

PGB ENGINEERING, LLC

CIVIL ENGINEERING DESIGN & CONSULTING

49 TUPELO ROAD
MARSHFIELD, Ma 02050-1739

Tel.: 781-834-8987
PGBEngineeringLLC@gmail.com

August 8, 2023

Hingham Planning Board
210 Central Street
Hingham, MA 02043

Subject: **16 Bishops Lane, Definitive Subdivision Plan**

Dear Planning Board Members:

This is to advise that we have reviewed the following documents pertaining to the proposed definitive subdivision at the subject site:

- Definitive Subdivision Plan (13 sheets), revised July 14, 2023, prepared by Merrill Engineers and Land Surveyors (Merrill)
- Stormwater Management Report, revised July 14, 2023, prepared by Merrill
- Applicant's Supplemental Response to Waiver Concerns, dated July 14, 2023
- Response to comments letter, dated July 14, 2023, prepared by Merrill
- Soil Evaluator Form, dated July 28, 2023, prepared by Merrill

The documents have been prepared to address comments contained in our May 10, 2023 letter to the Board as well as Traffic peer review comments and comments from Town departments. Below are our original comments in plain text, followed by the current status of each in **bold text**.

The Applicant is requesting waivers from the following:

- R&R §4.B(3)(a) which requires a minimum of 250 feet of stopping sight distance for a Minor Street. The Applicant is requesting this be reduced to 146 feet. This is a safety concern and we do not support the granting of this waiver. We agree with Mr. Dirk that a sight distance analysis for both intersection and stopping sight distance should be provided. **The Applicant is no longer requesting this waiver.**
- R&R §4.B(3)(a) and Table 1, which limit the maximum centerline grade of the road to be 8%. The Applicant is requesting this be increased to 10%. We agree with Mr. Dirk's concern about vehicles being able to stop in all weather conditions with the 10% grade transitioning to a 4.5% grade. **The revised plans show a maximum centerline grade of 8%, which complies. However, the Applicant prefers to construct the 10% centerline grade and is still requesting this waiver to reduce the amount of grading and ledge removal.**

- R&R §4.B(3)(f) which requires a leveling area be provided with a maximum grade of 3% for a distance of 100 feet. The Applicant is requesting the grade of the leveling area be increased to 4.5%. This is a safety concern, especially during winter weather conditions, and we do not support the granting of this waiver. **The Applicant is no longer requesting this waiver.**
- R&R §4.G and Table 1 which requires a sidewalk on one side of a minor street. The Applicant is requesting that no sidewalk be required. We note that there is a sidewalk along South Street and a sidewalk along Bishops Lane would provide a valuable pedestrian connection. **The Applicant is requesting this waiver and states that not constructing the sidewalk will result in less disturbance within the existing Bishops Lane right-of-way.**
- R&R §5.B4(1) which requires street trees to be planted at fifty foot spacing. The Applicant is requesting that street trees be allowed in areas where feasible. However, they are proposing to plant the required number of street trees. **No change.**

Comments

Compliance with the Planning Board Rules and Regulations

1. R&R §3.C.2(1) requires all existing trees over one foot in diameter to be shown on the plans. **In the response, Merrill states that “the survey of existing trees has been scheduled but not completed by the time of this submission and will be provided once completed.”**
2. R&R Table 1 requires a minimum centerline radius of 200 feet. The centerline radius on the extended portion of Bishops Lane will comply with this requirement but the existing portion of Bishops Lane has a centerline radius of less than 100 feet. We note that the transition from the existing right-of-way to the proposed right-of-way is offset in order to comply with the 200-foot centerline radius on the proposed roadway extension. **In the Applicant’s Supplemental Response to Waiver Concerns, the Applicant states that “the applicant respectfully submits that the issue of waivers is not implicated when it comes to making improvements to the existing first section of Bishops Lane.”**
3. As noted above, the existing portion of Bishops Lane has a right-of-way width of forty feet where forty-six feet is required (Table 1). We believe a waiver would be required. **See note under comment 2.**
4. R&R §4.C(3)(d) requires that all drainage discharges into basins be above the 10-year flood elevation. The invert into the stormwater basin should be raised to meet this requirement. **Addressed – the inlet invert into the basin has been modified to be above the 10-year storm event elevation.**

5. R&R §4.C(3)(e) requires a concrete or masonry headwall at the outfall end of all drains. A flared end section is proposed at the discharge into the stormwater basin. **Addressed – concrete headwalls are now proposed as required.**
6. R&R §4.L(6) requires documentation that there will be a minimum of 1,000 gallons of water per minute at the proposed fire hydrant(s). Documentation should be provided to verify this. **In the response, Merrill states that “the applicant will coordinate with Weir River Water to confirm hydrant flow requirements.” Should the Board close the public hearing prior to receiving this information, we recommend that this be a condition in the decision.**
7. R&R §4.L(7)a requires a ten foot wide electric easement around all Hingham Municipal Lighting Plant (HMLP) infrastructure. The Applicant should coordinate with HMLP as necessary, and the easements should be shown on the definitive plan. **Addressed – in the response, Merrill states that “the applicant will coordinate with HMLP to provide the required easements for the HMLP infrastructure. Easements have been provided for the anticipated transformer locations.”**
8. R&R §5.L1(4) requires HDPE drain pipe to have rubber gaskets. The Typical Utility Trench Detail on Sheet C7.1 should specify rubber gaskets for the drain pipe. This should also be specified in Grading and Drainage Note 3 on Sheet C7.6. **Addressed – the detail and note have been revised to specify rubber gasket joints.**
9. There should be a loam and seed detail and/or the Typical Roadway Section on Sheet C7.1 should specify a minimum of six inches of loam in accordance with R&R §5.A4(3). **Addressed – a Loam and Seed Detail has been added to Sheet C7.7 and the Typical Roadway Section specifies six inches of loam.**
10. R&R §5.C4(1) requires granite Hingham Highway bounds to be set at all street intersections and at all points of change in direction or curvature of streets. This is specified and bounds shown where required along the extended roadway on Sheet C3.1. However, no bounds are shown along the existing portion of Bishops Lane. A bound/monument detail should be shown on the plans. **In the response, Merrill states that a “concrete bound detail will be added to the plan set.” No bound detail is shown on the plans and the regulation requires granite bounds.**

Stormwater, Erosion Control & Utilities

1. The test pit that was excavated in the vicinity of the stormwater basin was only excavated to a depth of four feet. Additional soil testing is required in the footprint of the basin to confirm consistent soils across the basin. The test pits should also be excavated to a minimum depth of ten feet to make sure there is sufficient overburden soil to accept the proposed recharge of stormwater. **Addressed – additional soil testing has been performed. The test hole log indicates sandy soils and adequate separation from groundwater.**

2. We measure the areas of the contours within the stormwater basin to be about 100 s.f. less than the contours areas listed in the HydroCAD model. Merrill should check this and adjust the model as necessary. **Addressed – in the revised Stormwater Management Report the elevation 29 contour area was still in question. We brought this issue to the attention of Deb Keller of Merrill and she sent us a revised post-development HydroCAD report (copy attached) which had the corrected contour 29 area. The only impact was to the 100-year storm event calculations which resulted in slightly higher peak elevation, rate and volume than reported revised Stormwater Management Report. However, the rate and volume are below existing conditions as required.**
3. We question the purpose of the low flow channel within the stormwater basin. These are typically constructed to provide a means of draining the basin in the event of standing water. However, there is no outlet for the channel. Should the channel remain, and an outlet be provided, a normally closed valve should be provided so that the basin would only be drained when necessary. **Addressed – in the response, Merrill states that “the low flow channel is proposed to provide additional infiltration connection during frozen ground conditions and is not a means to drain the basin. A pond drain has been added to the outlet structure to drain the pond only when necessary.”**
4. Much of the proposed drainage will be very deep, with depths of over twenty feet. Installation of the drainage as well as future maintenance will be difficult, especially with the ledge on the property. We suspect significant blasting will be required. **Informational.**
5. The second TSS removal calculation sheet in the Stormwater Management Report does not take credit for the First Defense proprietary treatment unit. **Addressed – the calculation has been revised to include the First Defense unit.**
6. The Long Term Pollution Prevention Plan / Operation and Maintenance Plan (O&M) references subsurface infiltration chambers for roof runoff. If chambers are proposed for roof runoff they should be shown and detailed on the plans. **Addressed – the references to subsurface infiltration chambers have been removed from the O&M.**
7. The O&M also specifies biannual inspection of the First Defense units in the narrative but quarterly inspections in the checklist. Quarterly inspections should be specified in both. **Addressed – quarterly inspections of the First Defense units are now specified.**
8. The erosion control details on Sheet C7.5 reference hay bales. The Hingham Conservation Commission does not allow the use of hay or straw. We recommend that all references to hay or straw be changed to mulch or other materials acceptable to the Commission. **Addressed – silt socks are now specified rather than hay bales.**
9. The location(s) of stabilized construction entrances should be shown on the plans. A separate erosion and sedimentation control plan would be helpful. **In the response, Merrill states that “a separate Erosion and Sedimentation Control Plan will be provided under separate cover.” We are awaiting submission of this document.**

10. There appears that there may be a vertical conflict between the proposed sewer and water mains at about Sta. 2+35. **Addressed – the vertical conflict has been eliminated.**
11. The Proposed Sanitary Sewer Manhole Detail on Sheet C7.3 has a Section A-A symbol, but no section view is included. **Addressed – the section A-A symbol has been removed from the detail and additional sewer details have been added.**
12. The Water Service Detail on Sheet C7.2 specifies that the minimum service line is to be two-inch diameter. This is large for a single-family dwelling. We recommend consulting with the Weir River Water System to determine the appropriate service sizes. **Addressed – a note has been added to the detail instructing the contractor to verify minimum service size with Weir River Water.**

Roadway & General

1. As noted above, the road is proposed to be private with all maintenance responsibilities to be borne by the homeowners. Should the Board approve the project, we recommend this be a condition of approval. **Recommend condition.**
2. The geometry of the exiting Bishops Lane right-of-way should be shown on the plans. **Addressed – the geometry is shown on the Existing Conditions Plan, Sheet C2.1.**
3. The Reinforced Block Retaining Wall Detail on Sheet C7.3 shows a guardrail above the wall. The guardrail should be shown in plan on Sheets C4.1, C5.1 and C6.1. **Addressed – the proposed locations of the guardrail are shown in plan.**
4. The plans should show the Tree Yard as required by ZBL §I-I.5.h, along with a tree protection plan and an inventory of trees including the number, sizes and types of protected trees that will be removed as part of the project as well as the number, sizes and types of replacement trees, to confirm compliance with ZBL §I-I.6.d(ii). **In the response, Merrill states that the Tree Yard “plan shall be provided as requested once the existing tree inventory has been completed. This plan will be provided under separate cover.” We are awaiting submission of this document.**
5. There are a lot of ledge outcroppings shown on the plans. There will be extensive ledge removal required for roadway construction and utility installation, especially for the deep drain lines and structures. **Informational, no response required.**

Please give us a call should you have any questions.

Very truly yours,

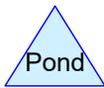
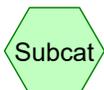
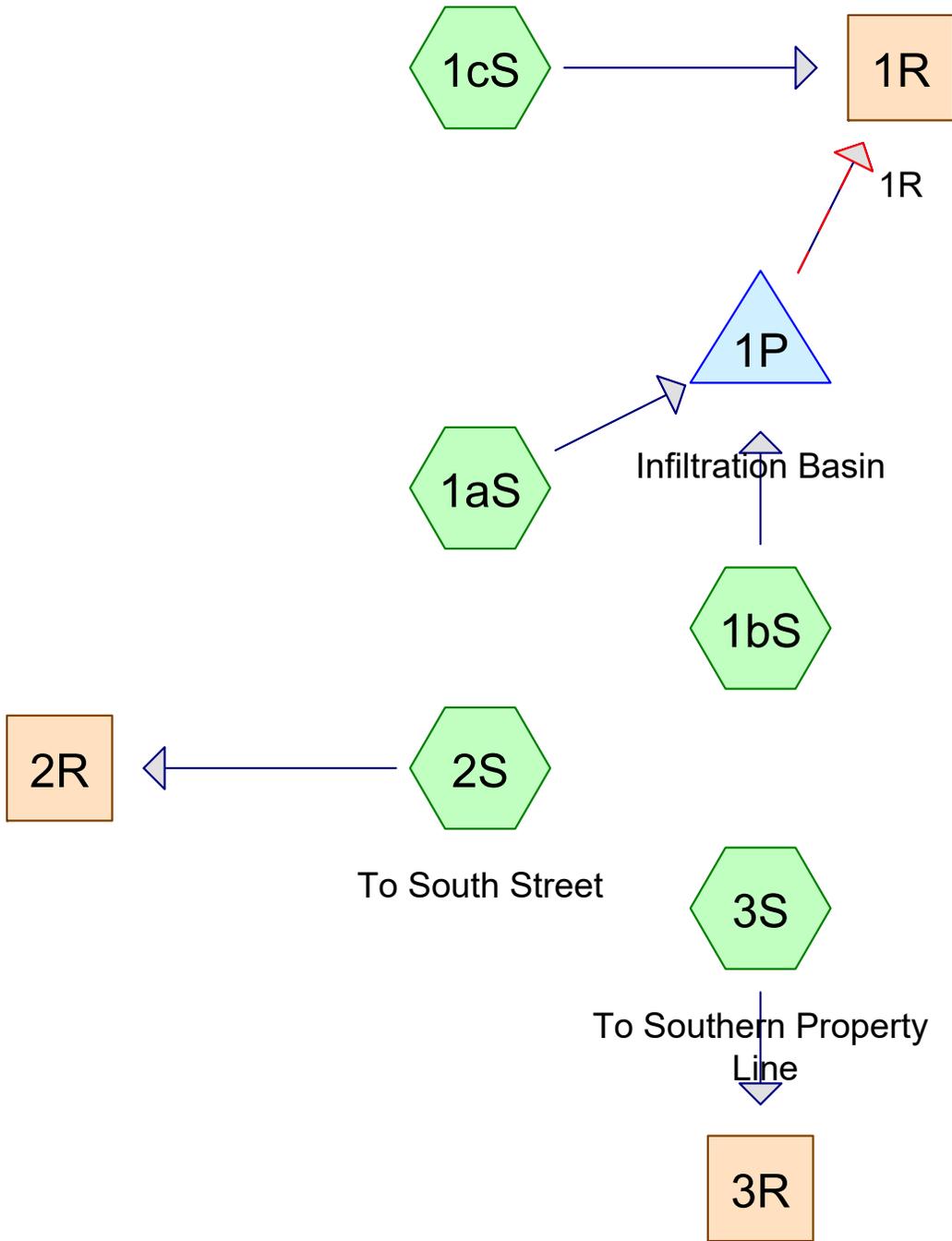
PGB Engineering, LLC

By:



Patrick G. Brennan, P.E.





Routing Diagram for 17-360 POST
 Prepared by Merrill Associates Inc, Printed 7/19/2023
 HydroCAD® 10.20-2g s/n 02159 © 2022 HydroCAD Software Solutions LLC

17-360 POST

Prepared by Merrill Associates Inc

HydroCAD® 10.20-2g s/n 02159 © 2022 HydroCAD Software Solutions LLC

Printed 7/19/2023

Page 2

Rainfall Events Listing (selected events)

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	2-Year	Type III 24-hr		Default	24.00	1	3.31	2
2	10-Year	Type III 24-hr		Default	24.00	1	4.89	2
3	25-Year	Type III 24-hr		Default	24.00	1	6.12	2
4	100-Year	Type III 24-hr		Default	24.00	1	8.60	2

17-360 POST

Prepared by Merrill Associates Inc

HydroCAD® 10.20-2g s/n 02159 © 2022 HydroCAD Software Solutions LLC

Printed 7/19/2023

Page 3

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
2.411	61	>75% Grass cover, Good, HSG B (1aS, 1bS, 1cS, 2S, 3S)
0.129	98	Ledge (1aS, 1bS, 2S, 3S)
0.753	98	Paved parking/Conc Walks, HSG B (1aS, 1bS, 1cS, 2S)
0.149	98	Roofs, HSG B (1aS, 1bS, 1cS)
0.640	55	Woods, Good, HSG B (1bS, 1cS, 2S, 3S)
4.082	69	TOTAL AREA

17-360 POST

Prepared by Merrill Associates Inc

HydroCAD® 10.20-2g s/n 02159 © 2022 HydroCAD Software Solutions LLC

Printed 7/19/2023

Page 4

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
3.953	HSG B	1aS, 1bS, 1cS, 2S, 3S
0.000	HSG C	
0.000	HSG D	
0.129	Other	1aS, 1bS, 2S, 3S
4.082		TOTAL AREA

17-360 POST

Prepared by Merrill Associates Inc

Printed 7/19/2023

HydroCAD® 10.20-2g s/n 02159 © 2022 HydroCAD Software Solutions LLC

Page 5

Ground Covers (all nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.000	2.411	0.000	0.000	0.000	2.411	>75% Grass cover, Good	1aS, 1bS, 1cS, 2S, 3S
0.000	0.000	0.000	0.000	0.129	0.129	Ledge	1aS, 1bS, 2S, 3S
0.000	0.753	0.000	0.000	0.000	0.753	Paved parking/Conc Walks	1aS, 1bS, 1cS, 2S
0.000	0.149	0.000	0.000	0.000	0.149	Roofs	1aS, 1bS, 1cS
0.000	0.640	0.000	0.000	0.000	0.640	Woods, Good	1bS, 1cS, 2S, 3S
0.000	3.953	0.000	0.000	0.129	4.082	TOTAL AREA	

17-360 POST

Prepared by Merrill Associates Inc

Printed 7/19/2023

HydroCAD® 10.20-2g s/n 02159 © 2022 HydroCAD Software Solutions LLC

Page 6

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	1P	25.90	25.30	30.0	0.0200	0.013	0.0	18.0	0.0

17-360 POST

Prepared by Merrill Associates Inc

HydroCAD® 10.20-2g s/n 02159 © 2022 HydroCAD Software Solutions LLC

Type III 24-hr 2-Year Rainfall=3.31"

Printed 7/19/2023

Page 7

Time span=0.00-72.00 hrs, dt=0.05 hrs, 1441 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1aS: Runoff Area=22,412 sf 51.24% Impervious Runoff Depth=1.49"
Flow Length=258' Tc=6.0 min CN=80 Runoff=0.87 cfs 0.064 af

Subcatchment 1bS: Runoff Area=95,283 sf 24.04% Impervious Runoff Depth=0.84"
Flow Length=255' Tc=6.0 min CN=69 Runoff=1.90 cfs 0.154 af

Subcatchment 1cS: Runoff Area=23,419 sf 13.96% Impervious Runoff Depth=0.61"
Flow Length=143' Tc=6.0 min CN=64 Runoff=0.30 cfs 0.027 af

Subcatchment 2S: To South Street Runoff Area=18,852 sf 36.97% Impervious Runoff Depth=1.17"
Tc=6.0 min CN=75 Runoff=0.56 cfs 0.042 af

Subcatchment 3S: To Southern Property Runoff Area=17,840 sf 1.46% Impervious Runoff Depth=0.38"
Tc=6.0 min CN=58 Runoff=0.09 cfs 0.013 af

Reach 1R: 1R Inflow=0.30 cfs 0.027 af
Outflow=0.30 cfs 0.027 af

Reach 2R: Inflow=0.56 cfs 0.042 af
Outflow=0.56 cfs 0.042 af

Reach 3R: Inflow=0.09 cfs 0.013 af
Outflow=0.09 cfs 0.013 af

Pond 1P: Infiltration Basin Peak Elev=26.48' Storage=1,729 cf Inflow=2.77 cfs 0.217 af
Discarded=0.87 cfs 0.218 af Primary=0.00 cfs 0.000 af Secondary=0.00 cfs 0.000 af Outflow=0.87 cfs 0.218 af

Total Runoff Area = 4.082 ac Runoff Volume = 0.300 af Average Runoff Depth = 0.88"
74.76% Pervious = 3.051 ac 25.24% Impervious = 1.030 ac

17-360 POST

Prepared by Merrill Associates Inc

HydroCAD® 10.20-2g s/n 02159 © 2022 HydroCAD Software Solutions LLC

Type III 24-hr 2-Year Rainfall=3.31"

Printed 7/19/2023

Page 8

Summary for Subcatchment 1aS:

Runoff = 0.87 cfs @ 12.10 hrs, Volume= 0.064 af, Depth= 1.49"
 Routed to Pond 1P : Infiltration Basin

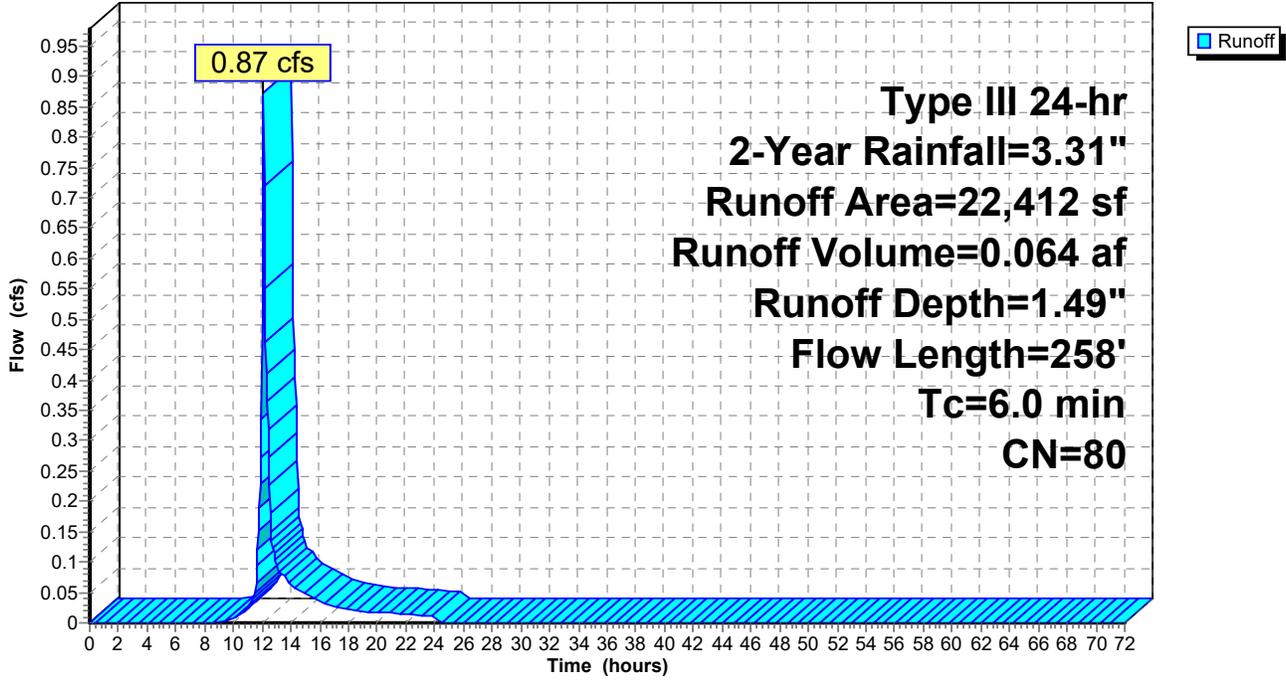
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 Type III 24-hr 2-Year Rainfall=3.31"

Area (sf)	CN	Description
10,928	61	>75% Grass cover, Good, HSG B
0	55	Woods, Good, HSG B
672	98	Roofs, HSG B
* 7,750	98	Paved parking/Conc Walks, HSG B
* 3,062	98	Ledge
22,412	80	Weighted Average
10,928		48.76% Pervious Area
11,484		51.24% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.2	50	0.0780	0.26		Sheet Flow, Grass: Short n= 0.150 P2= 3.31"
0.1	38	0.1970	7.15		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
0.0	13	0.1540	7.97		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.2	76	0.1450	6.13		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
0.3	65	0.0250	3.21		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.1	16	0.0300	2.79		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
3.9	258	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 1aS:

Hydrograph



17-360 POST

Prepared by Merrill Associates Inc

HydroCAD® 10.20-2g s/n 02159 © 2022 HydroCAD Software Solutions LLC

Type III 24-hr 2-Year Rainfall=3.31"

Printed 7/19/2023

Page 10

Summary for Subcatchment 1bS:

Runoff = 1.90 cfs @ 12.10 hrs, Volume= 0.154 af, Depth= 0.84"
 Routed to Pond 1P : Infiltration Basin

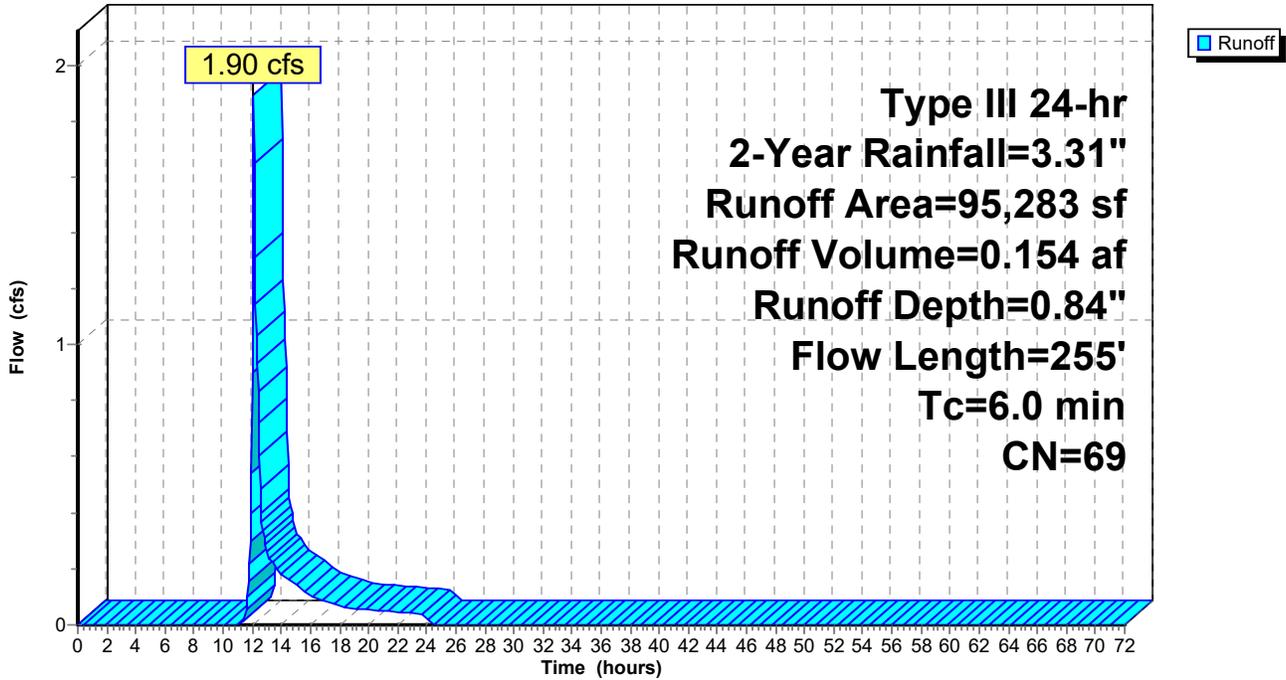
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 Type III 24-hr 2-Year Rainfall=3.31"

Area (sf)	CN	Description
65,624	61	>75% Grass cover, Good, HSG B
6,756	55	Woods, Good, HSG B
4,124	98	Roofs, HSG B
* 17,346	98	Paved parking/Conc Walks, HSG B
* 1,433	98	Ledge
95,283	69	Weighted Average
72,380		75.96% Pervious Area
22,903		24.04% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.4	50	0.0700	0.25		Sheet Flow, Grass: Short n= 0.150 P2= 3.31"
0.7	85	0.0170	2.10		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
0.1	55	0.1820	6.87		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
0.4	65	0.0310	2.83		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
4.6	255	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 1bS:

Hydrograph



17-360 POST

Prepared by Merrill Associates Inc

HydroCAD® 10.20-2g s/n 02159 © 2022 HydroCAD Software Solutions LLC

Type III 24-hr 2-Year Rainfall=3.31"

Printed 7/19/2023

Page 12

Summary for Subcatchment 1cS:

Runoff = 0.30 cfs @ 12.11 hrs, Volume= 0.027 af, Depth= 0.61"
 Routed to Reach 1R : 1R

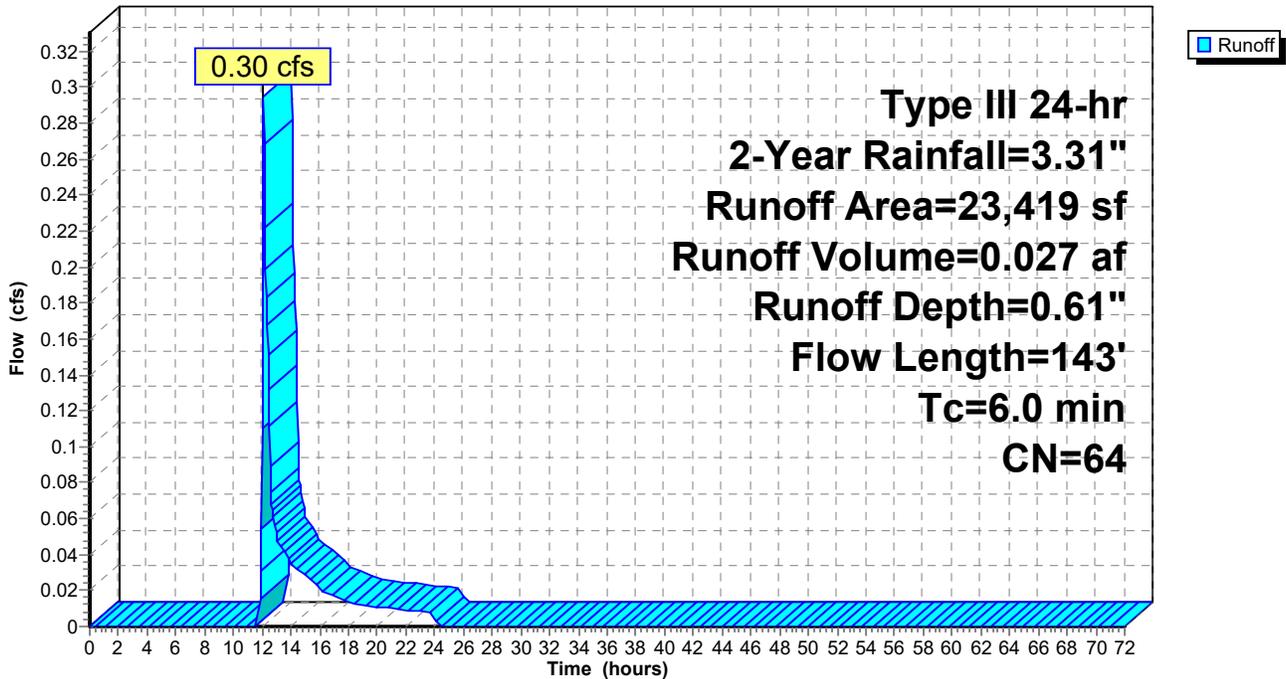
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 Type III 24-hr 2-Year Rainfall=3.31"

Area (sf)	CN	Description
9,992	61	>75% Grass cover, Good, HSG B
10,157	55	Woods, Good, HSG B
1,696	98	Roofs, HSG B
* 1,574	98	Paved parking/Conc Walks, HSG B
* 0	98	Ledge
23,419	64	Weighted Average
20,149		86.04% Pervious Area
3,270		13.96% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.6	50	0.1400	0.15		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.31"
0.3	93	0.1000	5.09		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
5.9	143	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 1cS:

Hydrograph



17-360 POST

Prepared by Merrill Associates Inc

HydroCAD® 10.20-2g s/n 02159 © 2022 HydroCAD Software Solutions LLC

Type III 24-hr 2-Year Rainfall=3.31"

Printed 7/19/2023

Page 13

Summary for Subcatchment 2S: To South Street

Runoff = 0.56 cfs @ 12.10 hrs, Volume= 0.042 af, Depth= 1.17"
Routed to Reach 2R :

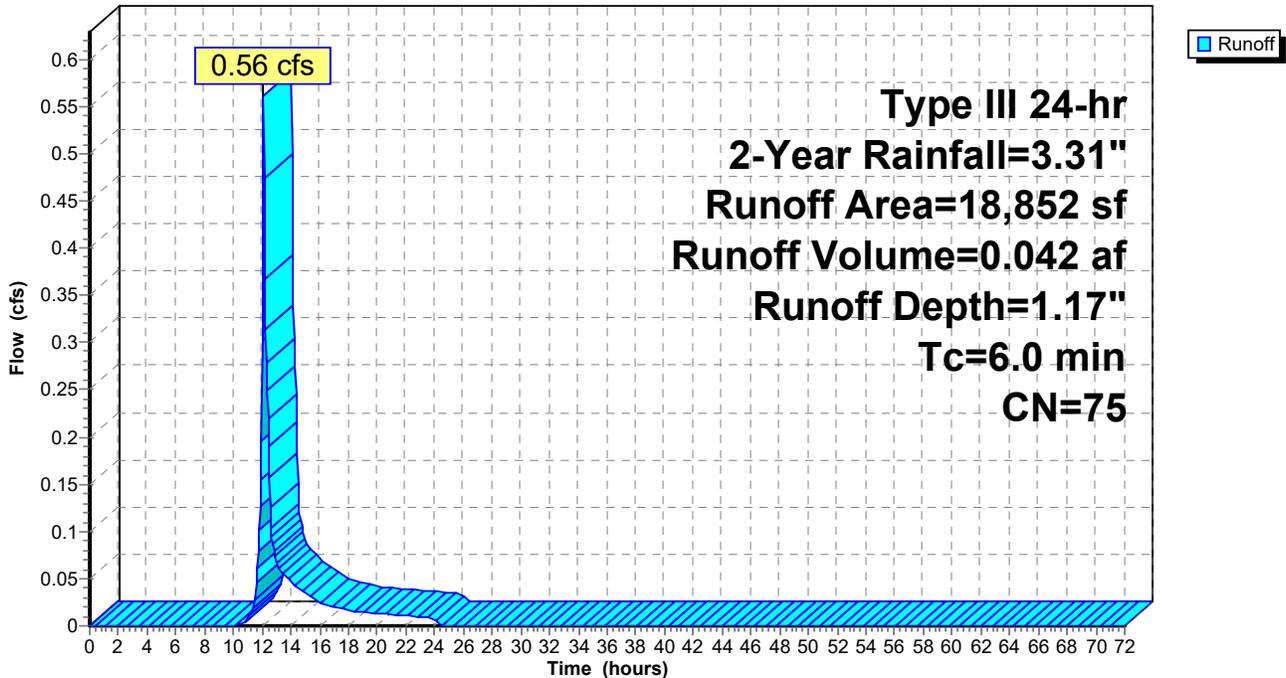
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.31"

Area (sf)	CN	Description
11,701	61	>75% Grass cover, Good, HSG B
182	55	Woods, Good, HSG B
0	98	Roofs, HSG B
* 6,111	98	Paved parking/Conc Walks, HSG B
* 858	98	Ledge
18,852	75	Weighted Average
11,883		63.03% Pervious Area
6,969		36.97% Impervious Area

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

Subcatchment 2S: To South Street

Hydrograph



17-360 POST

Prepared by Merrill Associates Inc

HydroCAD® 10.20-2g s/n 02159 © 2022 HydroCAD Software Solutions LLC

Type III 24-hr 2-Year Rainfall=3.31"

Printed 7/19/2023

Page 14

Summary for Subcatchment 3S: To Southern Property Line

Runoff = 0.09 cfs @ 12.16 hrs, Volume= 0.013 af, Depth= 0.38"
 Routed to Reach 3R :

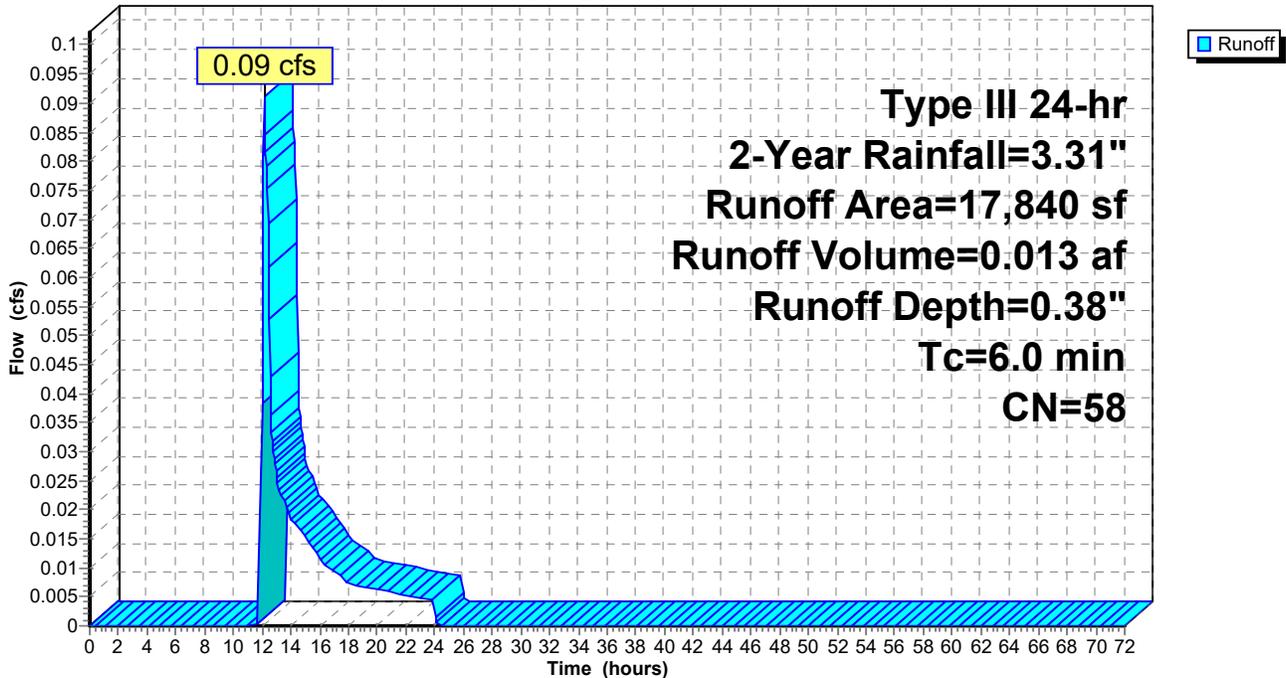
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 Type III 24-hr 2-Year Rainfall=3.31"

Area (sf)	CN	Description
6,785	61	>75% Grass cover, Good, HSG B
10,794	55	Woods, Good, HSG B
0	98	Unconnected pavement, HSG B
* 0	98	Paved parking/Conc Walks, HSG B
* 261	98	Ledge
17,840	58	Weighted Average
17,579		98.54% Pervious Area
261		1.46% Impervious Area

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

Subcatchment 3S: To Southern Property Line

Hydrograph



Summary for Reach 1R: 1R

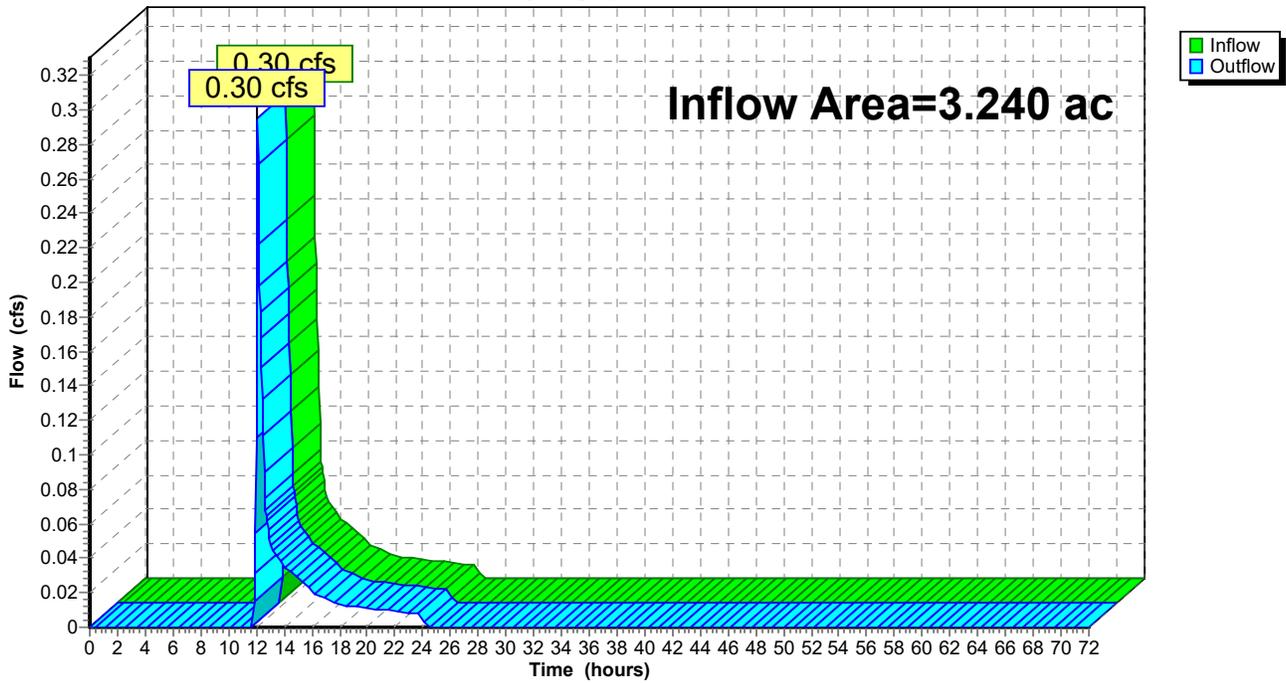
[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 3.240 ac, 26.69% Impervious, Inflow Depth = 0.10" for 2-Year event
Inflow = 0.30 cfs @ 12.11 hrs, Volume= 0.027 af
Outflow = 0.30 cfs @ 12.11 hrs, Volume= 0.027 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Reach 1R: 1R

Hydrograph



Summary for Reach 2R:

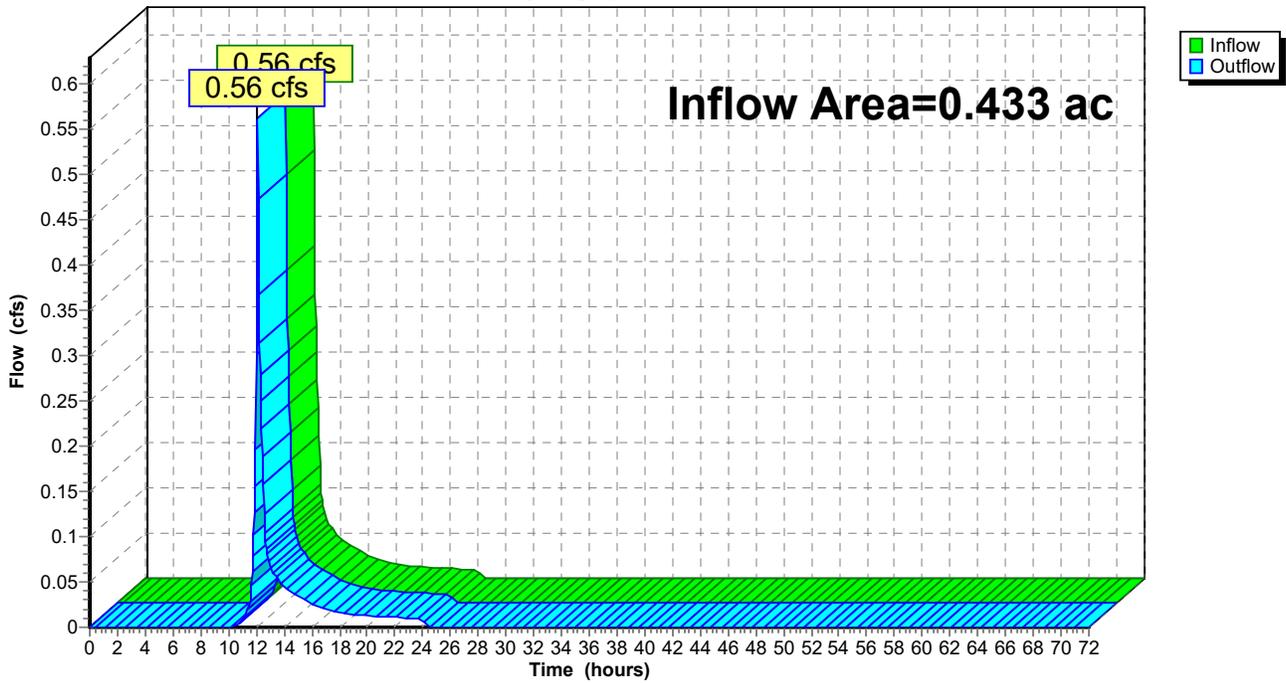
[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 0.433 ac, 36.97% Impervious, Inflow Depth = 1.17" for 2-Year event
Inflow = 0.56 cfs @ 12.10 hrs, Volume= 0.042 af
Outflow = 0.56 cfs @ 12.10 hrs, Volume= 0.042 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Reach 2R:

Hydrograph



Summary for Reach 3R:

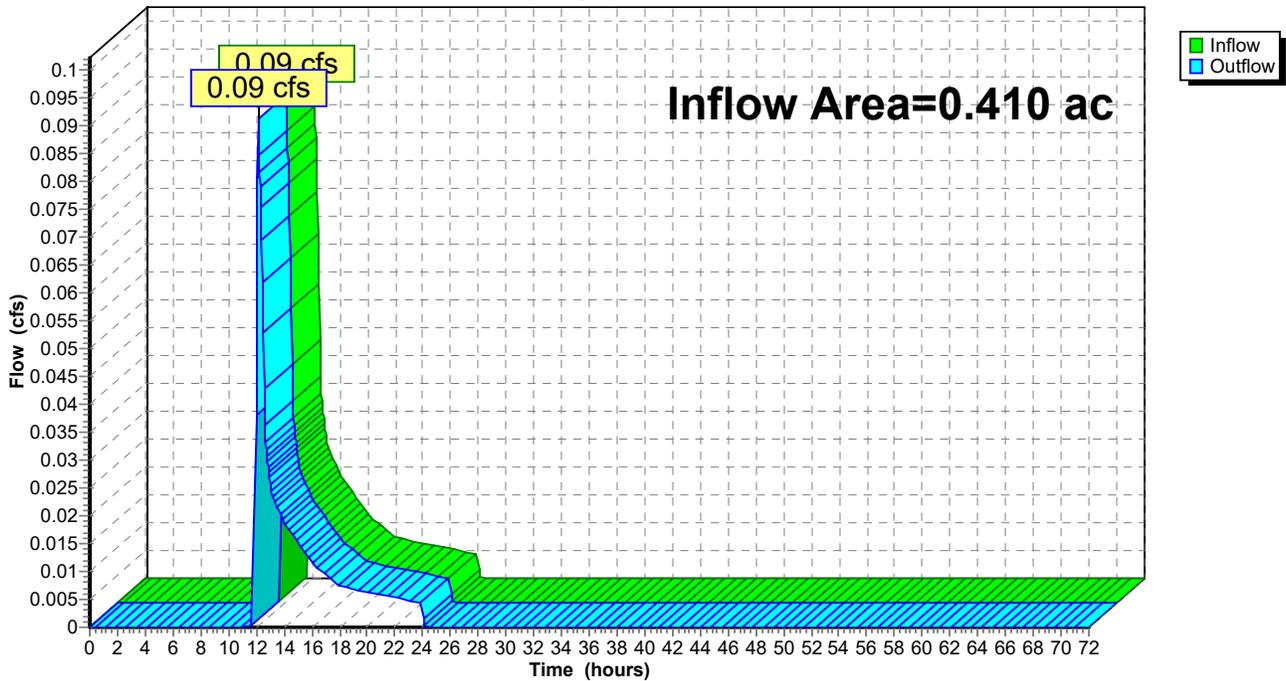
[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 0.410 ac, 1.46% Impervious, Inflow Depth = 0.38" for 2-Year event
Inflow = 0.09 cfs @ 12.16 hrs, Volume= 0.013 af
Outflow = 0.09 cfs @ 12.16 hrs, Volume= 0.013 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Reach 3R:

Hydrograph



Summary for Pond 1P: Infiltration Basin

[87] Warning: Oscillations may require smaller dt or Finer Routing (severity=102)

Inflow Area = 2.702 ac, 29.22% Impervious, Inflow Depth = 0.97" for 2-Year event
 Inflow = 2.77 cfs @ 12.10 hrs, Volume= 0.217 af
 Outflow = 0.87 cfs @ 12.49 hrs, Volume= 0.218 af, Atten= 69%, Lag= 23.2 min
 Discarded = 0.87 cfs @ 12.49 hrs, Volume= 0.218 af
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
 Routed to Reach 1R : 1R
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
 Routed to Reach 1R : 1R

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 Peak Elev= 26.48' @ 12.49 hrs Surf.Area= 3,844 sf Storage= 1,729 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 11.6 min (877.8 - 866.3)

Volume	Invert	Avail.Storage	Storage Description
#1	26.00'	19,116 cf	Custom Stage Data (Conic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet) Wet.Area (sq-ft)
26.00	3,308	0	0 3,308
27.00	4,460	3,870	3,870 4,481
28.00	5,752	5,092	8,962 5,797
29.00	7,110	6,419	15,381 7,185
29.50	7,835	3,735	19,116 7,926

Device	Routing	Invert	Outlet Devices
#1	Discarded	26.00'	8.270 in/hr Exfiltration over Wetted area Conductivity to Groundwater Elevation = 23.50'
#2	Secondary	28.50'	12.0' long x 15.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63
#3	Primary	25.90'	18.0" Round Culvert L= 30.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 25.90' / 25.30' S= 0.0200 1' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf
#4	Device 3	27.40'	2.4' long x 1.00' rise Sharp-Crested Vee/Trap Weir Cv= 2.62 (C= 3.28)

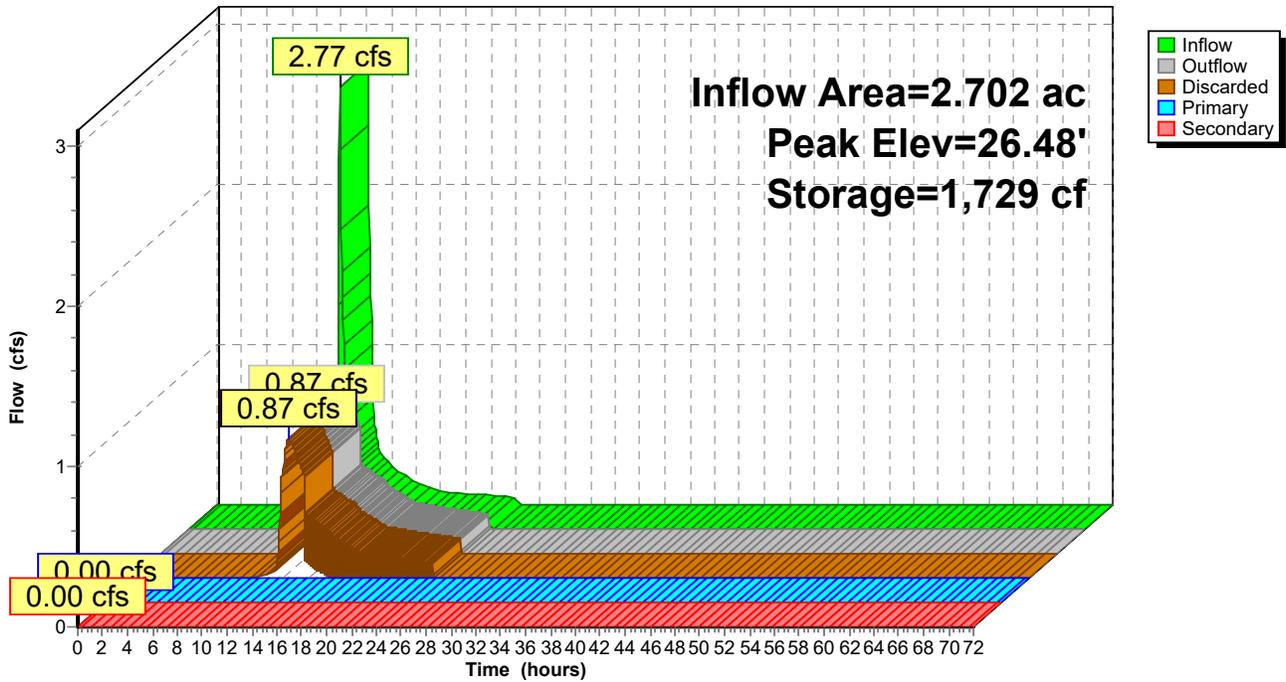
Discarded OutFlow Max=0.87 cfs @ 12.49 hrs HW=26.48' (Free Discharge)
 ↑1=Exfiltration (Controls 0.87 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=26.00' TW=0.00' (Dynamic Tailwater)
 ↑3=Culvert (Passes 0.00 cfs of 0.05 cfs potential flow)
 ↑4=Sharp-Crested Vee/Trap Weir (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=26.00' TW=0.00' (Dynamic Tailwater)
 ↑2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Pond 1P: Infiltration Basin

Hydrograph



17-360 POST

Type III 24-hr 10-Year Rainfall=4.89"

Prepared by Merrill Associates Inc

Printed 7/19/2023

HydroCAD® 10.20-2g s/n 02159 © 2022 HydroCAD Software Solutions LLC

Page 20

Time span=0.00-72.00 hrs, dt=0.05 hrs, 1441 points
 Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
 Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1aS: Runoff Area=22,412 sf 51.24% Impervious Runoff Depth=2.80"
 Flow Length=258' Tc=6.0 min CN=80 Runoff=1.65 cfs 0.120 af

Subcatchment 1bS: Runoff Area=95,283 sf 24.04% Impervious Runoff Depth=1.88"
 Flow Length=255' Tc=6.0 min CN=69 Runoff=4.62 cfs 0.342 af

Subcatchment 1cS: Runoff Area=23,419 sf 13.96% Impervious Runoff Depth=1.51"
 Flow Length=143' Tc=6.0 min CN=64 Runoff=0.88 cfs 0.068 af

Subcatchment 2S: To South Street Runoff Area=18,852 sf 36.97% Impervious Runoff Depth=2.36"
 Tc=6.0 min CN=75 Runoff=1.17 cfs 0.085 af

Subcatchment 3S: To Southern Property Runoff Area=17,840 sf 1.46% Impervious Runoff Depth=1.11"
 Tc=6.0 min CN=58 Runoff=0.45 cfs 0.038 af

Reach 1R: 1R Inflow=0.88 cfs 0.068 af
 Outflow=0.88 cfs 0.068 af

Reach 2R: Inflow=1.17 cfs 0.085 af
 Outflow=1.17 cfs 0.085 af

Reach 3R: Inflow=0.45 cfs 0.038 af
 Outflow=0.45 cfs 0.038 af

Pond 1P: Infiltration Basin Peak Elev=27.38' Storage=5,676 cf Inflow=6.27 cfs 0.462 af
 Discarded=1.37 cfs 0.462 af Primary=0.00 cfs 0.000 af Secondary=0.00 cfs 0.000 af Outflow=1.37 cfs 0.462 af

Total Runoff Area = 4.082 ac Runoff Volume = 0.653 af Average Runoff Depth = 1.92"
74.76% Pervious = 3.051 ac 25.24% Impervious = 1.030 ac

17-360 POST

Type III 24-hr 10-Year Rainfall=4.89"

Prepared by Merrill Associates Inc

Printed 7/19/2023

HydroCAD® 10.20-2g s/n 02159 © 2022 HydroCAD Software Solutions LLC

Page 21

Summary for Subcatchment 1aS:

Runoff = 1.65 cfs @ 12.09 hrs, Volume= 0.120 af, Depth= 2.80"
 Routed to Pond 1P : Infiltration Basin

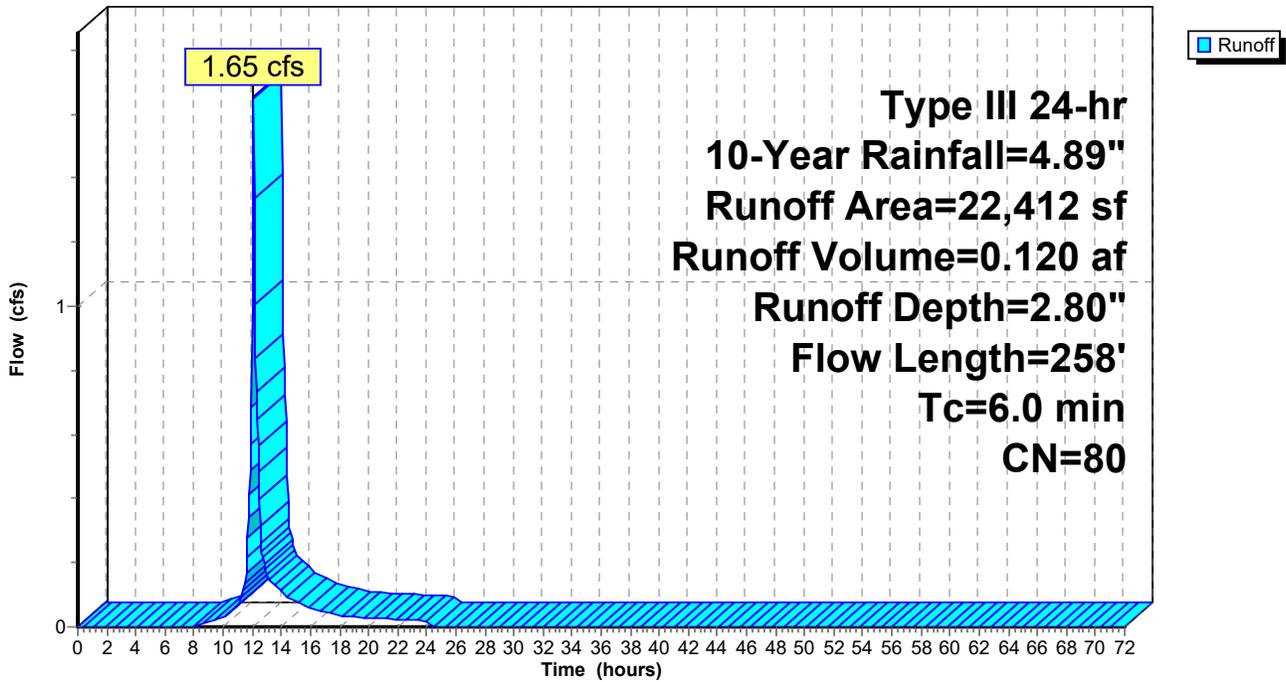
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 Type III 24-hr 10-Year Rainfall=4.89"

Area (sf)	CN	Description
10,928	61	>75% Grass cover, Good, HSG B
0	55	Woods, Good, HSG B
672	98	Roofs, HSG B
* 7,750	98	Paved parking/Conc Walks, HSG B
* 3,062	98	Ledge
22,412	80	Weighted Average
10,928		48.76% Pervious Area
11,484		51.24% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.2	50	0.0780	0.26		Sheet Flow, Grass: Short n= 0.150 P2= 3.31"
0.1	38	0.1970	7.15		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
0.0	13	0.1540	7.97		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.2	76	0.1450	6.13		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
0.3	65	0.0250	3.21		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.1	16	0.0300	2.79		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
3.9	258	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 1aS:

Hydrograph



17-360 POST

Type III 24-hr 10-Year Rainfall=4.89"

Prepared by Merrill Associates Inc

Printed 7/19/2023

HydroCAD® 10.20-2g s/n 02159 © 2022 HydroCAD Software Solutions LLC

Page 23

Summary for Subcatchment 1bS:

Runoff = 4.62 cfs @ 12.10 hrs, Volume= 0.342 af, Depth= 1.88"
 Routed to Pond 1P : Infiltration Basin

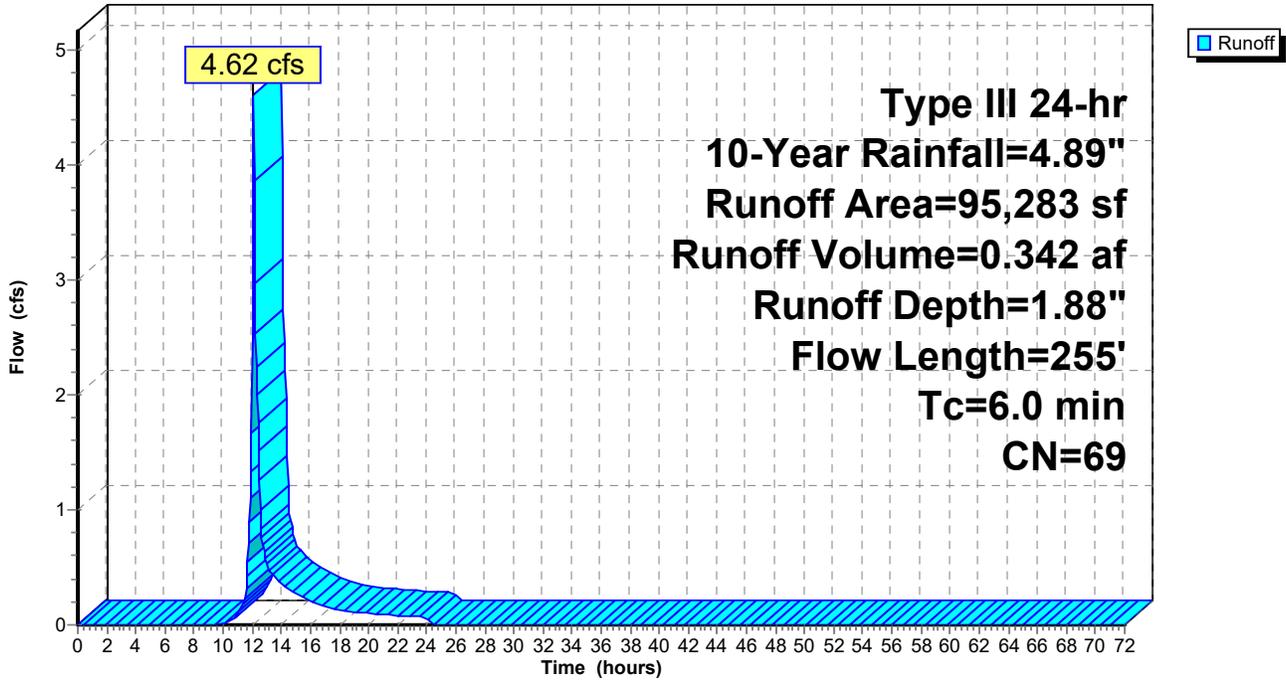
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 Type III 24-hr 10-Year Rainfall=4.89"

Area (sf)	CN	Description
65,624	61	>75% Grass cover, Good, HSG B
6,756	55	Woods, Good, HSG B
4,124	98	Roofs, HSG B
* 17,346	98	Paved parking/Conc Walks, HSG B
* 1,433	98	Ledge
95,283	69	Weighted Average
72,380		75.96% Pervious Area
22,903		24.04% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.4	50	0.0700	0.25		Sheet Flow, Grass: Short n= 0.150 P2= 3.31"
0.7	85	0.0170	2.10		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
0.1	55	0.1820	6.87		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
0.4	65	0.0310	2.83		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
4.6	255	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 1bS:

Hydrograph



17-360 POST

Prepared by Merrill Associates Inc

HydroCAD® 10.20-2g s/n 02159 © 2022 HydroCAD Software Solutions LLC

Type III 24-hr 10-Year Rainfall=4.89"

Printed 7/19/2023

Page 25

Summary for Subcatchment 1cS:

Runoff = 0.88 cfs @ 12.10 hrs, Volume= 0.068 af, Depth= 1.51"
 Routed to Reach 1R : 1R

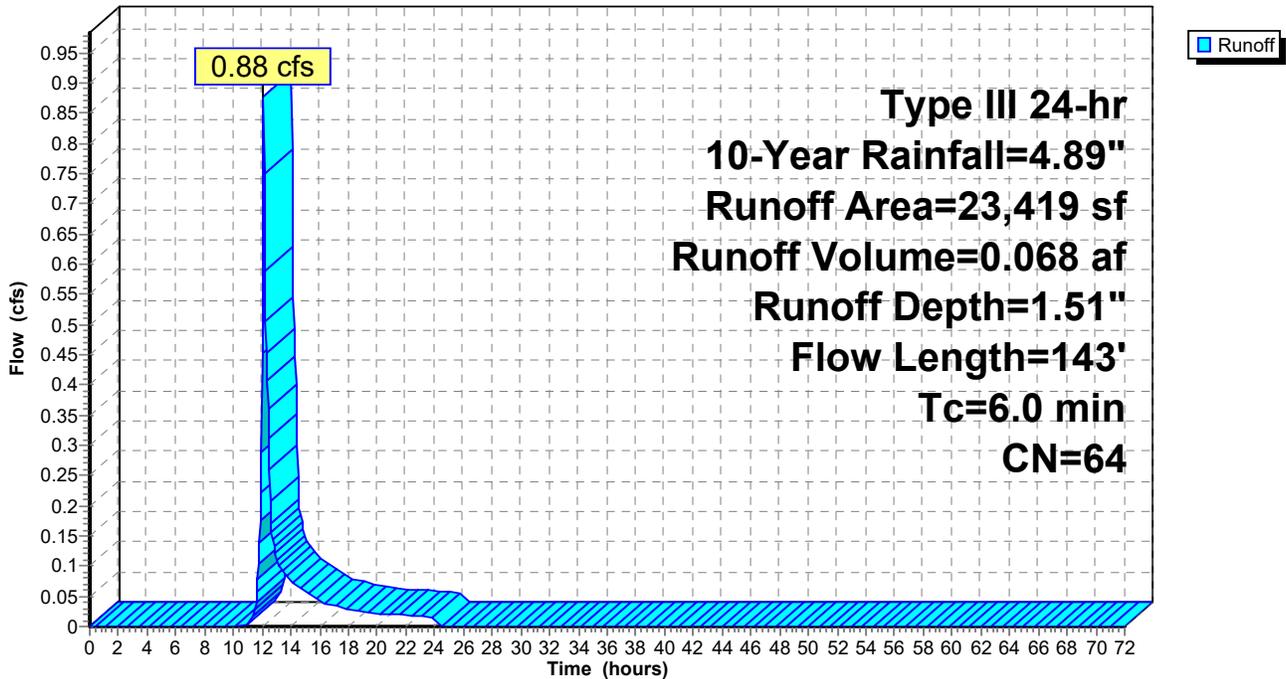
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 Type III 24-hr 10-Year Rainfall=4.89"

Area (sf)	CN	Description
9,992	61	>75% Grass cover, Good, HSG B
10,157	55	Woods, Good, HSG B
1,696	98	Roofs, HSG B
* 1,574	98	Paved parking/Conc Walks, HSG B
* 0	98	Ledge
23,419	64	Weighted Average
20,149		86.04% Pervious Area
3,270		13.96% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.6	50	0.1400	0.15		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.31"
0.3	93	0.1000	5.09		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
5.9	143	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 1cS:

Hydrograph



17-360 POST

Prepared by Merrill Associates Inc

HydroCAD® 10.20-2g s/n 02159 © 2022 HydroCAD Software Solutions LLC

Type III 24-hr 10-Year Rainfall=4.89"

Printed 7/19/2023

Page 26

Summary for Subcatchment 2S: To South Street

Runoff = 1.17 cfs @ 12.09 hrs, Volume= 0.085 af, Depth= 2.36"

Routed to Reach 2R :

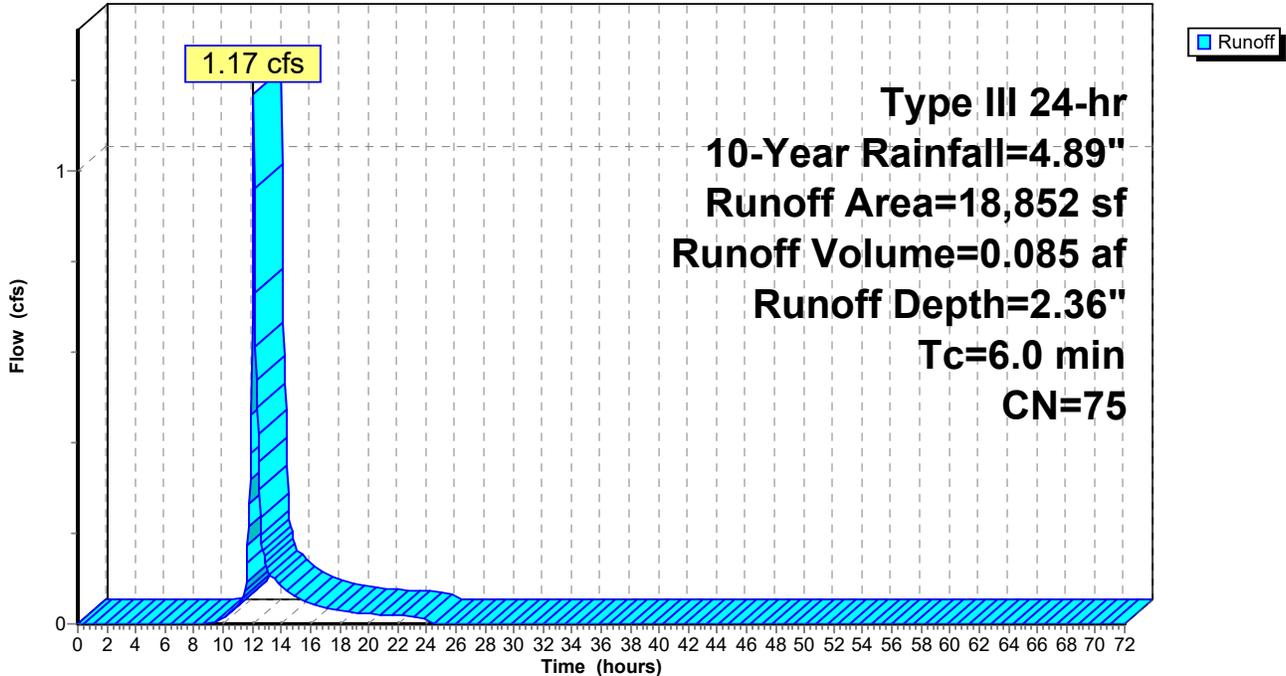
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=4.89"

Area (sf)	CN	Description
11,701	61	>75% Grass cover, Good, HSG B
182	55	Woods, Good, HSG B
0	98	Roofs, HSG B
* 6,111	98	Paved parking/Conc Walks, HSG B
* 858	98	Ledge
18,852	75	Weighted Average
11,883		63.03% Pervious Area
6,969		36.97% Impervious Area

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

Subcatchment 2S: To South Street

Hydrograph



17-360 POST

Prepared by Merrill Associates Inc

HydroCAD® 10.20-2g s/n 02159 © 2022 HydroCAD Software Solutions LLC

Type III 24-hr 10-Year Rainfall=4.89"

Printed 7/19/2023

Page 27

Summary for Subcatchment 3S: To Southern Property Line

Runoff = 0.45 cfs @ 12.11 hrs, Volume= 0.038 af, Depth= 1.11"
 Routed to Reach 3R :

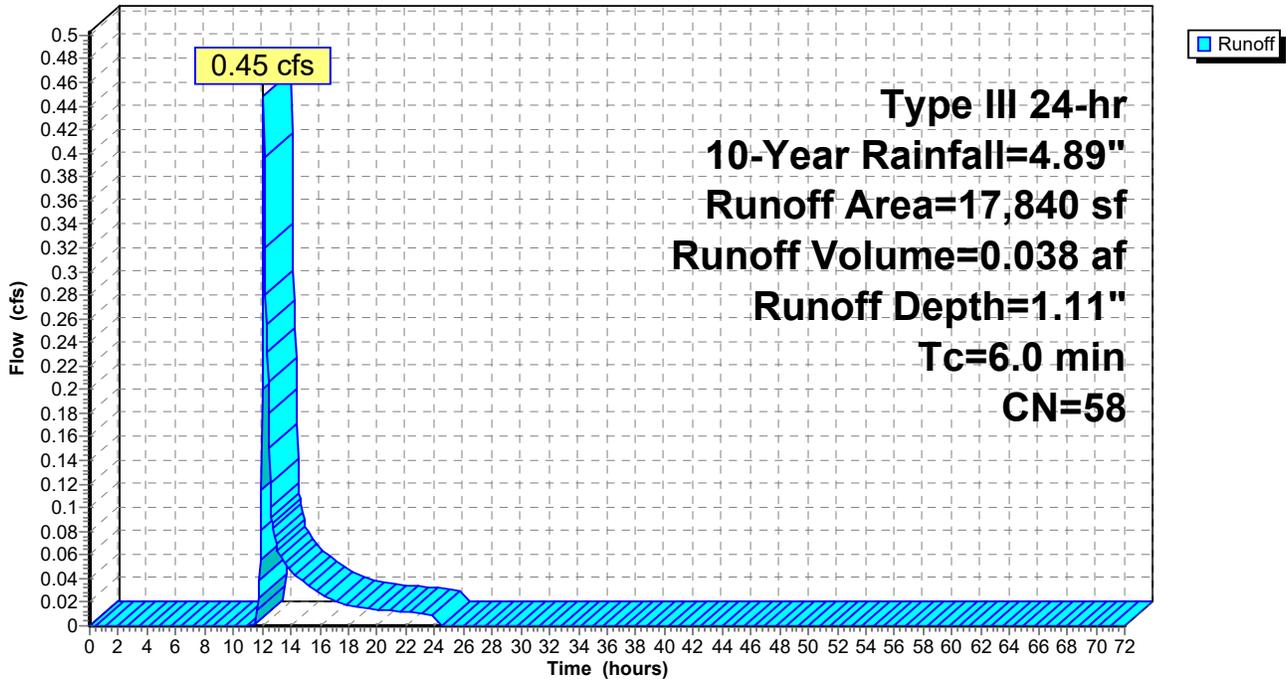
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 Type III 24-hr 10-Year Rainfall=4.89"

Area (sf)	CN	Description
6,785	61	>75% Grass cover, Good, HSG B
10,794	55	Woods, Good, HSG B
0	98	Unconnected pavement, HSG B
* 0	98	Paved parking/Conc Walks, HSG B
* 261	98	Ledge
17,840	58	Weighted Average
17,579		98.54% Pervious Area
261		1.46% Impervious Area

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

Subcatchment 3S: To Southern Property Line

Hydrograph



Summary for Reach 1R: 1R

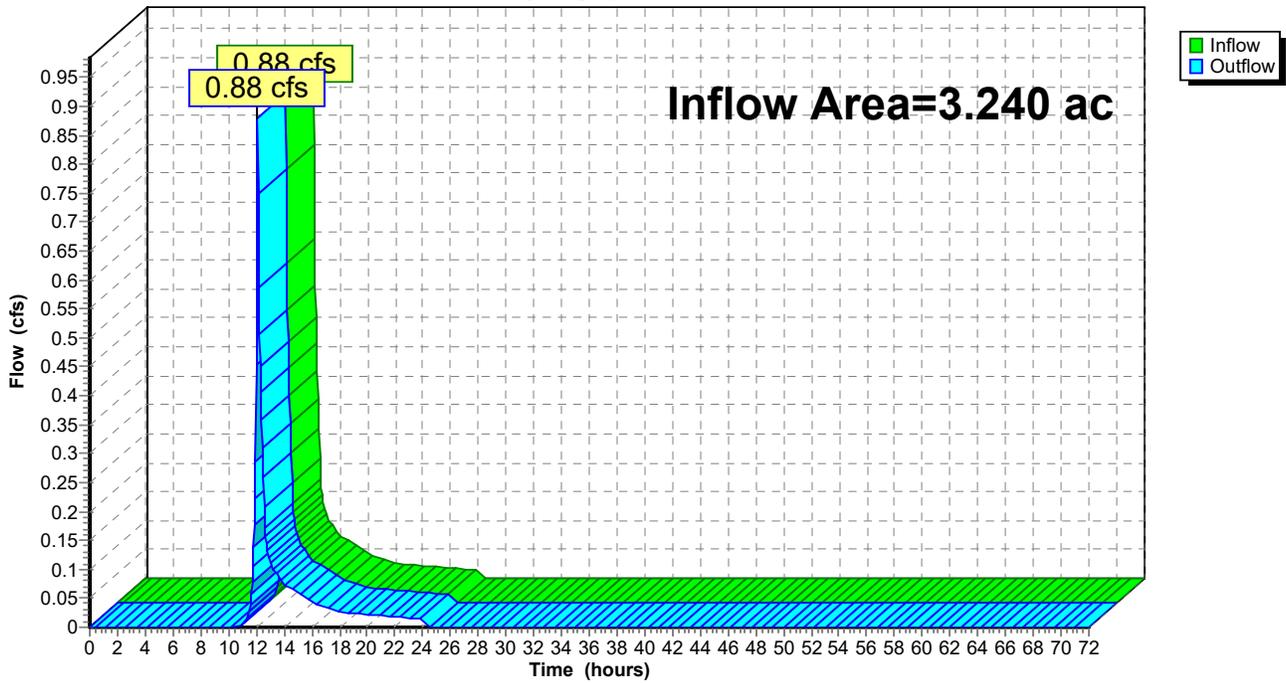
[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 3.240 ac, 26.69% Impervious, Inflow Depth = 0.25" for 10-Year event
Inflow = 0.88 cfs @ 12.10 hrs, Volume= 0.068 af
Outflow = 0.88 cfs @ 12.10 hrs, Volume= 0.068 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Reach 1R: 1R

Hydrograph



Summary for Reach 2R:

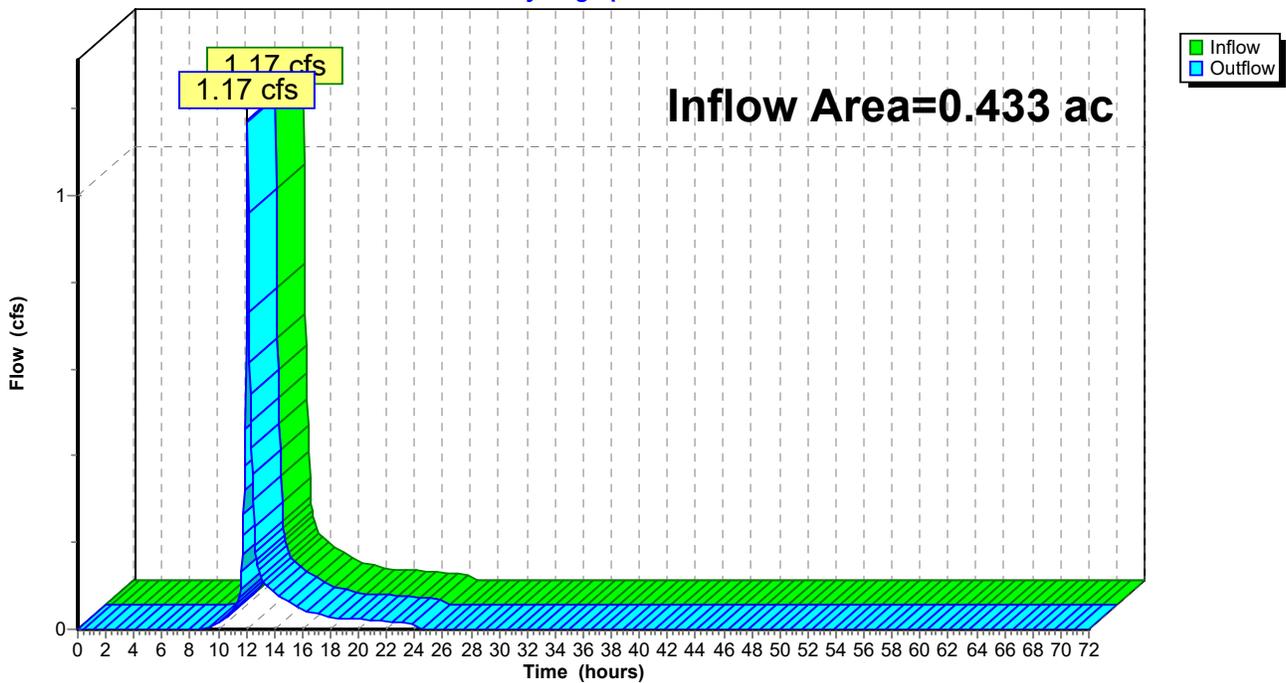
[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 0.433 ac, 36.97% Impervious, Inflow Depth = 2.36" for 10-Year event
Inflow = 1.17 cfs @ 12.09 hrs, Volume= 0.085 af
Outflow = 1.17 cfs @ 12.09 hrs, Volume= 0.085 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Reach 2R:

Hydrograph



Summary for Reach 3R:

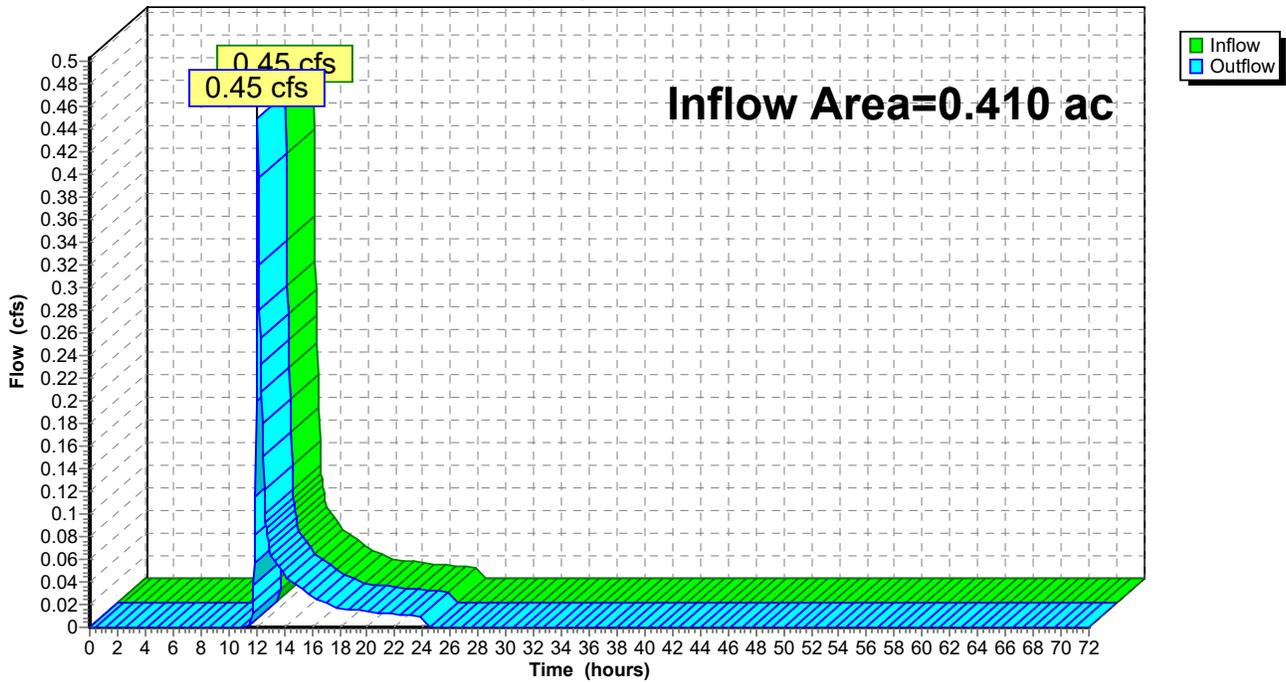
[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 0.410 ac, 1.46% Impervious, Inflow Depth = 1.11" for 10-Year event
Inflow = 0.45 cfs @ 12.11 hrs, Volume= 0.038 af
Outflow = 0.45 cfs @ 12.11 hrs, Volume= 0.038 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Reach 3R:

Hydrograph



Summary for Pond 1P: Infiltration Basin

[87] Warning: Oscillations may require smaller dt or Finer Routing (severity=82)

Inflow Area = 2.702 ac, 29.22% Impervious, Inflow Depth = 2.05" for 10-Year event
 Inflow = 6.27 cfs @ 12.10 hrs, Volume= 0.462 af
 Outflow = 1.37 cfs @ 12.55 hrs, Volume= 0.462 af, Atten= 78%, Lag= 26.9 min
 Discarded = 1.37 cfs @ 12.55 hrs, Volume= 0.462 af
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
 Routed to Reach 1R : 1R
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
 Routed to Reach 1R : 1R

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 Peak Elev= 27.38' @ 12.55 hrs Surf.Area= 4,937 sf Storage= 5,676 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 33.5 min (877.5 - 844.0)

Volume	Invert	Avail.Storage	Storage Description	
#1	26.00'	19,116 cf	Custom Stage Data (Conic) Listed below (Recalc)	
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
26.00	3,308	0	0	3,308
27.00	4,460	3,870	3,870	4,481
28.00	5,752	5,092	8,962	5,797
29.00	7,110	6,419	15,381	7,185
29.50	7,835	3,735	19,116	7,926

Device	Routing	Invert	Outlet Devices
#1	Discarded	26.00'	8.270 in/hr Exfiltration over Wetted area Conductivity to Groundwater Elevation = 23.50'
#2	Secondary	28.50'	12.0' long x 15.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63
#3	Primary	25.90'	18.0" Round Culvert L= 30.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 25.90' / 25.30' S= 0.0200 '/ Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf
#4	Device 3	27.40'	2.4' long x 1.00' rise Sharp-Crested Vee/Trap Weir Cv= 2.62 (C= 3.28)

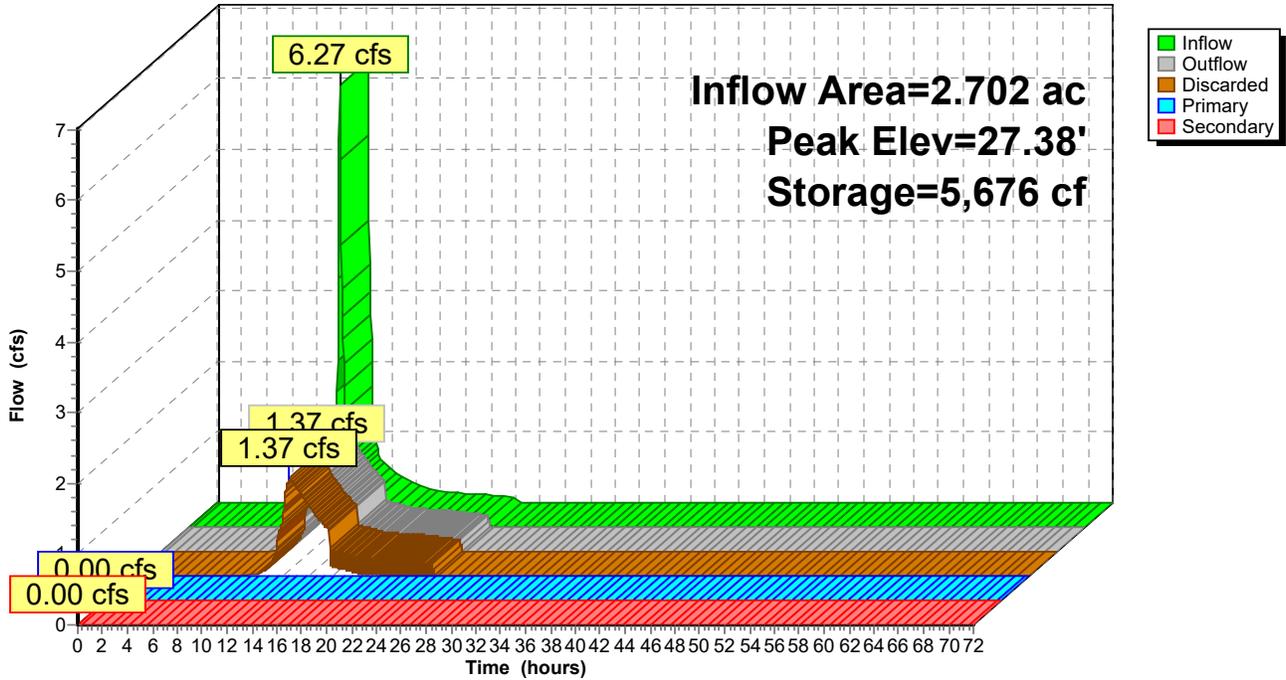
Discarded OutFlow Max=1.37 cfs @ 12.55 hrs HW=27.38' (Free Discharge)
 ↑1=Exfiltration (Controls 1.37 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=26.00' TW=0.00' (Dynamic Tailwater)
 ↑3=Culvert (Passes 0.00 cfs of 0.05 cfs potential flow)
 ↑4=Sharp-Crested Vee/Trap Weir (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=26.00' TW=0.00' (Dynamic Tailwater)
 ↑2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Pond 1P: Infiltration Basin

Hydrograph



17-360 POST

Type III 24-hr 25-Year Rainfall=6.12"

Prepared by Merrill Associates Inc

Printed 7/19/2023

HydroCAD® 10.20-2g s/n 02159 © 2022 HydroCAD Software Solutions LLC

Page 33

Time span=0.00-72.00 hrs, dt=0.05 hrs, 1441 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1aS: Runoff Area=22,412 sf 51.24% Impervious Runoff Depth=3.89"
Flow Length=258' Tc=6.0 min CN=80 Runoff=2.29 cfs 0.167 af

Subcatchment 1bS: Runoff Area=95,283 sf 24.04% Impervious Runoff Depth=2.81"
Flow Length=255' Tc=6.0 min CN=69 Runoff=7.02 cfs 0.512 af

Subcatchment 1cS: Runoff Area=23,419 sf 13.96% Impervious Runoff Depth=2.35"
Flow Length=143' Tc=6.0 min CN=64 Runoff=1.42 cfs 0.105 af

Subcatchment 2S: To South Street Runoff Area=18,852 sf 36.97% Impervious Runoff Depth=3.38"
Tc=6.0 min CN=75 Runoff=1.68 cfs 0.122 af

Subcatchment 3S: To Southern Property Runoff Area=17,840 sf 1.46% Impervious Runoff Depth=1.83"
Tc=6.0 min CN=58 Runoff=0.81 cfs 0.063 af

Reach 1R: 1R Inflow=2.47 cfs 0.177 af
Outflow=2.47 cfs 0.177 af

Reach 2R: Inflow=1.68 cfs 0.122 af
Outflow=1.68 cfs 0.122 af

Reach 3R: Inflow=0.81 cfs 0.063 af
Outflow=0.81 cfs 0.063 af

Pond 1P: Infiltration Basin Peak Elev=27.78' Storage=7,756 cf Inflow=9.30 cfs 0.678 af
Discarded=1.62 cfs 0.607 af Primary=1.88 cfs 0.072 af Secondary=0.00 cfs 0.000 af Outflow=3.50 cfs 0.678 af

Total Runoff Area = 4.082 ac Runoff Volume = 0.968 af Average Runoff Depth = 2.85"
74.76% Pervious = 3.051 ac 25.24% Impervious = 1.030 ac

17-360 POST

Prepared by Merrill Associates Inc

HydroCAD® 10.20-2g s/n 02159 © 2022 HydroCAD Software Solutions LLC

Type III 24-hr 25-Year Rainfall=6.12"

Printed 7/19/2023

Page 34

Summary for Subcatchment 1aS:

Runoff = 2.29 cfs @ 12.09 hrs, Volume= 0.167 af, Depth= 3.89"
 Routed to Pond 1P : Infiltration Basin

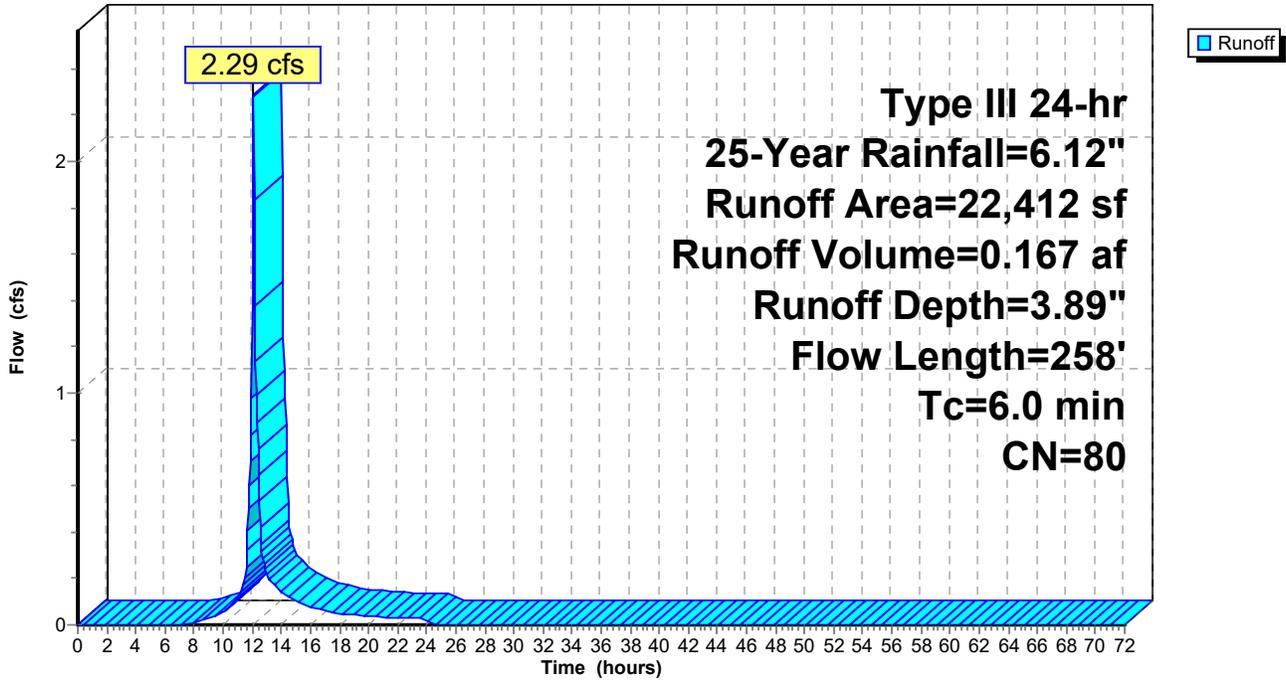
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 Type III 24-hr 25-Year Rainfall=6.12"

Area (sf)	CN	Description
10,928	61	>75% Grass cover, Good, HSG B
0	55	Woods, Good, HSG B
672	98	Roofs, HSG B
* 7,750	98	Paved parking/Conc Walks, HSG B
* 3,062	98	Ledge
22,412	80	Weighted Average
10,928		48.76% Pervious Area
11,484		51.24% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.2	50	0.0780	0.26		Sheet Flow, Grass: Short n= 0.150 P2= 3.31"
0.1	38	0.1970	7.15		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
0.0	13	0.1540	7.97		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.2	76	0.1450	6.13		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
0.3	65	0.0250	3.21		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.1	16	0.0300	2.79		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
3.9	258	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 1aS:

Hydrograph



17-360 POST

Prepared by Merrill Associates Inc

HydroCAD® 10.20-2g s/n 02159 © 2022 HydroCAD Software Solutions LLC

Type III 24-hr 25-Year Rainfall=6.12"

Printed 7/19/2023

Page 36

Summary for Subcatchment 1bS:

Runoff = 7.02 cfs @ 12.10 hrs, Volume= 0.512 af, Depth= 2.81"
 Routed to Pond 1P : Infiltration Basin

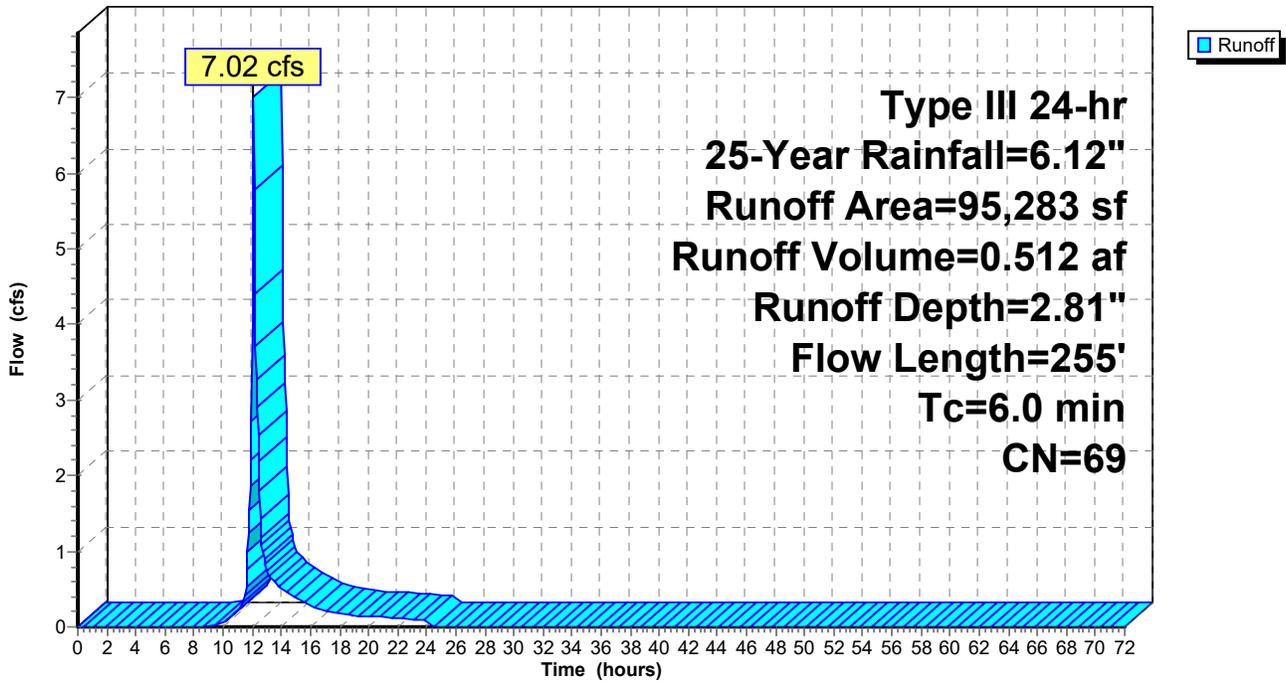
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 Type III 24-hr 25-Year Rainfall=6.12"

Area (sf)	CN	Description
65,624	61	>75% Grass cover, Good, HSG B
6,756	55	Woods, Good, HSG B
4,124	98	Roofs, HSG B
* 17,346	98	Paved parking/Conc Walks, HSG B
* 1,433	98	Ledge
95,283	69	Weighted Average
72,380		75.96% Pervious Area
22,903		24.04% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.4	50	0.0700	0.25		Sheet Flow, Grass: Short n= 0.150 P2= 3.31"
0.7	85	0.0170	2.10		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
0.1	55	0.1820	6.87		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
0.4	65	0.0310	2.83		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
4.6	255	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 1bS:

Hydrograph



Summary for Subcatchment 1cS:

Runoff = 1.42 cfs @ 12.10 hrs, Volume= 0.105 af, Depth= 2.35"
 Routed to Reach 1R : 1R

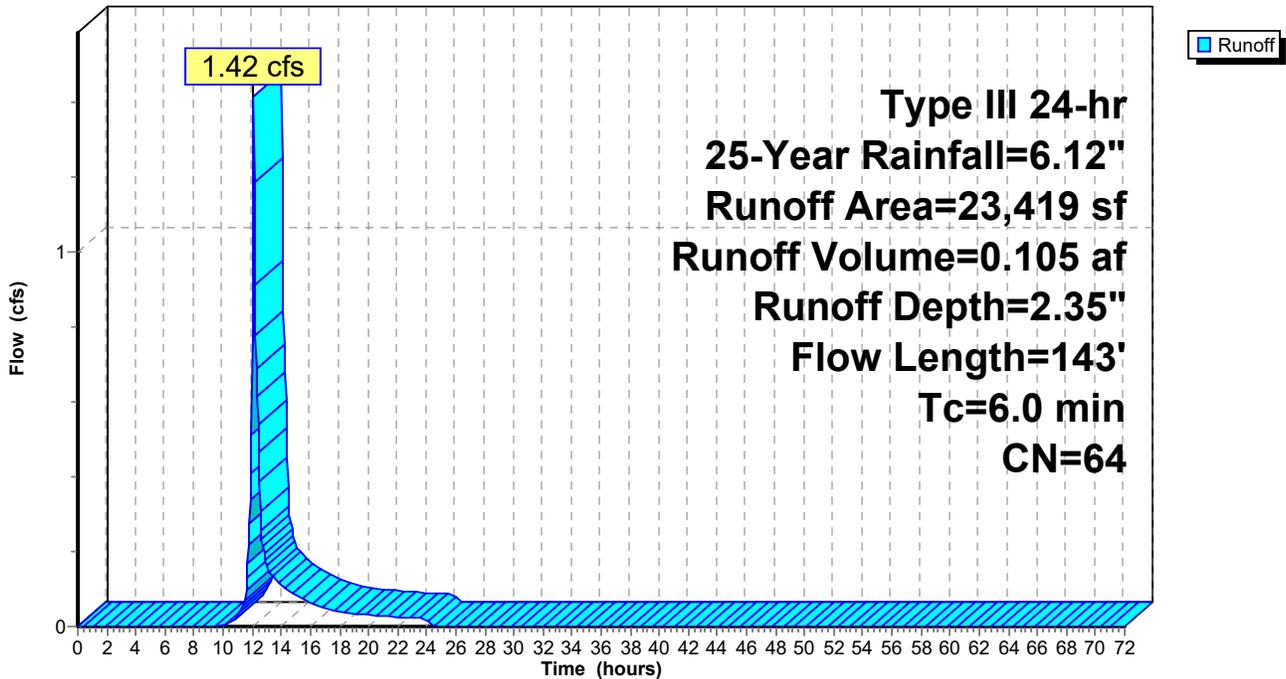
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 Type III 24-hr 25-Year Rainfall=6.12"

Area (sf)	CN	Description
9,992	61	>75% Grass cover, Good, HSG B
10,157	55	Woods, Good, HSG B
1,696	98	Roofs, HSG B
* 1,574	98	Paved parking/Conc Walks, HSG B
* 0	98	Ledge
23,419	64	Weighted Average
20,149		86.04% Pervious Area
3,270		13.96% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.6	50	0.1400	0.15		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.31"
0.3	93	0.1000	5.09		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
5.9	143	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 1cS:

Hydrograph



Summary for Subcatchment 2S: To South Street

Runoff = 1.68 cfs @ 12.09 hrs, Volume= 0.122 af, Depth= 3.38"
 Routed to Reach 2R :

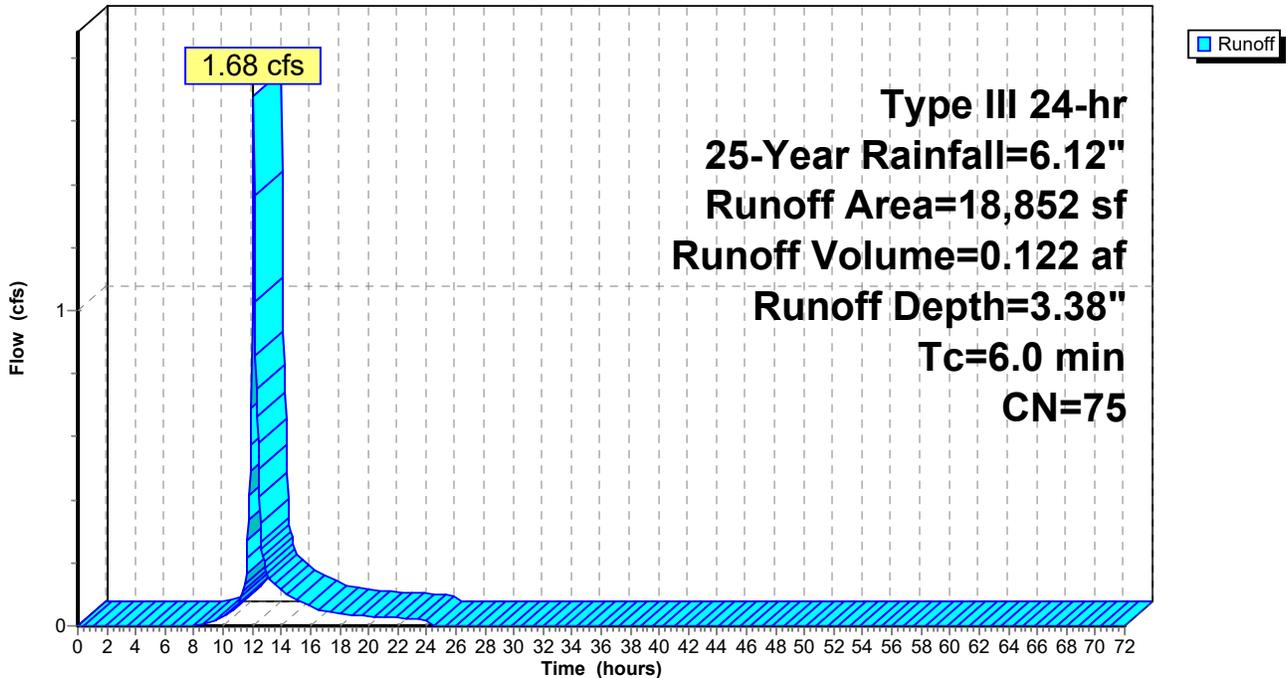
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 Type III 24-hr 25-Year Rainfall=6.12"

Area (sf)	CN	Description
11,701	61	>75% Grass cover, Good, HSG B
182	55	Woods, Good, HSG B
0	98	Roofs, HSG B
* 6,111	98	Paved parking/Conc Walks, HSG B
* 858	98	Ledge
18,852	75	Weighted Average
11,883		63.03% Pervious Area
6,969		36.97% Impervious Area

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

Subcatchment 2S: To South Street

Hydrograph



17-360 POST

Prepared by Merrill Associates Inc

HydroCAD® 10.20-2g s/n 02159 © 2022 HydroCAD Software Solutions LLC

Type III 24-hr 25-Year Rainfall=6.12"

Printed 7/19/2023

Page 40

Summary for Subcatchment 3S: To Southern Property Line

Runoff = 0.81 cfs @ 12.10 hrs, Volume= 0.063 af, Depth= 1.83"

Routed to Reach 3R :

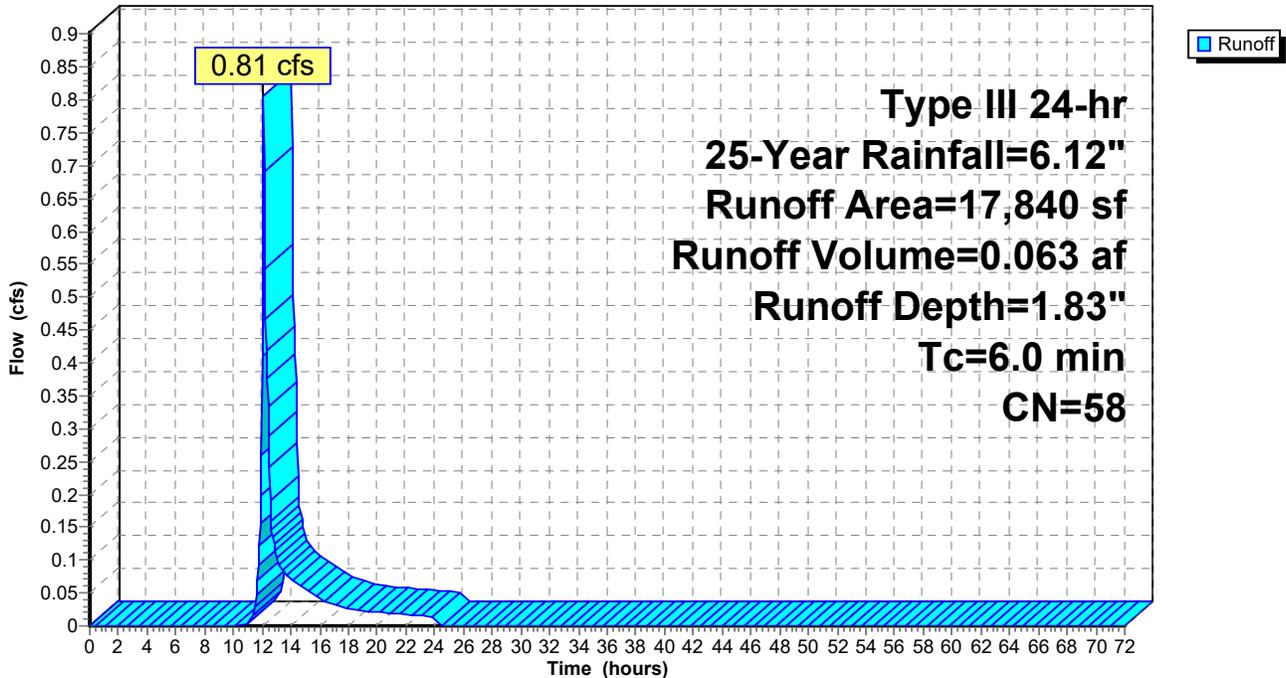
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 Type III 24-hr 25-Year Rainfall=6.12"

Area (sf)	CN	Description
6,785	61	>75% Grass cover, Good, HSG B
10,794	55	Woods, Good, HSG B
0	98	Unconnected pavement, HSG B
* 0	98	Paved parking/Conc Walks, HSG B
* 261	98	Ledge
17,840	58	Weighted Average
17,579		98.54% Pervious Area
261		1.46% Impervious Area

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

Subcatchment 3S: To Southern Property Line

Hydrograph

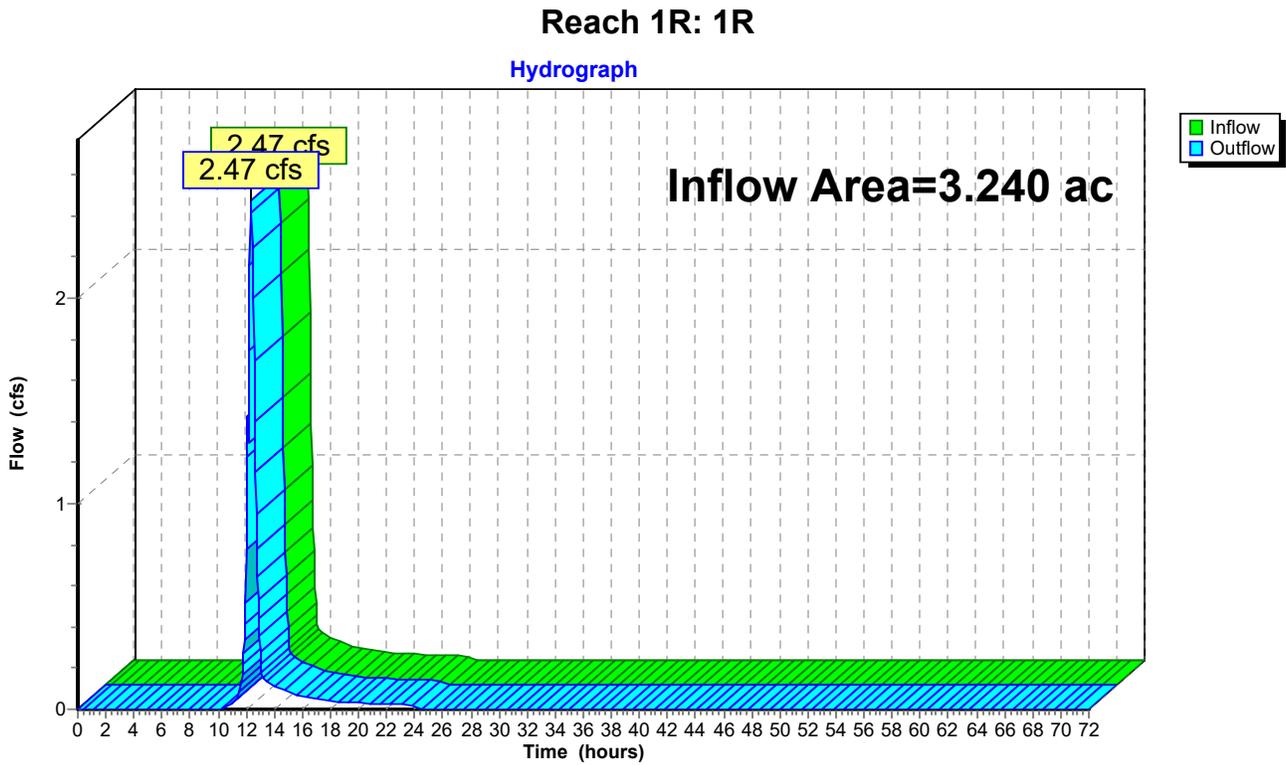


Summary for Reach 1R: 1R

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 3.240 ac, 26.69% Impervious, Inflow Depth = 0.66" for 25-Year event
Inflow = 2.47 cfs @ 12.35 hrs, Volume= 0.177 af
Outflow = 2.47 cfs @ 12.35 hrs, Volume= 0.177 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs



Summary for Reach 2R:

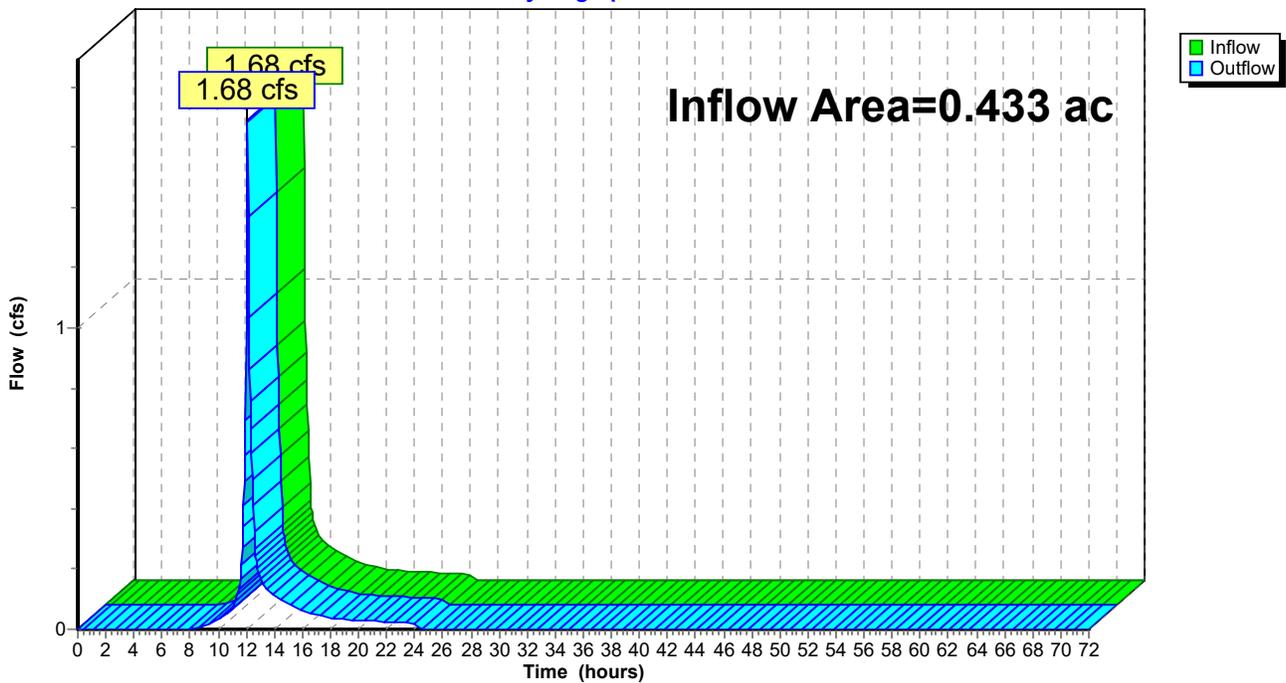
[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 0.433 ac, 36.97% Impervious, Inflow Depth = 3.38" for 25-Year event
Inflow = 1.68 cfs @ 12.09 hrs, Volume= 0.122 af
Outflow = 1.68 cfs @ 12.09 hrs, Volume= 0.122 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Reach 2R:

Hydrograph



Summary for Reach 3R:

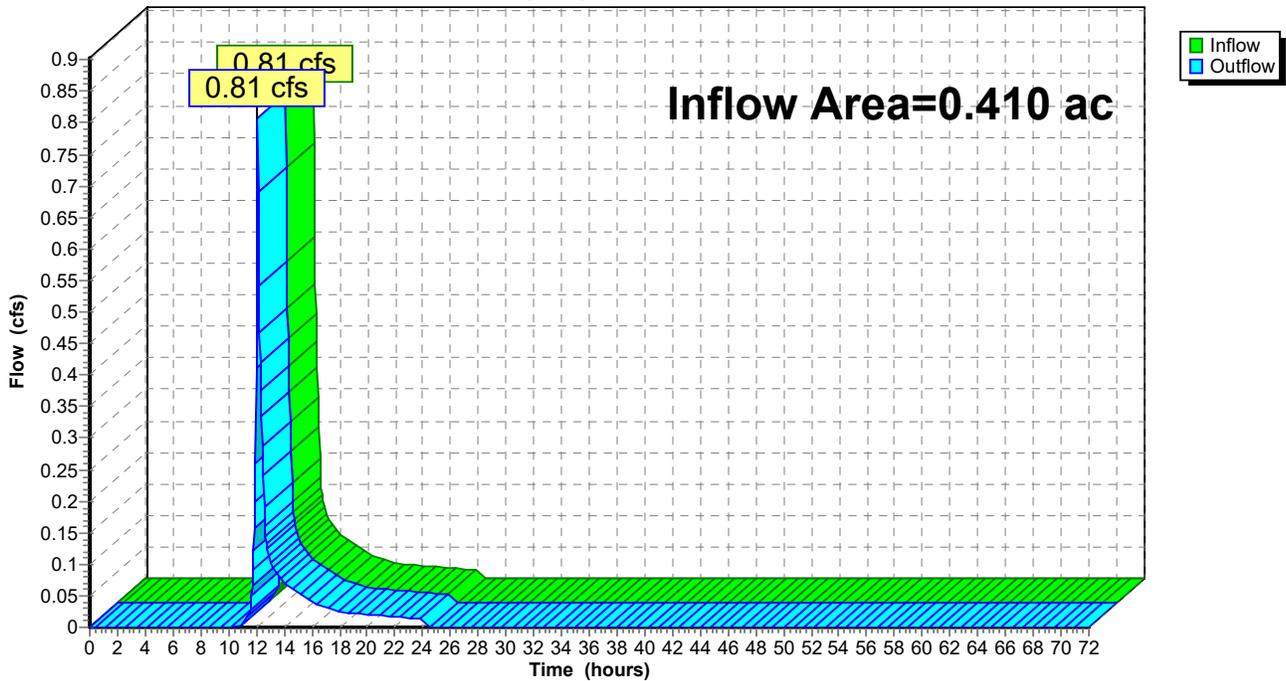
[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 0.410 ac, 1.46% Impervious, Inflow Depth = 1.83" for 25-Year event
Inflow = 0.81 cfs @ 12.10 hrs, Volume= 0.063 af
Outflow = 0.81 cfs @ 12.10 hrs, Volume= 0.063 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Reach 3R:

Hydrograph



Summary for Pond 1P: Infiltration Basin

[87] Warning: Oscillations may require smaller dt or Finer Routing (severity=72)

Inflow Area = 2.702 ac, 29.22% Impervious, Inflow Depth = 3.01" for 25-Year event
 Inflow = 9.30 cfs @ 12.09 hrs, Volume= 0.678 af
 Outflow = 3.50 cfs @ 12.38 hrs, Volume= 0.678 af, Atten= 62%, Lag= 17.3 min
 Discarded = 1.62 cfs @ 12.38 hrs, Volume= 0.607 af
 Primary = 1.88 cfs @ 12.38 hrs, Volume= 0.072 af
 Routed to Reach 1R : 1R
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
 Routed to Reach 1R : 1R

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 Peak Elev= 27.78' @ 12.38 hrs Surf.Area= 5,460 sf Storage= 7,756 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 34.6 min (867.7 - 833.1)

Volume	Invert	Avail.Storage	Storage Description
#1	26.00'	19,116 cf	Custom Stage Data (Conic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet) Wet.Area (sq-ft)
26.00	3,308	0	0 3,308
27.00	4,460	3,870	3,870 4,481
28.00	5,752	5,092	8,962 5,797
29.00	7,110	6,419	15,381 7,185
29.50	7,835	3,735	19,116 7,926

Device	Routing	Invert	Outlet Devices
#1	Discarded	26.00'	8.270 in/hr Exfiltration over Wetted area Conductivity to Groundwater Elevation = 23.50'
#2	Secondary	28.50'	12.0' long x 15.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63
#3	Primary	25.90'	18.0" Round Culvert L= 30.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 25.90' / 25.30' S= 0.0200 '/ Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf
#4	Device 3	27.40'	2.4' long x 1.00' rise Sharp-Crested Vee/Trap Weir Cv= 2.62 (C= 3.28)

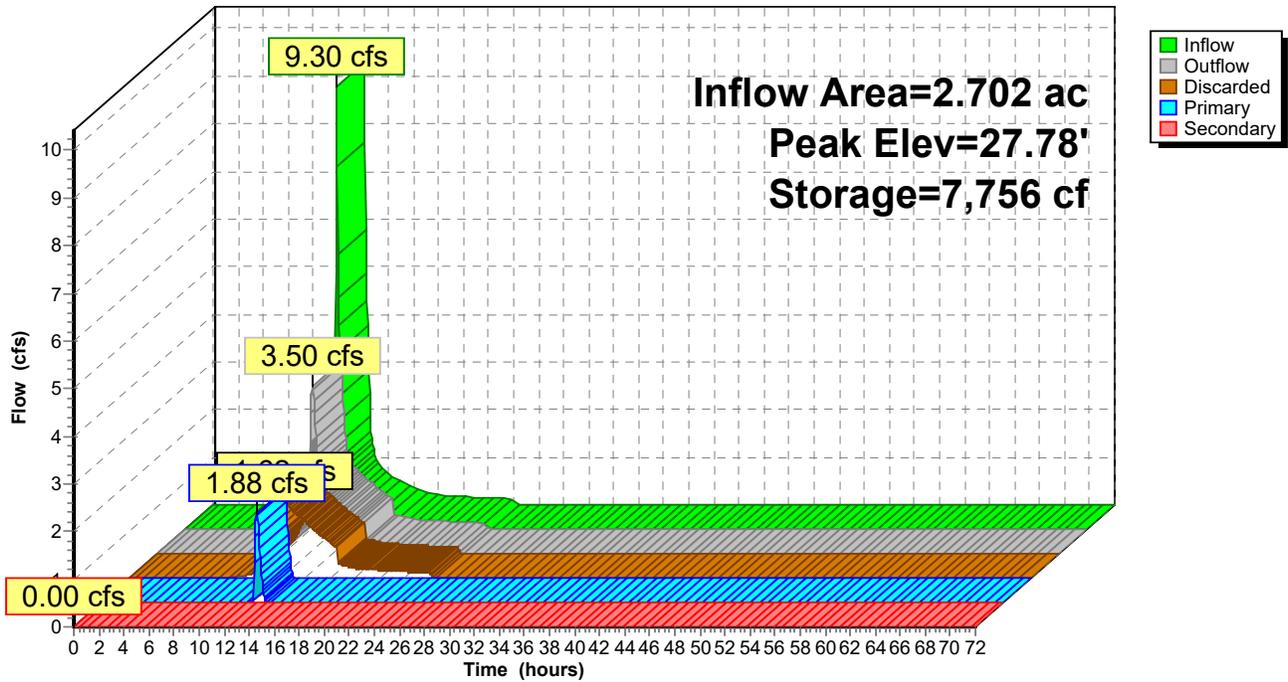
Discarded OutFlow Max=1.62 cfs @ 12.38 hrs HW=27.78' (Free Discharge)
 ↑1=Exfiltration (Controls 1.62 cfs)

Primary OutFlow Max=1.87 cfs @ 12.38 hrs HW=27.78' TW=0.00' (Dynamic Tailwater)
 ↑3=Culvert (Passes 1.87 cfs of 9.06 cfs potential flow)
 ↑4=Sharp-Crested Vee/Trap Weir (Weir Controls 1.87 cfs @ 2.03 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=26.00' TW=0.00' (Dynamic Tailwater)
 ↑2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Pond 1P: Infiltration Basin

Hydrograph



17-360 POST

Type III 24-hr 100-Year Rainfall=8.60"

Prepared by Merrill Associates Inc

Printed 7/19/2023

HydroCAD® 10.20-2g s/n 02159 © 2022 HydroCAD Software Solutions LLC

Page 46

Time span=0.00-72.00 hrs, dt=0.05 hrs, 1441 points
 Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
 Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1aS: Runoff Area=22,412 sf 51.24% Impervious Runoff Depth=6.19"
 Flow Length=258' Tc=6.0 min CN=80 Runoff=3.58 cfs 0.265 af

Subcatchment 1bS: Runoff Area=95,283 sf 24.04% Impervious Runoff Depth=4.86"
 Flow Length=255' Tc=6.0 min CN=69 Runoff=12.23 cfs 0.887 af

Subcatchment 1cS: Runoff Area=23,419 sf 13.96% Impervious Runoff Depth=4.27"
 Flow Length=143' Tc=6.0 min CN=64 Runoff=2.63 cfs 0.191 af

Subcatchment 2S: To South Street Runoff Area=18,852 sf 36.97% Impervious Runoff Depth=5.59"
 Tc=6.0 min CN=75 Runoff=2.76 cfs 0.201 af

Subcatchment 3S: To Southern Property Runoff Area=17,840 sf 1.46% Impervious Runoff Depth=3.55"
 Tc=6.0 min CN=58 Runoff=1.65 cfs 0.121 af

Reach 1R: 1R Inflow=8.82 cfs 0.497 af
 Outflow=8.82 cfs 0.497 af

Reach 2R: Inflow=2.76 cfs 0.201 af
 Outflow=2.76 cfs 0.201 af

Reach 3R: Inflow=1.65 cfs 0.121 af
 Outflow=1.65 cfs 0.121 af

Pond 1P: Infiltration Basin Peak Elev=28.35' Storage=11,039 cf Inflow=15.80 cfs 1.152 af
 Discarded=1.99 cfs 0.846 af Primary=7.25 cfs 0.306 af Secondary=0.00 cfs 0.000 af Outflow=9.23 cfs 1.152 af

Total Runoff Area = 4.082 ac Runoff Volume = 1.666 af Average Runoff Depth = 4.90"
74.76% Pervious = 3.051 ac 25.24% Impervious = 1.030 ac

17-360 POST

Prepared by Merrill Associates Inc

HydroCAD® 10.20-2g s/n 02159 © 2022 HydroCAD Software Solutions LLC

Type III 24-hr 100-Year Rainfall=8.60"

Printed 7/19/2023

Page 47

Summary for Subcatchment 1aS:

Runoff = 3.58 cfs @ 12.09 hrs, Volume= 0.265 af, Depth= 6.19"
 Routed to Pond 1P : Infiltration Basin

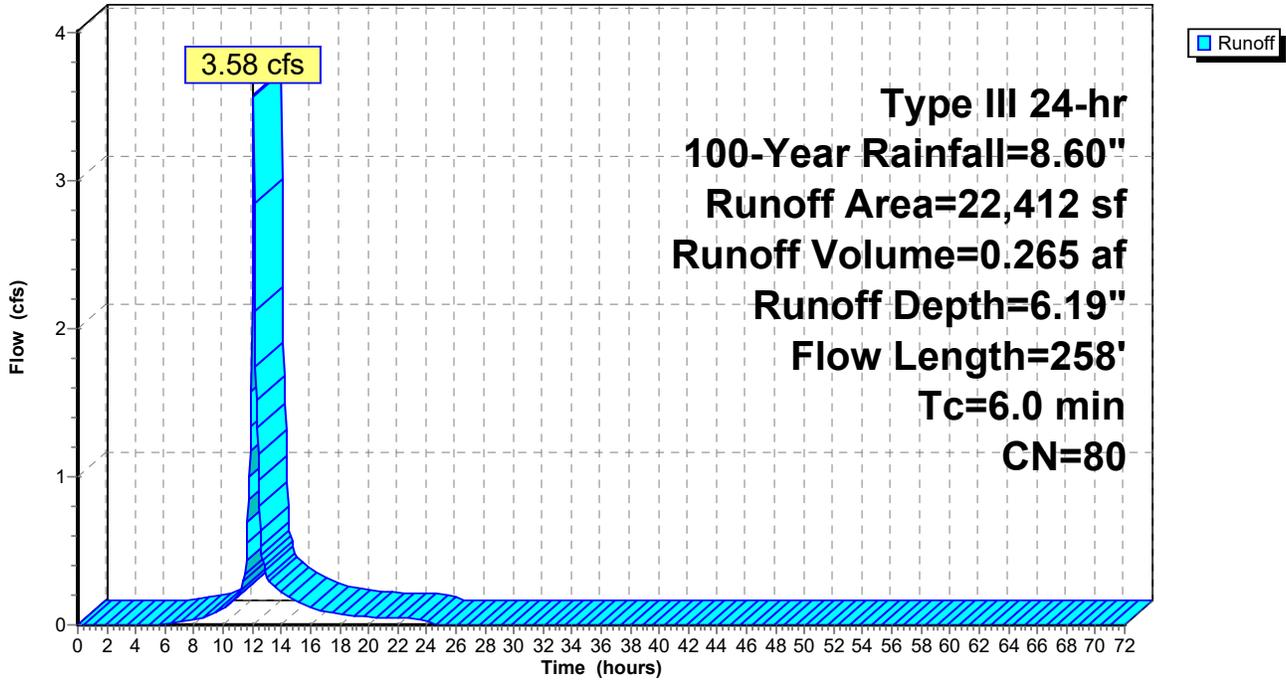
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 Type III 24-hr 100-Year Rainfall=8.60"

Area (sf)	CN	Description
10,928	61	>75% Grass cover, Good, HSG B
0	55	Woods, Good, HSG B
672	98	Roofs, HSG B
* 7,750	98	Paved parking/Conc Walks, HSG B
* 3,062	98	Ledge
22,412	80	Weighted Average
10,928		48.76% Pervious Area
11,484		51.24% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.2	50	0.0780	0.26		Sheet Flow, Grass: Short n= 0.150 P2= 3.31"
0.1	38	0.1970	7.15		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
0.0	13	0.1540	7.97		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.2	76	0.1450	6.13		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
0.3	65	0.0250	3.21		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.1	16	0.0300	2.79		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
3.9	258	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 1aS:

Hydrograph



17-360 POST

Type III 24-hr 100-Year Rainfall=8.60"

Prepared by Merrill Associates Inc

Printed 7/19/2023

HydroCAD® 10.20-2g s/n 02159 © 2022 HydroCAD Software Solutions LLC

Page 49

Summary for Subcatchment 1bS:

Runoff = 12.23 cfs @ 12.09 hrs, Volume= 0.887 af, Depth= 4.86"
 Routed to Pond 1P : Infiltration Basin

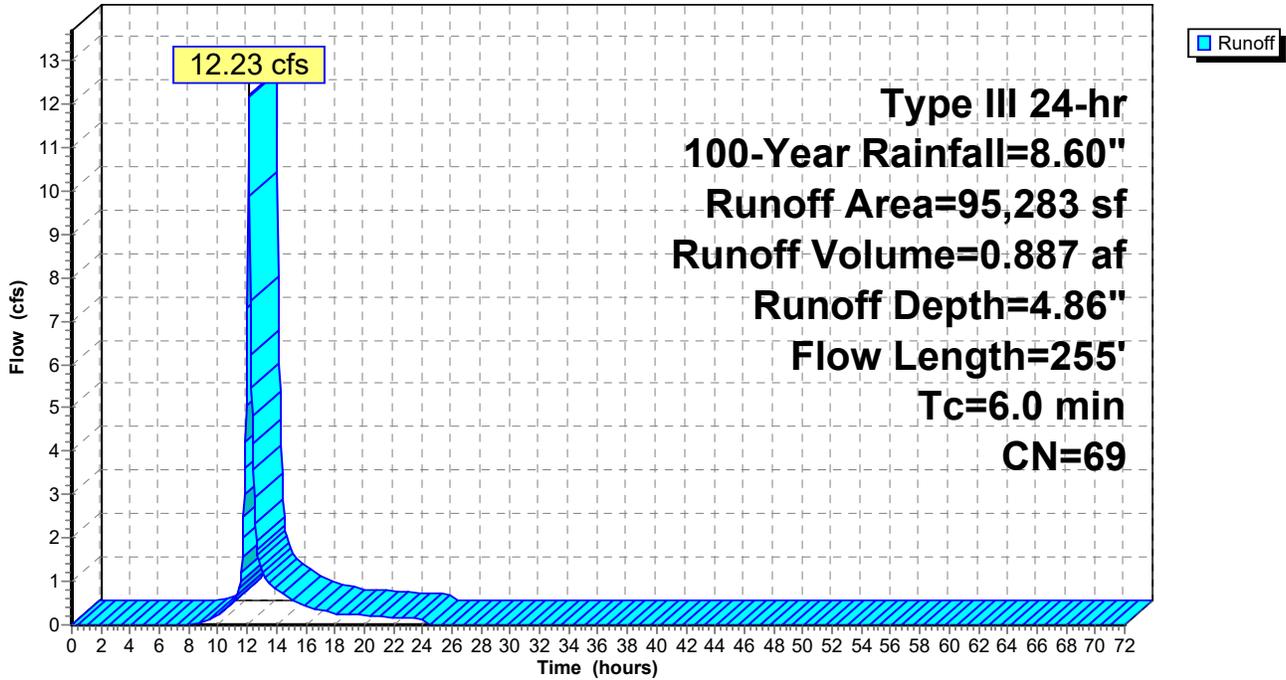
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 Type III 24-hr 100-Year Rainfall=8.60"

Area (sf)	CN	Description
65,624	61	>75% Grass cover, Good, HSG B
6,756	55	Woods, Good, HSG B
4,124	98	Roofs, HSG B
* 17,346	98	Paved parking/Conc Walks, HSG B
* 1,433	98	Ledge
95,283	69	Weighted Average
72,380		75.96% Pervious Area
22,903		24.04% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.4	50	0.0700	0.25		Sheet Flow, Grass: Short n= 0.150 P2= 3.31"
0.7	85	0.0170	2.10		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
0.1	55	0.1820	6.87		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
0.4	65	0.0310	2.83		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
4.6	255	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 1bS:

Hydrograph



Summary for Subcatchment 1cS:

Runoff = 2.63 cfs @ 12.09 hrs, Volume= 0.191 af, Depth= 4.27"
 Routed to Reach 1R : 1R

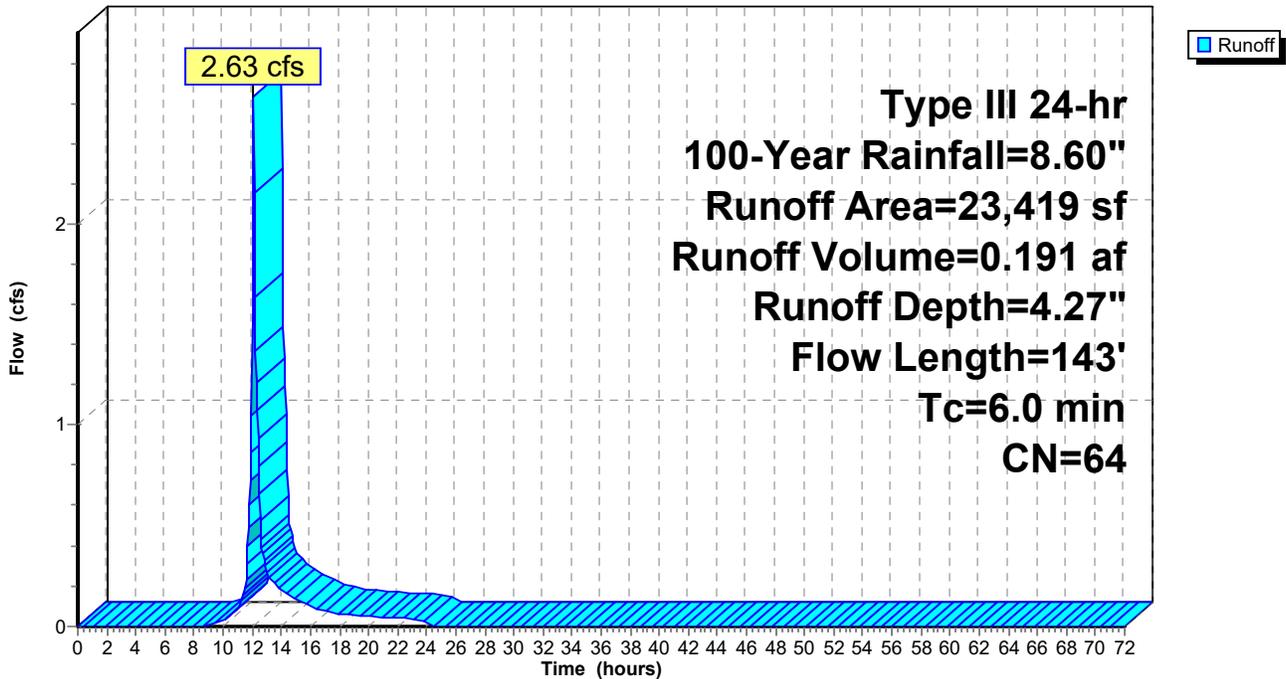
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 Type III 24-hr 100-Year Rainfall=8.60"

Area (sf)	CN	Description
9,992	61	>75% Grass cover, Good, HSG B
10,157	55	Woods, Good, HSG B
1,696	98	Roofs, HSG B
* 1,574	98	Paved parking/Conc Walks, HSG B
* 0	98	Ledge
23,419	64	Weighted Average
20,149		86.04% Pervious Area
3,270		13.96% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.6	50	0.1400	0.15		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.31"
0.3	93	0.1000	5.09		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
5.9	143	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 1cS:

Hydrograph



17-360 POST

Prepared by Merrill Associates Inc

HydroCAD® 10.20-2g s/n 02159 © 2022 HydroCAD Software Solutions LLC

Type III 24-hr 100-Year Rainfall=8.60"

Printed 7/19/2023

Page 52

Summary for Subcatchment 2S: To South Street

Runoff = 2.76 cfs @ 12.09 hrs, Volume= 0.201 af, Depth= 5.59"
 Routed to Reach 2R :

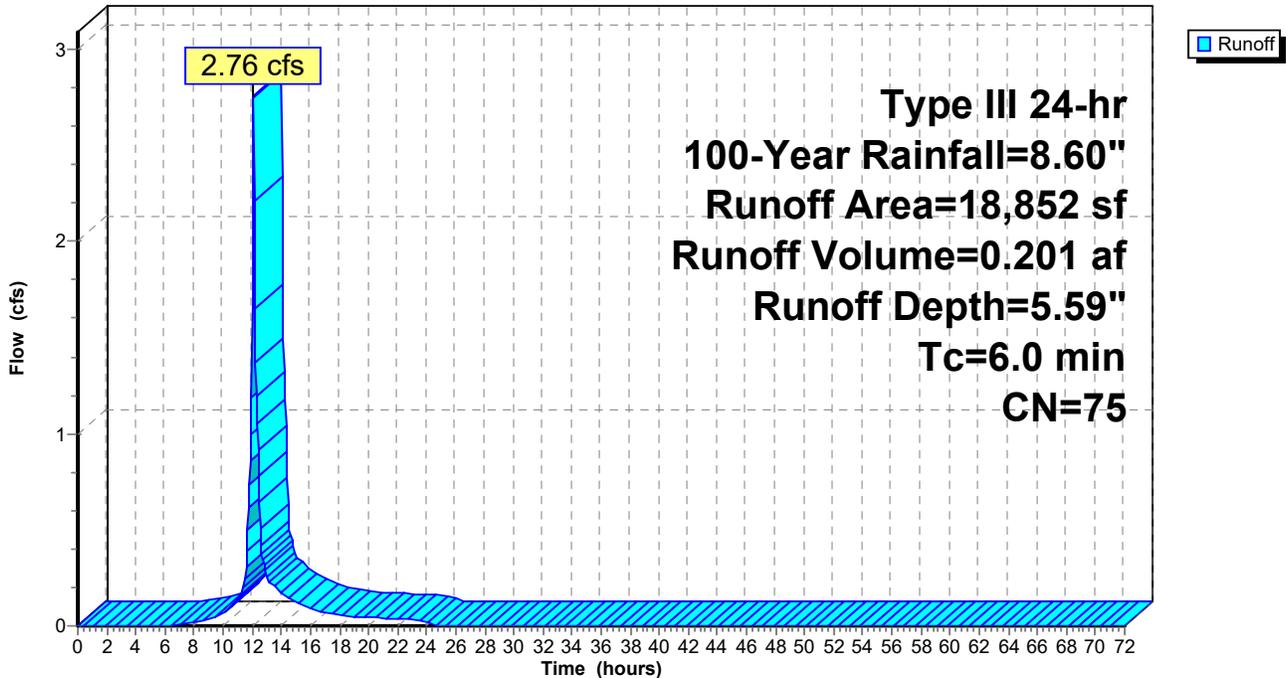
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 Type III 24-hr 100-Year Rainfall=8.60"

Area (sf)	CN	Description
11,701	61	>75% Grass cover, Good, HSG B
182	55	Woods, Good, HSG B
0	98	Roofs, HSG B
* 6,111	98	Paved parking/Conc Walks, HSG B
* 858	98	Ledge
18,852	75	Weighted Average
11,883		63.03% Pervious Area
6,969		36.97% Impervious Area

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

Subcatchment 2S: To South Street

Hydrograph



17-360 POST

Prepared by Merrill Associates Inc

HydroCAD® 10.20-2g s/n 02159 © 2022 HydroCAD Software Solutions LLC

Type III 24-hr 100-Year Rainfall=8.60"

Printed 7/19/2023

Page 53

Summary for Subcatchment 3S: To Southern Property Line

Runoff = 1.65 cfs @ 12.10 hrs, Volume= 0.121 af, Depth= 3.55"
Routed to Reach 3R :

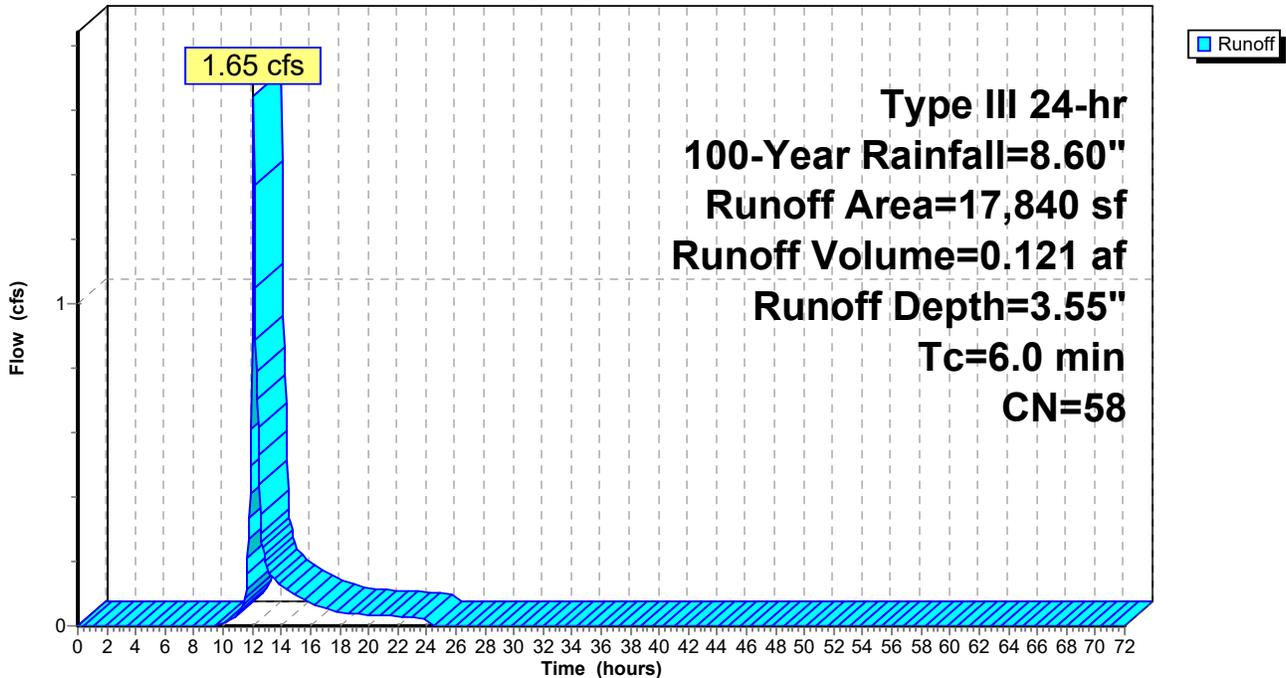
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=8.60"

Area (sf)	CN	Description
6,785	61	>75% Grass cover, Good, HSG B
10,794	55	Woods, Good, HSG B
0	98	Unconnected pavement, HSG B
* 0	98	Paved parking/Conc Walks, HSG B
* 261	98	Ledge
17,840	58	Weighted Average
17,579		98.54% Pervious Area
261		1.46% Impervious Area

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

Subcatchment 3S: To Southern Property Line

Hydrograph



Summary for Reach 1R: 1R

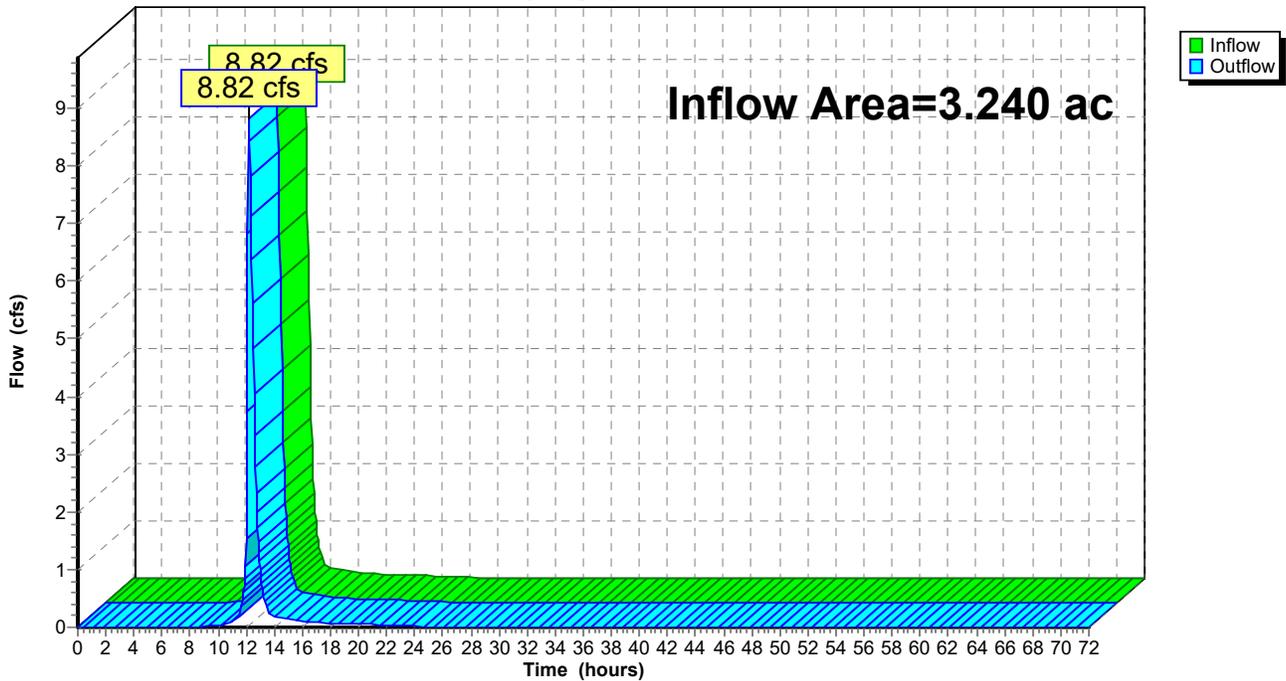
[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 3.240 ac, 26.69% Impervious, Inflow Depth = 1.84" for 100-Year event
Inflow = 8.82 cfs @ 12.20 hrs, Volume= 0.497 af
Outflow = 8.82 cfs @ 12.20 hrs, Volume= 0.497 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Reach 1R: 1R

Hydrograph



Summary for Reach 2R:

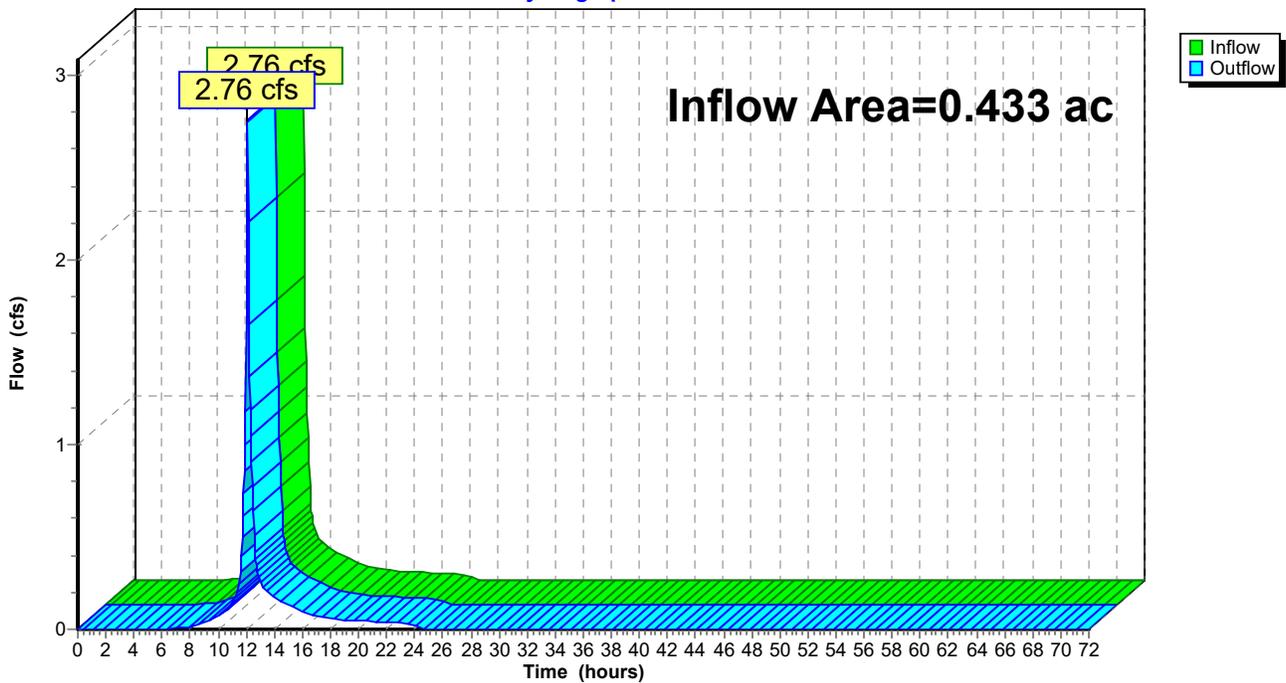
[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 0.433 ac, 36.97% Impervious, Inflow Depth = 5.59" for 100-Year event
Inflow = 2.76 cfs @ 12.09 hrs, Volume= 0.201 af
Outflow = 2.76 cfs @ 12.09 hrs, Volume= 0.201 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Reach 2R:

Hydrograph



Summary for Reach 3R:

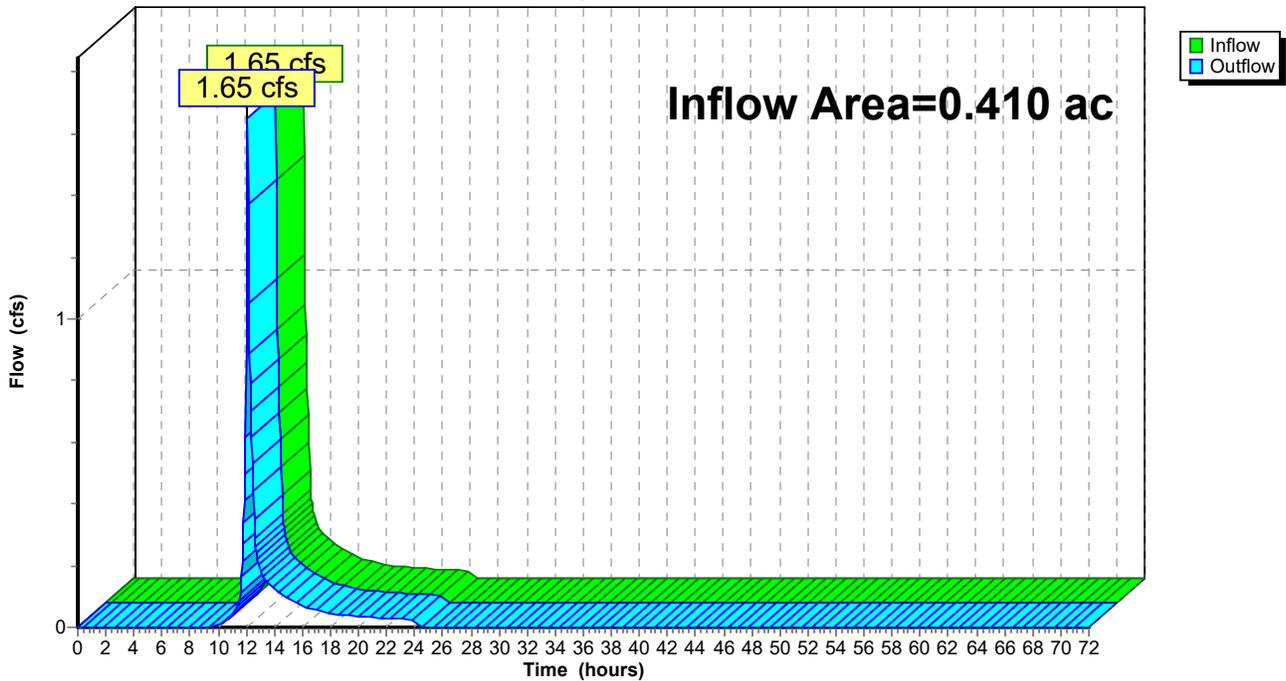
[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 0.410 ac, 1.46% Impervious, Inflow Depth = 3.55" for 100-Year event
Inflow = 1.65 cfs @ 12.10 hrs, Volume= 0.121 af
Outflow = 1.65 cfs @ 12.10 hrs, Volume= 0.121 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Reach 3R:

Hydrograph



Summary for Pond 1P: Infiltration Basin

Inflow Area = 2.702 ac, 29.22% Impervious, Inflow Depth = 5.12" for 100-Year event
 Inflow = 15.80 cfs @ 12.09 hrs, Volume= 1.152 af
 Outflow = 9.23 cfs @ 12.22 hrs, Volume= 1.152 af, Atten= 42%, Lag= 7.6 min
 Discarded = 1.99 cfs @ 12.22 hrs, Volume= 0.846 af
 Primary = 7.25 cfs @ 12.22 hrs, Volume= 0.306 af
 Routed to Reach 1R : 1R
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
 Routed to Reach 1R : 1R

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 Peak Elev= 28.35' @ 12.22 hrs Surf.Area= 6,207 sf Storage= 11,039 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 31.7 min (850.0 - 818.3)

Volume	Invert	Avail.Storage	Storage Description		
#1	26.00'	19,116 cf	Custom Stage Data (Conic) Listed below (Recalc)		
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)	
26.00	3,308	0	0	3,308	
27.00	4,460	3,870	3,870	4,481	
28.00	5,752	5,092	8,962	5,797	
29.00	7,110	6,419	15,381	7,185	
29.50	7,835	3,735	19,116	7,926	

Device	Routing	Invert	Outlet Devices
#1	Discarded	26.00'	8.270 in/hr Exfiltration over Wetted area Conductivity to Groundwater Elevation = 23.50'
#2	Secondary	28.50'	12.0' long x 15.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63
#3	Primary	25.90'	18.0" Round Culvert L= 30.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 25.90' / 25.30' S= 0.0200 '/ S= 0.0200 '/ Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf
#4	Device 3	27.40'	2.4' long x 1.00' rise Sharp-Crested Vee/Trap Weir Cv= 2.62 (C= 3.28)

Discarded OutFlow Max=1.98 cfs @ 12.22 hrs HW=28.34' (Free Discharge)
 ↑1=Exfiltration (Controls 1.98 cfs)

Primary OutFlow Max=7.14 cfs @ 12.22 hrs HW=28.34' TW=0.00' (Dynamic Tailwater)
 ↑3=Culvert (Passes 7.14 cfs of 11.05 cfs potential flow)
 ↑4=Sharp-Crested Vee/Trap Weir (Weir Controls 7.14 cfs @ 3.17 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=26.00' TW=0.00' (Dynamic Tailwater)
 ↑2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Pond 1P: Infiltration Basin

Hydrograph

