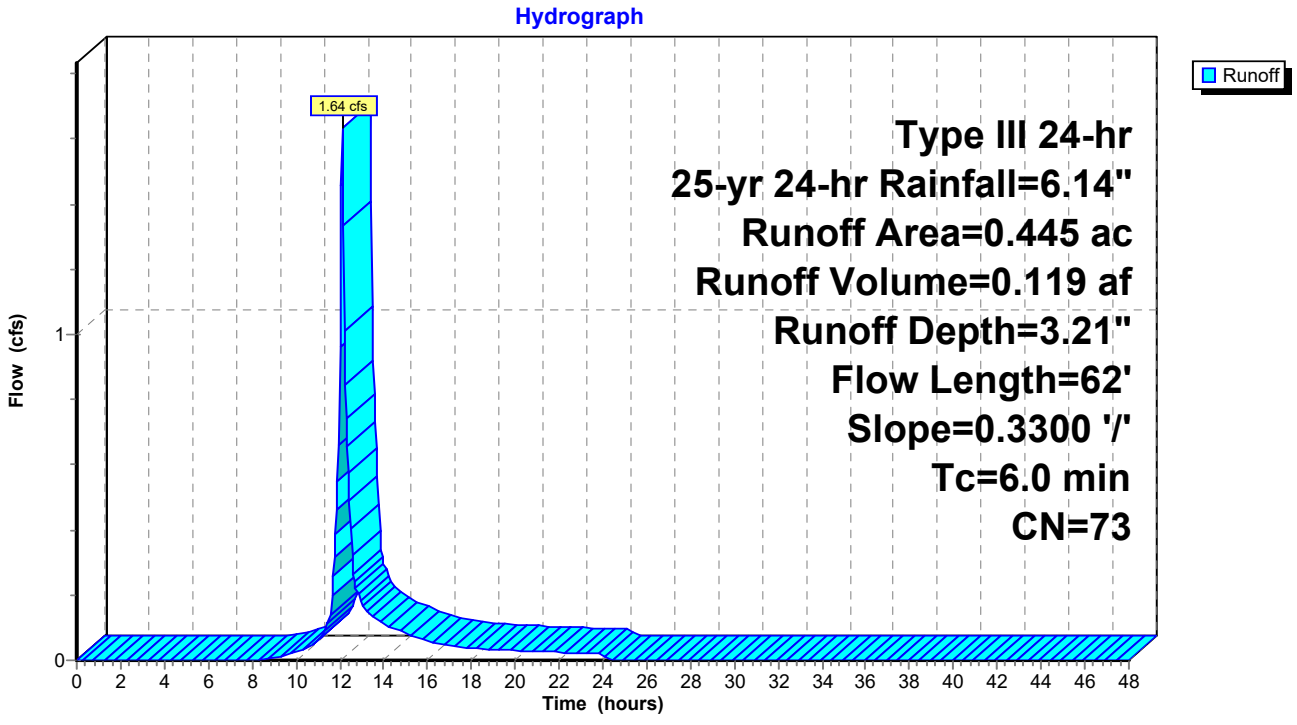
Runoff = 1.64 cfs @ 12.09 hrs, Volume= 0.119 af, Depth= 3.21"
Routed to Link N : POI-N

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-yr 24-hr Rainfall=6.14"

Area (ac)	CN	Description
0.029	49	50-75% Grass cover, Fair, HSG A
0.001	39	>75% Grass cover, Good, HSG A
0.000	96	Gravel surface, HSG C
0.396	74	>75% Grass cover, Good, HSG C
0.018	79	50-75% Grass cover, Fair, HSG C
0.445	73	Weighted Average
0.445		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.2	62	0.3300	0.33		**Sheet Flow, Landfill Slope** Grass: Dense n= 0.240 P2= 3.23"
3.2	62	Total, Increased to minimum Tc = 6.0 min			

Subcatchment N10: Subcat N10



Summary for Subcatchment N11: Subcat N11

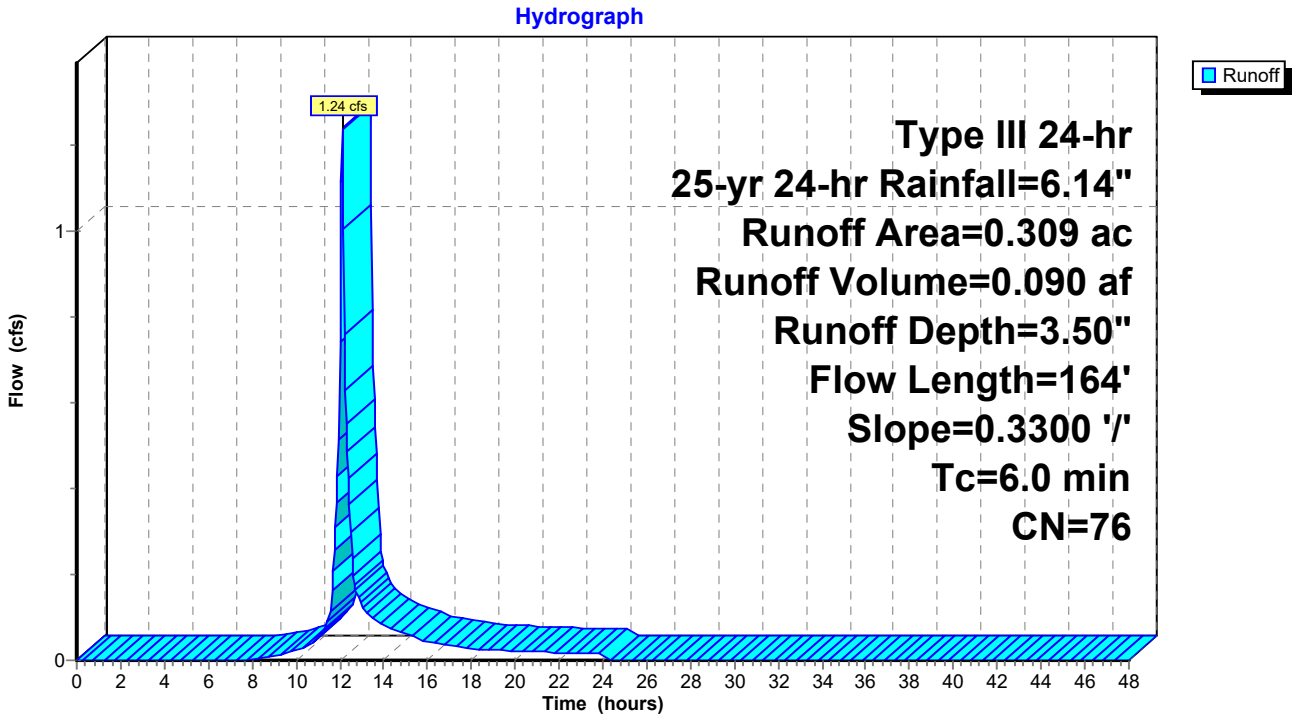
Runoff = 1.24 cfs @ 12.09 hrs, Volume= 0.090 af, Depth= 3.50"
Routed to Link N : POI-N

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-yr 24-hr Rainfall=6.14"

Area (ac)	CN	Description
0.027	96	Gravel surface, HSG C
0.276	74	>75% Grass cover, Good, HSG C
0.006	79	50-75% Grass cover, Fair, HSG C
0.309	76	Weighted Average
0.309		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.6	100	0.3300	0.36		**Sheet Flow, Landfill Slope** Grass: Dense n= 0.240 P2= 3.23"
0.3	64	0.3300	4.02		**Shallow Concentrated Flow, Landfill Slope** Short Grass Pasture Kv= 7.0 fps
4.9	164	Total, Increased to minimum Tc = 6.0 min			

Subcatchment N11: Subcat N11



Summary for Subcatchment N12: Subcat N12

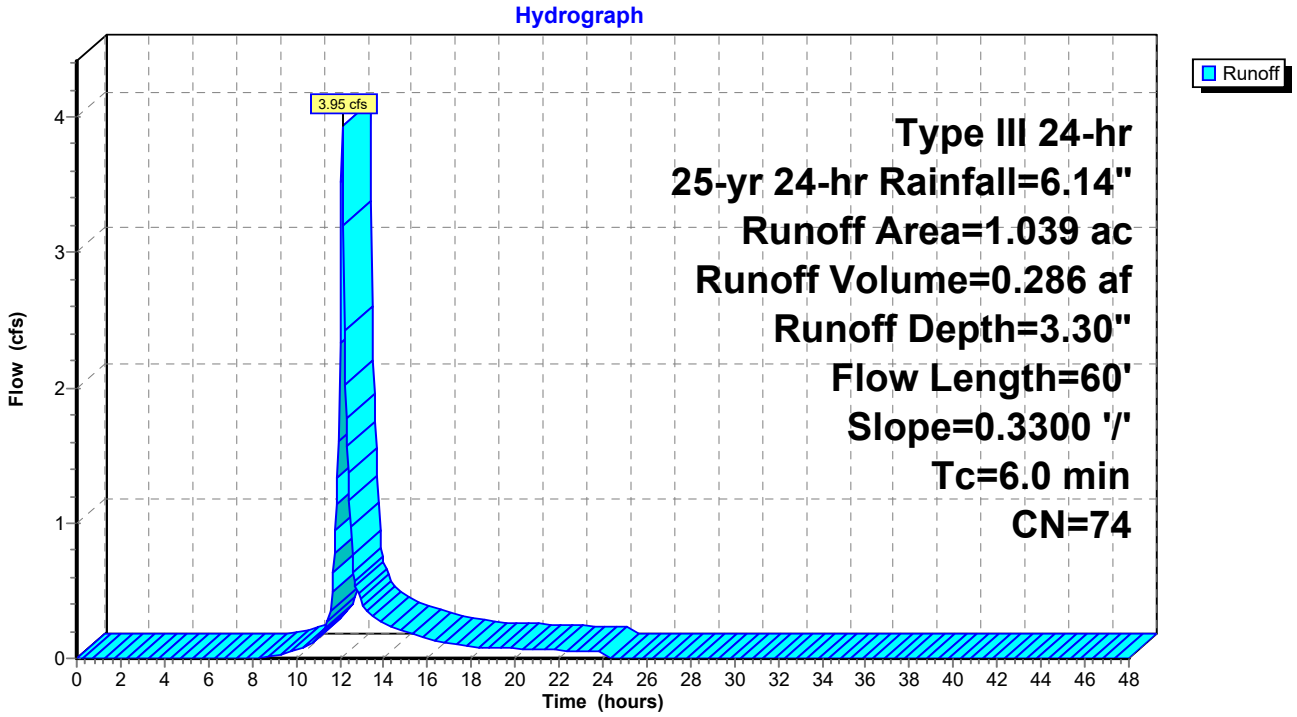
Runoff = 3.95 cfs @ 12.09 hrs, Volume= 0.286 af, Depth= 3.30"
Routed to Link N : POI-N

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-yr 24-hr Rainfall=6.14"

Area (ac)	CN	Description
0.000	49	50-75% Grass cover, Fair, HSG A
0.000	49	50-75% Grass cover, Fair, HSG A
0.000	79	50-75% Grass cover, Fair, HSG C
0.001	79	50-75% Grass cover, Fair, HSG C
0.001	79	50-75% Grass cover, Fair, HSG C
0.001	79	50-75% Grass cover, Fair, HSG C
0.000	79	50-75% Grass cover, Fair, HSG C
0.009	79	50-75% Grass cover, Fair, HSG C
0.003	79	50-75% Grass cover, Fair, HSG C
1.024	74	>75% Grass cover, Good, HSG C
1.039	74	Weighted Average
1.039		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.1	60	0.3300	0.33		**Sheet Flow, Landfill Slope** Grass: Dense n= 0.240 P2= 3.23"
3.1	60	Total, Increased to minimum Tc = 6.0 min			

Subcatchment N12: Subcat N12



Summary for Subcatchment N3: Subcat N3

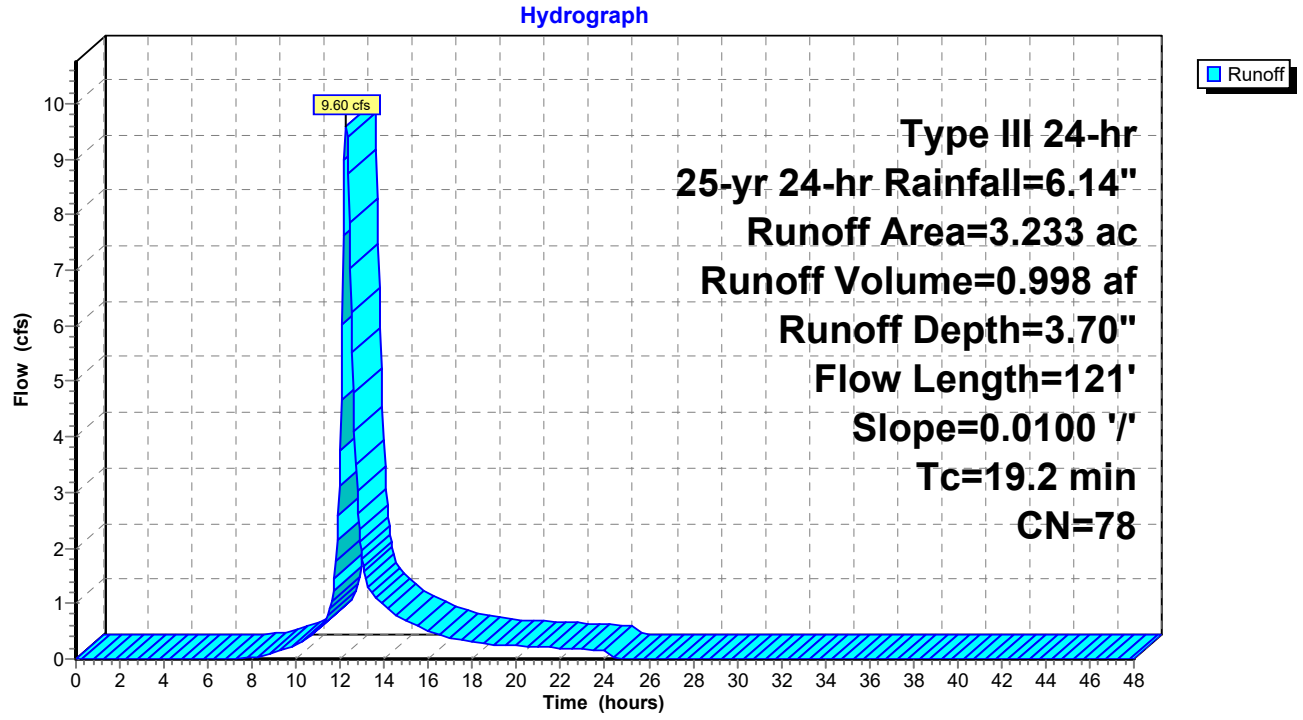
Runoff = 9.60 cfs @ 12.26 hrs, Volume= 0.998 af, Depth= 3.70"
Routed to Pond P-N2 : North Basin 2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-yr 24-hr Rainfall=6.14"

Area (ac)	CN	Description
0.166	49	50-75% Grass cover, Fair, HSG A
2.016	79	50-75% Grass cover, Fair, HSG C
0.654	79	50-75% Grass cover, Fair, HSG C
0.087	96	Gravel surface, HSG C
0.000	74	>75% Grass cover, Good, HSG C
0.021	96	Gravel surface, HSG C
0.289	74	>75% Grass cover, Good, HSG C
3.233	78	Weighted Average
3.233		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
18.7	100	0.0100	0.09		**Sheet Flow, Grass** Grass: Dense n= 0.240 P2= 3.23"
0.5	21	0.0100	0.70		**Shallow Concentrated Flow, Grass** Short Grass Pasture Kv= 7.0 fps
19.2	121	Total			

Subcatchment N3: Subcat N3



Summary for Subcatchment N4: Subcat N4

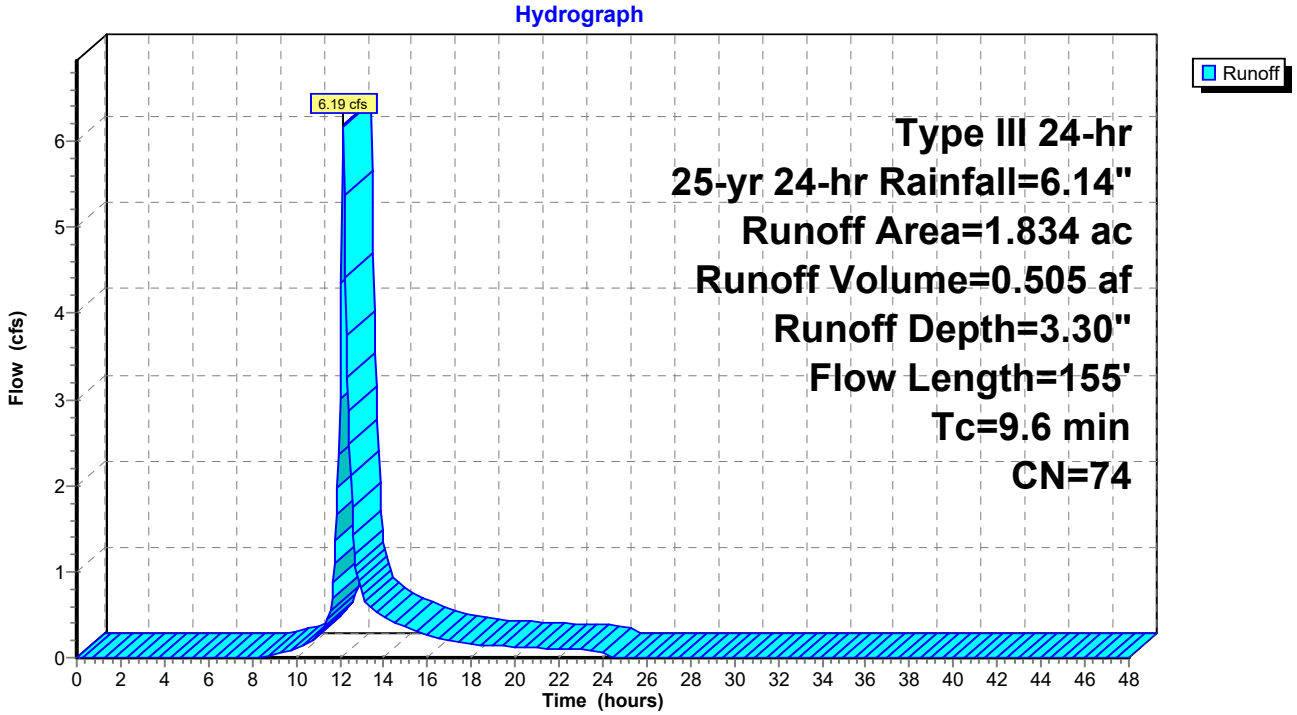
Runoff = 6.19 cfs @ 12.14 hrs, Volume= 0.505 af, Depth= 3.30"
Routed to Reach R9 : Sideslope Swale

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-yr 24-hr Rainfall=6.14"

Area (ac)	CN	Description
0.002	96	Gravel surface, HSG C
1.832	74	>75% Grass cover, Good, HSG C
1.834	74	Weighted Average
1.834		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.0	77	0.0500	0.16		**Sheet Flow, Landfill Deck** Grass: Dense n= 0.240 P2= 3.23"
1.4	23	0.3300	0.27		**Sheet Flow, Landfill Slope** Grass: Dense n= 0.240 P2= 3.23"
0.2	55	0.3300	4.02		**Shallow Concentrated Flow, Landfill Slope** Short Grass Pasture Kv= 7.0 fps
9.6	155	Total			

Subcatchment N4: Subcat N4



Summary for Subcatchment N5: Subcat N5

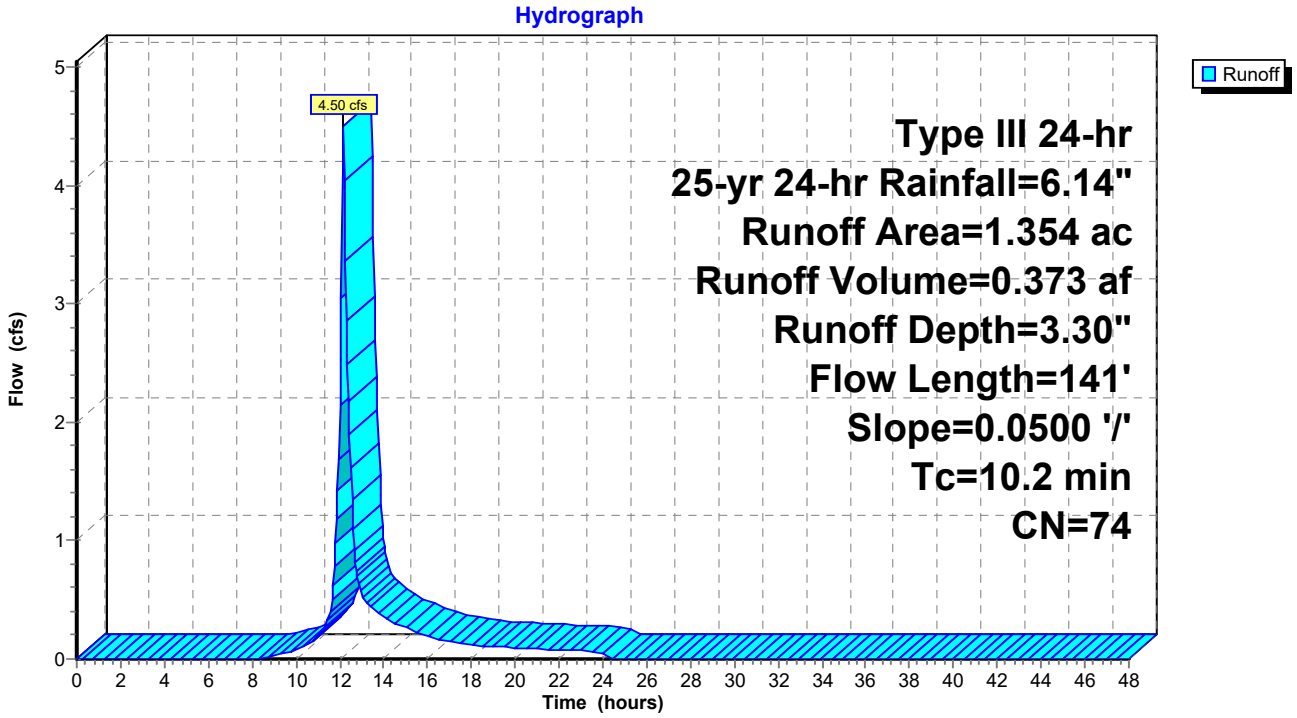
Runoff = 4.50 cfs @ 12.15 hrs, Volume= 0.373 af, Depth= 3.30"
Routed to Reach R8 : Sideslope Swale

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-yr 24-hr Rainfall=6.14"

Area (ac)	CN	Description
1.354	74	>75% Grass cover, Good, HSG C
1.354		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.8	100	0.0500	0.17		**Sheet Flow, Landfill Deck** Grass: Dense n= 0.240 P2= 3.23"
0.4	41	0.0500	1.57		**Shallow Concentrated Flow, Landfill Deck** Short Grass Pasture Kv= 7.0 fps
10.2	141	Total			

Subcatchment N5: Subcat N5



Summary for Subcatchment N6: Subcat N6

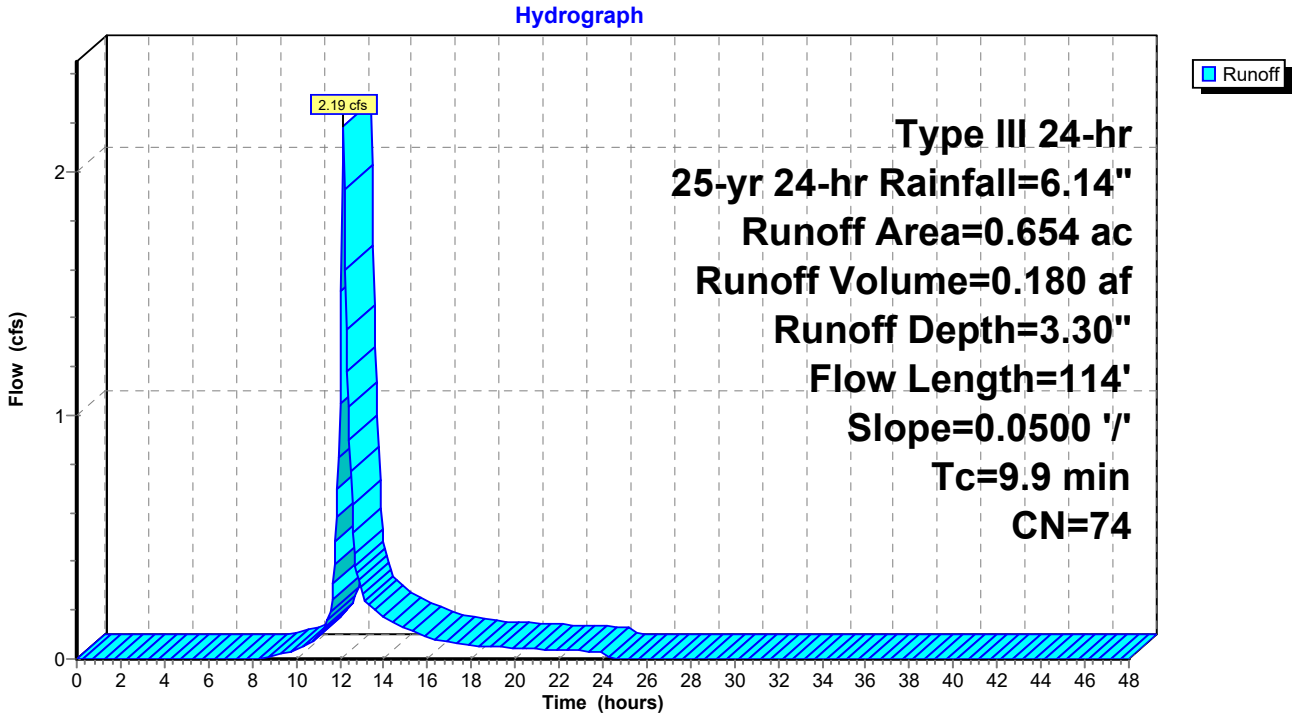
Runoff = 2.19 cfs @ 12.14 hrs, Volume= 0.180 af, Depth= 3.30"
Routed to Reach DC-N : RipRap Downchute

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-yr 24-hr Rainfall=6.14"

Area (ac)	CN	Description
0.654	74	>75% Grass cover, Good, HSG C
0.654		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.8	100	0.0500	0.17		**Sheet Flow, Landfill Deck** Grass: Dense n= 0.240 P2= 3.23"
0.1	14	0.0500	1.57		**Shallow Concentrated Flow, Landfill Deck** Short Grass Pasture Kv= 7.0 fps
9.9	114	Total			

Subcatchment N6: Subcat N6



Summary for Subcatchment N7: Subcat N7

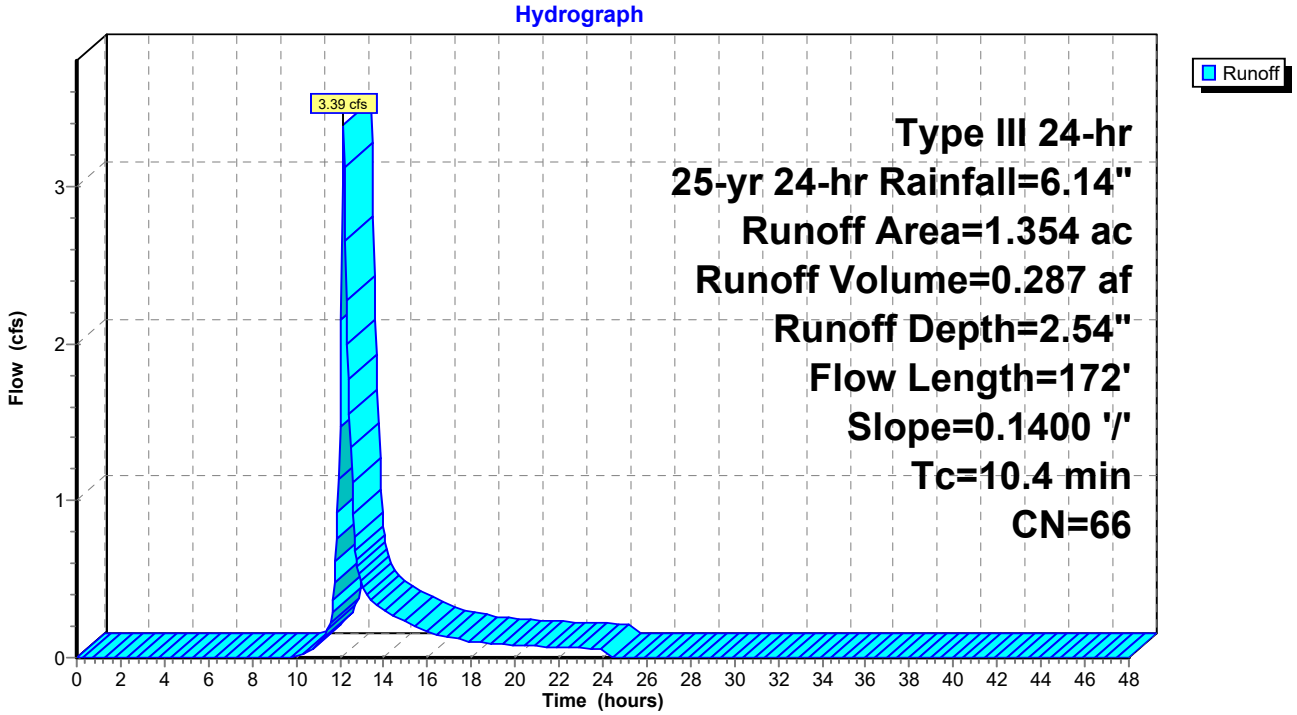
Runoff = 3.39 cfs @ 12.15 hrs, Volume= 0.287 af, Depth= 2.54"
Routed to Reach PRB : Perimeter Swale

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-yr 24-hr Rainfall=6.14"

Area (ac)	CN	Description
0.531	49	50-75% Grass cover, Fair, HSG A
0.045	96	Gravel surface, HSG C
0.430	74	>75% Grass cover, Good, HSG C
0.349	79	50-75% Grass cover, Fair, HSG C
1.354	66	Weighted Average
1.354		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.8	100	0.1400	0.17		**Sheet Flow, Woods** Woods: Light underbrush n= 0.400 P2= 3.23"
0.6	72	0.1400	1.87		**Shallow Concentrated Flow, Woods** Woodland Kv= 5.0 fps
10.4	172	Total			

Subcatchment N7: Subcat N7



Summary for Subcatchment N8: Subcat N8

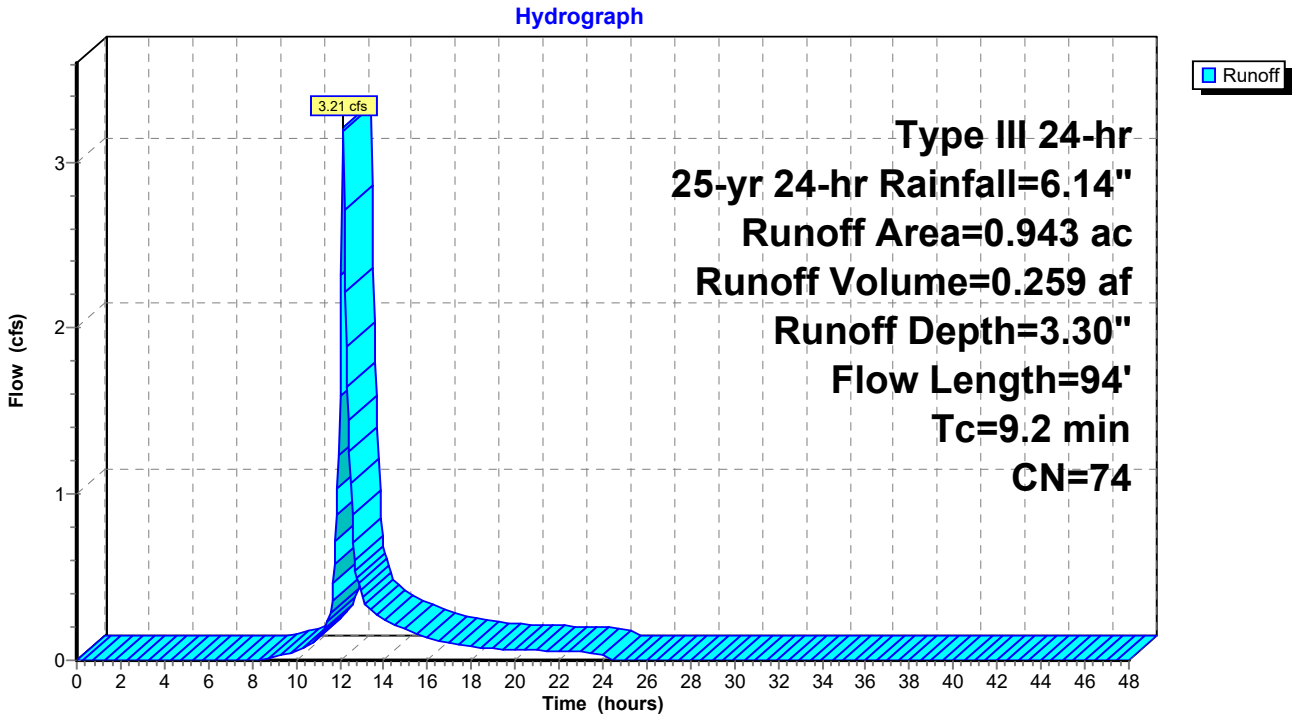
Runoff = 3.21 cfs @ 12.13 hrs, Volume= 0.259 af, Depth= 3.30"
Routed to Reach R6 : Sideslope Swale

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-yr 24-hr Rainfall=6.14"

Area (ac)	CN	Description
0.008	96	Gravel surface, HSG C
0.934	74	>75% Grass cover, Good, HSG C
0.000	79	50-75% Grass cover, Fair, HSG C
0.943	74	Weighted Average
0.943		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.2	80	0.0500	0.16		**Sheet Flow, Landfill Deck** Grass: Dense n= 0.240 P2= 3.23"
1.0	14	0.3300	0.24		**Sheet Flow, Landfill Slope** Grass: Dense n= 0.240 P2= 3.23"
9.2	94	Total			

Subcatchment N8: Subcat N8



Summary for Subcatchment N9: Subcat N9

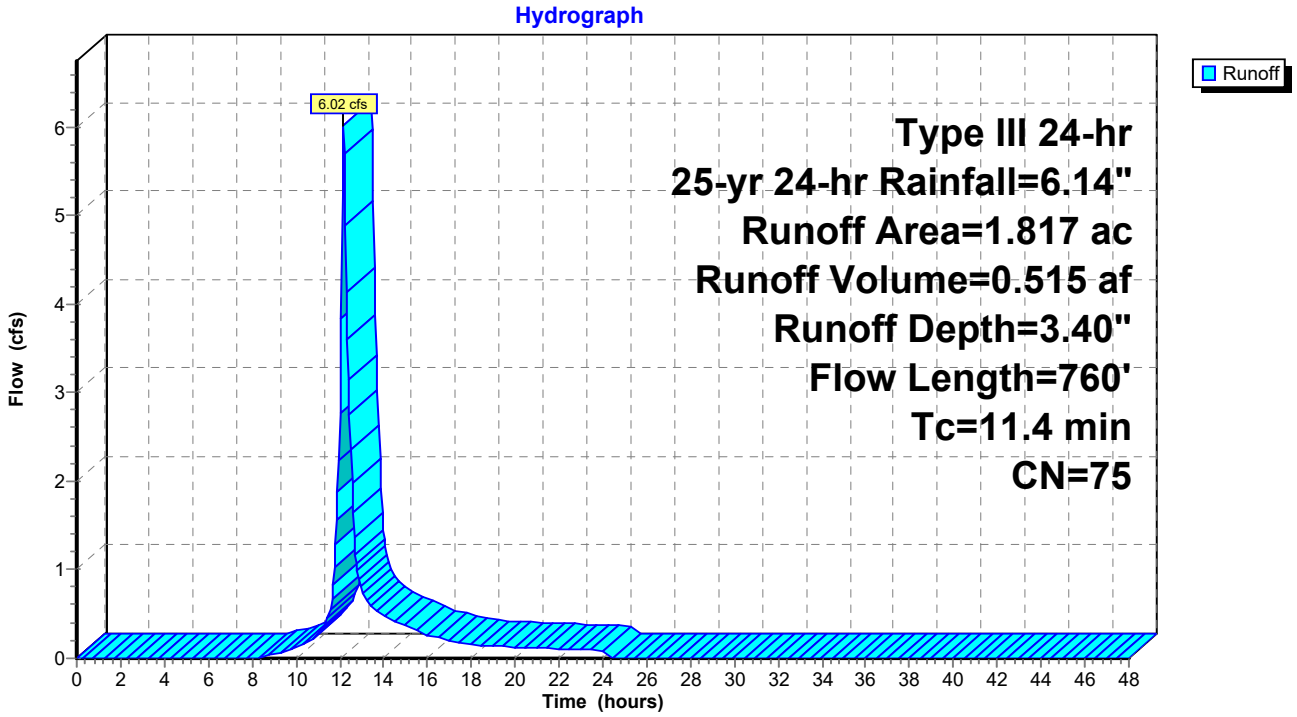
Runoff = 6.02 cfs @ 12.16 hrs, Volume= 0.515 af, Depth= 3.40"
Routed to Reach R7 : Sideslope Swale

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-yr 24-hr Rainfall=6.14"

Area (ac)	CN	Description
0.025	96	Gravel surface, HSG C
0.075	96	Gravel surface, HSG C
1.718	74	>75% Grass cover, Good, HSG C
0.000	74	>75% Grass cover, Good, HSG C
1.817	75	Weighted Average
1.817		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.2	56	0.0500	0.15		**Sheet Flow, Landfill Deck** Grass: Dense n= 0.240 P2= 3.23"
2.4	44	0.3300	0.31		**Sheet Flow, Landfill Slope** Grass: Dense n= 0.240 P2= 3.23"
0.0	10	0.3300	5.17		**Shallow Concentrated Flow, Landfill Slope** Cultivated Straight Rows Kv= 9.0 fps
2.8	650	0.0100	3.89	21.85	**Trap/Vee/Rect Channel Flow, Sideslope Swale** Bot.W=0.00' D=1.50' Z= 2.0 & 3.0 '/' Top.W=7.50' n= 0.030 Earth, grassed & winding
11.4	760	Total			

Subcatchment N9: Subcat N9



Summary for Subcatchment NP: Subcat NP

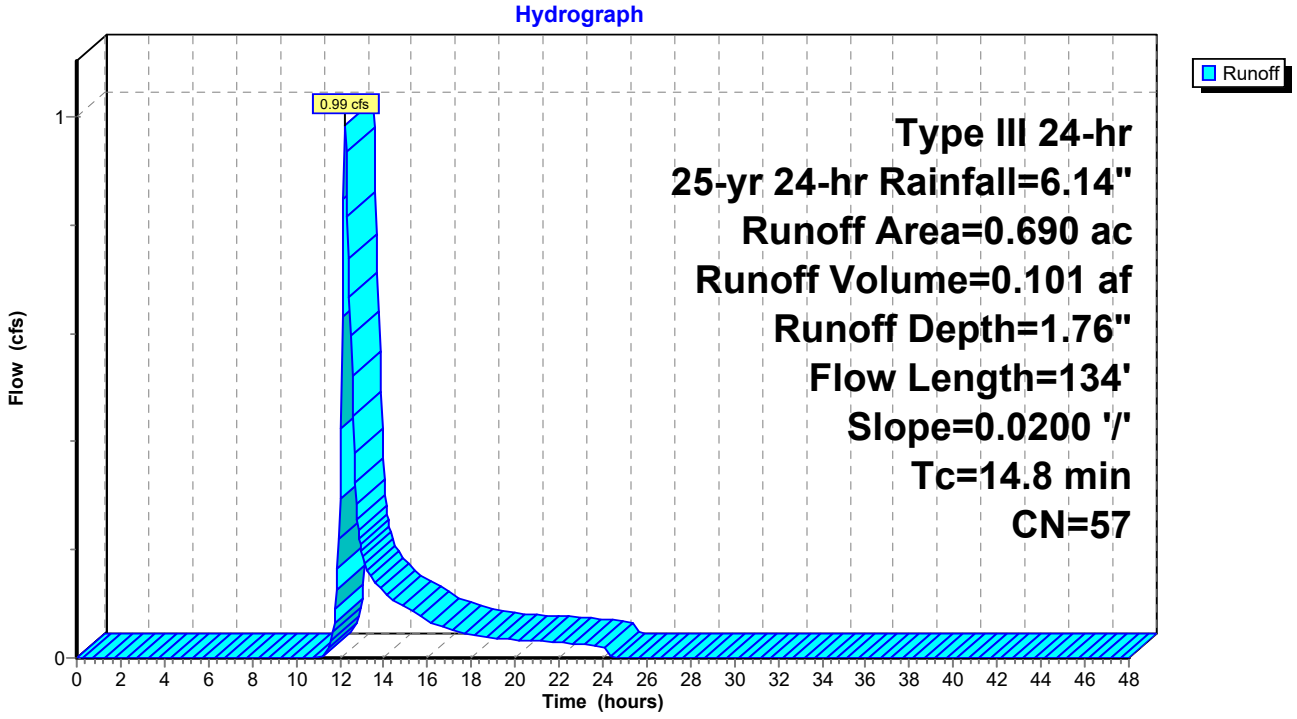
Runoff = 0.99 cfs @ 12.22 hrs, Volume= 0.101 af, Depth= 1.76"
Routed to Pond P-N1 : North Basin 1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-yr 24-hr Rainfall=6.14"

Area (ac)	CN	Description
0.056	49	50-75% Grass cover, Fair, HSG A
0.143	79	50-75% Grass cover, Fair, HSG C
0.004	79	50-75% Grass cover, Fair, HSG C
0.431	49	50-75% Grass cover, Fair, HSG A
0.056	74	>75% Grass cover, Good, HSG C
0.690	57	Weighted Average
0.690		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.2	100	0.0200	0.12		**Sheet Flow, Valley** Grass: Dense n= 0.240 P2= 3.23"
0.6	34	0.0200	0.99		**Shallow Concentrated Flow, Valley** Short Grass Pasture Kv= 7.0 fps
14.8	134	Total			

Subcatchment NP: Subcat NP



Summary for Subcatchment S1: Subcat S7

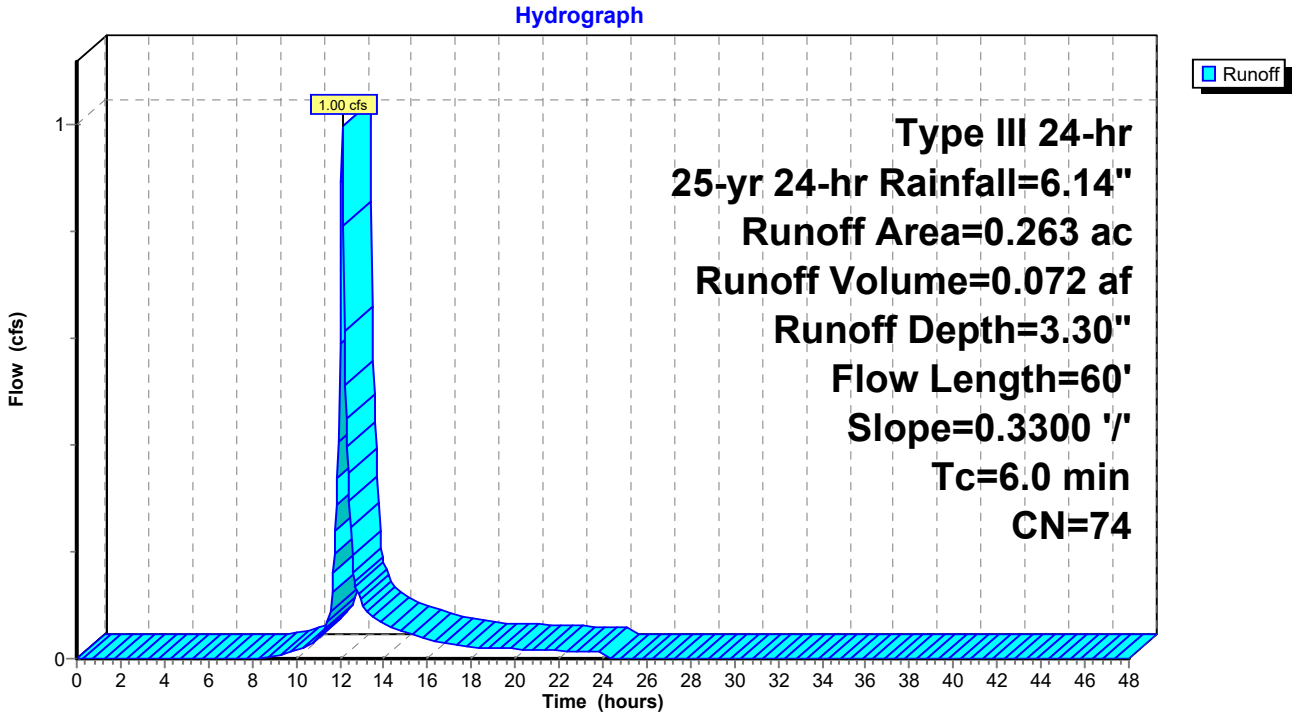
Runoff = 1.00 cfs @ 12.09 hrs, Volume= 0.072 af, Depth= 3.30"
Routed to Link S : POI-S

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-yr 24-hr Rainfall=6.14"

Area (ac)	CN	Description
0.002	79	50-75% Grass cover, Fair, HSG C
0.001	79	50-75% Grass cover, Fair, HSG C
0.163	74	>75% Grass cover, Good, HSG C
0.097	74	>75% Grass cover, Good, HSG C
0.263	74	Weighted Average
0.263		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.1	60	0.3300	0.33		**Sheet Flow, Landfill Slope** Grass: Dense n= 0.240 P2= 3.23"
3.1	60	Total, Increased to minimum Tc = 6.0 min			

Subcatchment S1: Subcat S7



Summary for Subcatchment S2: Subcat S2

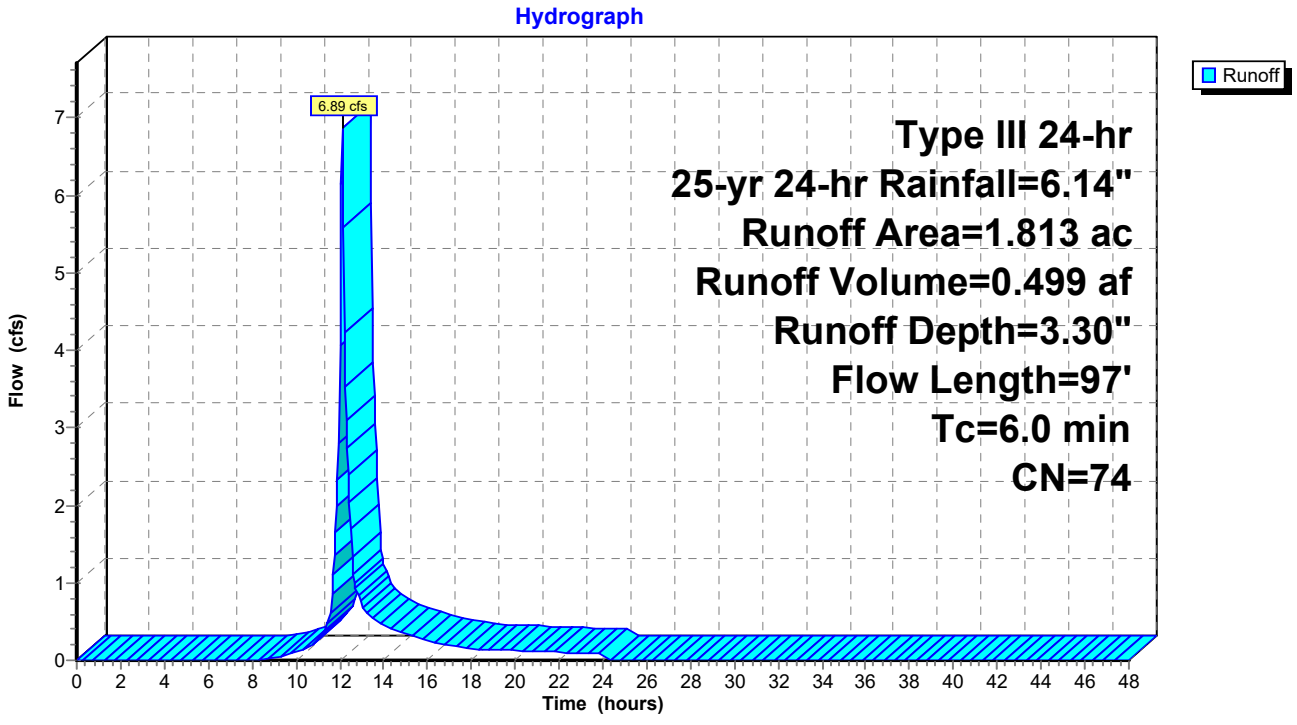
Runoff = 6.89 cfs @ 12.09 hrs, Volume= 0.499 af, Depth= 3.30"
Routed to Reach R1 : Sideslope Swale

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-yr 24-hr Rainfall=6.14"

Area (ac)	CN	Description
0.098	74	>75% Grass cover, Good, HSG C
0.039	96	Gravel surface, HSG C
1.676	74	>75% Grass cover, Good, HSG C
1.813	74	Weighted Average
1.813		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	31	0.1300	0.69		**Sheet Flow, Landfill Access Road** Fallow n= 0.050 P2= 3.23"
3.3	66	0.3300	0.33		**Sheet Flow, Landfill Slope** Grass: Dense n= 0.240 P2= 3.23"
4.1	97	Total, Increased to minimum Tc = 6.0 min			

Subcatchment S2: Subcat S2



Summary for Subcatchment S3: Subcat S3

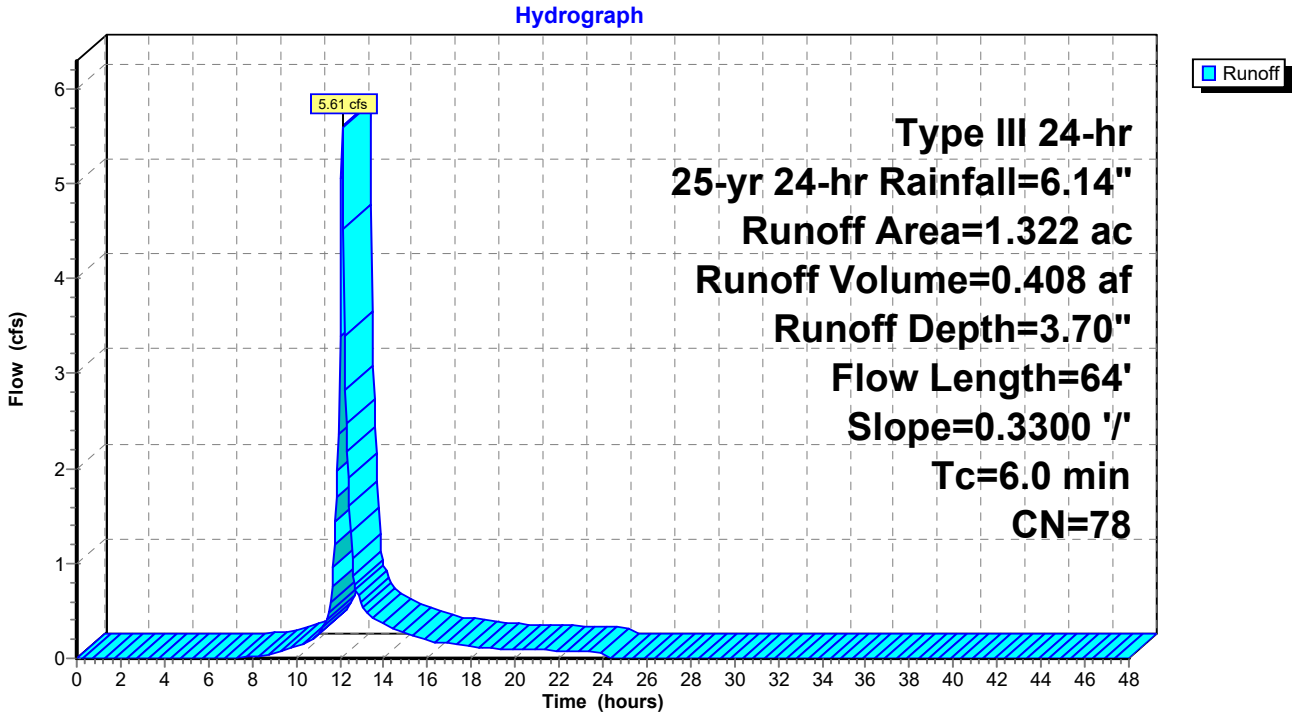
Runoff = 5.61 cfs @ 12.09 hrs, Volume= 0.408 af, Depth= 3.70"
Routed to Reach R5 : Sideslope Swale

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-yr 24-hr Rainfall=6.14"

Area (ac)	CN	Description
0.008	79	50-75% Grass cover, Fair, HSG C
0.003	79	50-75% Grass cover, Fair, HSG C
0.069	49	50-75% Grass cover, Fair, HSG A
0.164	91	Fallow, bare soil, HSG C
0.066	74	>75% Grass cover, Good, HSG C
0.016	96	Gravel surface, HSG C
0.071	96	Gravel surface, HSG C
0.025	96	Gravel surface, HSG C
0.087	96	Gravel surface, HSG C
0.001	98	Roofs, HSG C
0.033	74	>75% Grass cover, Good, HSG C
0.779	74	>75% Grass cover, Good, HSG C
1.322	78	Weighted Average
1.321		99.89% Pervious Area
0.001		0.11% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.2	64	0.3300	0.33		**Sheet Flow, Landfill Slope** Grass: Dense n= 0.240 P2= 3.23"
3.2	64	Total, Increased to minimum Tc = 6.0 min			

Subcatchment S3: Subcat S3



Summary for Subcatchment S4: Subcat S4

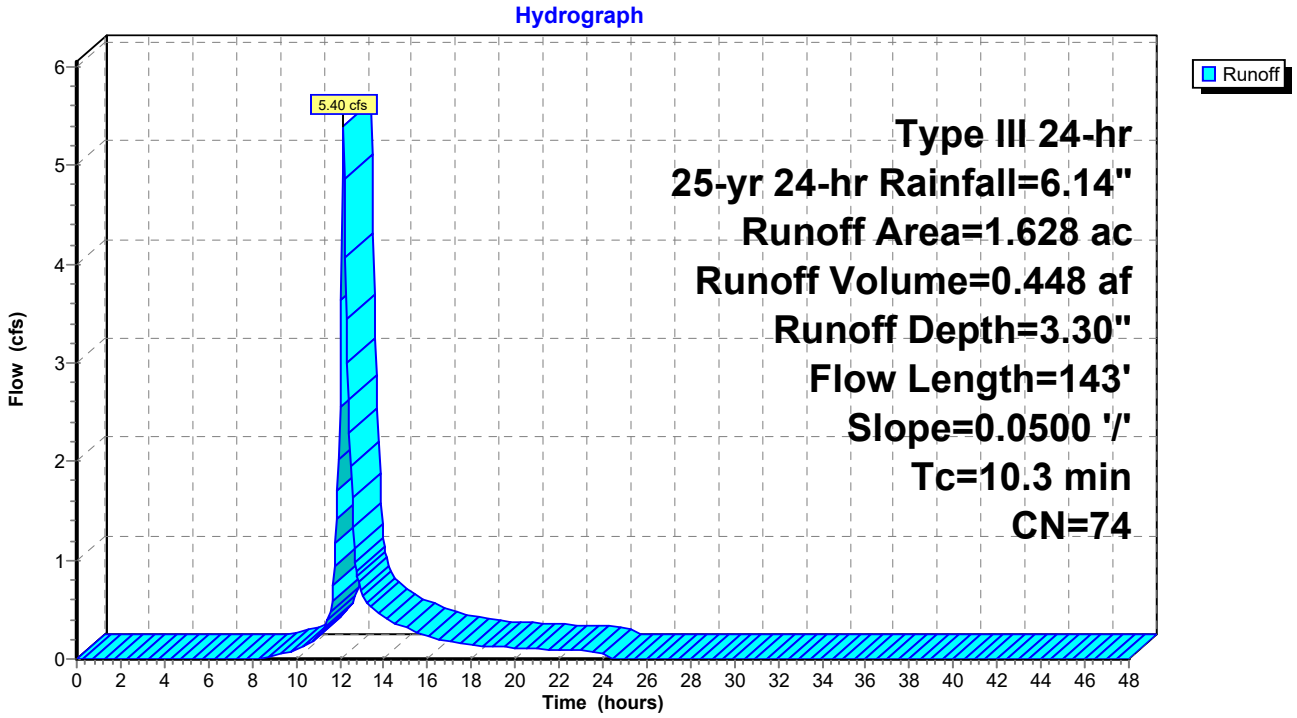
Runoff = 5.40 cfs @ 12.15 hrs, Volume= 0.448 af, Depth= 3.30"
Routed to Reach DC-S : RipRap Downchute

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-yr 24-hr Rainfall=6.14"

Area (ac)	CN	Description
1.628	74	>75% Grass cover, Good, HSG C
1.628		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.8	100	0.0500	0.17		**Sheet Flow, Landfill Deck** Grass: Dense n= 0.240 P2= 3.23"
0.5	43	0.0500	1.57		**Shallow Concentrated Flow, Landfill Deck** Short Grass Pasture Kv= 7.0 fps
10.3	143	Total			

Subcatchment S4: Subcat S4



Summary for Subcatchment S5: Subcat S5

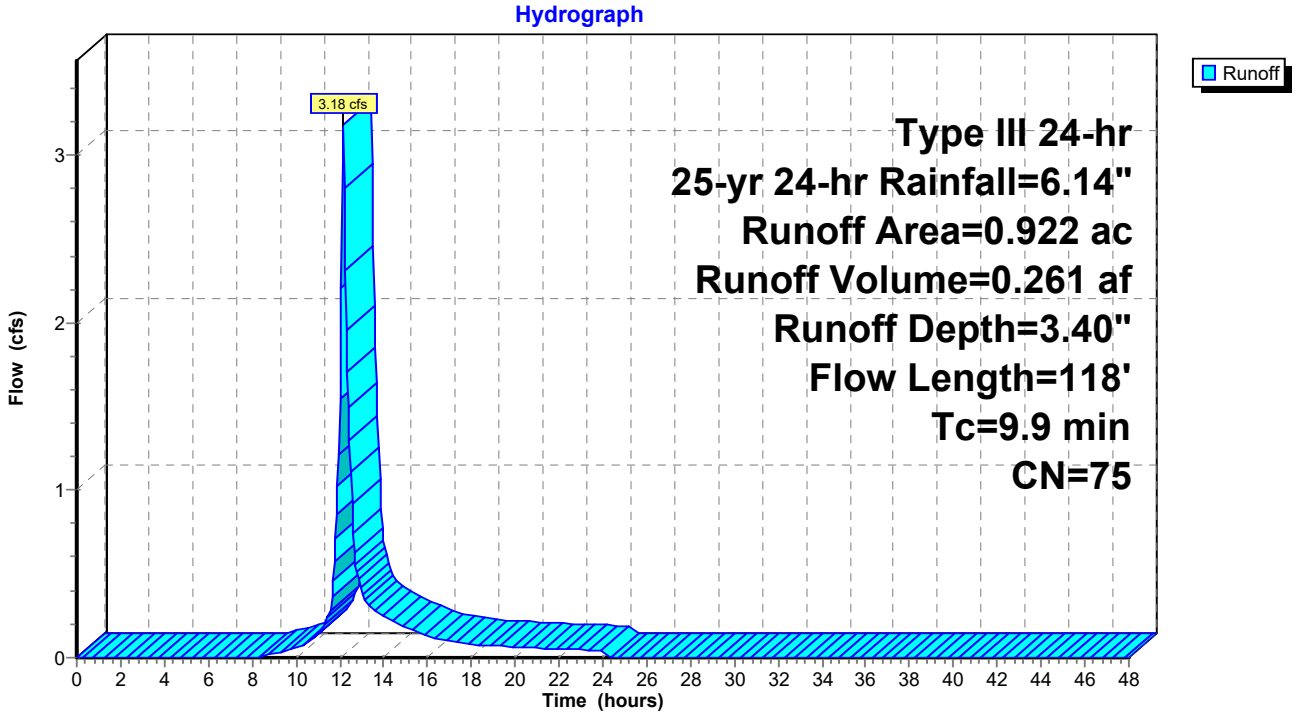
Runoff = 3.18 cfs @ 12.14 hrs, Volume= 0.261 af, Depth= 3.40"
Routed to Reach R4 : Sideslope Swale

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-yr 24-hr Rainfall=6.14"

Area (ac)	CN	Description
0.045	96	Gravel surface, HSG C
0.877	74	>75% Grass cover, Good, HSG C
0.922	75	Weighted Average
0.922		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.8	100	0.0500	0.17		**Sheet Flow, Landfill Deck** Grass: Dense n= 0.240 P2= 3.23"
0.1	12	0.0500	1.57		**Shallow Concentrated Flow, Landfill Deck** Short Grass Pasture Kv= 7.0 fps
0.0	6	0.3300	4.02		**Shallow Concentrated Flow, Landfill Slope** Short Grass Pasture Kv= 7.0 fps
9.9	118	Total			

Subcatchment S5: Subcat S5



Summary for Subcatchment S6: Subcat S6

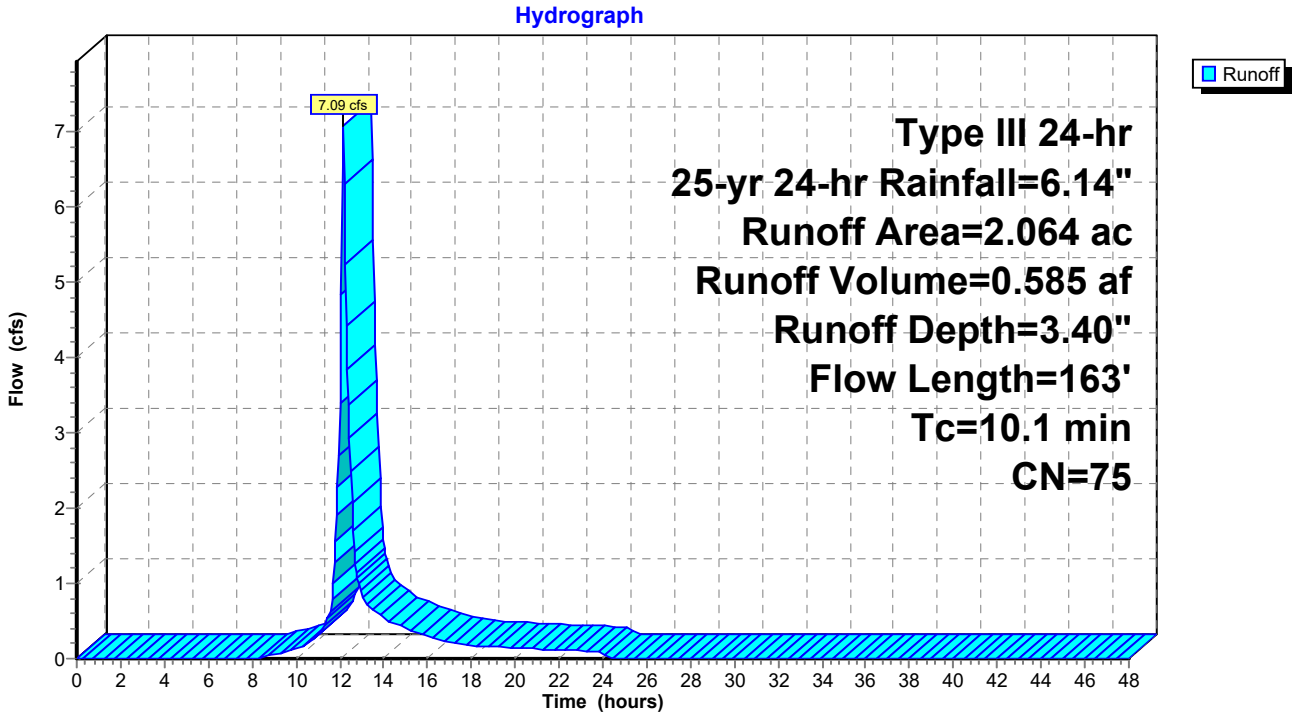
Runoff = 7.09 cfs @ 12.15 hrs, Volume= 0.585 af, Depth= 3.40"
Routed to Reach R2 : Sideslope Swale

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-yr 24-hr Rainfall=6.14"

Area (ac)	CN	Description
1.998	74	>75% Grass cover, Good, HSG C
0.066	96	Gravel surface, HSG C
2.064	75	Weighted Average
2.064		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.8	100	0.0500	0.17		**Sheet Flow, Landfill Deck** Grass: Dense n= 0.240 P2= 3.23"
0.3	63	0.3300	4.02		**Shallow Concentrated Flow, Landfill Slope** Short Grass Pasture Kv= 7.0 fps
10.1	163	Total			

Subcatchment S6: Subcat S6



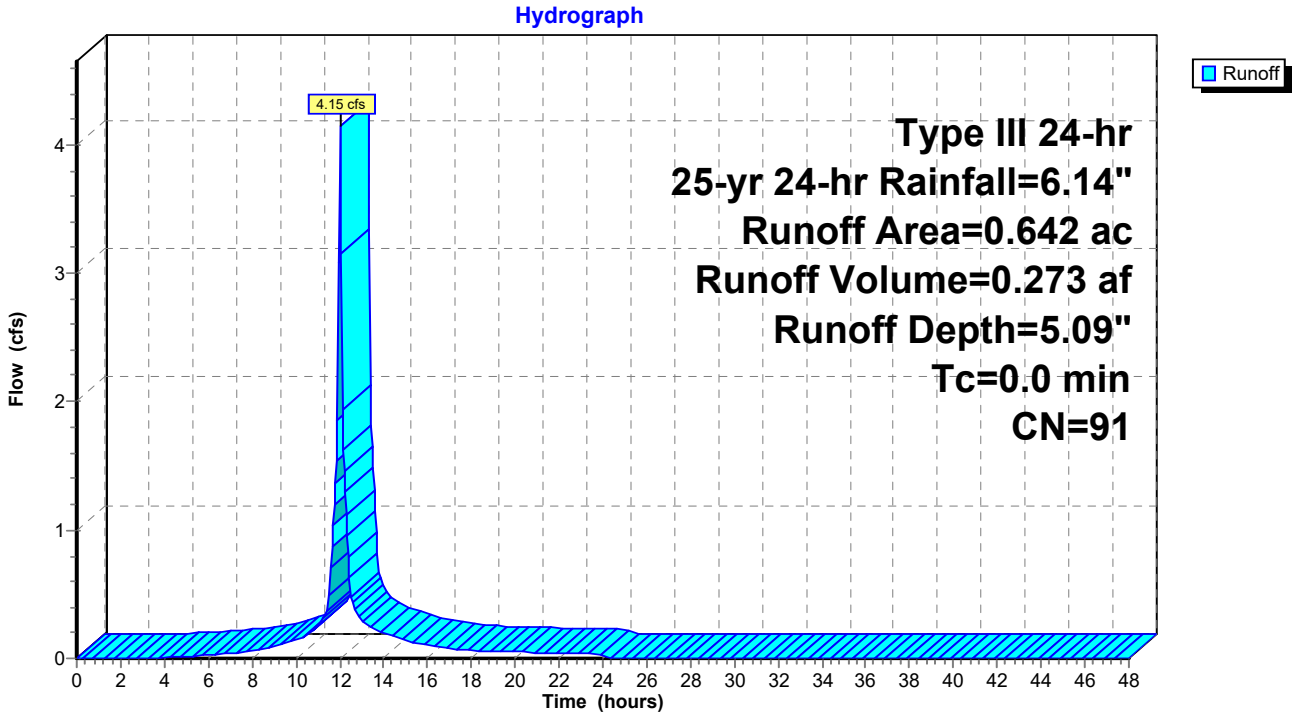
Summary for Subcatchment SP: Subcat SP

Runoff = 4.15 cfs @ 12.00 hrs, Volume= 0.273 af, Depth= 5.09"
Routed to Pond PND-S : South Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-yr 24-hr Rainfall=6.14"

Area (ac)	CN	Description
0.008	74	>75% Grass cover, Good, HSG C
0.635	91	Fallow, bare soil, HSG C
0.642	91	Weighted Average
0.642		100.00% Pervious Area

Subcatchment SP: Subcat SP



Summary for Reach DC-N: RipRap Downchute

Inflow Area = 3.841 ac, 0.00% Impervious, Inflow Depth = 3.30" for 25-yr 24-hr event
Inflow = 12.13 cfs @ 12.20 hrs, Volume= 1.057 af
Outflow = 12.04 cfs @ 12.21 hrs, Volume= 1.057 af, Atten= 1%, Lag= 0.5 min
Routed to Pond P-N2 : North Basin 2

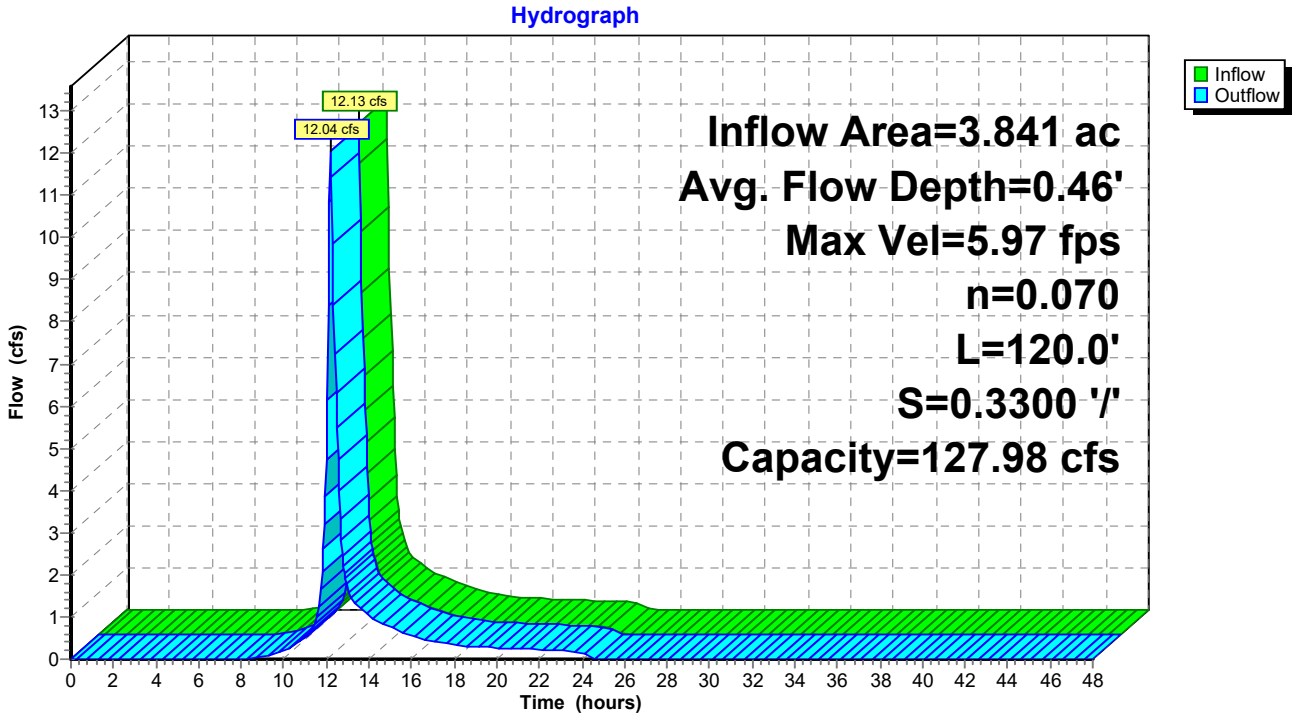
Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 5.97 fps, Min. Travel Time= 0.3 min
Avg. Velocity = 1.89 fps, Avg. Travel Time= 1.1 min

Peak Storage= 244 cf @ 12.20 hrs
Average Depth at Peak Storage= 0.46' , Surface Width= 5.78'
Bank-Full Depth= 1.50' Flow Area= 11.3 sf, Capacity= 127.98 cfs

3.00' x 1.50' deep channel, n= 0.070
Side Slope Z-value= 3.0 '/' Top Width= 12.00'
Length= 120.0' Slope= 0.3300 '/'
Inlet Invert= 919.60', Outlet Invert= 880.00'

‡

Reach DC-N: RipRap Downchute



Summary for Reach DC-S: RipRap Downchute

Inflow Area = 1.628 ac, 0.00% Impervious, Inflow Depth = 3.30" for 25-yr 24-hr event
Inflow = 5.40 cfs @ 12.15 hrs, Volume= 0.448 af
Outflow = 5.35 cfs @ 12.16 hrs, Volume= 0.448 af, Atten= 1%, Lag= 0.6 min
Routed to Reach PRA : Perimeter Swale

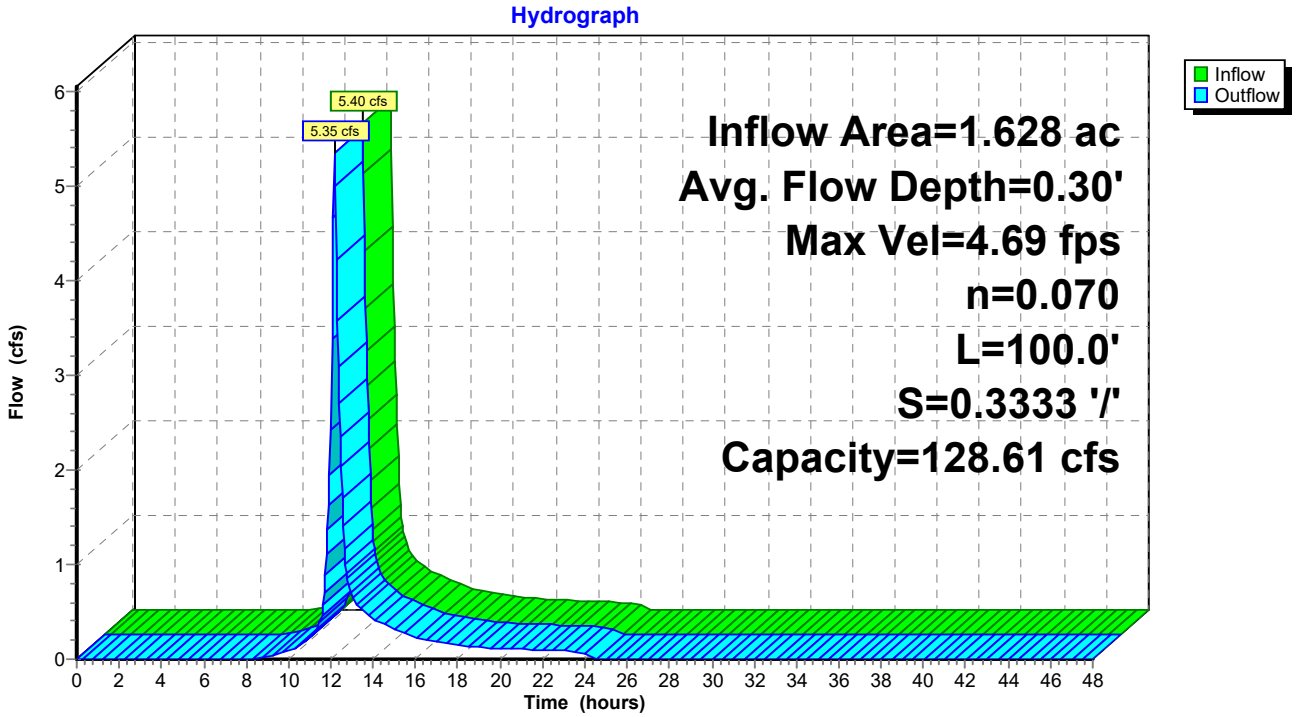
Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 4.69 fps, Min. Travel Time= 0.4 min
Avg. Velocity = 1.48 fps, Avg. Travel Time= 1.1 min

Peak Storage= 115 cf @ 12.15 hrs
Average Depth at Peak Storage= 0.30' , Surface Width= 4.78'
Bank-Full Depth= 1.50' Flow Area= 11.3 sf, Capacity= 128.61 cfs

3.00' x 1.50' deep channel, n= 0.070
Side Slope Z-value= 3.0 '/' Top Width= 12.00'
Length= 100.0' Slope= 0.3333 '/'
Inlet Invert= 915.33', Outlet Invert= 882.00'

‡

Reach DC-S: RipRap Downchute



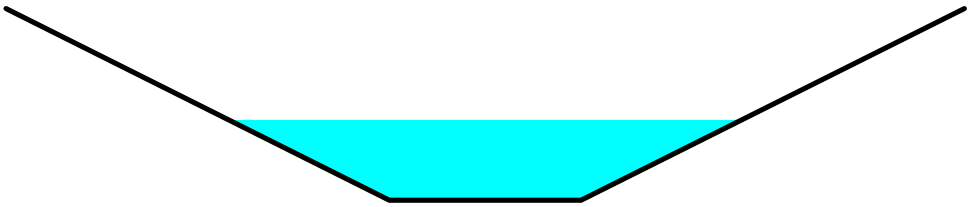
Summary for Reach PRA: Perimeter Swale

Inflow Area = 2.950 ac, 0.05% Impervious, Inflow Depth = 3.48" for 25-yr 24-hr event
Inflow = 10.56 cfs @ 12.15 hrs, Volume= 0.856 af
Outflow = 10.01 cfs @ 12.22 hrs, Volume= 0.856 af, Atten= 5%, Lag= 4.5 min
Routed to Pond C-1 : 30" Culvert

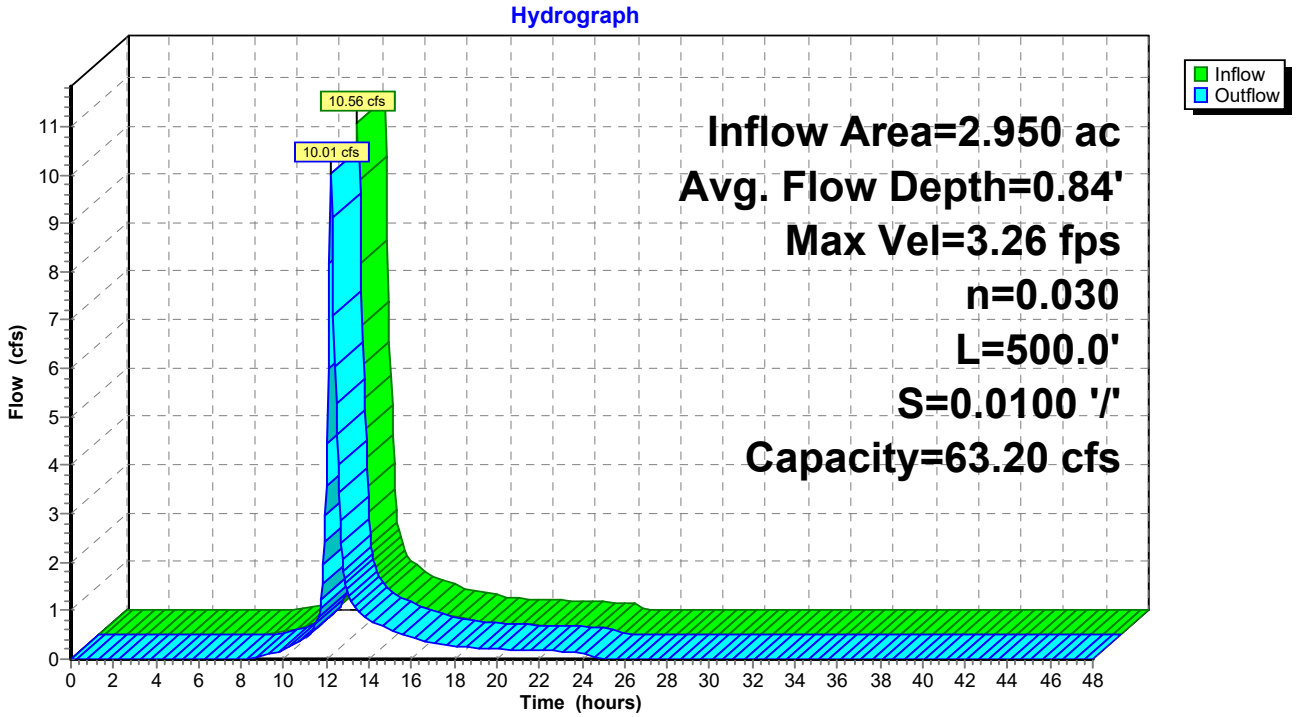
Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.26 fps, Min. Travel Time= 2.6 min
Avg. Velocity = 1.05 fps, Avg. Travel Time= 8.0 min

Peak Storage= 1,540 cf @ 12.18 hrs
Average Depth at Peak Storage= 0.84' , Surface Width= 5.35'
Bank-Full Depth= 2.00' Flow Area= 12.0 sf, Capacity= 63.20 cfs

2.00' x 2.00' deep channel, n= 0.030 Earth, grassed & winding
Side Slope Z-value= 2.0 '/' Top Width= 10.00'
Length= 500.0' Slope= 0.0100 '/'
Inlet Invert= 882.00', Outlet Invert= 877.00'



Reach PRA: Perimeter Swale



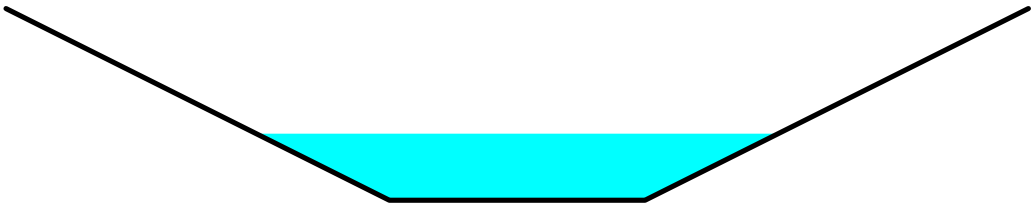
Summary for Reach PRB: Perimeter Swale

Inflow Area = 11.997 ac, 0.00% Impervious, Inflow Depth > 3.00" for 25-yr 24-hr event
Inflow = 4.16 cfs @ 12.16 hrs, Volume= 3.004 af
Outflow = 4.02 cfs @ 13.44 hrs, Volume= 3.002 af, Atten= 3%, Lag= 76.8 min
Routed to Pond C-2 : 30" Culvert

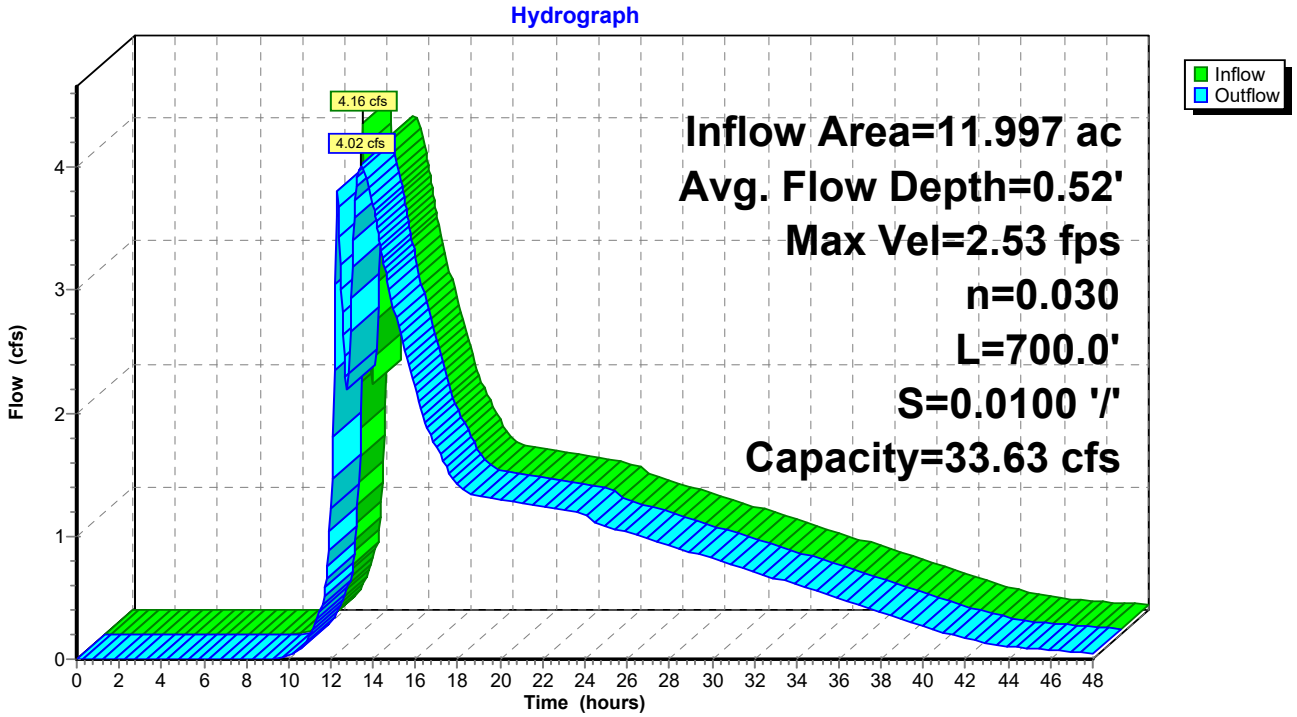
Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.53 fps, Min. Travel Time= 4.6 min
Avg. Velocity = 1.40 fps, Avg. Travel Time= 8.3 min

Peak Storage= 1,110 cf @ 13.36 hrs
Average Depth at Peak Storage= 0.52' , Surface Width= 4.08'
Bank-Full Depth= 1.50' Flow Area= 7.5 sf, Capacity= 33.63 cfs

2.00' x 1.50' deep channel, n= 0.030 Earth, grassed & winding
Side Slope Z-value= 2.0 '/' Top Width= 8.00'
Length= 700.0' Slope= 0.0100 '/'
Inlet Invert= 872.00', Outlet Invert= 865.00'



Reach PRB: Perimeter Swale



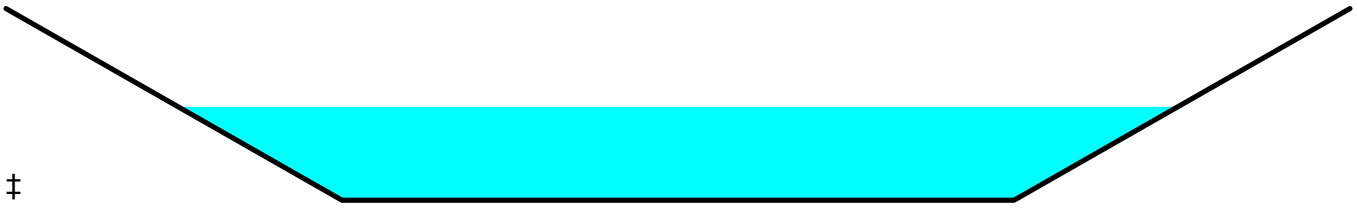
Summary for Reach PRC: Swale

Inflow Area = 3.568 ac, 0.00% Impervious, Inflow Depth = 2.36" for 25-yr 24-hr event
Inflow = 6.43 cfs @ 12.30 hrs, Volume= 0.703 af
Outflow = 6.39 cfs @ 12.32 hrs, Volume= 0.703 af, Atten= 1%, Lag= 1.5 min
Routed to Pond C-3 : 24" Culvert

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.65 fps, Min. Travel Time= 0.9 min
Avg. Velocity = 0.91 fps, Avg. Travel Time= 2.6 min

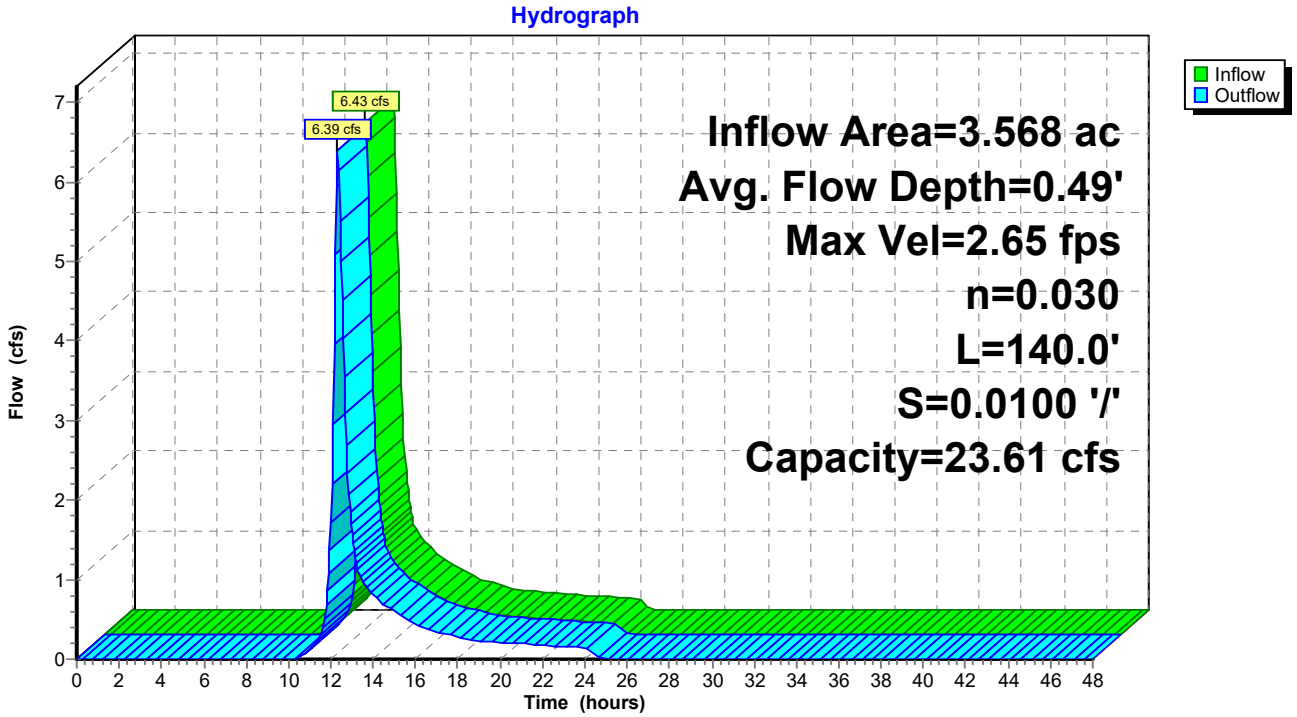
Peak Storage= 339 cf @ 12.31 hrs
Average Depth at Peak Storage= 0.49' , Surface Width= 5.95'
Bank-Full Depth= 1.00' Flow Area= 6.0 sf, Capacity= 23.61 cfs

4.00' x 1.00' deep channel, n= 0.030 Earth, grassed & winding
Side Slope Z-value= 2.0 '/' Top Width= 8.00'
Length= 140.0' Slope= 0.0100 '/'
Inlet Invert= 879.00', Outlet Invert= 877.60'



‡

Reach PRC: Swale



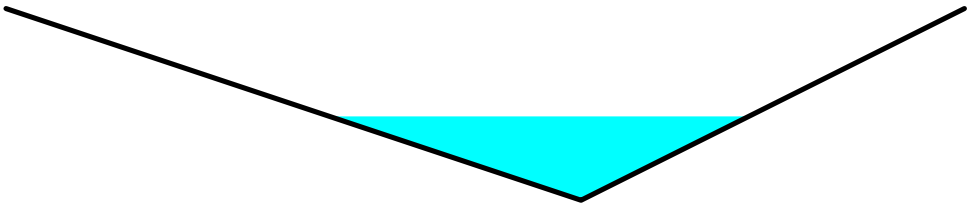
Summary for Reach R1: Sideslope Swale

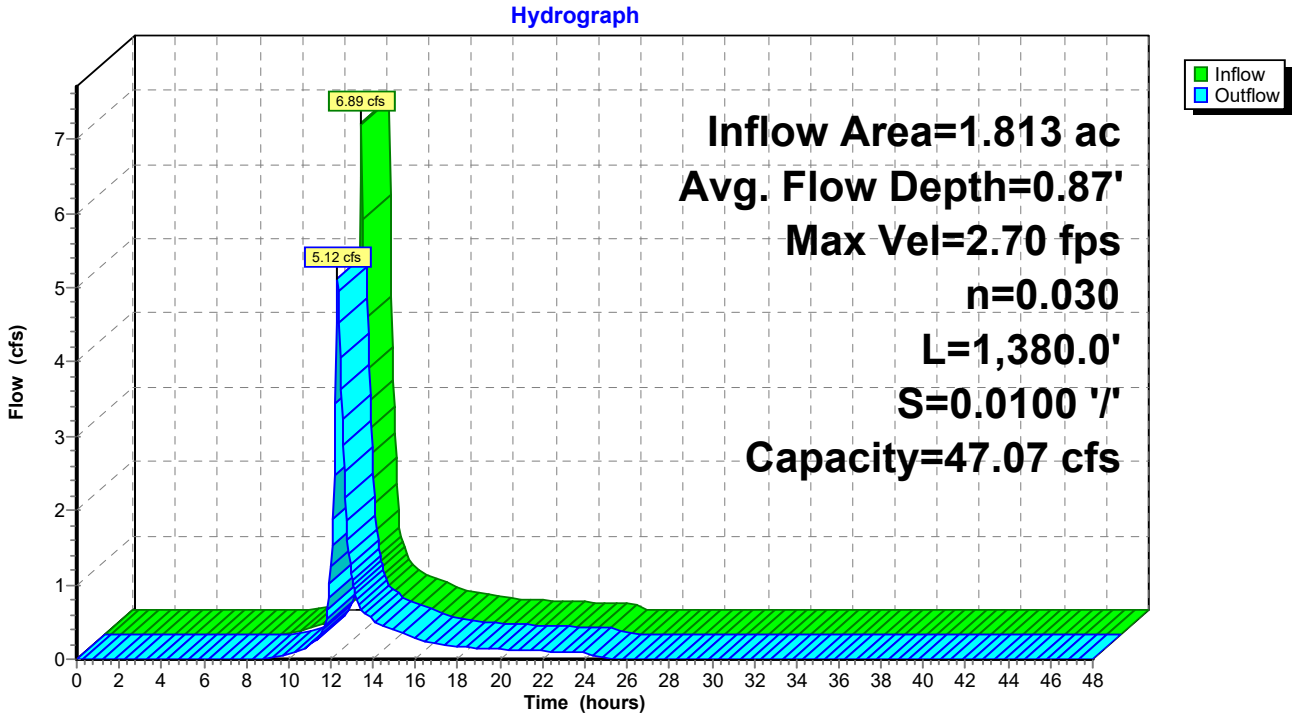
Inflow Area = 1.813 ac, 0.00% Impervious, Inflow Depth = 3.30" for 25-yr 24-hr event
Inflow = 6.89 cfs @ 12.09 hrs, Volume= 0.499 af
Outflow = 5.12 cfs @ 12.32 hrs, Volume= 0.499 af, Atten= 26%, Lag= 13.3 min
Routed to Pond PND-S : South Basin

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.70 fps, Min. Travel Time= 8.5 min
Avg. Velocity = 0.91 fps, Avg. Travel Time= 25.2 min

Peak Storage= 2,631 cf @ 12.17 hrs
Average Depth at Peak Storage= 0.87' , Surface Width= 4.37'
Bank-Full Depth= 2.00' Flow Area= 10.0 sf, Capacity= 47.07 cfs

0.00' x 2.00' deep channel, n= 0.030 Earth, grassed & winding
Side Slope Z-value= 3.0 2.0 '/' Top Width= 10.00'
Length= 1,380.0' Slope= 0.0100 '/'
Inlet Invert= 879.80', Outlet Invert= 866.00'





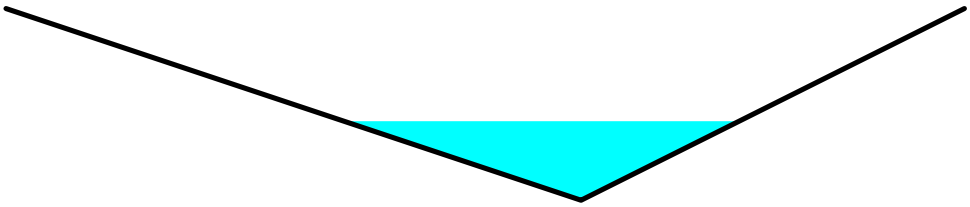
Summary for Reach R2: Sideslope Swale

Inflow Area = 2.064 ac, 0.00% Impervious, Inflow Depth = 3.40" for 25-yr 24-hr event
Inflow = 7.09 cfs @ 12.15 hrs, Volume= 0.585 af
Outflow = 6.20 cfs @ 12.30 hrs, Volume= 0.585 af, Atten= 13%, Lag= 9.1 min
Routed to Pond PND-S : South Basin

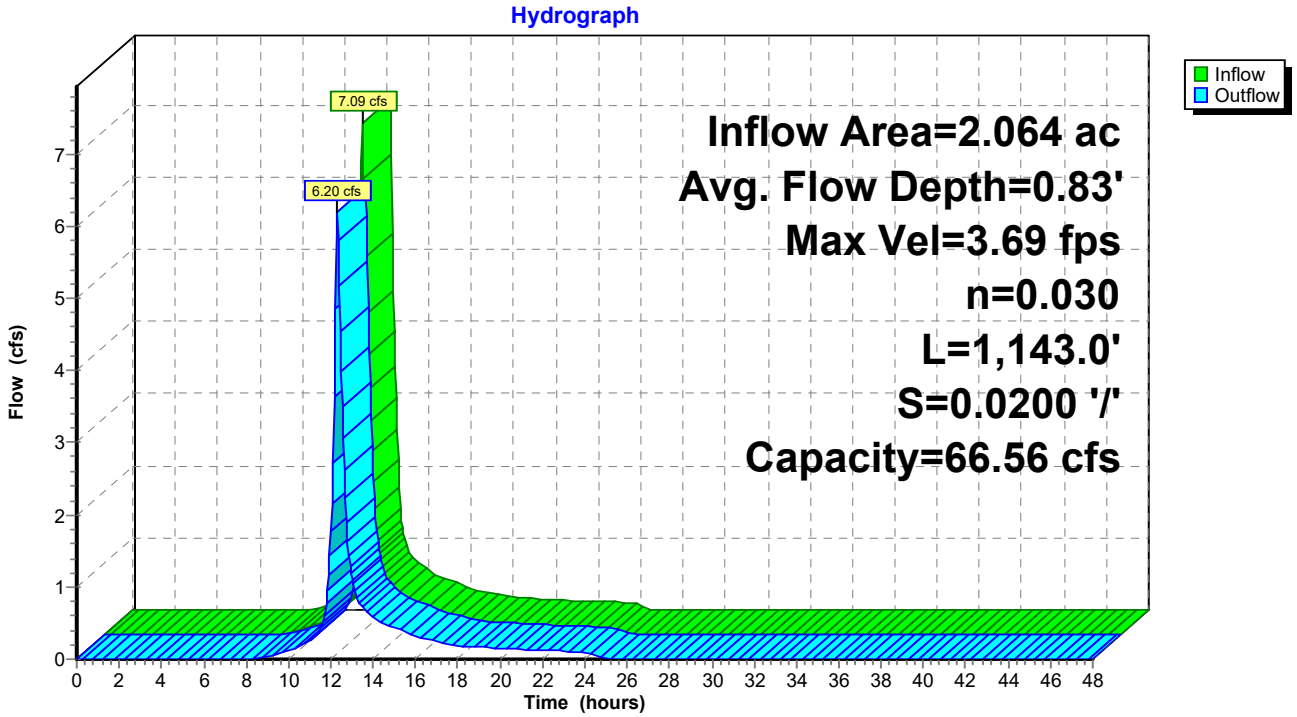
Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.69 fps, Min. Travel Time= 5.2 min
Avg. Velocity = 1.36 fps, Avg. Travel Time= 14.0 min

Peak Storage= 1,947 cf @ 12.21 hrs
Average Depth at Peak Storage= 0.83' , Surface Width= 4.13'
Bank-Full Depth= 2.00' Flow Area= 10.0 sf, Capacity= 66.56 cfs

0.00' x 2.00' deep channel, n= 0.030 Earth, grassed & winding
Side Slope Z-value= 3.0 2.0 '/' Top Width= 10.00'
Length= 1,143.0' Slope= 0.0200 '/'
Inlet Invert= 902.86', Outlet Invert= 880.00'



Reach R2: Sideslope Swale



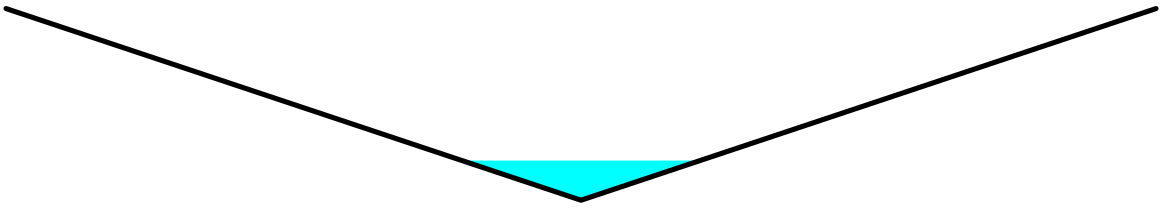
Summary for Reach R3: Sideslope Swale

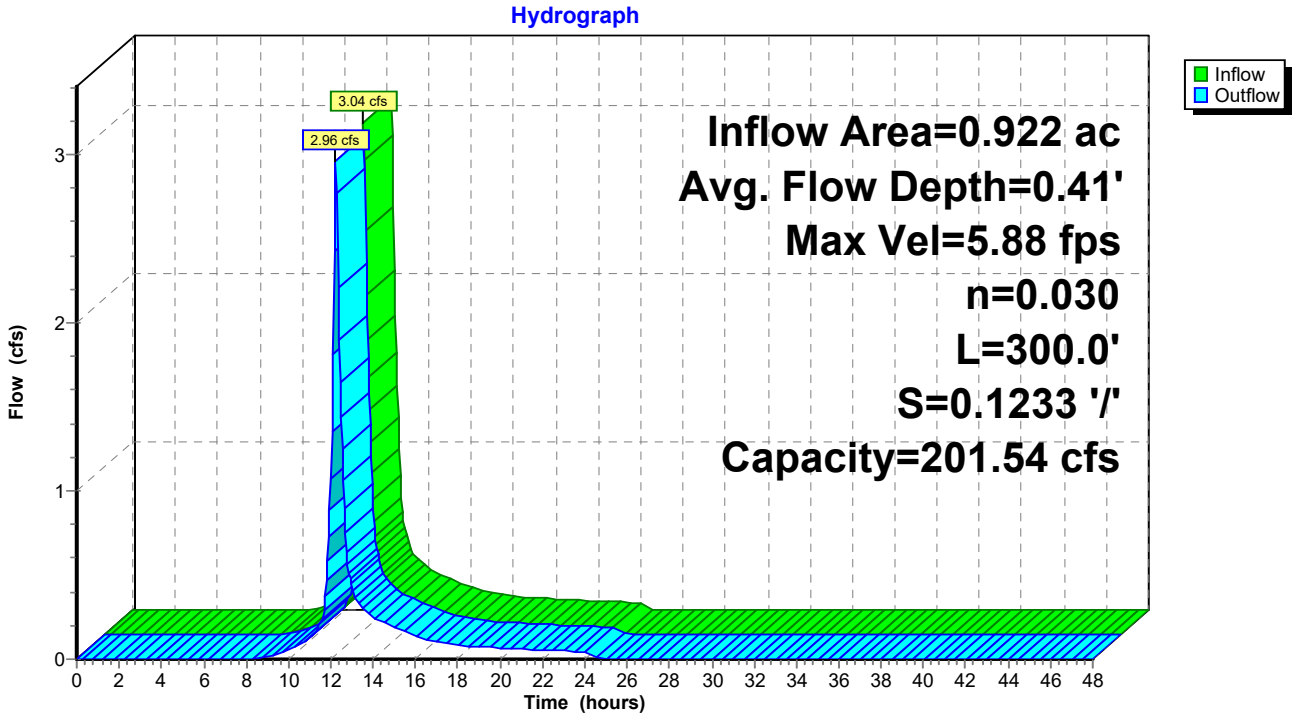
Inflow Area = 0.922 ac, 0.00% Impervious, Inflow Depth = 3.40" for 25-yr 24-hr event
Inflow = 3.04 cfs @ 12.20 hrs, Volume= 0.261 af
Outflow = 2.96 cfs @ 12.23 hrs, Volume= 0.261 af, Atten= 3%, Lag= 1.6 min
Routed to Pond PND-S : South Basin

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 5.88 fps, Min. Travel Time= 0.9 min
Avg. Velocity = 2.46 fps, Avg. Travel Time= 2.0 min

Peak Storage= 155 cf @ 12.21 hrs
Average Depth at Peak Storage= 0.41' , Surface Width= 2.49'
Bank-Full Depth= 2.00' Flow Area= 12.0 sf, Capacity= 201.54 cfs

0.00' x 2.00' deep channel, n= 0.030 Earth, grassed & winding
Side Slope Z-value= 3.0 '/' Top Width= 12.00'
Length= 300.0' Slope= 0.1233 '/'
Inlet Invert= 913.00', Outlet Invert= 876.00'





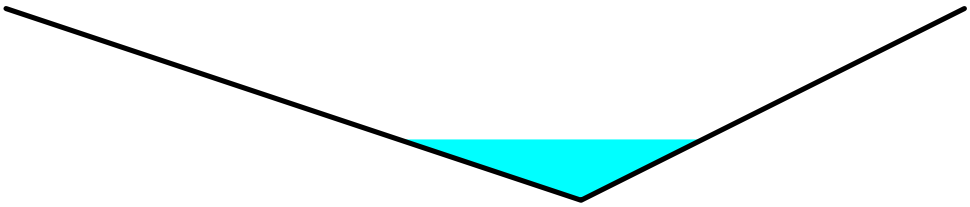
Summary for Reach R4: Sideslope Swale

Inflow Area = 0.922 ac, 0.00% Impervious, Inflow Depth = 3.40" for 25-yr 24-hr event
Inflow = 3.18 cfs @ 12.14 hrs, Volume= 0.261 af
Outflow = 3.04 cfs @ 12.20 hrs, Volume= 0.261 af, Atten= 4%, Lag= 3.6 min
Routed to Reach R3 : Sideslope Swale

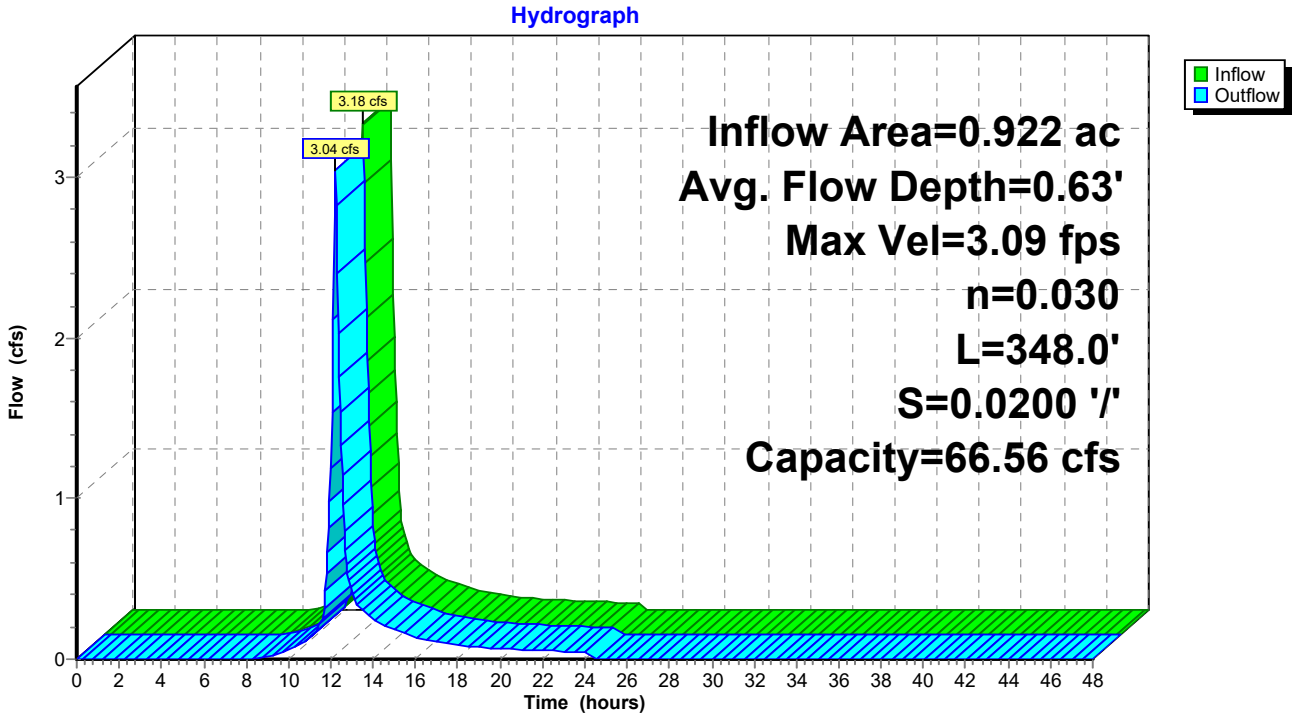
Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.09 fps, Min. Travel Time= 1.9 min
Avg. Velocity = 1.26 fps, Avg. Travel Time= 4.6 min

Peak Storage= 350 cf @ 12.17 hrs
Average Depth at Peak Storage= 0.63' , Surface Width= 3.17'
Bank-Full Depth= 2.00' Flow Area= 10.0 sf, Capacity= 66.56 cfs

0.00' x 2.00' deep channel, n= 0.030 Earth, grassed & winding
Side Slope Z-value= 3.0 2.0 '/' Top Width= 10.00'
Length= 348.0' Slope= 0.0200 '/'
Inlet Invert= 920.00', Outlet Invert= 913.04'



Reach R4: Sideslope Swale



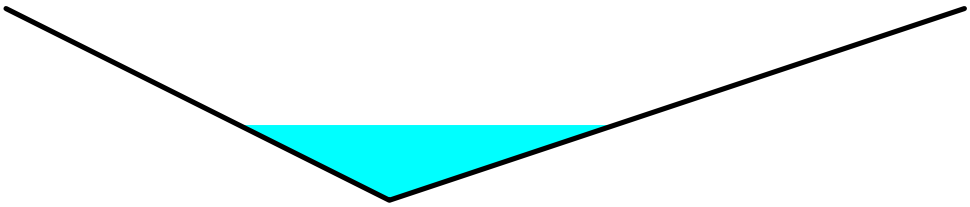
Summary for Reach R5: Sideslope Swale

Inflow Area = 1.322 ac, 0.11% Impervious, Inflow Depth = 3.70" for 25-yr 24-hr event
Inflow = 5.61 cfs @ 12.09 hrs, Volume= 0.408 af
Outflow = 5.25 cfs @ 12.14 hrs, Volume= 0.408 af, Atten= 6%, Lag= 2.8 min
Routed to Reach PRA : Perimeter Swale

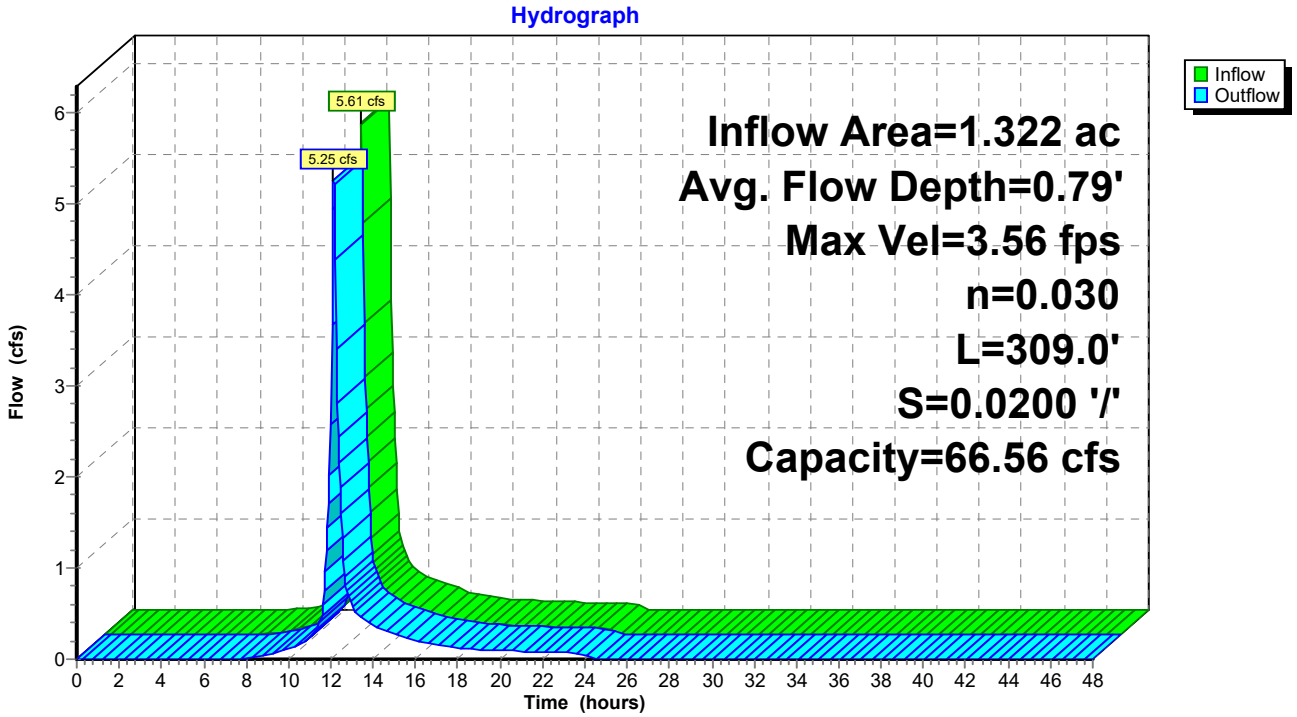
Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.56 fps, Min. Travel Time= 1.4 min
Avg. Velocity = 1.40 fps, Avg. Travel Time= 3.7 min

Peak Storage= 476 cf @ 12.11 hrs
Average Depth at Peak Storage= 0.79' , Surface Width= 3.93'
Bank-Full Depth= 2.00' Flow Area= 10.0 sf, Capacity= 66.56 cfs

0.00' x 2.00' deep channel, n= 0.030 Earth, grassed & winding
Side Slope Z-value= 2.0 3.0 '/' Top Width= 10.00'
Length= 309.0' Slope= 0.0200 '/'
Inlet Invert= 890.18', Outlet Invert= 884.00'



Reach R5: Sideslope Swale



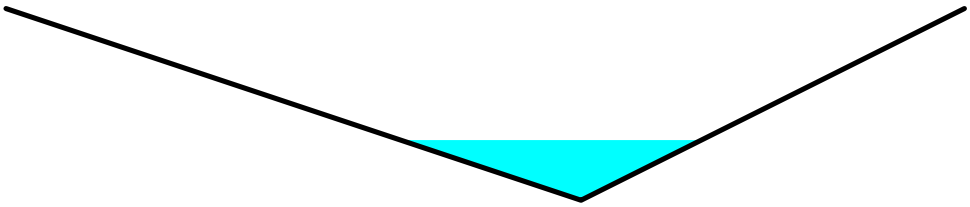
Summary for Reach R6: Sideslope Swale

Inflow Area = 0.943 ac, 0.00% Impervious, Inflow Depth = 3.30" for 25-yr 24-hr event
Inflow = 3.21 cfs @ 12.13 hrs, Volume= 0.259 af
Outflow = 2.99 cfs @ 12.23 hrs, Volume= 0.259 af, Atten= 7%, Lag= 5.7 min
Routed to Pond P-N1 : North Basin 1

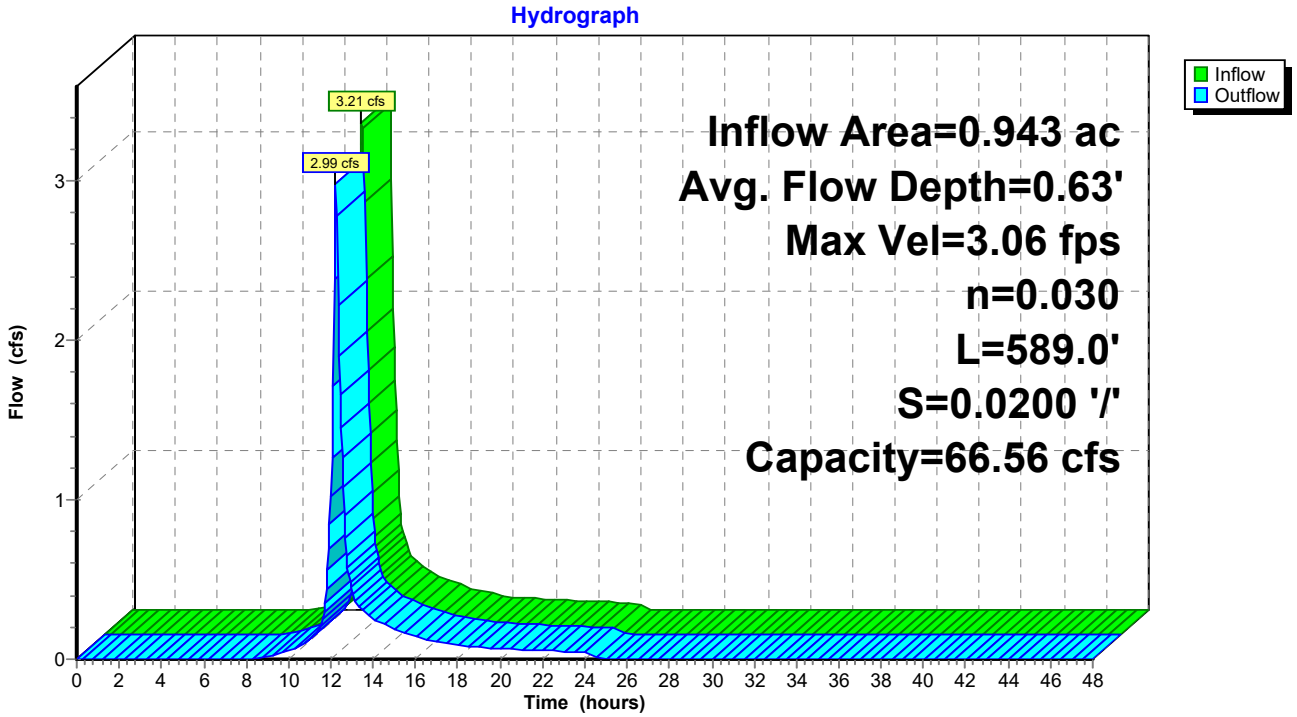
Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.06 fps, Min. Travel Time= 3.2 min
Avg. Velocity = 1.22 fps, Avg. Travel Time= 8.0 min

Peak Storage= 580 cf @ 12.17 hrs
Average Depth at Peak Storage= 0.63' , Surface Width= 3.14'
Bank-Full Depth= 2.00' Flow Area= 10.0 sf, Capacity= 66.56 cfs

0.00' x 2.00' deep channel, n= 0.030 Earth, grassed & winding
Side Slope Z-value= 3.0 2.0 '/' Top Width= 10.00'
Length= 589.0' Slope= 0.0200 '/'
Inlet Invert= 888.00', Outlet Invert= 876.22'



Reach R6: Sideslope Swale



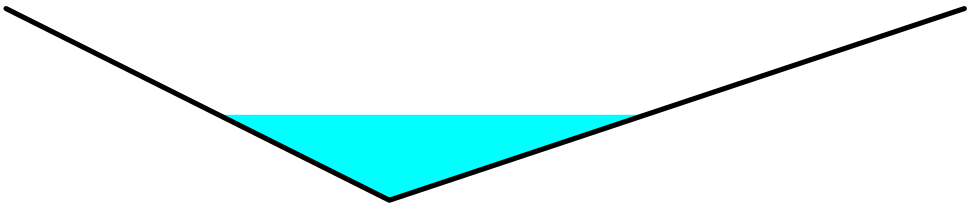
Summary for Reach R7: Sideslope Swale

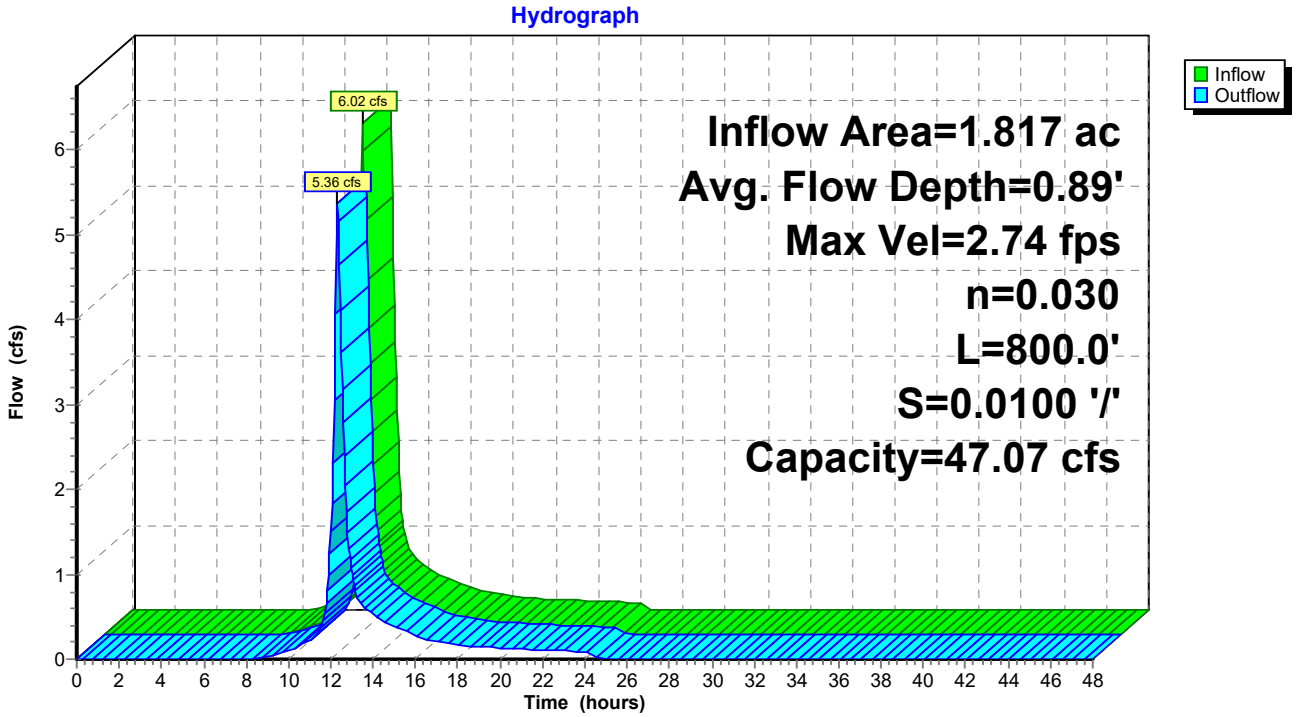
Inflow Area = 1.817 ac, 0.00% Impervious, Inflow Depth = 3.40" for 25-yr 24-hr event
Inflow = 6.02 cfs @ 12.16 hrs, Volume= 0.515 af
Outflow = 5.36 cfs @ 12.31 hrs, Volume= 0.515 af, Atten= 11%, Lag= 8.8 min
Routed to Pond P-N1 : North Basin 1

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.74 fps, Min. Travel Time= 4.9 min
Avg. Velocity = 1.01 fps, Avg. Travel Time= 13.1 min

Peak Storage= 1,586 cf @ 12.22 hrs
Average Depth at Peak Storage= 0.89' , Surface Width= 4.45'
Bank-Full Depth= 2.00' Flow Area= 10.0 sf, Capacity= 47.07 cfs

0.00' x 2.00' deep channel, n= 0.030 Earth, grassed & winding
Side Slope Z-value= 2.0 3.0 '/' Top Width= 10.00'
Length= 800.0' Slope= 0.0100 '/'
Inlet Invert= 872.00', Outlet Invert= 864.00'





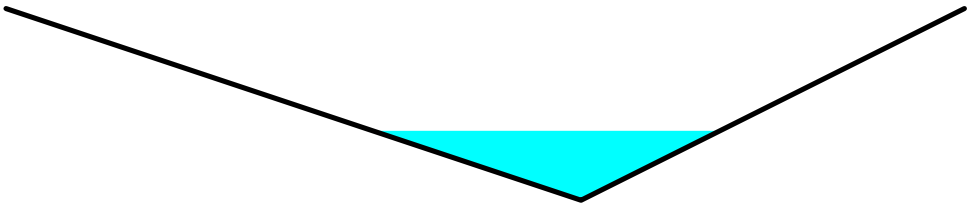
Summary for Reach R8: Sideslope Swale

Inflow Area = 1.354 ac, 0.00% Impervious, Inflow Depth = 3.30" for 25-yr 24-hr event
Inflow = 4.50 cfs @ 12.15 hrs, Volume= 0.373 af
Outflow = 4.32 cfs @ 12.20 hrs, Volume= 0.373 af, Atten= 4%, Lag= 3.4 min
Routed to Reach DC-N : RipRap Downchute

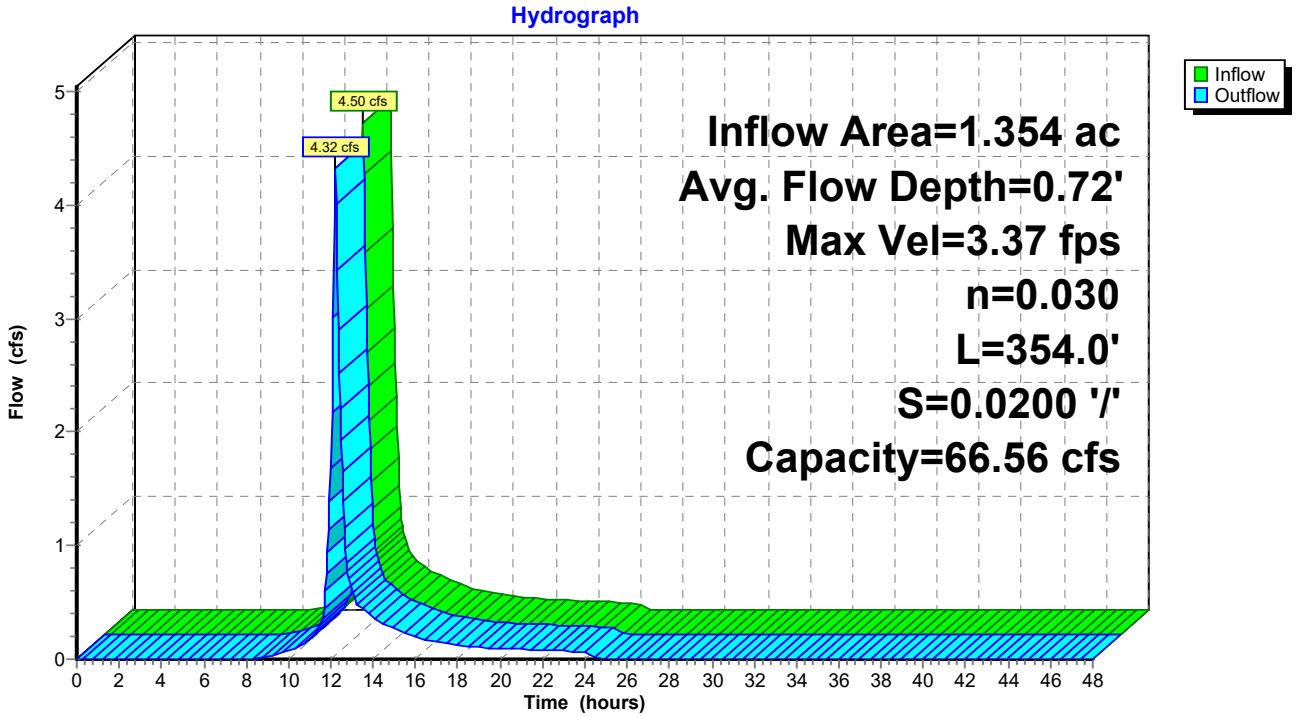
Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.37 fps, Min. Travel Time= 1.8 min
Avg. Velocity = 1.38 fps, Avg. Travel Time= 4.3 min

Peak Storage= 463 cf @ 12.17 hrs
Average Depth at Peak Storage= 0.72' , Surface Width= 3.62'
Bank-Full Depth= 2.00' Flow Area= 10.0 sf, Capacity= 66.56 cfs

0.00' x 2.00' deep channel, n= 0.030 Earth, grassed & winding
Side Slope Z-value= 3.0 2.0 '/' Top Width= 10.00'
Length= 354.0' Slope= 0.0200 '/'
Inlet Invert= 917.08', Outlet Invert= 910.00'



Reach R8: Sideslope Swale



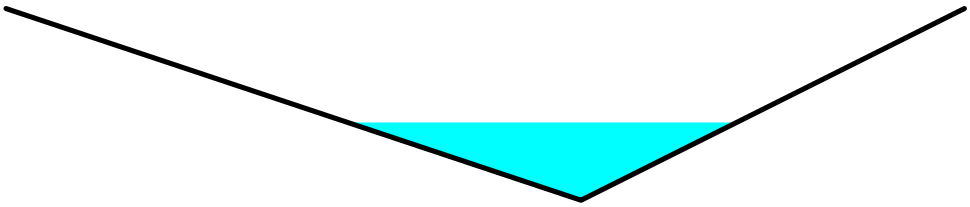
Summary for Reach R9: Sideslope Swale

Inflow Area = 1.834 ac, 0.00% Impervious, Inflow Depth = 3.30" for 25-yr 24-hr event
Inflow = 6.19 cfs @ 12.14 hrs, Volume= 0.505 af
Outflow = 5.90 cfs @ 12.21 hrs, Volume= 0.505 af, Atten= 5%, Lag= 4.2 min
Routed to Reach DC-N : RipRap Downchute

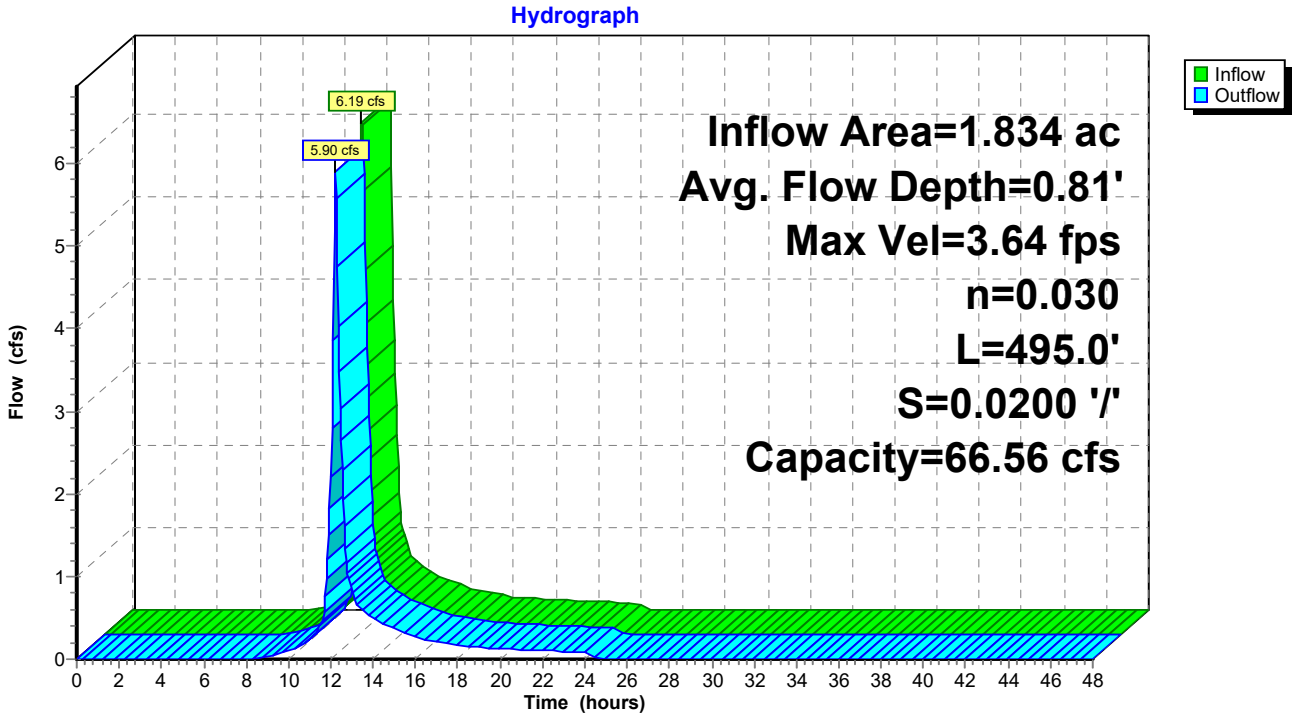
Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.64 fps, Min. Travel Time= 2.3 min
Avg. Velocity = 1.45 fps, Avg. Travel Time= 5.7 min

Peak Storage= 814 cf @ 12.17 hrs
Average Depth at Peak Storage= 0.81' , Surface Width= 4.06'
Bank-Full Depth= 2.00' Flow Area= 10.0 sf, Capacity= 66.56 cfs

0.00' x 2.00' deep channel, n= 0.030 Earth, grassed & winding
Side Slope Z-value= 3.0 2.0 '/' Top Width= 10.00'
Length= 495.0' Slope= 0.0200 '/'
Inlet Invert= 895.90', Outlet Invert= 886.00'



Reach R9: Sideslope Swale



Summary for Pond C-1: 30" Culvert

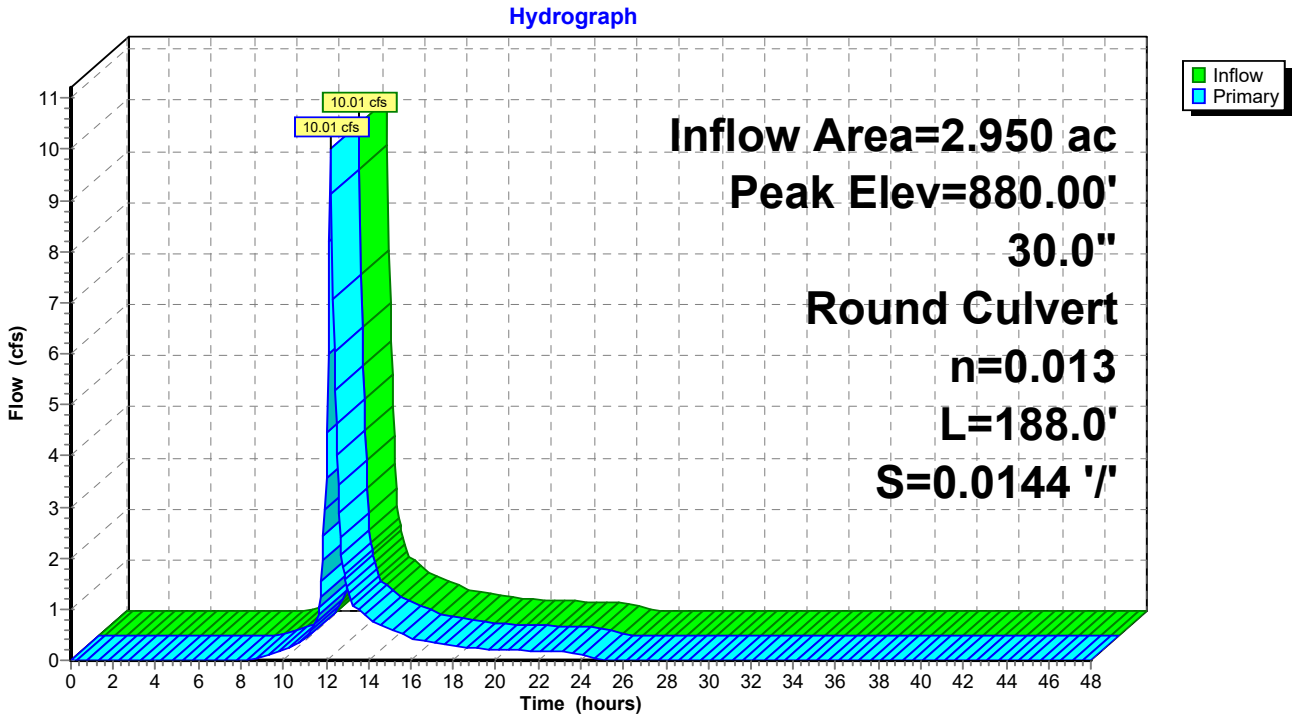
Inflow Area = 2.950 ac, 0.05% Impervious, Inflow Depth = 3.48" for 25-yr 24-hr event
Inflow = 10.01 cfs @ 12.22 hrs, Volume= 0.856 af
Outflow = 10.01 cfs @ 12.22 hrs, Volume= 0.856 af, Atten= 0%, Lag= 0.0 min
Primary = 10.01 cfs @ 12.22 hrs, Volume= 0.856 af
Routed to Pond PND-S : South Basin

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 880.00' @ 12.22 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	878.70'	**30.0" Round Culvert** L= 188.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 878.70' / 876.00' S= 0.0144 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 4.91 sf

Primary OutFlow Max=9.80 cfs @ 12.22 hrs HW=879.98' (Free Discharge)
1=Culvert (Inlet Controls 9.80 cfs @ 3.86 fps)

Pond C-1: 30" Culvert



Summary for Pond C-2: 30" Culvert

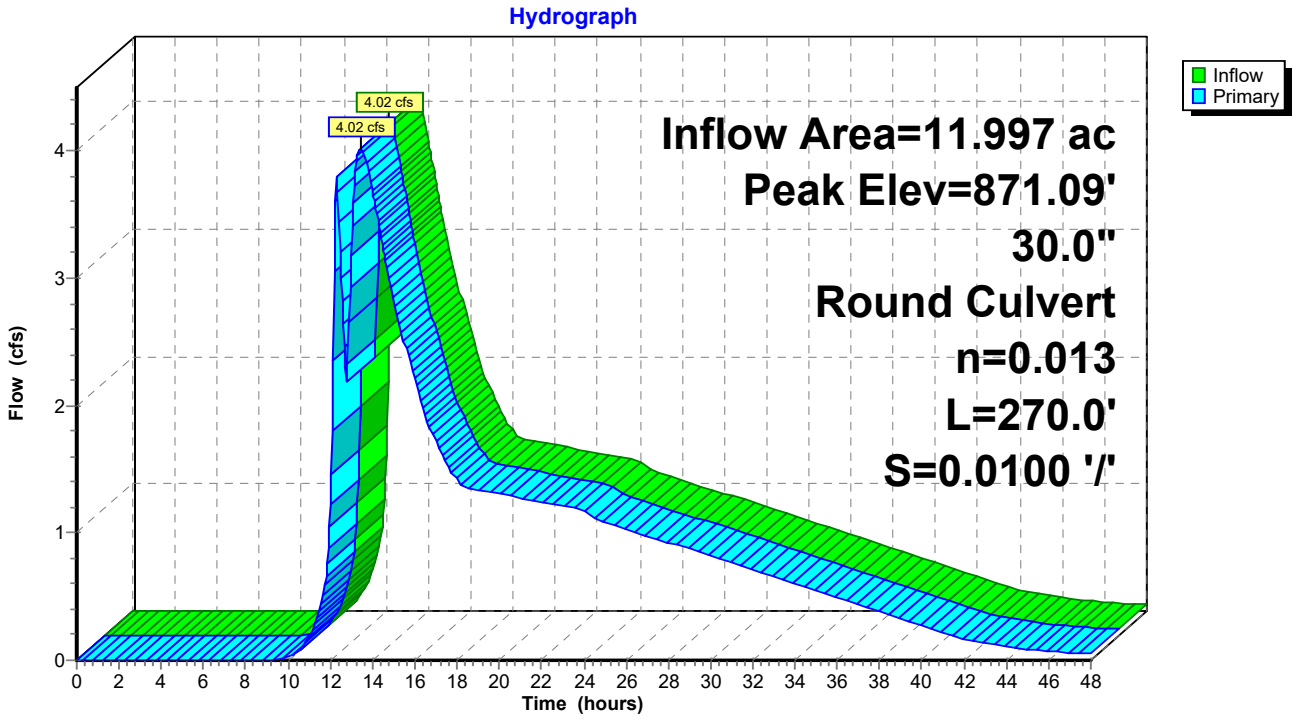
Inflow Area = 11.997 ac, 0.00% Impervious, Inflow Depth > 3.00" for 25-yr 24-hr event
Inflow = 4.02 cfs @ 13.44 hrs, Volume= 3.002 af
Outflow = 4.02 cfs @ 13.44 hrs, Volume= 3.002 af, Atten= 0%, Lag= 0.0 min
Primary = 4.02 cfs @ 13.44 hrs, Volume= 3.002 af
Routed to Pond P-N1 : North Basin 1

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 871.09' @ 13.44 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	870.30'	**30.0" Round Culvert** L= 270.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 870.30' / 867.60' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 4.91 sf

Primary OutFlow Max=4.02 cfs @ 13.44 hrs HW=871.09' (Free Discharge)
1=Culvert (Inlet Controls 4.02 cfs @ 3.02 fps)

Pond C-2: 30" Culvert



Summary for Pond C-3: 24" Culvert

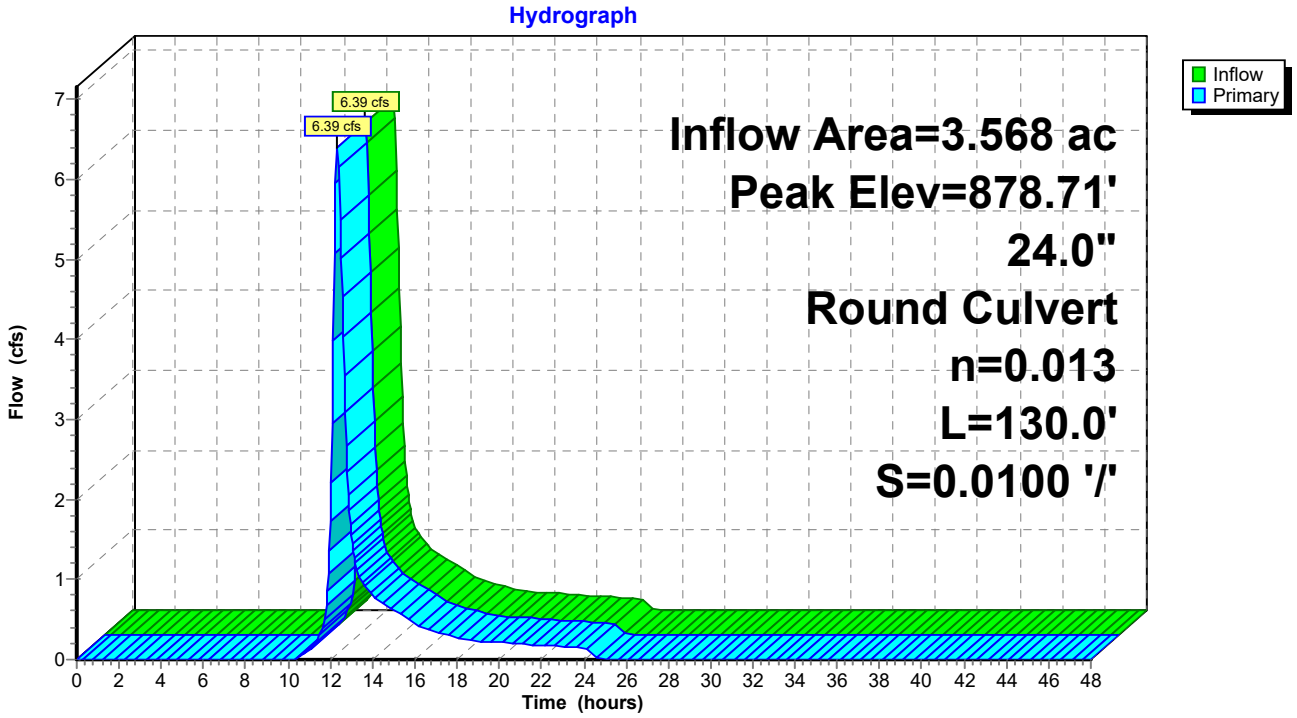
Inflow Area = 3.568 ac, 0.00% Impervious, Inflow Depth = 2.36" for 25-yr 24-hr event
Inflow = 6.39 cfs @ 12.32 hrs, Volume= 0.703 af
Outflow = 6.39 cfs @ 12.32 hrs, Volume= 0.703 af, Atten= 0%, Lag= 0.0 min
Primary = 6.39 cfs @ 12.32 hrs, Volume= 0.703 af
Routed to Pond P-N2 : North Basin 2

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 878.71' @ 12.32 hrs
Flood Elev= 880.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	877.60'	**24.0" Round Culvert** L= 130.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 877.60' / 876.30' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf

Primary OutFlow Max=6.34 cfs @ 12.32 hrs HW=878.70' (Free Discharge)
1=Culvert (Inlet Controls 6.34 cfs @ 3.57 fps)

Pond C-3: 24" Culvert



Summary for Pond P-N1: North Basin 1

Inflow Area = 15.447 ac, 0.00% Impervious, Inflow Depth > 3.01" for 25-yr 24-hr event
Inflow = 12.72 cfs @ 12.28 hrs, Volume= 3.878 af
Outflow = 8.20 cfs @ 12.53 hrs, Volume= 3.874 af, Atten= 36%, Lag= 15.0 min
Primary = 8.20 cfs @ 12.53 hrs, Volume= 3.874 af
Routed to Link N : POI-N
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Link N : POI-N

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Starting Elev= 859.00' Surf.Area= 3,382 sf Storage= 3,127 cf
Peak Elev= 862.22' @ 12.53 hrs Surf.Area= 5,157 sf Storage= 16,810 cf (13,683 cf above start)
Flood Elev= 863.00' Surf.Area= 5,635 sf Storage= 21,001 cf (17,873 cf above start)

Plug-Flow detention time= 77.7 min calculated for 3.802 af (98% of inflow)
Center-of-Mass det. time= 39.2 min (1,232.7 - 1,193.5)

Volume	Invert	Avail.Storage	Storage Description
#1	858.00'	26,943 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

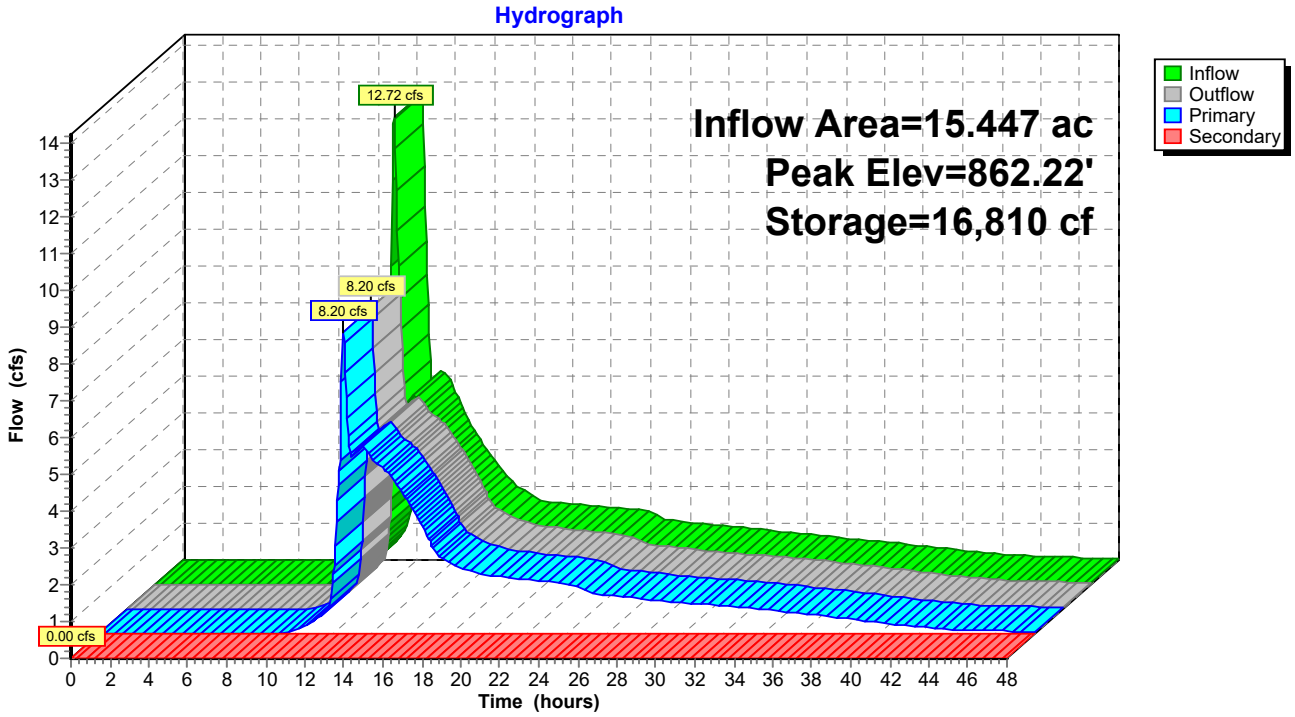
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
858.00	2,873	0	0
860.00	3,890	6,763	6,763
862.00	5,020	8,910	15,673
864.00	6,250	11,270	26,943

Device	Routing	Invert	Outlet Devices
#1	Primary	858.00'	**24.0" Round Culvert** L= 100.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 858.00' / 857.00' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf
#2	Device 1	859.00'	**2.0" Vert. Perforations X 10.00 columns** X 3 rows with 8.0" cc spacing C= 0.600 Limited to weir flow at low heads
#3	Device 1	862.00'	**36.0" Horiz. Top of Standpipe** C= 0.600 Limited to weir flow at low heads
#4	Secondary	863.00'	**10.0' long x 8.0' breadth Spillway** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.43 2.54 2.70 2.69 2.68 2.68 2.66 2.64 2.64 2.64 2.65 2.65 2.66 2.66 2.68 2.70 2.74

Primary OutFlow Max=8.12 cfs @ 12.53 hrs HW=862.22' (Free Discharge)
└**1=Culvert** (Passes 8.12 cfs of 27.15 cfs potential flow)
└**2=Perforations** (Orifice Controls 4.92 cfs @ 7.52 fps)
└**3=Top of Standpipe** (Weir Controls 3.20 cfs @ 1.54 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=859.00' (Free Discharge)
└**4=Spillway** (Controls 0.00 cfs)

Pond P-N1: North Basin 1



Summary for Pond P-N2: North Basin 2

Inflow Area = 10.643 ac, 0.00% Impervious, Inflow Depth = 3.11" for 25-yr 24-hr event
Inflow = 26.94 cfs @ 12.24 hrs, Volume= 2.758 af
Outflow = 3.64 cfs @ 13.33 hrs, Volume= 2.717 af, Atten= 86%, Lag= 65.2 min
Primary = 3.64 cfs @ 13.33 hrs, Volume= 2.717 af
Routed to Reach PRB : Perimeter Swale
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Reach PRB : Perimeter Swale

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Starting Elev= 876.00' Surf.Area= 35,250 sf Storage= 33,125 cf
Peak Elev= 877.68' @ 13.33 hrs Surf.Area= 40,074 sf Storage= 96,321 cf (63,196 cf above start)
Flood Elev= 879.00' Surf.Area= 44,000 sf Storage= 151,875 cf (118,750 cf above start)

Plug-Flow detention time= 780.7 min calculated for 1.954 af (71% of inflow)
Center-of-Mass det. time= 488.2 min (1,330.5 - 842.2)

Volume	Invert	Avail.Storage	Storage Description
#1	875.00'	151,875 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

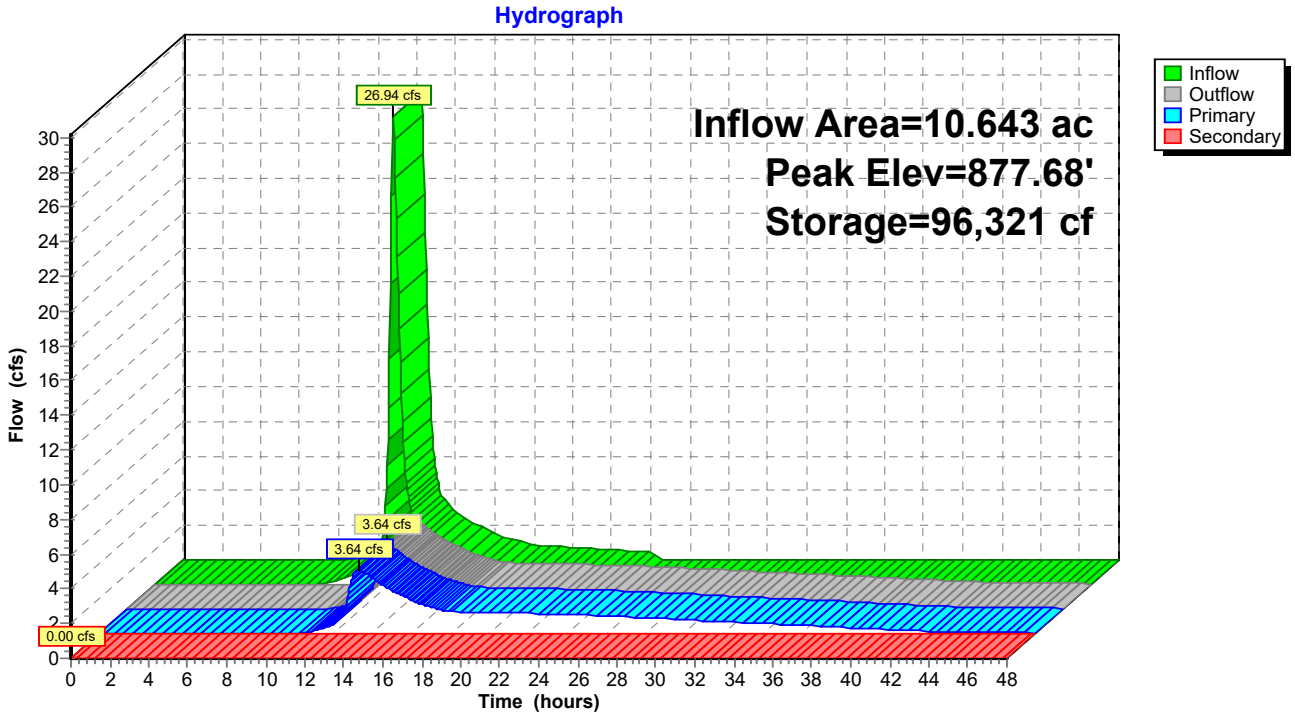
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
875.00	31,000	0	0
876.00	35,250	33,125	33,125
878.00	41,000	76,250	109,375
879.00	44,000	42,500	151,875

Device	Routing	Invert	Outlet Devices
#1	Primary	875.00'	**24.0" Round Culvert** L= 100.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 875.00' / 874.00' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf
#2	Device 1	876.00'	**2.0" Vert. Perforations X 10.00** C= 0.600 Limited to weir flow at low heads
#3	Device 1	877.50'	**36.0" Horiz. Top of Standpipe** C= 0.600 Limited to weir flow at low heads
#4	Secondary	878.00'	**6.0' long x 20.0' breadth Spillway** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=3.64 cfs @ 13.33 hrs HW=877.68' (Free Discharge)
└**1=Culvert** (Passes 3.64 cfs of 19.59 cfs potential flow)
├**2=Perforations** (Orifice Controls 1.33 cfs @ 6.08 fps)
└**3=Top of Standpipe** (Weir Controls 2.31 cfs @ 1.38 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=876.00' (Free Discharge)
└**4=Spillway** (Controls 0.00 cfs)

Pond P-N2: North Basin 2



Summary for Pond PND-S: South Basin

Inflow Area = 8.392 ac, 0.02% Impervious, Inflow Depth = 3.54" for 25-yr 24-hr event
Inflow = 24.46 cfs @ 12.26 hrs, Volume= 2.474 af
Outflow = 9.00 cfs @ 12.67 hrs, Volume= 2.474 af, Atten= 63%, Lag= 24.4 min
Primary = 9.00 cfs @ 12.67 hrs, Volume= 2.474 af
Routed to Link S : POI-S
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Link S : POI-S

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Starting Elev= 859.00' Surf.Area= 11,031 sf Storage= 10,489 cf
Peak Elev= 862.31' @ 12.67 hrs Surf.Area= 14,768 sf Storage= 53,150 cf (42,661 cf above start)
Flood Elev= 863.00' Surf.Area= 15,584 sf Storage= 63,560 cf (53,071 cf above start)

Plug-Flow detention time= 222.1 min calculated for 2.230 af (90% of inflow)
Center-of-Mass det. time= 144.8 min (978.4 - 833.6)

Volume	Invert	Avail.Storage	Storage Description
#1	858.00'	79,739 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

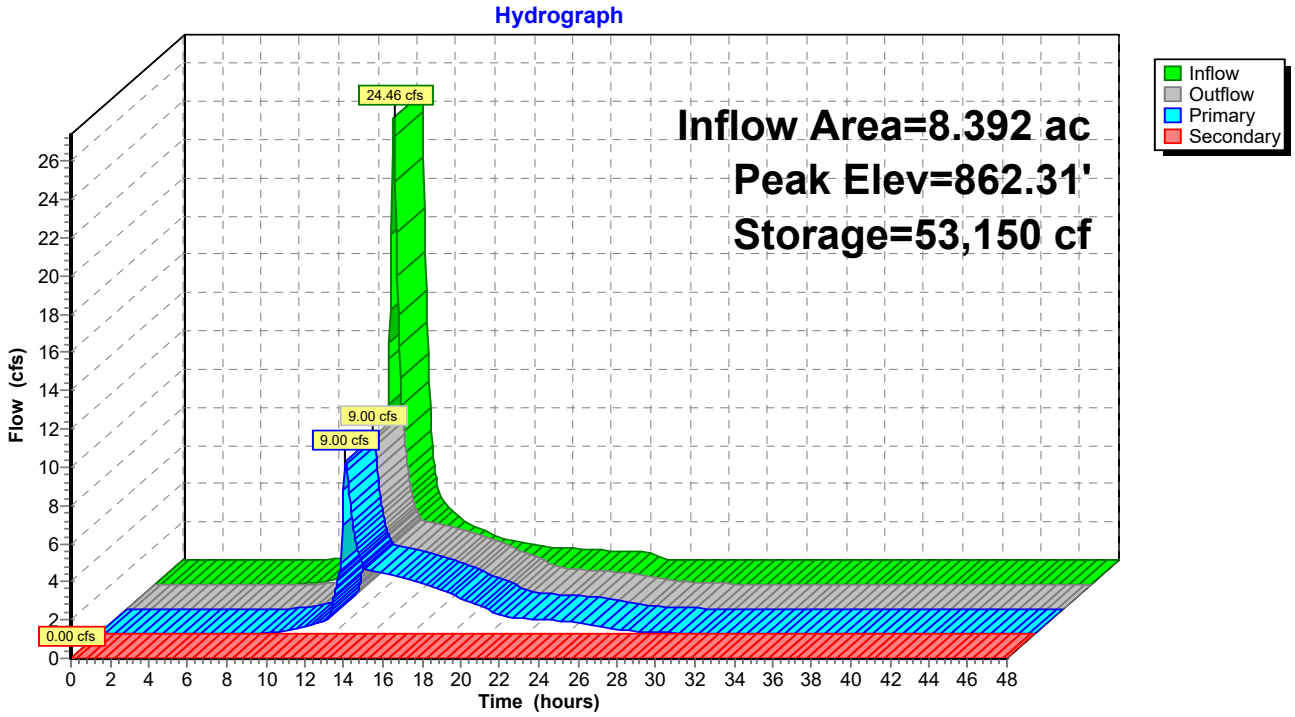
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
858.00	9,947	0	0
860.00	12,115	22,062	22,062
862.00	14,394	26,509	48,571
864.00	16,774	31,168	79,739

Device	Routing	Invert	Outlet Devices
#1	Primary	858.50'	**30.0" Round Culvert** L= 50.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 858.50' / 858.00' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 4.91 sf
#2	Device 1	859.00'	**2.0" Vert. Perforations X 10.00 columns** X 2 rows with 8.0" cc spacing C= 0.600 Limited to weir flow at low heads
#3	Device 1	862.00'	**36.0" Horiz. Top of Standpipe** C= 0.600 Limited to weir flow at low heads
#4	Secondary	863.00'	**10.0' long x 8.0' breadth Spillway** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.43 2.54 2.70 2.69 2.68 2.68 2.66 2.64 2.64 2.64 2.65 2.65 2.66 2.66 2.68 2.70 2.74

Primary OutFlow Max=8.94 cfs @ 12.67 hrs HW=862.31' (Free Discharge)
└**1=Culvert** (Passes 8.94 cfs of 33.38 cfs potential flow)
└**2=Perforations** (Orifice Controls 3.57 cfs @ 8.18 fps)
└**3=Top of Standpipe** (Weir Controls 5.37 cfs @ 1.83 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=859.00' (Free Discharge)
└**4=Spillway** (Controls 0.00 cfs)

Pond PND-S: South Basin

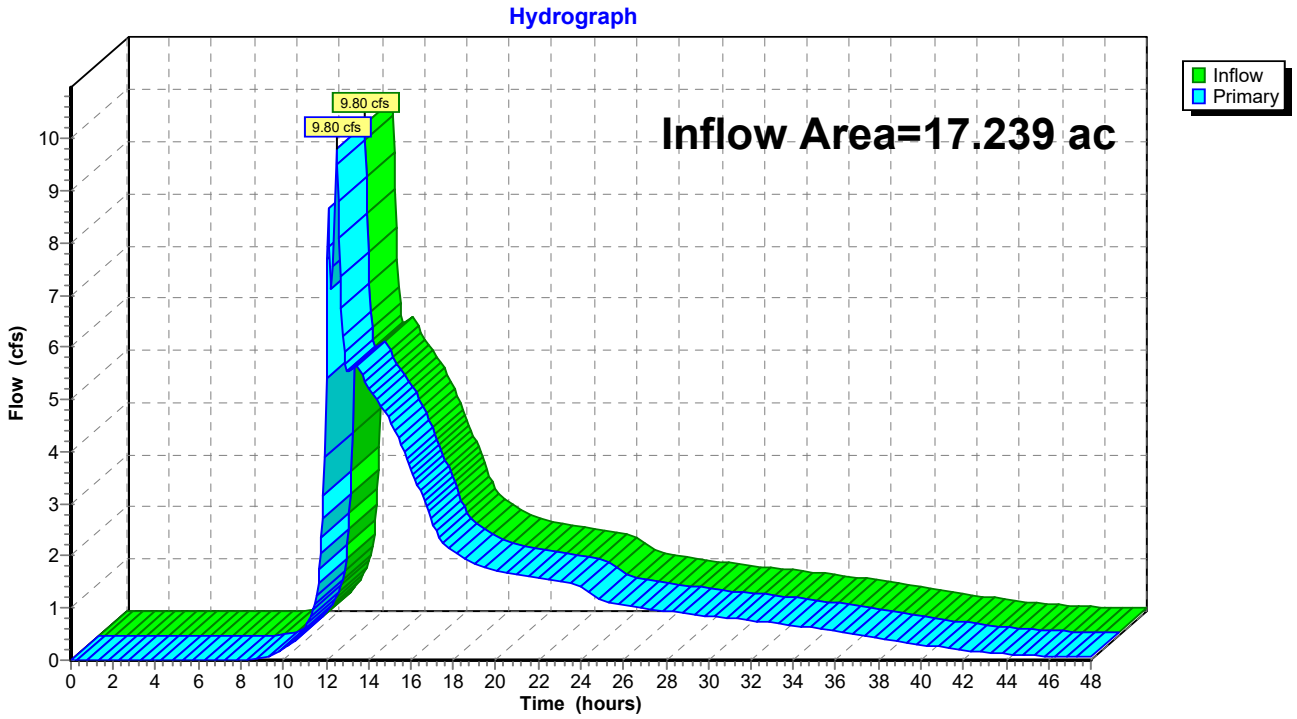


Summary for Link N: POI-N

Inflow Area = 17.239 ac, 0.00% Impervious, Inflow Depth > 3.04" for 25-yr 24-hr event
Inflow = 9.80 cfs @ 12.51 hrs, Volume= 4.369 af
Primary = 9.80 cfs @ 12.51 hrs, Volume= 4.369 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Link N: POI-N

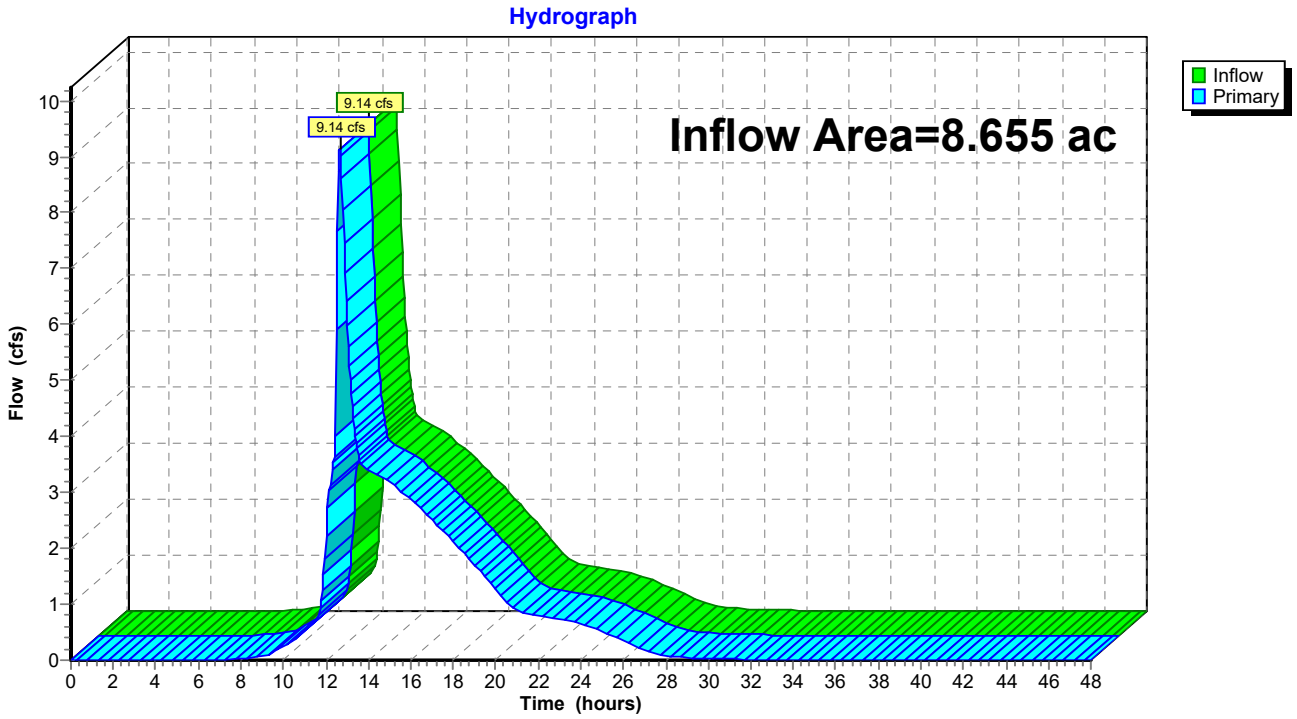


Summary for Link S: POI-S

Inflow Area = 8.655 ac, 0.02% Impervious, Inflow Depth > 3.53" for 25-yr 24-hr event
Inflow = 9.14 cfs @ 12.66 hrs, Volume= 2.546 af
Primary = 9.14 cfs @ 12.66 hrs, Volume= 2.546 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Link S: POI-S



Time span=0.00-48.00 hrs, dt=0.05 hrs, 961 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

SubcatchmentN1: Subcat N1 Runoff Area=3.568 ac 0.00% Impervious Runoff Depth=4.43"
Flow Length=630' Tc=20.1 min CN=64 Runoff=12.37 cfs 1.317 af

SubcatchmentN10: Subcat N10 Runoff Area=0.445 ac 0.00% Impervious Runoff Depth=5.53"
Flow Length=62' Slope=0.3300 '/' Tc=6.0 min CN=73 Runoff=2.81 cfs 0.205 af

SubcatchmentN11: Subcat N11 Runoff Area=0.309 ac 0.00% Impervious Runoff Depth=5.89"
Flow Length=164' Slope=0.3300 '/' Tc=6.0 min CN=76 Runoff=2.07 cfs 0.152 af

SubcatchmentN12: Subcat N12 Runoff Area=1.039 ac 0.00% Impervious Runoff Depth=5.65"
Flow Length=60' Slope=0.3300 '/' Tc=6.0 min CN=74 Runoff=6.70 cfs 0.489 af

SubcatchmentN3: Subcat N3 Runoff Area=3.233 ac 0.00% Impervious Runoff Depth=6.13"
Flow Length=121' Slope=0.0100 '/' Tc=19.2 min CN=78 Runoff=15.74 cfs 1.653 af

SubcatchmentN4: Subcat N4 Runoff Area=1.834 ac 0.00% Impervious Runoff Depth=5.65"
Flow Length=155' Tc=9.6 min CN=74 Runoff=10.53 cfs 0.863 af

SubcatchmentN5: Subcat N5 Runoff Area=1.354 ac 0.00% Impervious Runoff Depth=5.65"
Flow Length=141' Slope=0.0500 '/' Tc=10.2 min CN=74 Runoff=7.66 cfs 0.637 af

SubcatchmentN6: Subcat N6 Runoff Area=0.654 ac 0.00% Impervious Runoff Depth=5.65"
Flow Length=114' Slope=0.0500 '/' Tc=9.9 min CN=74 Runoff=3.73 cfs 0.308 af

SubcatchmentN7: Subcat N7 Runoff Area=1.354 ac 0.00% Impervious Runoff Depth=4.67"
Flow Length=172' Slope=0.1400 '/' Tc=10.4 min CN=66 Runoff=6.34 cfs 0.527 af

SubcatchmentN8: Subcat N8 Runoff Area=0.943 ac 0.00% Impervious Runoff Depth=5.65"
Flow Length=94' Tc=9.2 min CN=74 Runoff=5.46 cfs 0.444 af

SubcatchmentN9: Subcat N9 Runoff Area=1.817 ac 0.00% Impervious Runoff Depth=5.77"
Flow Length=760' Tc=11.4 min CN=75 Runoff=10.15 cfs 0.874 af

SubcatchmentNP: Subcat NP Runoff Area=0.690 ac 0.00% Impervious Runoff Depth=3.58"
Flow Length=134' Slope=0.0200 '/' Tc=14.8 min CN=57 Runoff=2.15 cfs 0.206 af

SubcatchmentS1: Subcat S7 Runoff Area=0.263 ac 0.00% Impervious Runoff Depth=5.65"
Flow Length=60' Slope=0.3300 '/' Tc=6.0 min CN=74 Runoff=1.69 cfs 0.124 af

SubcatchmentS2: Subcat S2 Runoff Area=1.813 ac 0.00% Impervious Runoff Depth=5.65"
Flow Length=97' Tc=6.0 min CN=74 Runoff=11.69 cfs 0.853 af

SubcatchmentS3: Subcat S3 Runoff Area=1.322 ac 0.11% Impervious Runoff Depth=6.13"
Flow Length=64' Slope=0.3300 '/' Tc=6.0 min CN=78 Runoff=9.17 cfs 0.676 af

SubcatchmentS4: Subcat S4 Runoff Area=1.628 ac 0.00% Impervious Runoff Depth=5.65"
Flow Length=143' Slope=0.0500 '/' Tc=10.3 min CN=74 Runoff=9.19 cfs 0.766 af

Subcatchment S5: Subcat S5 Runoff Area=0.922 ac 0.00% Impervious Runoff Depth=5.77"
Flow Length=118' Tc=9.9 min CN=75 Runoff=5.36 cfs 0.443 af

Subcatchment S6: Subcat S6 Runoff Area=2.064 ac 0.00% Impervious Runoff Depth=5.77"
Flow Length=163' Tc=10.1 min CN=75 Runoff=11.94 cfs 0.992 af

Subcatchment SP: Subcat SP Runoff Area=0.642 ac 0.00% Impervious Runoff Depth=7.72"
Tc=0.0 min CN=91 Runoff=6.13 cfs 0.413 af

Reach DC-N: RipRap Downchute Avg. Flow Depth=0.61' Max Vel=6.97 fps Inflow=20.74 cfs 1.808 af
n=0.070 L=120.0' S=0.3300 '/' Capacity=127.98 cfs Outflow=20.62 cfs 1.808 af

Reach DC-S: RipRap Downchute Avg. Flow Depth=0.40' Max Vel=5.52 fps Inflow=9.19 cfs 0.766 af
n=0.070 L=100.0' S=0.3333 '/' Capacity=128.61 cfs Outflow=9.12 cfs 0.766 af

Reach PRA: Perimeter Swale Avg. Flow Depth=1.09' Max Vel=3.75 fps Inflow=17.61 cfs 1.442 af
n=0.030 L=500.0' S=0.0100 '/' Capacity=63.20 cfs Outflow=16.78 cfs 1.442 af

Reach PRB: Perimeter Swale Avg. Flow Depth=1.26' Max Vel=4.07 fps Inflow=23.31 cfs 5.256 af
n=0.030 L=700.0' S=0.0100 '/' Capacity=33.63 cfs Outflow=23.09 cfs 5.254 af

Reach PRC: Swale Avg. Flow Depth=0.70' Max Vel=3.25 fps Inflow=12.37 cfs 1.317 af
n=0.030 L=140.0' S=0.0100 '/' Capacity=23.61 cfs Outflow=12.30 cfs 1.317 af

Reach R1: Sideslope Swale Avg. Flow Depth=1.08' Max Vel=3.12 fps Inflow=11.69 cfs 0.853 af
n=0.030 L=1,380.0' S=0.0100 '/' Capacity=47.07 cfs Outflow=8.96 cfs 0.853 af

Reach R2: Sideslope Swale Avg. Flow Depth=1.01' Max Vel=4.23 fps Inflow=11.94 cfs 0.992 af
n=0.030 L=1,143.0' S=0.0200 '/' Capacity=66.56 cfs Outflow=10.63 cfs 0.992 af

Reach R3: Sideslope Swale Avg. Flow Depth=0.50' Max Vel=6.71 fps Inflow=5.13 cfs 0.443 af
n=0.030 L=300.0' S=0.1233 '/' Capacity=201.54 cfs Outflow=5.04 cfs 0.443 af

Reach R4: Sideslope Swale Avg. Flow Depth=0.77' Max Vel=3.53 fps Inflow=5.36 cfs 0.443 af
n=0.030 L=348.0' S=0.0200 '/' Capacity=66.56 cfs Outflow=5.13 cfs 0.443 af

Reach R5: Sideslope Swale Avg. Flow Depth=0.95' Max Vel=4.04 fps Inflow=9.17 cfs 0.676 af
n=0.030 L=309.0' S=0.0200 '/' Capacity=66.56 cfs Outflow=8.60 cfs 0.676 af

Reach R6: Sideslope Swale Avg. Flow Depth=0.77' Max Vel=3.51 fps Inflow=5.46 cfs 0.444 af
n=0.030 L=589.0' S=0.0200 '/' Capacity=66.56 cfs Outflow=5.20 cfs 0.444 af

Reach R7: Sideslope Swale Avg. Flow Depth=1.09' Max Vel=3.14 fps Inflow=10.15 cfs 0.874 af
n=0.030 L=800.0' S=0.0100 '/' Capacity=47.07 cfs Outflow=9.16 cfs 0.874 af

Reach R8: Sideslope Swale Avg. Flow Depth=0.88' Max Vel=3.86 fps Inflow=7.66 cfs 0.637 af
n=0.030 L=354.0' S=0.0200 '/' Capacity=66.56 cfs Outflow=7.36 cfs 0.637 af

Reach R9: Sideslope Swale Avg. Flow Depth=0.99' Max Vel=4.17 fps Inflow=10.53 cfs 0.863 af
n=0.030 L=495.0' S=0.0200 '/' Capacity=66.56 cfs Outflow=10.06 cfs 0.863 af

Pond C-1: 30" Culvert Peak Elev=880.47' Inflow=16.78 cfs 1.442 af
30.0" Round Culvert n=0.013 L=188.0' S=0.0144 '/' Outflow=16.78 cfs 1.442 af

Pond C-2: 30" Culvert Peak Elev=872.50' Inflow=23.09 cfs 5.254 af
30.0" Round Culvert n=0.013 L=270.0' S=0.0100 '/' Outflow=23.09 cfs 5.254 af

Pond C-3: 24" Culvert Peak Elev=879.27' Inflow=12.30 cfs 1.317 af
24.0" Round Culvert n=0.013 L=130.0' S=0.0100 '/' Outflow=12.30 cfs 1.317 af

Pond P-N1: North Basin 1 Peak Elev=862.84' Storage=20,113 cf Inflow=29.33 cfs 6.777 af
Primary=29.03 cfs 6.772 af Secondary=0.00 cfs 0.000 af Outflow=29.03 cfs 6.772 af

Pond P-N2: North Basin 2 Peak Elev=878.21' Storage=118,108 cf Inflow=46.60 cfs 4.777 af
Primary=20.03 cfs 4.681 af Secondary=1.57 cfs 0.047 af Outflow=21.60 cfs 4.728 af

Pond PND-S: South Basin Peak Elev=862.92' Storage=62,370 cf Inflow=41.80 cfs 4.144 af
Primary=31.27 cfs 4.143 af Secondary=0.00 cfs 0.000 af Outflow=31.27 cfs 4.143 af

Link N: POI-N Inflow=30.66 cfs 7.617 af
Primary=30.66 cfs 7.617 af

Link S: POI-S Inflow=31.87 cfs 4.267 af
Primary=31.87 cfs 4.267 af

Total Runoff Area = 25.894 ac Runoff Volume = 11.941 af Average Runoff Depth = 5.53"
99.99% Pervious = 25.893 ac 0.01% Impervious = 0.001 ac

Summary for Subcatchment N1: Subcat N1

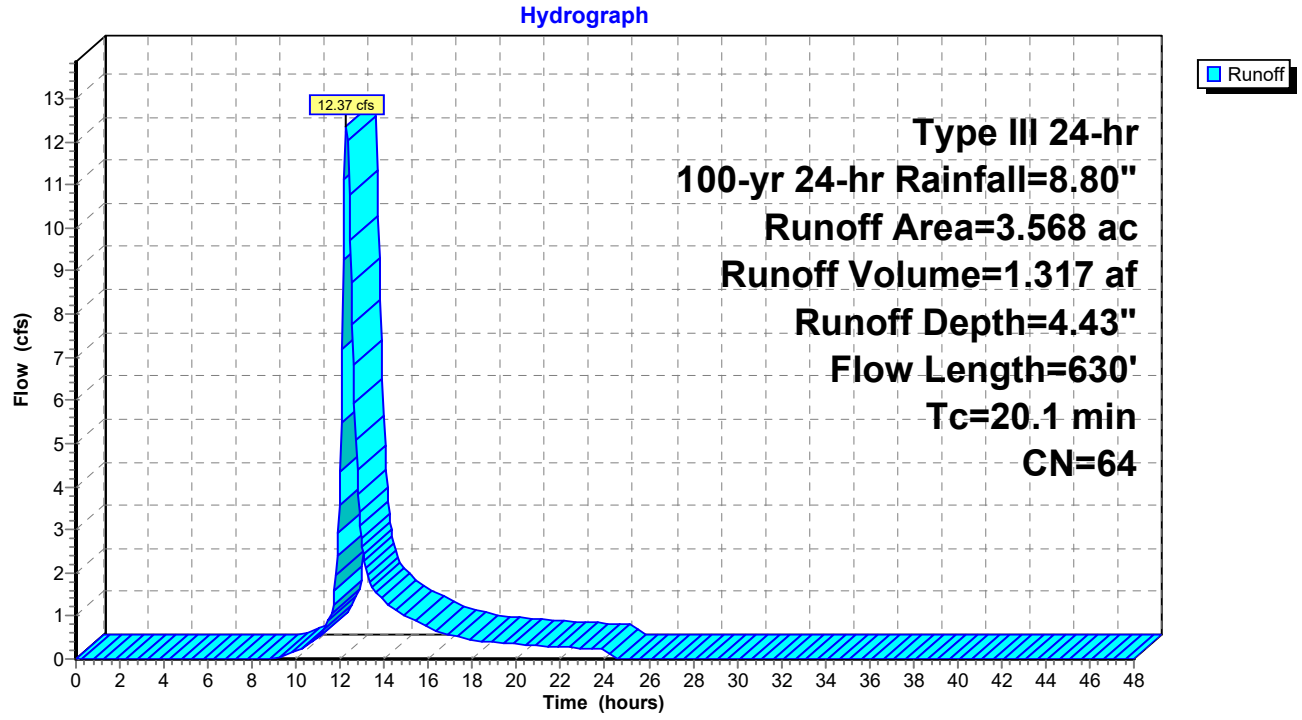
Runoff = 12.37 cfs @ 12.28 hrs, Volume= 1.317 af, Depth= 4.43"
Routed to Reach PRC : Swale

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-yr 24-hr Rainfall=8.80"

Area (ac)	CN	Description
0.073	79	50-75% Grass cover, Fair, HSG C
1.264	79	50-75% Grass cover, Fair, HSG C
1.678	49	50-75% Grass cover, Fair, HSG A
0.011	70	Woods, Good, HSG C
0.000	70	Woods, Good, HSG C
0.002	30	Woods, Good, HSG A
0.540	74	>75% Grass cover, Good, HSG C
3.568	64	Weighted Average
3.568		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.5	100	0.1000	0.22		**Sheet Flow, Grass** Grass: Dense n= 0.240 P2= 3.23"
12.6	530	0.0100	0.70		**Shallow Concentrated Flow, Grass** Short Grass Pasture Kv= 7.0 fps
20.1	630	Total			

Subcatchment N1: Subcat N1



Summary for Subcatchment N10: Subcat N10

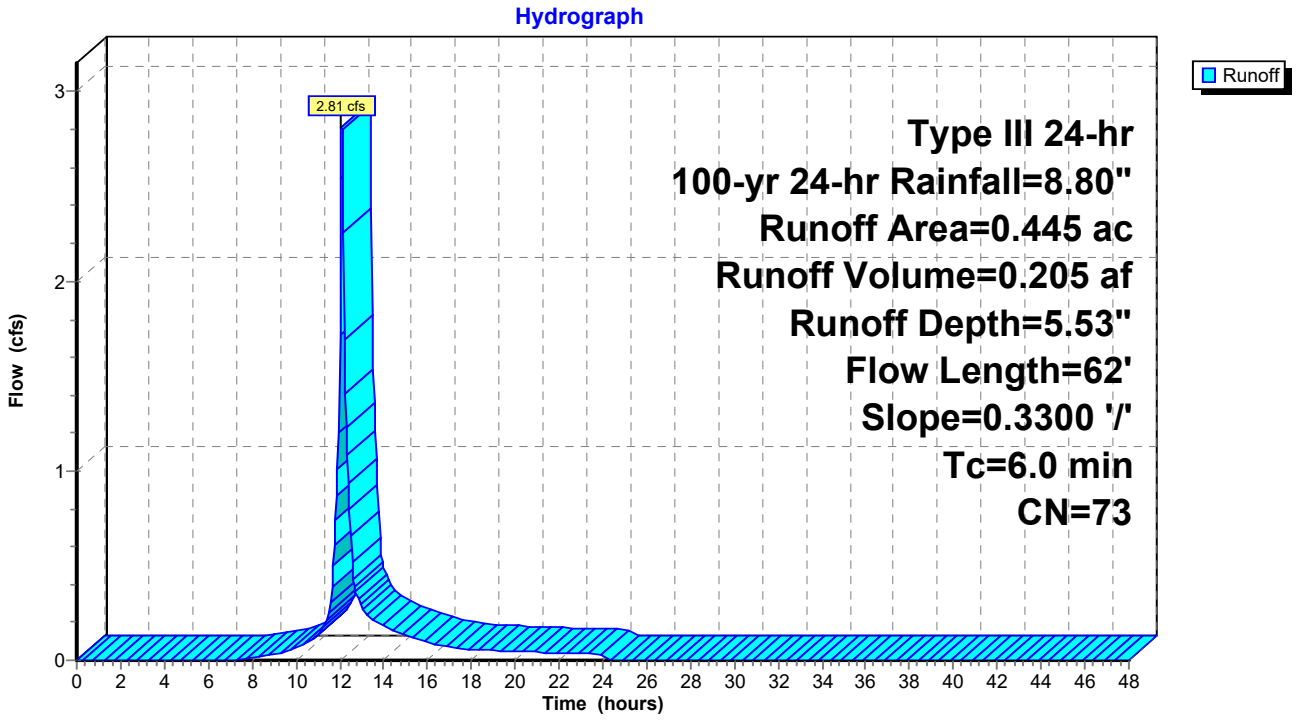
Runoff = 2.81 cfs @ 12.09 hrs, Volume= 0.205 af, Depth= 5.53"
Routed to Link N : POI-N

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-yr 24-hr Rainfall=8.80"

Area (ac)	CN	Description
0.029	49	50-75% Grass cover, Fair, HSG A
0.001	39	>75% Grass cover, Good, HSG A
0.000	96	Gravel surface, HSG C
0.396	74	>75% Grass cover, Good, HSG C
0.018	79	50-75% Grass cover, Fair, HSG C
0.445	73	Weighted Average
0.445		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.2	62	0.3300	0.33		**Sheet Flow, Landfill Slope** Grass: Dense n= 0.240 P2= 3.23"
3.2	62	Total, Increased to minimum Tc = 6.0 min			

Subcatchment N10: Subcat N10



Summary for Subcatchment N11: Subcat N11

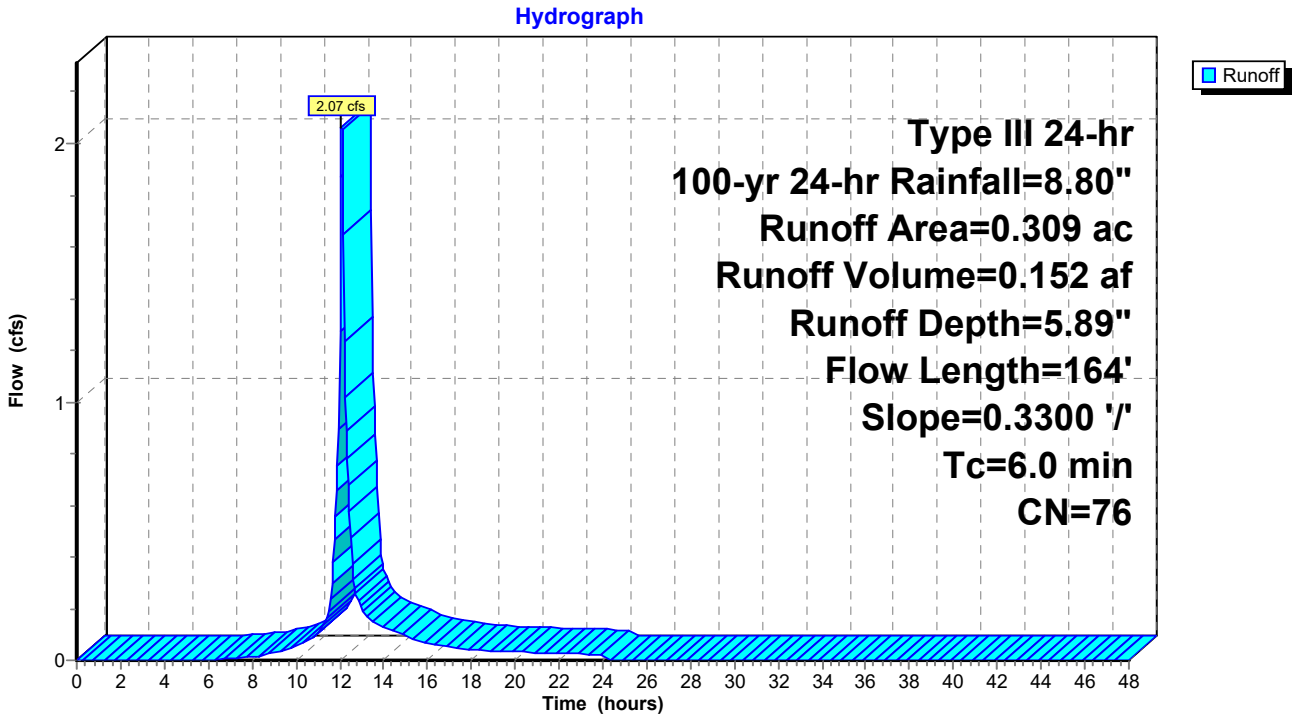
Runoff = 2.07 cfs @ 12.09 hrs, Volume= 0.152 af, Depth= 5.89"
Routed to Link N : POI-N

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-yr 24-hr Rainfall=8.80"

Area (ac)	CN	Description
0.027	96	Gravel surface, HSG C
0.276	74	>75% Grass cover, Good, HSG C
0.006	79	50-75% Grass cover, Fair, HSG C
0.309	76	Weighted Average
0.309		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.6	100	0.3300	0.36		**Sheet Flow, Landfill Slope** Grass: Dense n= 0.240 P2= 3.23"
0.3	64	0.3300	4.02		**Shallow Concentrated Flow, Landfill Slope** Short Grass Pasture Kv= 7.0 fps
4.9	164	Total, Increased to minimum Tc = 6.0 min			

Subcatchment N11: Subcat N11



Summary for Subcatchment N12: Subcat N12

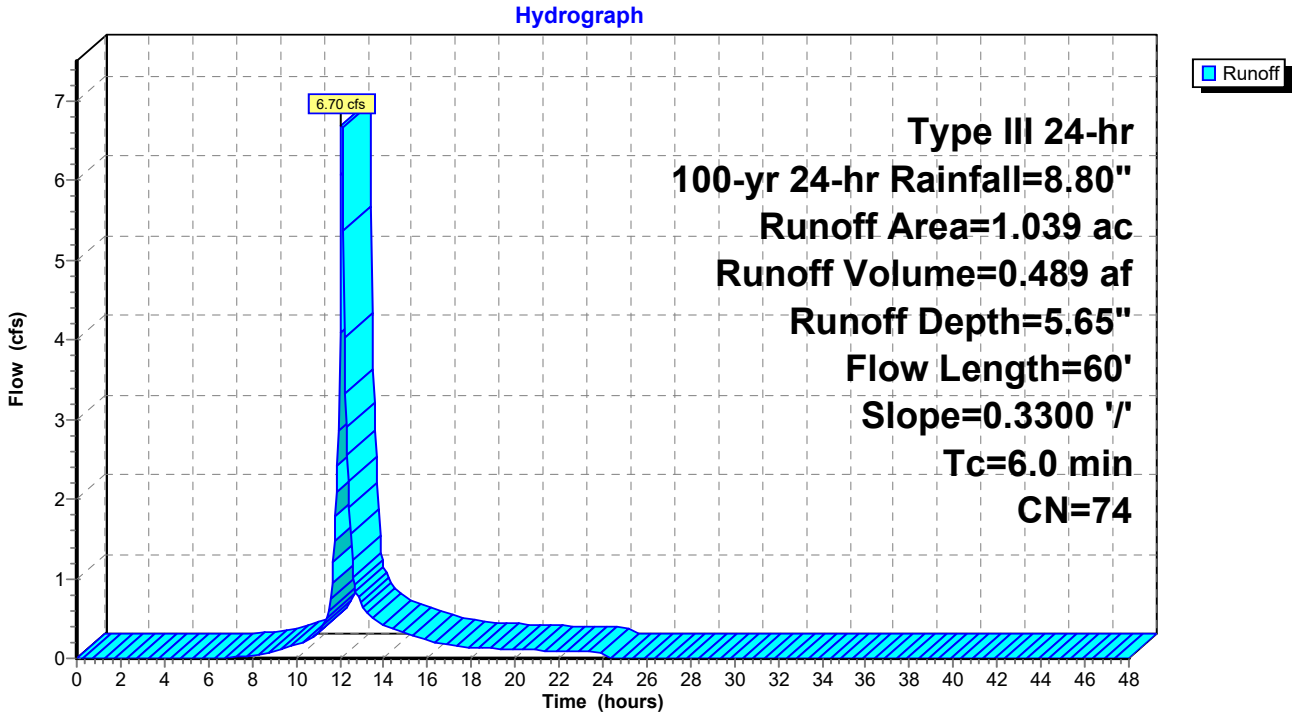
Runoff = 6.70 cfs @ 12.09 hrs, Volume= 0.489 af, Depth= 5.65"
Routed to Link N : POI-N

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-yr 24-hr Rainfall=8.80"

Area (ac)	CN	Description
0.000	49	50-75% Grass cover, Fair, HSG A
0.000	49	50-75% Grass cover, Fair, HSG A
0.000	79	50-75% Grass cover, Fair, HSG C
0.001	79	50-75% Grass cover, Fair, HSG C
0.001	79	50-75% Grass cover, Fair, HSG C
0.001	79	50-75% Grass cover, Fair, HSG C
0.000	79	50-75% Grass cover, Fair, HSG C
0.009	79	50-75% Grass cover, Fair, HSG C
0.003	79	50-75% Grass cover, Fair, HSG C
1.024	74	>75% Grass cover, Good, HSG C
1.039	74	Weighted Average
1.039		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.1	60	0.3300	0.33		**Sheet Flow, Landfill Slope** Grass: Dense n= 0.240 P2= 3.23"
3.1	60	Total, Increased to minimum Tc = 6.0 min			

Subcatchment N12: Subcat N12



Summary for Subcatchment N3: Subcat N3

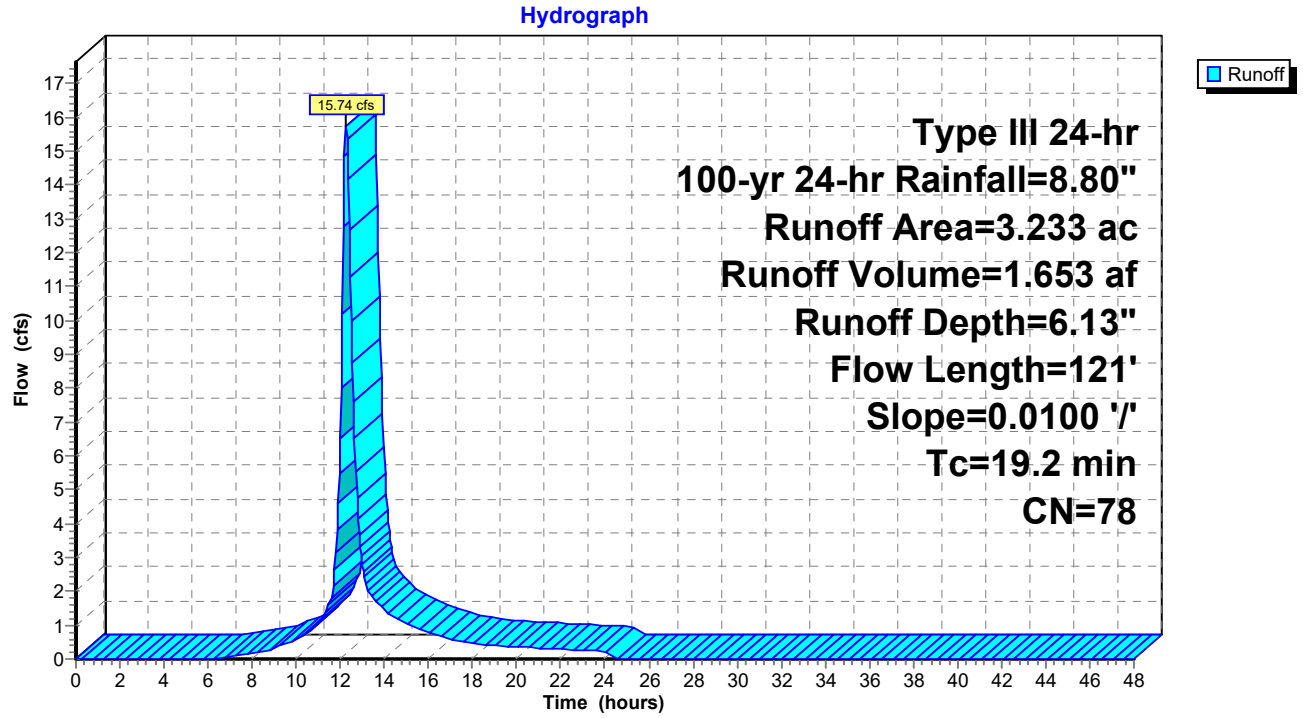
Runoff = 15.74 cfs @ 12.26 hrs, Volume= 1.653 af, Depth= 6.13"
Routed to Pond P-N2 : North Basin 2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-yr 24-hr Rainfall=8.80"

Area (ac)	CN	Description
0.166	49	50-75% Grass cover, Fair, HSG A
2.016	79	50-75% Grass cover, Fair, HSG C
0.654	79	50-75% Grass cover, Fair, HSG C
0.087	96	Gravel surface, HSG C
0.000	74	>75% Grass cover, Good, HSG C
0.021	96	Gravel surface, HSG C
0.289	74	>75% Grass cover, Good, HSG C
3.233	78	Weighted Average
3.233		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
18.7	100	0.0100	0.09		**Sheet Flow, Grass** Grass: Dense n= 0.240 P2= 3.23"
0.5	21	0.0100	0.70		**Shallow Concentrated Flow, Grass** Short Grass Pasture Kv= 7.0 fps
19.2	121	Total			

Subcatchment N3: Subcat N3



Summary for Subcatchment N4: Subcat N4

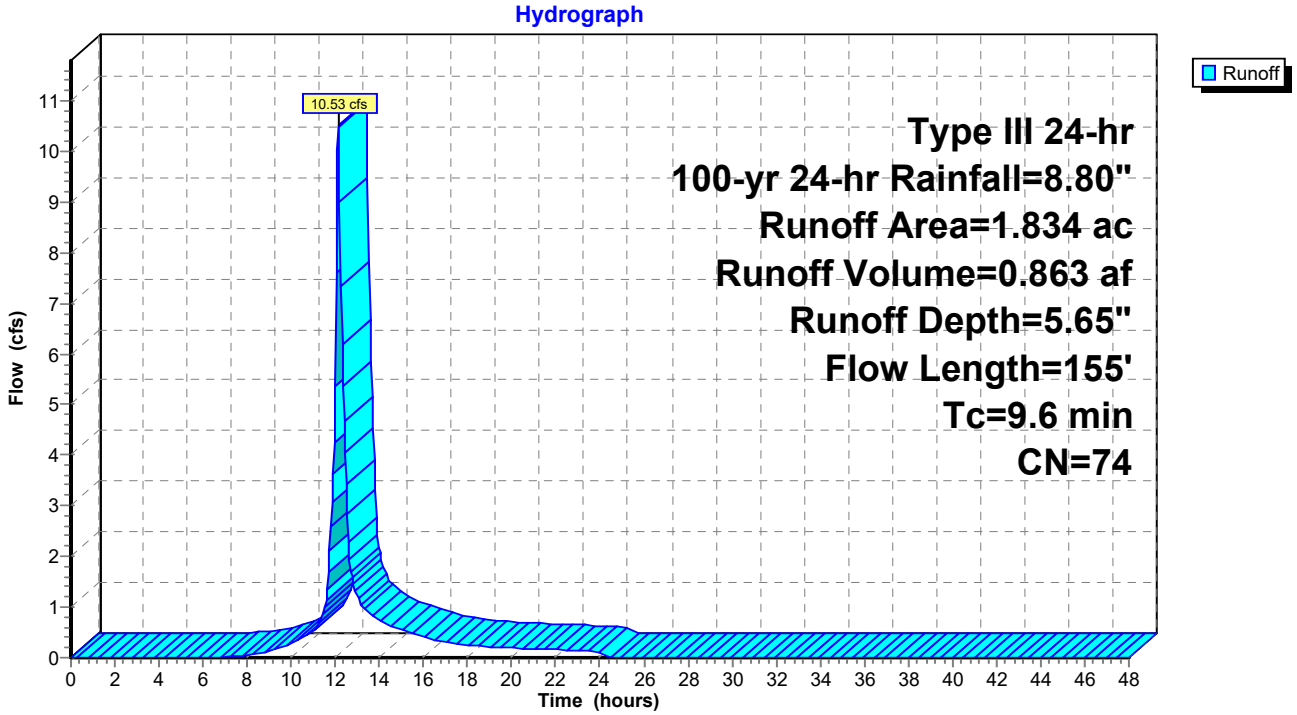
Runoff = 10.53 cfs @ 12.14 hrs, Volume= 0.863 af, Depth= 5.65"
Routed to Reach R9 : Sideslope Swale

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-yr 24-hr Rainfall=8.80"

Area (ac)	CN	Description
0.002	96	Gravel surface, HSG C
1.832	74	>75% Grass cover, Good, HSG C
1.834	74	Weighted Average
1.834		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.0	77	0.0500	0.16		**Sheet Flow, Landfill Deck** Grass: Dense n= 0.240 P2= 3.23"
1.4	23	0.3300	0.27		**Sheet Flow, Landfill Slope** Grass: Dense n= 0.240 P2= 3.23"
0.2	55	0.3300	4.02		**Shallow Concentrated Flow, Landfill Slope** Short Grass Pasture Kv= 7.0 fps
9.6	155	Total			

Subcatchment N4: Subcat N4



Summary for Subcatchment N5: Subcat N5

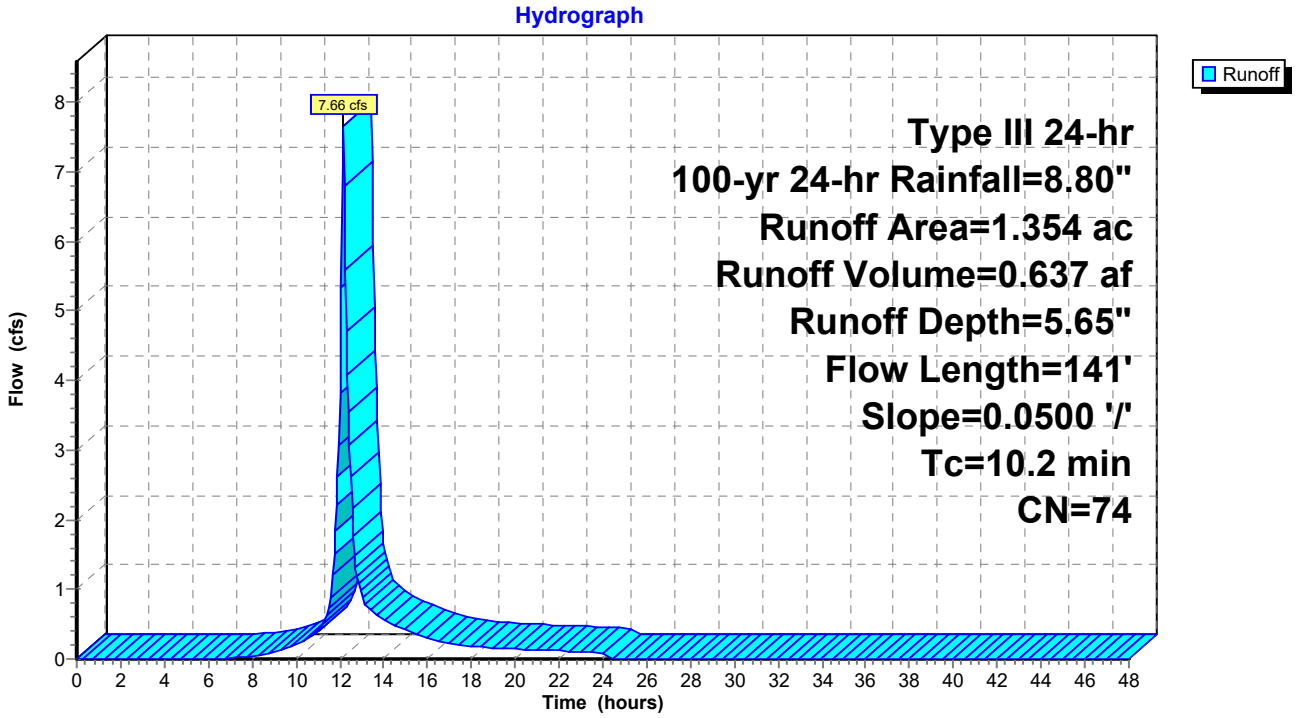
Runoff = 7.66 cfs @ 12.14 hrs, Volume= 0.637 af, Depth= 5.65"
Routed to Reach R8 : Sideslope Swale

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-yr 24-hr Rainfall=8.80"

Area (ac)	CN	Description
1.354	74	>75% Grass cover, Good, HSG C
1.354		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.8	100	0.0500	0.17		**Sheet Flow, Landfill Deck** Grass: Dense n= 0.240 P2= 3.23"
0.4	41	0.0500	1.57		**Shallow Concentrated Flow, Landfill Deck** Short Grass Pasture Kv= 7.0 fps
10.2	141	Total			

Subcatchment N5: Subcat N5



Summary for Subcatchment N6: Subcat N6

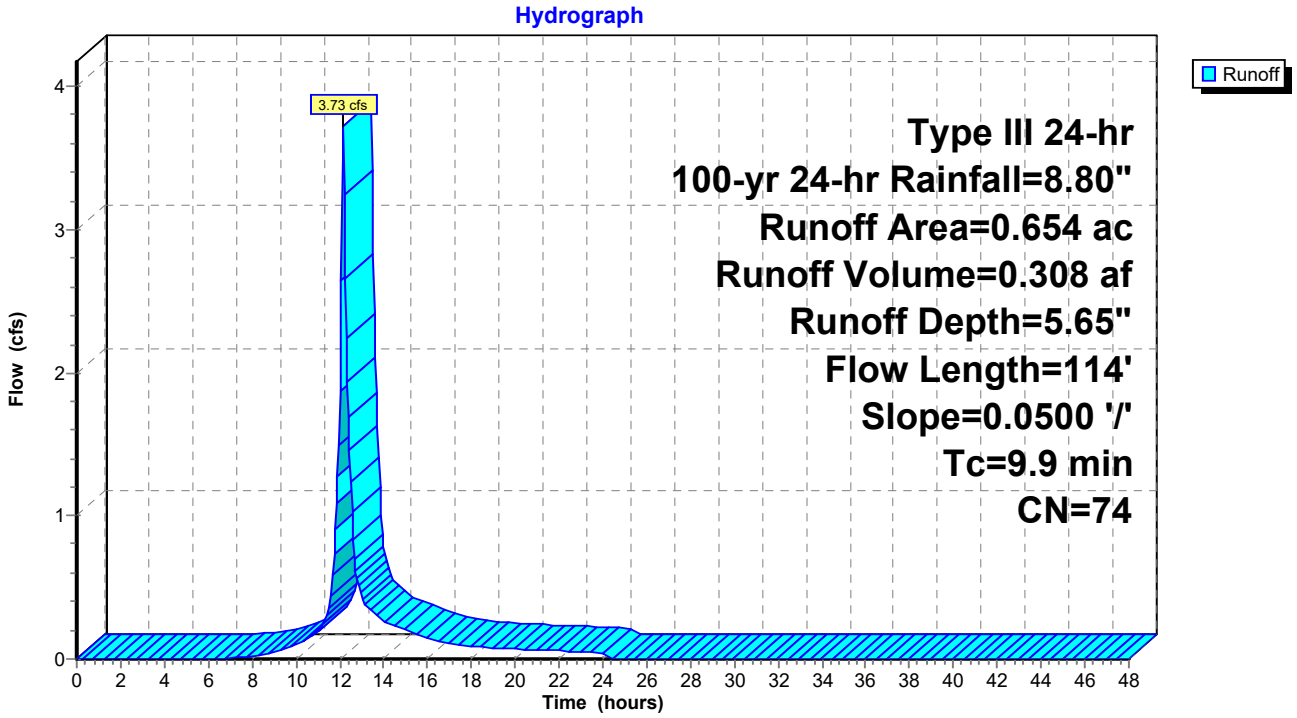
Runoff = 3.73 cfs @ 12.14 hrs, Volume= 0.308 af, Depth= 5.65"
Routed to Reach DC-N : RipRap Downchute

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-yr 24-hr Rainfall=8.80"

Area (ac)	CN	Description
0.654	74	>75% Grass cover, Good, HSG C
0.654		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.8	100	0.0500	0.17		**Sheet Flow, Landfill Deck** Grass: Dense n= 0.240 P2= 3.23"
0.1	14	0.0500	1.57		**Shallow Concentrated Flow, Landfill Deck** Short Grass Pasture Kv= 7.0 fps
9.9	114	Total			

Subcatchment N6: Subcat N6



Summary for Subcatchment N7: Subcat N7

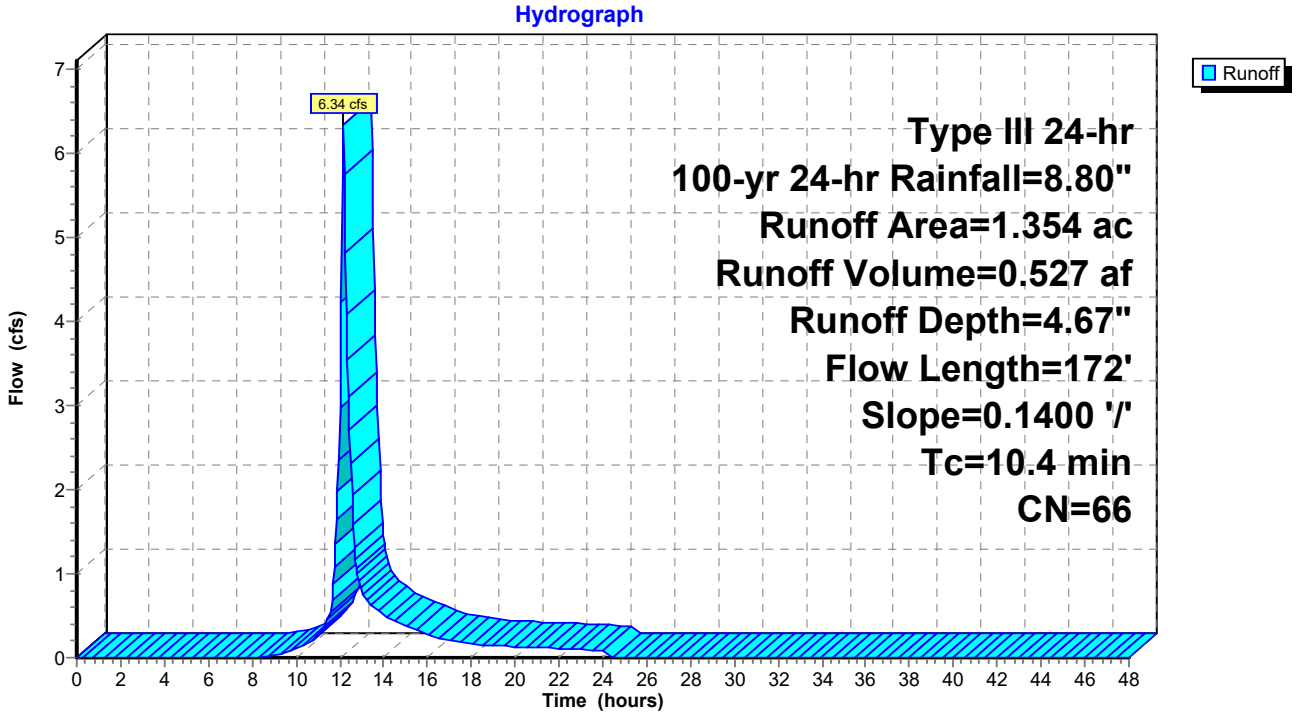
Runoff = 6.34 cfs @ 12.15 hrs, Volume= 0.527 af, Depth= 4.67"
Routed to Reach PRB : Perimeter Swale

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-yr 24-hr Rainfall=8.80"

Area (ac)	CN	Description
0.531	49	50-75% Grass cover, Fair, HSG A
0.045	96	Gravel surface, HSG C
0.430	74	>75% Grass cover, Good, HSG C
0.349	79	50-75% Grass cover, Fair, HSG C
1.354	66	Weighted Average
1.354		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.8	100	0.1400	0.17		**Sheet Flow, Woods** Woods: Light underbrush n= 0.400 P2= 3.23"
0.6	72	0.1400	1.87		**Shallow Concentrated Flow, Woods** Woodland Kv= 5.0 fps
10.4	172	Total			

Subcatchment N7: Subcat N7



Summary for Subcatchment N8: Subcat N8

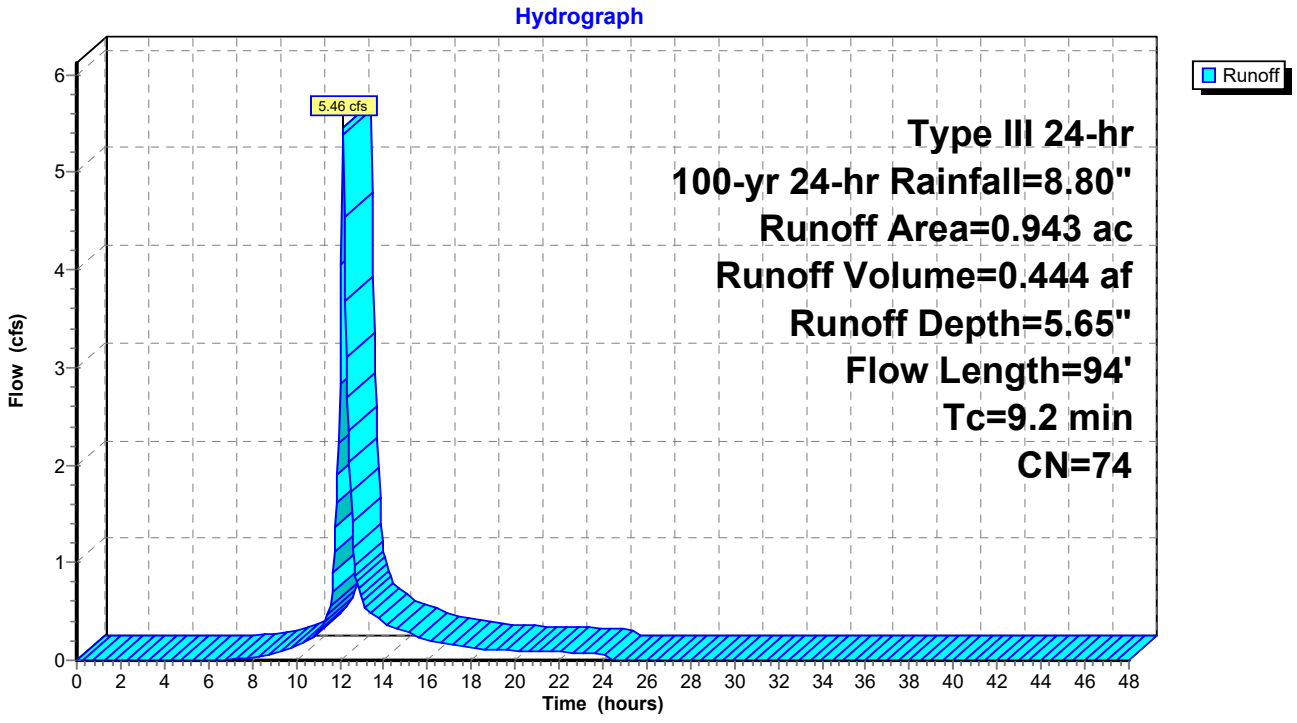
Runoff = 5.46 cfs @ 12.13 hrs, Volume= 0.444 af, Depth= 5.65"
Routed to Reach R6 : Sideslope Swale

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-yr 24-hr Rainfall=8.80"

Area (ac)	CN	Description
0.008	96	Gravel surface, HSG C
0.934	74	>75% Grass cover, Good, HSG C
0.000	79	50-75% Grass cover, Fair, HSG C
0.943	74	Weighted Average
0.943		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.2	80	0.0500	0.16		**Sheet Flow, Landfill Deck** Grass: Dense n= 0.240 P2= 3.23"
1.0	14	0.3300	0.24		**Sheet Flow, Landfill Slope** Grass: Dense n= 0.240 P2= 3.23"
9.2	94	Total			

Subcatchment N8: Subcat N8



Summary for Subcatchment N9: Subcat N9

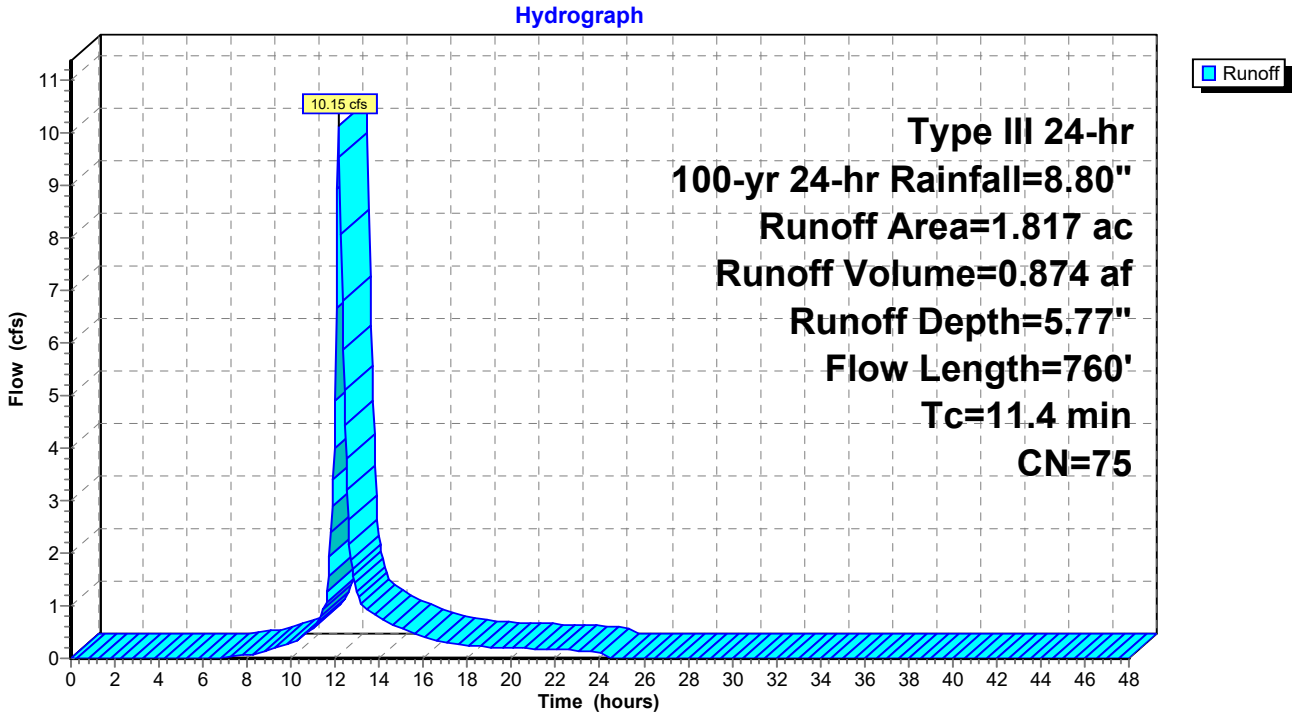
Runoff = 10.15 cfs @ 12.16 hrs, Volume= 0.874 af, Depth= 5.77"
Routed to Reach R7 : Sideslope Swale

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-yr 24-hr Rainfall=8.80"

Area (ac)	CN	Description
0.025	96	Gravel surface, HSG C
0.075	96	Gravel surface, HSG C
1.718	74	>75% Grass cover, Good, HSG C
0.000	74	>75% Grass cover, Good, HSG C
1.817	75	Weighted Average
1.817		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.2	56	0.0500	0.15		**Sheet Flow, Landfill Deck** Grass: Dense n= 0.240 P2= 3.23"
2.4	44	0.3300	0.31		**Sheet Flow, Landfill Slope** Grass: Dense n= 0.240 P2= 3.23"
0.0	10	0.3300	5.17		**Shallow Concentrated Flow, Landfill Slope** Cultivated Straight Rows Kv= 9.0 fps
2.8	650	0.0100	3.89	21.85	**Trap/Vee/Rect Channel Flow, Sideslope Swale** Bot.W=0.00' D=1.50' Z= 2.0 & 3.0 '/' Top.W=7.50' n= 0.030 Earth, grassed & winding
11.4	760	Total			

Subcatchment N9: Subcat N9



Summary for Subcatchment NP: Subcat NP

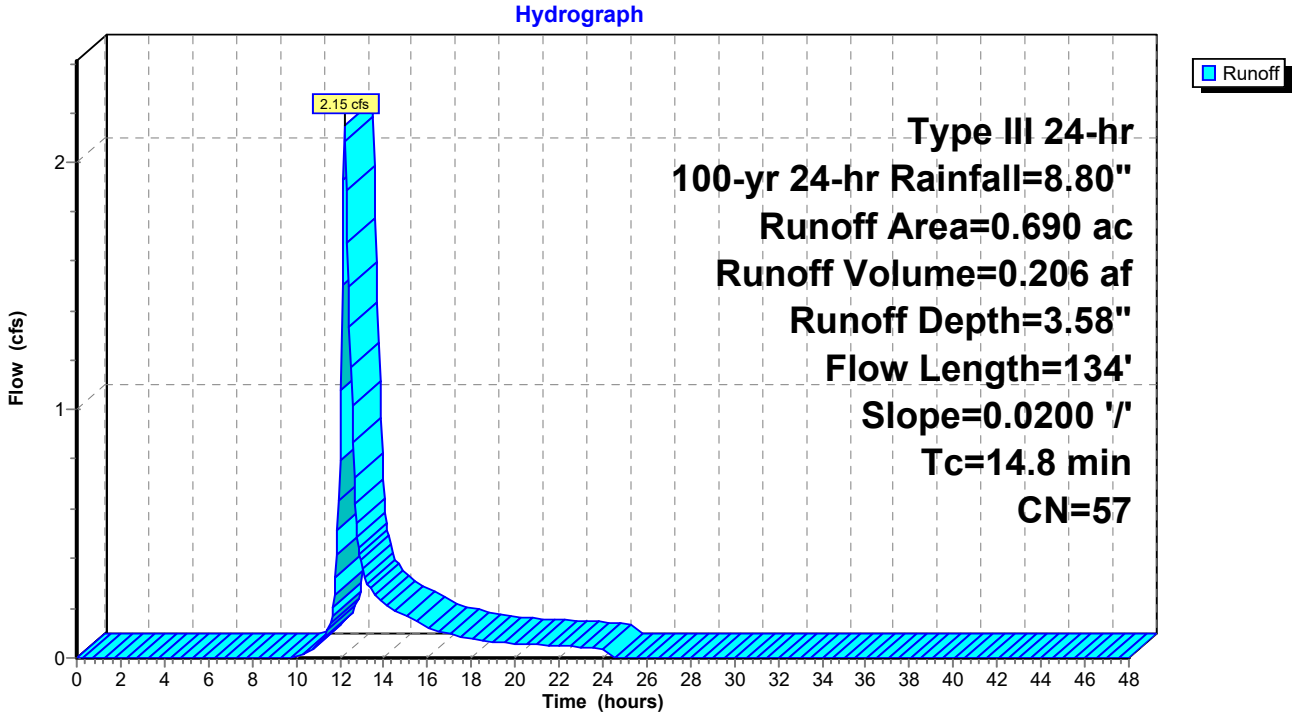
Runoff = 2.15 cfs @ 12.21 hrs, Volume= 0.206 af, Depth= 3.58"
Routed to Pond P-N1 : North Basin 1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-yr 24-hr Rainfall=8.80"

Area (ac)	CN	Description
0.056	49	50-75% Grass cover, Fair, HSG A
0.143	79	50-75% Grass cover, Fair, HSG C
0.004	79	50-75% Grass cover, Fair, HSG C
0.431	49	50-75% Grass cover, Fair, HSG A
0.056	74	>75% Grass cover, Good, HSG C
0.690	57	Weighted Average
0.690		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.2	100	0.0200	0.12		**Sheet Flow, Valley** Grass: Dense n= 0.240 P2= 3.23"
0.6	34	0.0200	0.99		**Shallow Concentrated Flow, Valley** Short Grass Pasture Kv= 7.0 fps
14.8	134	Total			

Subcatchment NP: Subcat NP



Summary for Subcatchment S1: Subcat S7

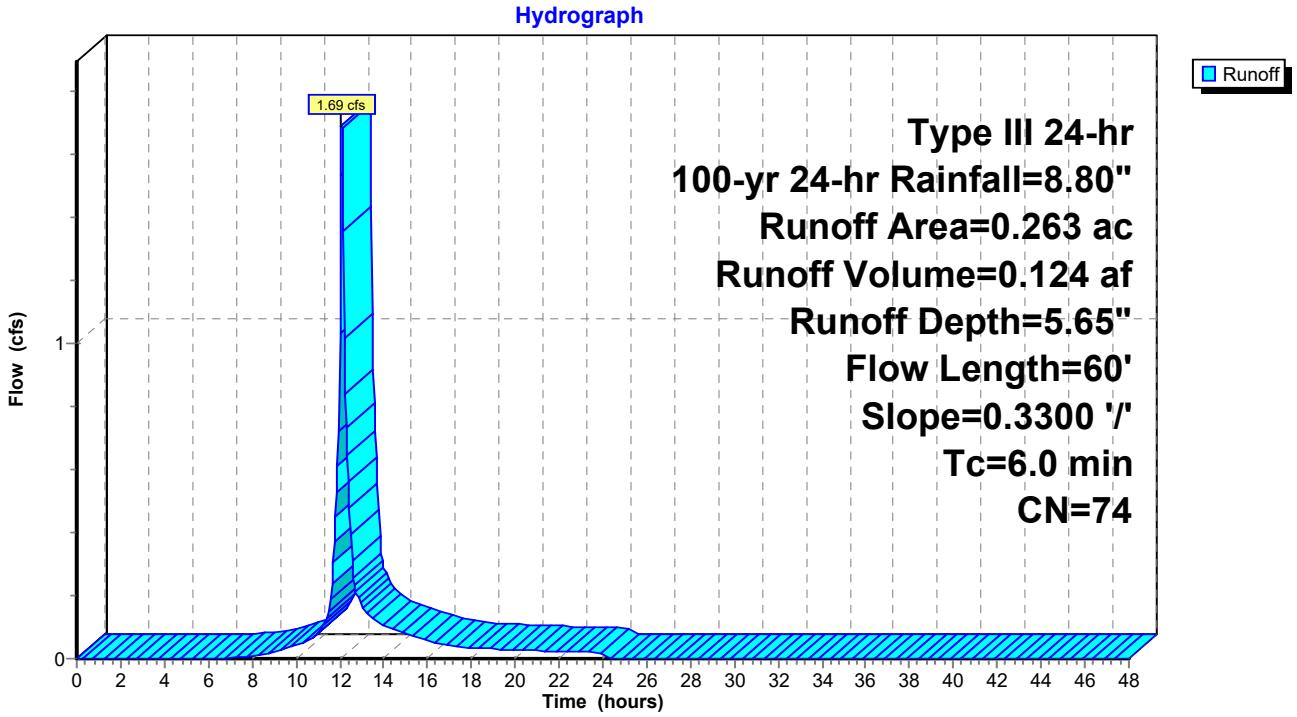
Runoff = 1.69 cfs @ 12.09 hrs, Volume= 0.124 af, Depth= 5.65"
Routed to Link S : POI-S

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-yr 24-hr Rainfall=8.80"

Area (ac)	CN	Description
0.002	79	50-75% Grass cover, Fair, HSG C
0.001	79	50-75% Grass cover, Fair, HSG C
0.163	74	>75% Grass cover, Good, HSG C
0.097	74	>75% Grass cover, Good, HSG C
0.263	74	Weighted Average
0.263		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.1	60	0.3300	0.33		**Sheet Flow, Landfill Slope** Grass: Dense n= 0.240 P2= 3.23"
3.1	60	Total, Increased to minimum Tc = 6.0 min			

Subcatchment S1: Subcat S7



Summary for Subcatchment S2: Subcat S2

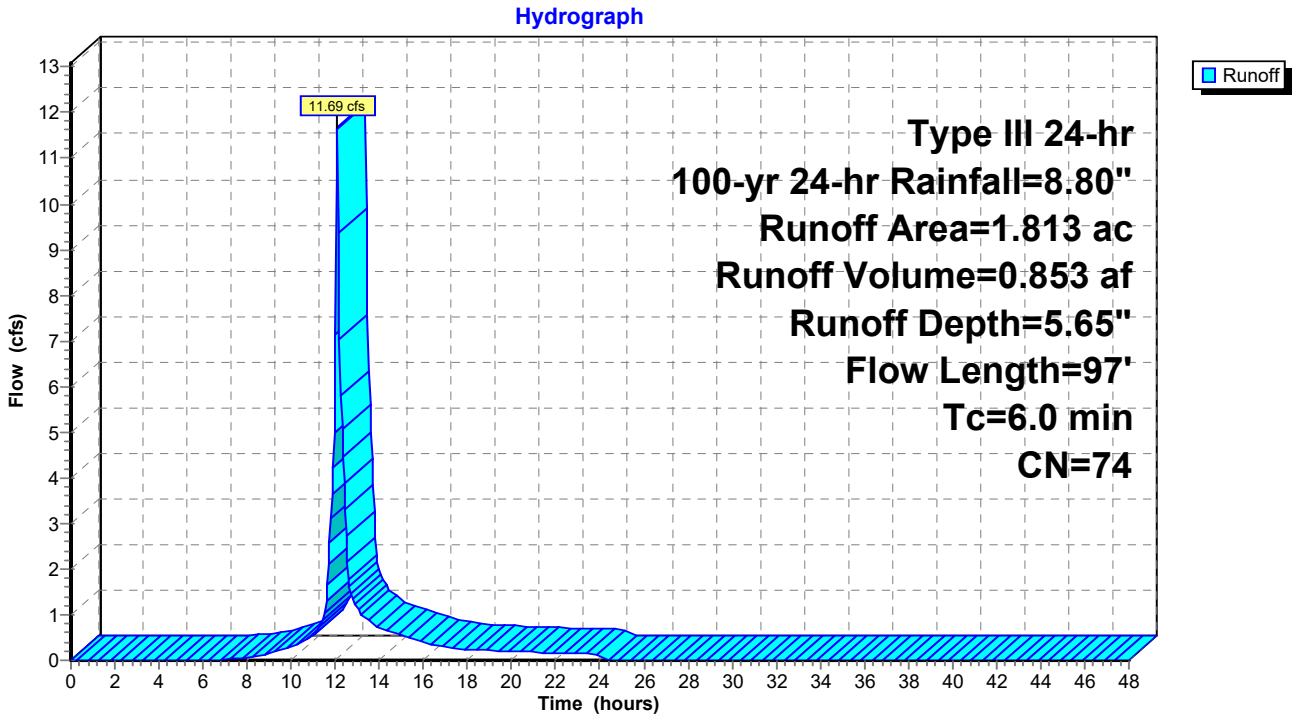
Runoff = 11.69 cfs @ 12.09 hrs, Volume= 0.853 af, Depth= 5.65"
Routed to Reach R1 : Sideslope Swale

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-yr 24-hr Rainfall=8.80"

Area (ac)	CN	Description
0.098	74	>75% Grass cover, Good, HSG C
0.039	96	Gravel surface, HSG C
1.676	74	>75% Grass cover, Good, HSG C
1.813	74	Weighted Average
1.813		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	31	0.1300	0.69		**Sheet Flow, Landfill Access Road** Fallow n= 0.050 P2= 3.23"
3.3	66	0.3300	0.33		**Sheet Flow, Landfill Slope** Grass: Dense n= 0.240 P2= 3.23"
4.1	97	Total, Increased to minimum Tc = 6.0 min			

Subcatchment S2: Subcat S2



Summary for Subcatchment S3: Subcat S3

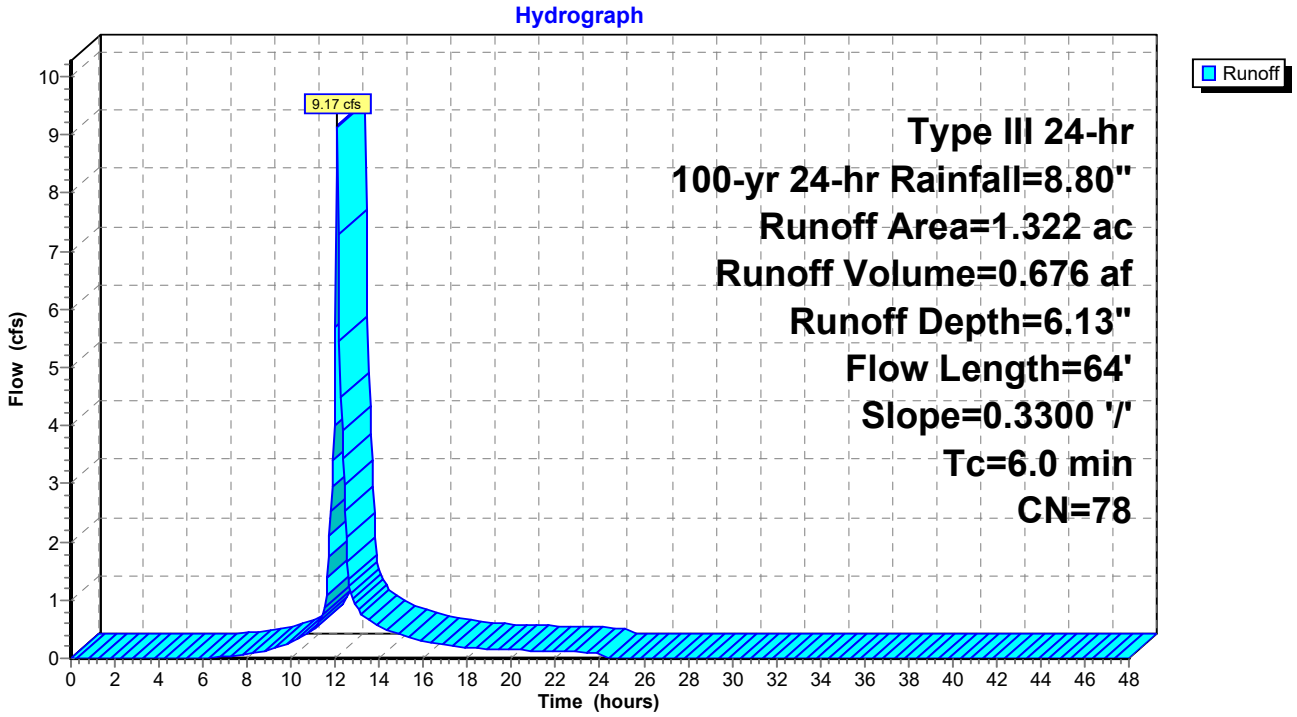
Runoff = 9.17 cfs @ 12.09 hrs, Volume= 0.676 af, Depth= 6.13"
Routed to Reach R5 : Sideslope Swale

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-yr 24-hr Rainfall=8.80"

Area (ac)	CN	Description
0.008	79	50-75% Grass cover, Fair, HSG C
0.003	79	50-75% Grass cover, Fair, HSG C
0.069	49	50-75% Grass cover, Fair, HSG A
0.164	91	Fallow, bare soil, HSG C
0.066	74	>75% Grass cover, Good, HSG C
0.016	96	Gravel surface, HSG C
0.071	96	Gravel surface, HSG C
0.025	96	Gravel surface, HSG C
0.087	96	Gravel surface, HSG C
0.001	98	Roofs, HSG C
0.033	74	>75% Grass cover, Good, HSG C
0.779	74	>75% Grass cover, Good, HSG C
1.322	78	Weighted Average
1.321		99.89% Pervious Area
0.001		0.11% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.2	64	0.3300	0.33		**Sheet Flow, Landfill Slope** Grass: Dense n= 0.240 P2= 3.23"
3.2	64	Total, Increased to minimum Tc = 6.0 min			

Subcatchment S3: Subcat S3



Summary for Subcatchment S4: Subcat S4

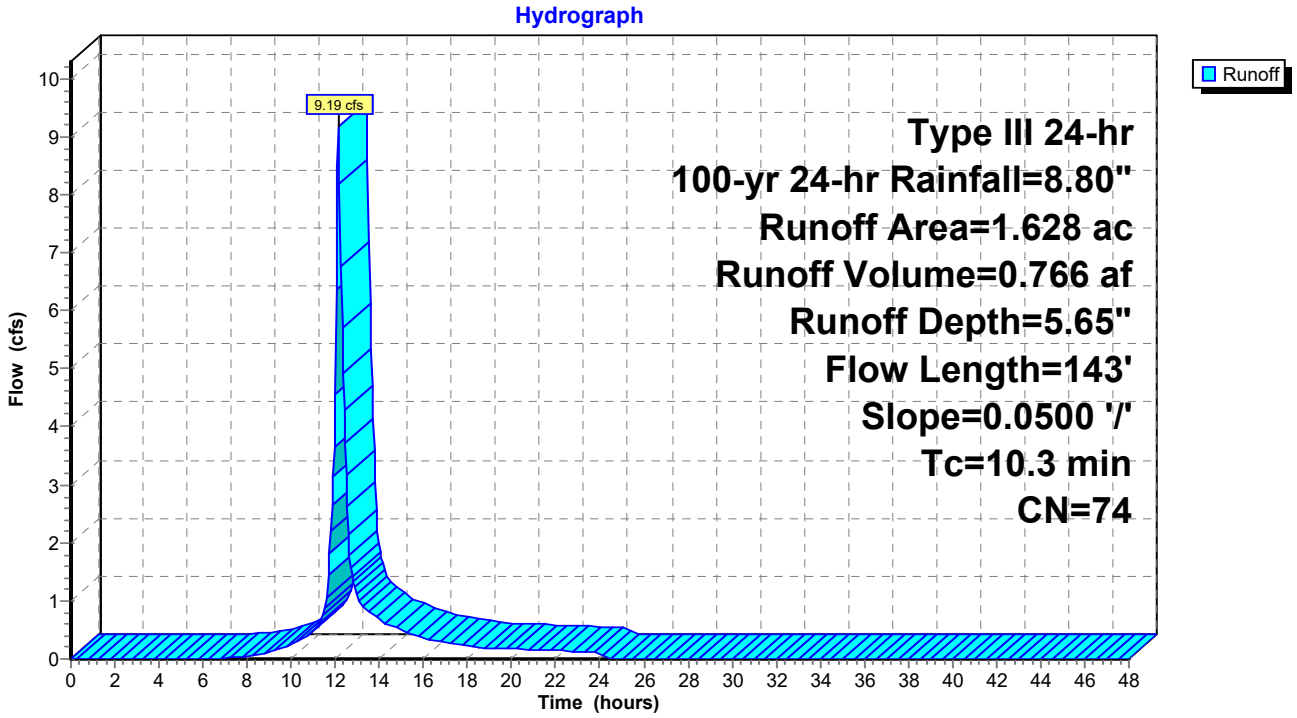
Runoff = 9.19 cfs @ 12.15 hrs, Volume= 0.766 af, Depth= 5.65"
Routed to Reach DC-S : RipRap Downchute

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-yr 24-hr Rainfall=8.80"

Area (ac)	CN	Description
1.628	74	>75% Grass cover, Good, HSG C
1.628		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.8	100	0.0500	0.17		**Sheet Flow, Landfill Deck** Grass: Dense n= 0.240 P2= 3.23"
0.5	43	0.0500	1.57		**Shallow Concentrated Flow, Landfill Deck** Short Grass Pasture Kv= 7.0 fps
10.3	143	Total			

Subcatchment S4: Subcat S4



Summary for Subcatchment S5: Subcat S5

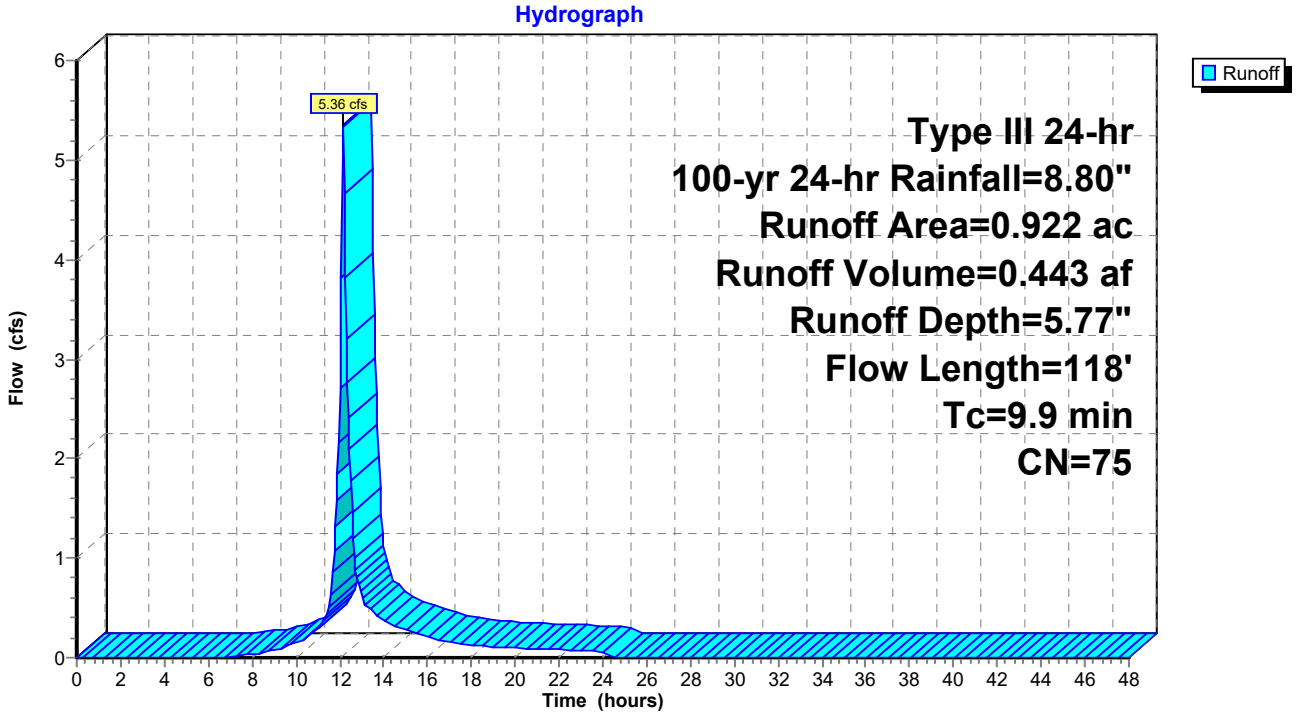
Runoff = 5.36 cfs @ 12.14 hrs, Volume= 0.443 af, Depth= 5.77"
Routed to Reach R4 : Sideslope Swale

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-yr 24-hr Rainfall=8.80"

Area (ac)	CN	Description
0.045	96	Gravel surface, HSG C
0.877	74	>75% Grass cover, Good, HSG C
0.922	75	Weighted Average
0.922		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.8	100	0.0500	0.17		**Sheet Flow, Landfill Deck** Grass: Dense n= 0.240 P2= 3.23"
0.1	12	0.0500	1.57		**Shallow Concentrated Flow, Landfill Deck** Short Grass Pasture Kv= 7.0 fps
0.0	6	0.3300	4.02		**Shallow Concentrated Flow, Landfill Slope** Short Grass Pasture Kv= 7.0 fps
9.9	118	Total			

Subcatchment S5: Subcat S5



Summary for Subcatchment S6: Subcat S6

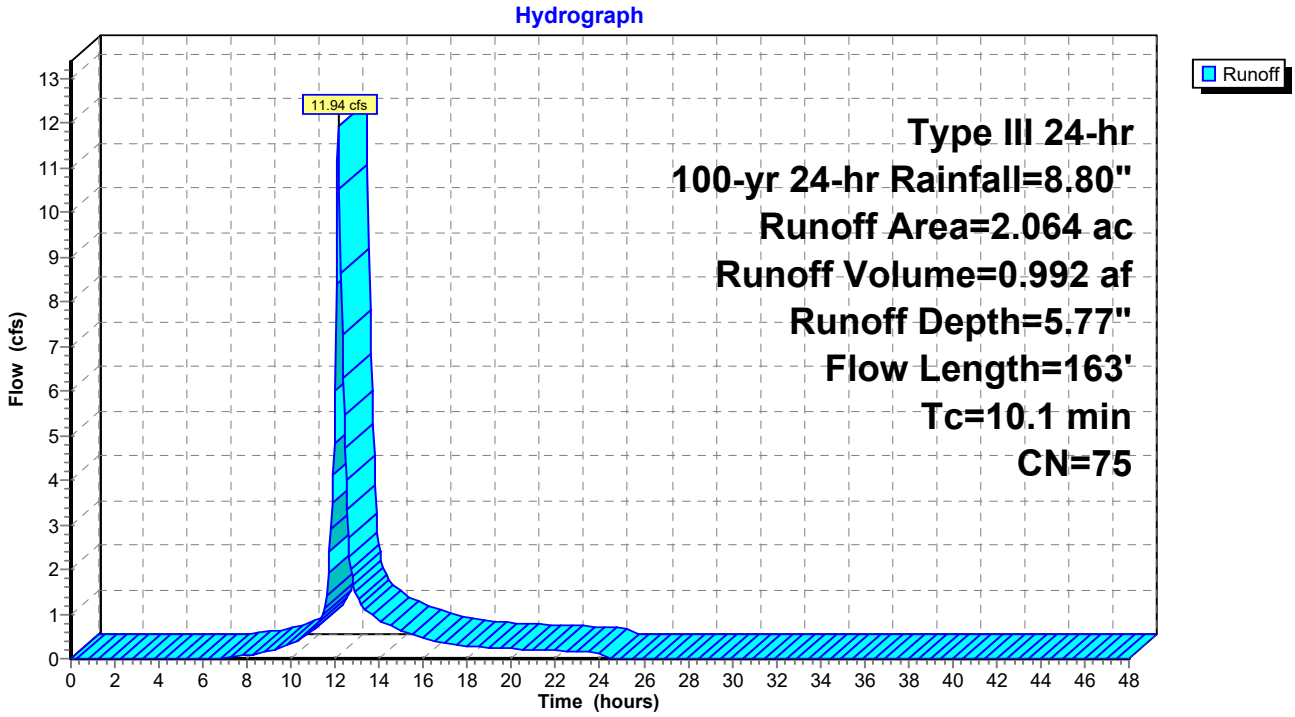
Runoff = 11.94 cfs @ 12.14 hrs, Volume= 0.992 af, Depth= 5.77"
Routed to Reach R2 : Sideslope Swale

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-yr 24-hr Rainfall=8.80"

Area (ac)	CN	Description
1.998	74	>75% Grass cover, Good, HSG C
0.066	96	Gravel surface, HSG C
2.064	75	Weighted Average
2.064		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.8	100	0.0500	0.17		**Sheet Flow, Landfill Deck** Grass: Dense n= 0.240 P2= 3.23"
0.3	63	0.3300	4.02		**Shallow Concentrated Flow, Landfill Slope** Short Grass Pasture Kv= 7.0 fps
10.1	163	Total			

Subcatchment S6: Subcat S6



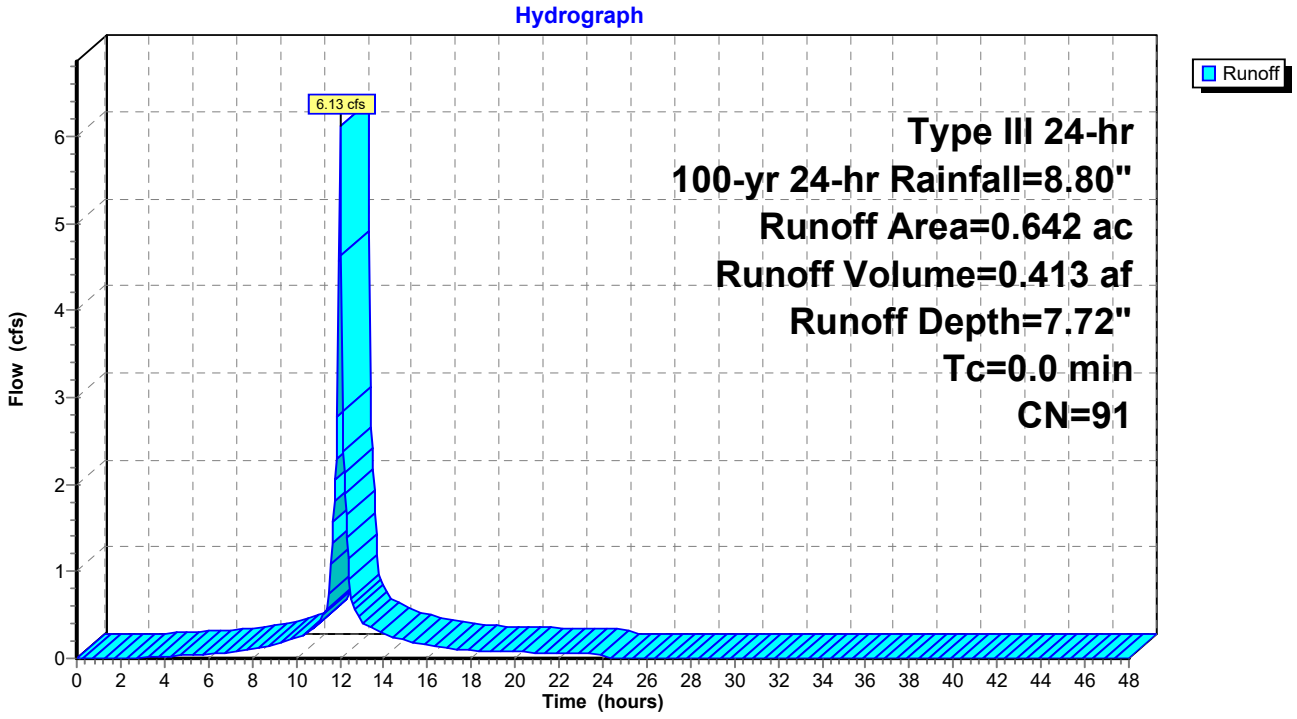
Summary for Subcatchment SP: Subcat SP

Runoff = 6.13 cfs @ 12.00 hrs, Volume= 0.413 af, Depth= 7.72"
Routed to Pond PND-S : South Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-yr 24-hr Rainfall=8.80"

Area (ac)	CN	Description
0.008	74	>75% Grass cover, Good, HSG C
0.635	91	Fallow, bare soil, HSG C
0.642	91	Weighted Average
0.642		100.00% Pervious Area

Subcatchment SP: Subcat SP



Summary for Reach DC-N: RipRap Downchute

Inflow Area = 3.841 ac, 0.00% Impervious, Inflow Depth = 5.65" for 100-yr 24-hr event
Inflow = 20.74 cfs @ 12.19 hrs, Volume= 1.808 af
Outflow = 20.62 cfs @ 12.20 hrs, Volume= 1.808 af, Atten= 1%, Lag= 0.5 min
Routed to Pond P-N2 : North Basin 2

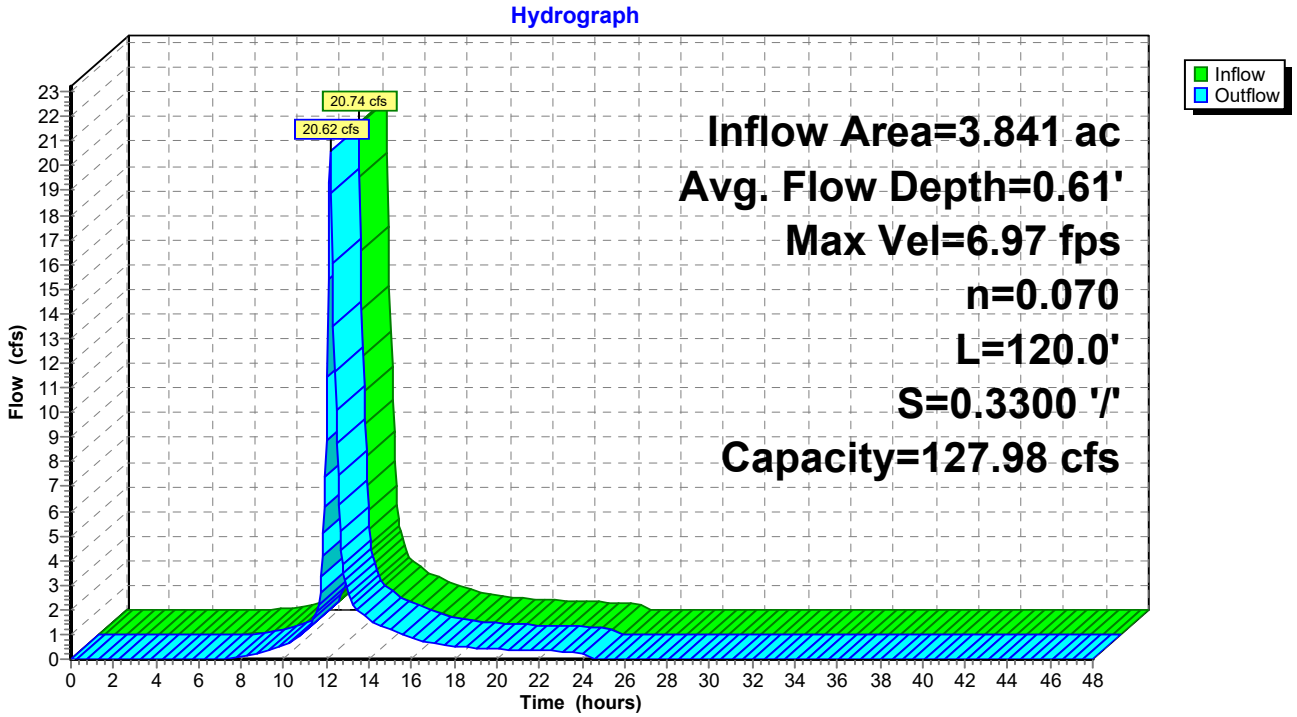
Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 6.97 fps, Min. Travel Time= 0.3 min
Avg. Velocity = 2.18 fps, Avg. Travel Time= 0.9 min

Peak Storage= 357 cf @ 12.19 hrs
Average Depth at Peak Storage= 0.61' , Surface Width= 6.69'
Bank-Full Depth= 1.50' Flow Area= 11.3 sf, Capacity= 127.98 cfs

3.00' x 1.50' deep channel, n= 0.070
Side Slope Z-value= 3.0 '/' Top Width= 12.00'
Length= 120.0' Slope= 0.3300 '/'
Inlet Invert= 919.60', Outlet Invert= 880.00'

‡

Reach DC-N: RipRap Downchute



Summary for Reach DC-S: RipRap Downchute

Inflow Area = 1.628 ac, 0.00% Impervious, Inflow Depth = 5.65" for 100-yr 24-hr event
Inflow = 9.19 cfs @ 12.15 hrs, Volume= 0.766 af
Outflow = 9.12 cfs @ 12.15 hrs, Volume= 0.766 af, Atten= 1%, Lag= 0.5 min
Routed to Reach PRA : Perimeter Swale

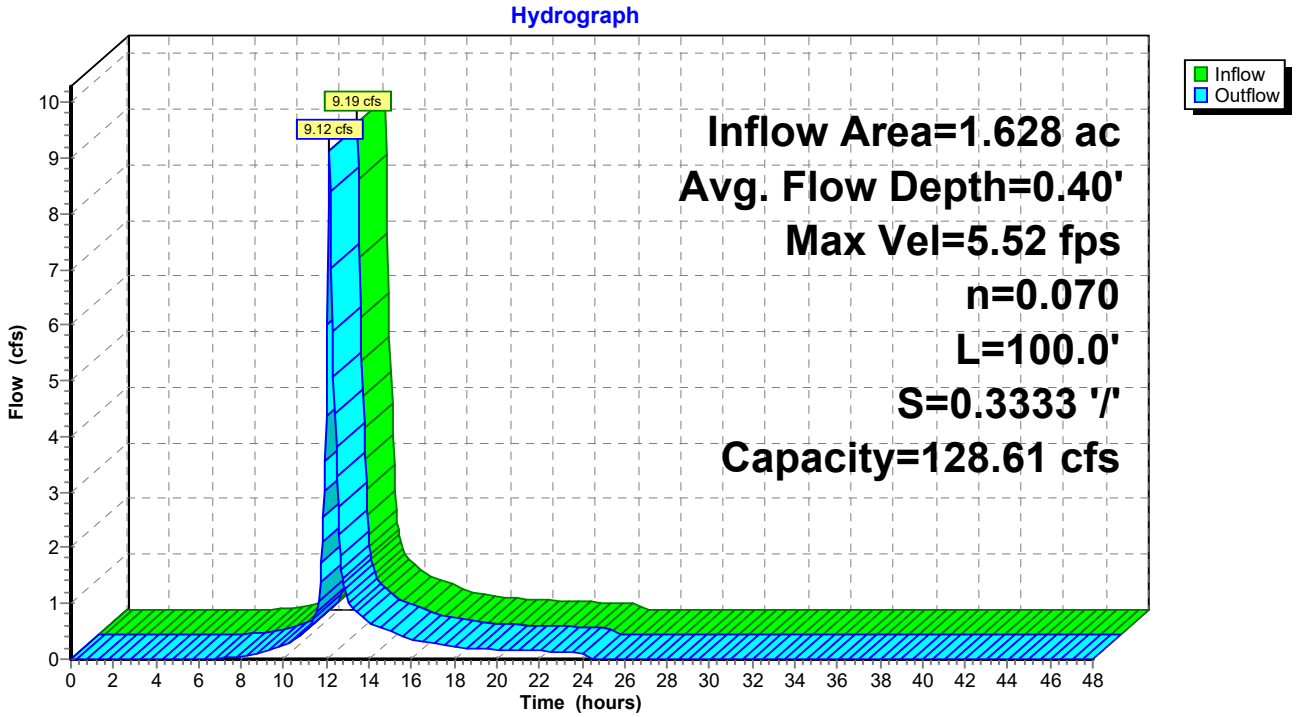
Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 5.52 fps, Min. Travel Time= 0.3 min
Avg. Velocity = 1.71 fps, Avg. Travel Time= 1.0 min

Peak Storage= 167 cf @ 12.15 hrs
Average Depth at Peak Storage= 0.40' , Surface Width= 5.39'
Bank-Full Depth= 1.50' Flow Area= 11.3 sf, Capacity= 128.61 cfs

3.00' x 1.50' deep channel, n= 0.070
Side Slope Z-value= 3.0 '/' Top Width= 12.00'
Length= 100.0' Slope= 0.3333 '/'
Inlet Invert= 915.33', Outlet Invert= 882.00'

‡

Reach DC-S: RipRap Downchute



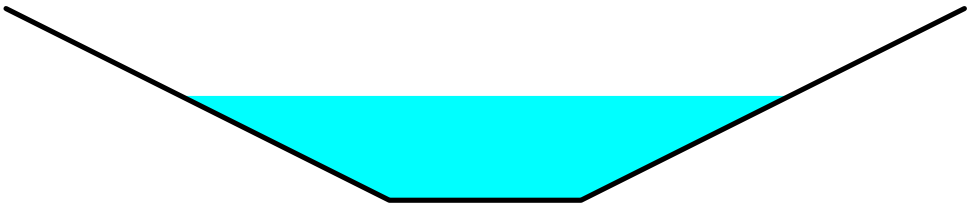
Summary for Reach PRA: Perimeter Swale

Inflow Area = 2.950 ac, 0.05% Impervious, Inflow Depth = 5.87" for 100-yr 24-hr event
Inflow = 17.61 cfs @ 12.14 hrs, Volume= 1.442 af
Outflow = 16.78 cfs @ 12.21 hrs, Volume= 1.442 af, Atten= 5%, Lag= 4.0 min
Routed to Pond C-1 : 30" Culvert

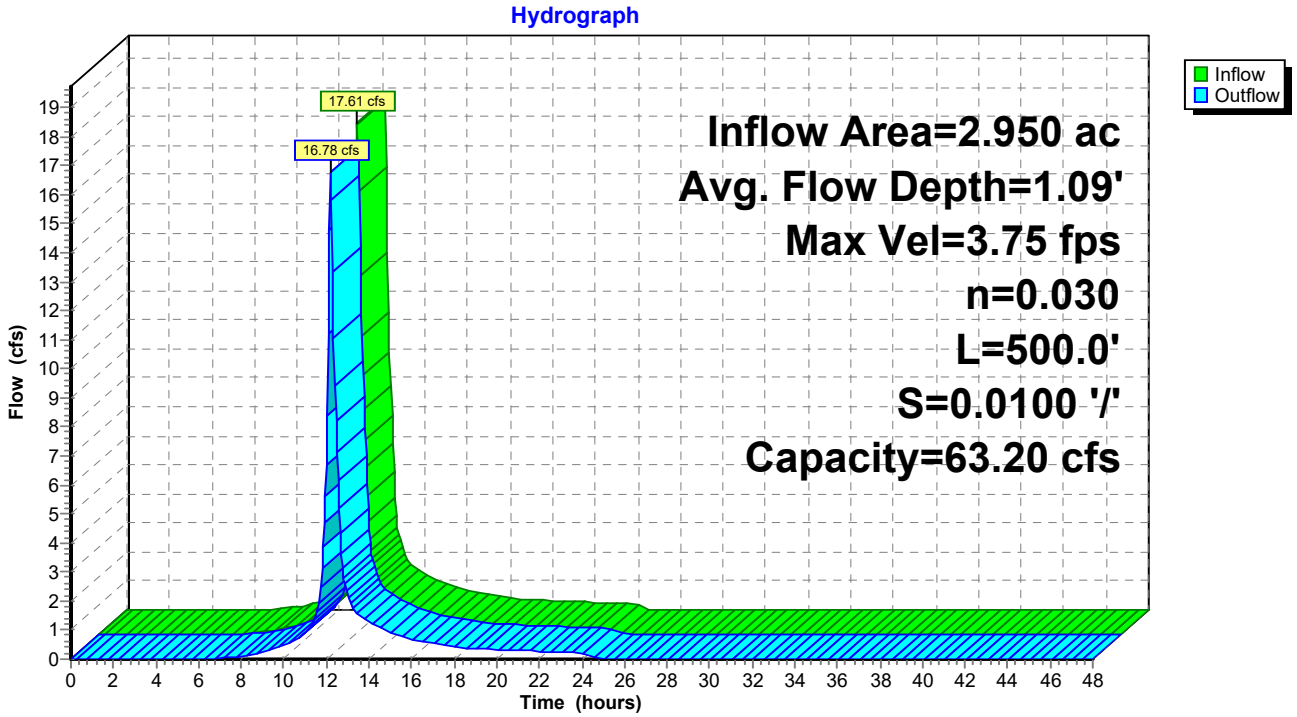
Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.75 fps, Min. Travel Time= 2.2 min
Avg. Velocity = 1.19 fps, Avg. Travel Time= 7.0 min

Peak Storage= 2,270 cf @ 12.17 hrs
Average Depth at Peak Storage= 1.09' , Surface Width= 6.35'
Bank-Full Depth= 2.00' Flow Area= 12.0 sf, Capacity= 63.20 cfs

2.00' x 2.00' deep channel, n= 0.030 Earth, grassed & winding
Side Slope Z-value= 2.0 '/' Top Width= 10.00'
Length= 500.0' Slope= 0.0100 '/'
Inlet Invert= 882.00', Outlet Invert= 877.00'



Reach PRA: Perimeter Swale



Summary for Reach PRB: Perimeter Swale

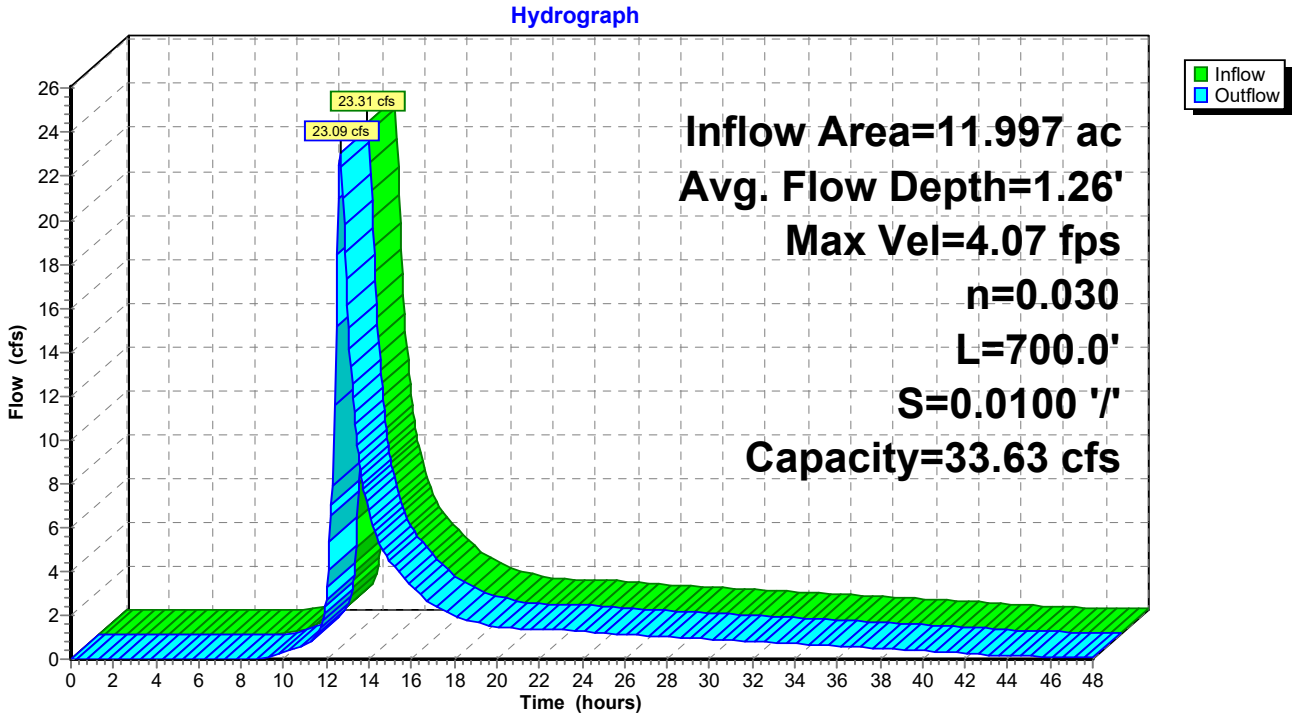
Inflow Area = 11.997 ac, 0.00% Impervious, Inflow Depth > 5.26" for 100-yr 24-hr event
Inflow = 23.31 cfs @ 12.57 hrs, Volume= 5.256 af
Outflow = 23.09 cfs @ 12.66 hrs, Volume= 5.254 af, Atten= 1%, Lag= 5.3 min
Routed to Pond C-2 : 30" Culvert

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 4.07 fps, Min. Travel Time= 2.9 min
Avg. Velocity = 1.53 fps, Avg. Travel Time= 7.6 min

Peak Storage= 3,975 cf @ 12.61 hrs
Average Depth at Peak Storage= 1.26' , Surface Width= 7.03'
Bank-Full Depth= 1.50' Flow Area= 7.5 sf, Capacity= 33.63 cfs

2.00' x 1.50' deep channel, n= 0.030 Earth, grassed & winding
Side Slope Z-value= 2.0 '/' Top Width= 8.00'
Length= 700.0' Slope= 0.0100 '/'
Inlet Invert= 872.00', Outlet Invert= 865.00'

Reach PRB: Perimeter Swale



Summary for Reach PRC: Swale

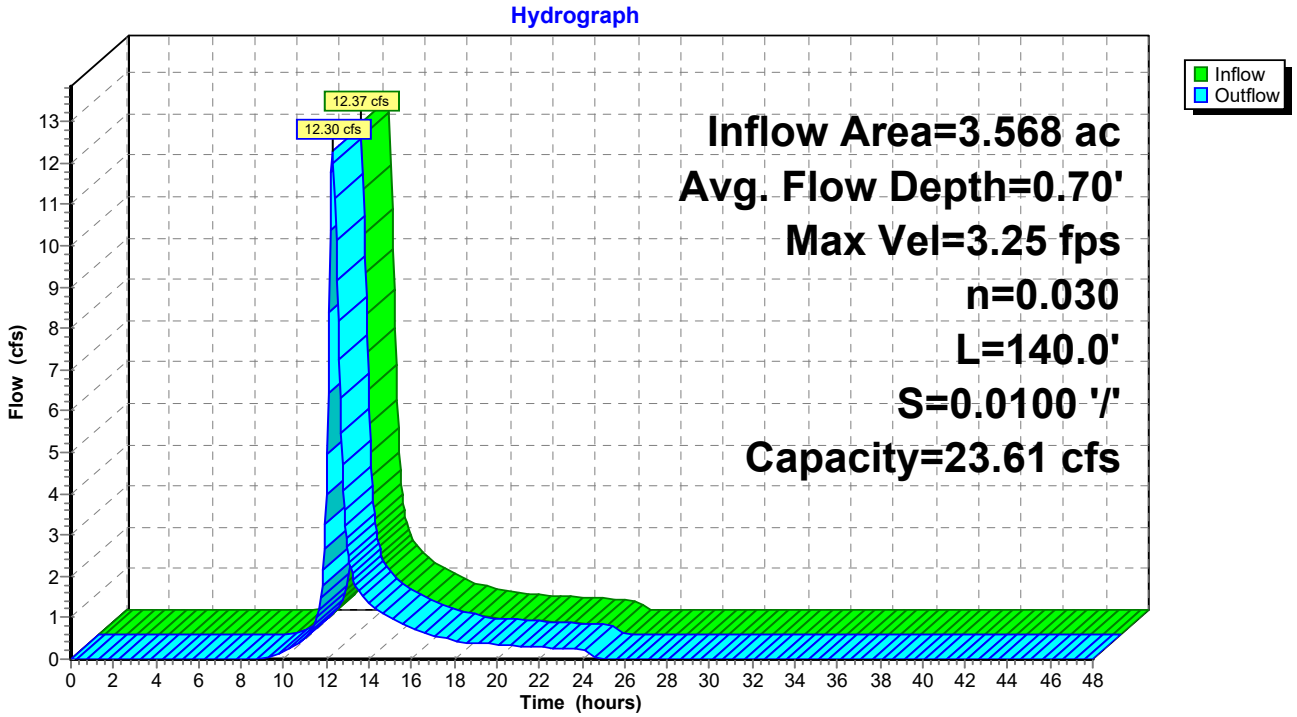
Inflow Area = 3.568 ac, 0.00% Impervious, Inflow Depth = 4.43" for 100-yr 24-hr event
Inflow = 12.37 cfs @ 12.28 hrs, Volume= 1.317 af
Outflow = 12.30 cfs @ 12.31 hrs, Volume= 1.317 af, Atten= 1%, Lag= 1.4 min
Routed to Pond C-3 : 24" Culvert

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.25 fps, Min. Travel Time= 0.7 min
Avg. Velocity = 1.08 fps, Avg. Travel Time= 2.2 min

Peak Storage= 532 cf @ 12.29 hrs
Average Depth at Peak Storage= 0.70' , Surface Width= 6.81'
Bank-Full Depth= 1.00' Flow Area= 6.0 sf, Capacity= 23.61 cfs

4.00' x 1.00' deep channel, n= 0.030 Earth, grassed & winding
Side Slope Z-value= 2.0 '/' Top Width= 8.00'
Length= 140.0' Slope= 0.0100 '/'
Inlet Invert= 879.00', Outlet Invert= 877.60'

‡



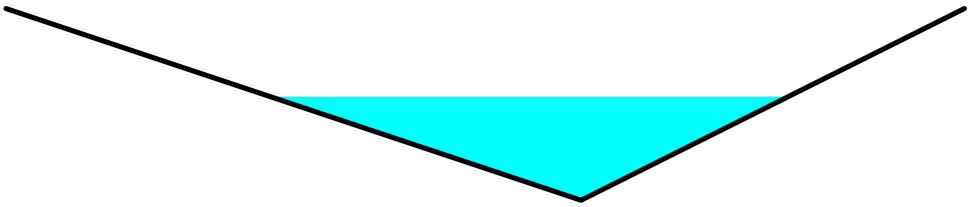
Summary for Reach R1: Sideslope Swale

Inflow Area = 1.813 ac, 0.00% Impervious, Inflow Depth = 5.65" for 100-yr 24-hr event
Inflow = 11.69 cfs @ 12.09 hrs, Volume= 0.853 af
Outflow = 8.96 cfs @ 12.29 hrs, Volume= 0.853 af, Atten= 23%, Lag= 11.8 min
Routed to Pond PND-S : South Basin

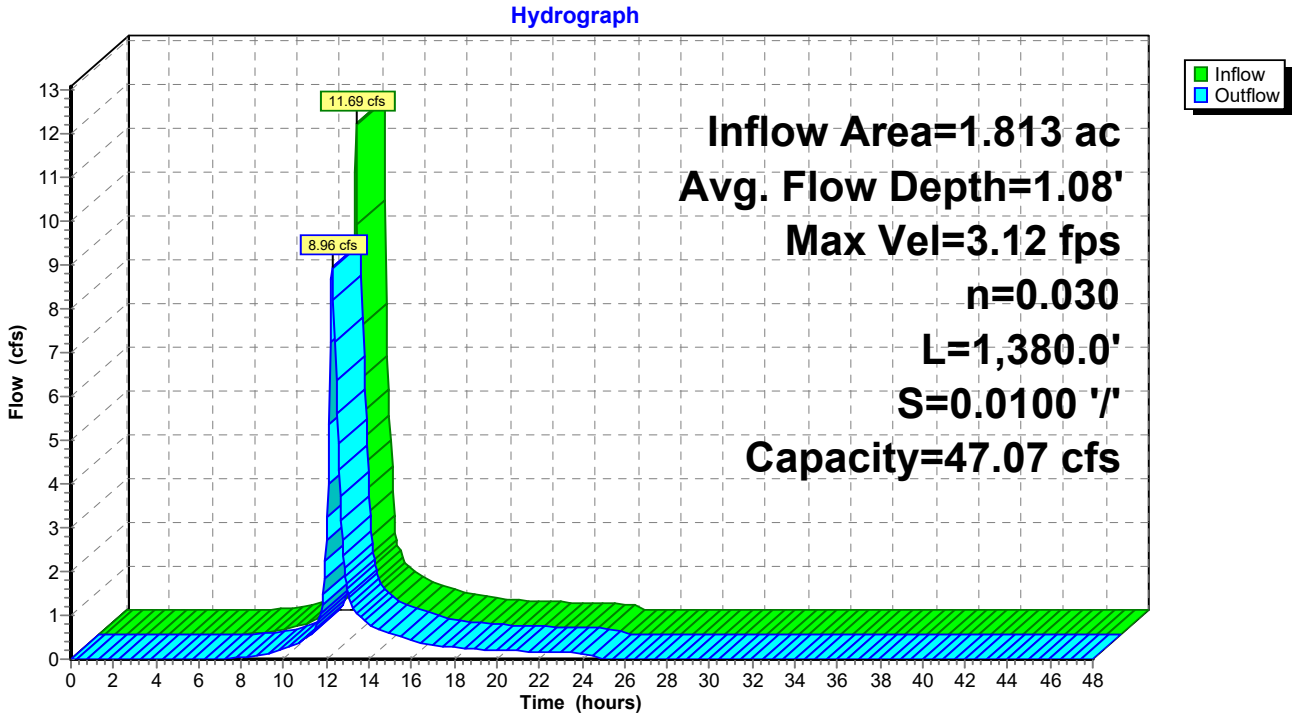
Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.12 fps, Min. Travel Time= 7.4 min
Avg. Velocity = 1.02 fps, Avg. Travel Time= 22.6 min

Peak Storage= 4,049 cf @ 12.16 hrs
Average Depth at Peak Storage= 1.08' , Surface Width= 5.42'
Bank-Full Depth= 2.00' Flow Area= 10.0 sf, Capacity= 47.07 cfs

0.00' x 2.00' deep channel, n= 0.030 Earth, grassed & winding
Side Slope Z-value= 3.0 2.0 '/' Top Width= 10.00'
Length= 1,380.0' Slope= 0.0100 '/'
Inlet Invert= 879.80', Outlet Invert= 866.00'



Reach R1: Sideslope Swale



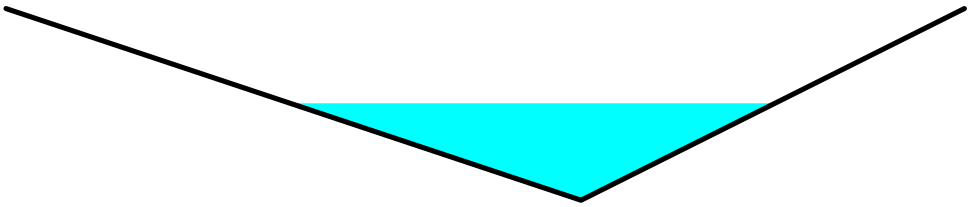
Summary for Reach R2: Sideslope Swale

Inflow Area = 2.064 ac, 0.00% Impervious, Inflow Depth = 5.77" for 100-yr 24-hr event
Inflow = 11.94 cfs @ 12.14 hrs, Volume= 0.992 af
Outflow = 10.63 cfs @ 12.27 hrs, Volume= 0.992 af, Atten= 11%, Lag= 7.8 min
Routed to Pond PND-S : South Basin

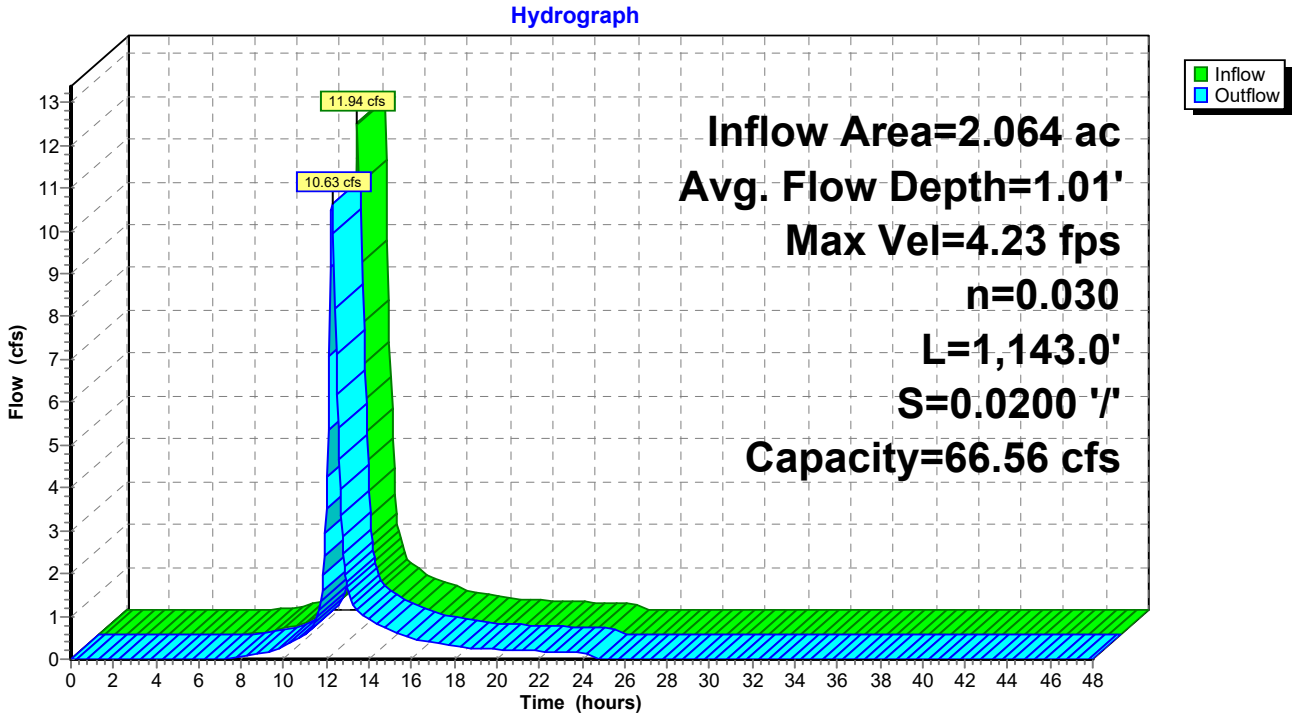
Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 4.23 fps, Min. Travel Time= 4.5 min
Avg. Velocity = 1.51 fps, Avg. Travel Time= 12.6 min

Peak Storage= 2,924 cf @ 12.20 hrs
Average Depth at Peak Storage= 1.01' , Surface Width= 5.06'
Bank-Full Depth= 2.00' Flow Area= 10.0 sf, Capacity= 66.56 cfs

0.00' x 2.00' deep channel, n= 0.030 Earth, grassed & winding
Side Slope Z-value= 3.0 2.0 '/' Top Width= 10.00'
Length= 1,143.0' Slope= 0.0200 '/'
Inlet Invert= 902.86', Outlet Invert= 880.00'



Reach R2: Sideslope Swale



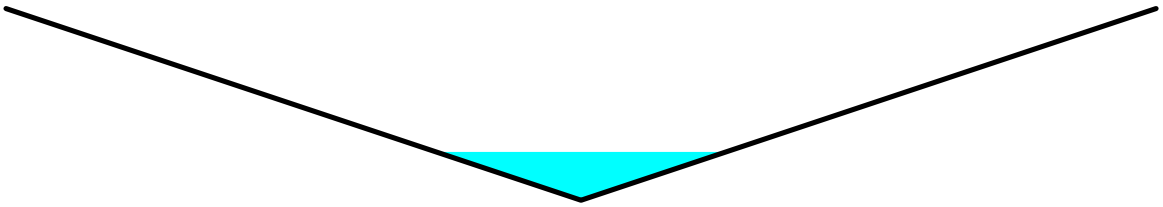
Summary for Reach R3: Sideslope Swale

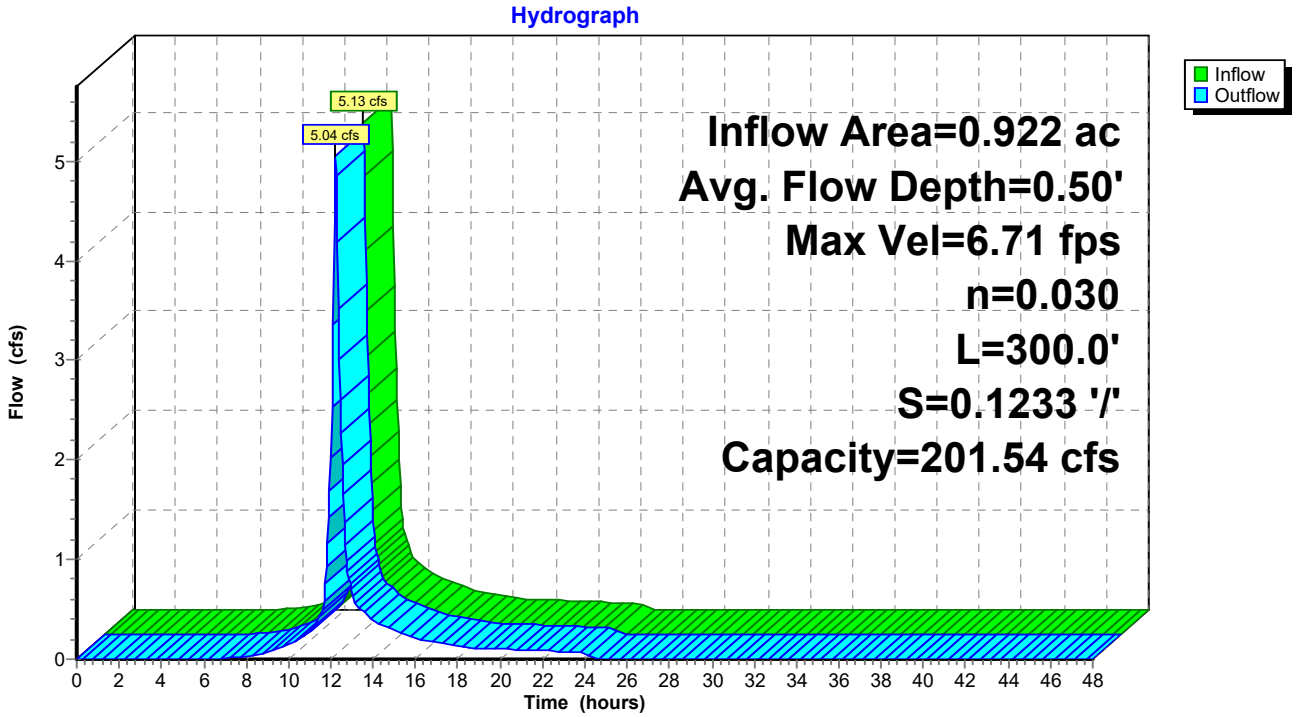
Inflow Area = 0.922 ac, 0.00% Impervious, Inflow Depth = 5.77" for 100-yr 24-hr event
Inflow = 5.13 cfs @ 12.19 hrs, Volume= 0.443 af
Outflow = 5.04 cfs @ 12.21 hrs, Volume= 0.443 af, Atten= 2%, Lag= 1.3 min
Routed to Pond PND-S : South Basin

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 6.71 fps, Min. Travel Time= 0.7 min
Avg. Velocity = 2.70 fps, Avg. Travel Time= 1.8 min

Peak Storage= 229 cf @ 12.20 hrs
Average Depth at Peak Storage= 0.50' , Surface Width= 3.03'
Bank-Full Depth= 2.00' Flow Area= 12.0 sf, Capacity= 201.54 cfs

0.00' x 2.00' deep channel, n= 0.030 Earth, grassed & winding
Side Slope Z-value= 3.0 '/' Top Width= 12.00'
Length= 300.0' Slope= 0.1233 '/'
Inlet Invert= 913.00', Outlet Invert= 876.00'





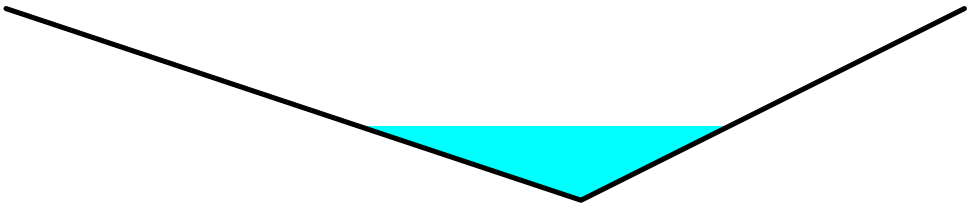
Summary for Reach R4: Sideslope Swale

Inflow Area = 0.922 ac, 0.00% Impervious, Inflow Depth = 5.77" for 100-yr 24-hr event
Inflow = 5.36 cfs @ 12.14 hrs, Volume= 0.443 af
Outflow = 5.13 cfs @ 12.19 hrs, Volume= 0.443 af, Atten= 4%, Lag= 3.2 min
Routed to Reach R3 : Sideslope Swale

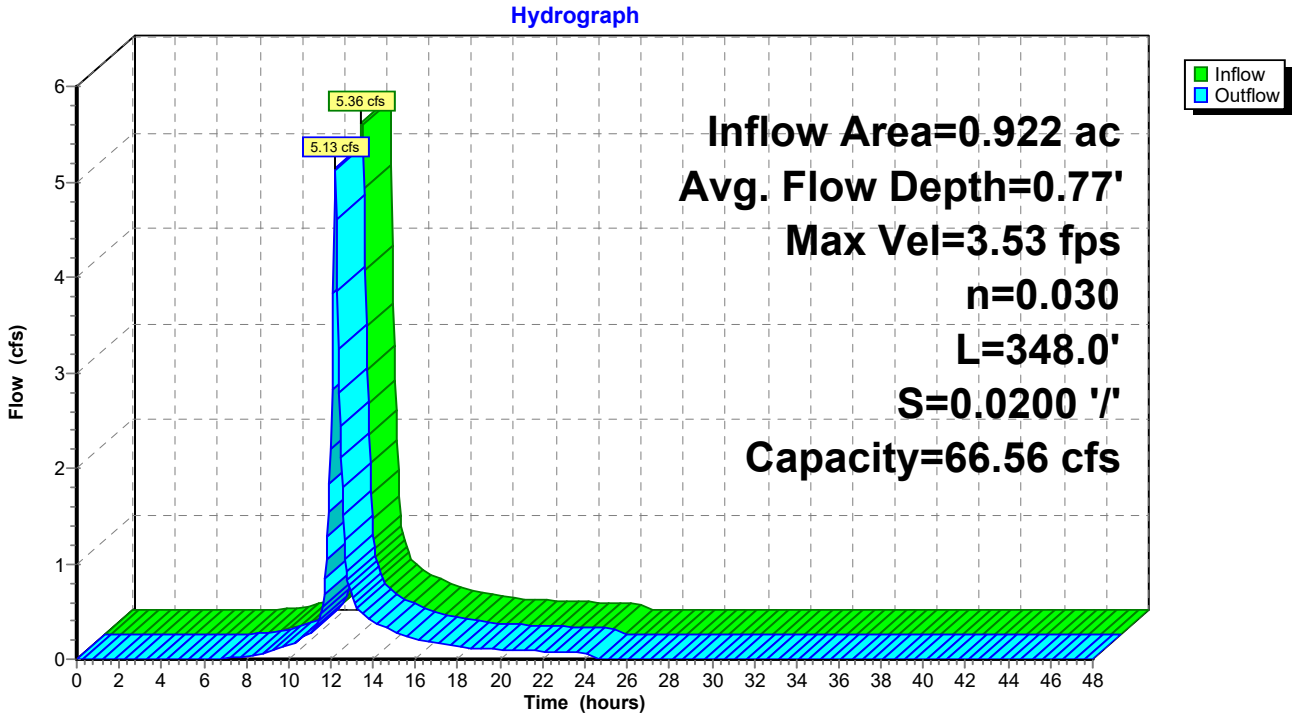
Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.53 fps, Min. Travel Time= 1.6 min
Avg. Velocity = 1.40 fps, Avg. Travel Time= 4.2 min

Peak Storage= 520 cf @ 12.16 hrs
Average Depth at Peak Storage= 0.77' , Surface Width= 3.87'
Bank-Full Depth= 2.00' Flow Area= 10.0 sf, Capacity= 66.56 cfs

0.00' x 2.00' deep channel, n= 0.030 Earth, grassed & winding
Side Slope Z-value= 3.0 2.0 '/' Top Width= 10.00'
Length= 348.0' Slope= 0.0200 '/'
Inlet Invert= 920.00', Outlet Invert= 913.04'



Reach R4: Sideslope Swale



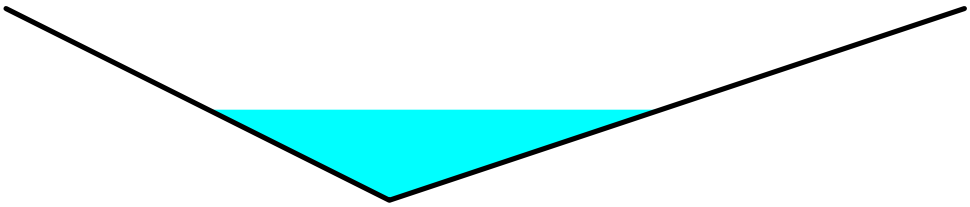
Summary for Reach R5: Sideslope Swale

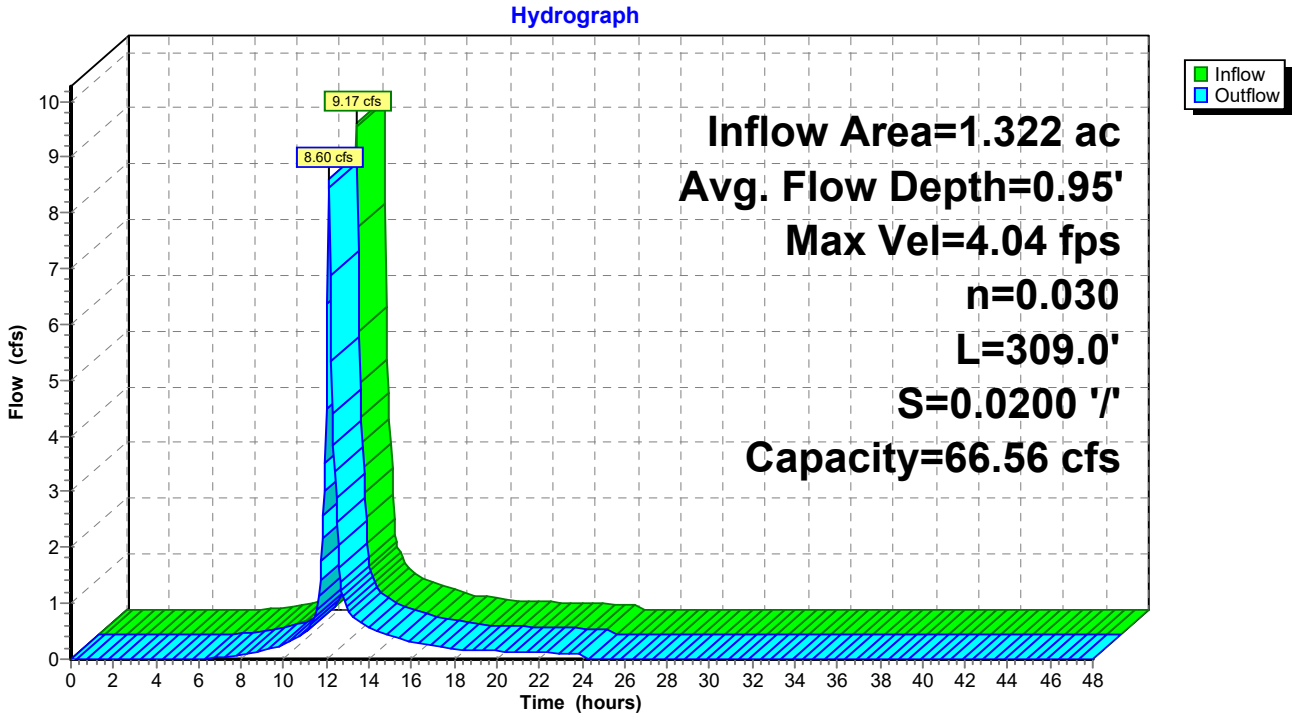
Inflow Area = 1.322 ac, 0.11% Impervious, Inflow Depth = 6.13" for 100-yr 24-hr event
Inflow = 9.17 cfs @ 12.09 hrs, Volume= 0.676 af
Outflow = 8.60 cfs @ 12.13 hrs, Volume= 0.676 af, Atten= 6%, Lag= 2.3 min
Routed to Reach PRA : Perimeter Swale

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 4.04 fps, Min. Travel Time= 1.3 min
Avg. Velocity = 1.54 fps, Avg. Travel Time= 3.4 min

Peak Storage= 691 cf @ 12.11 hrs
Average Depth at Peak Storage= 0.95' , Surface Width= 4.73'
Bank-Full Depth= 2.00' Flow Area= 10.0 sf, Capacity= 66.56 cfs

0.00' x 2.00' deep channel, n= 0.030 Earth, grassed & winding
Side Slope Z-value= 2.0 3.0 '/' Top Width= 10.00'
Length= 309.0' Slope= 0.0200 '/'
Inlet Invert= 890.18', Outlet Invert= 884.00'





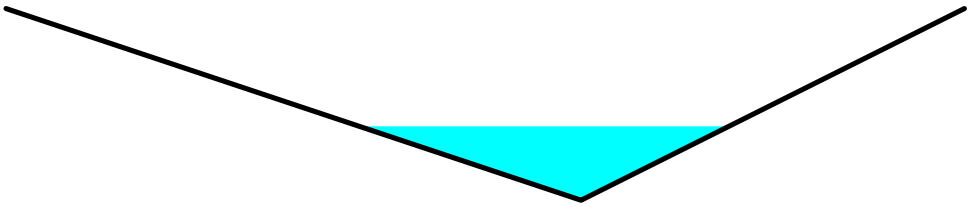
Summary for Reach R6: Sideslope Swale

Inflow Area = 0.943 ac, 0.00% Impervious, Inflow Depth = 5.65" for 100-yr 24-hr event
Inflow = 5.46 cfs @ 12.13 hrs, Volume= 0.444 af
Outflow = 5.20 cfs @ 12.21 hrs, Volume= 0.444 af, Atten= 5%, Lag= 5.0 min
Routed to Pond P-N1 : North Basin 1

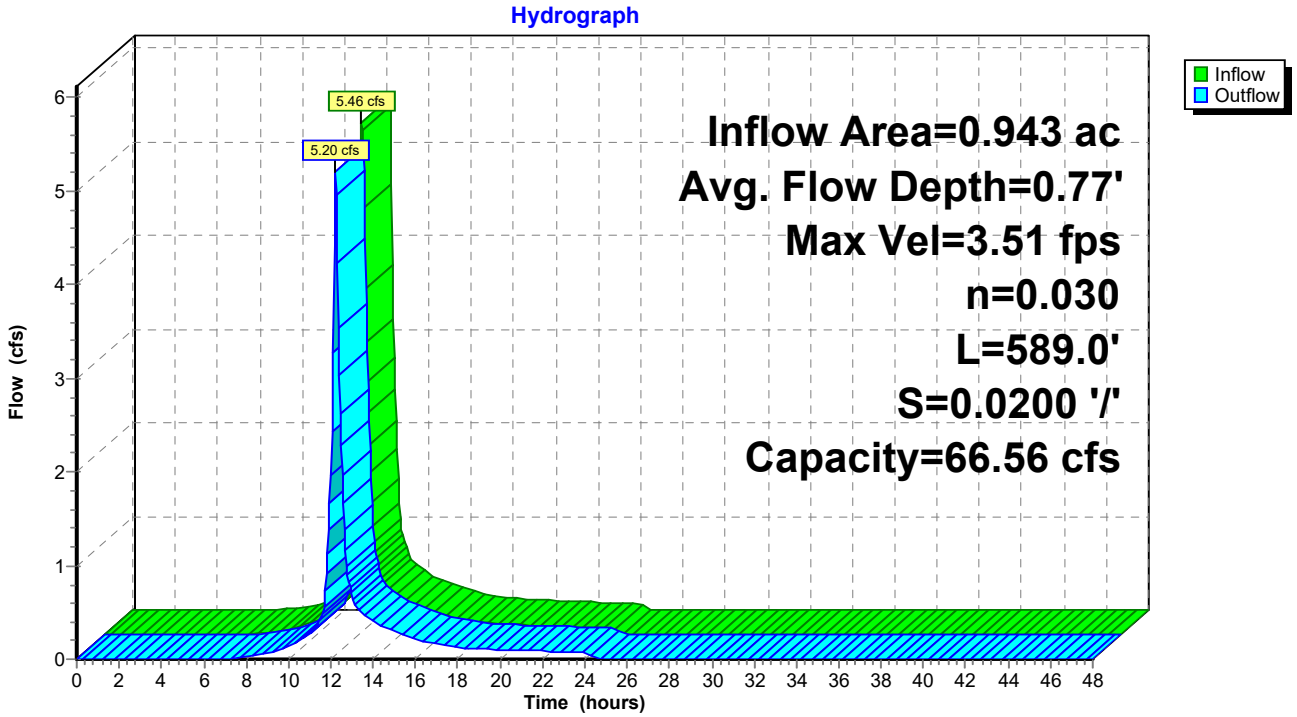
Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.51 fps, Min. Travel Time= 2.8 min
Avg. Velocity = 1.35 fps, Avg. Travel Time= 7.3 min

Peak Storage= 873 cf @ 12.17 hrs
Average Depth at Peak Storage= 0.77' , Surface Width= 3.85'
Bank-Full Depth= 2.00' Flow Area= 10.0 sf, Capacity= 66.56 cfs

0.00' x 2.00' deep channel, n= 0.030 Earth, grassed & winding
Side Slope Z-value= 3.0 2.0 '/' Top Width= 10.00'
Length= 589.0' Slope= 0.0200 '/'
Inlet Invert= 888.00', Outlet Invert= 876.22'



Reach R6: Sideslope Swale



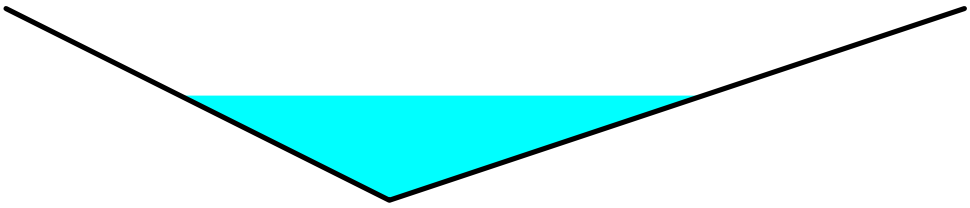
Summary for Reach R7: Sideslope Swale

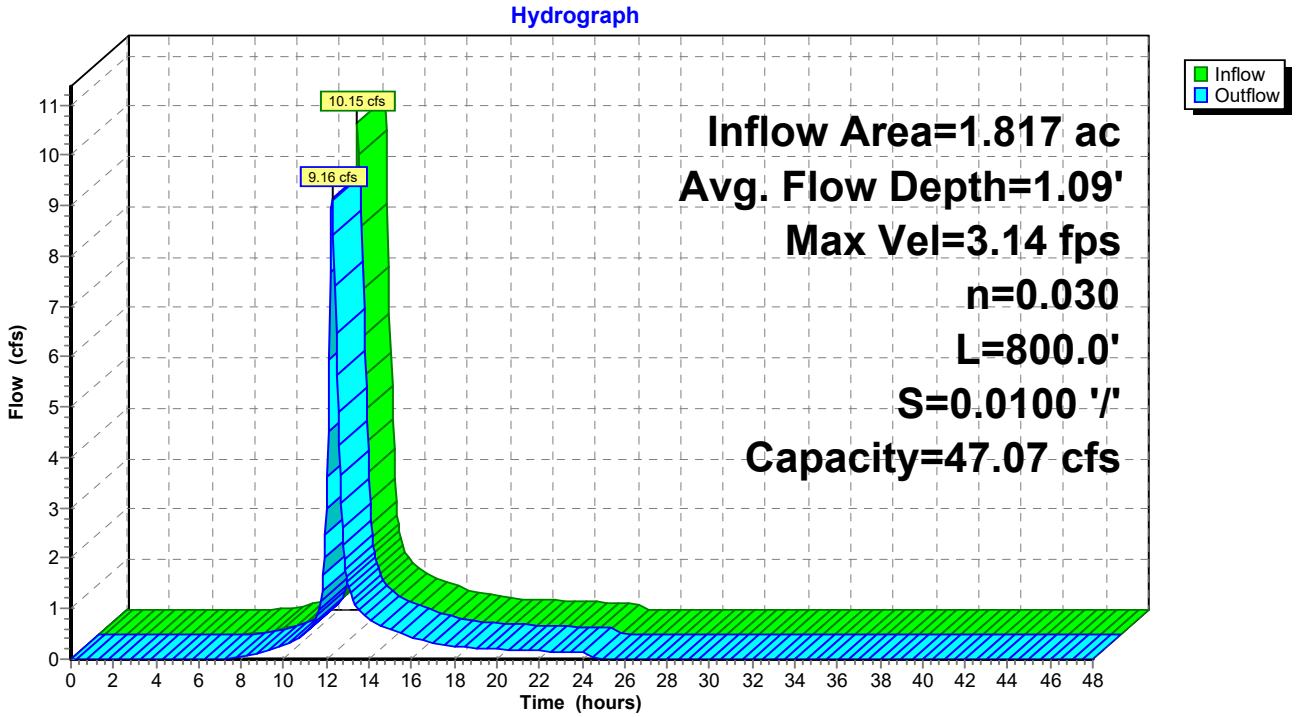
Inflow Area = 1.817 ac, 0.00% Impervious, Inflow Depth = 5.77" for 100-yr 24-hr event
Inflow = 10.15 cfs @ 12.16 hrs, Volume= 0.874 af
Outflow = 9.16 cfs @ 12.29 hrs, Volume= 0.874 af, Atten= 10%, Lag= 7.6 min
Routed to Pond P-N1 : North Basin 1

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.14 fps, Min. Travel Time= 4.2 min
Avg. Velocity = 1.13 fps, Avg. Travel Time= 11.8 min

Peak Storage= 2,380 cf @ 12.21 hrs
Average Depth at Peak Storage= 1.09' , Surface Width= 5.45'
Bank-Full Depth= 2.00' Flow Area= 10.0 sf, Capacity= 47.07 cfs

0.00' x 2.00' deep channel, n= 0.030 Earth, grassed & winding
Side Slope Z-value= 2.0 3.0 '/' Top Width= 10.00'
Length= 800.0' Slope= 0.0100 '/'
Inlet Invert= 872.00', Outlet Invert= 864.00'





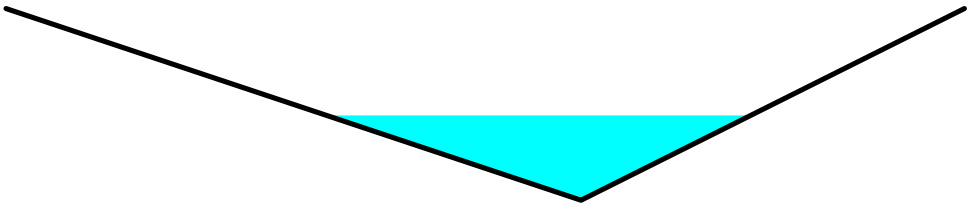
Summary for Reach R8: Sideslope Swale

Inflow Area = 1.354 ac, 0.00% Impervious, Inflow Depth = 5.65" for 100-yr 24-hr event
Inflow = 7.66 cfs @ 12.14 hrs, Volume= 0.637 af
Outflow = 7.36 cfs @ 12.19 hrs, Volume= 0.637 af, Atten= 4%, Lag= 3.0 min
Routed to Reach DC-N : RipRap Downchute

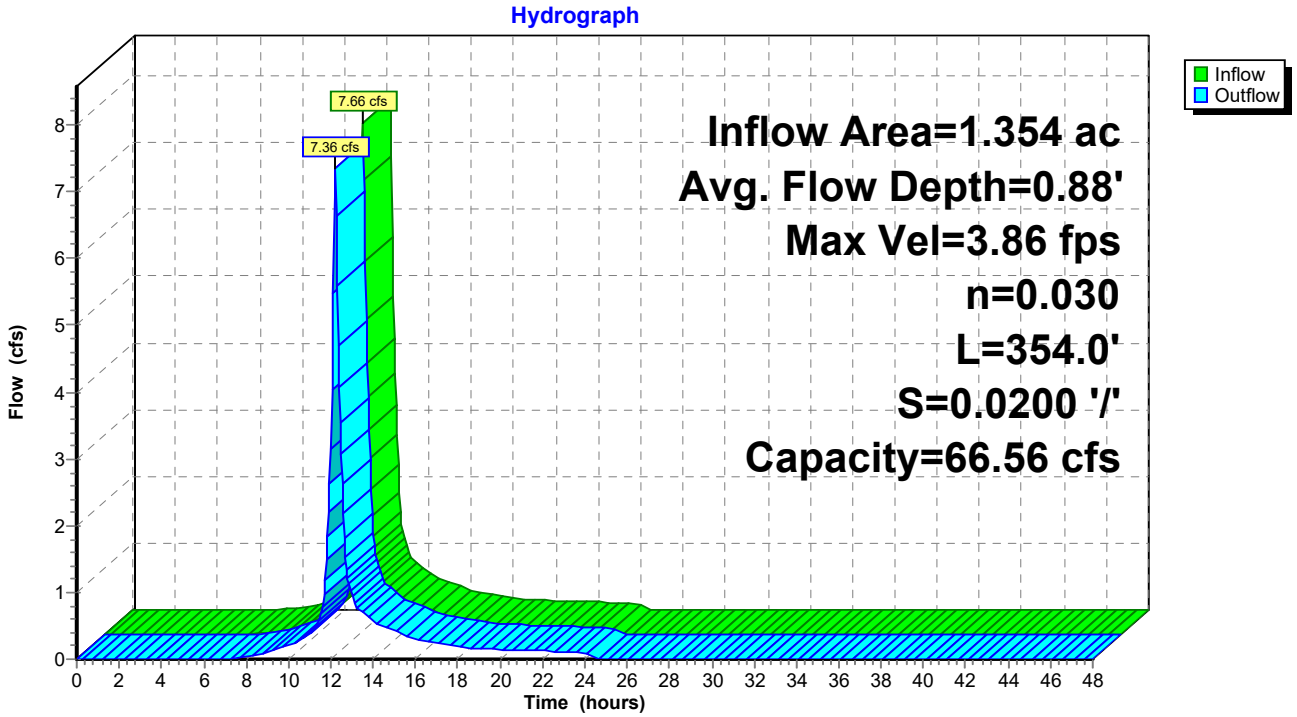
Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.86 fps, Min. Travel Time= 1.5 min
Avg. Velocity = 1.53 fps, Avg. Travel Time= 3.9 min

Peak Storage= 693 cf @ 12.16 hrs
Average Depth at Peak Storage= 0.88' , Surface Width= 4.42'
Bank-Full Depth= 2.00' Flow Area= 10.0 sf, Capacity= 66.56 cfs

0.00' x 2.00' deep channel, n= 0.030 Earth, grassed & winding
Side Slope Z-value= 3.0 2.0 '/' Top Width= 10.00'
Length= 354.0' Slope= 0.0200 '/'
Inlet Invert= 917.08', Outlet Invert= 910.00'



Reach R8: Sideslope Swale



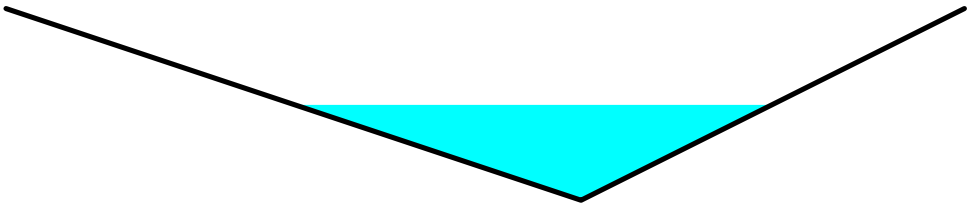
Summary for Reach R9: Sideslope Swale

Inflow Area = 1.834 ac, 0.00% Impervious, Inflow Depth = 5.65" for 100-yr 24-hr event
Inflow = 10.53 cfs @ 12.14 hrs, Volume= 0.863 af
Outflow = 10.06 cfs @ 12.20 hrs, Volume= 0.863 af, Atten= 4%, Lag= 3.8 min
Routed to Reach DC-N : RipRap Downchute

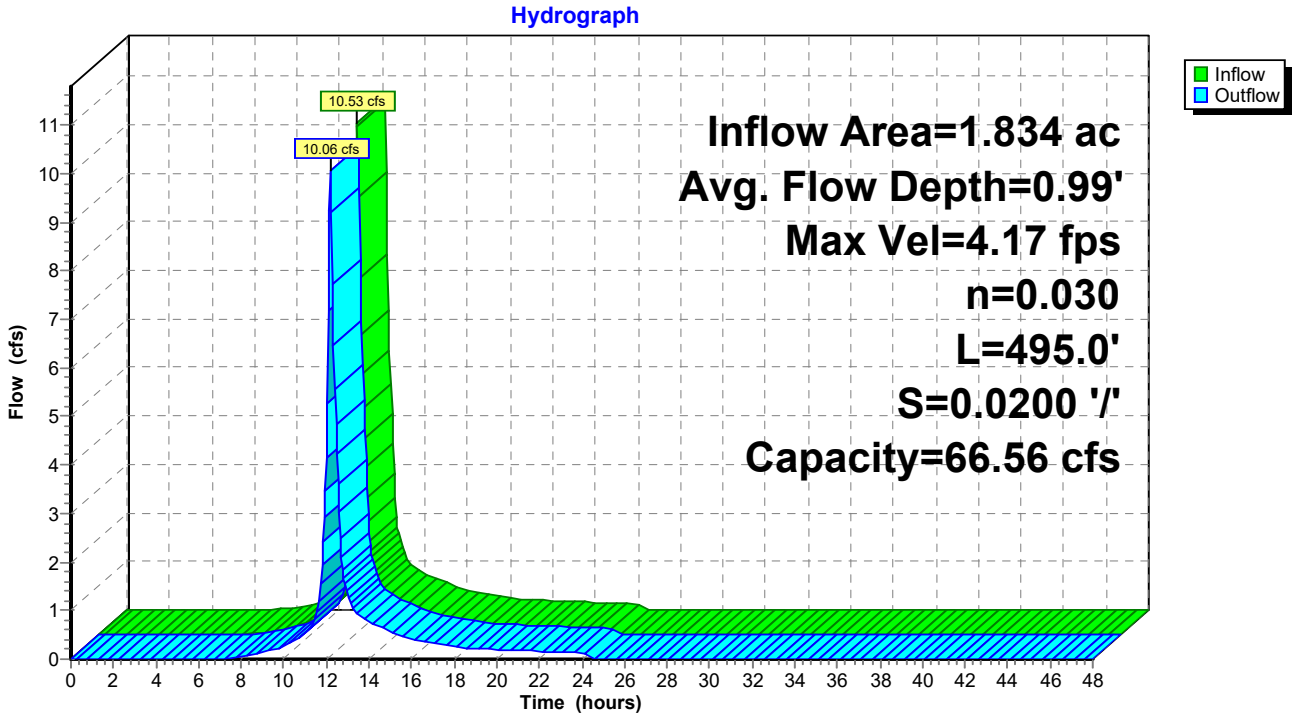
Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 4.17 fps, Min. Travel Time= 2.0 min
Avg. Velocity = 1.61 fps, Avg. Travel Time= 5.1 min

Peak Storage= 1,221 cf @ 12.16 hrs
Average Depth at Peak Storage= 0.99' , Surface Width= 4.97'
Bank-Full Depth= 2.00' Flow Area= 10.0 sf, Capacity= 66.56 cfs

0.00' x 2.00' deep channel, n= 0.030 Earth, grassed & winding
Side Slope Z-value= 3.0 2.0 '/' Top Width= 10.00'
Length= 495.0' Slope= 0.0200 '/'
Inlet Invert= 895.90', Outlet Invert= 886.00'



Reach R9: Sideslope Swale



Summary for Pond C-1: 30" Culvert

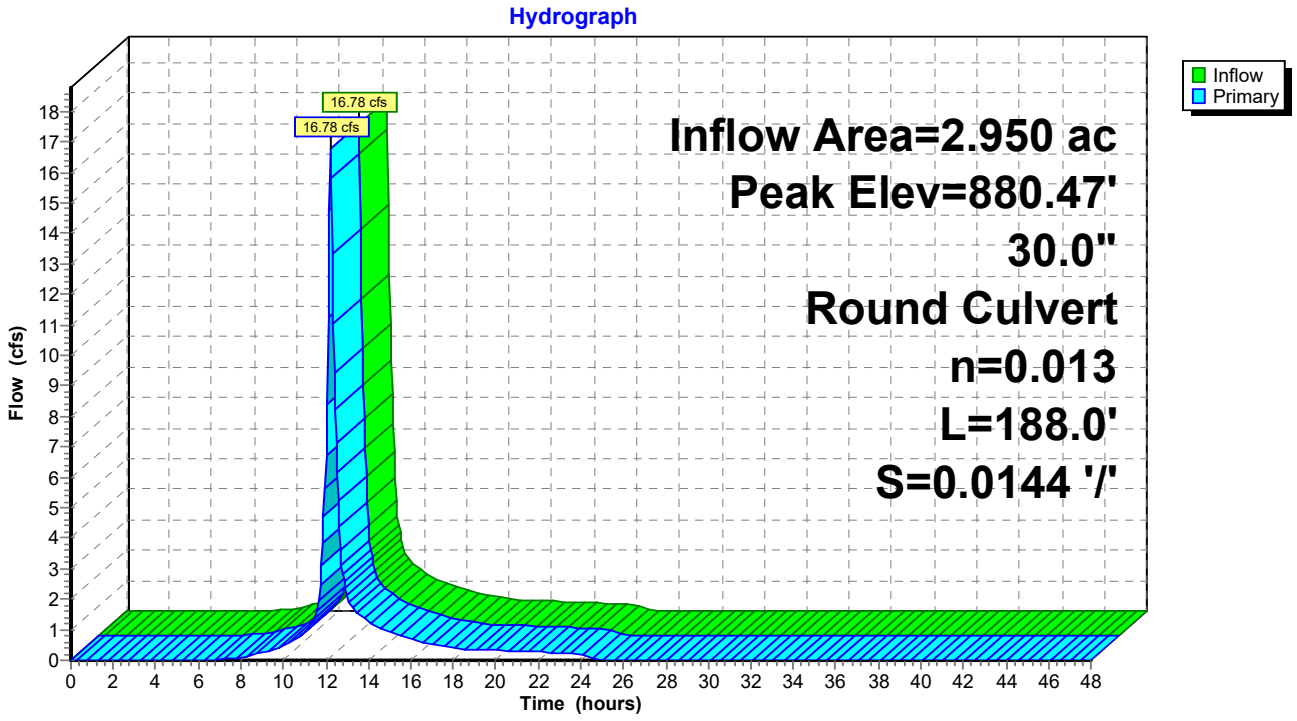
Inflow Area = 2.950 ac, 0.05% Impervious, Inflow Depth = 5.87" for 100-yr 24-hr event
Inflow = 16.78 cfs @ 12.21 hrs, Volume= 1.442 af
Outflow = 16.78 cfs @ 12.21 hrs, Volume= 1.442 af, Atten= 0%, Lag= 0.0 min
Primary = 16.78 cfs @ 12.21 hrs, Volume= 1.442 af
Routed to Pond PND-S : South Basin

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 880.47' @ 12.21 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	878.70'	**30.0" Round Culvert** L= 188.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 878.70' / 876.00' S= 0.0144 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 4.91 sf

Primary OutFlow Max=16.57 cfs @ 12.21 hrs HW=880.45' (Free Discharge)
1=Culvert (Inlet Controls 16.57 cfs @ 4.51 fps)

Pond C-1: 30" Culvert



Summary for Pond C-2: 30" Culvert

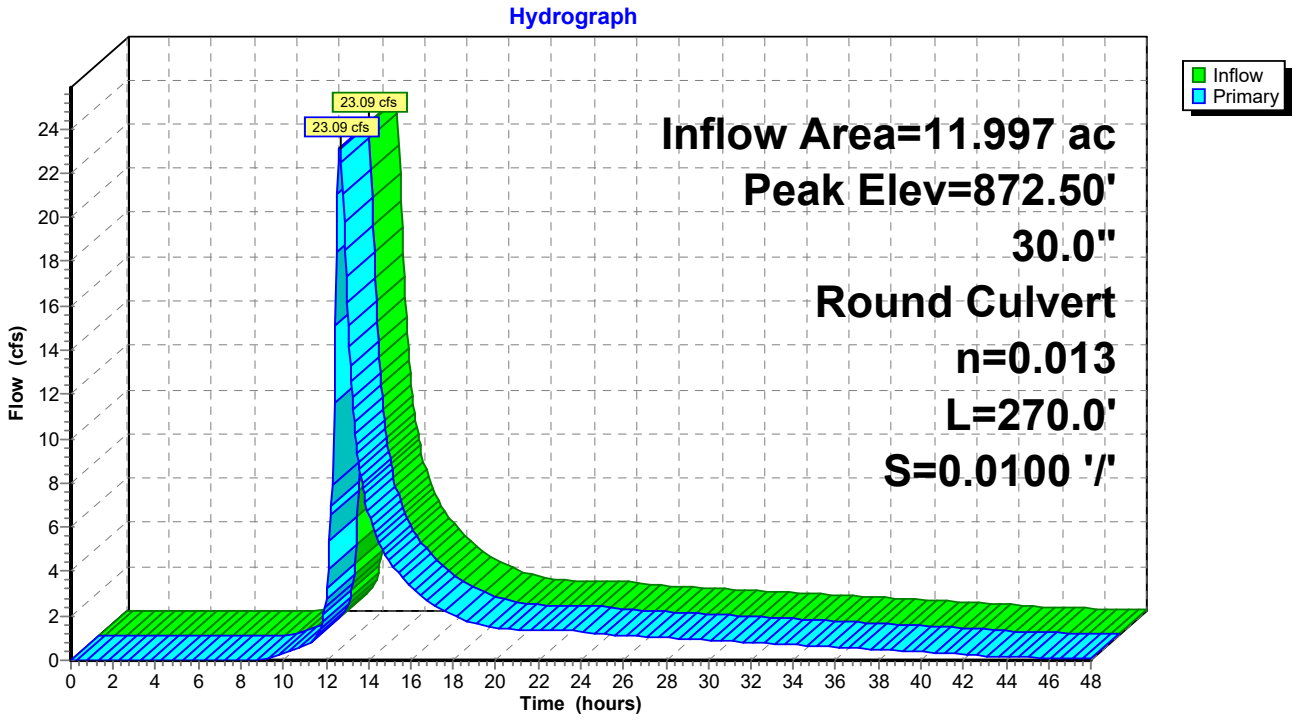
Inflow Area = 11.997 ac, 0.00% Impervious, Inflow Depth > 5.25" for 100-yr 24-hr event
Inflow = 23.09 cfs @ 12.66 hrs, Volume= 5.254 af
Outflow = 23.09 cfs @ 12.66 hrs, Volume= 5.254 af, Atten= 0%, Lag= 0.0 min
Primary = 23.09 cfs @ 12.66 hrs, Volume= 5.254 af
Routed to Pond P-N1 : North Basin 1

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 872.50' @ 12.66 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	870.30'	**30.0" Round Culvert** L= 270.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 870.30' / 867.60' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 4.91 sf

Primary OutFlow Max=23.03 cfs @ 12.66 hrs HW=872.49' (Free Discharge)
1=Culvert (Inlet Controls 23.03 cfs @ 5.04 fps)

Pond C-2: 30" Culvert



Summary for Pond C-3: 24" Culvert

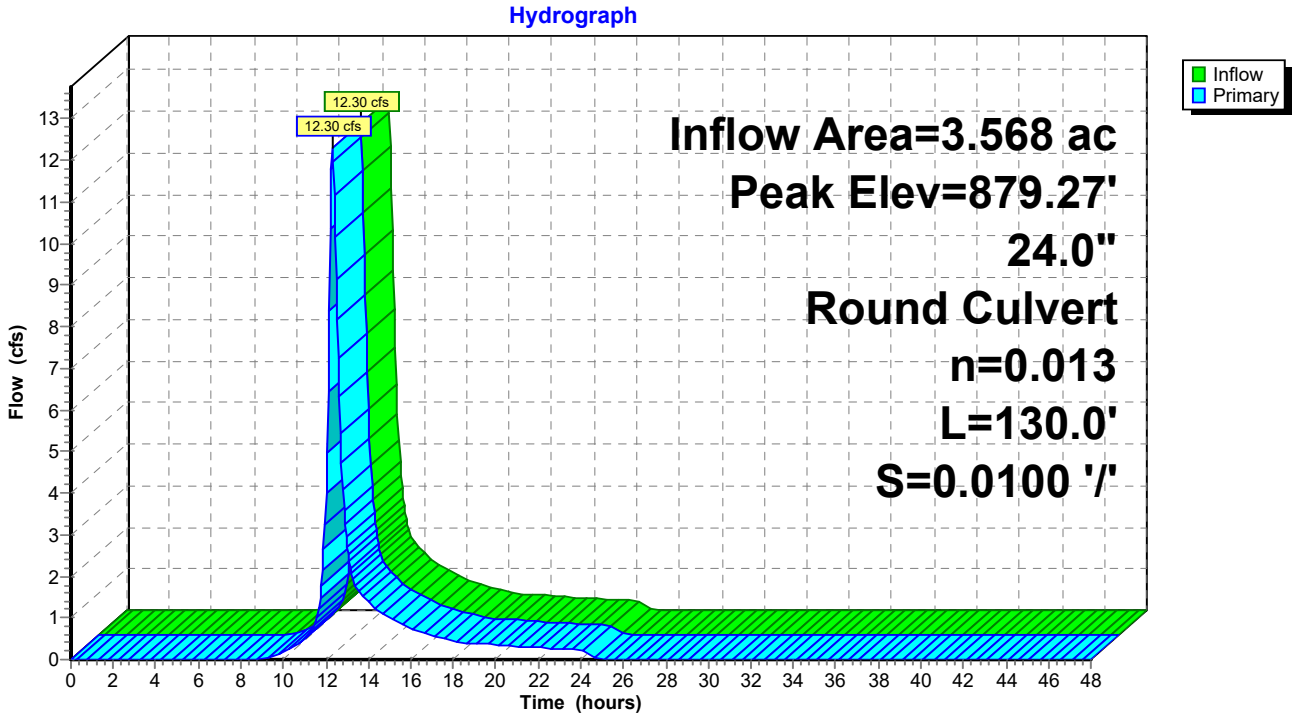
Inflow Area = 3.568 ac, 0.00% Impervious, Inflow Depth = 4.43" for 100-yr 24-hr event
Inflow = 12.30 cfs @ 12.31 hrs, Volume= 1.317 af
Outflow = 12.30 cfs @ 12.31 hrs, Volume= 1.317 af, Atten= 0%, Lag= 0.0 min
Primary = 12.30 cfs @ 12.31 hrs, Volume= 1.317 af
Routed to Pond P-N2 : North Basin 2

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 879.27' @ 12.31 hrs
Flood Elev= 880.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	877.60'	**24.0" Round Culvert** L= 130.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 877.60' / 876.30' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf

Primary OutFlow Max=12.26 cfs @ 12.31 hrs HW=879.26' (Free Discharge)
1=Culvert (Inlet Controls 12.26 cfs @ 4.39 fps)

Pond C-3: 24" Culvert



Summary for Pond P-N1: North Basin 1

Inflow Area = 15.447 ac, 0.00% Impervious, Inflow Depth > 5.26" for 100-yr 24-hr event
Inflow = 29.33 cfs @ 12.60 hrs, Volume= 6.777 af
Outflow = 29.03 cfs @ 12.64 hrs, Volume= 6.772 af, Atten= 1%, Lag= 2.5 min
Primary = 29.03 cfs @ 12.64 hrs, Volume= 6.772 af
Routed to Link N : POI-N
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Link N : POI-N

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Starting Elev= 859.00' Surf.Area= 3,382 sf Storage= 3,127 cf
Peak Elev= 862.84' @ 12.64 hrs Surf.Area= 5,537 sf Storage= 20,113 cf (16,985 cf above start)
Flood Elev= 863.00' Surf.Area= 5,635 sf Storage= 21,001 cf (17,873 cf above start)

Plug-Flow detention time= 52.5 min calculated for 6.700 af (99% of inflow)
Center-of-Mass det. time= 28.8 min (1,091.5 - 1,062.7)

Volume	Invert	Avail.Storage	Storage Description
#1	858.00'	26,943 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

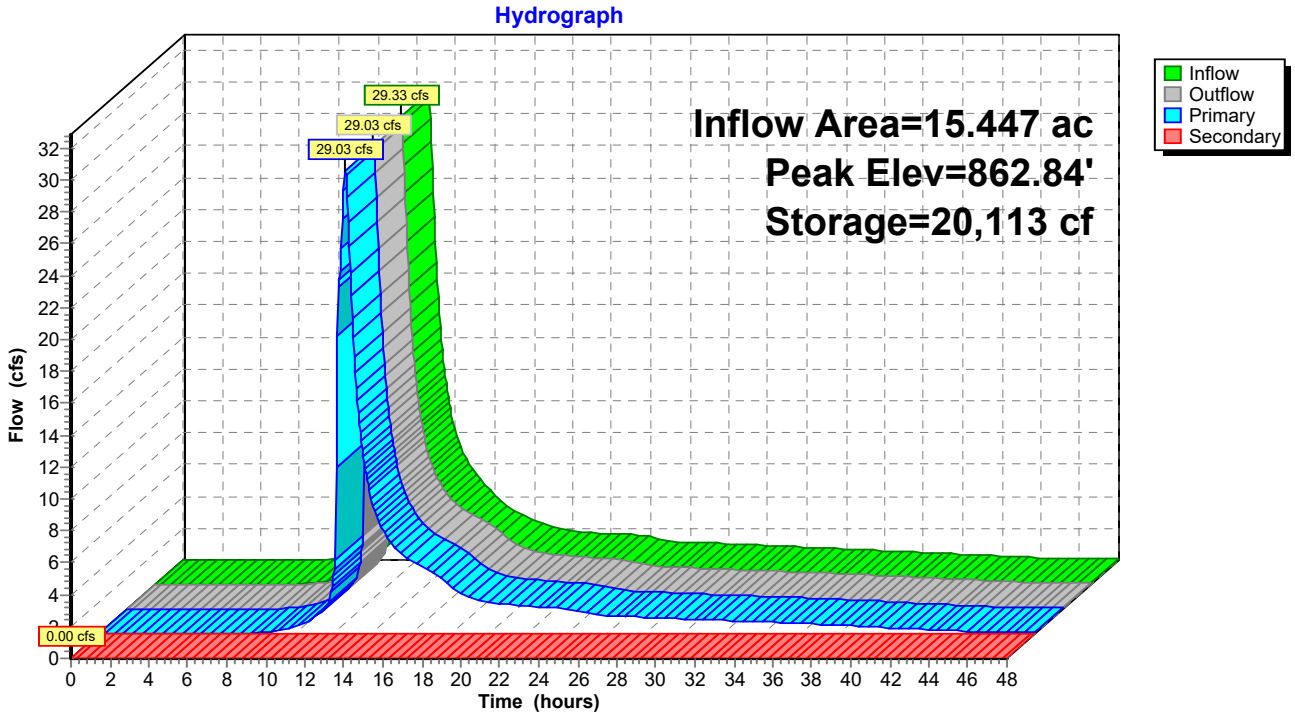
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
858.00	2,873	0	0
860.00	3,890	6,763	6,763
862.00	5,020	8,910	15,673
864.00	6,250	11,270	26,943

Device	Routing	Invert	Outlet Devices
#1	Primary	858.00'	**24.0" Round Culvert** L= 100.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 858.00' / 857.00' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf
#2	Device 1	859.00'	**2.0" Vert. Perforations X 10.00 columns** X 3 rows with 8.0" cc spacing C= 0.600 Limited to weir flow at low heads
#3	Device 1	862.00'	**36.0" Horiz. Top of Standpipe** C= 0.600 Limited to weir flow at low heads
#4	Secondary	863.00'	**10.0' long x 8.0' breadth Spillway** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.43 2.54 2.70 2.69 2.68 2.68 2.66 2.64 2.64 2.64 2.65 2.65 2.66 2.66 2.68 2.70 2.74

Primary OutFlow Max=29.22 cfs @ 12.64 hrs HW=862.84' (Free Discharge)
└**1=Culvert** (Passes 29.22 cfs of 29.64 cfs potential flow)
└**2=Perforations** (Orifice Controls 5.52 cfs @ 8.43 fps)
└**3=Top of Standpipe** (Weir Controls 23.70 cfs @ 3.00 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=859.00' (Free Discharge)
└**4=Spillway** (Controls 0.00 cfs)

Pond P-N1: North Basin 1



Summary for Pond P-N2: North Basin 2

Inflow Area = 10.643 ac, 0.00% Impervious, Inflow Depth = 5.39" for 100-yr 24-hr event
Inflow = 46.60 cfs @ 12.23 hrs, Volume= 4.777 af
Outflow = 21.60 cfs @ 12.60 hrs, Volume= 4.728 af, Atten= 54%, Lag= 21.7 min
Primary = 20.03 cfs @ 12.60 hrs, Volume= 4.681 af
Routed to Reach PRB : Perimeter Swale
Secondary = 1.57 cfs @ 12.60 hrs, Volume= 0.047 af
Routed to Reach PRB : Perimeter Swale

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Starting Elev= 876.00' Surf.Area= 35,250 sf Storage= 33,125 cf
Peak Elev= 878.21' @ 12.60 hrs Surf.Area= 41,634 sf Storage= 118,108 cf (84,983 cf above start)
Flood Elev= 879.00' Surf.Area= 44,000 sf Storage= 151,875 cf (118,750 cf above start)

Plug-Flow detention time= 478.6 min calculated for 3.968 af (83% of inflow)
Center-of-Mass det. time= 328.4 min (1,155.2 - 826.7)

Volume	Invert	Avail.Storage	Storage Description
#1	875.00'	151,875 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

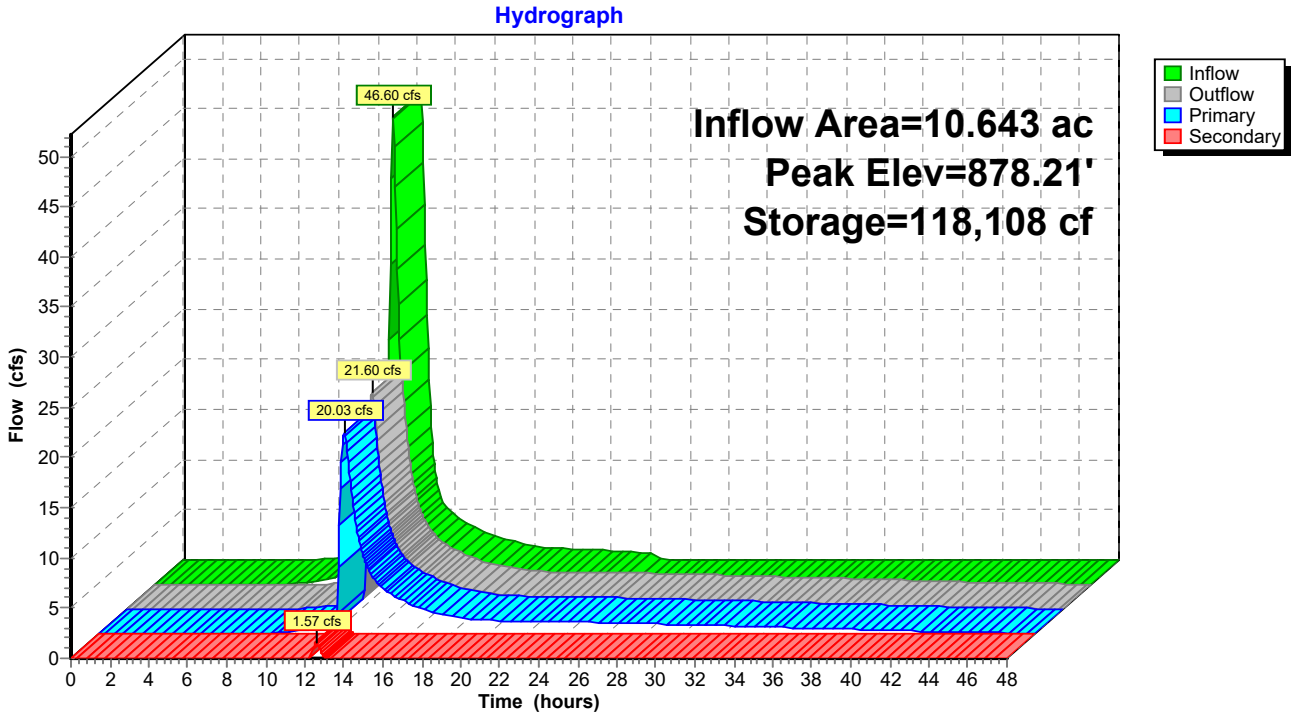
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
875.00	31,000	0	0
876.00	35,250	33,125	33,125
878.00	41,000	76,250	109,375
879.00	44,000	42,500	151,875

Device	Routing	Invert	Outlet Devices
#1	Primary	875.00'	**24.0" Round Culvert** L= 100.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 875.00' / 874.00' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf
#2	Device 1	876.00'	**2.0" Vert. Perforations X 10.00** C= 0.600 Limited to weir flow at low heads
#3	Device 1	877.50'	**36.0" Horiz. Top of Standpipe** C= 0.600 Limited to weir flow at low heads
#4	Secondary	878.00'	**6.0' long x 20.0' breadth Spillway** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=20.00 cfs @ 12.60 hrs HW=878.21' (Free Discharge)
└**1=Culvert** (Passes 20.00 cfs of 22.49 cfs potential flow)
├**2=Perforations** (Orifice Controls 1.53 cfs @ 7.02 fps)
└**3=Top of Standpipe** (Weir Controls 18.47 cfs @ 2.76 fps)

Secondary OutFlow Max=1.56 cfs @ 12.60 hrs HW=878.21' (Free Discharge)
└**4=Spillway** (Weir Controls 1.56 cfs @ 1.23 fps)

Pond P-N2: North Basin 2



Summary for Pond PND-S: South Basin

Inflow Area = 8.392 ac, 0.02% Impervious, Inflow Depth = 5.93" for 100-yr 24-hr event
Inflow = 41.80 cfs @ 12.24 hrs, Volume= 4.144 af
Outflow = 31.27 cfs @ 12.38 hrs, Volume= 4.143 af, Atten= 25%, Lag= 8.3 min
Primary = 31.27 cfs @ 12.38 hrs, Volume= 4.143 af
Routed to Link S : POI-S
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Link S : POI-S

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Starting Elev= 859.00' Surf.Area= 11,031 sf Storage= 10,489 cf
Peak Elev= 862.92' @ 12.38 hrs Surf.Area= 15,493 sf Storage= 62,370 cf (51,881 cf above start)
Flood Elev= 863.00' Surf.Area= 15,584 sf Storage= 63,560 cf (53,071 cf above start)

Plug-Flow detention time= 163.3 min calculated for 3.898 af (94% of inflow)
Center-of-Mass det. time= 113.8 min (932.0 - 818.2)

Volume	Invert	Avail.Storage	Storage Description
#1	858.00'	79,739 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

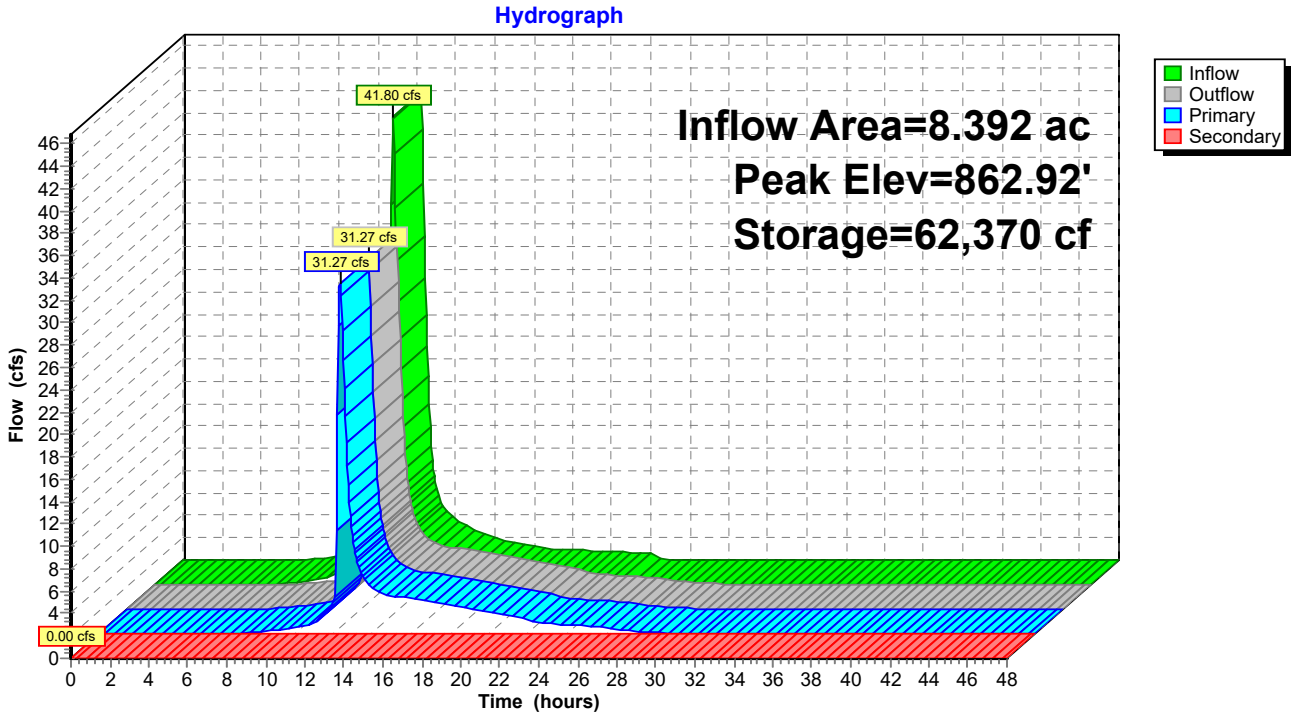
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
858.00	9,947	0	0
860.00	12,115	22,062	22,062
862.00	14,394	26,509	48,571
864.00	16,774	31,168	79,739

Device	Routing	Invert	Outlet Devices
#1	Primary	858.50'	**30.0" Round Culvert** L= 50.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 858.50' / 858.00' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 4.91 sf
#2	Device 1	859.00'	**2.0" Vert. Perforations X 10.00 columns** X 2 rows with 8.0" cc spacing C= 0.600 Limited to weir flow at low heads
#3	Device 1	862.00'	**36.0" Horiz. Top of Standpipe** C= 0.600 Limited to weir flow at low heads
#4	Secondary	863.00'	**10.0' long x 8.0' breadth Spillway** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.43 2.54 2.70 2.69 2.68 2.68 2.66 2.64 2.64 2.64 2.65 2.65 2.66 2.66 2.68 2.70 2.74

Primary OutFlow Max=31.06 cfs @ 12.38 hrs HW=862.92' (Free Discharge)
└**1=Culvert** (Passes 31.06 cfs of 37.12 cfs potential flow)
└**2=Perforations** (Orifice Controls 3.93 cfs @ 9.00 fps)
└**3=Top of Standpipe** (Weir Controls 27.13 cfs @ 3.13 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=859.00' (Free Discharge)
└**4=Spillway** (Controls 0.00 cfs)

Pond PND-S: South Basin

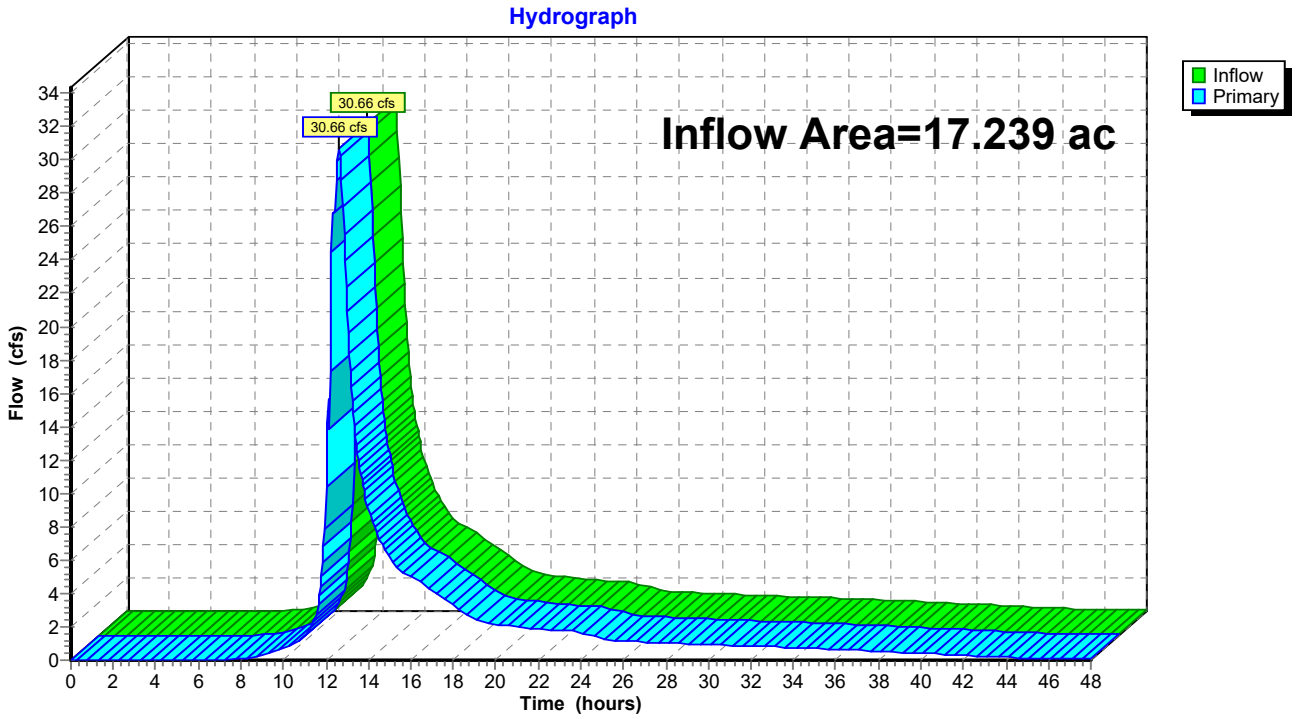


Summary for Link N: POI-N

Inflow Area = 17.239 ac, 0.00% Impervious, Inflow Depth > 5.30" for 100-yr 24-hr event
Inflow = 30.66 cfs @ 12.63 hrs, Volume= 7.617 af
Primary = 30.66 cfs @ 12.63 hrs, Volume= 7.617 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Link N: POI-N

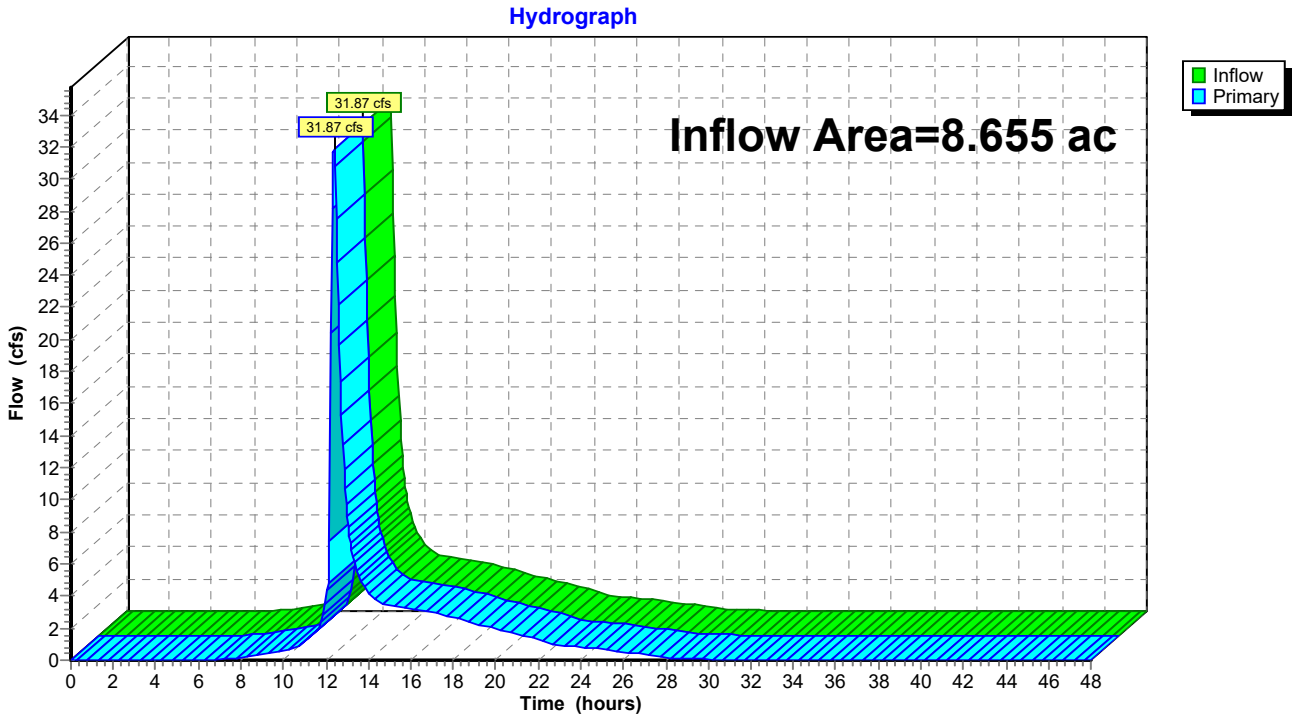


Summary for Link S: POI-S

Inflow Area = 8.655 ac, 0.02% Impervious, Inflow Depth = 5.92" for 100-yr 24-hr event
Inflow = 31.87 cfs @ 12.38 hrs, Volume= 4.267 af
Primary = 31.87 cfs @ 12.38 hrs, Volume= 4.267 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Link S: POI-S



APPENDIX B

REVISED PLANS

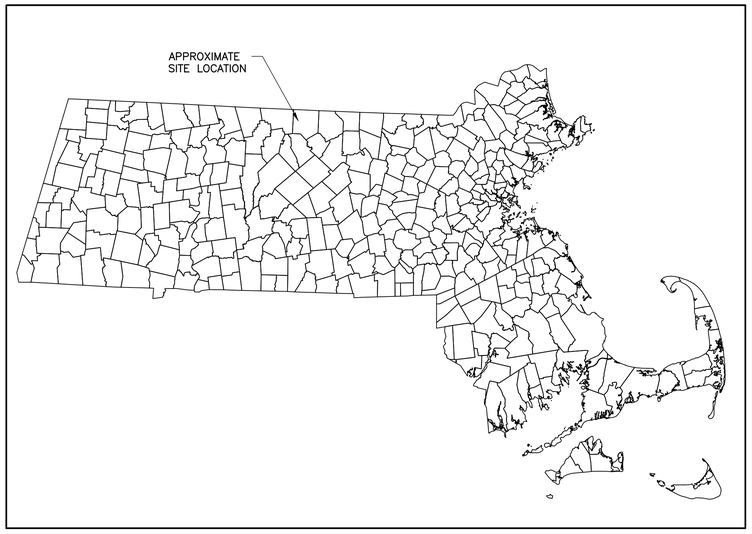
BWP SW 11
PERMIT MODIFICATION PLANS

FORMER MABARDY LANDFILL

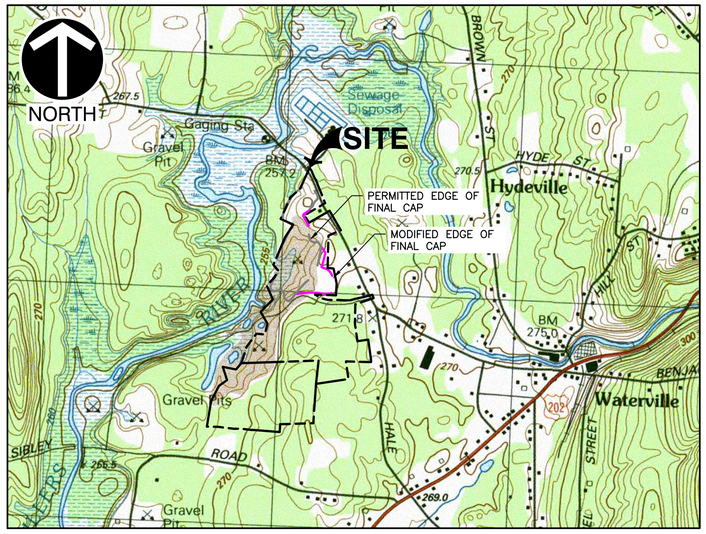
WINCHENDON, MASSACHUSETTS

PREPARED FOR:

W.L. FRENCH EXCAVATING CORPORATION



LOCATION OF SITE IN MASSACHUSETTS



SITE LOCATION MAP
SCALE: 1"= 1,000'

REFERENCE: USGS TOPOGRAPHIC MAP QUADRANGLES OBTAINED FROM MASSACHUSETTS BUREAU OF INFORMATION TECHNOLOGY (MASSGIS). WINCHENDON QUAD LAST REVISED 1988. CONTOUR ELEVATIONS ARE IN METERS.

DRAWING INDEX:

Sheets C800 and C801 are omitted from the Conservation Commission Submittal

MARCH 2023

REVISION RECORD

NO	DATE	DESCRIPTION

Civil & Environmental Consultants, Inc.
31 Bellows Road · Raynham, MA 02767
Ph: 774.501.2176 · 866.312.2024 · Fax: 774.501.2669
www.cecinc.com

PERMIT MODIFICATION PLANS
FORMER MABARDY LANDFILL
W.L. FRENCH EXCAVATING CORPORATION
RIVER ROAD
WINCHENDON, MA

COVER SHEET

DATE:	MARCH 2023
DWG SCALE:	AS SHOWN
PROJECT NO:	306-000
DRAWN BY:	KFH
CHECKED BY:	AJK
APPROVED BY:	AJK*

*HAND SIGNATURE ON FILE

COMMONWEALTH OF MASSACHUSETTS
AMY J. KNIGHT
CIVIL
No. 50157
REGISTERED PROFESSIONAL ENGINEER

DRAWING NO.:
C000
SHEET 1 OF 6

NORTH

REFERENCE

1. EXISTING TOPOGRAPHIC CONTOURS SHOWN ON THIS PLAN WERE PRODUCED BY A DRONE FLIGHT COMPLETED ON DECEMBER 28, 2022, AND PROVIDED ELECTRONICALLY TO CEC, AND ARE SUPPLEMENTED WITH A SURVEY PERFORMED BY EXISTING GRADE, INC. OF DOUGLAS, MASSACHUSETTS DATED JANUARY 2019.
2. EXISTING TOPOGRAPHIC FEATURES ARE BASED ON AN AERIAL IMAGE DATED JULY 5, 2021, WHICH WAS PROVIDED ELECTRONICALLY TO CEC. CEC HAS NOT VERIFIED THE ACCURACY OF THE TOPOGRAPHIC INFORMATION SHOWN ON THE PLAN.
3. SITE PROPERTY BOUNDARY WAS PROVIDED BY W.L. FRENCH. CEC HAS NOT VERIFIED THE ACCURACY OF THE INFORMATION.
4. ADJACENT PROPERTY BOUNDARIES AND INFORMATION WERE OBTAINED FROM THE MASSACHUSETTS OFFICE OF INFORMATION TECHNOLOGY, OFFICE OF GEOGRAPHIC INFORMATION (MASSGIS) ONLINE RESOURCES. LAST UPDATED OCTOBER 2022 FOR WINCHENDON MA. PROPERTY BOUNDARIES SHOULD BE CONSIDERED APPROXIMATE.
5. EXISTING WETLAND DELINEATIONS WERE FLAGGED BY EPSILON ASSOCIATES, INC. ON MAY 11, 2018. CEC HAS NOT VERIFIED THE ACCURACY OF THIS INFORMATION.
6. PERMITTED FINAL CLOSURE CONDITIONS SHOWN ON THIS PLAN WERE OBTAINED FROM THE PLAN SET TITLED "FORMER MABARDY LANDFILL – CORRECTIVE ACTION DESIGN" DATED JUNE 2019, REVISED OCTOBER 2019, PREPARED BY LANGDON ENVIRONMENTAL LLC.

LEGEND

- EXISTING PROPERTY LINE
- EXISTING ADJACENT PROPERTY LINE
- PERMITTED LIMIT OF FINAL CAP
- PROPOSED LIMIT OF FINAL CAP
- 100-FOOT WETLAND BUFFER
- 200-FOOT RIVERFRONT BUFFER
- BORDERING LAND SUBJECT TO FLOODING
- 860 EXISTING INDEX (MAJOR) CONTOUR
- EXISTING INTERMEDIATE (MINOR) CONTOUR
- EXISTING WETLAND
- EXISTING PAVED ROAD
- EXISTING UNPAVED ROAD
- EXISTING TREE LINE
- EXISTING STRUCTURE
- MW-2 EXISTING ENVIRONMENTAL MONITORING WELL
- 800 PERMITTED INDEX (MAJOR) CONTOUR
- PERMITTED INTERMEDIATE (MINOR) CONTOUR
- PERMITTED STORMWATER SWALE
- PERMITTED STORMWATER SUBDRAIN
- GV PERMITTED LANDFILL GAS VENT

NOTES

1. DASHED LIGHT CONTOURS REPRESENT EXISTING GROUND ELEVATIONS. REFER TO REFERENCE NOTES.
2. SOLID LIGHT CONTOURS REPRESENT PERMITTED SUBGRADE ELEVATIONS, AS SHOWN ON THE PLAN TITLED "SUBGRADE PLAN" PREPARED BY LANGDON ENVIRONMENTAL, LLC LAST REVISED OCTOBER 1, 2019.

MILLERS RIVER

PERMITTED MONITORING WELL LOCATION (TYP.)

EXISTING MONITORING WELL (TYP.)

200 FOOT RIVERFRONT BUFFER

100 FOOT WETLAND BUFFER ZONE

PASSIVE GAS VENT (TYP.)

BORDERING LAND SUBJECT TO FLOODING (ELEV. 852.26 NAVD88)

PERMITTED BASIN OUTLET RISER PIPE

PERMITTED BASIN SPILLWAY

PERMITTED STORMWATER BASIN (SOUTH BASIN)

LIMIT OF 12/28/2022 SURVEY (SEE REF. NOTE 1)

EXISTING SCALE

EXISTING SCALE HOUSE

EXISTING GARAGE

PERMITTED FINAL CAP ACCESS ROAD

PERMITTED EDGE OF FINAL CAP

PERMITTED DRAINAGE SWALE ON CAP (TYP.)

EXISTING MONITORING WELL (TO BE RELOCATED AS NECESSARY)

PERMITTED LOCATION OF STORMWATER CHANNEL OUTLET

PERMITTED LOCATION OF CONCRETE V-NOTCH WEIR OUTLET STRUCTURE

18" PERFORATED HDPE FLAT PANEL PIPE (TYP.)

PERMITTED STORMWATER BASIN (NORTH BASIN)

LIMIT OF 12/28/2022 SURVEY (SEE REF. NOTE 1)

EXISTING ACCESS ROAD

SITE PROPERTY BOUNDARY

RIVER STREET

N/F UNITED STATES OF AMERICA 109 FRONT STREET WINCHENDON, MA

N/F 580 RIVER STREET LLC 355 MAIN ST SUITE 25 WOBURN, MA

N/F HOWLETT, MELISSA A. 630 RIVER STREET WINCHENDON, MA

N/F LUNDIN, ROBERT D. III 596 RIVER STREET WINCHENDON, MA

N/F JORDAN, KEVIN J. 608 RIVER STREET WINCHENDON, MA

N/F ALLEN, JENNIFER M. 582 RIVER STREET WINCHENDON, MA

N/F 580 RIVER LAND NG LLC 287 WATER STREET 2ND FLOOR WARREN, RI

N/F COSTA, AUGUSTO M. 605 RIVER STREET WINCHENDON, MA

N/F BOWLER, CAROL 607 RIVER STREET WINCHENDON, MA

*HAND SIGNATURE ON FILE

COMMONWEALTH OF MASSACHUSETTS AMY J. KNIGHT CIVIL No. 50157 REGISTERED PROFESSIONAL ENGINEER 5/31/2023

SCALE IN FEET
0 80 160

NO	DATE	REVISION RECORD DESCRIPTION

Civil & Environmental Consultants, Inc.
31 Bellows Road · Raynham, MA 02767
Ph: 774.501.2176 · 866.312.2024 · Fax: 774.501.2669
www.cecinc.com

PERMIT MODIFICATION PLANS
FORMER MABARDY LANDFILL
W.L. FRENCH EXCAVATING CORPORATION
RIVER ROAD
WINCHENDON, MA

PERMITTED CONDITIONS SITE PLAN

DATE:	MARCH 2023
DWG SCALE:	1" = 80'
PROJECT NO:	306-000
DRAWN BY:	KFH
CHECKED BY:	AJK
APPROVED BY:	AJK*

DRAWING NO.: **C100**

SHEET 2 OF 6

P:\300-999\306-000\-CADD\Dwg\SWPS - SWPS Permit - Test Pitting\306000-SWPS-C100-Permitted Conditions Site Plan.dwg(C100) LS(5/17/2023 - dbukun) - LP: 5/17/2023 10:58 AM

NORTH

N/F
UNITED STATES OF AMERICA
109 FRONT STREET
WINCHENDON, MA

MILLERS RIVER

200-FT RIVERFRONT BUFFER

100-FT BUFFER FROM BVW

PERMITTED MONITORING WELL LOCATION (TYP.)

EXISTING MONITORING WELL (TYP.)

MW-1R
MW-2
MW-3
MW-4

200 FOOT RIVERFRONT BUFFER

100 FOOT WETLAND BUFFER ZONE

BORDERING LAND SUBJECT TO FLOODING (ELEV. 852.26 NAVD88)

PERMITTED EDGE OF FINAL CAP

LIMITS OF MODIFIED SOUTH STORMWATER BASIN (REFER TO SHEET C301)

EXISTING SCALE

EXISTING SCALE HOUSE

EXISTING GARAGE

MODIFIED LIMIT OF FINAL CAP

N/F
580 RIVER STREET, LLC
355 MAIN ST SUITE 25
WOBURN, MA

SITE ENTRANCE

MONITORING WELL MW-1R RELOCATED AS NECESSARY

SITE PROPERTY BOUNDARY

MODIFIED LIMIT OF FINAL CAP (SEE NOTE 1)

LIMITS OF PROPOSED STORMWATER BASIN 'N2' (REFER TO SHEET C301)

SHADED AREA REPRESENTS APPROXIMATE LIMITS OF CONTOUR FILL PLACEMENT (SEE NOTE 2)

LIMITS OF PROPOSED STORMWATER BASIN 'N1' (REFER TO SHEET C301)

EXISTING ACCESS ROAD

RIVER STREET

N/F
LUNDIN, ROBERT D. III
596 RIVER STREET
WINCHENDON, MA

N/F
JORDAN, KEVIN J.
608 RIVER STREET
WINCHENDON, MA

N/F
ALLEN, JENNIFER M.
582 RIVER STREET
WINCHENDON, MA

N/F
HOWLETT, MELISSA A.
630 RIVER STREET
WINCHENDON, MA

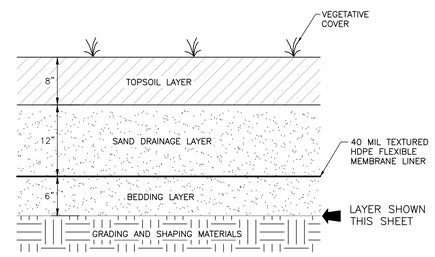
N/F
BOWLER, CAROL
607 RIVER STREET
WINCHENDON, MA

N/F
COSTA, AUGUSTO M.
605 RIVER STREET
WINCHENDON, MA

N/F
580 RIVER LAND NG LLC
267 WATER STREET 2ND FLOOR
WARREN, RI

REFERENCE

1. EXISTING TOPOGRAPHIC CONTOURS SHOWN ON THIS PLAN WERE PRODUCED BY A DRONE FLIGHT COMPLETED ON DECEMBER 28, 2022, AND PROVIDED ELECTRONICALLY TO CEC, AND ARE SUPPLEMENTED WITH A SURVEY PERFORMED BY EXISTING GRADE, INC. OF DOUGLAS, MASSACHUSETTS DATED JANUARY 2019.
2. EXISTING TOPOGRAPHIC FEATURES ARE BASED ON AN AERIAL IMAGE DATED JULY 5, 2021, WHICH WAS PROVIDED ELECTRONICALLY TO CEC. CEC HAS NOT VERIFIED THE ACCURACY OF THE TOPOGRAPHIC INFORMATION SHOWN ON THE PLAN.
3. SITE PROPERTY BOUNDARY WAS PROVIDED BY W.L. FRENCH. CEC HAS NOT VERIFIED THE ACCURACY OF THE INFORMATION.
4. ADJACENT PROPERTY BOUNDARIES AND INFORMATION WERE OBTAINED FROM THE MASSACHUSETTS OFFICE OF INFORMATION TECHNOLOGY, OFFICE OF GEOGRAPHIC INFORMATION (MASSGIS) ONLINE RESOURCES. LAST UPDATED OCTOBER 2022 FOR WINCHENDON MA. PROPERTY BOUNDARIES SHOULD BE CONSIDERED APPROXIMATE.
5. EXISTING WETLAND DELINEATIONS WERE FLAGGED BY EPSILON ASSOCIATES, INC. ON MAY 11, 2018. CEC HAS NOT VERIFIED THE ACCURACY OF THIS INFORMATION.
6. PERMITTED FINAL CLOSURE CONDITIONS SHOWN ON THIS PLAN WERE OBTAINED FROM THE PLAN SET TITLED "FORMER MABARDY LANDFILL – CORRECTIVE ACTION DESIGN" DATED JUNE 2019, REVISED OCTOBER 2019, PREPARED BY LANGDON ENVIRONMENTAL LLC.



FINAL COVER SECTION
N.T.S.

LEGEND

- EXISTING PROPERTY LINE
- EXISTING ADJACENT PROPERTY LINE
- PERMITTED LIMIT OF FINAL CAP
- PROPOSED LIMIT OF FINAL CAP
- 100-FOOT WETLAND BUFFER
- 200-FOOT RIVERFRONT BUFFER
- BORDERING LAND SUBJECT TO FLOODING
- 860 EXISTING INDEX (MAJOR) CONTOUR
- EXISTING INTERMEDIATE (MINOR) CONTOUR
- EXISTING WETLAND
- EXISTING PAVED ROAD
- EXISTING UNPAVED ROAD
- EXISTING TREE LINE
- EXISTING STRUCTURE
- MW-2 EXISTING ENVIRONMENTAL MONITORING WELL
- 800 PERMITTED INDEX (MAJOR) CONTOUR
- PERMITTED INTERMEDIATE (MINOR) CONTOUR
- PERMITTED STORMWATER SWALE
- PERMITTED STORMWATER SUBDRAIN
- GV PERMITTED LANDFILL GAS VENT
- 860 PROPOSED INDEX (MAJOR) CONTOUR
- PROPOSED INTERMEDIATE (MINOR) CONTOUR
- 925.0 PROPOSED SPOT ELEVATION

NOTES

1. EXISTING IN-PLACE WASTE ENCOUNTERED OUTSIDE THE LIMIT OF FINAL CAP WILL BE EXCAVATED AND RELOCATED TO WITHIN THE LANDFILL LIMITS.
2. THE PLACEMENT OF 'CONTOUR FILL' IS PROPOSED OUTSIDE THE LIMITS OF FINAL COVER TO ACHIEVE THE DESIGN GRADES SHOWN ON THIS PLAN.

SCALE IN FEET
0 80 160

COMMONWEALTH OF MASSACHUSETTS
AMY J. KNIGHT
CIVIL
No. 50157
REGISTERED PROFESSIONAL ENGINEER
5/17/2023

*HAND SIGNATURE ON FILE

REVISION RECORD

NO	DATE	DESCRIPTION

Civil & Environmental Consultants, Inc.
31 Bellows Road · Raynham, MA 02767
Ph: 774.501.2176 · 866.312.2024 · Fax: 774.501.2669
www.cecinc.com

PERMIT MODIFICATION PLANS
FORMER MABARDY LANDFILL
W.L. FRENCH EXCAVATING CORPORATION
RIVER ROAD
WINCHENDON, MA

MODIFIED SUBGRADE GRADING PLAN

DATE:	MARCH 2023
DWG SCALE:	1" = 80'
PROJECT NO:	306-000
DRAWN BY:	KFH
CHECKED BY:	AJK
APPROVED BY:	AJK*

DRAWING NO.: **C300**
SHEET 3 OF 6

P:\300-000\306-0001-0401\dwg\SMS - SW5 Permit - Text Filling\300000-SW5-C300-Subgrade Plan.dwg[LAYOUT1] (5/17/2023 - khampton) - LP: 5/17/2023 10:59 AM

REFERENCE

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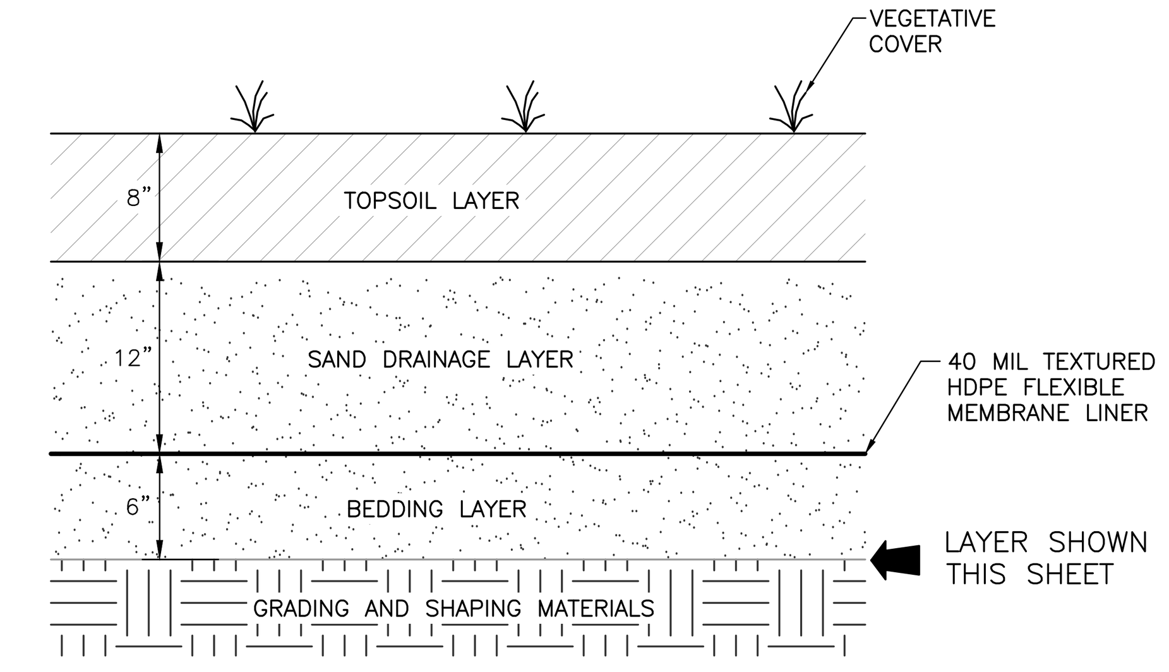


FINAL COVER SECTION

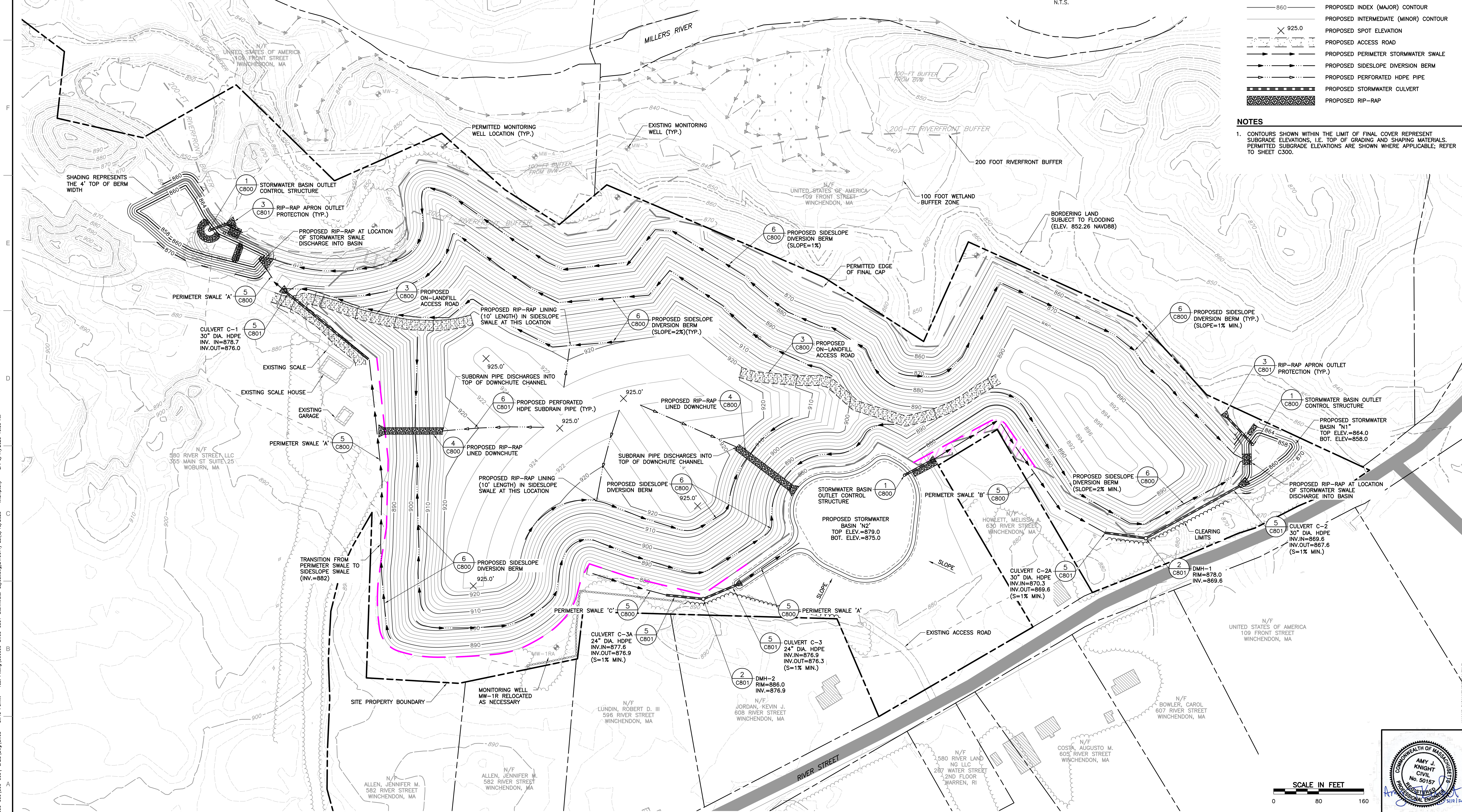
N.T.S.

LEGEND

- EXISTING PROPERTY LINE
- EXISTING ADJACENT PROPERTY LINE
- PERMITTED LIMIT OF FINAL CAP
- PROPOSED LIMIT OF FINAL CAP
- 100-FOOT WETLAND BUFFER
- 200-FOOT RIVERFRONT BUFFER
- BORDERING LAND SUBJECT TO FLOODING
- EXISTING INDEX (MAJOR) CONTOUR
- EXISTING INTERMEDIATE (MINOR) CONTOUR
- EXISTING WETLAND
- EXISTING PAVED ROAD
- EXISTING UNPAVED ROAD
- EXISTING TREE LINE
- EXISTING STRUCTURE
- EXISTING ENVIRONMENTAL MONITORING WELL
- PROPOSED INDEX (MAJOR) CONTOUR
- PROPOSED INTERMEDIATE (MINOR) CONTOUR
- PROPOSED SPOT ELEVATION
- PROPOSED ACCESS ROAD
- PROPOSED PERIMETER STORMWATER SWALE
- PROPOSED SIDESLOPE DIVERSION BERM
- PROPOSED PERFORATED HDPE PIPE
- PROPOSED STORMWATER CULVERT
- PROPOSED RIP-RAP

NOTES

1. CONTOURS SHOWN WITHIN THE LIMIT OF FINAL COVER REPRESENT SUBGRADE ELEVATIONS, I.E. TOP OF GRADING AND SHAPING MATERIALS. PERMITTED SUBGRADE ELEVATIONS ARE SHOWN WHERE APPLICABLE; REFER TO SHEET C300.



NORTH
MILLERS RIVER
N/F UNITED STATES OF AMERICA 109 FRONT STREET WINCHENDON, MA
SHADING REPRESENTS THE 4' TOP OF BERM WIDTH
STORMWATER BASIN OUTLET CONTROL STRUCTURE
RIP-RAP APRON OUTLET PROTECTION (TYP.)
PROPOSED RIP-RAP AT LOCATION OF STORMWATER SWALE DISCHARGE INTO BASIN
PERMITTED MONITORING WELL LOCATION (TYP.)
EXISTING MONITORING WELL (TYP.)
200 FOOT RIVERFRONT BUFFER
100 FOOT WETLAND BUFFER ZONE
BORDERING LAND SUBJECT TO FLOODING (ELEV. 852.26 NAVD88)
PROPOSED SIDESLOPE DIVERSION BERM (SLOPE=1%)
PERMITTED EDGE OF FINAL CAP
PERIMETER SWALE 'A'
PROPOSED ON-LANDFILL ACCESS ROAD
PROPOSED RIP-RAP LINING (10' LENGTH) IN SIDESLOPE SWALE AT THIS LOCATION
PROPOSED SIDESLOPE DIVERSION BERM (SLOPE=2%)(TYP.)
CULVERT C-1 30" DIA. HDPE INV. IN=878.7 INV.OUT=876.0
EXISTING SCALE
EXISTING SCALE HOUSE
EXISTING GARAGE
SUBDRAIN PIPE DISCHARGES INTO TOP OF DOWNCHUTE CHANNEL
PROPOSED PERFORATED HDPE SUBDRAIN PIPE (TYP.)
PROPOSED RIP-RAP LINED DOWNCHUTE
PROPOSED SIDESLOPE DIVERSION BERM (SLOPE=1% MIN.)
PROPOSED SIDESLOPE DIVERSION BERM (TYP.)
PROPOSED STORMWATER BASIN "N1" TOP ELEV.=864.0 BOT. ELEV.=858.0
N/F 580 RIVER STREET, LLC 355 MAIN ST SUITE 25 WOBURN, MA
STORMWATER BASIN OUTLET CONTROL STRUCTURE
PROPOSED STORMWATER BASIN "N2" TOP ELEV.=879.0 BOT. ELEV.=875.0
PERIMETER SWALE 'B'
PROPOSED SIDESLOPE DIVERSION BERM (SLOPE=2% MIN.)
N/F HOWLETT, MELISSA A. 630 RIVER STREET WINCHENDON, MA
CLEARING LIMITS
CULVERT C-2 30" DIA. HDPE INV.IN=869.6 INV.OUT=867.6 (S=1% MIN.)
TRANSITION FROM PERIMETER SWALE TO SIDESLOPE SWALE (INV.=882)
CULVERT C-2A 30" DIA. HDPE INV.IN=870.3 INV.OUT=869.6 (S=1% MIN.)
DMH-1 RIM=878.0 INV.=869.6
PERIMETER SWALE 'C'
CULVERT C-3A 24" DIA. HDPE INV.IN=877.6 INV.OUT=876.9 (S=1% MIN.)
CULVERT C-3 24" DIA. HDPE INV.IN=876.9 INV.OUT=876.3 (S=1% MIN.)
DMH-2 RIM=886.0 INV.=876.9
EXISTING ACCESS ROAD
MONITORING WELL MW-1R RELOCATED AS NECESSARY
SITE PROPERTY BOUNDARY
N/F LUNDIN, ROBERT D. III 596 RIVER STREET WINCHENDON, MA
N/F JORDAN, KEVIN J. 608 RIVER STREET WINCHENDON, MA
N/F BOWLER, CAROL 607 RIVER STREET WINCHENDON, MA
N/F COSTA, AUGUSTO M. 605 RIVER STREET WINCHENDON, MA
N/F 580 RIVER LAND NG LLC 287 WATER STREET 2ND FLOOR WARREN, RI
N/F ALLEN, JENNIFER M. 582 RIVER STREET WINCHENDON, MA
RIVER STREET
SLOPE
SCALE IN FEET
0 80 160

*HAND SIGNATURE ON FILE

REVISION RECORD

NO	DATE	DESCRIPTION

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MODIFIED STORMWATER MANAGEMENT SYSTEM LAYOUT PLAN

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C301
SHEET 4 OF 6