



**NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES)
DISCHARGES OF STORMWATER ASSOCIATED WITH CONSTRUCTION ACTIVITIES
POST-CONSTRUCTION STORMWATER MANAGEMENT (PCSM) MODULE 2**

Applicant: 180-115 C-1 Site, LLC

Project Site Name: 180-115 C-1 Site, LLC .

Surface Water Name(s): EV wetlands to
Tunkhannock creek

Surface Water Use(s): HQ-CWF, MF

PCSM PLAN INFORMATION

1. Identify all structural and non-structural PCSM BMPs that have been selected and provide the information requested.

Discharge Point(s)	BMP ID	BMP Name	BMP Manual	Latitude	Longitude	DA Treated (ac)

NO BMPS IN THIS WATERSHED

Undetained Areas: 5.77 acre(s)

The Project Qualifies as a Site Restoration Project (25 Pa. Code §102.8(n))

2. Describe the sequence of PCSM BMP implementation in relation to earth disturbance activities and a schedule of inspections for the critical stages of PCSM BMP installation.

No Structural BMPs are proposed within this watershed

NO BMPS IN THIS WATERSHED

INFILTRATION INFORMATION	
BMP ID: NO BMPS in this watershed	<input type="checkbox"/> Soil/geologic test results are attached.
1. No. of infiltration tests completed: 1	
2. Method(s) used for infiltration testing:	
3. Test Pit Identifiers (from PCSM Plan Drawings):	
4. Avg Infiltration Rate: in/hr	5. FOS: 2 : 1
6. Infiltration rate used for design: in/hr	
7. Separation distance between the BMP bottom and bedrock: NA feet	
8. Separation distance between the BMP bottom and seasonal high-water table: 2 feet	
9. Comments:	
BMP ID:	<input type="checkbox"/> Soil/geologic test results are attached.
1. No. of infiltration tests completed:	
2. Method(s) used for infiltration testing:	
3. Test Pit Identifiers (from PCSM Plan Drawings):	
4. Avg Infiltration Rate: in/hr	5. FOS: : 1
6. Infiltration Rate Used for Design: in/hr	
7. Separation distance between the BMP bottom and bedrock: feet	
8. Separation distance between the BMP bottom and seasonal high-water table: feet	
9. Comments:	
BMP ID:	<input type="checkbox"/> Soil/geologic test results are attached.
1. No. of infiltration tests completed:	
2. Method(s) used for infiltration testing:	
3. Test Pit Identifiers (from PCSM Plan Drawings):	
4. Avg Infiltration Rate: in/hr	5. FOS: : 1
6. Infiltration Rate Used for Design: in/hr	
7. Separation distance between the BMP bottom and bedrock: feet	
8. Separation distance between the BMP bottom and seasonal high-water table: feet	
9. Comments:	

DISCHARGE POINT 003

STORMWATER ANALYSIS – PEAK RATE

Surface Water Name: EV Wetlands to Tunkhannock Creek **Discharge Point(s):** 003

1. The design standard is based on rate requirements in an Act 167 Plan approved by DEP within the past five years.
2. The design standard is based on managing the net change for 2-, 10-, 50-, and 100-year/24-hour storms.
3. An alternative design standard is being used.
4. A printout of DEP's PCSM Spreadsheet – Rate Worksheet is attached.
5. Alternative rate calculations are attached.

6. Identify precipitation amounts.		Source of precipitation data: NOAA Atlas 14	
2-Year/24-Hour Storm:	3.36	10-Year/24-Hour Storm	5.28
50-Year/24-Hour Storm:	7.20	100-Year/24-Hour Storm	8.40

7. Report peak discharge rates, pre- and post-construction (without BMPs), based on a time of concentration analysis.

Design Storm	Pre-Construction Peak Rate (cfs)	Post-Construction Peak Rate (cfs)	Difference (cfs)
2-Year/24-Hour	3.93	1.12	-2.81
10-Year/24-Hour	15.47	5.66	-9.81
50-Year/24-Hour	30.87	11.96	-18.91
100-Year/24-Hour	41.56	16.38	-25.18

8. Identify all BMPs used to mitigate peak rate differences and provide the requested information.

BMP ID	Inflow to BMP (cfs)				Outflow from BMP (cfs)			
	2-Yr	10-Yr	50-Yr	100-Yr	2-Yr	10-Yr	50-Yr	100-Yr
No BMPS in Watershed								

9. Report peak rates for pre-construction and post-construction with BMPs and identify the differences.

Design Storm	Pre-Construction Peak Rate (cfs)	Post-Construction Peak Rate (with BMPs) (cfs)	Difference (cfs)
2-Year/24-Hour	3.93	1.12	-2.81
10-Year/24-Hour	15.47	5.66	-9.81
50-Year/24-Hour	30.87	11.96	-18.91
100-Year/24-Hour	41.56	16.38	-25.18

General Information

Instructions
General
Volume
Rate
Quality

<p>Project Name: <input style="width: 90%;" type="text" value="I80-115 C-1. LLC."/></p> <p>County: <input style="width: 90%;" type="text" value="Monroe"/></p> <p>Project Type: <input style="width: 90%;" type="text" value="Commercial Building"/></p> <hr style="border-top: 1px dashed #ccc;"/> <p>Area: <input style="width: 100px;" type="text" value="5.77"/> acres <i>(In Watershed)</i></p> <p>No. of Post-Construction Discharge Points: <input style="width: 60px;" type="text" value="1"/></p>	<p>Application Type: <input style="width: 90%;" type="text" value="Individual NPDES Application"/></p> <p>Municipality: <input style="width: 90%;" type="text" value="Tunkhannock Township"/></p> <p> <input checked="" type="radio"/> New Project <input type="radio"/> Minor / Major Amendment </p> <p>Total Earth Disturbance: <input style="width: 100px;" type="text" value="3.27"/> acres <i>(In Watershed)</i></p> <p>Start DP Numbering at: <input style="width: 60px;" type="text" value="003"/></p>
--	--

Discharge Point (DP) No.	Drainage Area (DA) (acres)	Earth Disturbance in DA (acres)	Existing Impervious in DA (acres)	Proposed Impervious in DA (acres)	Receiving Waters	Ch. 93 Class	Structural BMP(s)
003	0.00	0.00	0.00	0.00			
Undetained Areas	5.77	3.27	0.00	0.00	Discharge to Non-Surface Waters	EV	

Totals: 5.77 3.27

PROJECT SITE MEETS SMALL SITE EXCEPTION - RATE WORKSHEET NOT REQUIRED

Volume Management

Project: I80-115 C-1. LLC.

- Instructions
- General
- Volume
- Rate
- Quality

2-Year / 24-Hour Storm Event (NOAA Atlas 14): inches Alternative 2-Year / 24-Hour Storm Event inches

Alternative Source:

Pre-Construction Conditions: No. Rows: Exempt from Meadow in Good Condition Automatically Calculate CN, Ia, Runoff and Volume

Land Cover	Area (acres)	Soil Group	CN	Ia (in)	Q Runoff (in)	Runoff Volume (cf)
Forested (Good Condition)	24.09	B	55	1.636	0.26	22,719
TOTAL (ACRES):		24.09		TOTAL (CF):		22,719

Post-Construction Conditions: No. Rows:

Land Cover	Area (acres)	Soil Group	CN	Ia (in)	Q Runoff (in)	Runoff Volume (cf)
Open Space (Lawns, Parks, Golf Courses, Cemeteries, Etc.) - Good Condition (Grass Cover > 75%)	3.27	B	61	1.279	0.46	5,416
TOTAL (ACRES):		3.27		TOTAL (CF):		5,416

NET CHANGE IN VOLUME TO MANAGE (CF): -17,303

Non-Structural BMP Volume Credits:

Tree Planting Credit

Number of new deciduous trees that will be planted within disturbed area:

Number of new evergreen trees that will be planted within disturbed area:

CREDIT (CF):

CREDIT (CF):

Other (attach calculations):

Structural BMP Volume Credits:

No. Structural BMPs:

Start BMP Numbering at:

DP No.	BMP No.	BMP Name	MRC?	Discharge	Incremental BMP DA (acres)	Volume Routed to BMP (CF)	Infiltration / Vegetated Area (SF)	Infiltration Rate (in/hr)	Infiltration Period (hrs)	Vegetated?	Media Depth (ft)	Storage Volume (CF)	Infiltration Credit (CF)	ET Credit (CF)

Totals:

INFILTRATION & ET CREDITS (CF):

NET CHANGE IN VOLUME TO MANAGE (CF):

TOTAL CREDITS (CF):

Water Quality

Project: I80-115 C-1. LLC.

PRINT

Instructions

General

Volume

Rate

Quality

Pre-Construction Pollutant Loads:

Land Cover (from Volume Worksheet)	Land Cover for Water Quality	Area (acres)	Soil Group	Runoff Volume (cf)	Pollutant Conc. (mg/L)			Pollutant Loads (lbs)		
					TSS	TP	TN	TSS	TP	TN
Forested (Good Condition)	Deciduous Forest/Evergreen Forest/Mixed Forest	24.09	B	22,719	45	0.13	1.05	63.84	0.18	1.49
TOTAL (ACRES):		24.09			TOTALS:			63.84	0.18	1.49

Post-Construction Pollutant Loads (without BMPs):

Land Cover (from Volume Worksheet)	Land Cover for Water Quality	Area (acres)	Soil Group	Runoff Volume (cf)	Pollutant Conc. (mg/L)			Pollutant Loads (lbs)		
					TSS	TP	TN	TSS	TP	TN
Open Space (Lawns, Parks, Golf Courses, Cemeteries, Etc.) - Good Condition (Grass Cover > 75%)	Open Space	3.27	B	5,416	78.00	0.25	1.25	26.38	0.08	0.42
TOTAL (ACRES):		3.27			TOTALS:			26.38	0.08	0.42

POLLUTANT LOAD REDUCTION REQUIREMENTS (LBS):

0.00	0.00	0.00
------	------	------

Characterize Undetained Areas (for Untreated Stormwater)

Land Cover	Area (acres)	Soil Group	CN	Ia (in)	Q Runoff (in)	Runoff Volume (cf)
------------	--------------	------------	----	---------	---------------	--------------------

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

Non-Structural BMP Water Quality Credits:

Pervious Undetained Area Credit

--	--	--

Other (attach calculations)

Structural BMP Water Quality Credits:

Use default BMP Outflows and Median BMP Outflow Concentrations

DP No.	BMP No.	BMP Name	MRC?	BMP DA (acres)	Vol. Routed to BMP (CF)	Inf. & ET Credits (CF)	Capture & Buffer Credits (CF)	Outflow (CF)	Outflow Conc. (mg/L)			Pollutant Loads (lbs)			
									TSS	TP	TN	TSS	TP	TN	

	TSS	TP	TN
POLLUTANT LOADS FROM STRUCTURAL BMP (TREATED) OUTFLOWS (LBS):	0.00	0.00	0.00
POLLUTANT LOADS FROM UNTREATED STORMWATER (LBS):	26.38	0.08	0.42
NON-STRUCTURAL BMP WATER QUALITY CREDITS (LBS):			
NET POLLUTANT LOADS FROM SITE, POST-CONSTRUCTION (LBS):	26.38	0.08	0.42
POLLUTANT LOADS FROM SITE, PRE-CONSTRUCTION (LBS):	63.84	0.18	1.49

WATER QUALITY REQUIREMENT SATISFIED

CERTIFICATION

I certify under penalty of law and subject to the penalties of 18 Pa.C.S. § 4904 (relating to unsworn falsification to authorities) that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I further certify that the structure, function, and calculations contained in this spreadsheet have not been modified in comparison to the spreadsheet DEP has posted to its website or, if modifications were made, an explanation of the modifications made is attached to this spreadsheet.

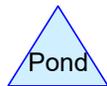
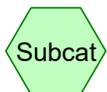
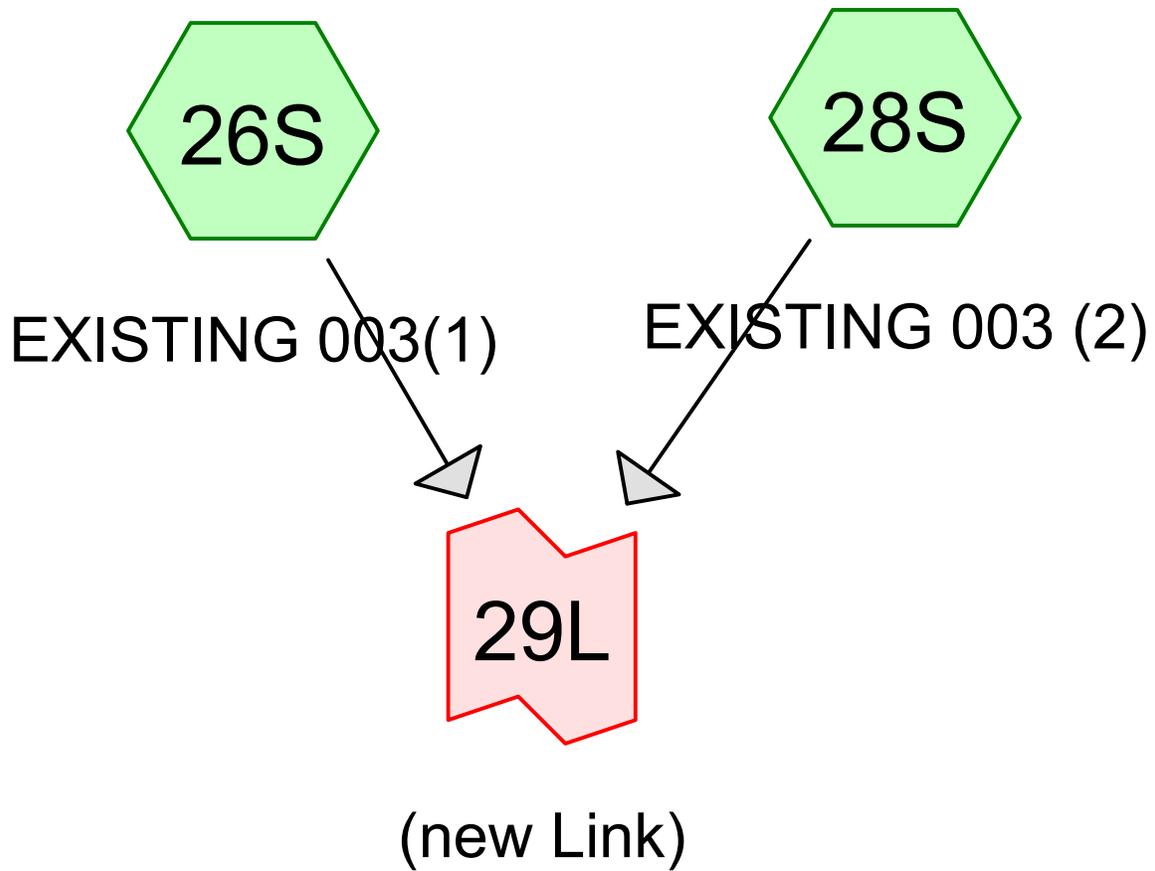
Steven Hawk

Spreadsheet User Name

12/14/2022

Date

EXISTING DISCHARGE 003



NPDES_Stormwater-REV2

Prepared by Keystone Consulting Engineers
HydroCAD® 10.20-2b s/n 02767 © 2021 HydroCAD Software Solutions LLC

Area Listing (selected nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.205	40	Meadow, non-grazed, HSG A (26S)
0.477	98	Paved roads w/curbs & sewers, HSG B (26S)
23.487	60	Woods, Fair, HSG B (26S, 28S)
0.395	40	Woods, Good, HSG A (26S)
2.689	70	Woods, Good, HSG C (26S)
27.253	61	TOTAL AREA

NPDES_Stormwater-REV2

Prepared by Keystone Consulting Engineers

HydroCAD® 10.20-2b s/n 02767 © 2021 HydroCAD Software Solutions LLC

Total Developed Condition
Type II 24-hr 2-Year Rainfall=3.36"

Printed 1/5/2023

Page 3

Summary for Subcatchment 26S: EXISTING 003(1)

Runoff = 2.77 cfs @ 12.25 hrs, Volume= 0.300 af, Depth= 0.77"
Routed to Link 29L : (new Link)

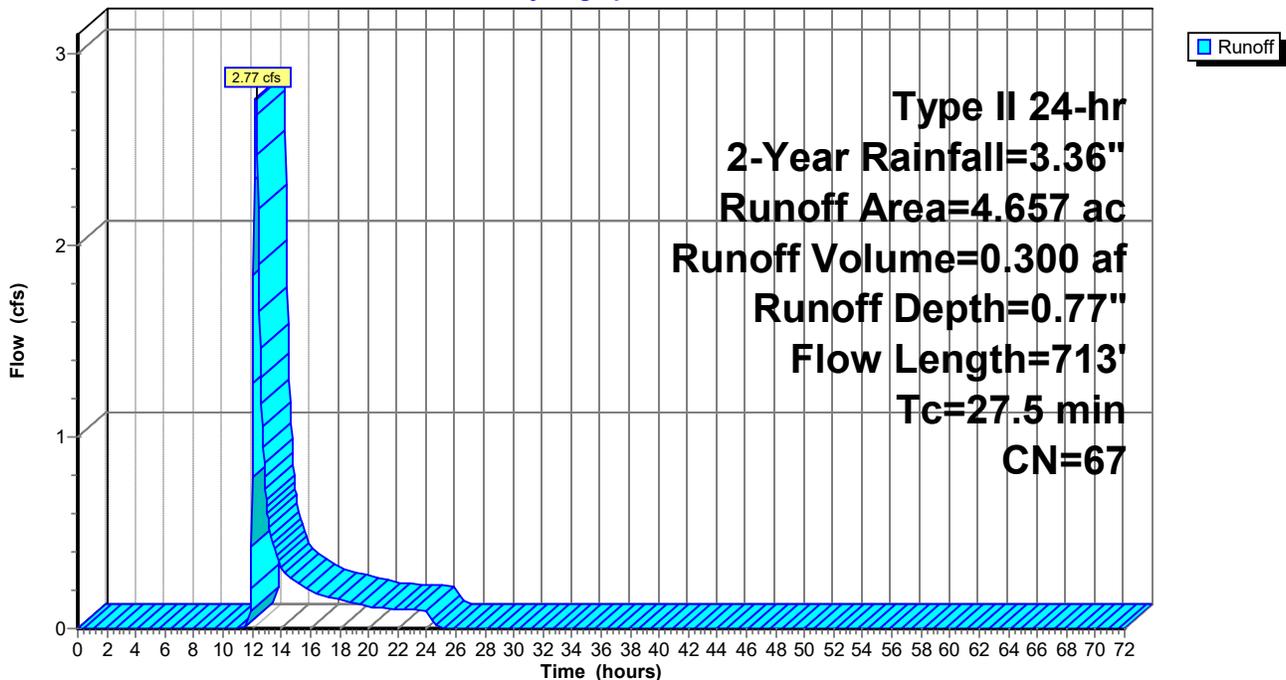
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type II 24-hr 2-Year Rainfall=3.36"

Area (ac)	CN	Description
0.891	60	Woods, Fair, HSG B
2.689	70	Woods, Good, HSG C
* 0.205	40	Meadow, non-grazed, HSG A
* 0.395	40	Woods, Good, HSG A
0.477	98	Paved roads w/curbs & sewers, HSG B
4.657	67	Weighted Average
4.180		89.76% Pervious Area
0.477		10.24% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
17.9	150	0.0700	0.14		Sheet Flow, SEG 1
					Woods: Light underbrush n= 0.400 P2= 3.23"
9.6	563	0.0380	0.97		Shallow Concentrated Flow, SEG 2
					Woodland Kv= 5.0 fps
27.5	713	Total			

Subcatchment 26S: EXISTING 003(1)

Hydrograph



NPDES_Stormwater-REV2

Prepared by Keystone Consulting Engineers

HydroCAD® 10.20-2b s/n 02767 © 2021 HydroCAD Software Solutions LLC

Total Developed Condition
Type II 24-hr 2-Year Rainfall=3.36"

Printed 1/5/2023

Page 4

Summary for Subcatchment 28S: EXISTING 003 (2)

Runoff = 3.23 cfs @ 12.98 hrs, Volume= 0.890 af, Depth= 0.47"
Routed to Link 29L : (new Link)

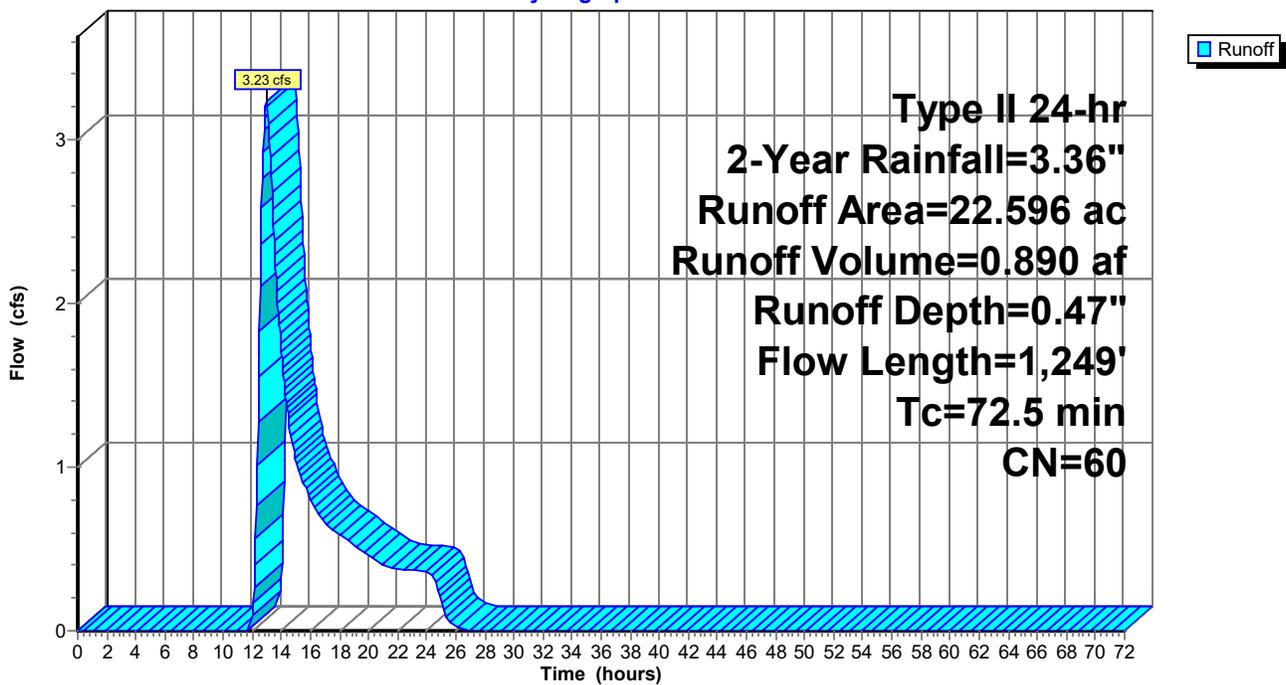
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type II 24-hr 2-Year Rainfall=3.36"

Area (ac)	CN	Description
22.596	60	Woods, Fair, HSG B
22.596		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
39.0	150	0.0100	0.06		Sheet Flow, SEG 1
					Woods: Light underbrush n= 0.400 P2= 3.23"
8.9	386	0.0210	0.72		Shallow Concentrated Flow, SEG 2
					Woodland Kv= 5.0 fps
14.2	331	0.0060	0.39		Shallow Concentrated Flow, SEG 3
					Woodland Kv= 5.0 fps
10.4	382	0.0150	0.61		Shallow Concentrated Flow, SEG 4
					Woodland Kv= 5.0 fps
72.5	1,249	Total			

Subcatchment 28S: EXISTING 003 (2)

Hydrograph



NPDES_Stormwater-REV2

Prepared by Keystone Consulting Engineers

HydroCAD® 10.20-2b s/n 02767 © 2021 HydroCAD Software Solutions LLC

Total Developed Condition
Type II 24-hr 2-Year Rainfall=3.36"

Printed 1/5/2023

Page 5

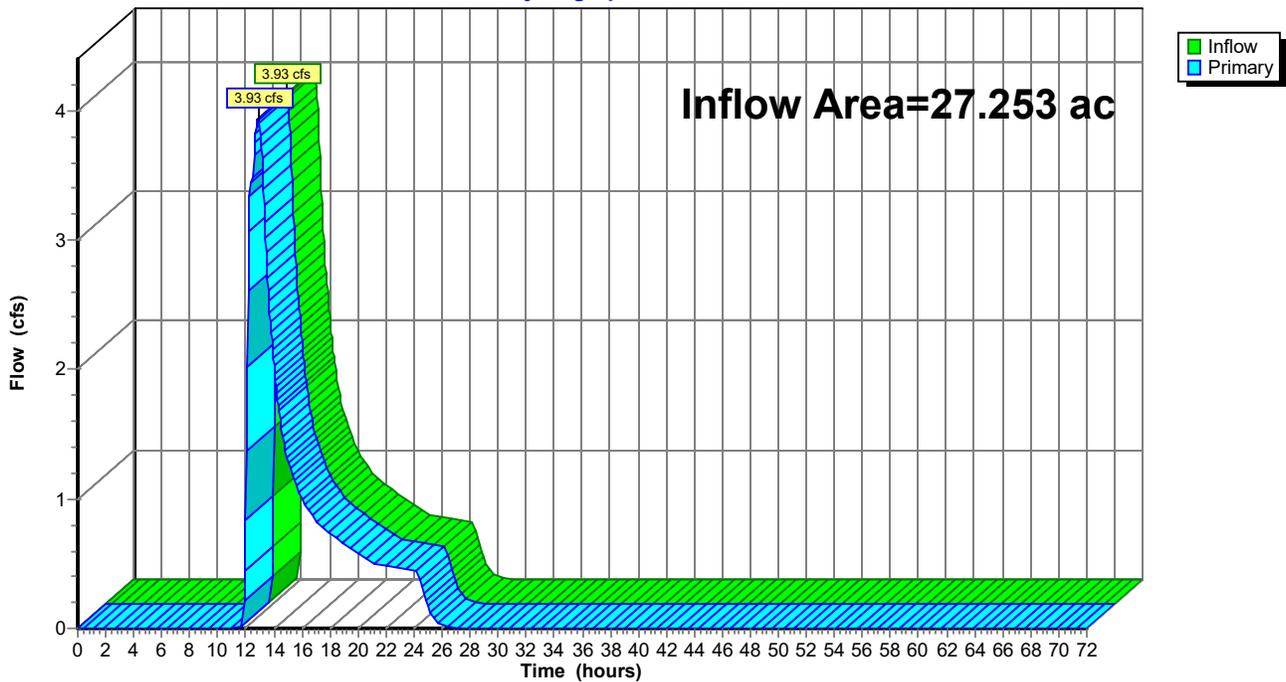
Summary for Link 29L: (new Link)

Inflow Area = 27.253 ac, 1.75% Impervious, Inflow Depth = 0.52" for 2-Year event
Inflow = 3.93 cfs @ 12.85 hrs, Volume= 1.190 af
Primary = 3.93 cfs @ 12.85 hrs, Volume= 1.190 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link 29L: (new Link)

Hydrograph



NPDES_Stormwater-REV2

Prepared by Keystone Consulting Engineers

HydroCAD® 10.20-2b s/n 02767 © 2021 HydroCAD Software Solutions LLC

Total Developed Condition
Type II 24-hr 10-Year Rainfall=5.28"

Printed 1/5/2023

Page 6

Summary for Subcatchment 26S: EXISTING 003(1)

Runoff = 8.21 cfs @ 12.23 hrs, Volume= 0.776 af, Depth= 2.00"
Routed to Link 29L : (new Link)

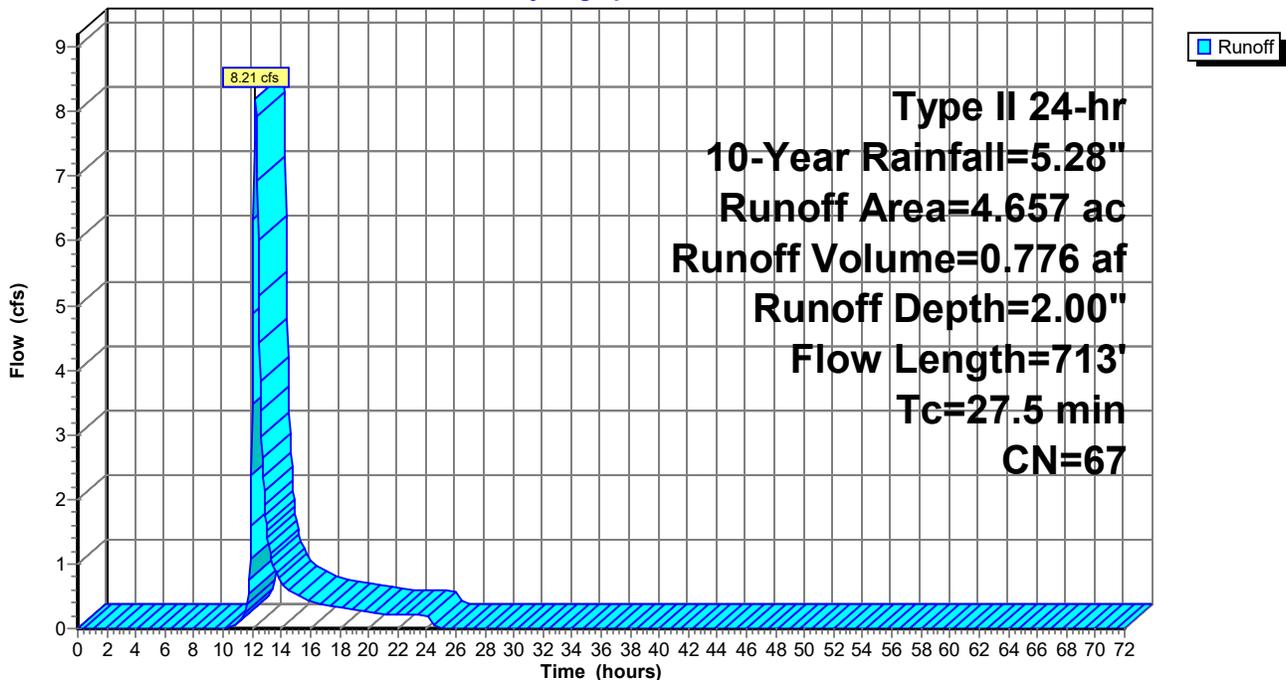
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-Year Rainfall=5.28"

Area (ac)	CN	Description
0.891	60	Woods, Fair, HSG B
2.689	70	Woods, Good, HSG C
* 0.205	40	Meadow, non-grazed, HSG A
* 0.395	40	Woods, Good, HSG A
0.477	98	Paved roads w/curbs & sewers, HSG B
4.657	67	Weighted Average
4.180		89.76% Pervious Area
0.477		10.24% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
17.9	150	0.0700	0.14		Sheet Flow, SEG 1
					Woods: Light underbrush n= 0.400 P2= 3.23"
9.6	563	0.0380	0.97		Shallow Concentrated Flow, SEG 2
					Woodland Kv= 5.0 fps
27.5	713	Total			

Subcatchment 26S: EXISTING 003(1)

Hydrograph



NPDES_Stormwater-REV2

Prepared by Keystone Consulting Engineers

HydroCAD® 10.20-2b s/n 02767 © 2021 HydroCAD Software Solutions LLC

Total Developed Condition
Type II 24-hr 10-Year Rainfall=5.28"

Printed 1/5/2023

Page 7

Summary for Subcatchment 28S: EXISTING 003 (2)

Runoff = 13.40 cfs @ 12.85 hrs, Volume= 2.763 af, Depth= 1.47"
Routed to Link 29L : (new Link)

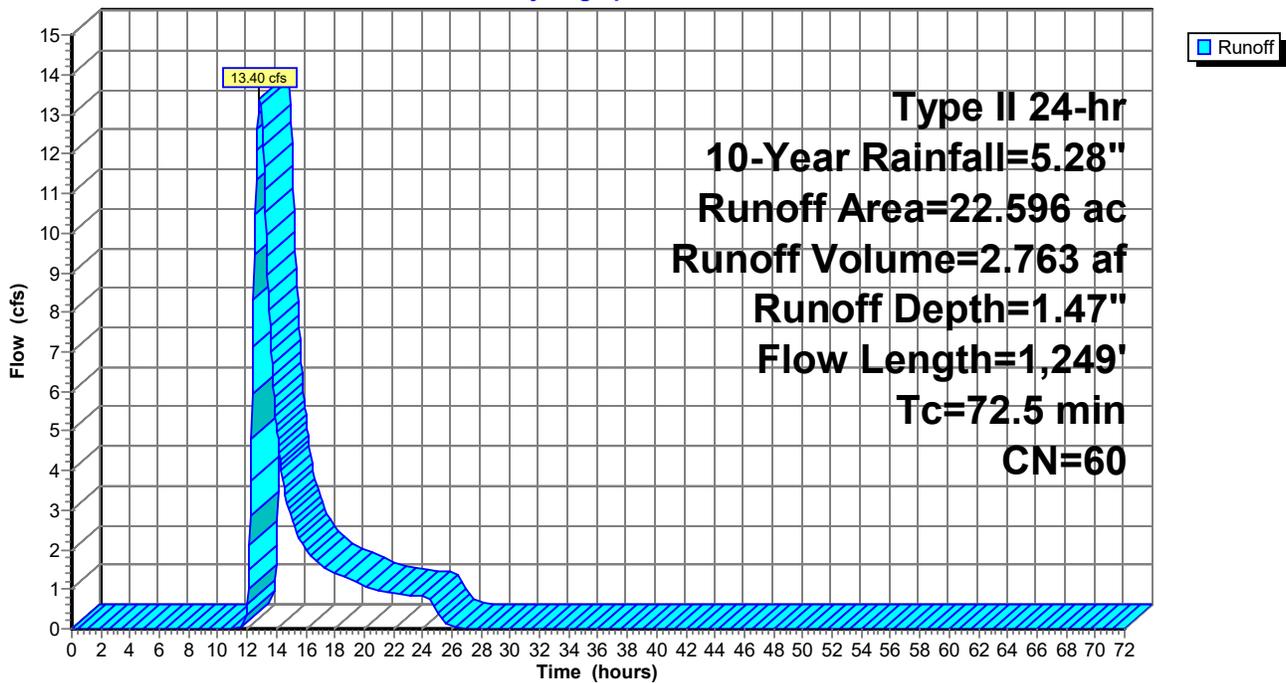
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-Year Rainfall=5.28"

Area (ac)	CN	Description
22.596	60	Woods, Fair, HSG B
22.596		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
39.0	150	0.0100	0.06		Sheet Flow, SEG 1 Woods: Light underbrush n= 0.400 P2= 3.23"
8.9	386	0.0210	0.72		Shallow Concentrated Flow, SEG 2 Woodland Kv= 5.0 fps
14.2	331	0.0060	0.39		Shallow Concentrated Flow, SEG 3 Woodland Kv= 5.0 fps
10.4	382	0.0150	0.61		Shallow Concentrated Flow, SEG 4 Woodland Kv= 5.0 fps
72.5	1,249	Total			

Subcatchment 28S: EXISTING 003 (2)

Hydrograph



NPDES_Stormwater-REV2

Prepared by Keystone Consulting Engineers

HydroCAD® 10.20-2b s/n 02767 © 2021 HydroCAD Software Solutions LLC

Total Developed Condition
Type II 24-hr 10-Year Rainfall=5.28"

Printed 1/5/2023

Page 8

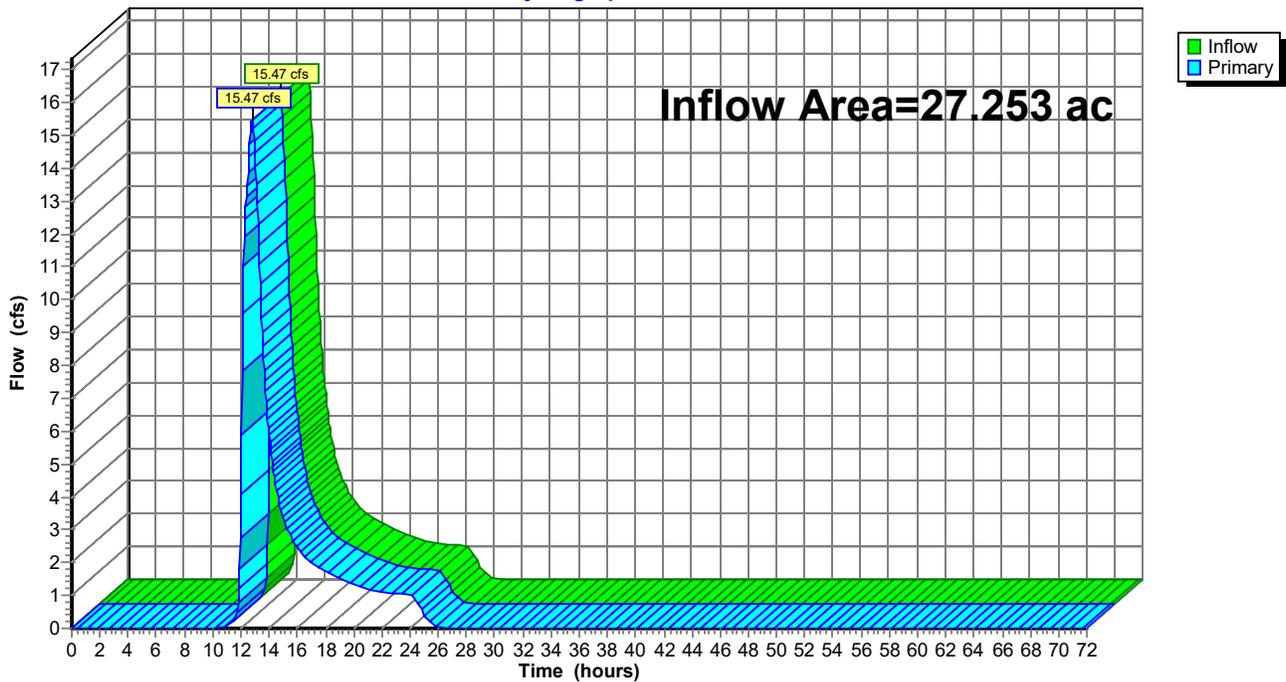
Summary for Link 29L: (new Link)

Inflow Area = 27.253 ac, 1.75% Impervious, Inflow Depth = 1.56" for 10-Year event
Inflow = 15.47 cfs @ 12.79 hrs, Volume= 3.540 af
Primary = 15.47 cfs @ 12.79 hrs, Volume= 3.540 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link 29L: (new Link)

Hydrograph



NPDES_Stormwater-REV2

Prepared by Keystone Consulting Engineers

HydroCAD® 10.20-2b s/n 02767 © 2021 HydroCAD Software Solutions LLC

Total Developed Condition
Type II 24-hr 50-Year Rainfall=7.20"

Printed 1/5/2023

Page 9

Summary for Subcatchment 26S: EXISTING 003(1)

Runoff = 14.68 cfs @ 12.22 hrs, Volume= 1.346 af, Depth= 3.47"
Routed to Link 29L : (new Link)

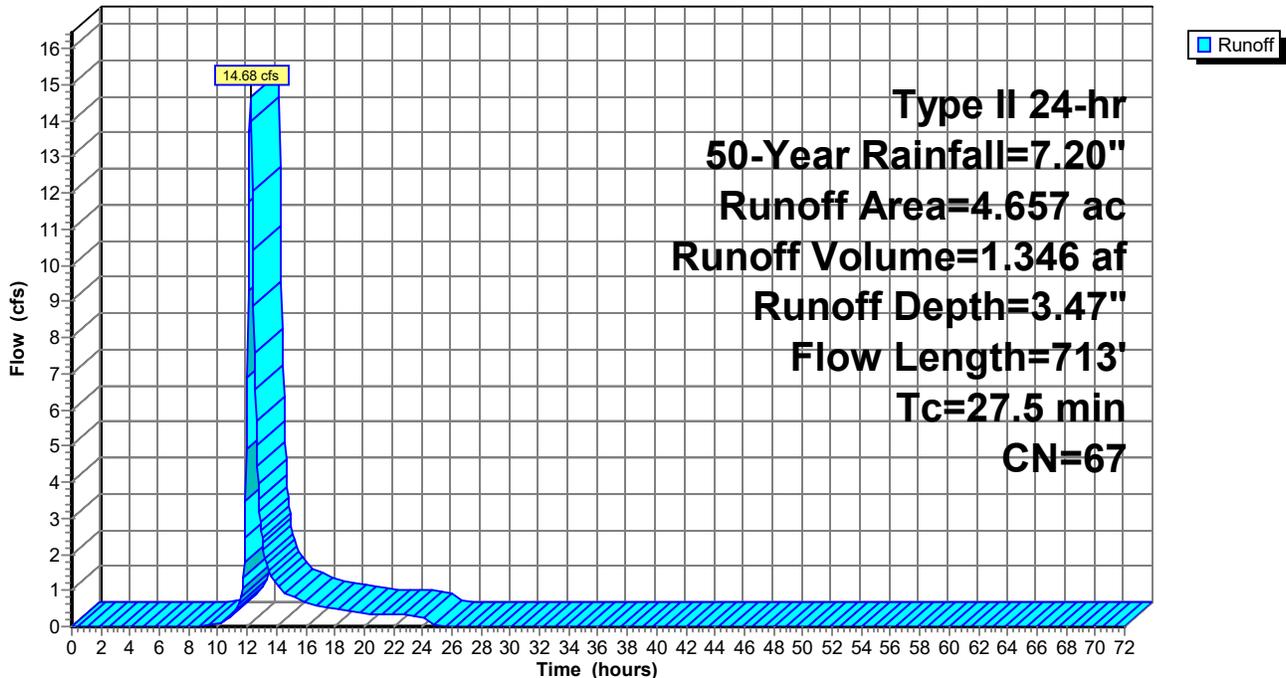
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type II 24-hr 50-Year Rainfall=7.20"

Area (ac)	CN	Description
0.891	60	Woods, Fair, HSG B
2.689	70	Woods, Good, HSG C
* 0.205	40	Meadow, non-grazed, HSG A
* 0.395	40	Woods, Good, HSG A
0.477	98	Paved roads w/curbs & sewers, HSG B
4.657	67	Weighted Average
4.180		89.76% Pervious Area
0.477		10.24% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
17.9	150	0.0700	0.14		Sheet Flow, SEG 1
					Woods: Light underbrush n= 0.400 P2= 3.23"
9.6	563	0.0380	0.97		Shallow Concentrated Flow, SEG 2
					Woodland Kv= 5.0 fps
27.5	713	Total			

Subcatchment 26S: EXISTING 003(1)

Hydrograph



NPDES_Stormwater-REV2

Prepared by Keystone Consulting Engineers

HydroCAD® 10.20-2b s/n 02767 © 2021 HydroCAD Software Solutions LLC

Total Developed Condition
Type II 24-hr 50-Year Rainfall=7.20"

Printed 1/5/2023

Page 10

Summary for Subcatchment 28S: EXISTING 003 (2)

Runoff = 27.32 cfs @ 12.82 hrs, Volume= 5.171 af, Depth= 2.75"
Routed to Link 29L : (new Link)

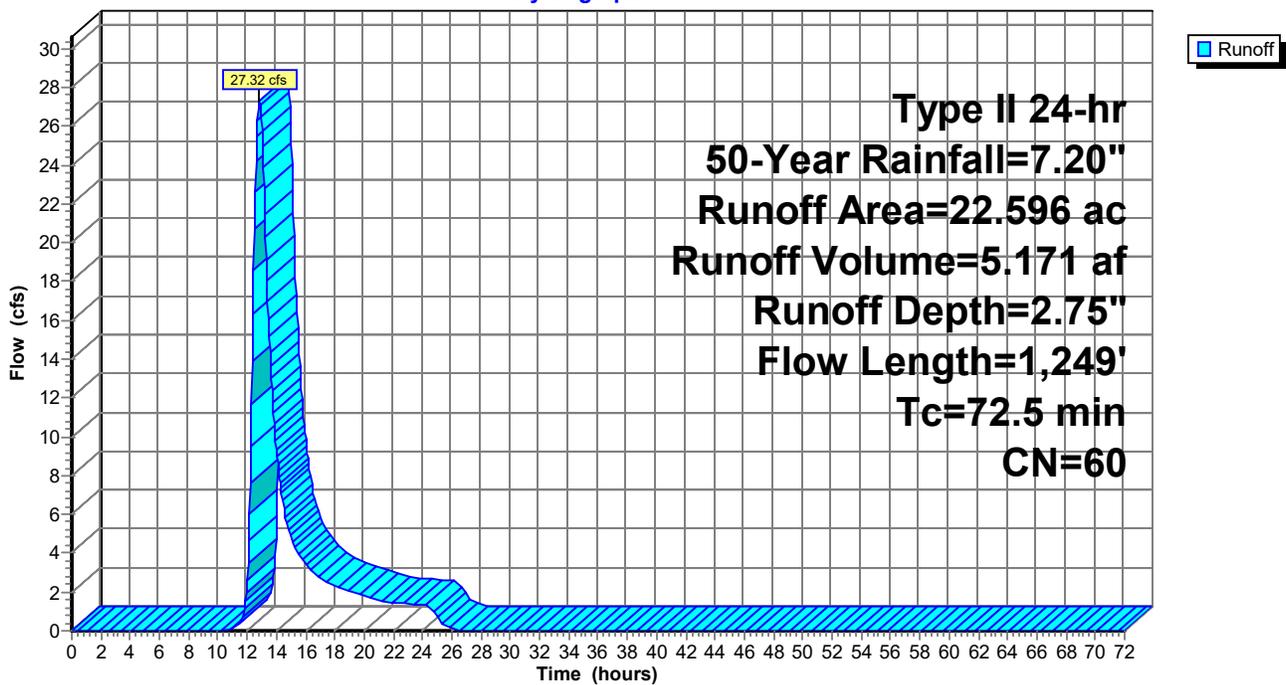
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type II 24-hr 50-Year Rainfall=7.20"

Area (ac)	CN	Description
22.596	60	Woods, Fair, HSG B
22.596		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
39.0	150	0.0100	0.06		Sheet Flow, SEG 1 Woods: Light underbrush n= 0.400 P2= 3.23"
8.9	386	0.0210	0.72		Shallow Concentrated Flow, SEG 2 Woodland Kv= 5.0 fps
14.2	331	0.0060	0.39		Shallow Concentrated Flow, SEG 3 Woodland Kv= 5.0 fps
10.4	382	0.0150	0.61		Shallow Concentrated Flow, SEG 4 Woodland Kv= 5.0 fps
72.5	1,249	Total			

Subcatchment 28S: EXISTING 003 (2)

Hydrograph



NPDES_Stormwater-REV2

Prepared by Keystone Consulting Engineers

HydroCAD® 10.20-2b s/n 02767 © 2021 HydroCAD Software Solutions LLC

Total Developed Condition
Type II 24-hr 50-Year Rainfall=7.20"

Printed 1/5/2023

Page 11

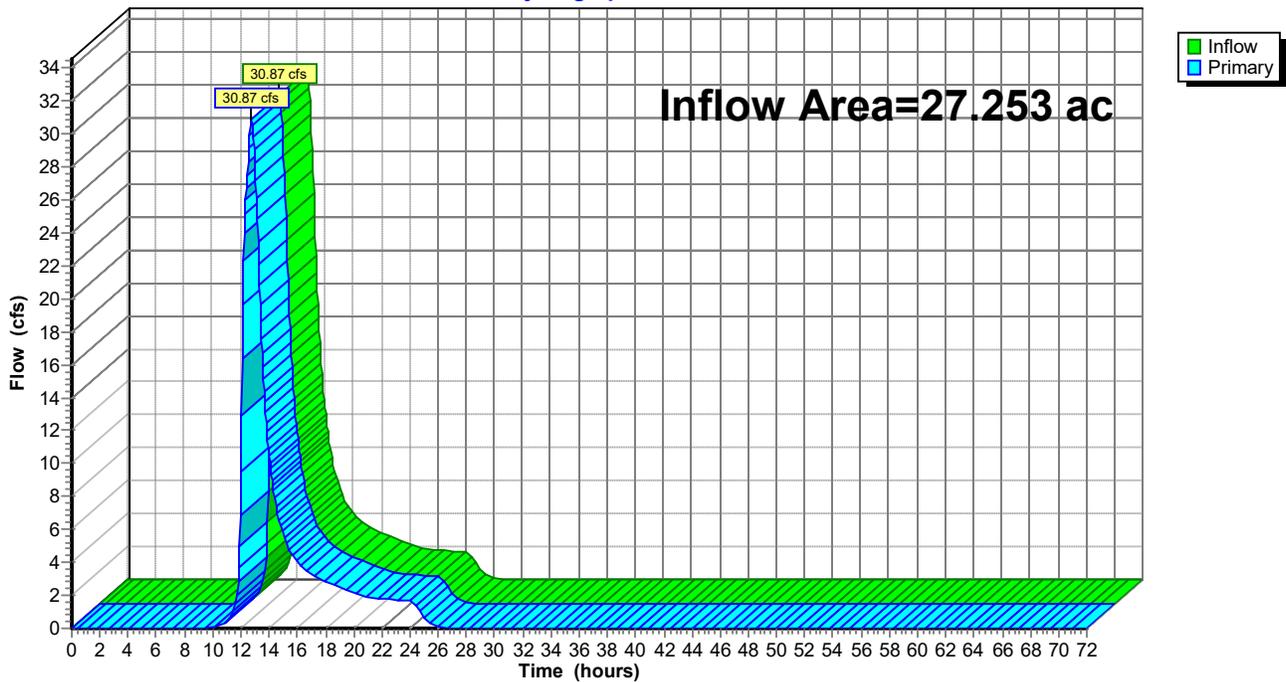
Summary for Link 29L: (new Link)

Inflow Area = 27.253 ac, 1.75% Impervious, Inflow Depth = 2.87" for 50-Year event
Inflow = 30.87 cfs @ 12.76 hrs, Volume= 6.516 af
Primary = 30.87 cfs @ 12.76 hrs, Volume= 6.516 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link 29L: (new Link)

Hydrograph



NPDES_Stormwater-REV2

Prepared by Keystone Consulting Engineers

HydroCAD® 10.20-2b s/n 02767 © 2021 HydroCAD Software Solutions LLC

Total Developed Condition
Type II 24-hr 100-Year Rainfall=8.40"

Printed 1/5/2023

Page 12

Summary for Subcatchment 26S: EXISTING 003(1)

Runoff = 18.98 cfs @ 12.22 hrs, Volume= 1.729 af, Depth= 4.46"
Routed to Link 29L : (new Link)

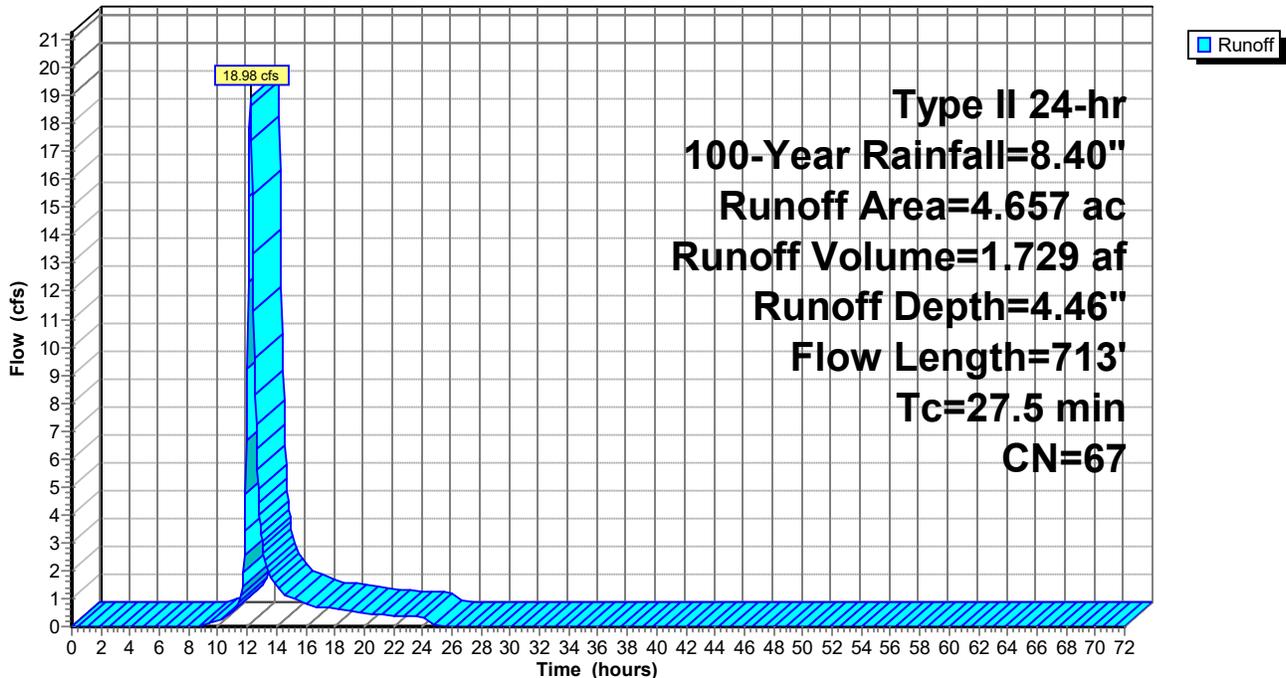
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type II 24-hr 100-Year Rainfall=8.40"

Area (ac)	CN	Description
0.891	60	Woods, Fair, HSG B
2.689	70	Woods, Good, HSG C
* 0.205	40	Meadow, non-grazed, HSG A
* 0.395	40	Woods, Good, HSG A
0.477	98	Paved roads w/curbs & sewers, HSG B
4.657	67	Weighted Average
4.180		89.76% Pervious Area
0.477		10.24% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
17.9	150	0.0700	0.14		Sheet Flow, SEG 1
9.6	563	0.0380	0.97		Woods: Light underbrush n= 0.400 P2= 3.23" Shallow Concentrated Flow, SEG 2
27.5	713	Total			Woodland Kv= 5.0 fps

Subcatchment 26S: EXISTING 003(1)

Hydrograph



NPDES_Stormwater-REV2

Prepared by Keystone Consulting Engineers

HydroCAD® 10.20-2b s/n 02767 © 2021 HydroCAD Software Solutions LLC

Total Developed Condition
Type II 24-hr 100-Year Rainfall=8.40"

Printed 1/5/2023

Page 13

Summary for Subcatchment 28S: EXISTING 003 (2)

Runoff = 37.02 cfs @ 12.81 hrs, Volume= 6.847 af, Depth= 3.64"
Routed to Link 29L : (new Link)

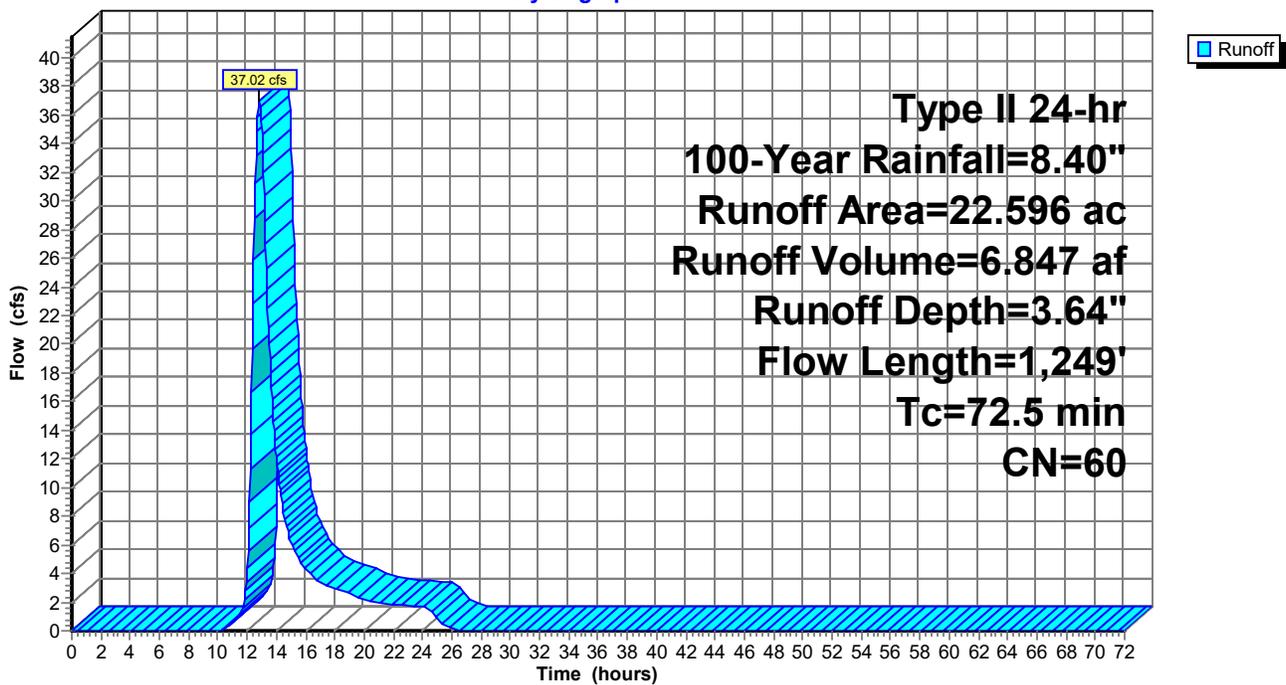
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type II 24-hr 100-Year Rainfall=8.40"

Area (ac)	CN	Description
22.596	60	Woods, Fair, HSG B
22.596		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
39.0	150	0.0100	0.06		Sheet Flow, SEG 1
8.9	386	0.0210	0.72		Woods: Light underbrush n= 0.400 P2= 3.23" Shallow Concentrated Flow, SEG 2
14.2	331	0.0060	0.39		Woodland Kv= 5.0 fps Shallow Concentrated Flow, SEG 3
10.4	382	0.0150	0.61		Woodland Kv= 5.0 fps Shallow Concentrated Flow, SEG 4
72.5	1,249	Total			

Subcatchment 28S: EXISTING 003 (2)

Hydrograph



NPDES_Stormwater-REV2

Prepared by Keystone Consulting Engineers

HydroCAD® 10.20-2b s/n 02767 © 2021 HydroCAD Software Solutions LLC

Total Developed Condition
Type II 24-hr 100-Year Rainfall=8.40"

Printed 1/5/2023

Page 14

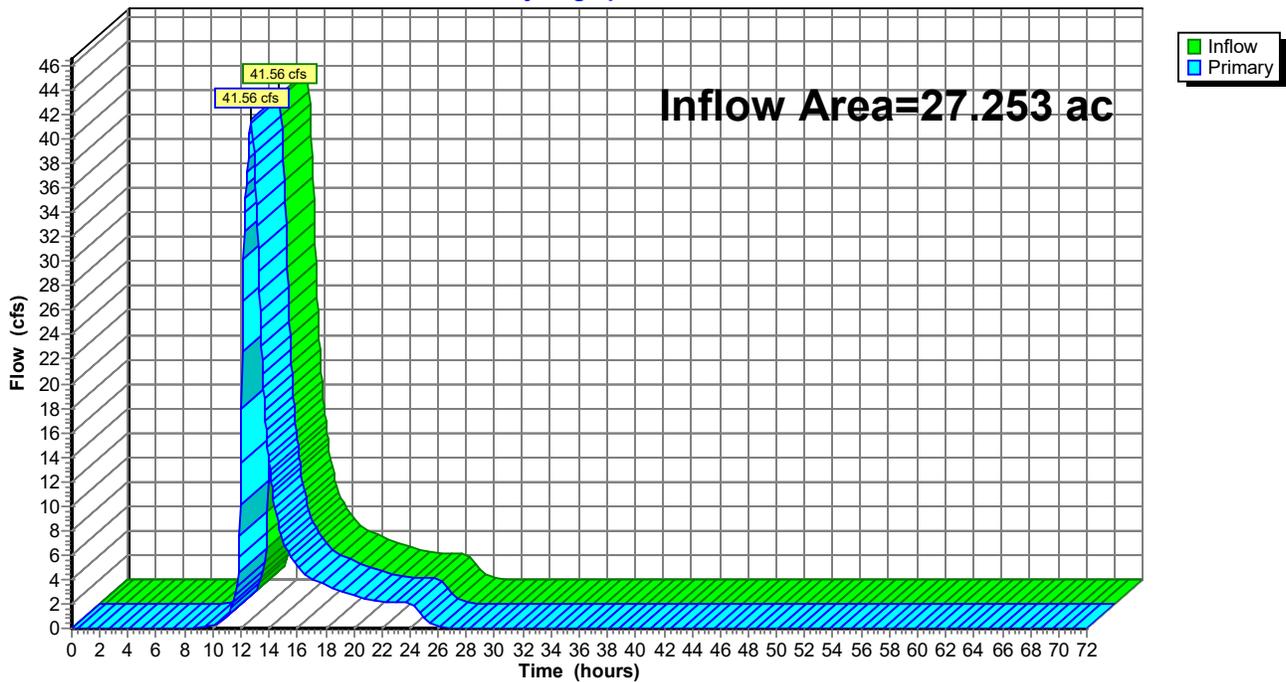
Summary for Link 29L: (new Link)

Inflow Area = 27.253 ac, 1.75% Impervious, Inflow Depth = 3.78" for 100-Year event
Inflow = 41.56 cfs @ 12.74 hrs, Volume= 8.576 af
Primary = 41.56 cfs @ 12.74 hrs, Volume= 8.576 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link 29L: (new Link)

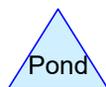
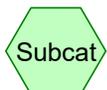
Hydrograph



PROPOSED DISCHARGE 003



PROPOSED-UNDETAINED RUN OFF TO 003



NPDES_Stormwater-REV2

Prepared by Keystone Consulting Engineers
HydroCAD® 10.20-2b s/n 02767 © 2021 HydroCAD Software Solutions LLC

Area Listing (selected nodes)

Area (acres)	CN	Description (subcatchment-numbers)
3.270	61	>75% Grass cover, Good, HSG B (40S)
2.503	55	Woods, Good, HSG B (40S)
5.773	58	TOTAL AREA

NPDES_Stormwater-REV2

Prepared by Keystone Consulting Engineers

HydroCAD® 10.20-2b s/n 02767 © 2021 HydroCAD Software Solutions LLC

Total Developed Condition
Type II 24-hr 2-Year Rainfall=3.36"

Printed 1/5/2023

Page 3

Summary for Subcatchment 40S: PROPOSED-UNDETAINED RUN OFF TO 003

Runoff = 1.12 cfs @ 12.35 hrs, Volume= 0.192 af, Depth= 0.40"

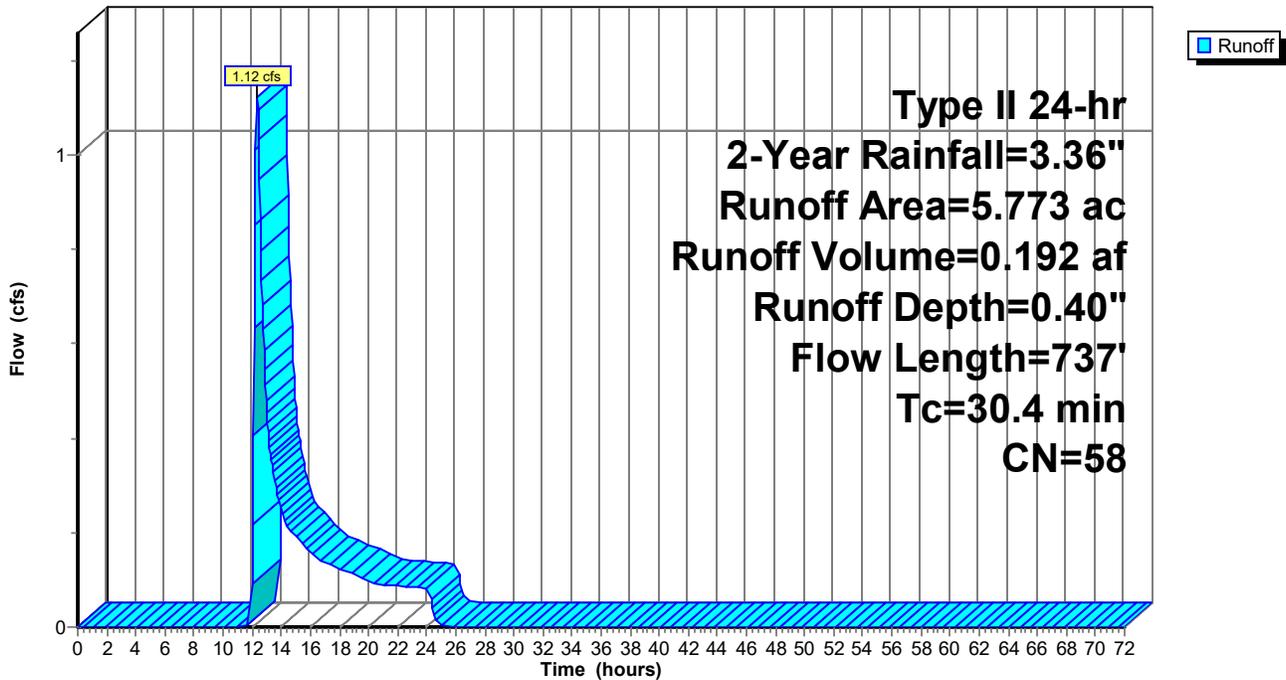
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type II 24-hr 2-Year Rainfall=3.36"

Area (ac)	CN	Description
2.503	55	Woods, Good, HSG B
3.270	61	>75% Grass cover, Good, HSG B
5.773	58	Weighted Average
5.773		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
17.8	150	0.0100	0.14		Sheet Flow, Grass: Short n= 0.150 P2= 3.23"
12.6	587	0.0240	0.77		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
30.4	737	Total			

Subcatchment 40S: PROPOSED-UNDETAINED RUN OFF TO 003

Hydrograph



NPDES_Stormwater-REV2

Prepared by Keystone Consulting Engineers

HydroCAD® 10.20-2b s/n 02767 © 2021 HydroCAD Software Solutions LLC

Total Developed Condition
Type II 24-hr 10-Year Rainfall=5.28"

Printed 1/5/2023

Page 4

Summary for Subcatchment 40S: PROPOSED-UNDETAINED RUN OFF TO 003

Runoff = 5.66 cfs @ 12.28 hrs, Volume= 0.638 af, Depth= 1.33"

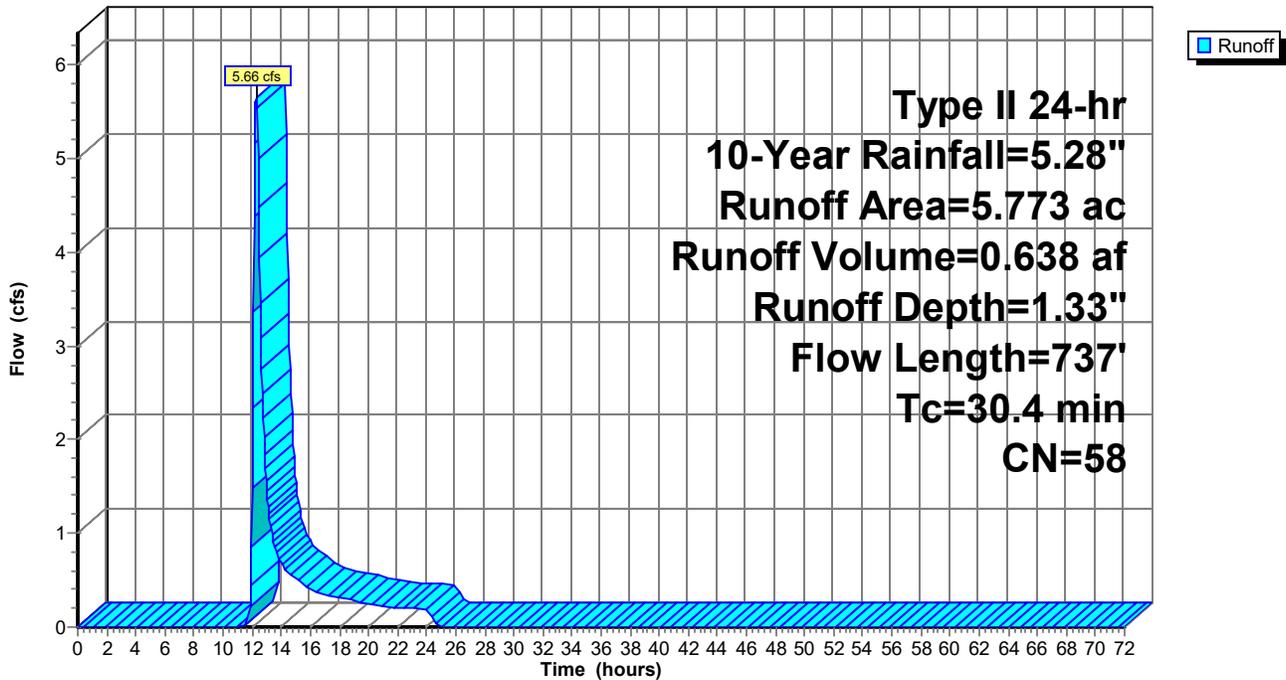
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-Year Rainfall=5.28"

Area (ac)	CN	Description
2.503	55	Woods, Good, HSG B
3.270	61	>75% Grass cover, Good, HSG B
5.773	58	Weighted Average
5.773		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
17.8	150	0.0100	0.14		Sheet Flow, Grass: Short n= 0.150 P2= 3.23"
12.6	587	0.0240	0.77		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
30.4	737	Total			

Subcatchment 40S: PROPOSED-UNDETAINED RUN OFF TO 003

Hydrograph



NPDES_Stormwater-REV2

Prepared by Keystone Consulting Engineers

HydroCAD® 10.20-2b s/n 02767 © 2021 HydroCAD Software Solutions LLC

Total Developed Condition
Type II 24-hr 50-Year Rainfall=7.20"

Printed 1/5/2023

Page 5

Summary for Subcatchment 40S: PROPOSED-UNDETAINED RUN OFF TO 003

Runoff = 11.96 cfs @ 12.27 hrs, Volume= 1.225 af, Depth= 2.55"

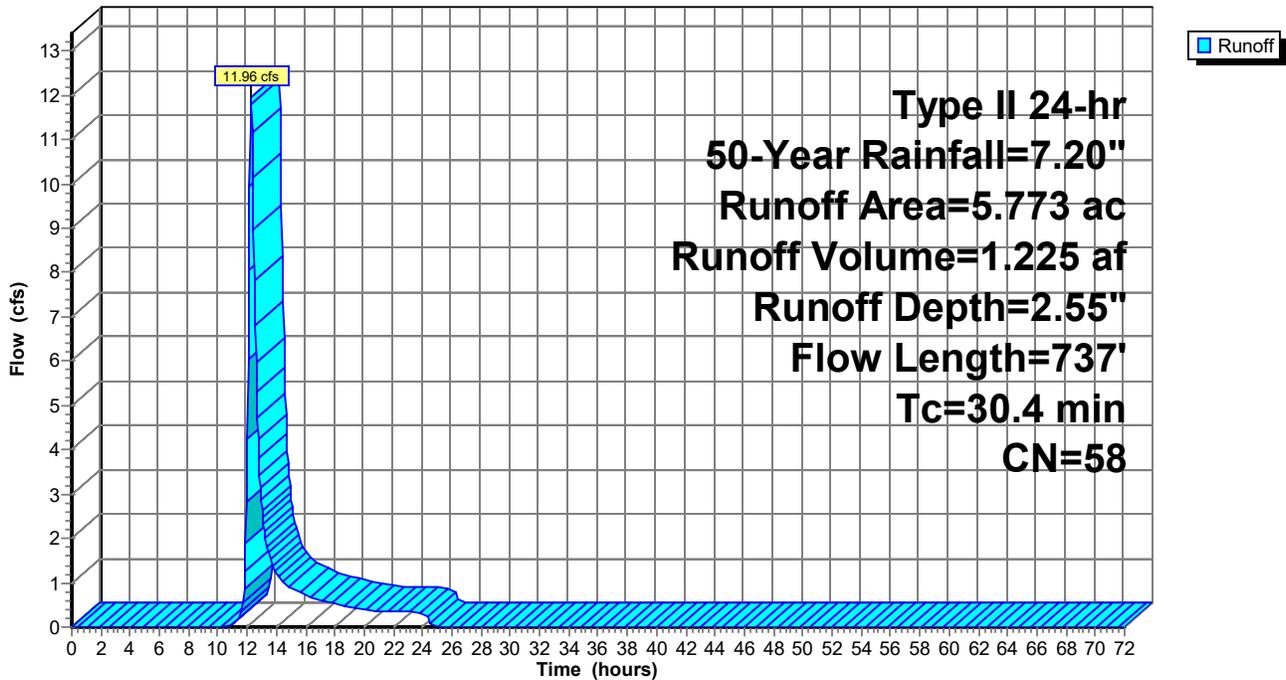
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type II 24-hr 50-Year Rainfall=7.20"

Area (ac)	CN	Description
2.503	55	Woods, Good, HSG B
3.270	61	>75% Grass cover, Good, HSG B
5.773	58	Weighted Average
5.773		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
17.8	150	0.0100	0.14		Sheet Flow, Grass: Short n= 0.150 P2= 3.23"
12.6	587	0.0240	0.77		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
30.4	737	Total			

Subcatchment 40S: PROPOSED-UNDETAINED RUN OFF TO 003

Hydrograph



NPDES_Stormwater-REV2

Prepared by Keystone Consulting Engineers

HydroCAD® 10.20-2b s/n 02767 © 2021 HydroCAD Software Solutions LLC

Total Developed Condition
Type II 24-hr 100-Year Rainfall=8.40"

Printed 1/5/2023

Page 6

Summary for Subcatchment 40S: PROPOSED-UNDETAINED RUN OFF TO 003

Runoff = 16.38 cfs @ 12.26 hrs, Volume= 1.638 af, Depth= 3.40"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type II 24-hr 100-Year Rainfall=8.40"

Area (ac)	CN	Description
2.503	55	Woods, Good, HSG B
3.270	61	>75% Grass cover, Good, HSG B
5.773	58	Weighted Average
5.773		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
17.8	150	0.0100	0.14		Sheet Flow, Grass: Short n= 0.150 P2= 3.23"
12.6	587	0.0240	0.77		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
30.4	737	Total			

Subcatchment 40S: PROPOSED-UNDETAINED RUN OFF TO 003

Hydrograph

