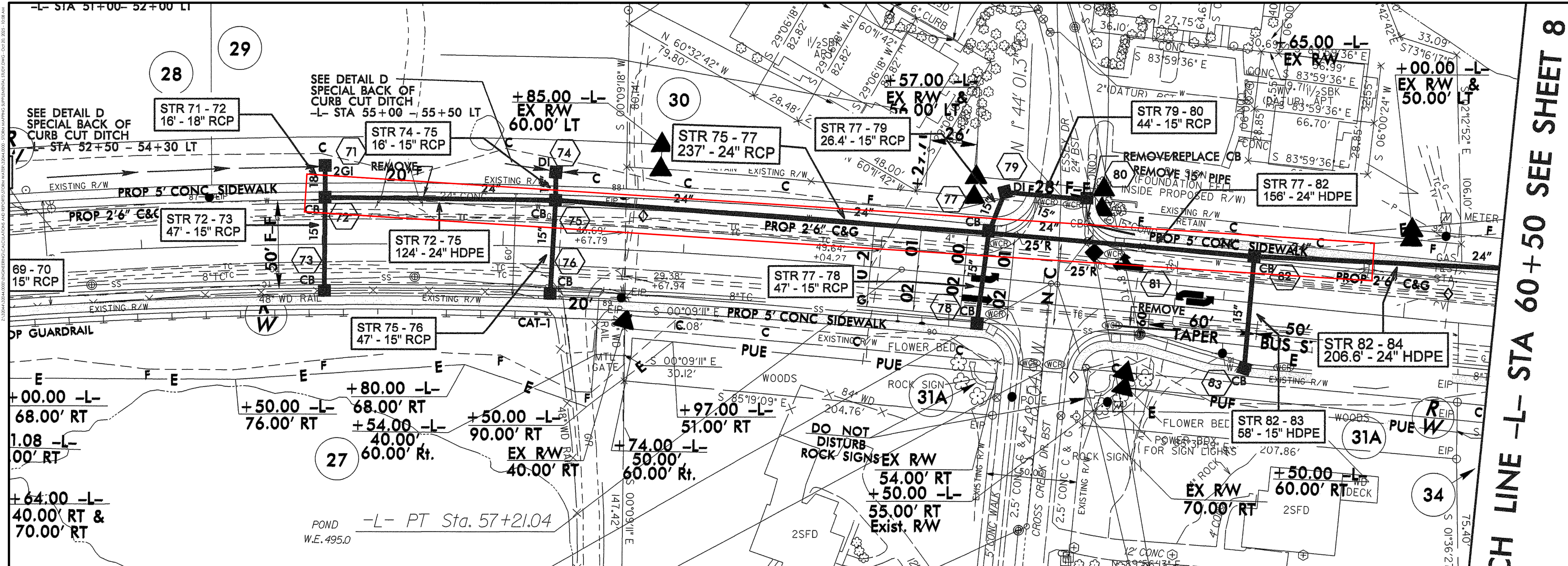
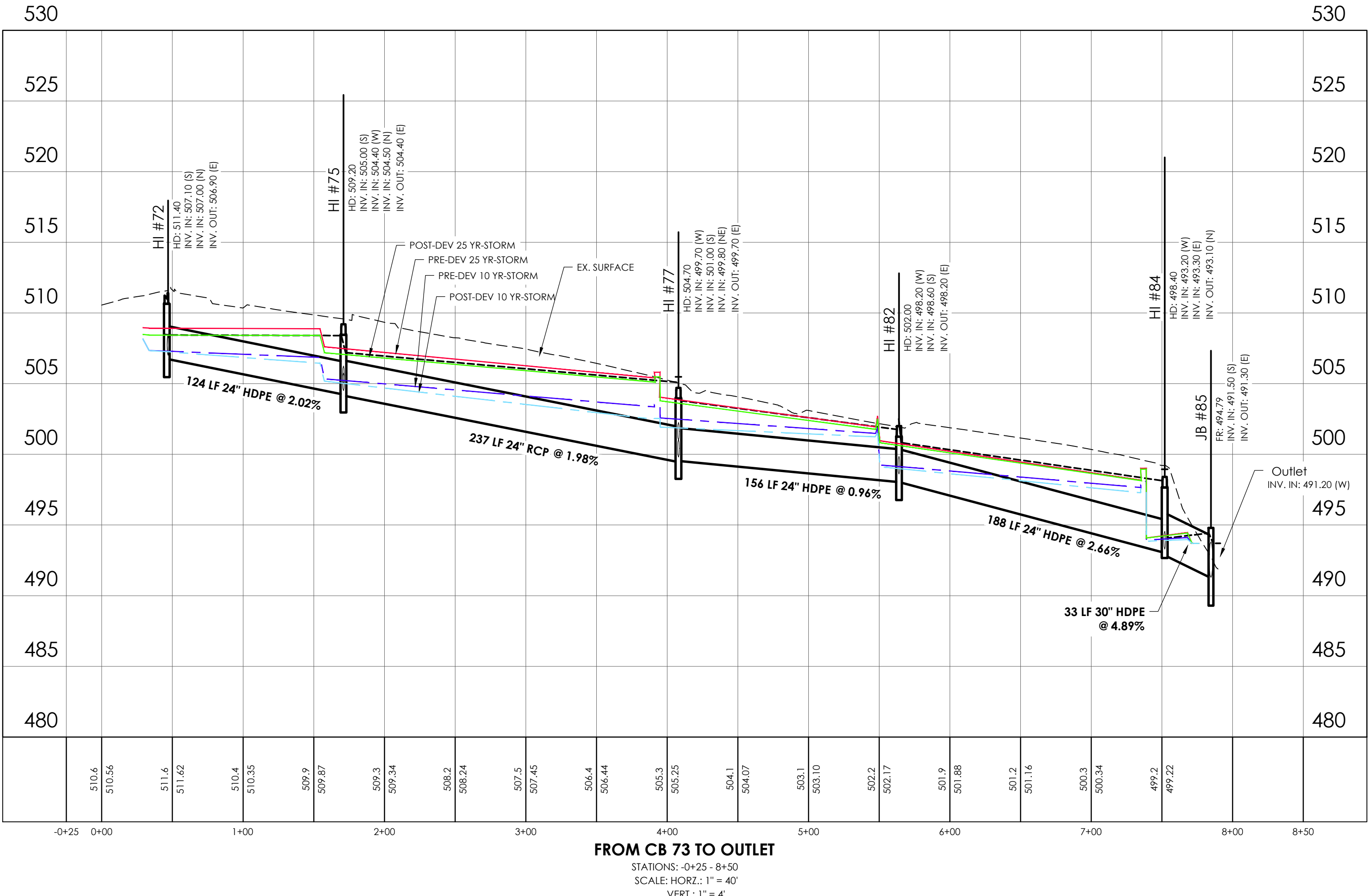




CH LINE -L- STA 60+50 SEE SHEET 8



---	PRE-DEV 10 YR-STORM
---	POST-DEV 10 YR-STORM
---	PRE-DEV 25 YR-STORM
---	POST-DEV 25 YR-STORM

NO.	REVISIONS	BY	DATE

THOMAS & HUTTON

2510 Meridian Parkway • Suite 100
Durham, NC 27713 • 919.682.0368
www.thomasandhutton.com

HGL FOR EXISTING STORM DRAINAGE NETWORK

860 WEAVER DAIRY ROAD

PROJECT LOCATION:

CLIENT/OWNER:
LAND PLANNING & ENTITLEMENTS
157 EAST FRANKLIN STREET
CHAPEL HILL, NC 27514

GRAPHIC SCALE:
1 INCH = 60 FEET

DATUM: HORIZ.: NAD 83 VERT.: NAVD 88

JOB NO.: 32044.0000
DATE: _____
DRAWN: _____
DESIGNED: _____
REVIEWED: _____
APPROVED: _____
SCALE: 1" = 60'

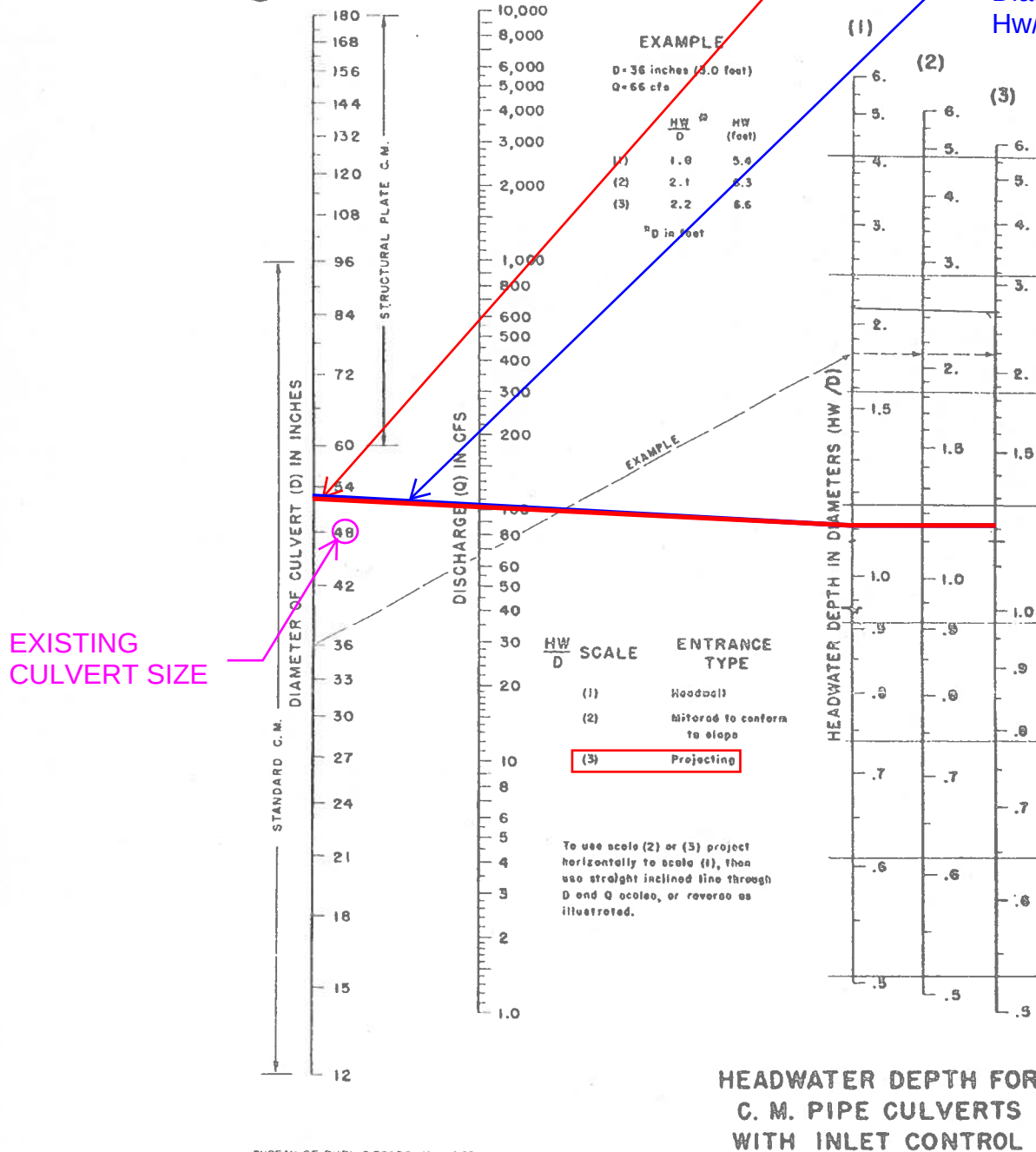
HGL

13. REFERENCE MATERIAL FOR CULVERT ANALYSIS

Exhibit 12
Culvert capacity under inlet control
Circular CMP

Post Dev. 25 Year Storm
 $Q(25) = 103.32 \text{ cfs}$
 Dia. = 48"
 $H_w/D = 1.23$

Pre Dev. 25 Year Storm
 $Q(25) = 103.70 \text{ cfs}$
 Dia. = 48"
 $H_w/D = 1.23$



BUREAU OF PUBLIC ROADS JAN 1963

HEADWATER DEPTH FOR
C. M. PIPE CULVERTS
WITH INLET CONTROL

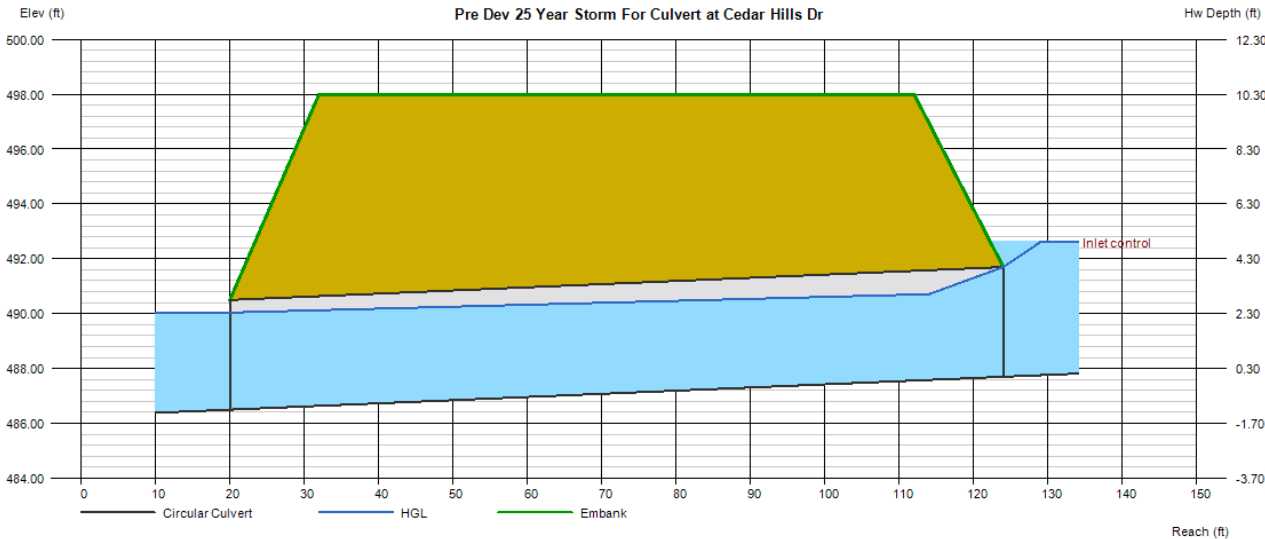
Culvert Report

Pre Dev 25 Year Storm For Culvert at Cedar Hills Dr

Invert Elev Dn (ft)	=	486.50
Pipe Length (ft)	=	104.00
Slope (%)	=	1.15
Invert Elev Up (ft)	=	487.70
Rise (in)	=	48.0
Shape	=	Circular
Span (in)	=	48.0
No. Barrels	=	1
n-Value	=	0.013
Culvert Type	=	Circular Concrete
Culvert Entrance	=	Groove end projecting (C)
Coeff. K,M,c,Y,k	=	0.0045, 2, 0.0317, 0.69, 0.2

Embankment	
Top Elevation (ft)	= 498.00
Top Width (ft)	= 80.00
Crest Width (ft)	= 0.00

Calculations		31.4 + 72.30 = 103.70
Qmin (cfs)	=	103.70
Qmax (cfs)	=	103.70
Tailwater Elev (ft)	=	(dc+D)/2
Highlighted		
Qtotal (cfs)	=	103.70
Qpipe (cfs)	=	103.70
Qovertop (cfs)	=	0.00
Veloc Dn (ft/s)	=	8.81
Veloc Up (ft/s)	=	9.98
HGL Dn (ft)	=	490.04
HGL Up (ft)	=	490.78
Hw Elev (ft)	=	492.61
Hw/D (ft)	=	1.23
Flow Regime	=	Inlet Control



Culvert Report

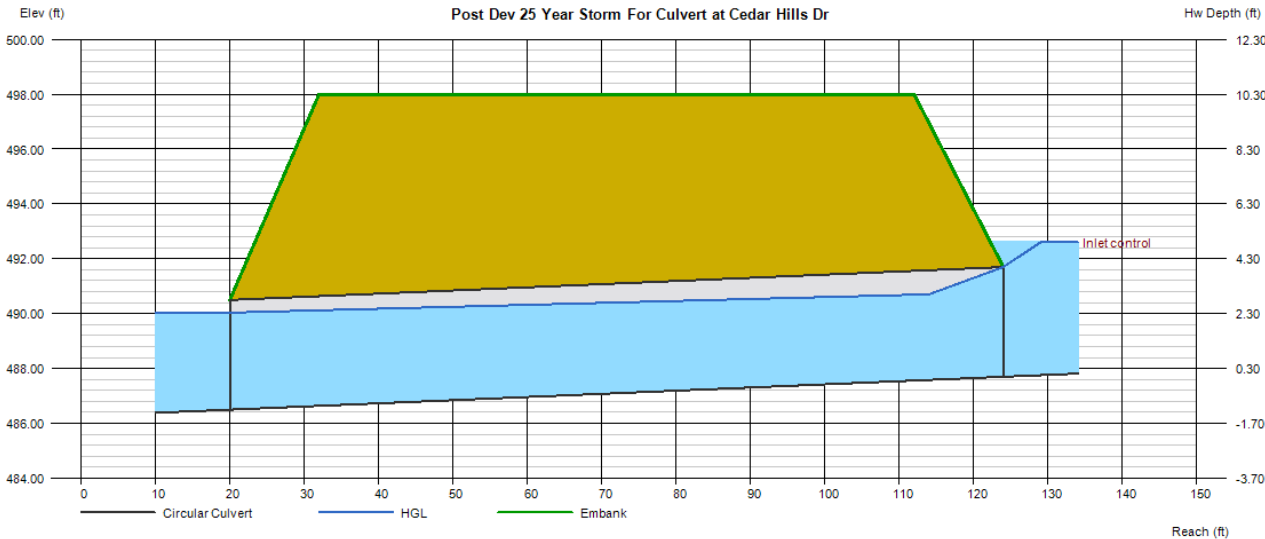
Post Dev 25 Year Storm For Culvert at Cedar Hills Dr

$30.8 + 72.52 = 103.32$

Invert Elev Dn (ft)	= 486.50
Pipe Length (ft)	= 104.00
Slope (%)	= 1.15
Invert Elev Up (ft)	= 487.70
Rise (in)	= 48.0
Shape	= Circular
Span (in)	= 48.0
No. Barrels	= 1
n-Value	= 0.013
Culvert Type	= Circular Concrete
Culvert Entrance	= Groove end projecting (C)
Coeff. K,M,c,Y,k	= 0.0045, 2, 0.0317, 0.69, 0.2

Embankment	
Top Elevation (ft)	= 498.00
Top Width (ft)	= 80.00
Crest Width (ft)	= 0.00

Calculations	
Qmin (cfs)	= 103.32
Qmax (cfs)	= 103.32
Tailwater Elev (ft)	= (dc+D)/2
Highlighted	
Qtotal (cfs)	= 103.32
Qpipe (cfs)	= 103.32
Qovertop (cfs)	= 0.00
Veloc Dn (ft/s)	= 8.79
Veloc Up (ft/s)	= 9.97
HGL Dn (ft)	= 490.04
HGL Up (ft)	= 490.78
Hw Elev (ft)	= 492.60
Hw/D (ft)	= 1.23
Flow Regime	= Inlet Control



Pipe Capacity Analysis - ZCP

Prepared by Thomas & Hutton

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Page 2

Rainfall Events Listing (selected events)

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	10-yr	Type II 24-hr		Default	24.00	1	5.17	2
2	25-yr	Type II 24-hr		Default	24.00	1	6.54	2

Pipe Capacity Analysis - ZCP

Prepared by Thomas & Hutton

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Type II 24-hr 10-yr Rainfall=5.17"

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Summary for Subcatchment 13S: Pre Dev. Basin 7

Runoff = 8.38 cfs @ 12.03 hrs, Volume= 0.545 af, Depth= 1.20"

Routed to Reach 46R : Flowpath Downstream POA 5

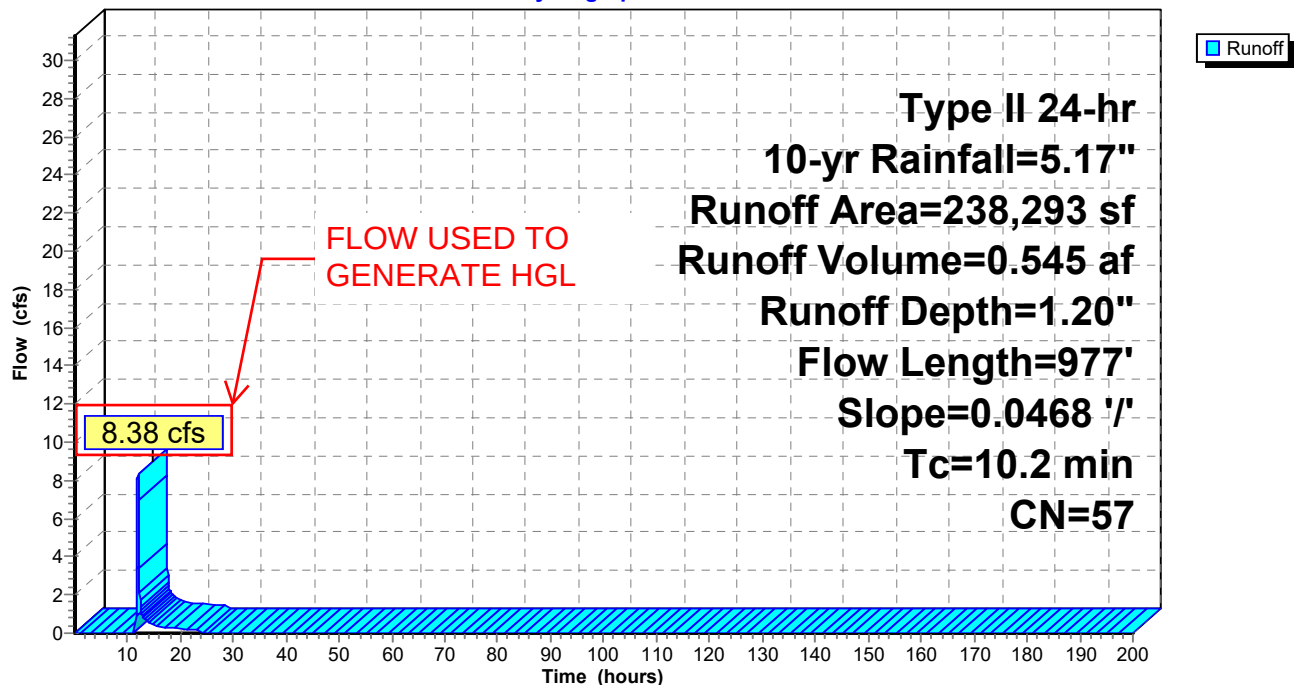
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.10-200.00 hrs, dt= 0.10 hrs
Type II 24-hr 10-yr Rainfall=5.17"

Area (sf)	CN	Description
207,447	55	Woods, Good, HSG B
30,846	67	Brush, Poor, HSG B
238,293	57	Weighted Average
238,293		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.2	977	0.0468	1.60		Kirpich Method, Estimated Tc General overland flow k= 2.00

Subcatchment 13S: Pre Dev. Basin 7

Hydrograph



Pipe Capacity Analysis - ZCP

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Type II 24-hr 25-yr Rainfall=6.54"

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Summary for Subcatchment 13S: Pre Dev. Basin 7

Runoff = 15.13 cfs @ 12.02 hrs, Volume= 0.918 af, Depth= 2.01"

Routed to Reach 46R : Flowpath Downstream POA 5

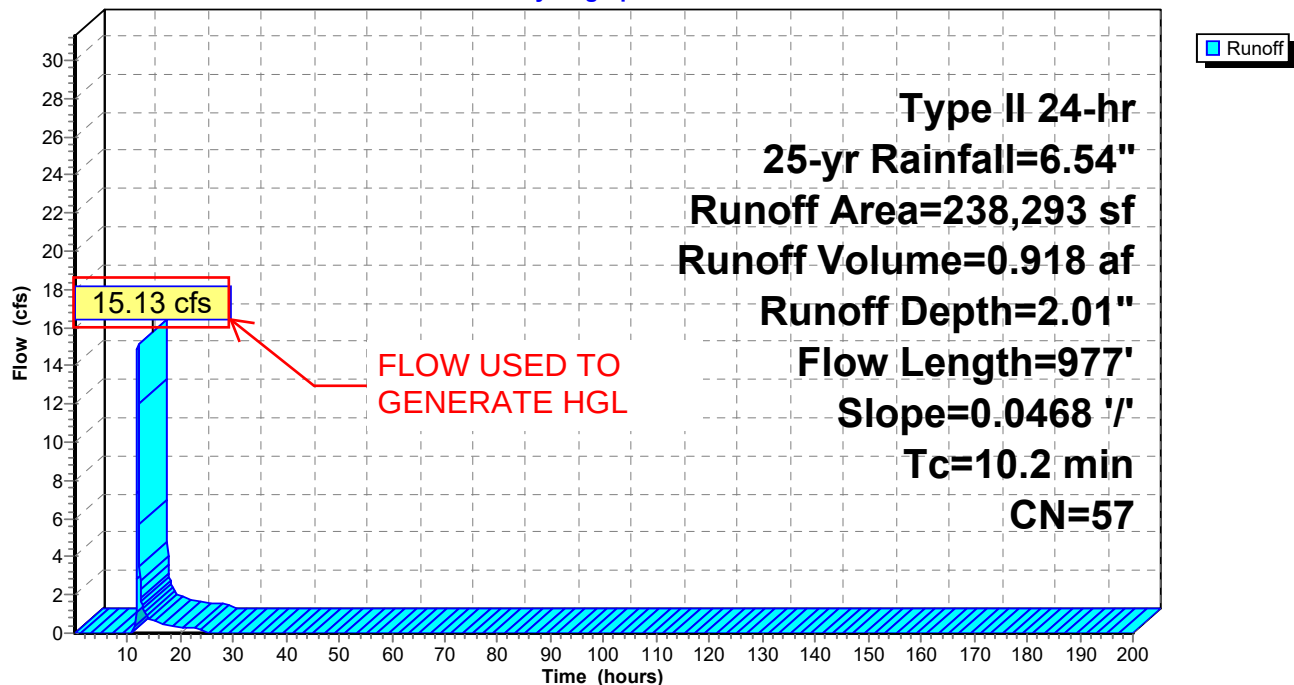
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.10-200.00 hrs, dt= 0.10 hrs
Type II 24-hr 25-yr Rainfall=6.54"

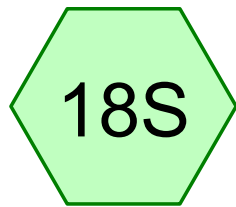
Area (sf)	CN	Description
207,447	55	Woods, Good, HSG B
30,846	67	Brush, Poor, HSG B
238,293	57	Weighted Average
238,293		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.2	977	0.0468	1.60		Kirpich Method, Estimated Tc General overland flow k= 2.00

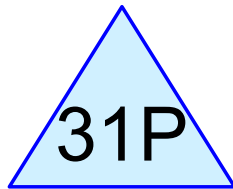
Subcatchment 13S: Pre Dev. Basin 7

Hydrograph

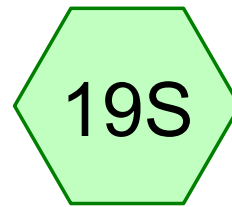




Post Dev. Basin 7 to
SCM



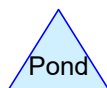
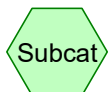
Wet Pond SCM 5



Post Dev. Bypass 7



POA 6



Pipe Capacity Analysis - ZCP

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Project Notes

Rainfall events imported from "HydroCAD-30792-ZCP.hcp"

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Rainfall Events Listing (selected events)

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	10-yr	Type II 24-hr		Default	24.00	1	5.17	2
2	25-yr	Type II 24-hr		Default	24.00	1	6.54	2

Pipe Capacity Analysis - ZCP

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Area Listing (selected nodes)

Area (acres)	CN	Description (subcatchment-numbers)
2.179	56	Brush, Fair, HSG B (18S, 19S)
1.485	98	Paved parking, HSG B (18S, 19S)
0.774	98	Roofs, HSG B (18S)
0.082	98	Water Surface, 0% imp, HSG B (18S)
0.917	55	Woods, Good, HSG B (19S)
5.438	74	TOTAL AREA

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Soil Listing (selected nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
5.438	HSG B	18S, 19S
0.000	HSG C	
0.000	HSG D	
0.000	Other	
5.438		TOTAL AREA

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Ground Covers (selected nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.000	2.179	0.000	0.000	0.000	2.179	Brush, Fair	18S, 19S
0.000	1.485	0.000	0.000	0.000	1.485	Paved parking	18S, 19S
0.000	0.774	0.000	0.000	0.000	0.774	Roofs	18S
0.000	0.082	0.000	0.000	0.000	0.082	Water Surface, 0% imp	18S
0.000	0.917	0.000	0.000	0.000	0.917	Woods, Good	19S
0.000	5.438	0.000	0.000	0.000	5.438	TOTAL AREA	

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Pipe Listing (selected nodes)

Line#	Node Number	In-Invert (feet)	Out-Invert (feet)	Length (feet)	Slope (ft/ft)	n	Width (inches)	Diam/Height (inches)	Inside-Fill (inches)	Node Name
1	31P	510.50	510.00	79.0	0.0063	0.013	0.0	36.0	0.0	

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Type II 24-hr 10-yr Rainfall=5.17"

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Time span=0.10-200.00 hrs, dt=0.10 hrs, 2000 points

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN

Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment18S: Post Dev. Basin 7 to Runoff Area=150,448 sf 57.98% Impervious Runoff Depth=3.14"
Tc=5.0 min CN=81 Runoff=17.00 cfs 0.903 af

Subcatchment19S: Post Dev. Bypass 7 Runoff Area=86,411 sf 12.93% Impervious Runoff Depth=1.47"
Tc=10.0 min CN=61 Runoff=3.99 cfs 0.243 af

Pond 31P: Wet Pond SCM 5 Peak Elev=514.94' Storage=22,276 cf Inflow=17.00 cfs 0.903 af
Outflow=2.31 cfs 0.903 af

Link 33L: POA 6 Inflow=4.20 cfs 1.146 af
Primary=4.20 cfs 1.146 af

Total Runoff Area = 5.438 ac Runoff Volume = 1.146 af Average Runoff Depth = 2.53"
58.46% Pervious = 3.179 ac 41.54% Impervious = 2.259 ac

Pipe Capacity Analysis - ZCP

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Type II 24-hr 10-yr Rainfall=5.17"

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Summary for Subcatchment 18S: Post Dev. Basin 7 to SCM

Runoff = 17.00 cfs @ 11.96 hrs, Volume= 0.903 af, Depth= 3.14"
Routed to Pond 31P : Wet Pond SCM 5

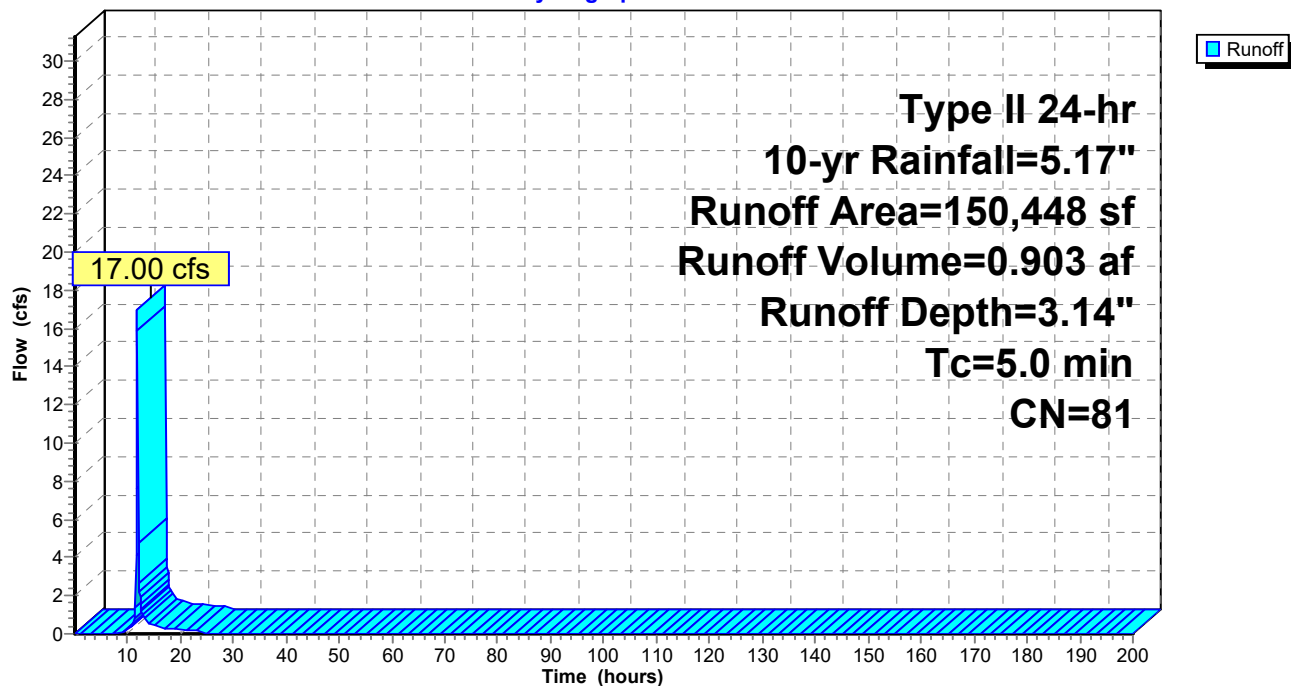
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.10-200.00 hrs, dt= 0.10 hrs
Type II 24-hr 10-yr Rainfall=5.17"

Area (sf)	CN	Description
53,515	98	Paved parking, HSG B
33,715	98	Roofs, HSG B
59,637	56	Brush, Fair, HSG B
3,581	98	Water Surface, 0% imp, HSG B
150,448	81	Weighted Average
63,218		42.02% Pervious Area
87,230		57.98% Impervious Area

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

Subcatchment 18S: Post Dev. Basin 7 to SCM

Hydrograph



Pipe Capacity Analysis - ZCP

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Type II 24-hr 10-yr Rainfall=5.17"

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Summary for Subcatchment 19S: Post Dev. Bypass 7

Runoff = 3.99 cfs @ 12.02 hrs, Volume= 0.243 af, Depth= 1.47"
Routed to Link 33L : POA 6

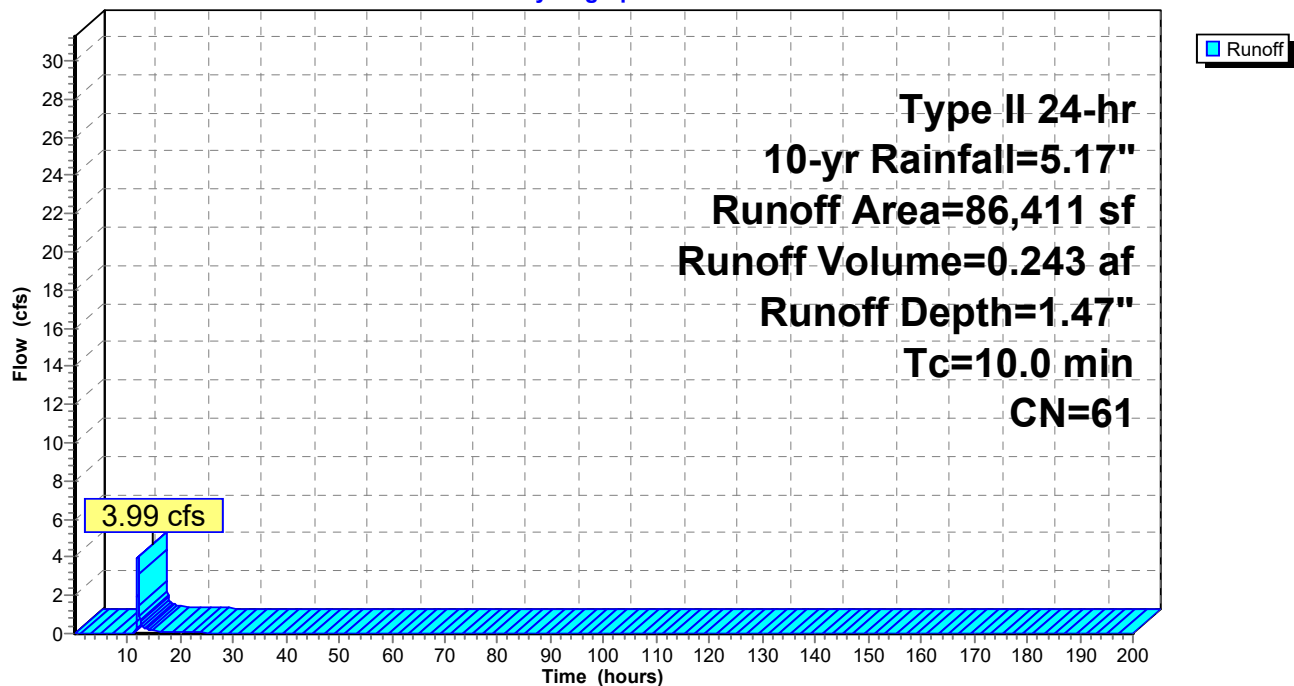
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.10-200.00 hrs, dt= 0.10 hrs
Type II 24-hr 10-yr Rainfall=5.17"

Area (sf)	CN	Description
11,171	98	Paved parking, HSG B
35,296	56	Brush, Fair, HSG B
39,944	55	Woods, Good, HSG B
86,411	61	Weighted Average
75,240		87.07% Pervious Area
11,171		12.93% Impervious Area

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

Subcatchment 19S: Post Dev. Bypass 7

Hydrograph



Pipe Capacity Analysis - ZCP

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Type II 24-hr 10-yr Rainfall=5.17"

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Summary for Pond 31P: Wet Pond SCM 5

Inflow Area = 3.454 ac, 57.98% Impervious, Inflow Depth = 3.14" for 10-yr event
Inflow = 17.00 cfs @ 11.96 hrs, Volume= 0.903 af
Outflow = 2.31 cfs @ 12.30 hrs, Volume= 0.903 af, Atten= 86%, Lag= 20.6 min
Primary = 2.31 cfs @ 12.30 hrs, Volume= 0.903 af
Routed to Link 33L : POA 6

Routing by Stor-Ind method, Time Span= 0.10-200.00 hrs, dt= 0.10 hrs

Starting Elev= 510.50' Surf.Area= 3,231 sf Storage= 1,401 cf

Peak Elev= 514.94' @ 12.30 hrs Surf.Area= 5,722 sf Storage= 22,276 cf (20,876 cf above start)

Plug-Flow detention time= 1,320.6 min calculated for 0.870 af (96% of inflow)

Center-of-Mass det. time= 1,252.3 min (2,065.9 - 813.7)

Volume	Invert	Avail.Storage	Storage Description
#1	510.00'	42,078 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
510.00	2,371	0	0
510.50	3,231	1,401	1,401
511.00	3,997	1,807	3,208
512.00	4,407	4,202	7,410
513.00	4,836	4,622	12,031
514.00	5,284	5,060	17,091
515.00	5,749	5,517	22,608
516.00	6,233	5,991	28,599
517.00	6,735	6,484	35,083
518.00	7,255	6,995	42,078

Device	Routing	Invert	Outlet Devices
#1	Primary	510.50'	36.0" Round Culvert L= 79.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 510.50' / 510.00' S= 0.0063 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 7.07 sf
#2	Device 1	510.50'	1.5" Vert. Drawdown C= 0.600 Limited to weir flow at low heads
#3	Device 1	514.70'	34.0" W x 4.5" H Vert. Peakflow Orifice X 2.00 C= 0.600 Limited to weir flow at low heads
#4	Device 1	516.60'	48.0" x 48.0" Horiz. Overflow C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=2.29 cfs @ 12.30 hrs HW=514.94' (Free Discharge)

1=Culvert (Passes 2.29 cfs of 54.90 cfs potential flow)
2=Drawdown (Orifice Controls 0.12 cfs @ 10.08 fps)
3=Peakflow Orifice (Orifice Controls 2.17 cfs @ 1.58 fps)
4=Overflow (Controls 0.00 cfs)

Pipe Capacity Analysis - ZCP

Prepared by Thomas & Hutton

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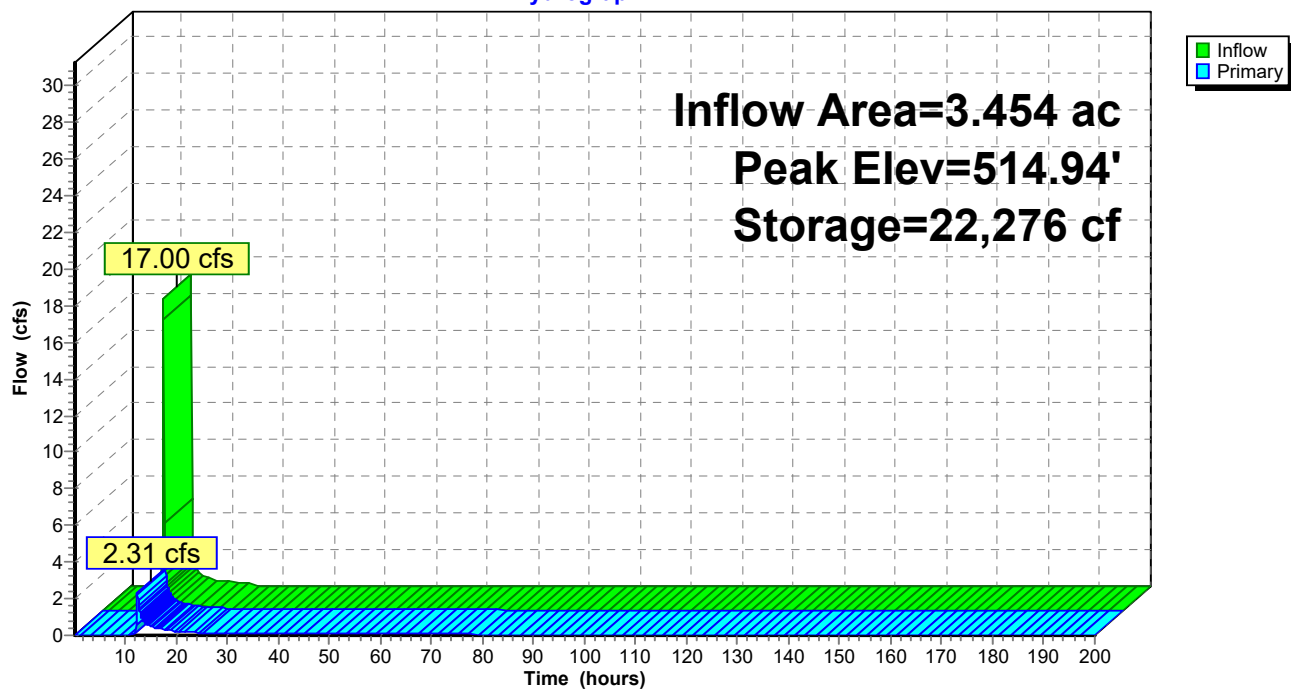
Type II 24-hr 10-yr Rainfall=5.17"

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Pond 31P: Wet Pond SCM 5

Hydrograph



Pipe Capacity Analysis - ZCP

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Type II 24-hr 10-yr Rainfall=5.17"

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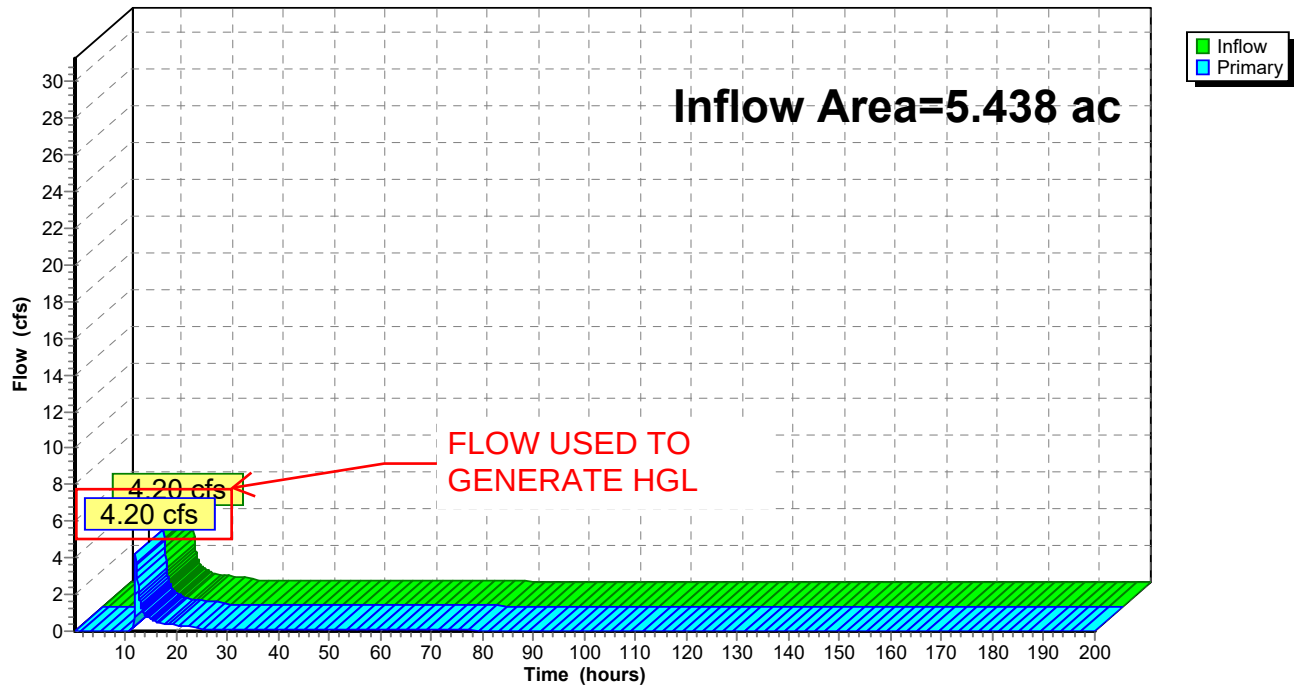
Summary for Link 33L: POA 6

Inflow Area = 5.438 ac, 41.54% Impervious, Inflow Depth = 2.53" for 10-yr event
Inflow = 4.20 cfs @ 12.04 hrs, Volume= 1.146 af
Primary = 4.20 cfs @ 12.04 hrs, Volume= 1.146 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.10-200.00 hrs, dt= 0.10 hrs

Link 33L: POA 6

Hydrograph



Pipe Capacity Analysis - ZCP

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Type II 24-hr 25-yr Rainfall=6.54"

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Time span=0.10-200.00 hrs, dt=0.10 hrs, 2000 points

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN

Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment18S: Post Dev. Basin 7 to Runoff Area=150,448 sf 57.98% Impervious Runoff Depth=4.38"
Tc=5.0 min CN=81 Runoff=23.36 cfs 1.260 af

Subcatchment19S: Post Dev. Bypass 7 Runoff Area=86,411 sf 12.93% Impervious Runoff Depth=2.38"
Tc=10.0 min CN=61 Runoff=6.70 cfs 0.393 af

Pond 31P: Wet Pond SCM 5 Peak Elev=515.68' Storage=26,654 cf Inflow=23.36 cfs 1.260 af
Outflow=9.26 cfs 1.260 af

Link 33L: POA 6 Inflow=14.55 cfs 1.653 af
Primary=14.55 cfs 1.653 af

Total Runoff Area = 5.438 ac Runoff Volume = 1.653 af Average Runoff Depth = 3.65"
58.46% Pervious = 3.179 ac 41.54% Impervious = 2.259 ac

Pipe Capacity Analysis - ZCP

Prepared by Thomas & Hutton

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Type II 24-hr 25-yr Rainfall=6.54"

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Summary for Subcatchment 18S: Post Dev. Basin 7 to SCM

Runoff = 23.36 cfs @ 11.95 hrs, Volume= 1.260 af, Depth= 4.38"
Routed to Pond 31P : Wet Pond SCM 5

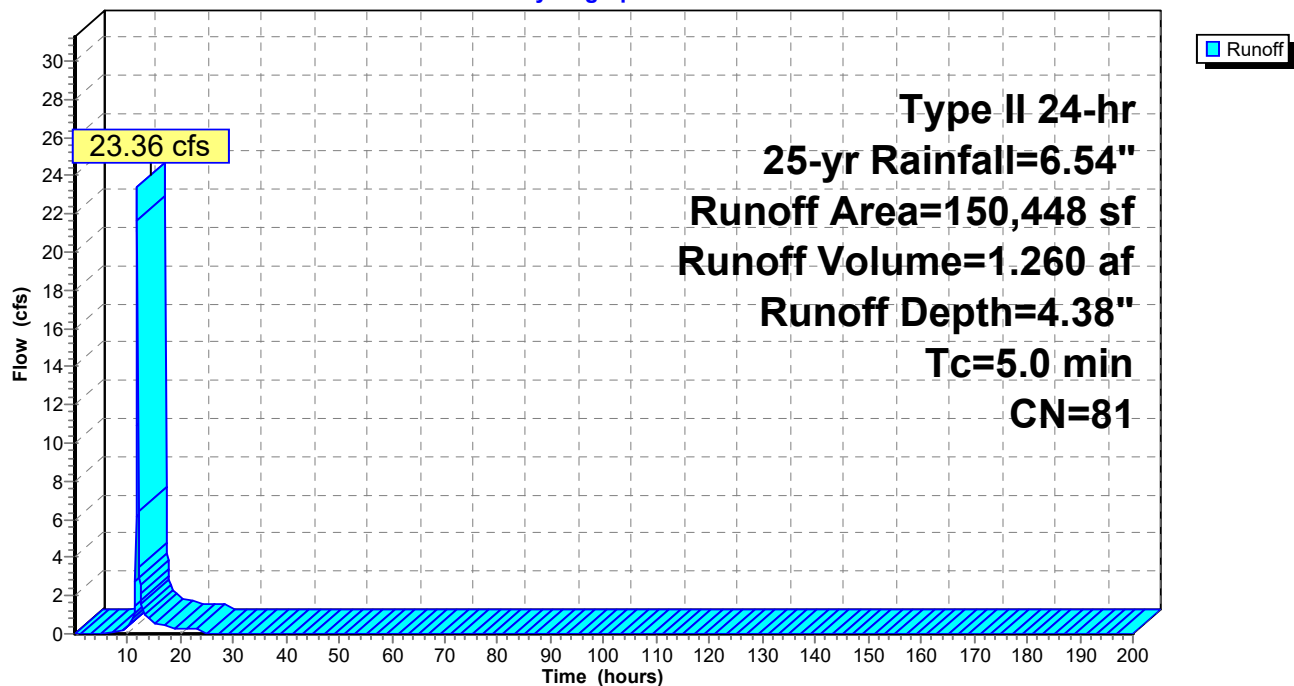
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.10-200.00 hrs, dt= 0.10 hrs
Type II 24-hr 25-yr Rainfall=6.54"

Area (sf)	CN	Description
53,515	98	Paved parking, HSG B
33,715	98	Roofs, HSG B
59,637	56	Brush, Fair, HSG B
3,581	98	Water Surface, 0% imp, HSG B
150,448	81	Weighted Average
63,218		42.02% Pervious Area
87,230		57.98% Impervious Area

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

Subcatchment 18S: Post Dev. Basin 7 to SCM

Hydrograph



Pipe Capacity Analysis - ZCP

Prepared by Thomas & Hutton

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Type II 24-hr 25-yr Rainfall=6.54"

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Summary for Subcatchment 19S: Post Dev. Bypass 7

Runoff = 6.70 cfs @ 12.02 hrs, Volume= 0.393 af, Depth= 2.38"
Routed to Link 33L : POA 6

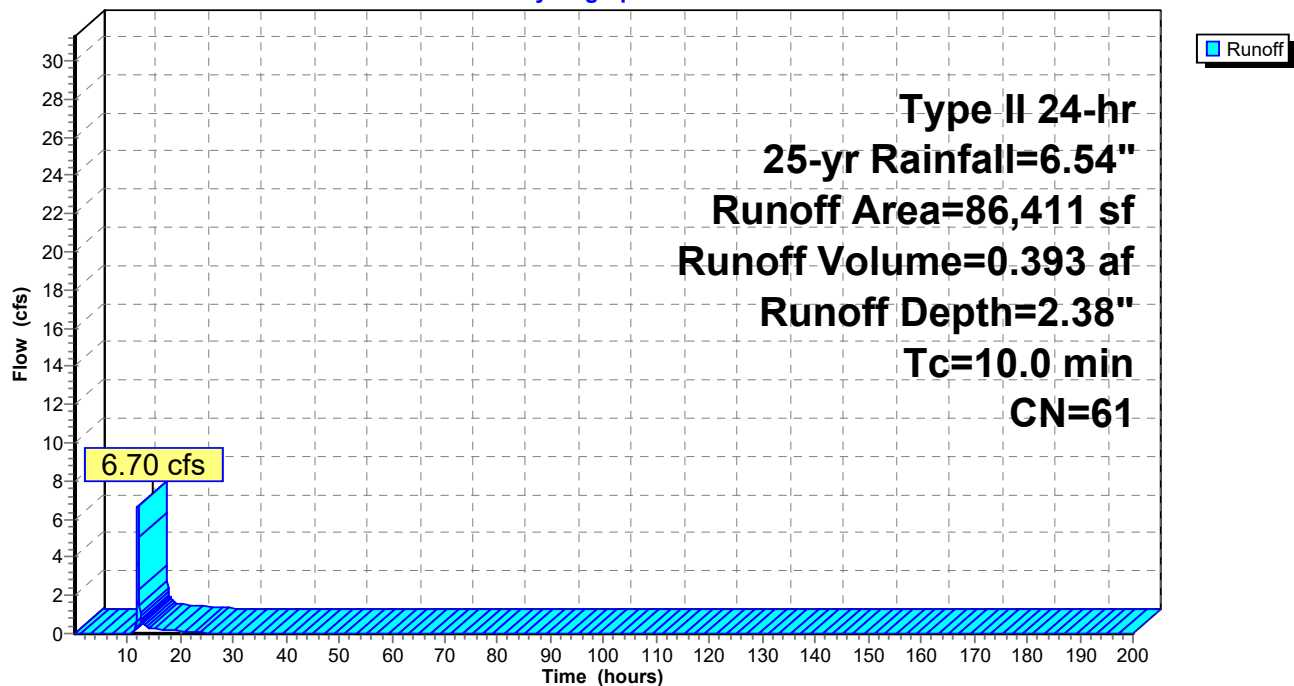
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.10-200.00 hrs, dt= 0.10 hrs
Type II 24-hr 25-yr Rainfall=6.54"

Area (sf)	CN	Description
11,171	98	Paved parking, HSG B
35,296	56	Brush, Fair, HSG B
39,944	55	Woods, Good, HSG B
86,411	61	Weighted Average
75,240		87.07% Pervious Area
11,171		12.93% Impervious Area

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

Subcatchment 19S: Post Dev. Bypass 7

Hydrograph



Pipe Capacity Analysis - ZCP

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Type II 24-hr 25-yr Rainfall=6.54"

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Summary for Pond 31P: Wet Pond SCM 5

Inflow Area = 3.454 ac, 57.98% Impervious, Inflow Depth = 4.38" for 25-yr event
Inflow = 23.36 cfs @ 11.95 hrs, Volume= 1.260 af
Outflow = 9.26 cfs @ 12.11 hrs, Volume= 1.260 af, Atten= 60%, Lag= 9.7 min
Primary = 9.26 cfs @ 12.11 hrs, Volume= 1.260 af
Routed to Link 33L : POA 6

Routing by Stor-Ind method, Time Span= 0.10-200.00 hrs, dt= 0.10 hrs

Starting Elev= 510.50' Surf.Area= 3,231 sf Storage= 1,401 cf

Peak Elev= 515.68' @ 12.11 hrs Surf.Area= 6,080 sf Storage= 26,654 cf (25,254 cf above start)

Plug-Flow detention time= 950.7 min calculated for 1.228 af (97% of inflow)

Center-of-Mass det. time= 907.2 min (1,711.4 - 804.2)

Volume	Invert	Avail.Storage	Storage Description
#1	510.00'	42,078 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
510.00	2,371	0	0
510.50	3,231	1,401	1,401
511.00	3,997	1,807	3,208
512.00	4,407	4,202	7,410
513.00	4,836	4,622	12,031
514.00	5,284	5,060	17,091
515.00	5,749	5,517	22,608
516.00	6,233	5,991	28,599
517.00	6,735	6,484	35,083
518.00	7,255	6,995	42,078

Device	Routing	Invert	Outlet Devices
#1	Primary	510.50'	36.0" Round Culvert L= 79.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 510.50' / 510.00' S= 0.0063 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 7.07 sf
#2	Device 1	510.50'	1.5" Vert. Drawdown C= 0.600 Limited to weir flow at low heads
#3	Device 1	514.70'	34.0" W x 4.5" H Vert. Peakflow Orifice X 2.00 C= 0.600 Limited to weir flow at low heads
#4	Device 1	516.60'	48.0" x 48.0" Horiz. Overflow C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=9.03 cfs @ 12.11 hrs HW=515.65' (Free Discharge)

1=Culvert (Passes 9.03 cfs of 64.10 cfs potential flow)
2=Drawdown (Orifice Controls 0.13 cfs @ 10.86 fps)
3=Peakflow Orifice (Orifice Controls 8.90 cfs @ 4.19 fps)
4=Overflow (Controls 0.00 cfs)

Pipe Capacity Analysis - ZCP

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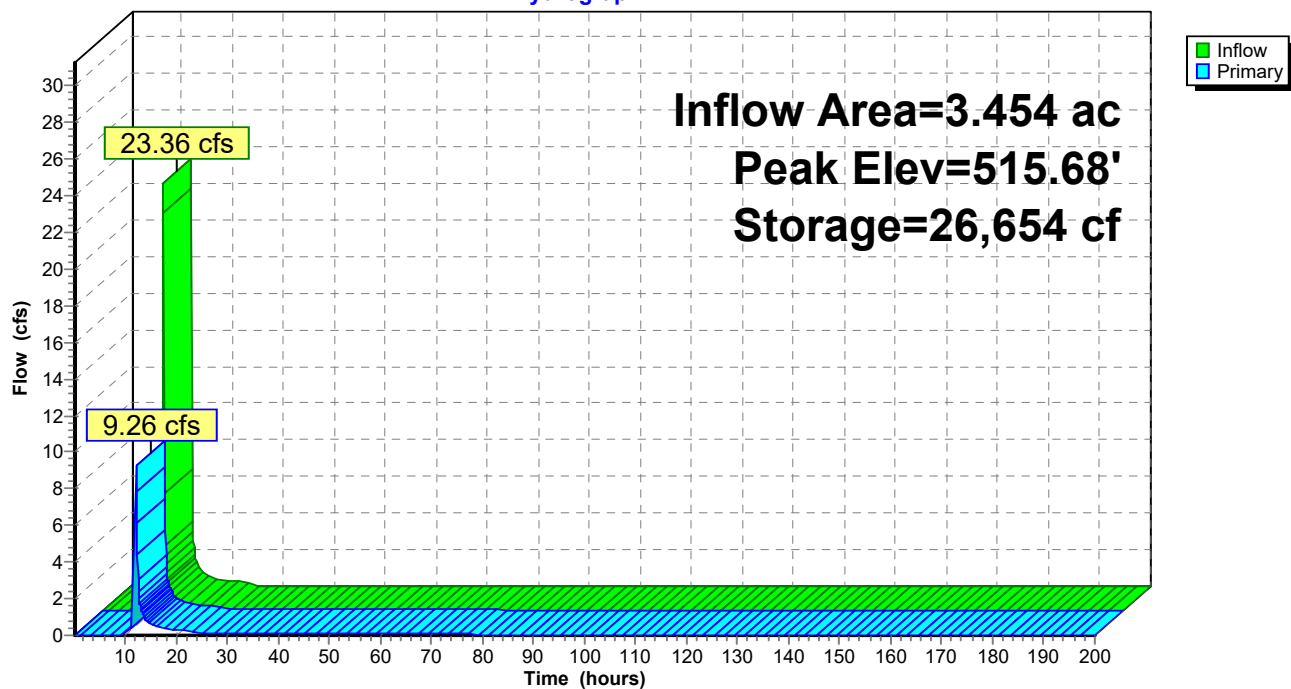
Type II 24-hr 25-yr Rainfall=6.54"

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Pond 31P: Wet Pond SCM 5

Hydrograph



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Type II 24-hr 25-yr Rainfall=6.54"

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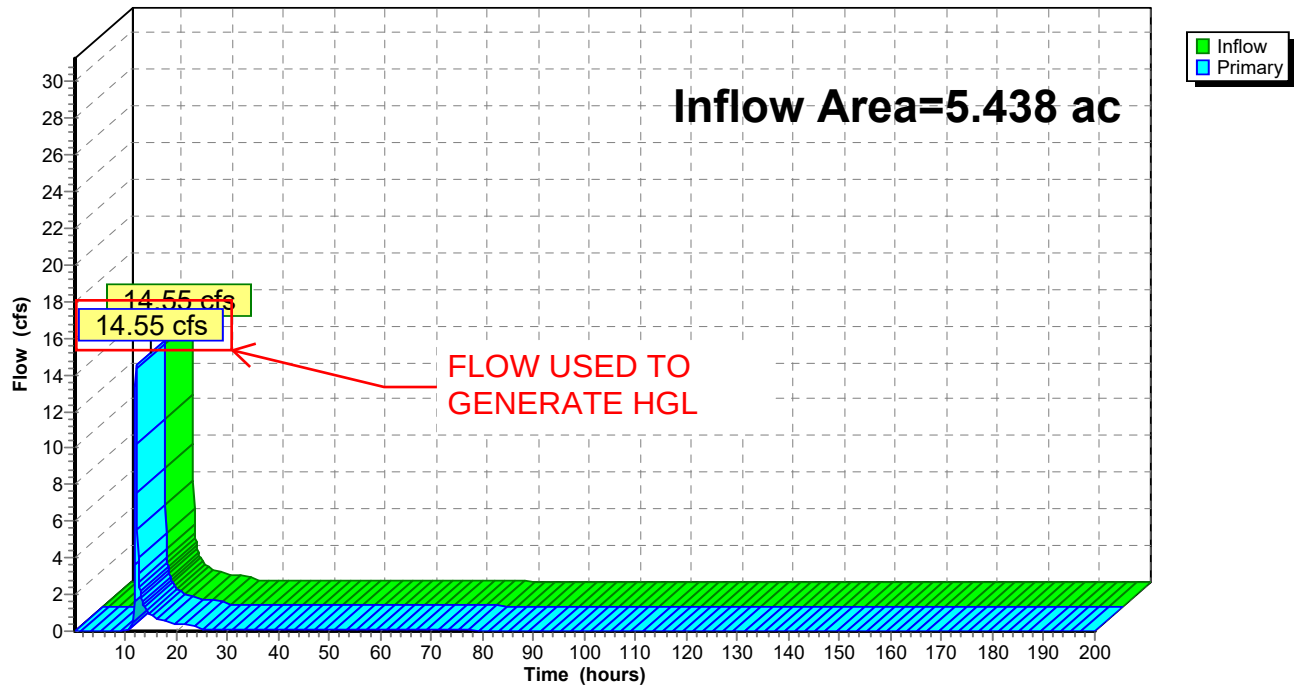
Summary for Link 33L: POA 6

Inflow Area = 5.438 ac, 41.54% Impervious, Inflow Depth = 3.65" for 25-yr event
Inflow = 14.55 cfs @ 12.07 hrs, Volume= 1.653 af
Primary = 14.55 cfs @ 12.07 hrs, Volume= 1.653 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.10-200.00 hrs, dt= 0.10 hrs

Link 33L: POA 6

Hydrograph





Pre Dev. Basin 6



Pre Dev. Basin 8



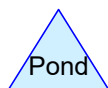
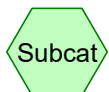
Area 4



Flowpath Downstream
POA 6



48" Culvert



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Rainfall Events Listing (selected events)

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	25-yr	Type II 24-hr		Default	24.00	1	6.54	2

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Area Listing (selected nodes)

Area (acres)	CN	Description (subcatchment-numbers)
9.726	85	1/8 acre lots, 65% imp, HSG B (54S)
1.351	69	50-75% Grass cover, Fair, HSG B (14S)
0.914	56	Brush, Fair, HSG B (12S)
14.513	60	Woods, Fair, HSG B (12S, 14S)
26.504	69	TOTAL AREA

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Soil Listing (selected nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
26.504	HSG B	12S, 14S, 54S
0.000	HSG C	
0.000	HSG D	
0.000	Other	
26.504		TOTAL AREA

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Ground Covers (selected nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.000	9.726	0.000	0.000	0.000	9.726	1/8 acre lots, 65% imp	54S
0.000	1.351	0.000	0.000	0.000	1.351	50-75% Grass cover, Fair	14S
0.000	0.914	0.000	0.000	0.000	0.914	Brush, Fair	12S
0.000	14.513	0.000	0.000	0.000	14.513	Woods, Fair	12S, 14S
0.000	26.504	0.000	0.000	0.000	26.504	TOTAL AREA	

Pipe Capacity Analysis - ZCP

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Type II 24-hr 25-yr Rainfall=6.54"

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Time span=0.10-200.00 hrs, dt=0.10 hrs, 2000 points

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN

Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment12S: Pre Dev. Basin 6 Runoff Area=441,055 sf 0.00% Impervious Runoff Depth=2.28"
Flow Length=1,222' Slope=0.0441 '/' Tc=12.4 min CN=60 Runoff=29.27 cfs 1.927 af

Subcatchment14S: Pre Dev. Basin 8 Runoff Area=289,814 sf 0.00% Impervious Runoff Depth=2.47"
Flow Length=826' Slope=0.0447 '/' Tc=9.1 min CN=62 Runoff=24.46 cfs 1.368 af

Subcatchment54S: Area 4 Runoff Area=423,660 sf 65.00% Impervious Runoff Depth=4.81"
Tc=5.0 min CN=85 Runoff=70.77 cfs 3.902 af

Reach 45R: Flowpath Downstream Avg. Flow Depth=2.56' Max Vel=1.72 fps Inflow=52.95 cfs 3.295 af
n=0.100 L=1,509.0' S=0.0154 '/' Capacity=6.78 cfs Outflow=31.10 cfs 3.295 af

Link 55L: 48" Culvert Inflow=72.30 cfs 7.196 af
Primary=72.30 cfs 7.196 af

Total Runoff Area = 26.504 ac Runoff Volume = 7.196 af Average Runoff Depth = 3.26"
76.15% Pervious = 20.183 ac 23.85% Impervious = 6.322 ac

Pipe Capacity Analysis - ZCP

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Type II 24-hr 25-yr Rainfall=6.54"

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Summary for Subcatchment 12S: Pre Dev. Basin 6

Runoff = 29.27 cfs @ 12.05 hrs, Volume= 1.927 af, Depth= 2.28"

Routed to Reach 45R : Flowpath Downstream POA 6

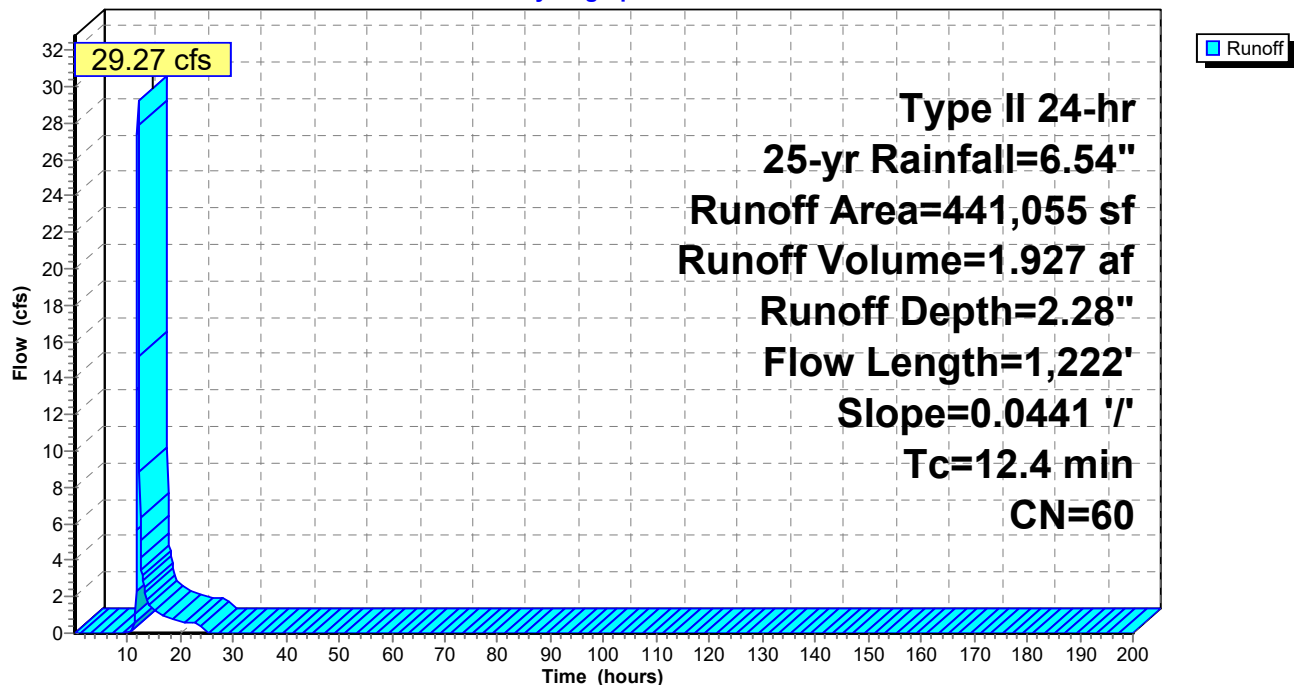
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.10-200.00 hrs, dt= 0.10 hrs
Type II 24-hr 25-yr Rainfall=6.54"

Area (sf)	CN	Description
401,238	60	Woods, Fair, HSG B
39,817	56	Brush, Fair, HSG B
441,055	60	Weighted Average
441,055		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.4	1,222	0.0441	1.65		Kirpich Method, Estimated Tc General overland flow k= 2.00

Subcatchment 12S: Pre Dev. Basin 6

Hydrograph



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Type II 24-hr 25-yr Rainfall=6.54"

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Summary for Subcatchment 14S: Pre Dev. Basin 8

Runoff = 24.46 cfs @ 12.01 hrs, Volume= 1.368 af, Depth= 2.47"

Routed to Reach 45R : Flowpath Downstream POA 6

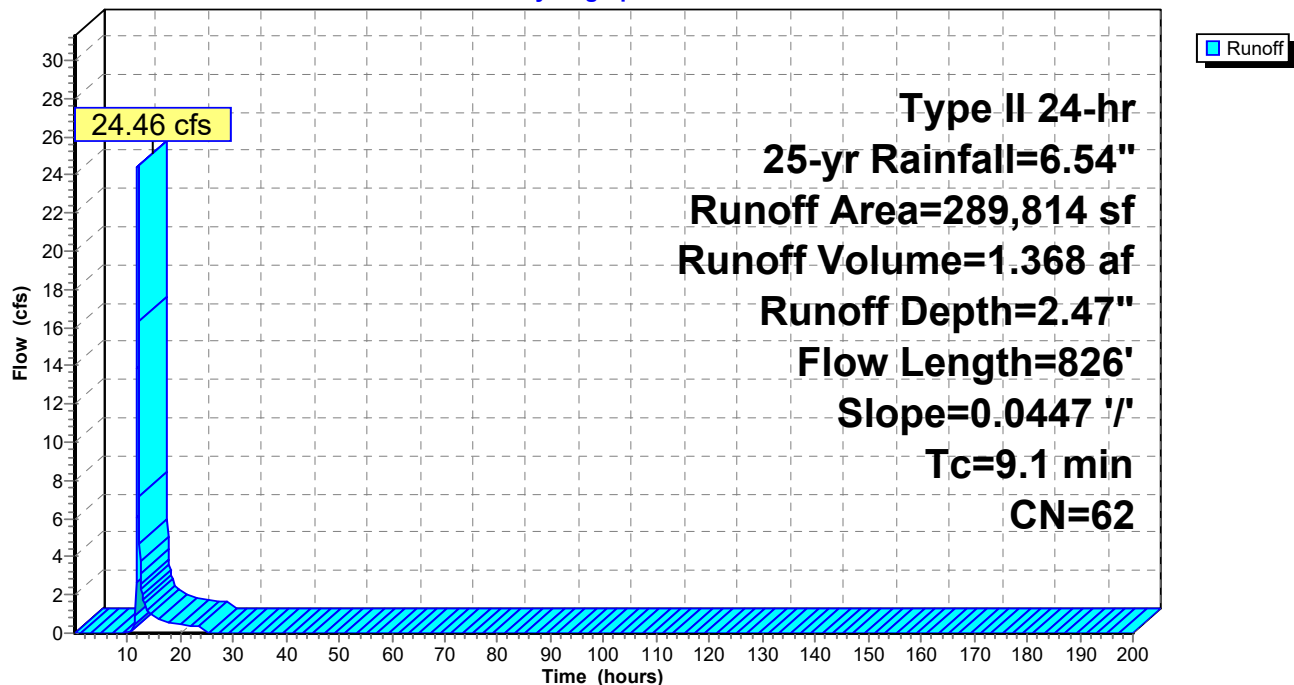
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.10-200.00 hrs, dt= 0.10 hrs
Type II 24-hr 25-yr Rainfall=6.54"

Area (sf)	CN	Description
230,959	60	Woods, Fair, HSG B
58,855	69	50-75% Grass cover, Fair, HSG B
289,814	62	Weighted Average
289,814		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.1	826	0.0447	1.51		Kirpich Method, General overland flow k= 2.00

Subcatchment 14S: Pre Dev. Basin 8

Hydrograph



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Type II 24-hr 25-yr Rainfall=6.54"

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Summary for Subcatchment 54S: Area 4

Runoff = 70.77 cfs @ 11.95 hrs, Volume= 3.902 af, Depth= 4.81"
Routed to Link 55L : 48" Culvert

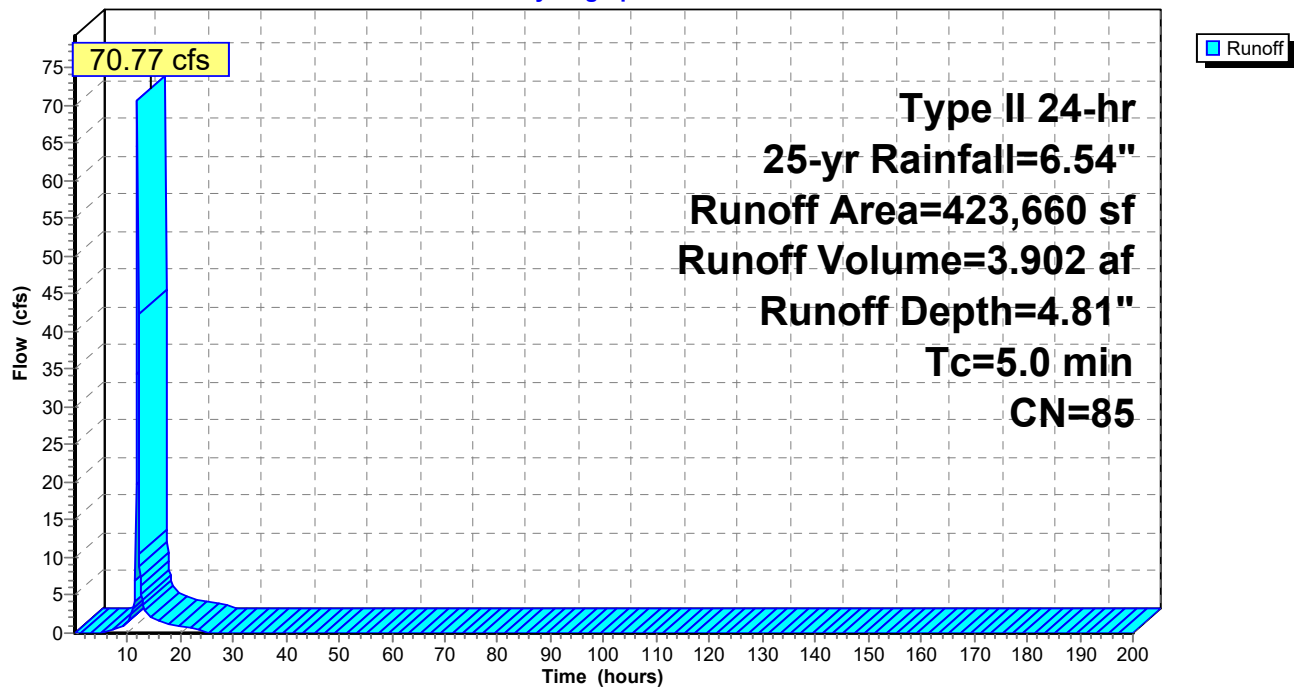
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.10-200.00 hrs, dt= 0.10 hrs
Type II 24-hr 25-yr Rainfall=6.54"

Area (sf)	CN	Description
423,660	85	1/8 acre lots, 65% imp, HSG B
148,281		35.00% Pervious Area
275,379		65.00% Impervious Area

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

Subcatchment 54S: Area 4

Hydrograph



Pipe Capacity Analysis - ZCP

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Type II 24-hr 25-yr Rainfall=6.54"

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Summary for Reach 45R: Flowpath Downstream POA 6

Inflow Area = 16.778 ac, 0.00% Impervious, Inflow Depth = 2.36" for 25-yr event
Inflow = 52.95 cfs @ 12.03 hrs, Volume= 3.295 af
Outflow = 31.10 cfs @ 12.42 hrs, Volume= 3.295 af, Atten= 41%, Lag= 23.5 min
Routed to Link 55L : 48" Culvert

Routing by Stor-Ind+Trans method, Time Span= 0.10-200.00 hrs, dt= 0.10 hrs

Max. Velocity= 1.72 fps, Min. Travel Time= 14.6 min

Avg. Velocity = 0.29 fps, Avg. Travel Time= 85.8 min

Peak Storage= 27,793 cf @ 12.17 hrs

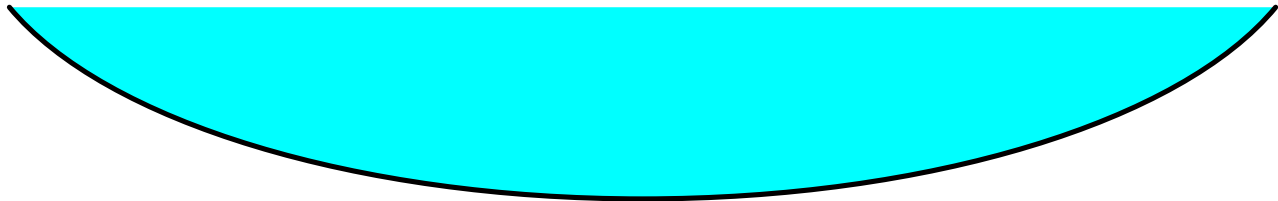
Average Depth at Peak Storage= 2.56' , Surface Width= 13.54'

Bank-Full Depth= 0.94' Flow Area= 5.1 sf, Capacity= 6.78 cfs

8.20' x 0.94' deep Parabolic Channel, n= 0.100 Earth, dense brush, high stage

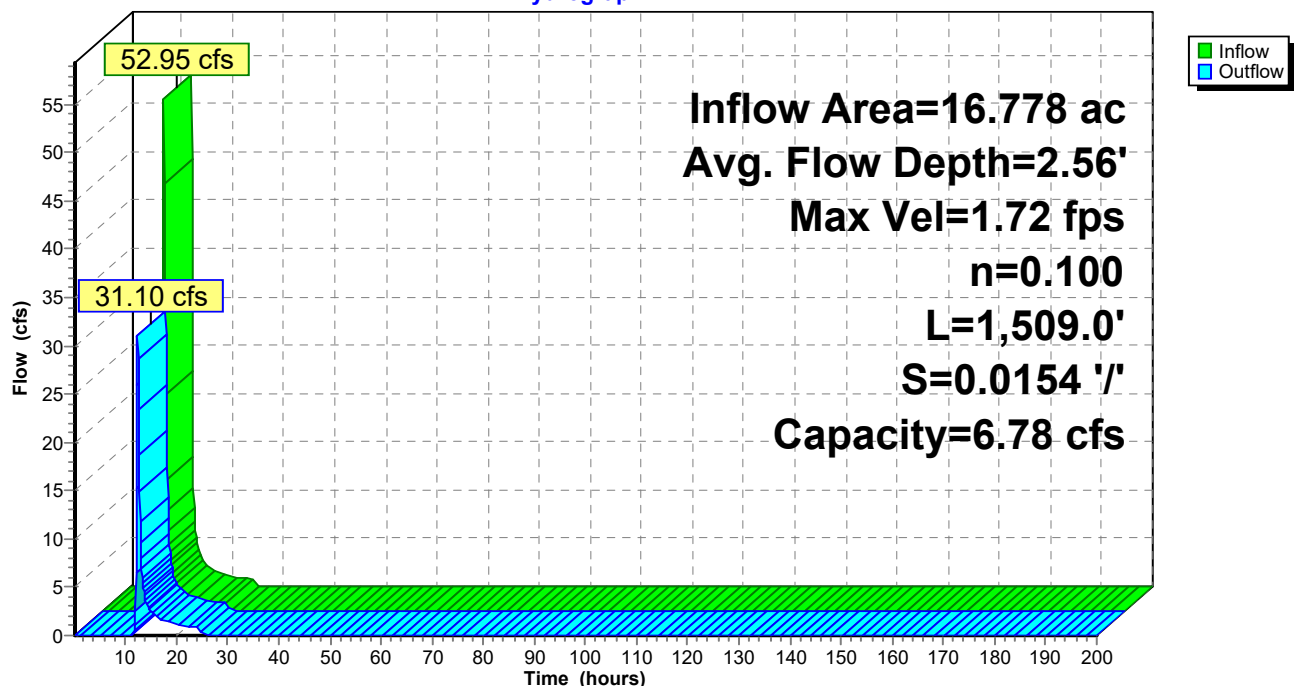
Length= 1,509.0' Slope= 0.0154 '/'

Inlet Invert= 505.43', Outlet Invert= 482.25'



Reach 45R: Flowpath Downstream POA 6

Hydrograph



Pipe Capacity Analysis - ZCP

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Type II 24-hr 25-yr Rainfall=6.54"

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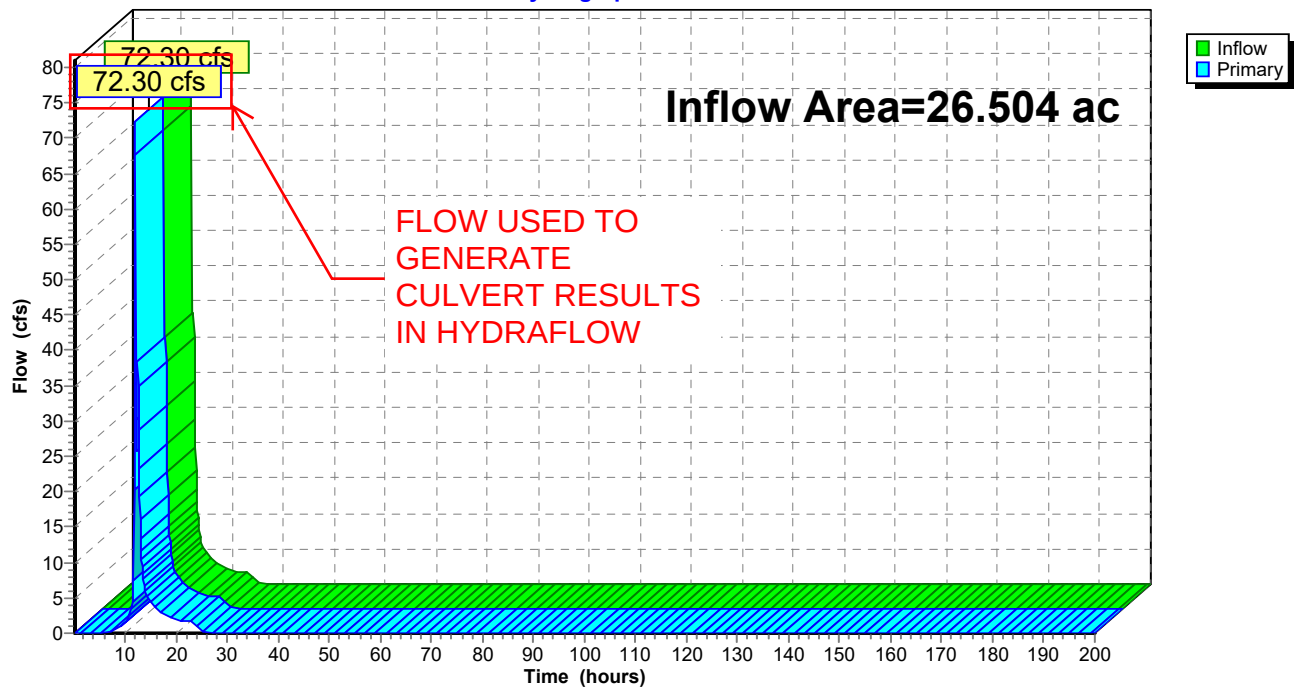
Summary for Link 55L: 48" Culvert

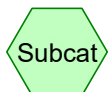
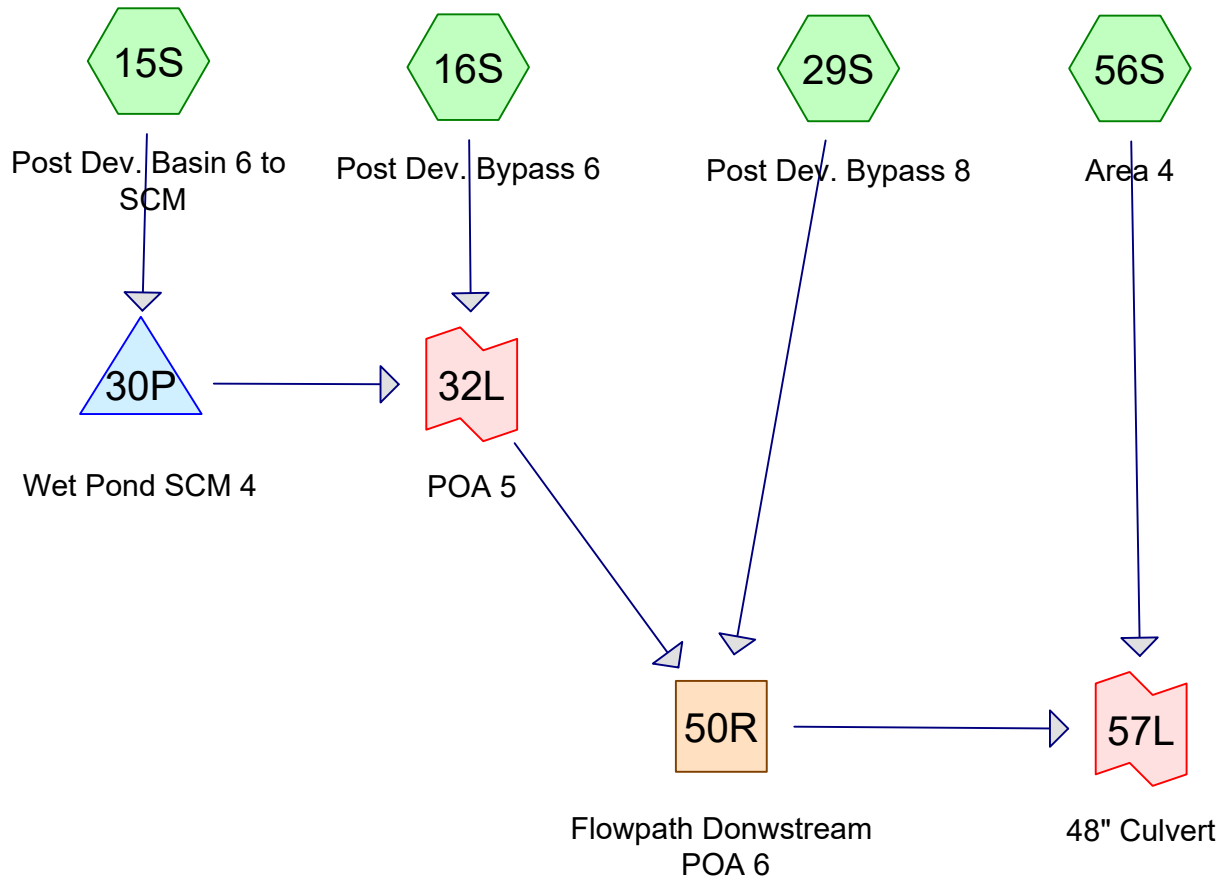
Inflow Area = 26.504 ac, 23.85% Impervious, Inflow Depth = 3.26" for 25-yr event
Inflow = 72.30 cfs @ 11.95 hrs, Volume= 7.196 af
Primary = 72.30 cfs @ 11.95 hrs, Volume= 7.196 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.10-200.00 hrs, dt= 0.10 hrs

Link 55L: 48" Culvert

Hydrograph

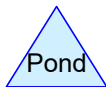




Subcat



Reach



Pond



Link

Routing Diagram for Pipe Capacity Analysis - ZCP

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Pipe Capacity Analysis - ZCP

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Project Notes

Rainfall events imported from "HydroCAD-30792-ZCP.hcp"

Pipe Capacity Analysis - ZCP

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Area Listing (selected nodes)

Area (acres)	CN	Description (subcatchment-numbers)
9.726	85	1/8 acre lots, 65% imp, HSG B (56S)
1.227	69	50-75% Grass cover, Fair, HSG B (29S)
1.880	56	Brush, Fair, HSG B (15S, 16S)
1.986	98	Paved parking, HSG B (15S, 16S, 29S)
1.455	98	Roofs, HSG B (15S)
0.326	98	Water Surface, 0% imp, HSG B (15S)
9.943	60	Woods, Fair, HSG B (16S, 29S)
26.542	75	TOTAL AREA

Pipe Capacity Analysis - ZCP

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Soil Listing (selected nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
26.542	HSG B	15S, 16S, 29S, 56S
0.000	HSG C	
0.000	HSG D	
0.000	Other	
26.542		TOTAL AREA

Pipe Capacity Analysis - ZCP

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Ground Covers (selected nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.000	9.726	0.000	0.000	0.000	9.726	1/8 acre lots, 65% imp	56S
0.000	1.227	0.000	0.000	0.000	1.227	50-75% Grass cover, Fair	29S
0.000	1.880	0.000	0.000	0.000	1.880	Brush, Fair	15S, 16S
0.000	1.986	0.000	0.000	0.000	1.986	Paved parking	15S, 16S, 29S
0.000	1.455	0.000	0.000	0.000	1.455	Roofs	15S
0.000	0.326	0.000	0.000	0.000	0.326	Water Surface, 0% imp	15S
0.000	9.943	0.000	0.000	0.000	9.943	Woods, Fair	16S, 29S
0.000	26.542	0.000	0.000	0.000	26.542	TOTAL AREA	

Pipe Capacity Analysis - ZCP

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Pipe Listing (selected nodes)

Line#	Node Number	In-Invert (feet)	Out-Invert (feet)	Length (feet)	Slope (ft/ft)	n	Width (inches)	Diam/Height (inches)	Inside-Fill (inches)	Node Name
1	30P	522.00	521.50	45.0	0.0111	0.011	0.0	36.0	0.0	

Pipe Capacity Analysis - ZCP

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Type II 24-hr 25-yr Rainfall=6.54"

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Time span=0.10-200.00 hrs, dt=0.10 hrs, 2000 points

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN

Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment15S: Post Dev. Basin 6 to Runoff Area=185,285 sf 75.67% Impervious Runoff Depth=5.49"
Tc=5.0 min CN=91 Runoff=32.86 cfs 1.945 af

Subcatchment16S: Post Dev. Bypass 6 Runoff Area=257,427 sf 1.66% Impervious Runoff Depth=2.28"
Tc=5.0 min CN=60 Runoff=21.62 cfs 1.124 af

Subcatchment29S: Post Dev. Bypass 8 Runoff Area=289,814 sf 1.87% Impervious Runoff Depth=2.47"
Flow Length=826' Slope=0.0447 '/' Tc=9.1 min CN=62 Runoff=24.46 cfs 1.368 af

Subcatchment56S: Area 4 Runoff Area=423,660 sf 65.00% Impervious Runoff Depth=4.81"
Tc=5.0 min CN=85 Runoff=70.77 cfs 3.902 af

Reach 50R: Flowpath Downstream Avg. Flow Depth=2.48' Max Vel=1.72 fps Inflow=53.42 cfs 4.433 af
n=0.100 L=1,509.0' S=0.0154 '/' Capacity=6.78 cfs Outflow=29.31 cfs 4.432 af

Pond 30P: Wet Pond SCM 4 Peak Elev=526.48' Storage=52,233 cf Inflow=32.86 cfs 1.945 af
Outflow=10.36 cfs 1.940 af

Link 32L: POA 5 Inflow=28.99 cfs 3.065 af
Primary=28.99 cfs 3.065 af

Link 57L: 48" Culvert Inflow=72.52 cfs 8.334 af
Primary=72.52 cfs 8.334 af

Total Runoff Area = 26.542 ac Runoff Volume = 8.339 af Average Runoff Depth = 3.77"
63.22% Pervious = 16.779 ac 36.78% Impervious = 9.763 ac

Pipe Capacity Analysis - ZCP

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Type II 24-hr 25-yr Rainfall=6.54"

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Summary for Subcatchment 15S: Post Dev. Basin 6 to SCM

[49] Hint: $T_c < 2dt$ may require smaller dt

Runoff = 32.86 cfs @ 11.95 hrs, Volume= 1.945 af, Depth= 5.49"
Routed to Pond 30P : Wet Pond SCM 4

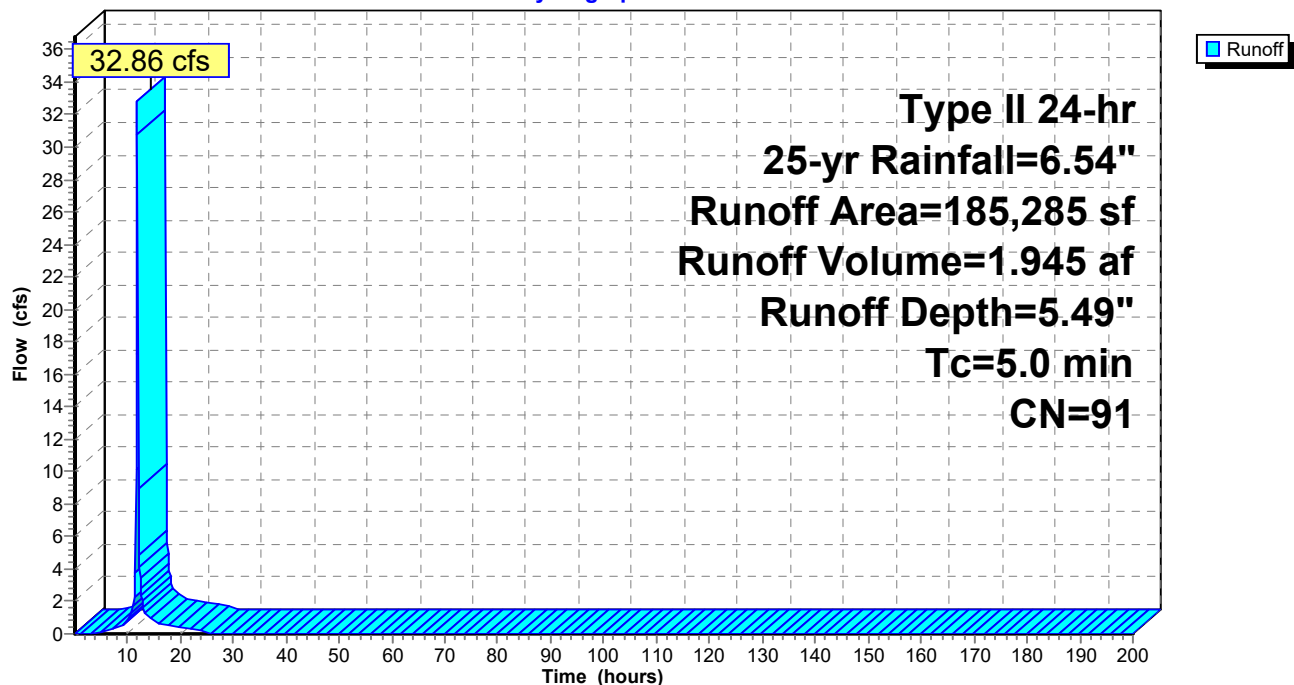
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.10-200.00 hrs, $dt=0.10$ hrs
Type II 24-hr 25-yr Rainfall=6.54"

Area (sf)	CN	Description
76,830	98	Paved parking, HSG B
63,382	98	Roofs, HSG B
30,858	56	Brush, Fair, HSG B
14,215	98	Water Surface, 0% imp, HSG B
185,285	91	Weighted Average
45,073		24.33% Pervious Area
140,212		75.67% Impervious Area

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

Subcatchment 15S: Post Dev. Basin 6 to SCM

Hydrograph



Pipe Capacity Analysis - ZCP

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Type II 24-hr 25-yr Rainfall=6.54"

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Summary for Subcatchment 16S: Post Dev. Bypass 6

[49] Hint: $T_c < 2dt$ may require smaller dt

Runoff = 21.62 cfs @ 11.97 hrs, Volume= 1.124 af, Depth= 2.28"
Routed to Link 32L : POA 5

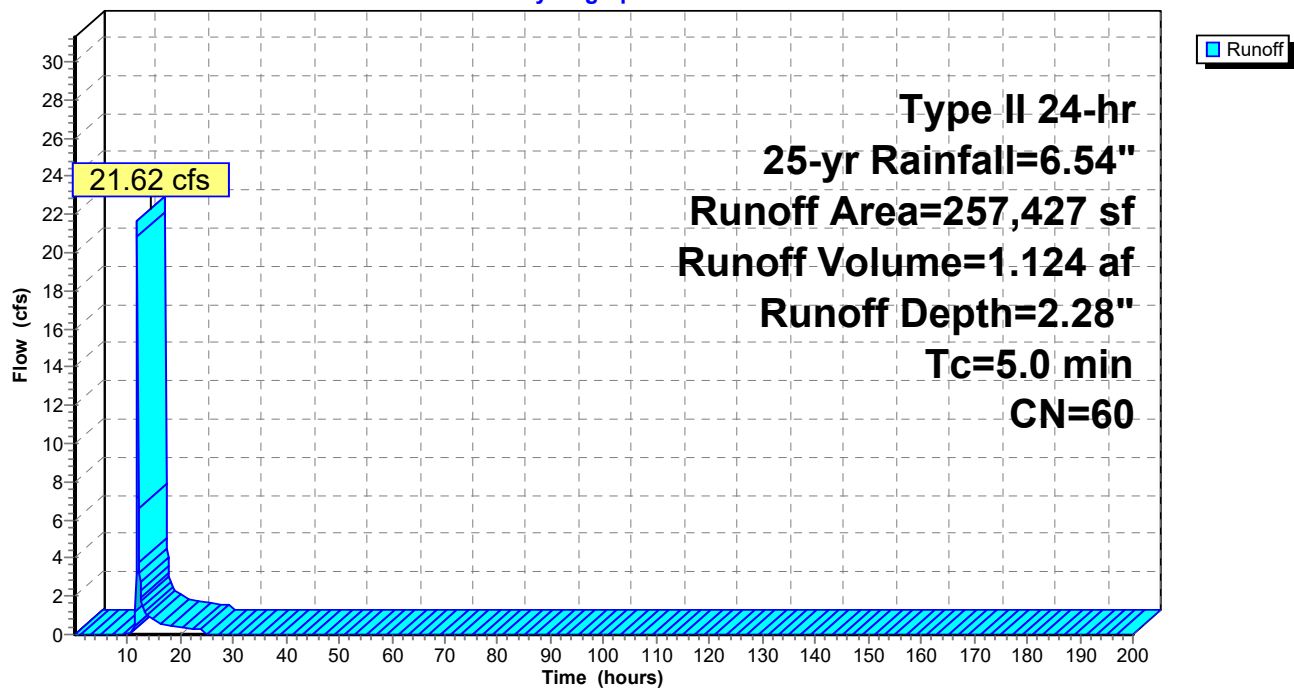
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.10-200.00 hrs, $dt=0.10$ hrs
Type II 24-hr 25-yr Rainfall=6.54"

Area (sf)	CN	Description
4,268	98	Paved parking, HSG B
51,015	56	Brush, Fair, HSG B
202,144	60	Woods, Fair, HSG B
257,427	60	Weighted Average
253,159		98.34% Pervious Area
4,268		1.66% Impervious Area

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

Subcatchment 16S: Post Dev. Bypass 6

Hydrograph



Pipe Capacity Analysis - ZCP

Prepared by Thomas & Hutton

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Type II 24-hr 25-yr Rainfall=6.54"

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Summary for Subcatchment 29S: Post Dev. Bypass 8

[49] Hint: $T_c < 2dt$ may require smaller dt

Runoff = 24.46 cfs @ 12.01 hrs, Volume= 1.368 af, Depth= 2.47"
Routed to Reach 50R : Flowpath Downstream POA 6

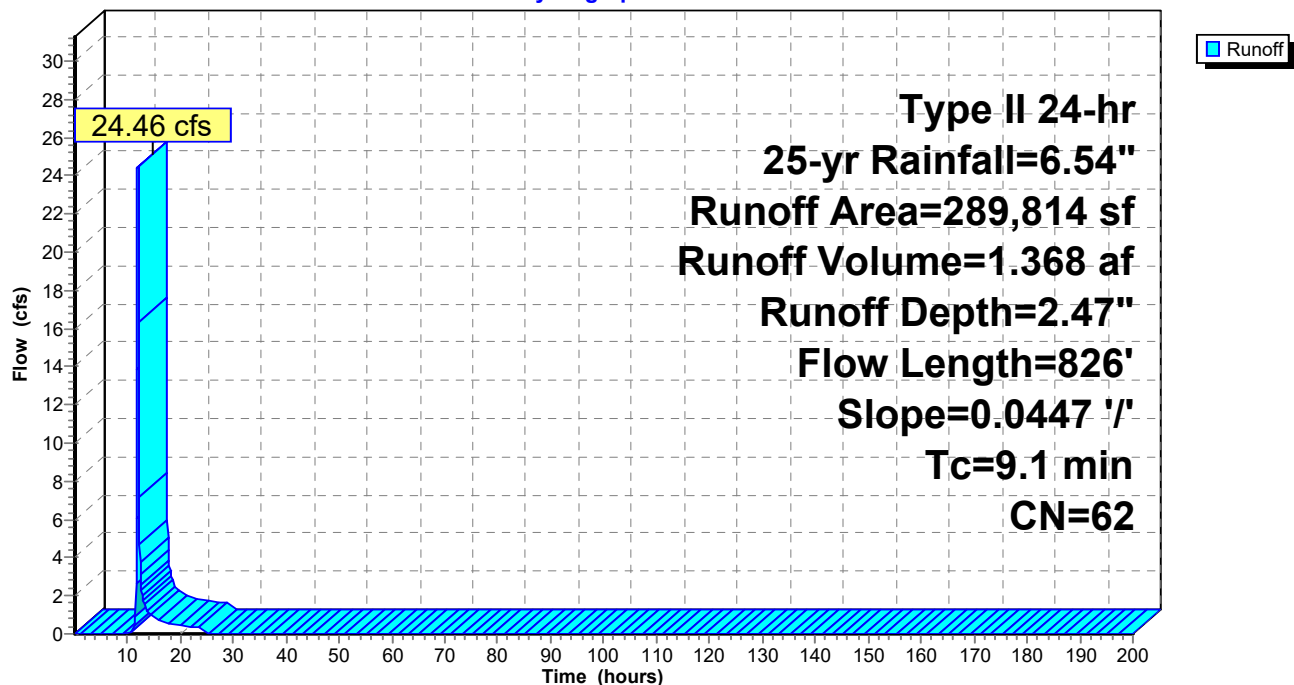
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.10-200.00 hrs, $dt=0.10$ hrs
Type II 24-hr 25-yr Rainfall=6.54"

Area (sf)	CN	Description
230,959	60	Woods, Fair, HSG B
53,439	69	50-75% Grass cover, Fair, HSG B
5,416	98	Paved parking, HSG B
289,814	62	Weighted Average
284,398		98.13% Pervious Area
5,416		1.87% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.1	826	0.0447	1.51		Kirpich Method, General overland flow $k=2.00$

Subcatchment 29S: Post Dev. Bypass 8

Hydrograph



Pipe Capacity Analysis - ZCP

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Type II 24-hr 25-yr Rainfall=6.54"

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Summary for Subcatchment 56S: Area 4

[49] Hint: $T_c < 2dt$ may require smaller dt

Runoff = 70.77 cfs @ 11.95 hrs, Volume= 3.902 af, Depth= 4.81"
Routed to Link 57L : 48" Culvert

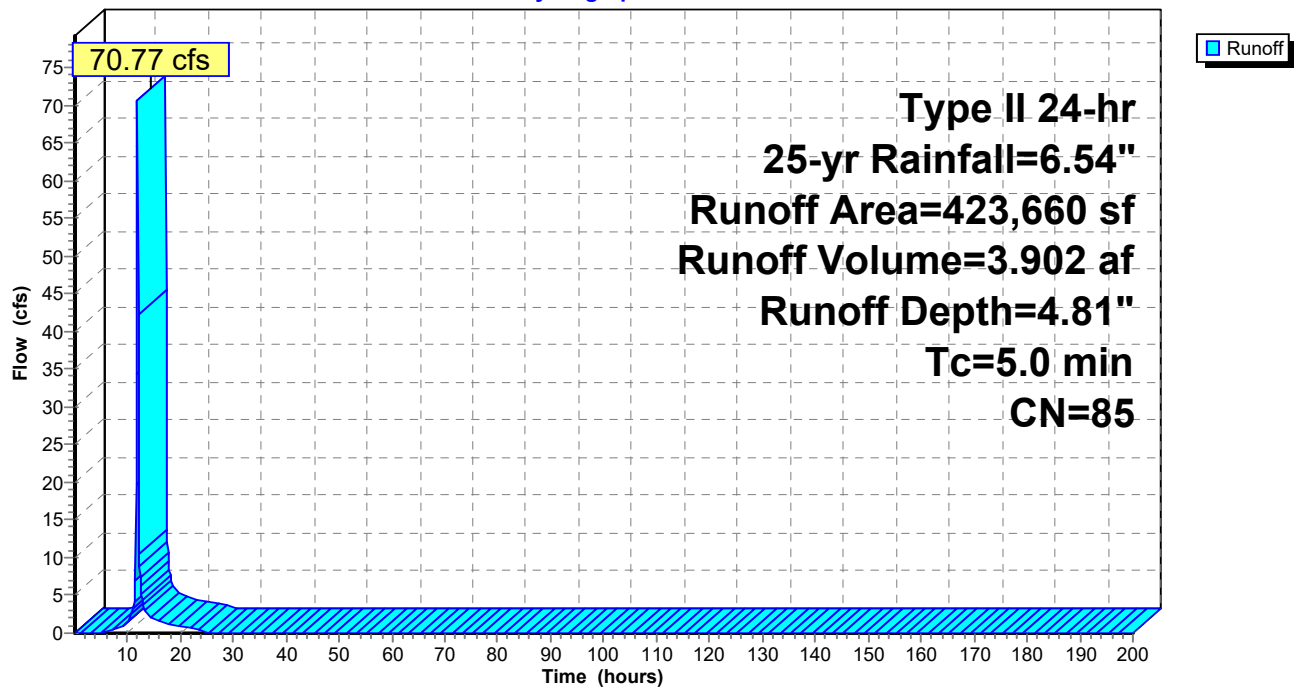
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.10-200.00 hrs, $dt=0.10$ hrs
Type II 24-hr 25-yr Rainfall=6.54"

Area (sf)	CN	Description
423,660	85	1/8 acre lots, 65% imp, HSG B
148,281		35.00% Pervious Area
275,379		65.00% Impervious Area

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

Subcatchment 56S: Area 4

Hydrograph



Pipe Capacity Analysis - ZCP

Prepared by Thomas & Hutton

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Type II 24-hr 25-yr Rainfall=6.54"

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Summary for Reach 50R: Flowpath Downstream POA 6

[91] Warning: Storage range exceeded by 1.54'

[55] Hint: Peak inflow is 788% of Manning's capacity

Inflow Area = 16.816 ac, 20.46% Impervious, Inflow Depth = 3.16" for 25-yr event
Inflow = 53.42 cfs @ 12.00 hrs, Volume= 4.433 af
Outflow = 29.31 cfs @ 12.40 hrs, Volume= 4.432 af, Atten= 45%, Lag= 24.0 min
Routed to Link 57L : 48" Culvert

Routing by Stor-Ind+Trans method, Time Span= 0.10-200.00 hrs, dt= 0.10 hrs

Max. Velocity= 1.72 fps, Min. Travel Time= 14.7 min

Avg. Velocity = 0.32 fps, Avg. Travel Time= 78.5 min

Peak Storage= 26,822 cf @ 12.14 hrs

Average Depth at Peak Storage= 2.48' , Surface Width= 13.33'

Bank-Full Depth= 0.94' Flow Area= 5.1 sf, Capacity= 6.78 cfs

8.20' x 0.94' deep Parabolic Channel, n= 0.100 Earth, dense brush, high stage

Length= 1,509.0' Slope= 0.0154 '/'

Inlet Invert= 505.43', Outlet Invert= 482.25'



Pipe Capacity Analysis - ZCP

Prepared by Thomas & Hutton

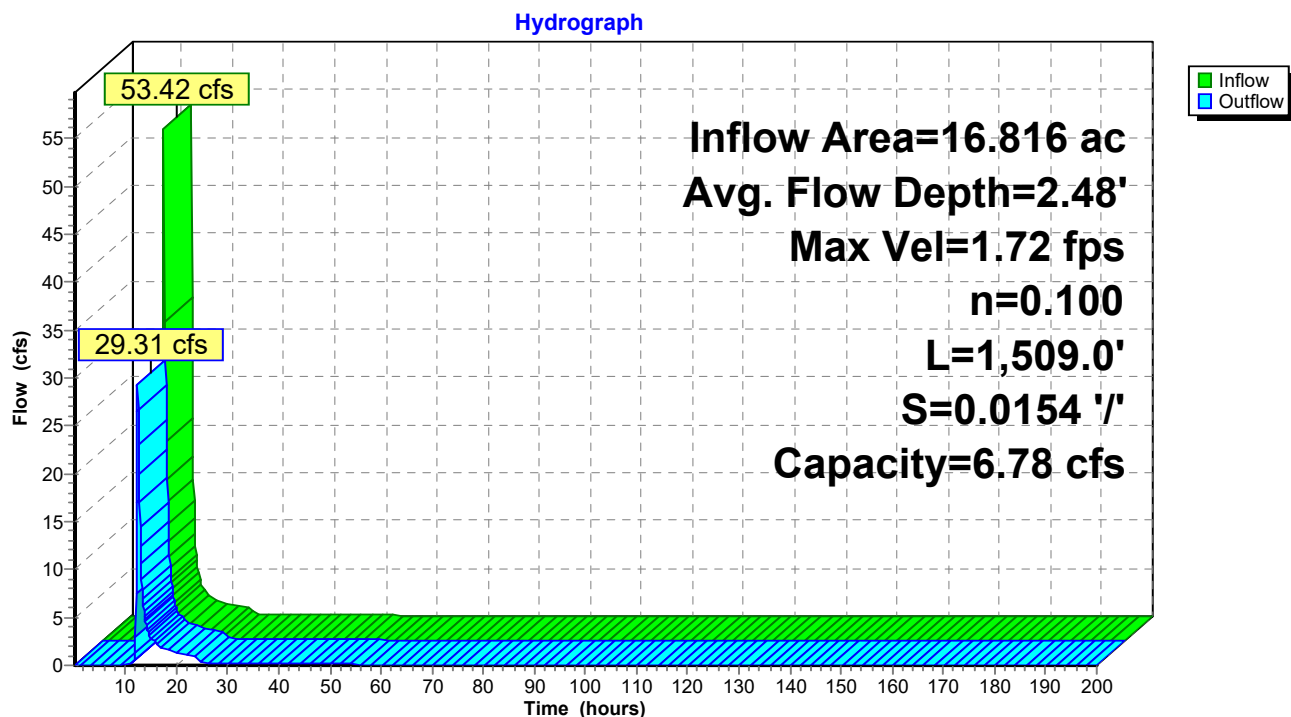
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Type II 24-hr 25-yr Rainfall=6.54"

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Reach 50R: Flowpath Downstream POA 6



Pipe Capacity Analysis - ZCP

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Type II 24-hr 25-yr Rainfall=6.54"

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Summary for Pond 30P: Wet Pond SCM 4

Inflow Area = 4.254 ac, 75.67% Impervious, Inflow Depth = 5.49" for 25-yr event
Inflow = 32.86 cfs @ 11.95 hrs, Volume= 1.945 af
Outflow = 10.36 cfs @ 12.13 hrs, Volume= 1.940 af, Atten= 68%, Lag= 11.0 min
Primary = 10.36 cfs @ 12.13 hrs, Volume= 1.940 af
Routed to Link 32L : POA 5

Routing by Stor-Ind method, Time Span= 0.10-200.00 hrs, dt= 0.10 hrs

Starting Elev= 522.00' Surf.Area= 7,056 sf Storage= 6,623 cf

Peak Elev= 526.48' @ 12.13 hrs Surf.Area= 11,930 sf Storage= 52,233 cf (45,610 cf above start)

Plug-Flow detention time= 1,812.3 min calculated for 1.788 af (92% of inflow)

Center-of-Mass det. time= 1,624.1 min (2,398.1 - 774.1)

Volume	Invert	Avail.Storage	Storage Description
#1	521.00'	71,189 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
521.00	6,190	0	0
522.00	7,056	6,623	6,623
522.50	8,333	3,847	10,470
523.00	9,531	4,466	14,936
524.00	10,198	9,865	24,801
525.00	10,883	10,541	35,341
526.00	11,584	11,234	46,575
527.00	12,303	11,944	58,518
528.00	13,038	12,671	71,189

Device	Routing	Invert	Outlet Devices
#1	Primary	522.00'	36.0" Round Culvert L= 45.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 522.00' / 521.50' S= 0.0111 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 7.07 sf
#2	Device 1	522.00'	1.5" Vert. Drawdown C= 0.600 Limited to weir flow at low heads
#3	Device 1	525.40'	40.0" W x 4.0" H Vert. Peakflow Orifice X 2.00 C= 0.600 Limited to weir flow at low heads
#4	Device 1	526.90'	48.0" x 48.0" Horiz. Overflow C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=10.10 cfs @ 12.13 hrs HW=526.44' (Free Discharge)

1=Culvert (Passes 10.10 cfs of 58.34 cfs potential flow)
2=Drawdown (Orifice Controls 0.12 cfs @ 10.07 fps)
3=Peakflow Orifice (Orifice Controls 9.97 cfs @ 4.49 fps)
4=Overflow (Controls 0.00 cfs)

Pipe Capacity Analysis - ZCP

Prepared by Thomas & Hutton

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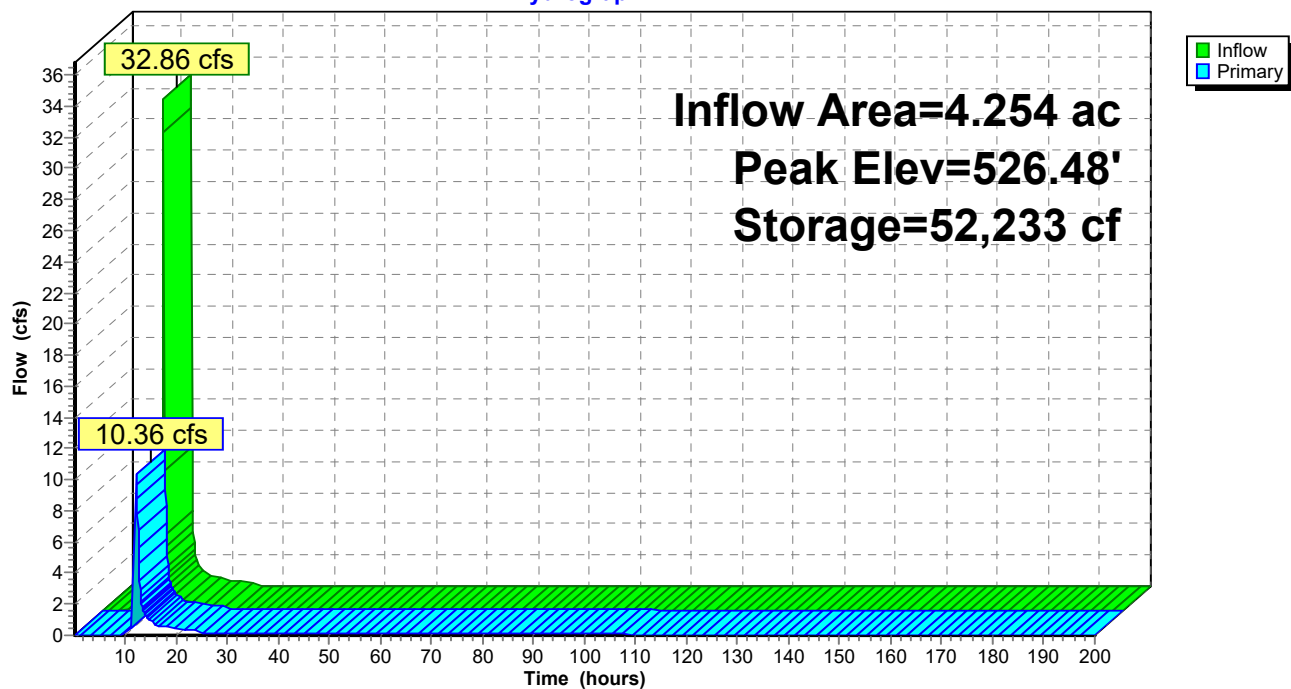
Type II 24-hr 25-yr Rainfall=6.54"

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Pond 30P: Wet Pond SCM 4

Hydrograph



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Type II 24-hr 25-yr Rainfall=6.54"

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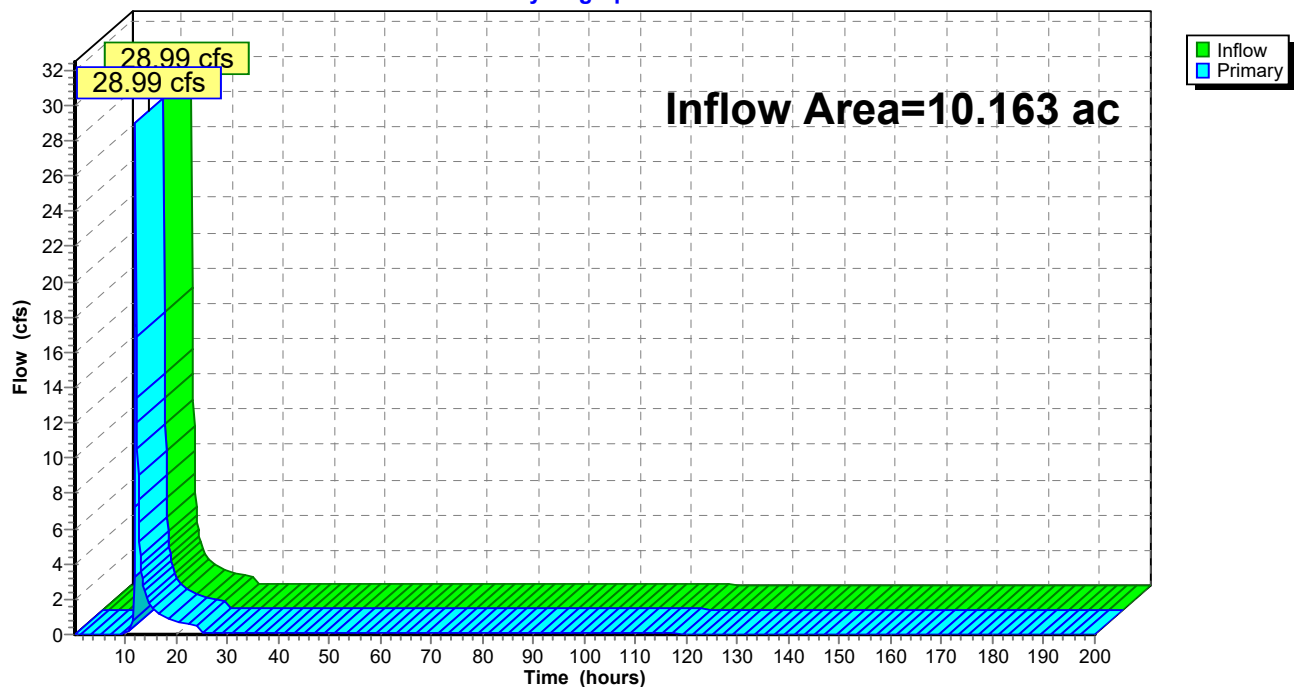
Summary for Link 32L: POA 5

Inflow Area = 10.163 ac, 32.64% Impervious, Inflow Depth = 3.62" for 25-yr event
Inflow = 28.99 cfs @ 12.00 hrs, Volume= 3.065 af
Primary = 28.99 cfs @ 12.00 hrs, Volume= 3.065 af, Atten= 0%, Lag= 0.0 min
Routed to Reach 50R : Flowpath Downstream POA 6

Primary outflow = Inflow, Time Span= 0.10-200.00 hrs, dt= 0.10 hrs

Link 32L: POA 5

Hydrograph



Pipe Capacity Analysis - ZCP

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Type II 24-hr 25-yr Rainfall=6.54"

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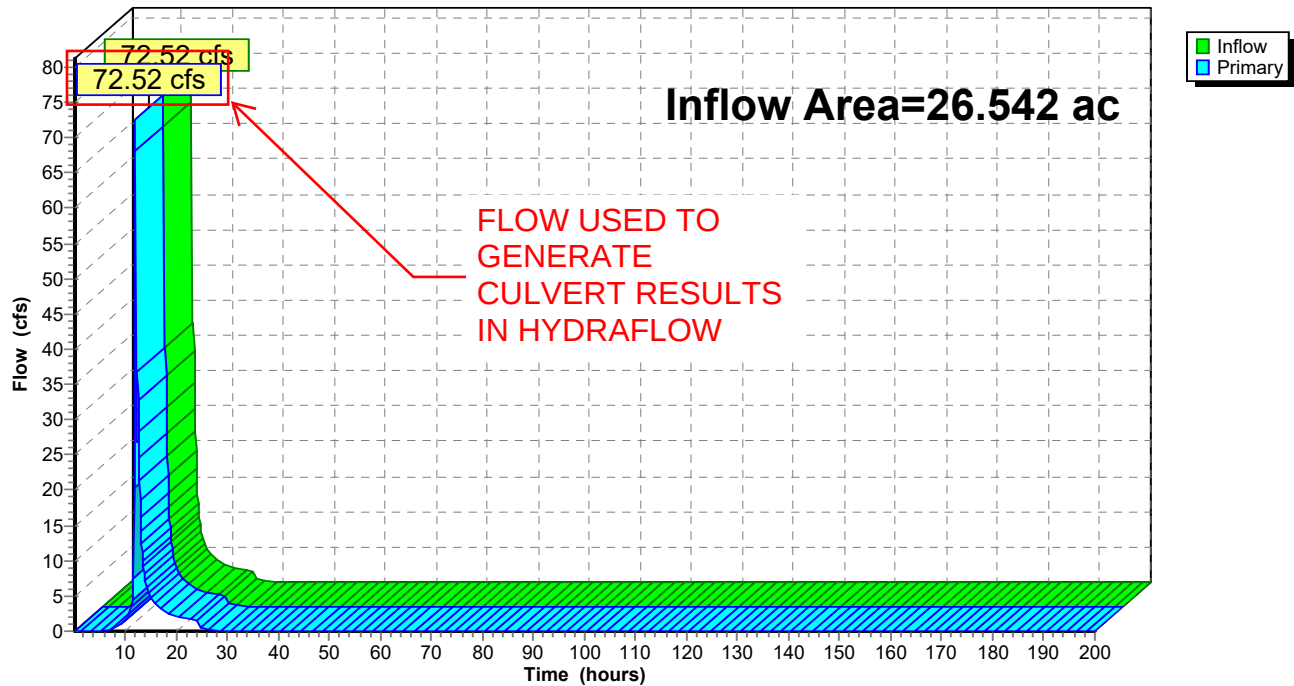
Summary for Link 57L: 48" Culvert

Inflow Area = 26.542 ac, 36.78% Impervious, Inflow Depth = 3.77" for 25-yr event
Inflow = 72.52 cfs @ 11.95 hrs, Volume= 8.334 af
Primary = 72.52 cfs @ 11.95 hrs, Volume= 8.334 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.10-200.00 hrs, dt= 0.10 hrs

Link 57L: 48" Culvert

Hydrograph





**STORMWATER IMPACT ANALYSIS
CONDITIONAL ZONING SUBMITTAL**

**860 WEAVER DAIRY ROAD
CHAPEL HILL, NC**



**PREPARED BY:
ALBERTO SARRAFF LOPEZ
REVISED BY:
ANDREW M. OAKLEY, PE**

**THOMAS & HUTTON
2510 MERIDIAN PARKWAY, SUITE 100
DURHAM, NC 27713
NC BOARD OF ENGINEERS & SURVEYORS LICENSE NO.
F-0871**

JOB NUMBER: 32044.0000

06.03.2025

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4. REFERENCE MATERIAL

5. PEAK FLOW ANALYSIS – HYDROLOGY AND HYDRAULICS MODELING

6. RUNOFF VOLUME ANALYSIS

3. PROJECT NARRATIVE

A. PROJECT DESCRIPTION AND SUMMARY

This residential / mixed use project will encompass 45.23 acres of multi-family and town home housing located north of Weaver Dairy Road and south of I-40 and between Chapel Hill North and Carol Woods. The project involves 425-450 apartment rental units in two 6-story apartment buildings with 700 parking spaces, all located in a parking structure behind the apartments. The project also includes 120-140 townhomes with garages to reduce surface parking.

Calculations for peak discharge, runoff volume (2-yr only), and water quality treatment (85% TSS) for all of the proposed improvements are provided. Soils on the site are mainly hydrologic soil group B with some D. The proposed site is located in the Cape Fear River Basin in the Jordan Lake Watershed.

Per the Town of Chapel Hill stormwater ordinance, the stormwater runoff rate leaving the site under post-development conditions may not exceed the stormwater runoff rate under predevelopment conditions for the 1-year, 2-year, 25-year, and 100-year storms. The additional runoff volume from the pre-development to post-development conditions for the 2-year storm must also be captured on-site. In addition, added impervious surfaces must be treated for 85% total suspended solids (TSS) removal.

B. METHODOLOGY

- The Durham County Soil Survey is used to identify the soil types located on the site.
- HydroCAD software is used to calculate pre- and post-development peak flow rates and volumes for each sub-basin. HydroCAD uses the SCS TR-20 method to develop hydrographs.
- HydroCAD software is used to calculate the composite curve number for each sub-basin. HydroCAD uses the NRCS TR-55 method for calculation composite curve numbers.

Pre- development drainage patterns are based on existing topographic information available with Survey and GIS data. Post-development drainage patterns are based on the proposed grading and development. Summary tables are included that detail pre-development and post-development peak flow rates from the proposed work, along with the percentage increase or decrease.

C. DISCUSSION OF RESULTS

Peak Flow Analysis:

For the peak discharge calculations, $Q_1/Q_2/Q_{25}/Q_{100}$, the site was broken into 8 drainage basins with 6 points of analysis. The post development configuration of the site redirects drainage from 5 of the basins (Basin 2A, Basin 2C, Basin 3, Basin 4, and Basin 8) into the other drainage areas, therefore decreasing the peak flow to these areas without detention.

Basin 1 receives flow from the proposed apartment building and parking deck with a discharge point at the ROW of I-40 and underground detention will be required to provide attenuation. Basin 2B receives flow from offsite which bypasses detention and receives flow from a future mid-rise structure. Basin 2B discharge at the ROW of I-40 and will require a pond to attenuate flow. Basin 5 receives flow from townhomes, associated parking and walks. Basin 5 discharges at a point on the southern property line and will require a pond to attenuate flow. Basin 6 receives flow from townhomes, associated parking and walks. Basin 6 will require a pond to attenuate flow. Basin 7 receives flow from townhomes, associated parking and walks. Basin 7 discharges into an existing storm drain in Weaver Dairy Road and will require a pond to attenuate flow.

Runoff Volume Analysis:

Per the Town of Chapel Hill Design Manual, "the post-development stormwater runoff rate leaving the site shall not exceed the pre-development (existing conditions) stormwater runoff rate leaving the site for the local 1-year, 2-year, 25-year, and 100-year storm events." In addition, "the post-development stormwater runoff volume leaving the site shall not exceed the pre-development (existing conditions) stormwater runoff volume leaving the site for the local 2-year frequency, 24-hour duration storm event." The underground detention and the wet ponds are sized to capture the increased volume to meet this requirement.

Pollutant Analysis:

The Town of Chapel Hill Design Manual states that BMP's shall be designed to remove 85% average total suspended solids from the post-development stormwater runoff. The proposed project results in an increase in impervious surface. As a result, a BMP must be installed to treat for 85% TSS removal for the additional impervious surface added.

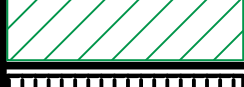
In order to meet this requirement, a sandfilter addition is proposed to the underground detention and the ponds will be wet ponds.

D. CONCLUSIONS

Because the increase in impervious surfaces as a result of this project resulted in an increase in peak flow for the 1-year, 2-year, 25-year, and 100-year storms, and in runoff volume for the 2-year storm, detention and treatment are proposed in the form of underground detention and wet ponds to meet the requirements of the Town's stormwater ordinance. In addition, two sand-filters and wet ponds will provide an 85% TSS reduction for all of the proposed impervious areas that can be captured. Some required trail and walk areas are unable to be directed to the SCM's.

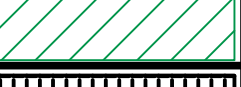
4. REFERENCE MATERIAL

232044.0000 ENGINEERING CALCULATIONS AND REPORTS/TOWN WATERS/232044.000 - STORMWATER DRAINAGE - 04.13.2025 - 1:41 PM

BASIN 1			
	PARKING, DRIVES, WALKS	0	SF
	ROOF	0	SF
	GRASS	24,759	SF
	WOODS	342,042	SF
	POND	0	SF
	TOTAL	366,801	SF

BASIN 2A			
	PARKING, DRIVES, WALKS	0	SF
	ROOF	0	SF
	GRASS	0	SF
	WOODS	250,337	SF
	POND	0	SF
	TOTAL	250,337	SF

BASIN 2B			
	PARKING, DRIVES, WALKS	0	SF
	ROOF	0	SF
	GRASS	0	SF
	WOODS	132,113	SF
	POND	0	SF
	TOTAL	132,113	SF

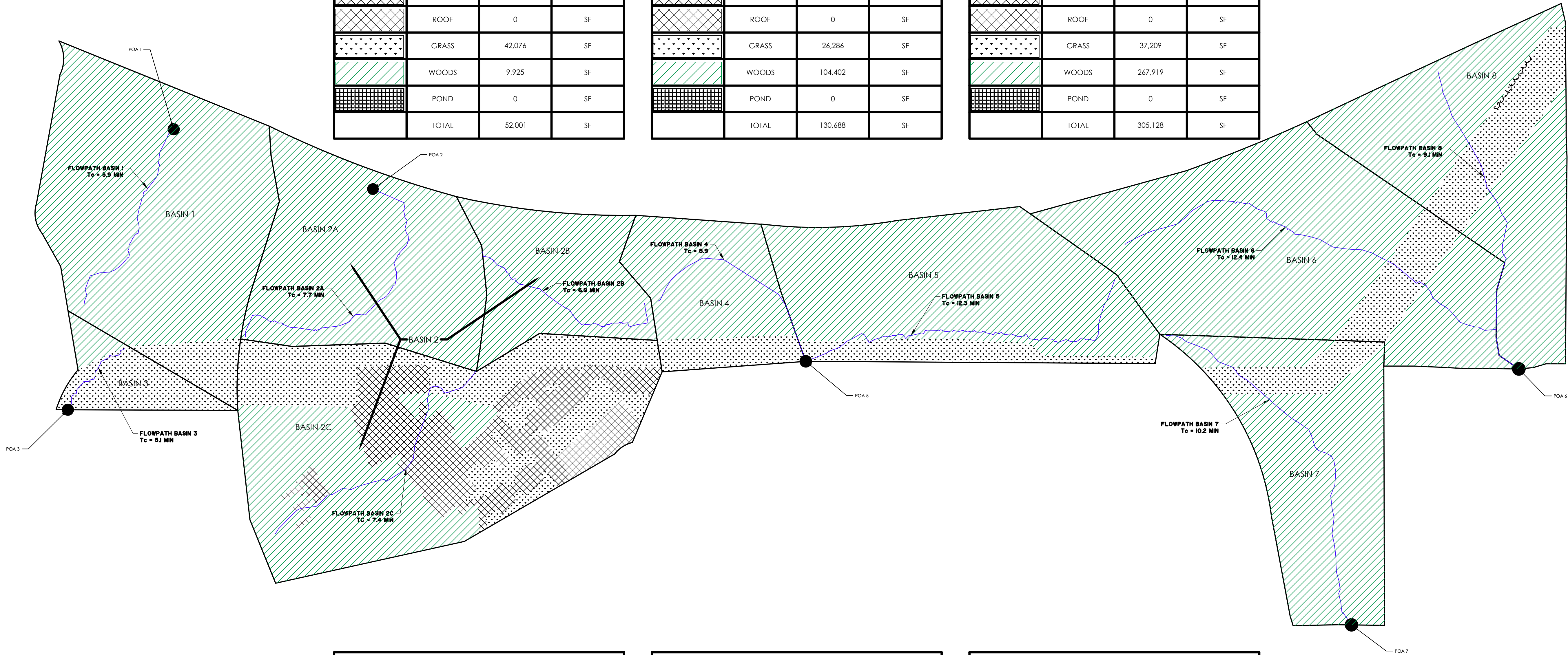
BASIN 2C			
	PARKING, DRIVES, WALKS	90,721	SF
	ROOF	59,458	SF
	GRASS	143,869	SF
	WOODS	173,689	SF
	POND	0	SF
	TOTAL	467,737	SF

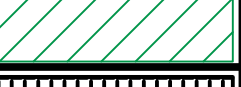
BASIN 2			
	PARKING, DRIVES, WALKS	94,275	SF
	ROOF	55,905	SF
	GRASS	143,869	SF
	WOODS	476,725	SF
	POND	0	SF
	TOTAL	770,774	SF

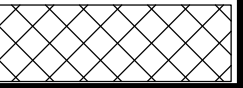
BASIN 3			
	PARKING, DRIVES, WALKS	0	SF
	ROOF	0	SF
	GRASS	42,076	SF
	WOODS	9,925	SF
	POND	0	SF
	TOTAL	52,001	SF

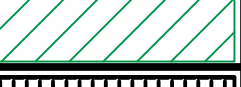
BASIN 4			
	PARKING, DRIVES, WALKS	0	SF
	ROOF	0	SF
	GRASS	26,286	SF
	WOODS	104,402	SF
	POND	0	SF
	TOTAL	130,688	SF

BASIN 5			
	PARKING, DRIVES, WALKS	0	SF
	ROOF	0	SF
	GRASS	37,209	SF
	WOODS	267,919	SF
	POND	0	SF
	TOTAL	305,128	SF



BASIN 6			
	PARKING, DRIVES, WALKS	0	SF
	ROOF	0	SF
	GRASS	39,817	SF
	WOODS	401,238	SF
	POND	0	SF
	TOTAL	441,055	SF

BASIN 7			
	PARKING, DRIVES, WALKS	0	SF
	ROOF	0	SF
	GRASS	30,846	SF
	WOODS	207,447	SF
	POND	0	SF
	TOTAL	238,293	SF

BASIN 8			
	PARKING, DRIVES, WALKS	0	SF
	ROOF	0	SF
	GRASS	58,854	SF
	WOODS	230,959	SF
	POND	0	SF
	TOTAL	289,813	SF

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NO.	REVISIONS	BY	DATE



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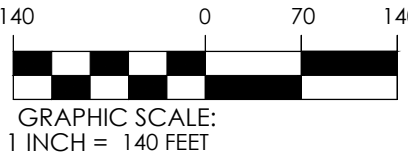
PRE DEV STUDY

860 WEAVER DAIRY ROAD

PROJECT LOCATION:

###

CLIENT/OWNER:
LAND PLANNING & ENTITLEMENTS
157 EAST FRANKLIN STREET
CHAPEL HILL, NC 27514



DATUM: HORIZ.: NAV 83

VERT.: NAVD 88

JOB NO.: 32044.0000
DATE: 06/03/25
DRAWN: ASL
DESIGNED: ###
REVIEWED: AO
APPROVED: ###
SCALE: 1" = 140'

PRE

233044.0004.0000 (ENGINEERING CALCULATIONS AND REPORT) TOWN WATERS 33044.0003 - 10700 MAP PLOTTING - AUG. 3, 2023, 3:52 PM

BASIN 1			
	PARKING, DRIVES, WALKS	109,684	SF
	ROOF	150,132	SF
	GRASS	72,655	SF
	WOODS	0	SF
	POND	0	SF
	TOTAL	332,471	SF

BYPASS BASIN 1			
	PARKING, DRIVES, WALKS	7,173	SF
	ROOF	0	SF
	GRASS	49,243	SF
	WOODS	124,058	SF
	POND	0	SF
	TOTAL	180,474	SF

BYPASS BASIN 2A			
	PARKING, DRIVES, WALKS	0	SF
	ROOF	0	SF
	GRASS	0	SF
	WOODS	120,581	SF
	POND	0	SF
	TOTAL	120,581	SF

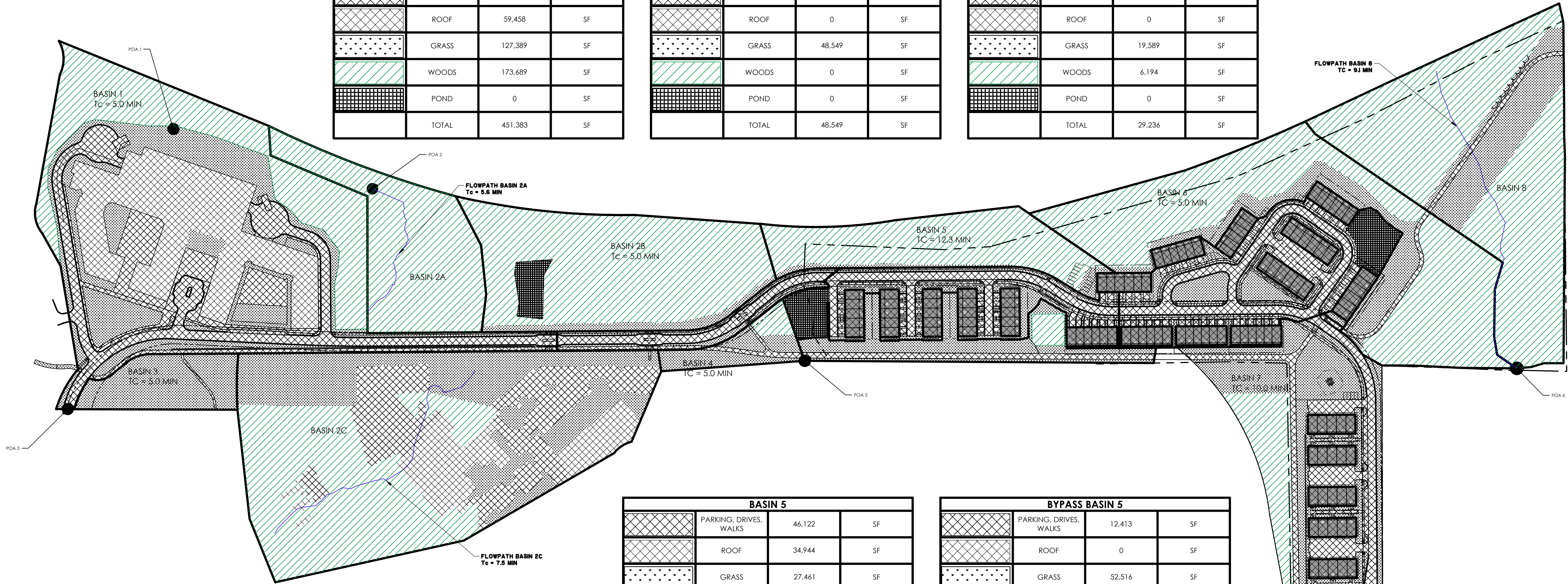
BASIN 2B			
	PARKING, DRIVES, WALKS	26,969	SF
	ROOF	95,673	SF
	GRASS	49,749	SF
	WOODS	0	SF
	POND	9,901	SF
	TOTAL	182,292	SF

BYPASS BASIN 2B			
	PARKING, DRIVES, WALKS	0	SF
	ROOF	0	SF
	GRASS	4,686	SF
	WOODS	53,889	SF
	POND	0	SF
	TOTAL	58,575	SF

BASIN 2C			
	PARKING, DRIVES, WALKS	90,847	SF
	ROOF	59,458	SF
	GRASS	127,389	SF
	WOODS	173,689	SF
	POND	0	SF
	TOTAL	451,383	SF

BASIN 3			
	PARKING, DRIVES, WALKS	0	SF
	ROOF	0	SF
	GRASS	48,549	SF
	WOODS	0	SF
	POND	0	SF
	TOTAL	48,549	SF

BASIN 4			
	PARKING, DRIVES, WALKS	3,453	SF
	ROOF	0	SF
	GRASS	19,589	SF
	WOODS	6,194	SF
	POND	0	SF
	TOTAL	29,236	SF



BASIN 6			
	PARKING, DRIVES, WALKS	70,779	SF
	ROOF	63,382	SF
	GRASS	32,683	SF
	WOODS	0	SF
	POND	14,215	SF
	TOTAL	181,059	SF

BYPASS BASIN 6			
	PARKING, DRIVES, WALKS	4,268	SF
	ROOF	0	SF
	GRASS	55,562	SF
	WOODS	201,745	SF
	POND	0	SF
	TOTAL	261,575	SF

BASIN 7			
	PARKING, DRIVES, WALKS	50,376	SF
	ROOF	28,800	SF
	GRASS	21,628	SF
	WOODS	0	SF
	POND	6,497	SF
	TOTAL	107,301	SF

BYPASS BASIN 7			
	PARKING, DRIVES, WALKS	15,708	SF
	ROOF	0	SF
	GRASS	72,602	SF
	WOODS	39,944	SF
	POND	0	SF
	TOTAL	128,254	SF

BASIN 8			
	PARKING, DRIVES, WALKS	5,416	SF
	ROOF	0	SF
	GRASS	53,439	SF
	WOODS	230,959	SF
	POND	0	SF
	TOTAL	289,814	SF

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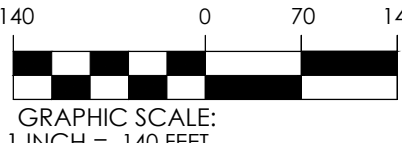
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POST DEV. STUDY

860 WEAVER DAIRY ROAD

PROJECT LOCATION:

CLIENT/OWNER:
LAND PLANNING & ENTITLEMENTS
157 EAST FRANKLIN STREET
CHAPEL HILL, NC 27514

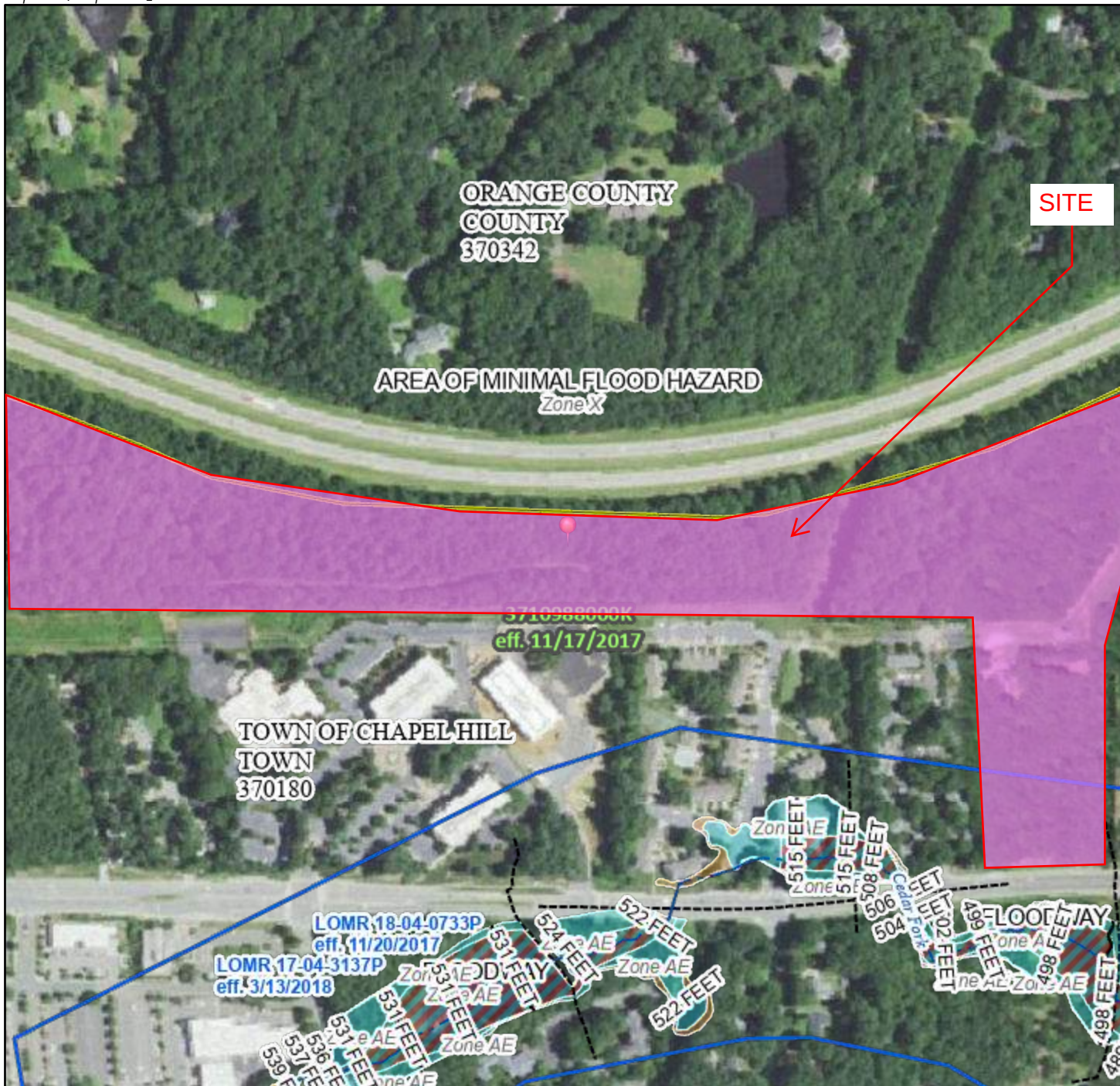


DATUM: HORIZ.: NAD 83 VERT.: NAVD 88

JOB NO: 32044.0000
DATE: 06/03/2025
DRAWN: ASL
DESIGNED: ###
REVIEWED: AO
APPROVED: ###
SCALE: 1" = 140'

POST





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63(&,\$/)/22' +\$=\$5' \$5(

5HJXODWRU\)ORRGZD\

\$QQXDO &KDQFH)ORRG RI DQQXDO FKDQFH IOI GHSWK OHVV WKDQ RQH DUHDV RI OHVV WKDQ RQH)XWXUH &RQLWLROV &KDQFH)ORRG +D]DUG \$UHD ZLWK 5HGXFHG)ORRG /HYHH 6HHH RWRHV \$UHD ZLWK)ORRG 5-IRVN

12 6&5((\$UHD RI 0LQLPDO)ORRG (IIHFWLYH /205V

27+(5 \$5 (\$6 \$UHD RI 8QGHWHUPLQH

*(1(\$ /--- &KDQHO &XOYHUW RU 6758&785(16111 /HYHH 'LNH RU)ORRGZD

&URVV 6HFWRQV ZLWK :DWHU 6XUIDFH (OHYDWL &RDVDO 7UDQVHF %DVH)ORRG (OHYDWLRQ /LPLW RI 6WXG\ -XULVGLFWLRQ %RXQGDU &RDVDO 7UDQVHF %DVH 27+(5 3URLOH %DVHOLQH)(\$785(6 +IGURJUDSKLF)HDWXUH

'LJLWDO 'DWD \$YDLODEO 1R 'LJLWDO 'DWD \$YDLODEO 8QPDSHG

7KH SLQ GLVSODIHG RQ WKH SRLQW VHOHFWHG E\ WKH XV DQ DXWKRLWDWLYH SURSHU

7KL V PDS FRPSOLHV ZLWK)(0\$ V VWDQ GLJLWDO IORRG PDSV LI LW LV QRW YR 7KH EDVHPDS VKRZQ FRPSOLHV ZLWK)(DFFXUD\ VWDQGDUG

7KH IORRG KD]DUG LQIRUPDWLRQ LV GH DXWKRLWDWLYH 1)/ ZHE VHUFLWH S ZDV H[SRUWHG RQ W DQG GRHV QRW UHIOHFV FKDQJHV RU DPHQGPHQV VX WLPH 7KH 1)/ DQG HIIHFWLYH LQIRUP EHFRPH VXSHUVHG E\ QHZ GDWD RYH

7KL V PDS LPDJH LV YRLG LI WKH RQH R HOHPHQWV GR QRW DSSHDU EDVHPDS OHJHQG VFDOH EDU PDS FUHDWLRQ G),50 SDQHO QXPEHU DQG),50 HIIHFWLY XQPDSSHG DQG XQPRGHUQLJHG DUHDV UHJXODWRU\ XSUSRVHV

Custom Soil Resource Report Soil Map



Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
ApB	Appling sandy loam, 2 to 6 percent slopes	9.6	4.0%
ApC	Appling sandy loam, 6 to 10 percent slopes	47.3	19.7%
CfC	Cecil fine sandy loam, 6 to 10 percent slopes	11.0	4.6%
Ch	Chewacla loam, 0 to 2 percent slopes, frequently flooded	9.7	4.0%
GeB	Georgeville silt loam, 2 to 6 percent slopes	18.0	7.5%
GeC	Georgeville silt loam, 6 to 10 percent slopes	25.7	10.7%
HeB	Helena sandy loam, 2 to 8 percent slopes	20.6	8.6%
HrB	Herndon silt loam, 2 to 6 percent slopes	23.7	9.9%
HrC	Herndon silt loam, 6 to 10 percent slopes	44.5	18.6%
Lg	Lignum silt loam, 0 to 3 percent slopes	8.0	3.3%
TaD	Tarrus silt loam, 8 to 15 percent slopes	15.9	6.6%
W	Water	1.1	0.4%
WmD	Wedowee sandy loam, 8 to 15 percent slopes	1.3	0.6%
WmE	Wedowee sandy loam, 15 to 25 percent slopes	3.6	1.5%
Totals for Area of Interest		240.0	100.0%

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without

5. PEAK FLOW ANALYSIS – HYDROLOGY AND HYDRAULICS MODELING



Project Name: 860 Weaver Dairy
Project Number: 32044.0000

By: ASL
Date: 6/3/2025

Revised: AO
Date: 6/3/2025

Peak Flow Analysis Summary

Drainage Basin 1	Tc (min)	Area (ac)	CN	Q1 (cfs)	Q2 (cfs)	Q25 (cfs)	Q100 (cfs)
Pre-Dev Basin 1	5.9	8.42	79	17.85	24.78	50.25	73.94
Post Basin 1 to SCM 1	5	7.52	89	24.26	31.06	57.43	73.65
Post Dev Bypass 1	5	4.14	60	2.02	4.04	15.16	23.05
Post 1 + Bypass 1				26.28	35.10	72.59	96.70
Post-Dev Basin 1 with Treatment (POA 1)				4.77	7.16	42.33	56.77
Percent difference between Pre- Development and Post Development with Treatment				-73%	-71%	-16%	-23%

Drainage Basin 2A	Tc (min)	Area (ac)	CN	Q1 (cfs)	Q2 (cfs)	Q25 (cfs)	Q100 (cfs)
Pre-Dev Basin 2A	7.7	5.75	79	11.86	16.53	37.13	49.79
Post-Dev Bypass 2A	5.6	2.77	79	5.86	8.13	18.12	24.25
Percent difference between Pre- Development and Post Development without Treatment				-51%	-51%	-51%	-51%

NOTE FOR BASIN 2B:

IN ORDER TO GENERATE A MORE REALISTIC CN FOR THE FUTURE DEVELOPMENT OF BASIN 2B, 70% OF THE INITIAL POST DEV. BYPASS AREA WAS ASSUMED TO BE DEVELOPED. WITHIN THE 70% OF DEVELOPED AREA, 70% WAS ASSUMED TO BE IMPERVIOUS AND 30% TO BE PERVIOUS AND ADDED TO THE ROAD AND GRASS AREAS DRAINING TO SCM 2.

FOR THE REMAINING 30 % IMPERVIOUS, AROUND 92% WAS ASSUMED TO BE WOODED AND 8% TO BE GRASS (BASED ON THE INITIAL GRASS AND WOODS RATIO IN THE POST DEV. BYPASS 2B)

Drainage Basin 2B	Tc (min)	Area (ac)	CN	Q1 (cfs)	Q2 (cfs)	Q25 (cfs)	Q100 (cfs)
Pre-Dev Basin 2B	6.9	3.03	60	1.36	2.85	11.06	16.90
Post Basin 2B to SCM 2	5	4.13	84	11.00	14.62	29.94	38.03
Post Dev Bypass 2B	5	1.34	54	0.18	0.65	3.69	6.01
Post 2B + Bypass 2B				11.18	15.27	33.63	44.04
Post-Dev Basin 2B with Treatment (POA 2)				0.87	2.80	9.99	16.20
Percent difference between Pre-Development and Post Development with Treatment				-36%	-2%	-10%	-4%

Drainage Basin 2C	Tc (min)	Area (ac)	CN	Q1 (cfs)	Q2 (cfs)	Q25 (cfs)	Q100 (cfs)
Pre-Dev Basin 2C	7.4	10.74	84	28.14	37.49	77.04	100.77
Post-Dev Bypass 2C	7.4	10.36	85	25.96	34.31	69.39	90.37
Percent difference between Pre-Development and Post Development without Treatment				-8%	-8%	-10%	-10%

Drainage Basin 3	Tc (min)	Area (ac)	CN	Q1 (cfs)	Q2 (cfs)	Q25 (cfs)	Q100 (cfs)
Pre-Dev Basin 3	5.1	1.19	71	1.60	2.43	6.38	8.93
Post-Dev Bypass 3	5	1.11	70	1.40	2.15	5.78	8.14
Percent difference between Pre-Development and Post Development without Treatment				-13%	-12%	-9%	-9%

Drainage Basin 4	Tc <i>(min)</i>	Area <i>(ac)</i>	CN	Q1 <i>(cfs)</i>	Q2 <i>(cfs)</i>	Q25 <i>(cfs)</i>	Q100 <i>(cfs)</i>
Pre-Dev Basin 4	8.9	2.99	59	0.97	2.26	9.74	15.15
Post-Dev Bypass 4	5	0.67	62	0.42	0.77	2.66	3.97
Percent difference between Pre-Development and Post Development without Treatment				-57%	-66%	-73%	-74%

Drainage Basin 5	Tc <i>(min)</i>	Area <i>(ac)</i>	CN	Q1 <i>(cfs)</i>	Q2 <i>(cfs)</i>	Q25 <i>(cfs)</i>	Q100 <i>(cfs)</i>
Pre-Dev Basin 5	12.3	7.00	59	2.07	4.56	19.38	30.46
Post Basin 5 to SCM 3	5	2.76	87	8.18	10.62	20.19	26.10
Post Dev Bypass 5	12.3	3.81	59	1.13	2.48	10.55	16.58
Post 5 + Bypass 5				9.31	13.10	30.74	42.68
Post-Dev Basin 5 with Treatment (POA 5)				1.13	2.55	17.33	30.16
Percent difference between Pre-Development and Post Development with Treatment				-45%	-44%	-11%	-1%

Drainage Basin 6	Tc (min)	Area (ac)	CN	Q1 (cfs)	Q2 (cfs)	Q25 (cfs)	Q100 (cfs)
Pre-Dev Basin 6	12.4	12.76	60	3.49	7.29	29.27	45.48
Post Basin 6 to SCM 4	5	4.16	91	14.12	17.82	32.11	40.87
Post Dev Bypass 6	5	6.00	61	2.93	5.85	21.97	33.41
Post 6 + Bypass 6				17.05	23.67	54.08	74.28
Post-Dev Basin 6 with Treatment (POA 6)				3.27	6.19	27.76	45.27
Percent difference between Pre- Development and Post Development with Treatment				-6%	-15%	-5%	0%

Drainage Basin 7	Tc (min)	Area (ac)	CN	Q1 (cfs)	Q2 (cfs)	Q25 (cfs)	Q100 (cfs)
Pre-Dev Basin 7	10.2	5.47	57	1.16	2.89	15.13	24.22
Post Basin 7 to SCM 5	5	2.46	88	7.56	9.75	18.27	23.52
Post Dev Bypass 7	10	2.94	56	0.51	1.37	7.80	12.64
Post 7 + Bypass 7				8.07	11.12	26.07	36.16
Post-Dev Basin 7 with Treatment (POA 7)				1.07	2.44	15.02	23.78
Percent difference between Pre- Development and Post Development with Treatment				-8%	-16%	-1%	-2%

Drainage Basin 8	Tc <i>(min)</i>	Area <i>(ac)</i>	CN	Q1 <i>(cfs)</i>	Q2 <i>(cfs)</i>	Q25 <i>(cfs)</i>	Q100 <i>(cfs)</i>
Pre-Development	9.1	6.65	62	3.40	6.67	24.46	36.97
Post-Development Basin H	9.1	6.65	62	3.40	6.67	24.46	36.97
Percent difference between Pre-Development and Post-Development with Treatment				0%	0%	0%	0%

6. RUNOFF VOLUME ANALYSIS



Project Name: 860 Weaver Dairy
Project Number: 32044.0000

By: ASL
Date: 6/3/2025

Revised: AMO
Date: 6/3/2025

Runoff Volume Analysis Summary Basin 1

	V2 <i>af</i>	V2 <i>(cf)</i>
Pre-Development Basin A	1.271	55,365
Pre-Development Runoff Volume		55,365
Post-Development Basin A area to Sandfilter	1.619	70,524
Post-Development Basin A area to Bypass	0.233	10,149
Post-Development Basin A		80,673
Post Development Runoff Volume		80,673
Sandfilter 2-year Volume		33,270
		11,323
Post Development Runoff Volume with Treatment		47,403
Percent difference between Pre-Development and Post Development with Treatment		-14%

Runoff Volume Analysis Summary Basin 2A

	V2 <i>af</i>	V2 <i>(cf)</i>
Pre-Development Basin 2A	0.868	37,810
Pre-Development Runoff Volume		37,810
Post-Development Basin 2A	0.418	18,208
Post Development Runoff Volume		18,208
Percent difference between Pre-Development and Post		-52%

Runoff Volume Analysis Summary Basin 2B

	V2 <i>af</i>	V2 <i>(cf)</i>
Pre-Development Basin 2B	0.171	7,449
Pre-Development Runoff Volume	0.171	7,449
Post-Development Basin 2B area to SCM 2	0.758	33,018
Post-Development Basin 2B area to Bypass	0.047	2,047
Post-Development Basin 2B		35,066
Post Development Runoff Volume		35,066
Wet Pond Volume		55,230
Post Development Runoff Volume with Treatment		-20,164
Percent difference between Pre-Development and Post		-371%

Runoff Volume Analysis Summary Basin 2C

	V2 <i>af</i>	V2 <i>(cf)</i>
Pre-Development Basin 2C	1.947	84,811
Pre-Development Runoff Volume		84,811
Post-Development Basin 2C	1.785	77,755
Post Development Runoff Volume		77,755
Percent difference between Pre-Development and Post		-8%

Runoff Volume Analysis Summary Basin 3

	V2 <i>af</i>	V2 <i>(cf)</i>
Pre-Development Basin 3	0.127	5,532
Pre-Development Runoff Volume		5,532
Post-Development Basin 3	0.112	4,879
Post Development Runoff Volume		4,879
Percent difference between Pre-Development and Post		-12%

Runoff Volume Analysis Summary Basin 4

	V2 <i>af</i>	V2 <i>(cf)</i>
Pre-Development Basin 4	0.157	6,839
Pre-Development Runoff Volume		6,839
Post-Development Basin 4	0.043	1,873
Post Development Runoff Volume		1,873
Percent difference between Pre-Development and Post		-73%

Runoff Volume Analysis Summary Basin 5

	V2 <i>af</i>	V2 <i>(cf)</i>
Pre-Development Basin 5	0.368	16,030
Pre-Development Runoff Volume	0.368	16,030
Post-Development Basin 5 area to SCM 3	0.552	24,045
Post-Development Basin 5 area to Bypass	0.200	8,712
Post-Development Basin 5		32,757
Post Development Runoff Volume		32,757
Wet Pond Volume		17,021
Post Development Runoff Volume with Treatment		15,736
Percent difference between Pre-Development and Post		-2%

Runoff Volume Analysis Summary Basin 6

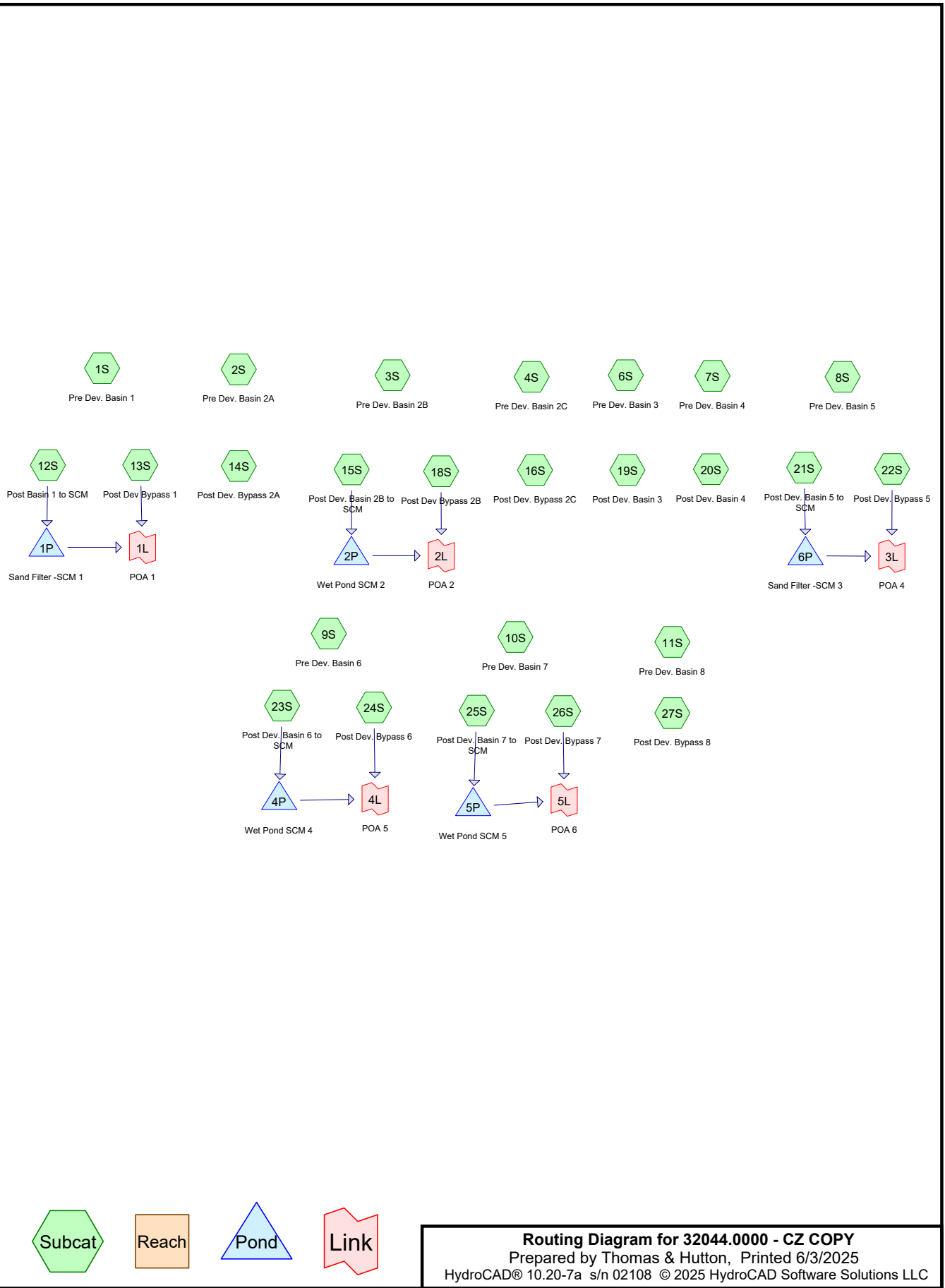
	V2 <i>af</i>	V2 <i>(cf)</i>
Pre-Development Basin 6	0.570	24,829
Pre-Development Runoff Volume	0.570	24,829
Post-Development Basin 6 area to SCM 4	0.932	40,598
Post-Development Basin 6 area to Bypass	0.338	14,723
Post-Development Basin 6		55,321
Post Development Runoff Volume		55,321
Wet Pond Volume		33,175
Post Development Runoff Volume with Treatment		22,146
Percent difference between Pre-Development and Post		-11%

Runoff Volume Analysis Summary Basin 7

	V2 <i>af</i>	V2 <i>(cf)</i>
Pre-Development Basin 7	0.247	10,759
Pre-Development Runoff Volume	0.247	10,759
Post-Development Basin 7 area to SCM 5	0.507	22,085
Post-Development Basin 7 area to Bypass	0.123	5,358
Post-Development Basin 7		27,443
Post Development Runoff Volume		27,443
Wet Pond Volume		21,771
Post Development Runoff Volume with Treatment		5,672
Percent difference between Pre-Development and Post		-47%

Runoff Volume Analysis Summary Basin 8

	V2 <i>af</i>	V2 <i>(cf)</i>
Pre-Development Basin 4 Pre-Development Runoff Volume	0.770	33,541 33,541
Post-Development Basin 4 Post Development Runoff Volume	0.770	33,541 33,541
Percent difference between Pre-Development and Post		0%



Project Notes

Rainfall events imported from "HydroCAD-30792-ZCP.hcp"

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Rainfall Events Listing (selected events)

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	1-yr	Type II 24-hr		Default	24.00	1	3.16	2
2	2-yr	Type II 24-hr		Default	24.00	1	3.82	2
3	25-yr	Type II 24-hr		Default	24.00	1	6.54	2
4	100-yr	Type II 24-hr		Default	24.00	1	8.17	2

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Area Listing (selected nodes)

Area (acres)	CN	Description (subcatchment-numbers)
2.578	69	50-75% Grass cover, Fair, HSG B (11S, 27S)
0.750	61	>75% Grass cover, Good, HSG B (23S)
6.041	56	Brush, Fair, HSG B (7S, 9S, 12S, 13S, 20S, 24S)
2.080	70	Brush, Fair, HSG C (6S, 19S)
5.385	77	Brush, Fair, HSG D (4S, 16S)
6.103	48	Brush, Good, HSG B (8S, 15S, 18S, 21S, 22S, 25S, 26S)
0.568	73	Brush, Good, HSG D (1S)
0.708	69	Pasture/grassland/range, Fair, HSG B (10S)
2.518	98	Paved parking, HSG A (12S)
5.571	98	Paved parking, HSG B (13S, 15S, 20S, 21S, 22S, 23S, 24S, 25S, 26S, 27S)
4.168	98	Paved parking, HSG D (4S, 16S)
8.561	98	Roofs, HSG B (12S, 15S, 21S, 23S, 25S)
2.730	98	Roofs, HSG D (4S, 16S)
0.749	98	Water Surface, 0% imp, HSG B (21S, 23S, 25S)
0.227	98	Water Surface, HSG B (15S)
41.332	60	Woods, Fair, HSG B (3S, 7S, 8S, 9S, 11S, 13S, 20S, 22S, 24S, 27S)
0.228	73	Woods, Fair, HSG C (6S)
24.342	79	Woods, Fair, HSG D (1S, 2S, 4S, 14S, 16S)
6.916	55	Woods, Good, HSG B (10S, 18S, 26S)
121.558	72	TOTAL AREA

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Soil Listing (selected nodes)

Area (acres)	Soil Group	Subcatchment Numbers
2.518	HSG A	12S
79.538	HSG B	3S, 7S, 8S, 9S, 10S, 11S, 12S, 13S, 15S, 18S, 20S, 21S, 22S, 23S, 24S, 25S, 26S, 27S
2.308	HSG C	6S, 19S
37.194	HSG D	1S, 2S, 4S, 14S, 16S
0.000	Other	
121.558		TOTAL AREA

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Type II 24-hr 1-yr Rainfall=3.16"

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Time span=10.00-200.00 hrs, dt=0.10 hrs, 1901 points

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN

Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1S: Pre Dev. Basin 1	Runoff Area=366,801 sf 0.00% Impervious Runoff Depth>1.31"
Flow Length=560'	Slope=0.0630 '/' Tc=5.9 min CN=79 Runoff=17.85 cfs 0.917 af
Subcatchment2S: Pre Dev. Basin 2A	Runoff Area=250,337 sf 0.00% Impervious Runoff Depth>1.31"
Flow Length=803'	Slope=0.0650 '/' Tc=7.7 min CN=79 Runoff=11.86 cfs 0.626 af
Subcatchment3S: Pre Dev. Basin 2B	Runoff Area=132,113 sf 0.00% Impervious Runoff Depth=0.39"
Flow Length=577'	Slope=0.0451 '/' Tc=6.9 min CN=60 Runoff=1.36 cfs 0.099 af
Subcatchment4S: Pre Dev. Basin 2C	Runoff Area=467,737 sf 32.11% Impervious Runoff Depth>1.63"
Flow Length=753'	Slope=0.0633 '/' Tc=7.4 min CN=84 Runoff=28.14 cfs 1.463 af
Subcatchment6S: Pre Dev. Basin 3	Runoff Area=52,001 sf 0.00% Impervious Runoff Depth=0.85"
Flow Length=243'	Slope=0.0170 '/' Tc=5.1 min CN=71 Runoff=1.60 cfs 0.085 af
Subcatchment7S: Pre Dev. Basin 4	Runoff Area=130,388 sf 0.00% Impervious Runoff Depth=0.36"
Flow Length=561'	Slope=0.0221 '/' Tc=8.9 min CN=59 Runoff=0.97 cfs 0.090 af
Subcatchment8S: Pre Dev. Basin 5	Runoff Area=305,128 sf 0.00% Impervious Runoff Depth=0.36"
Flow Length=998'	Slope=0.0301 '/' Tc=12.3 min CN=59 Runoff=2.07 cfs 0.210 af
Subcatchment9S: Pre Dev. Basin 6	Runoff Area=441,055 sf 0.00% Impervious Runoff Depth=0.39"
Flow Length=1,222'	Slope=0.0441 '/' Tc=12.4 min CN=60 Runoff=3.49 cfs 0.331 af
Subcatchment10S: Pre Dev. Basin 7	Runoff Area=238,293 sf 0.00% Impervious Runoff Depth=0.30"
Flow Length=977'	Slope=0.0468 '/' Tc=10.2 min CN=57 Runoff=1.16 cfs 0.135 af
Subcatchment11S: Pre Dev. Basin 8	Runoff Area=289,814 sf 0.00% Impervious Runoff Depth=0.46"
Flow Length=826'	Slope=0.0447 '/' Tc=9.1 min CN=62 Runoff=3.40 cfs 0.257 af
Subcatchment12S: Post Basin 1 to SCM	Runoff Area=332,471 sf 78.15% Impervious Runoff Depth>1.98"
	Tc=5.0 min CN=89 Runoff=24.26 cfs 1.261 af
Subcatchment13S: Post Dev Bypass 1	Runoff Area=180,474 sf 3.97% Impervious Runoff Depth=0.39"
	Tc=5.0 min CN=60 Runoff=2.02 cfs 0.136 af
Subcatchment14S: Post Dev. Bypass 2A	Runoff Area=120,581 sf 0.00% Impervious Runoff Depth>1.31"
Flow Length=421'	Slope=0.0411 '/' Tc=5.6 min CN=79 Runoff=5.86 cfs 0.301 af
Subcatchment15S: Post Dev. Basin 2B	Runoff Area=182,292 sf 72.71% Impervious Runoff Depth>1.63"
	Tc=5.0 min CN=84 Runoff=11.00 cfs 0.570 af
Subcatchment16S: Post Dev. Bypass 2C	Runoff Area=414,715 sf 36.24% Impervious Runoff Depth>1.70"
Flow Length=760'	Slope=0.0633 '/' Tc=7.5 min CN=85 Runoff=25.96 cfs 1.351 af
Subcatchment18S: Post Dev Bypass 2B	Runoff Area=58,575 sf 0.00% Impervious Runoff Depth=0.21"
	Tc=5.0 min CN=54 Runoff=0.18 cfs 0.024 af

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Type II 24-hr 1-yr Rainfall=3.16"

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Subcatchment19S: Post Dev. Basin 3	Runoff Area=48,549 sf 0.00% Impervious Runoff Depth=0.80" Tc=5.0 min CN=70 Runoff=1.40 cfs 0.075 af
Subcatchment20S: Post Dev. Basin 4	Runoff Area=29,236 sf 11.81% Impervious Runoff Depth=0.46" Tc=5.0 min CN=62 Runoff=0.42 cfs 0.026 af
Subcatchment21S: Post Dev. Basin 5 to	Runoff Area=120,435 sf 67.31% Impervious Runoff Depth>1.84" Tc=5.0 min CN=87 Runoff=8.18 cfs 0.424 af
Subcatchment22S: Post Dev. Bypass 5	Runoff Area=166,064 sf 7.47% Impervious Runoff Depth=0.36" Tc=12.3 min CN=59 Runoff=1.13 cfs 0.114 af
Subcatchment23S: Post Dev. Basin 6 to	Runoff Area=181,059 sf 74.10% Impervious Runoff Depth>2.13" Tc=5.0 min CN=91 Runoff=14.12 cfs 0.736 af
Subcatchment24S: Post Dev. Bypass 6	Runoff Area=261,575 sf 1.63% Impervious Runoff Depth=0.39" Tc=5.0 min CN=60 Runoff=2.93 cfs 0.197 af
Subcatchment25S: Post Dev. Basin 7 to	Runoff Area=107,301 sf 73.79% Impervious Runoff Depth>1.91" Tc=5.0 min CN=88 Runoff=7.56 cfs 0.393 af
Subcatchment26S: Post Dev. Bypass 7	Runoff Area=128,254 sf 12.25% Impervious Runoff Depth=0.27" Tc=10.0 min CN=56 Runoff=0.51 cfs 0.066 af
Subcatchment27S: Post Dev. Bypass 8 Flow Length=826'	Runoff Area=289,814 sf 1.87% Impervious Runoff Depth=0.46" Slope=0.0447 '/' Tc=9.1 min CN=62 Runoff=3.40 cfs 0.257 af
Pond 1P: Sand Filter -SCM 1	Peak Elev=527.68' Storage=25,147 cf Inflow=24.26 cfs 1.261 af Outflow=3.08 cfs 1.261 af
Pond 2P: Wet Pond SCM 2	Peak Elev=527.28' Storage=52,298 cf Inflow=11.00 cfs 0.570 af Outflow=0.81 cfs 0.570 af
Pond 4P: Wet Pond SCM 4	Peak Elev=525.00' Storage=31,060 cf Inflow=14.12 cfs 0.736 af Outflow=0.71 cfs 0.736 af
Pond 5P: Wet Pond SCM 5	Peak Elev=515.12' Storage=19,712 cf Inflow=7.56 cfs 0.393 af Outflow=0.59 cfs 0.393 af
Pond 6P: Sand Filter -SCM 3	Peak Elev=532.85' Storage=14,163 cf Inflow=8.18 cfs 0.424 af Outflow=0.13 cfs 0.163 af
Link 1L: POA 1	Inflow=4.77 cfs 1.397 af Primary=4.77 cfs 1.397 af
Link 2L: POA 2	Inflow=0.87 cfs 0.594 af Primary=0.87 cfs 0.594 af
Link 3L: POA 4	Inflow=1.13 cfs 0.277 af Primary=1.13 cfs 0.277 af

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Prepared by Thomas & Hutton

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Type II 24-hr 1-yr Rainfall=3.16"

Printed 6/3/2025

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Link 4L: POA 5

Inflow=3.27 cfs 0.933 af

Primary=3.27 cfs 0.933 af

Link 5L: POA 6

Inflow=1.07 cfs 0.458 af

Primary=1.07 cfs 0.458 af

Total Runoff Area = 121.558 ac Runoff Volume = 10.144 af Average Runoff Depth = 1.00"
80.44% Pervious = 97.782 ac 19.56% Impervious = 23.776 ac

Summary for Subcatchment 1S: Pre Dev. Basin 1

Runoff = 17.85 cfs @ 11.98 hrs, Volume= 0.917 af, Depth> 1.31"

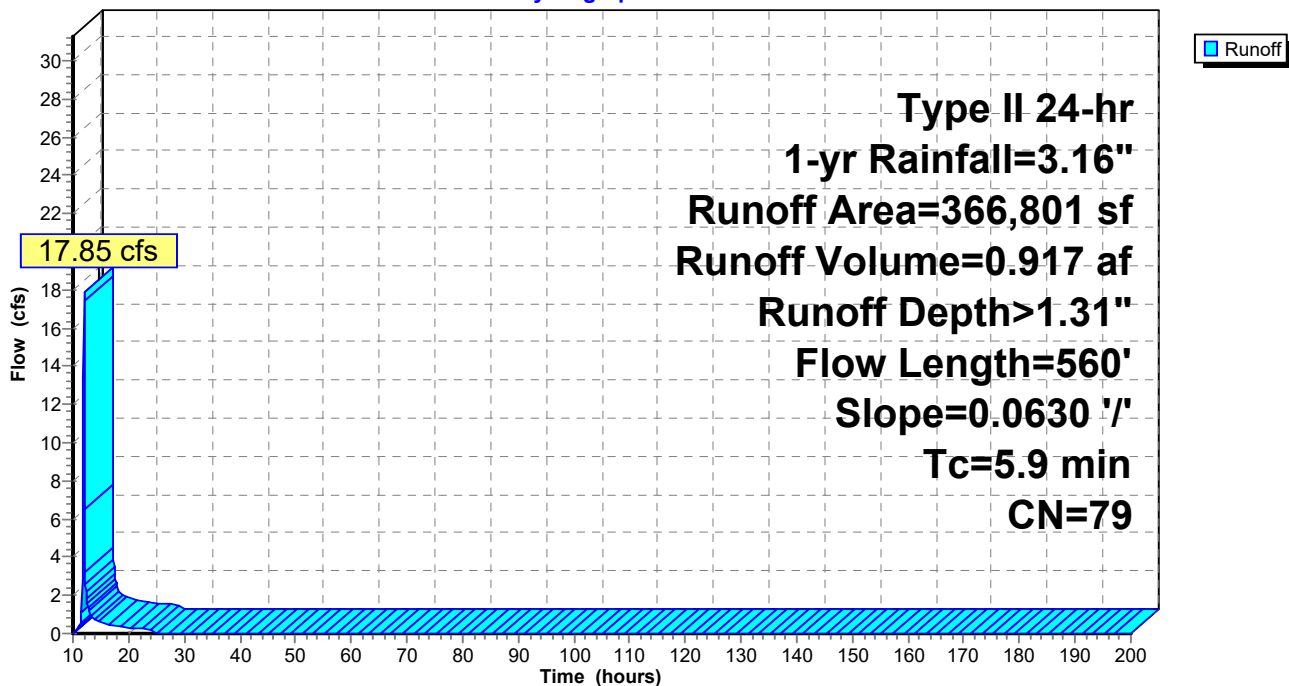
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-200.00 hrs, dt= 0.10 hrs
Type II 24-hr 1-yr Rainfall=3.16"

Area (sf)	CN	Description
342,042	79	Woods, Fair, HSG D
24,759	73	Brush, Good, HSG D
366,801	79	Weighted Average
366,801		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.9	560	0.0630	1.58		Kirpich Method, Estimated Tc General overland flow k= 2.00

Subcatchment 1S: Pre Dev. Basin 1

Hydrograph



Summary for Subcatchment 2S: Pre Dev. Basin 2A

Runoff = 11.86 cfs @ 11.99 hrs, Volume= 0.626 af, Depth> 1.31"

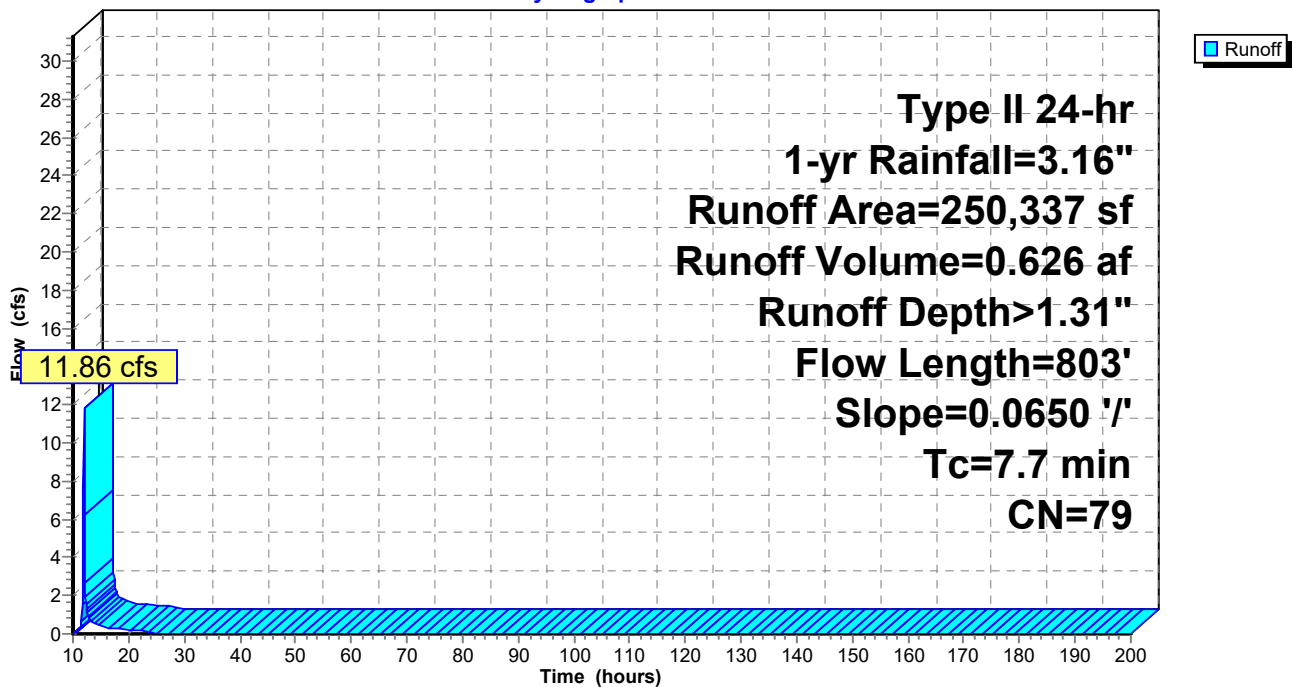
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-200.00 hrs, dt= 0.10 hrs
Type II 24-hr 1-yr Rainfall=3.16"

Area (sf)	CN	Description
250,337	79	Woods, Fair, HSG D
250,337		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.7	803	0.0650	1.74		Kirpich Method, Estimated Tc General overland flow k= 2.00

Subcatchment 2S: Pre Dev. Basin 2A

Hydrograph



Summary for Subcatchment 3S: Pre Dev. Basin 2B

Runoff = 1.36 cfs @ 12.01 hrs, Volume= 0.099 af, Depth= 0.39"

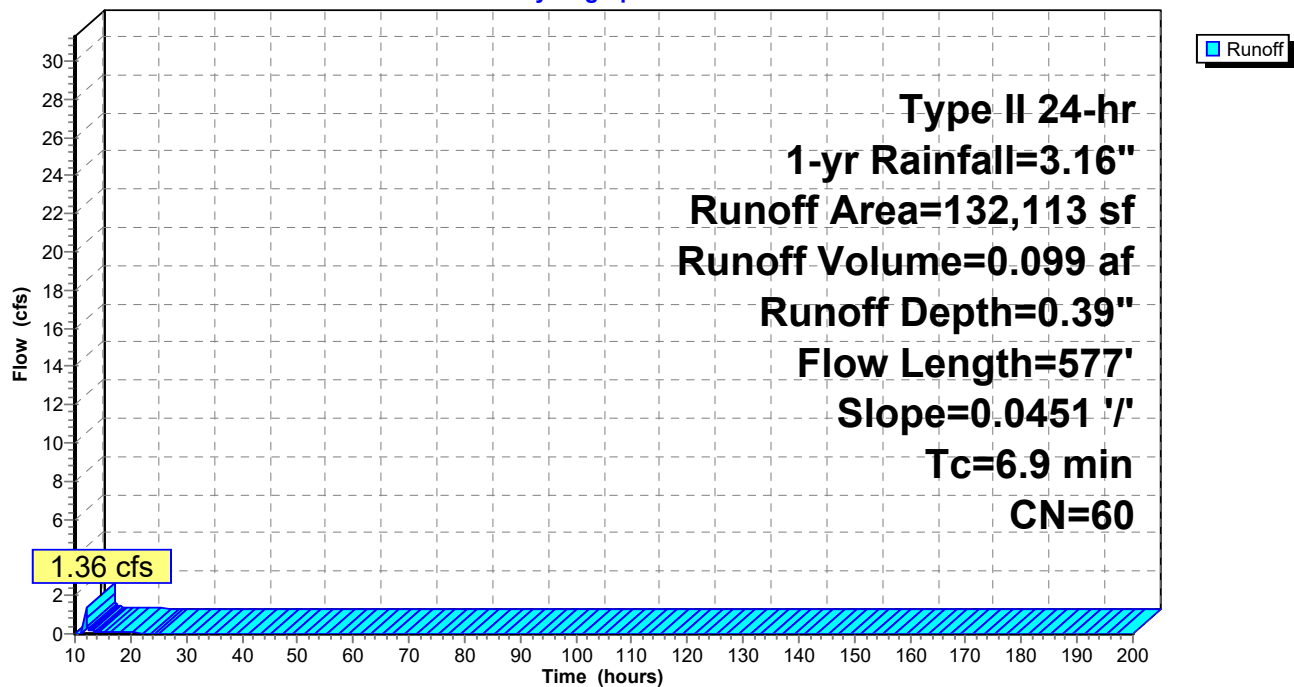
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-200.00 hrs, dt= 0.10 hrs
Type II 24-hr 1-yr Rainfall=3.16"

Area (sf)	CN	Description
132,113	60	Woods, Fair, HSG B
132,113		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.9	577	0.0451	1.40		Kirpich Method, Estimated Tc General overland flow k= 2.00

Subcatchment 3S: Pre Dev. Basin 2B

Hydrograph



Summary for Subcatchment 4S: Pre Dev. Basin 2C

Runoff = 28.14 cfs @ 11.99 hrs, Volume= 1.463 af, Depth> 1.63"

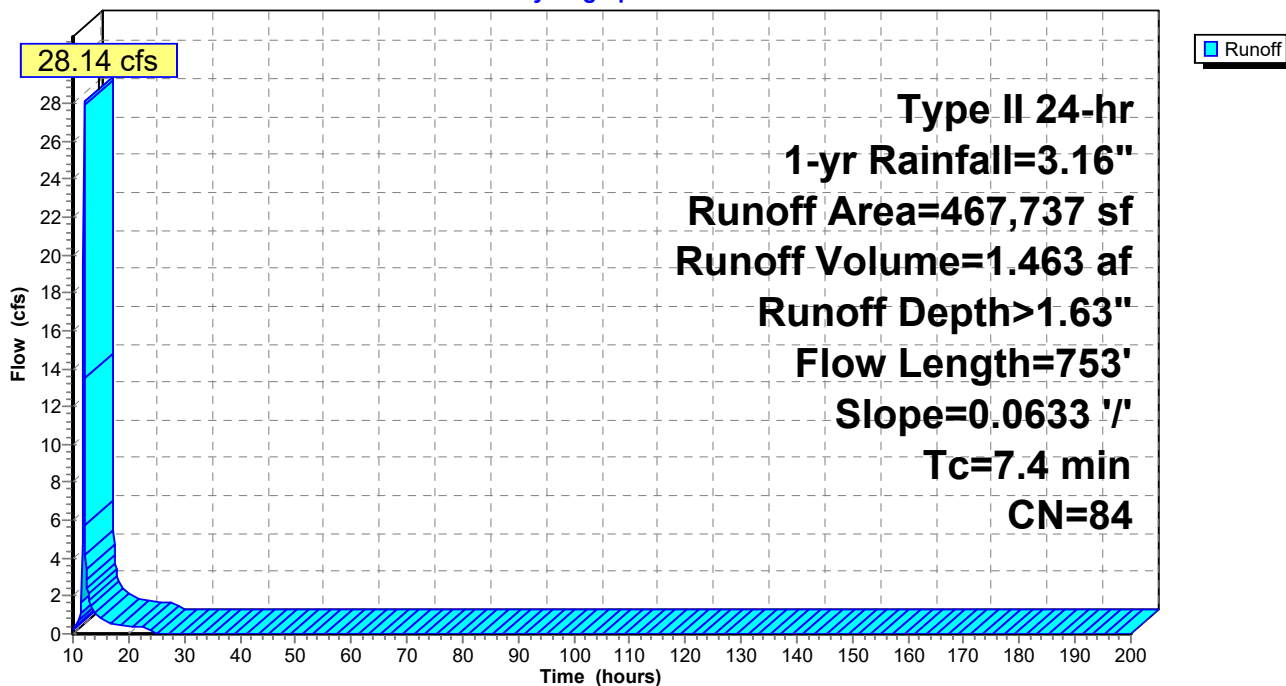
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-200.00 hrs, dt= 0.10 hrs
Type II 24-hr 1-yr Rainfall=3.16"

Area (sf)	CN	Description
173,689	79	Woods, Fair, HSG D
143,869	77	Brush, Fair, HSG D
90,721	98	Paved parking, HSG D
59,458	98	Roofs, HSG D
467,737	84	Weighted Average
317,558		67.89% Pervious Area
150,179		32.11% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.4	753	0.0633	1.69		Kirpich Method, Estimated Tc General overland flow k= 2.00

Subcatchment 4S: Pre Dev. Basin 2C

Hydrograph



Summary for Subcatchment 6S: Pre Dev. Basin 3

Runoff = 1.60 cfs @ 11.98 hrs, Volume= 0.085 af, Depth= 0.85"

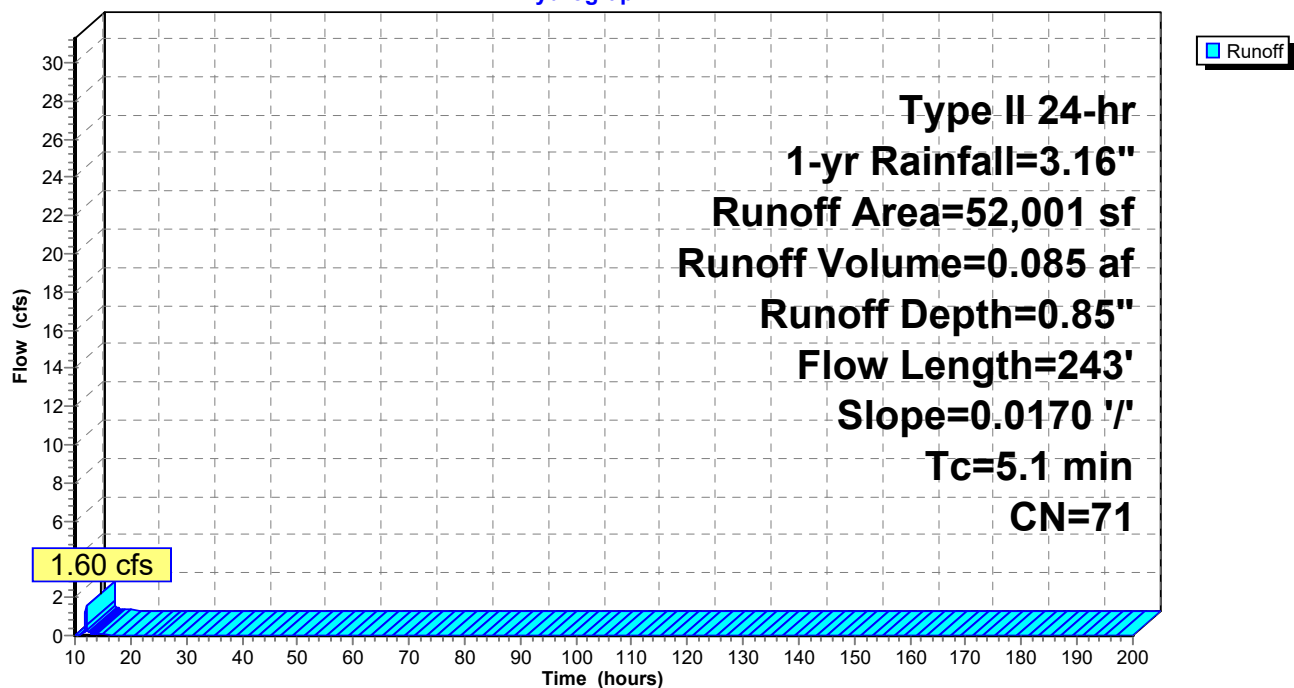
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-200.00 hrs, dt= 0.10 hrs
Type II 24-hr 1-yr Rainfall=3.16"

Area (sf)	CN	Description
9,925	73	Woods, Fair, HSG C
42,076	70	Brush, Fair, HSG C
52,001	71	Weighted Average
52,001		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.1	243	0.0170	0.79		Kirpich Method, Estimated Tc General overland flow k= 2.00

Subcatchment 6S: Pre Dev. Basin 3

Hydrograph



Summary for Subcatchment 7S: Pre Dev. Basin 4

Runoff = 0.97 cfs @ 12.04 hrs, Volume= 0.090 af, Depth= 0.36"

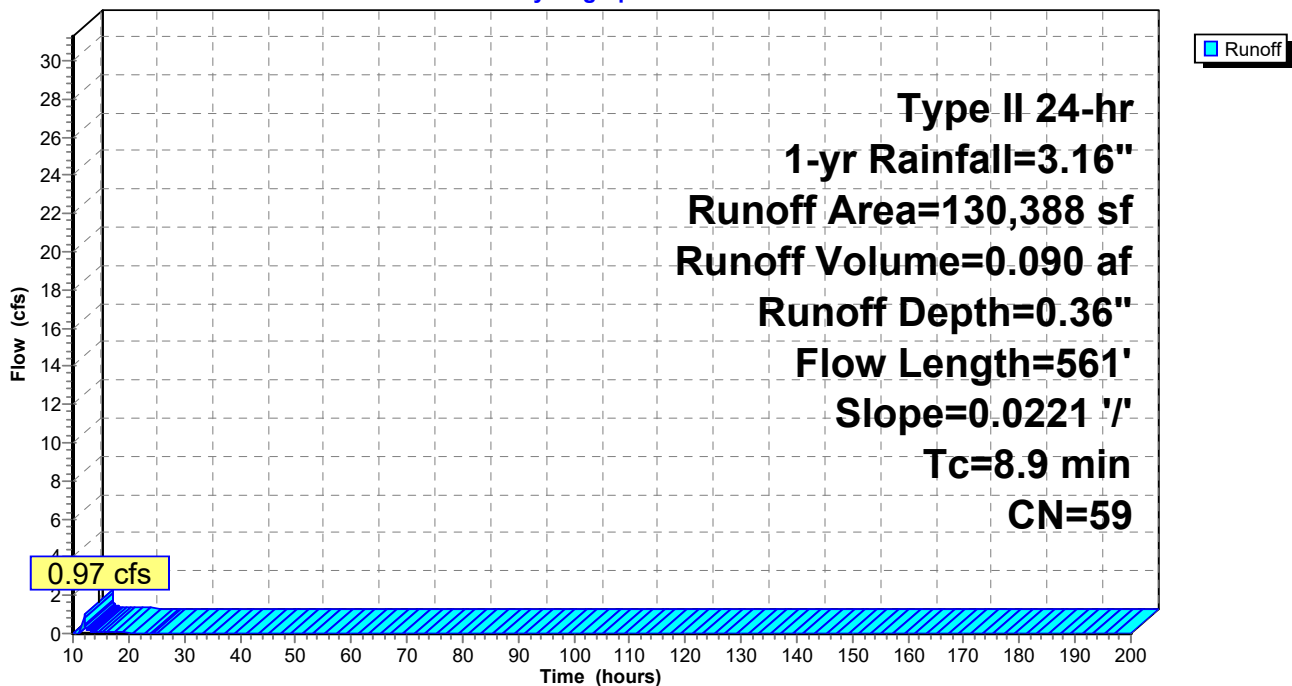
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-200.00 hrs, dt= 0.10 hrs
Type II 24-hr 1-yr Rainfall=3.16"

Area (sf)	CN	Description
104,102	60	Woods, Fair, HSG B
26,286	56	Brush, Fair, HSG B
130,388	59	Weighted Average
130,388		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.9	561	0.0221	1.06		Kirpich Method, General overland flow k= 2.00

Subcatchment 7S: Pre Dev. Basin 4

Hydrograph



Summary for Subcatchment 8S: Pre Dev. Basin 5

Runoff = 2.07 cfs @ 12.10 hrs, Volume= 0.210 af, Depth= 0.36"

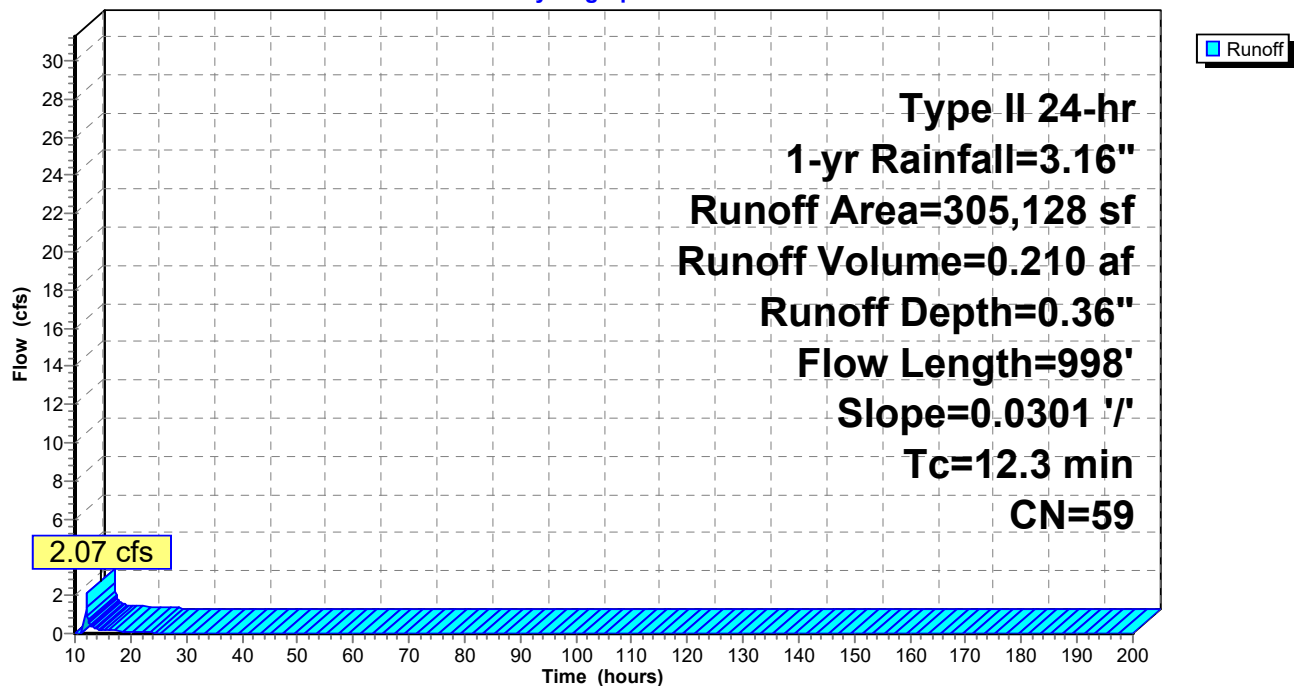
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-200.00 hrs, dt= 0.10 hrs
Type II 24-hr 1-yr Rainfall=3.16"

Area (sf)	CN	Description
267,919	60	Woods, Fair, HSG B
37,209	48	Brush, Good, HSG B
305,128	59	Weighted Average
305,128		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.3	998	0.0301	1.36		Kirpich Method, Estimated Tc General overland flow k= 2.00

Subcatchment 8S: Pre Dev. Basin 5

Hydrograph



Summary for Subcatchment 9S: Pre Dev. Basin 6

Runoff = 3.49 cfs @ 12.10 hrs, Volume= 0.331 af, Depth= 0.39"

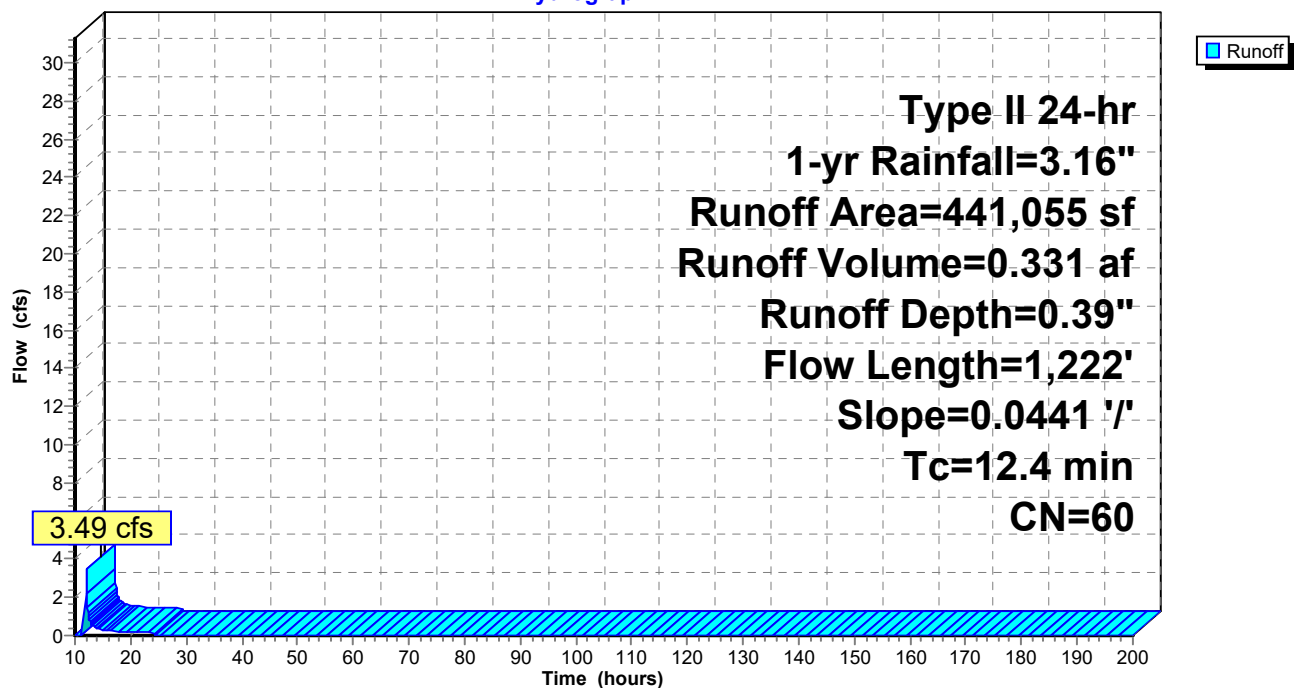
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-200.00 hrs, dt= 0.10 hrs
Type II 24-hr 1-yr Rainfall=3.16"

Area (sf)	CN	Description
401,238	60	Woods, Fair, HSG B
39,817	56	Brush, Fair, HSG B
441,055	60	Weighted Average
441,055		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.4	1,222	0.0441	1.65		Kirpich Method, Estimated Tc General overland flow k= 2.00

Subcatchment 9S: Pre Dev. Basin 6

Hydrograph



Summary for Subcatchment 10S: Pre Dev. Basin 7

Runoff = 1.16 cfs @ 12.09 hrs, Volume= 0.135 af, Depth= 0.30"

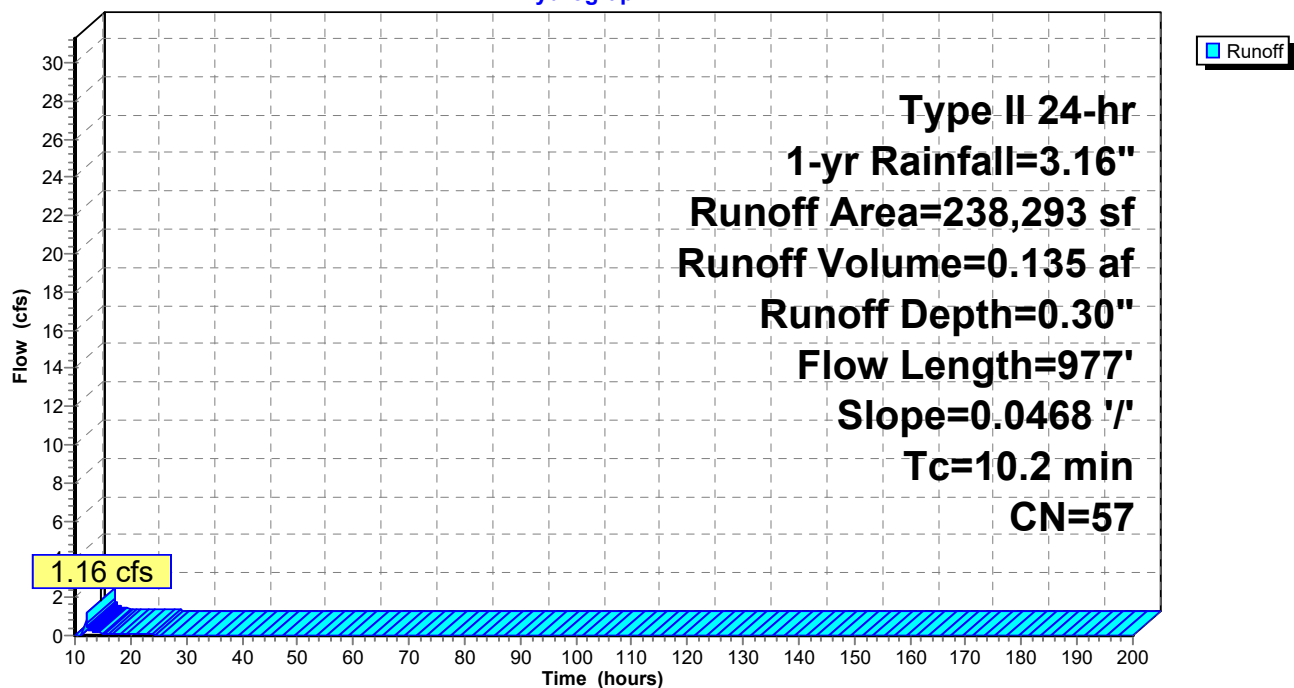
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-200.00 hrs, dt= 0.10 hrs
Type II 24-hr 1-yr Rainfall=3.16"

Area (sf)	CN	Description
207,447	55	Woods, Good, HSG B
30,846	69	Pasture/grassland/range, Fair, HSG B
238,293	57	Weighted Average
238,293		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.2	977	0.0468	1.60		Kirpich Method, Estimated Tc General overland flow k= 2.00

Subcatchment 10S: Pre Dev. Basin 7

Hydrograph



Summary for Subcatchment 11S: Pre Dev. Basin 8

Runoff = 3.40 cfs @ 12.03 hrs, Volume= 0.257 af, Depth= 0.46"

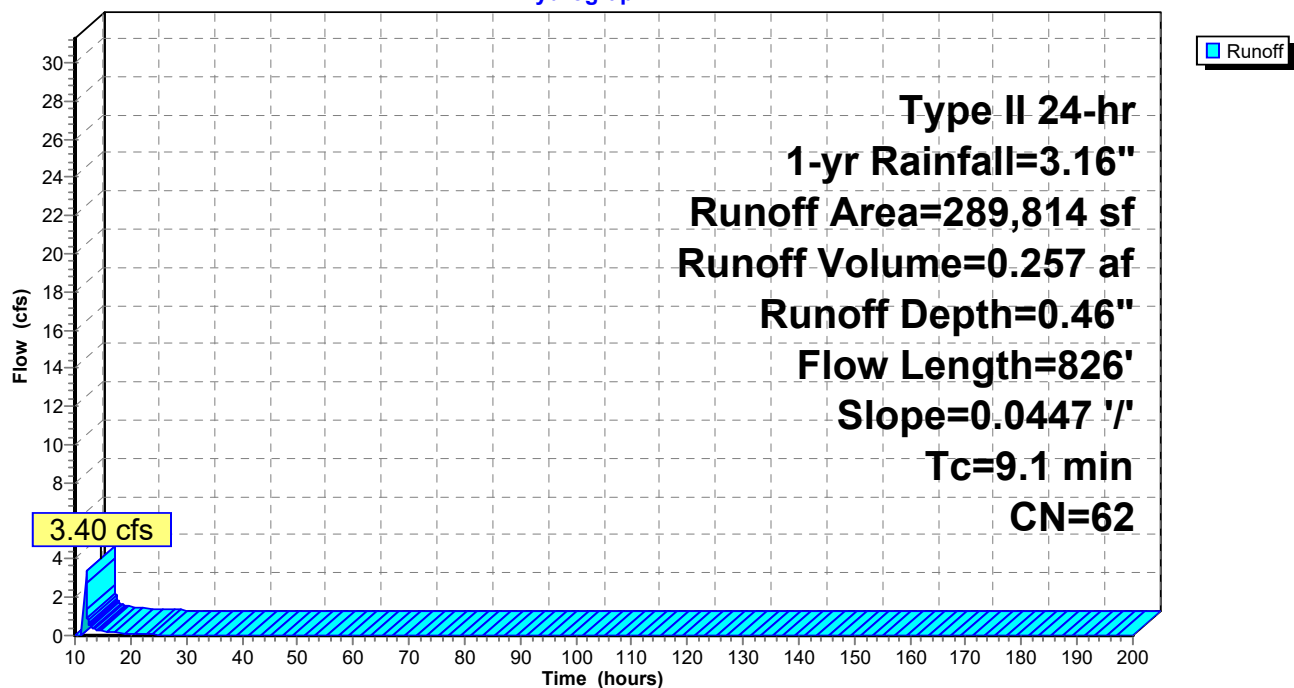
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-200.00 hrs, dt= 0.10 hrs
Type II 24-hr 1-yr Rainfall=3.16"

Area (sf)	CN	Description
230,959	60	Woods, Fair, HSG B
58,855	69	50-75% Grass cover, Fair, HSG B
289,814	62	Weighted Average
289,814		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.1	826	0.0447	1.51		Kirpich Method, General overland flow k= 2.00

Subcatchment 11S: Pre Dev. Basin 8

Hydrograph



Summary for Subcatchment 12S: Post Basin 1 to SCM

Runoff = 24.26 cfs @ 11.95 hrs, Volume= 1.261 af, Depth> 1.98"
 Routed to Pond 1P : Sand Filter -SCM 1

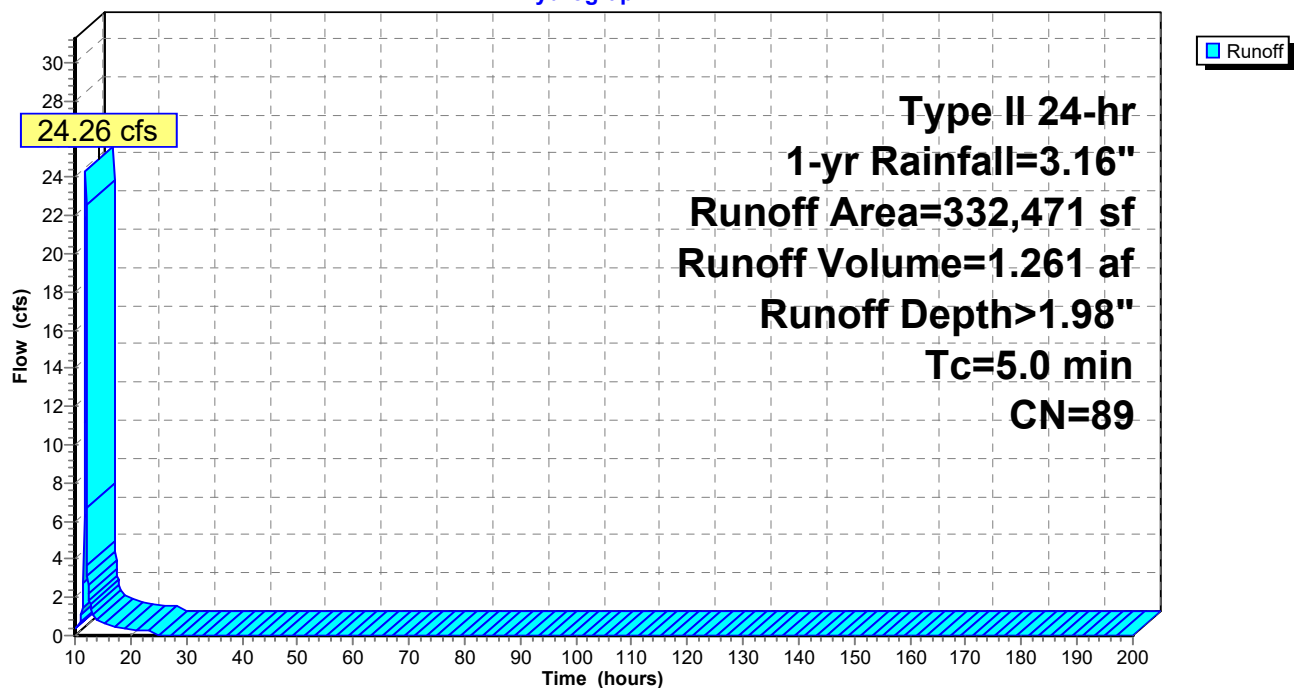
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-200.00 hrs, dt= 0.10 hrs
 Type II 24-hr 1-yr Rainfall=3.16"

Area (sf)	CN	Description
109,684	98	Paved parking, HSG A
72,655	56	Brush, Fair, HSG B
150,132	98	Roofs, HSG B
332,471	89	Weighted Average
72,655		21.85% Pervious Area
259,816		78.15% Impervious Area

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

Subcatchment 12S: Post Basin 1 to SCM

Hydrograph



Summary for Subcatchment 13S: Post Dev Bypass 1

Runoff = 2.02 cfs @ 12.00 hrs, Volume= 0.136 af, Depth= 0.39"
 Routed to Link 1L : POA 1

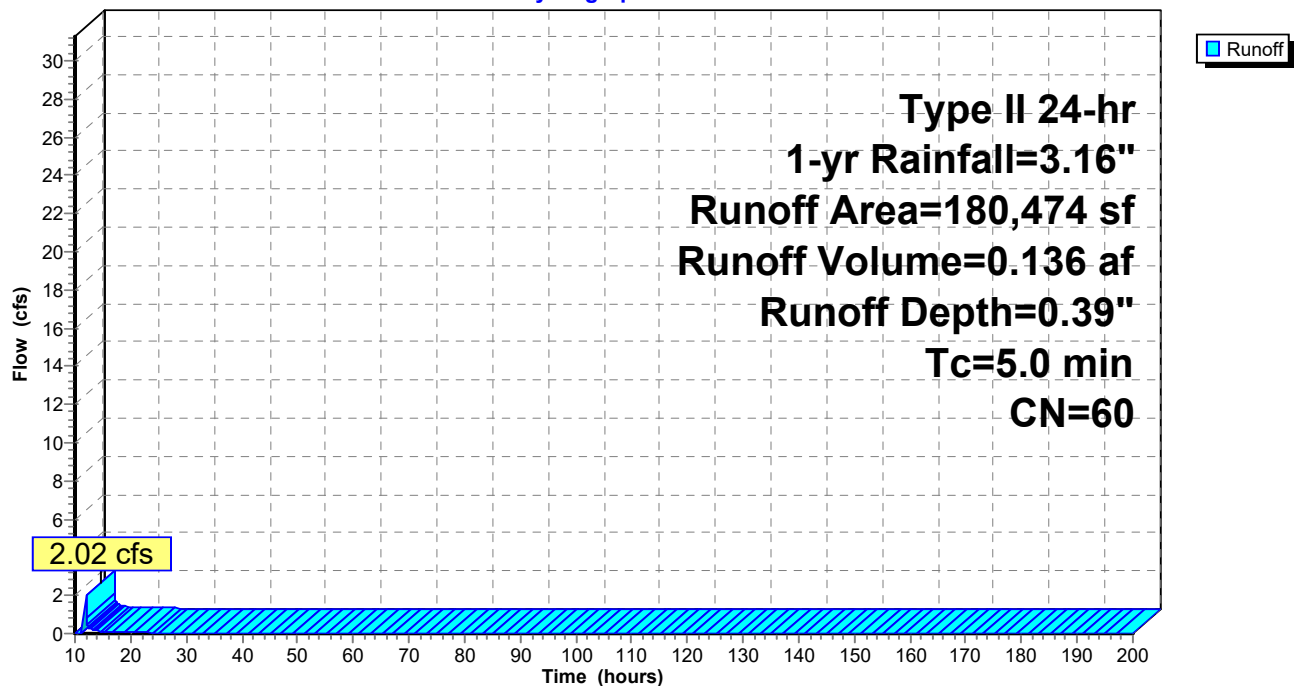
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-200.00 hrs, dt= 0.10 hrs
 Type II 24-hr 1-yr Rainfall=3.16"

Area (sf)	CN	Description
124,058	60	Woods, Fair, HSG B
49,243	56	Brush, Fair, HSG B
7,173	98	Paved parking, HSG B
180,474	60	Weighted Average
173,301		96.03% Pervious Area
7,173		3.97% Impervious Area

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

Subcatchment 13S: Post Dev Bypass 1

Hydrograph



Summary for Subcatchment 14S: Post Dev. Bypass 2A

Runoff = 5.86 cfs @ 11.97 hrs, Volume= 0.301 af, Depth> 1.31"

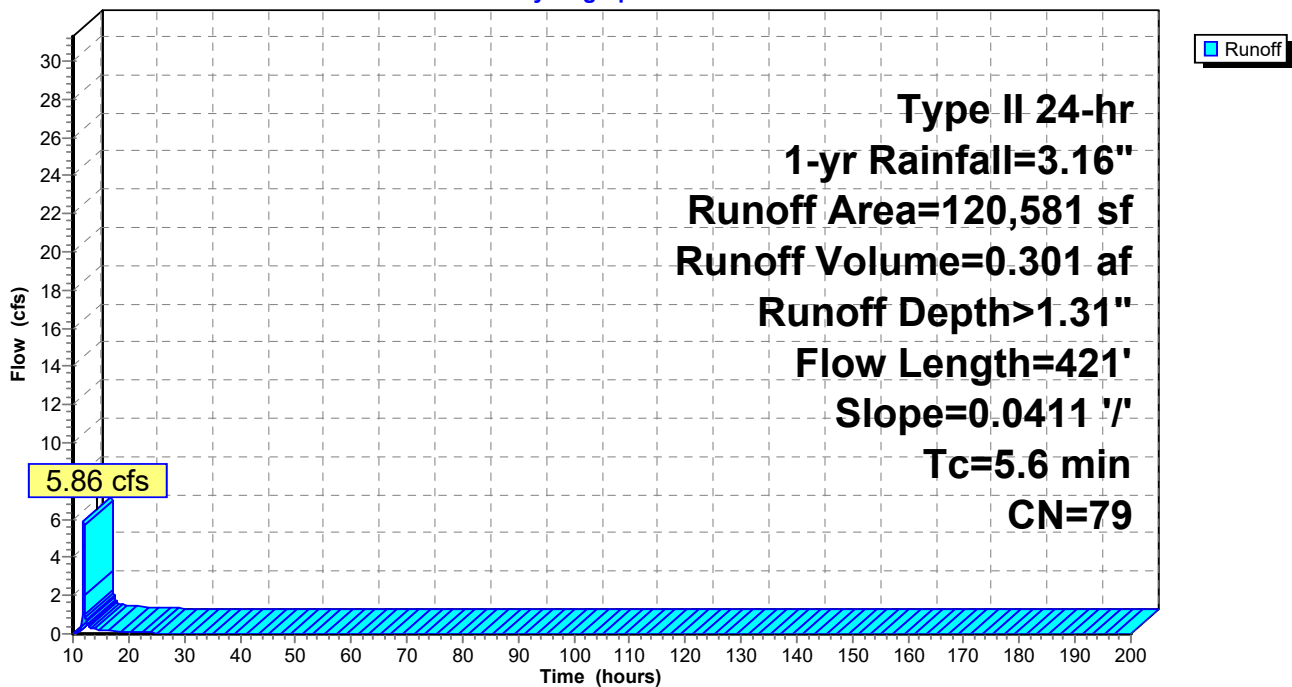
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-200.00 hrs, dt= 0.10 hrs
Type II 24-hr 1-yr Rainfall=3.16"

Area (sf)	CN	Description
120,581	79	Woods, Fair, HSG D
120,581		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.6	421	0.0411	1.25		Kirpich Method, Estimated Tc General overland flow k= 2.00

Subcatchment 14S: Post Dev. Bypass 2A

Hydrograph



Summary for Subcatchment 15S: Post Dev. Basin 2B to SCM

Runoff = 11.00 cfs @ 11.96 hrs, Volume= 0.570 af, Depth> 1.63"
 Routed to Pond 2P : Wet Pond SCM 2

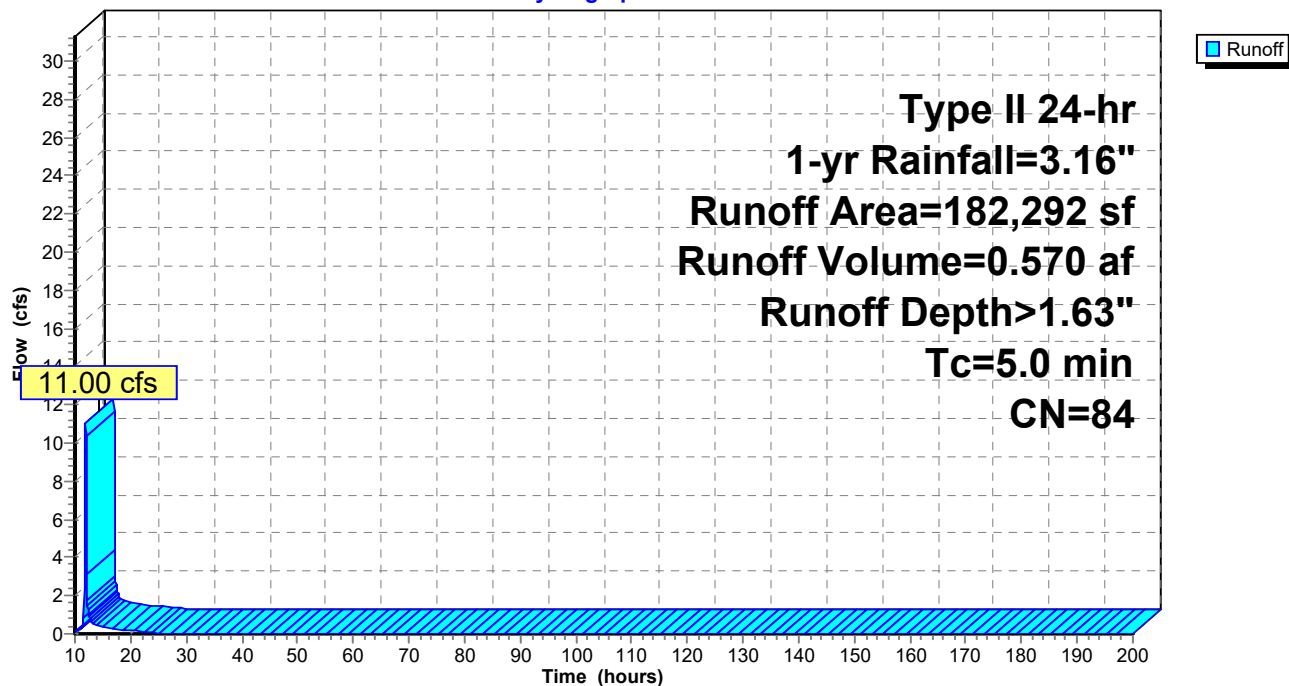
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-200.00 hrs, dt= 0.10 hrs
 Type II 24-hr 1-yr Rainfall=3.16"

Area (sf)	CN	Description
26,969	98	Paved parking, HSG B
49,749	48	Brush, Good, HSG B
95,673	98	Roofs, HSG B
9,901	98	Water Surface, HSG B
182,292	84	Weighted Average
49,749		27.29% Pervious Area
132,543		72.71% Impervious Area

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

Subcatchment 15S: Post Dev. Basin 2B to SCM

Hydrograph



Summary for Subcatchment 16S: Post Dev. Bypass 2C

Runoff = 25.96 cfs @ 11.99 hrs, Volume= 1.351 af, Depth> 1.70"

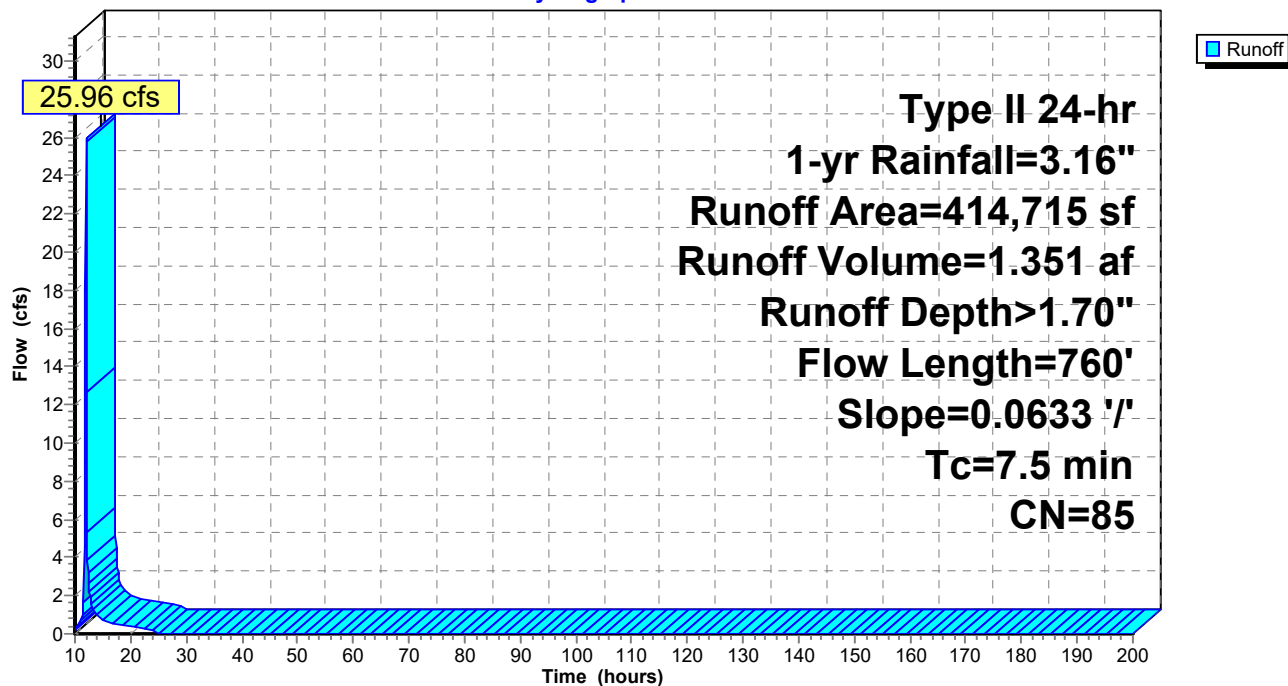
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-200.00 hrs, dt= 0.10 hrs
Type II 24-hr 1-yr Rainfall=3.16"

Area (sf)	CN	Description
173,689	79	Woods, Fair, HSG D
90,847	98	Paved parking, HSG D
90,721	77	Brush, Fair, HSG D
59,458	98	Roofs, HSG D
414,715	85	Weighted Average
264,410		63.76% Pervious Area
150,305		36.24% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.5	760	0.0633	1.70		Kirpich Method, Estimated Tc General overland flow k= 2.00

Subcatchment 16S: Post Dev. Bypass 2C

Hydrograph



Summary for Subcatchment 18S: Post Dev Bypass 2B

Runoff = 0.18 cfs @ 12.02 hrs, Volume= 0.024 af, Depth= 0.21"
 Routed to Link 2L : POA 2

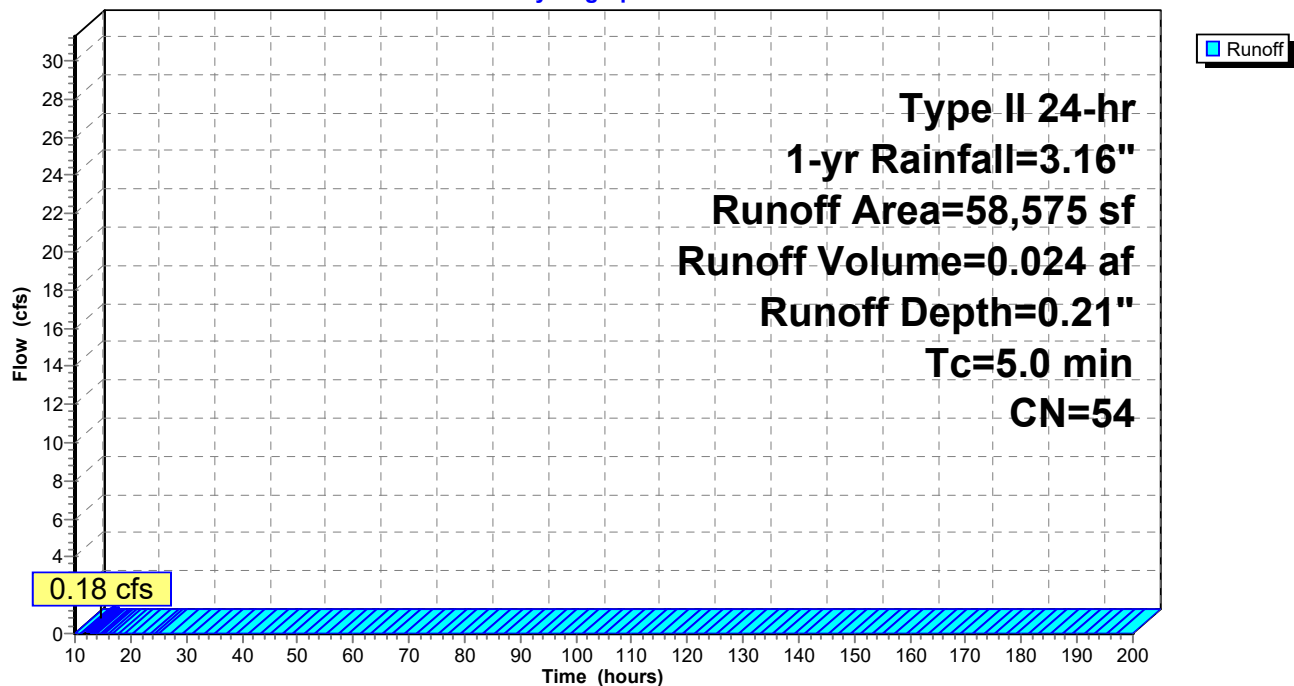
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-200.00 hrs, dt= 0.10 hrs
 Type II 24-hr 1-yr Rainfall=3.16"

Area (sf)	CN	Description
53,889	55	Woods, Good, HSG B
4,686	48	Brush, Good, HSG B
58,575	54	Weighted Average
58,575		100.00% Pervious Area

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

Subcatchment 18S: Post Dev Bypass 2B

Hydrograph



Summary for Subcatchment 19S: Post Dev. Basin 3

Runoff = 1.40 cfs @ 11.98 hrs, Volume= 0.075 af, Depth= 0.80"

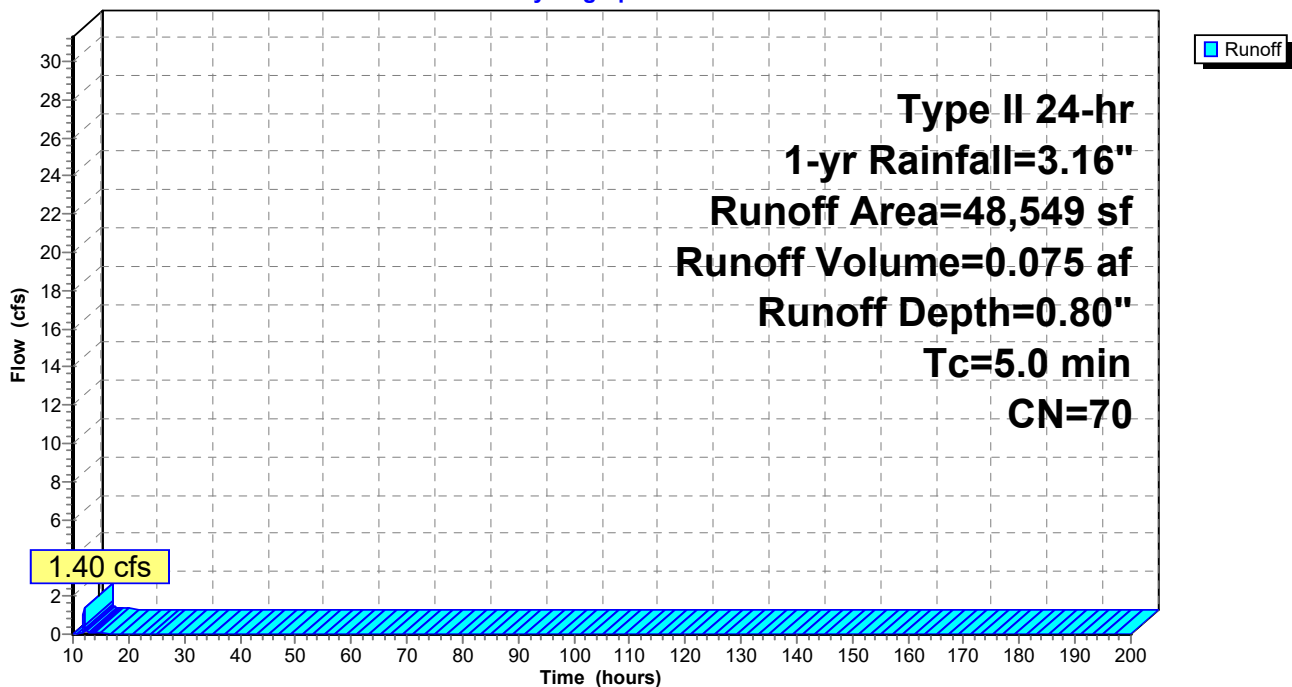
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-200.00 hrs, dt= 0.10 hrs
Type II 24-hr 1-yr Rainfall=3.16"

Area (sf)	CN	Description
48,549	70	Brush, Fair, HSG C
48,549		100.00% Pervious Area

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

Subcatchment 19S: Post Dev. Basin 3

Hydrograph



Summary for Subcatchment 20S: Post Dev. Basin 4

Runoff = 0.42 cfs @ 11.99 hrs, Volume= 0.026 af, Depth= 0.46"

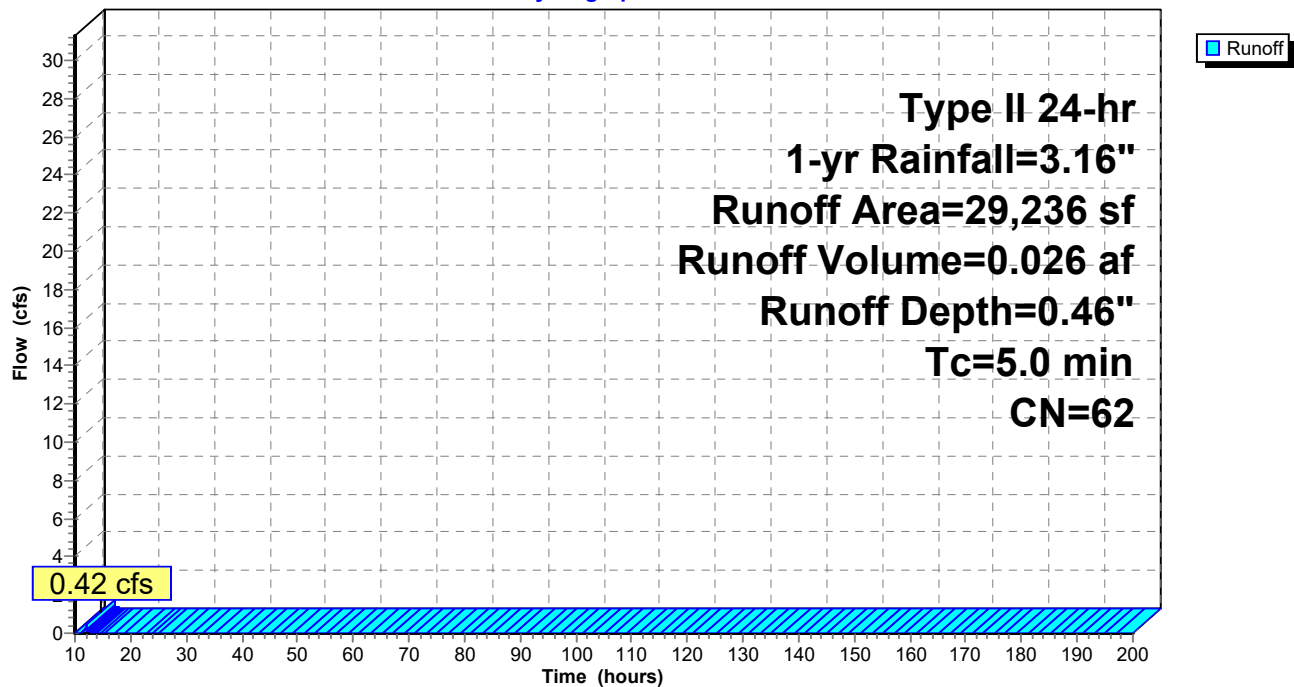
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-200.00 hrs, dt= 0.10 hrs
Type II 24-hr 1-yr Rainfall=3.16"

Area (sf)	CN	Description
6,194	60	Woods, Fair, HSG B
19,589	56	Brush, Fair, HSG B
3,453	98	Paved parking, HSG B
29,236	62	Weighted Average
25,783		88.19% Pervious Area
3,453		11.81% Impervious Area

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

Subcatchment 20S: Post Dev. Basin 4

Hydrograph



Summary for Subcatchment 21S: Post Dev. Basin 5 to SCM

Runoff = 8.18 cfs @ 11.96 hrs, Volume= 0.424 af, Depth> 1.84"
 Routed to Pond 6P : Sand Filter -SCM 3

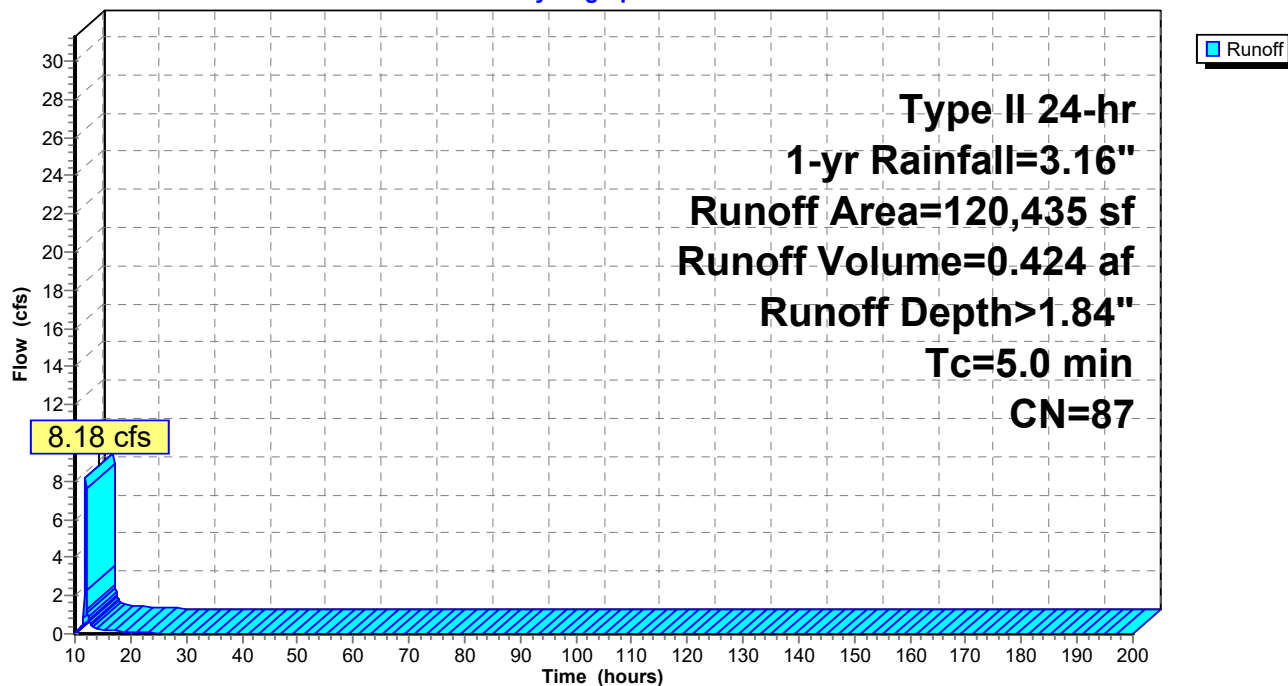
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-200.00 hrs, dt= 0.10 hrs
 Type II 24-hr 1-yr Rainfall=3.16"

Area (sf)	CN	Description
34,944	98	Roofs, HSG B
27,461	48	Brush, Good, HSG B
46,122	98	Paved parking, HSG B
11,908	98	Water Surface, 0% imp, HSG B
120,435	87	Weighted Average
39,369		32.69% Pervious Area
81,066		67.31% Impervious Area

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

Subcatchment 21S: Post Dev. Basin 5 to SCM

Hydrograph



Summary for Subcatchment 22S: Post Dev. Bypass 5

Runoff = 1.13 cfs @ 12.10 hrs, Volume= 0.114 af, Depth= 0.36"
 Routed to Link 3L : POA 4

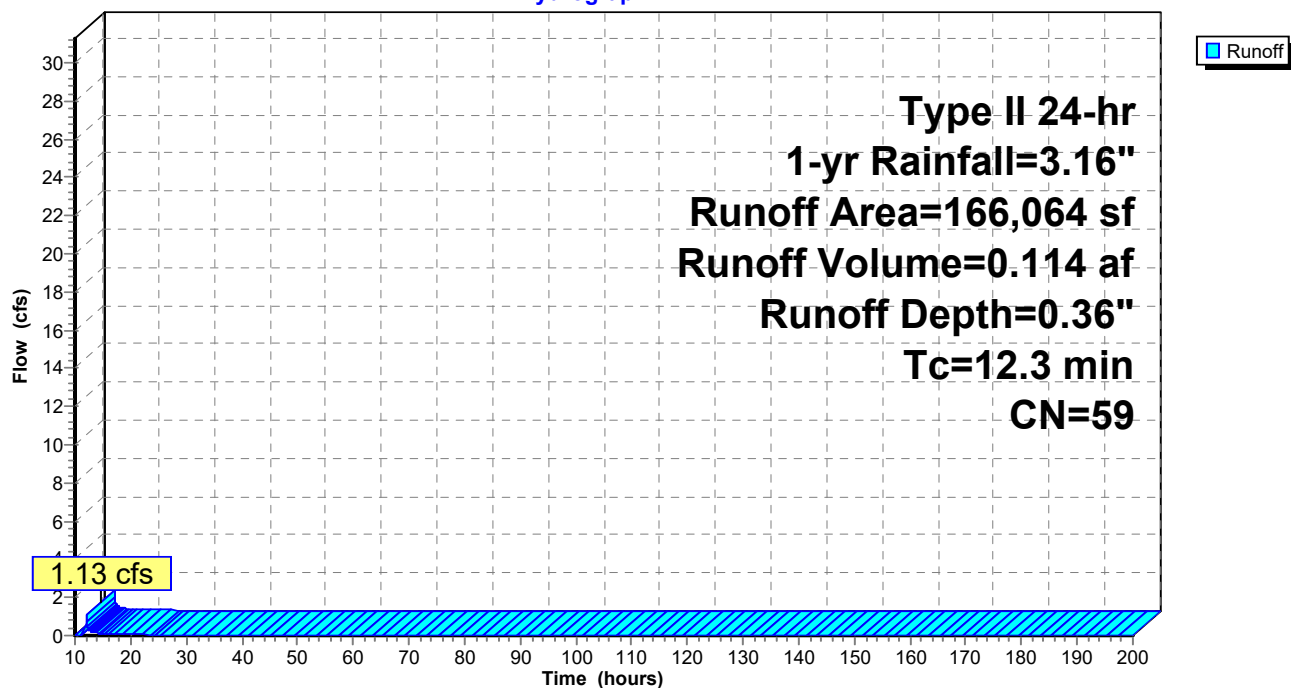
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-200.00 hrs, dt= 0.10 hrs
 Type II 24-hr 1-yr Rainfall=3.16"

Area (sf)	CN	Description
101,135	60	Woods, Fair, HSG B
52,516	48	Brush, Good, HSG B
12,413	98	Paved parking, HSG B
166,064	59	Weighted Average
153,651		92.53% Pervious Area
12,413		7.47% Impervious Area

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

Subcatchment 22S: Post Dev. Bypass 5

Hydrograph



Summary for Subcatchment 23S: Post Dev. Basin 6 to SCM

Runoff = 14.12 cfs @ 11.95 hrs, Volume= 0.736 af, Depth> 2.13"
 Routed to Pond 4P : Wet Pond SCM 4

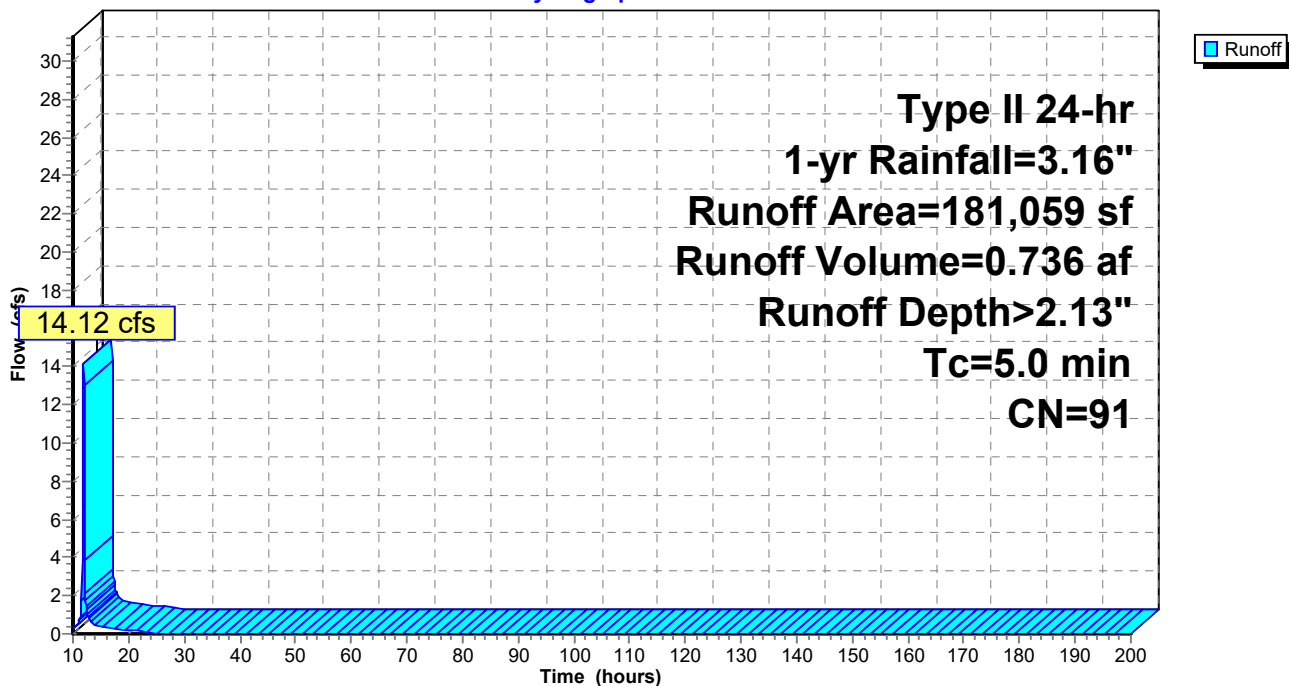
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-200.00 hrs, dt= 0.10 hrs
 Type II 24-hr 1-yr Rainfall=3.16"

Area (sf)	CN	Description
70,779	98	Paved parking, HSG B
32,683	61	>75% Grass cover, Good, HSG B
63,382	98	Roofs, HSG B
14,215	98	Water Surface, 0% imp, HSG B
181,059	91	Weighted Average
46,898		25.90% Pervious Area
134,161		74.10% Impervious Area

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

Subcatchment 23S: Post Dev. Basin 6 to SCM

Hydrograph



Summary for Subcatchment 24S: Post Dev. Bypass 6

Runoff = 2.93 cfs @ 12.00 hrs, Volume= 0.197 af, Depth= 0.39"
 Routed to Link 4L : POA 5

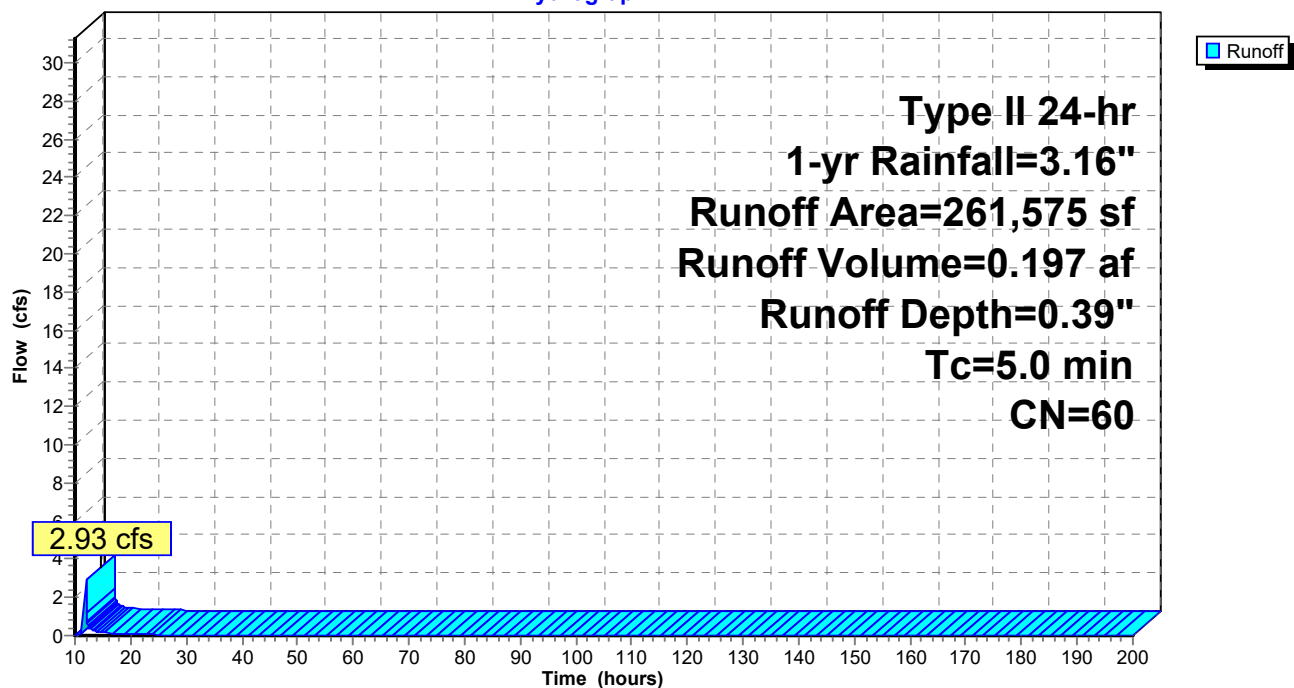
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-200.00 hrs, dt= 0.10 hrs
 Type II 24-hr 1-yr Rainfall=3.16"

Area (sf)	CN	Description
201,745	60	Woods, Fair, HSG B
55,562	56	Brush, Fair, HSG B
4,268	98	Paved parking, HSG B
261,575	60	Weighted Average
257,307		98.37% Pervious Area
4,268		1.63% Impervious Area

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

Subcatchment 24S: Post Dev. Bypass 6

Hydrograph



Summary for Subcatchment 25S: Post Dev. Basin 7 to SCM

Runoff = 7.56 cfs @ 11.96 hrs, Volume= 0.393 af, Depth> 1.91"
 Routed to Pond 5P : Wet Pond SCM 5

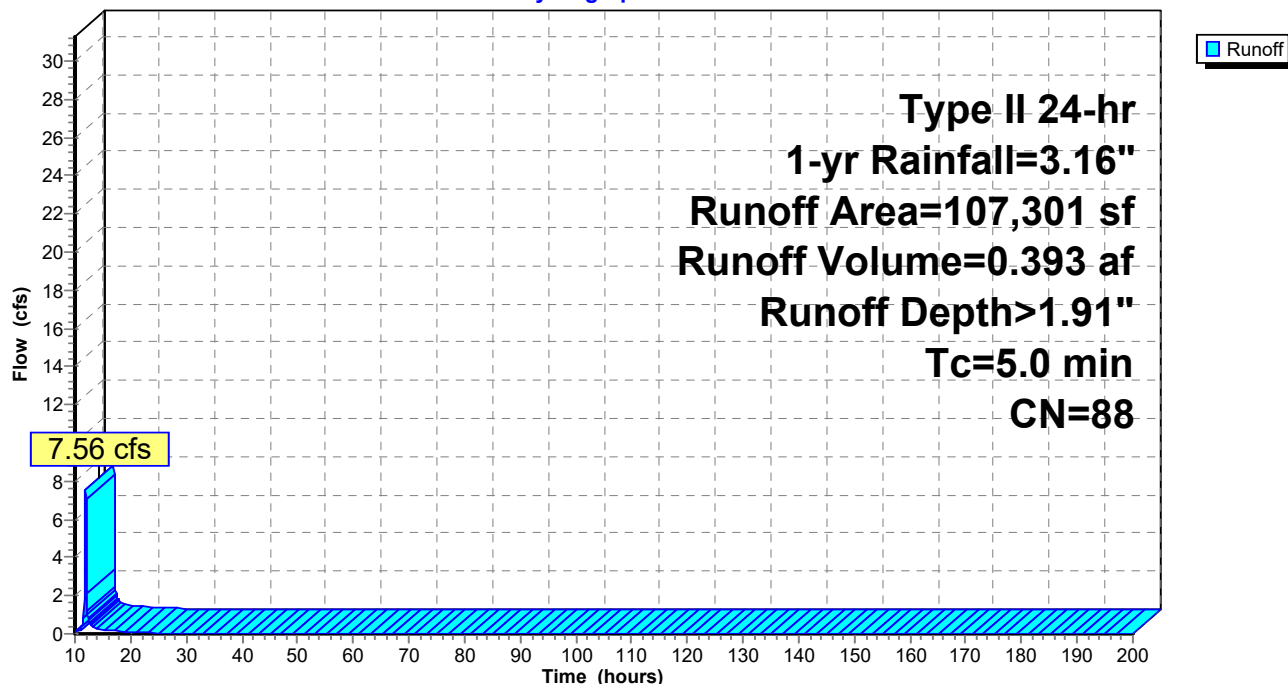
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-200.00 hrs, dt= 0.10 hrs
 Type II 24-hr 1-yr Rainfall=3.16"

Area (sf)	CN	Description
50,376	98	Paved parking, HSG B
21,628	48	Brush, Good, HSG B
28,800	98	Roofs, HSG B
6,497	98	Water Surface, 0% imp, HSG B
107,301	88	Weighted Average
28,125		26.21% Pervious Area
79,176		73.79% Impervious Area

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

Subcatchment 25S: Post Dev. Basin 7 to SCM

Hydrograph



Summary for Subcatchment 26S: Post Dev. Bypass 7

Runoff = 0.51 cfs @ 12.10 hrs, Volume= 0.066 af, Depth= 0.27"
 Routed to Link 5L : POA 6

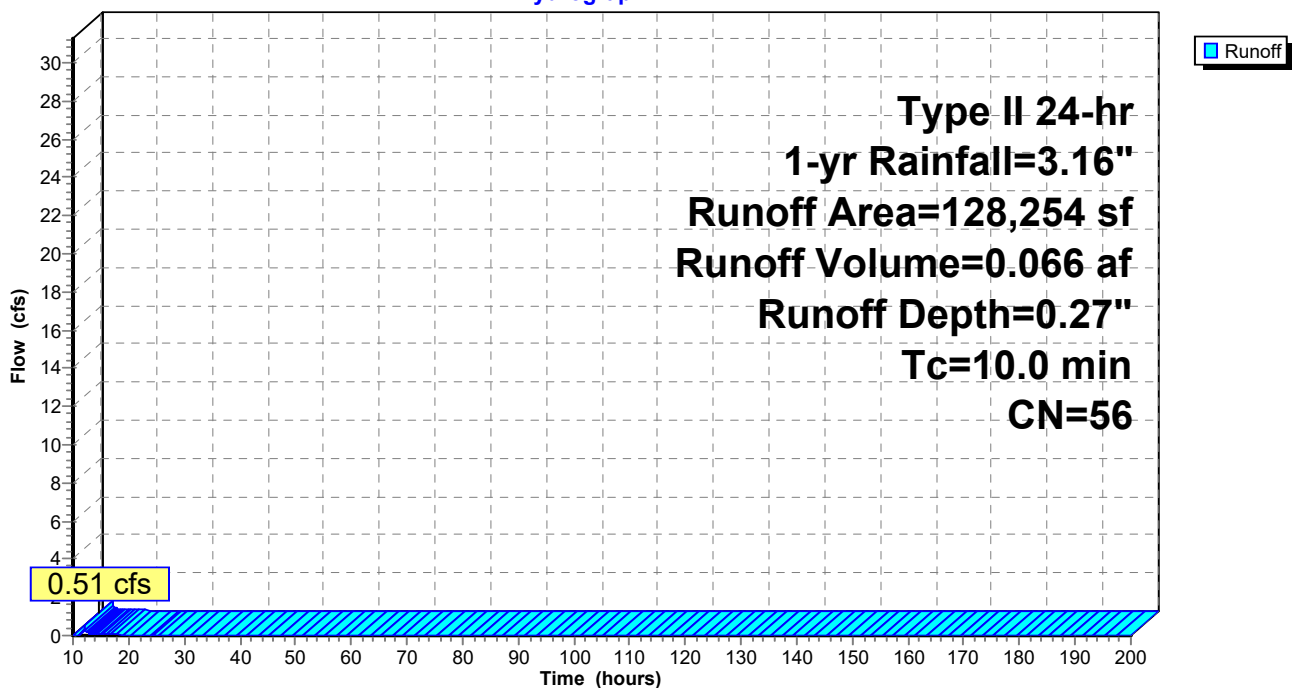
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-200.00 hrs, dt= 0.10 hrs
 Type II 24-hr 1-yr Rainfall=3.16"

Area (sf)	CN	Description
39,944	55	Woods, Good, HSG B
72,602	48	Brush, Good, HSG B
15,708	98	Paved parking, HSG B
128,254	56	Weighted Average
112,546		87.75% Pervious Area
15,708		12.25% Impervious Area

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

Subcatchment 26S: Post Dev. Bypass 7

Hydrograph



Summary for Subcatchment 27S: Post Dev. Bypass 8

Runoff = 3.40 cfs @ 12.03 hrs, Volume= 0.257 af, Depth= 0.46"

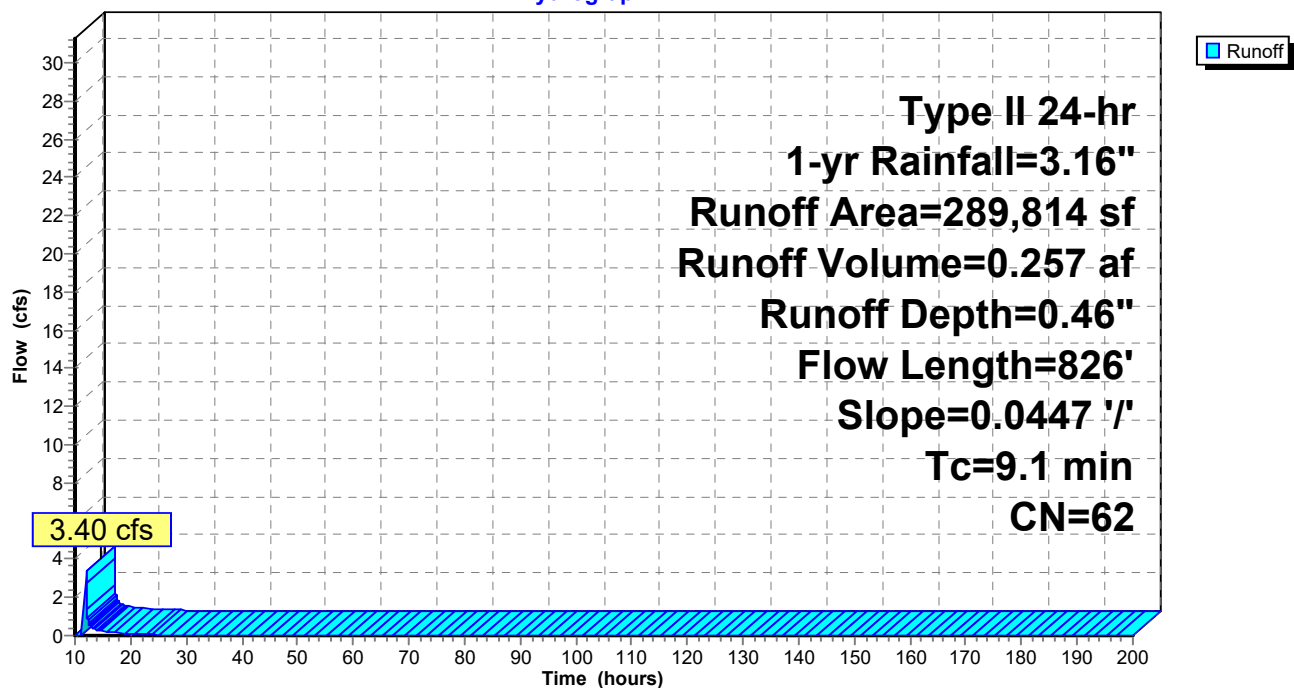
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-200.00 hrs, dt= 0.10 hrs
Type II 24-hr 1-yr Rainfall=3.16"

Area (sf)	CN	Description
230,959	60	Woods, Fair, HSG B
53,439	69	50-75% Grass cover, Fair, HSG B
5,416	98	Paved parking, HSG B
289,814	62	Weighted Average
284,398		98.13% Pervious Area
5,416		1.87% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.1	826	0.0447	1.51		Kirpich Method, General overland flow k= 2.00

Subcatchment 27S: Post Dev. Bypass 8

Hydrograph



Summary for Pond 1P: Sand Filter -SCM 1

Inflow Area = 7.632 ac, 78.15% Impervious, Inflow Depth > 1.98" for 1-yr event
 Inflow = 24.26 cfs @ 11.95 hrs, Volume= 1.261 af
 Outflow = 3.08 cfs @ 12.31 hrs, Volume= 1.261 af, Atten= 87%, Lag= 21.5 min
 Primary = 3.08 cfs @ 12.31 hrs, Volume= 1.261 af
 Routed to Link 1L : POA 1

Routing by Stor-Ind method, Time Span= 10.00-200.00 hrs, dt= 0.10 hrs
 Peak Elev= 527.68' @ 12.31 hrs Surf.Area= 6,825 sf Storage= 25,147 cf

Plug-Flow detention time= 117.0 min calculated for 1.260 af (100% of inflow)
 Center-of-Mass det. time= 113.9 min (930.2 - 816.3)

Volume	Invert	Avail.Storage	Storage Description
#1	524.00'	68,250 cf	Custom Stage Data (Prismatic) Listed below (Recalc) x 65

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
524.00	105	0	0
534.00	105	1,050	1,050

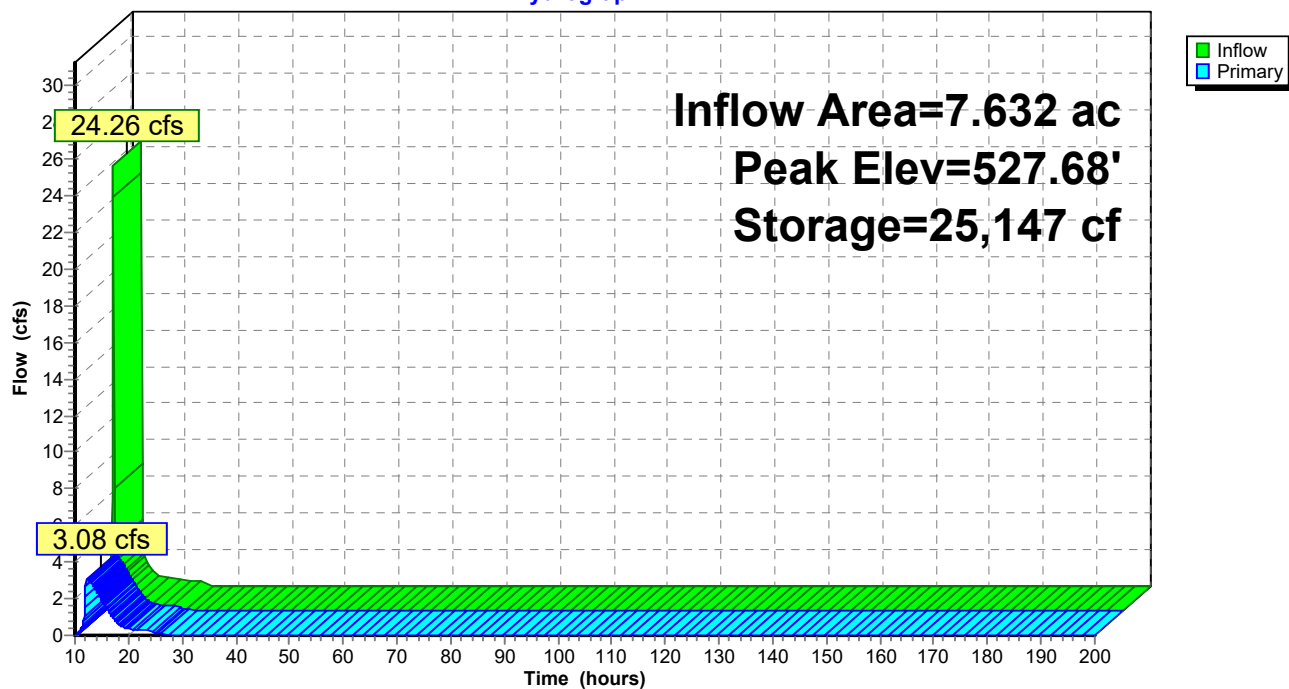
Device	Routing	Invert	Outlet Devices
#1	Primary	524.00'	36.0" Round Culvert L= 85.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 524.00' / 523.00' S= 0.0118 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 7.07 sf
#2	Device 1	524.00'	8.0" Vert. Drawdown C= 0.600 Limited to weir flow at low heads
#3	Device 1	528.90'	60.0" W x 8.0" H Vert. Main Orifice C= 0.600 Limited to weir flow at low heads
#4	Device 1	533.00'	25.0' long Overflow 2 End Contraction(s)

Primary OutFlow Max=3.08 cfs @ 12.31 hrs HW=527.68' (Free Discharge)

1=Culvert (Passes 3.08 cfs of 50.29 cfs potential flow)
 2=Drawdown (Orifice Controls 3.08 cfs @ 8.81 fps)
 3=Main Orifice (Controls 0.00 cfs)
 4=Overflow (Controls 0.00 cfs)

Pond 1P: Sand Filter -SCM 1

Hydrograph



Summary for Pond 2P: Wet Pond SCM 2

Inflow Area = 4.185 ac, 72.71% Impervious, Inflow Depth > 1.63" for 1-yr event
 Inflow = 11.00 cfs @ 11.96 hrs, Volume= 0.570 af
 Outflow = 0.81 cfs @ 12.71 hrs, Volume= 0.570 af, Atten= 93%, Lag= 45.0 min
 Primary = 0.81 cfs @ 12.71 hrs, Volume= 0.570 af
 Routed to Link 2L : POA 2

Routing by Stor-Ind method, Time Span= 10.00-200.00 hrs, dt= 0.10 hrs

Starting Elev= 526.00' Surf.Area= 9,300 sf Storage= 39,787 cf

Peak Elev= 527.28' @ 12.71 hrs Surf.Area= 10,253 sf Storage= 52,298 cf (12,511 cf above start)

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)

Center-of-Mass det. time= 257.5 min (1,086.0 - 828.4)

Volume	Invert	Avail.Storage	Storage Description
#1	521.00'	83,553 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
521.00	6,868	0	0
522.00	7,244	7,056	7,056
523.00	7,656	7,450	14,506
524.00	8,129	7,893	22,399
525.00	8,674	8,402	30,800
526.00	9,300	8,987	39,787
527.00	10,020	9,660	49,447
528.00	10,848	10,434	59,881
529.00	11,800	11,324	71,205
530.00	12,895	12,348	83,553

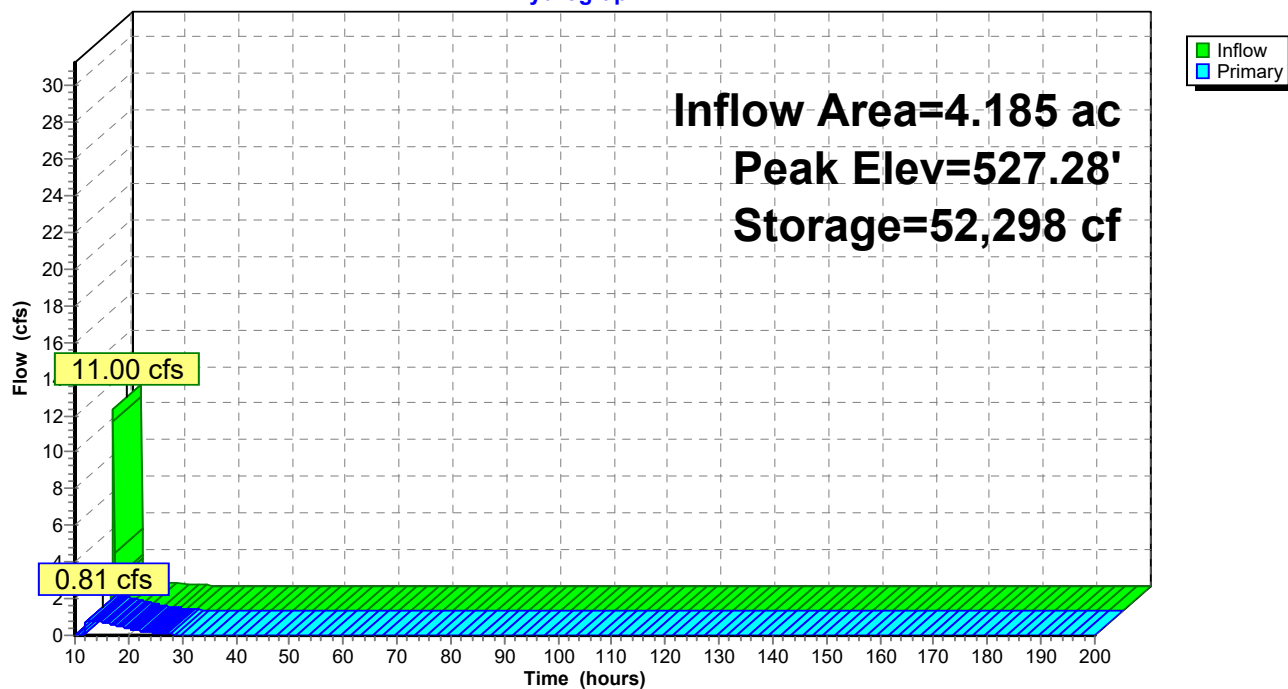
Device	Routing	Invert	Outlet Devices
#1	Primary	526.00'	36.0" Round Culvert L= 45.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 526.00' / 525.55' S= 0.0100 ' S= 0.0100 ' Cc= 0.900 n= 0.010 Concrete pipe, straight & clean, Flow Area= 7.07 sf
#2	Device 1	526.00'	5.5" Vert. Drawdown C= 0.600 Limited to weir flow at low heads
#3	Device 1	527.30'	24.0" W x 3.0" H Vert. Peakflow X 2.00 C= 0.600 Limited to weir flow at low heads
#4	Device 1	529.40'	48.0" x 48.0" Horiz. Overflow C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.81 cfs @ 12.71 hrs HW=527.28' (Free Discharge)

1=Culvert (Passes 0.81 cfs of 10.25 cfs potential flow)
 2=Drawdown (Orifice Controls 0.81 cfs @ 4.94 fps)
 3=Peakflow (Controls 0.00 cfs)
 4=Overflow (Controls 0.00 cfs)

Pond 2P: Wet Pond SCM 2

Hydrograph



Summary for Pond 4P: Wet Pond SCM 4

Inflow Area = 4.157 ac, 74.10% Impervious, Inflow Depth > 2.13" for 1-yr event
 Inflow = 14.12 cfs @ 11.95 hrs, Volume= 0.736 af
 Outflow = 0.71 cfs @ 13.16 hrs, Volume= 0.736 af, Atten= 95%, Lag= 72.3 min
 Primary = 0.71 cfs @ 13.16 hrs, Volume= 0.736 af
 Routed to Link 4L : POA 5

Routing by Stor-Ind method, Time Span= 10.00-200.00 hrs, dt= 0.10 hrs
 Starting Elev= 522.00' Surf.Area= 5,116 sf Storage= 11,656 cf
 Peak Elev= 525.00' @ 13.16 hrs Surf.Area= 7,863 sf Storage= 31,060 cf (19,405 cf above start)

Plug-Flow detention time= 974.4 min calculated for 0.467 af (63% of inflow)
 Center-of-Mass det. time= 582.9 min (1,394.7 - 811.7)

Volume	Invert	Avail.Storage	Storage Description
#1	519.00'	59,179 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
519.00	2,769	0	0
520.00	3,460	3,115	3,115
521.00	4,253	3,857	6,971
522.00	5,116	4,685	11,656
523.00	5,998	5,557	17,213
524.00	6,912	6,455	23,668
525.00	7,862	7,387	31,055
526.00	8,852	8,357	39,412
527.00	9,875	9,364	48,775
528.00	10,932	10,404	59,179

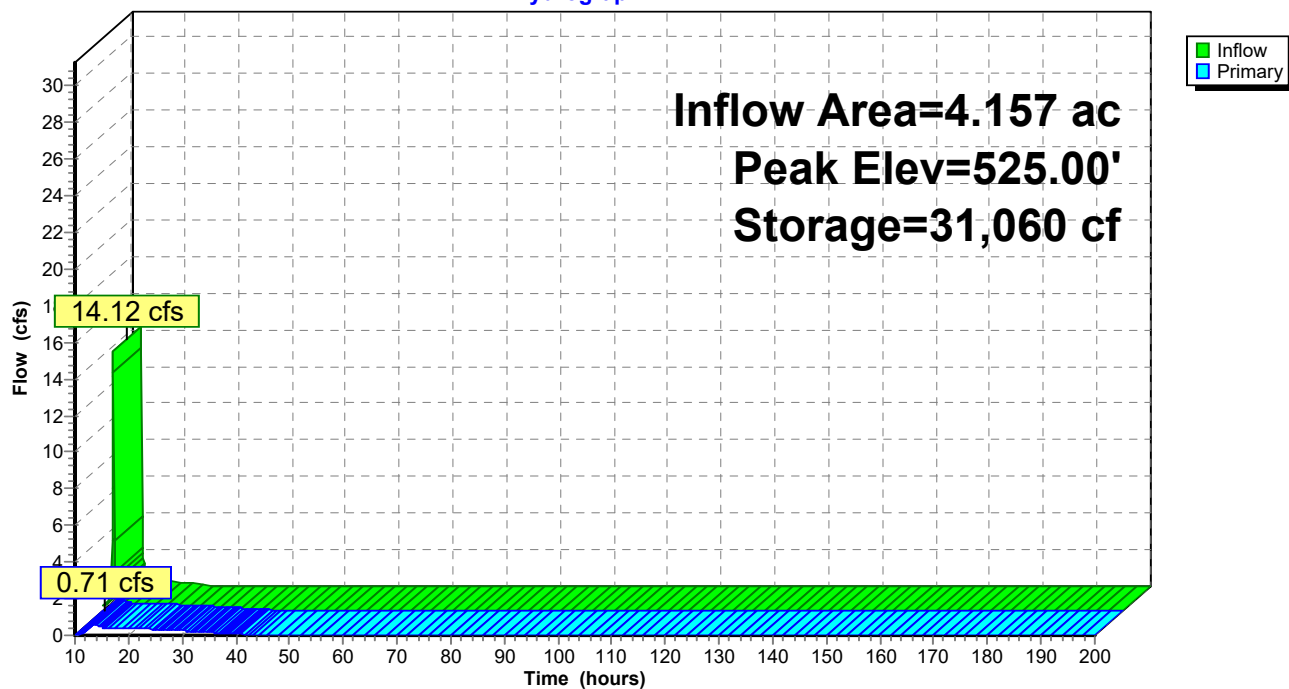
Device	Routing	Invert	Outlet Devices
#1	Primary	522.00'	36.0" Round Culvert L= 45.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 522.00' / 521.50' S= 0.0111 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 7.07 sf
#2	Device 1	522.00'	3.0" Vert. Drawdown C= 0.600 Limited to weir flow at low heads
#3	Device 1	524.90'	36.0" W x 4.0" H Vert. Peakflow C= 0.600 Limited to weir flow at low heads
#4	Device 1	527.10'	48.0" x 48.0" Horiz. Overflow C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.71 cfs @ 13.16 hrs HW=525.00' (Free Discharge)

- 1=Culvert (Passes 0.71 cfs of 39.35 cfs potential flow)
- 2=Drawdown (Orifice Controls 0.40 cfs @ 8.16 fps)
- 3=Peakflow (Orifice Controls 0.31 cfs @ 1.02 fps)
- 4=Overflow (Controls 0.00 cfs)

Pond 4P: Wet Pond SCM 4

Hydrograph



Summary for Pond 5P: Wet Pond SCM 5

Inflow Area = 2.463 ac, 73.79% Impervious, Inflow Depth > 1.91" for 1-yr event
 Inflow = 7.56 cfs @ 11.96 hrs, Volume= 0.393 af
 Outflow = 0.59 cfs @ 12.61 hrs, Volume= 0.393 af, Atten= 92%, Lag= 39.2 min
 Primary = 0.59 cfs @ 12.61 hrs, Volume= 0.393 af
 Routed to Link 5L : POA 6

Routing by Stor-Ind method, Time Span= 10.00-200.00 hrs, dt= 0.10 hrs
 Starting Elev= 513.00' Surf.Area= 3,681 sf Storage= 11,032 cf
 Peak Elev= 515.12' @ 12.61 hrs Surf.Area= 4,513 sf Storage= 19,712 cf (8,680 cf above start)

Plug-Flow detention time= 580.0 min calculated for 0.139 af (35% of inflow)
 Center-of-Mass det. time= 194.3 min (1,012.9 - 818.6)

Volume	Invert	Avail.Storage	Storage Description
#1	509.00'	34,456 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
509.00	1,925	0	0
510.00	2,310	2,118	2,118
511.00	2,731	2,521	4,638
512.00	3,188	2,960	7,598
513.00	3,681	3,435	11,032
514.00	4,062	3,872	14,904
515.00	4,462	4,262	19,166
516.00	4,879	4,671	23,836
517.00	5,315	5,097	28,933
518.00	5,731	5,523	34,456

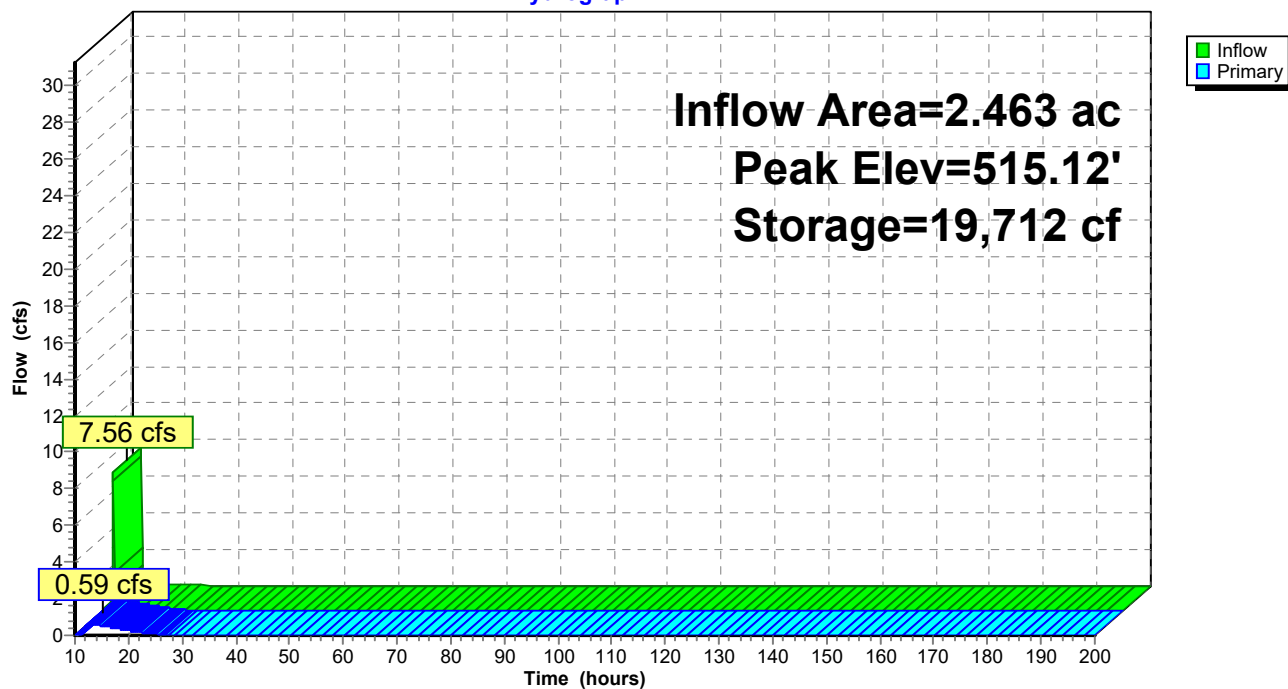
Device	Routing	Invert	Outlet Devices
#1	Primary	513.00'	36.0" Round Culvert L= 79.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 513.00' / 512.00' S= 0.0127 ' S= 0.0127 ' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 7.07 sf
#2	Device 1	513.00'	4.0" Vert. Drawdown C= 0.600 Limited to weir flow at low heads
#3	Device 1	515.40'	24.0" W x 3.5" H Vert. Peakflow Orifice X 2.00 C= 0.600 Limited to weir flow at low heads
#4	Device 1	517.50'	48.0" x 48.0" Horiz. Overflow C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.59 cfs @ 12.61 hrs HW=515.12' (Free Discharge)

1=Culvert (Passes 0.59 cfs of 26.42 cfs potential flow)
 2=Drawdown (Orifice Controls 0.59 cfs @ 6.73 fps)
 3=Peakflow Orifice (Controls 0.00 cfs)
 4=Overflow (Controls 0.00 cfs)

Pond 5P: Wet Pond SCM 5

Hydrograph



Summary for Pond 6P: Sand Filter -SCM 3

Inflow Area = 2.765 ac, 67.31% Impervious, Inflow Depth > 1.84" for 1-yr event
 Inflow = 8.18 cfs @ 11.96 hrs, Volume= 0.424 af
 Outflow = 0.13 cfs @ 18.36 hrs, Volume= 0.163 af, Atten= 98%, Lag= 384.5 min
 Primary = 0.13 cfs @ 18.36 hrs, Volume= 0.163 af
 Routed to Link 3L : POA 4

Routing by Stor-Ind method, Time Span= 10.00-200.00 hrs, dt= 0.10 hrs
 Peak Elev= 532.85' @ 18.36 hrs Surf.Area= 3,675 sf Storage= 14,163 cf

Plug-Flow detention time= 625.0 min calculated for 0.162 af (38% of inflow)
 Center-of-Mass det. time= 502.4 min (1,323.4 - 821.0)

Volume	Invert	Avail.Storage	Storage Description
#1	529.00'	33,075 cf	Sediment Chamber (Prismatic) Listed below x 35

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
529.00	105	0	0
538.00	105	945	945

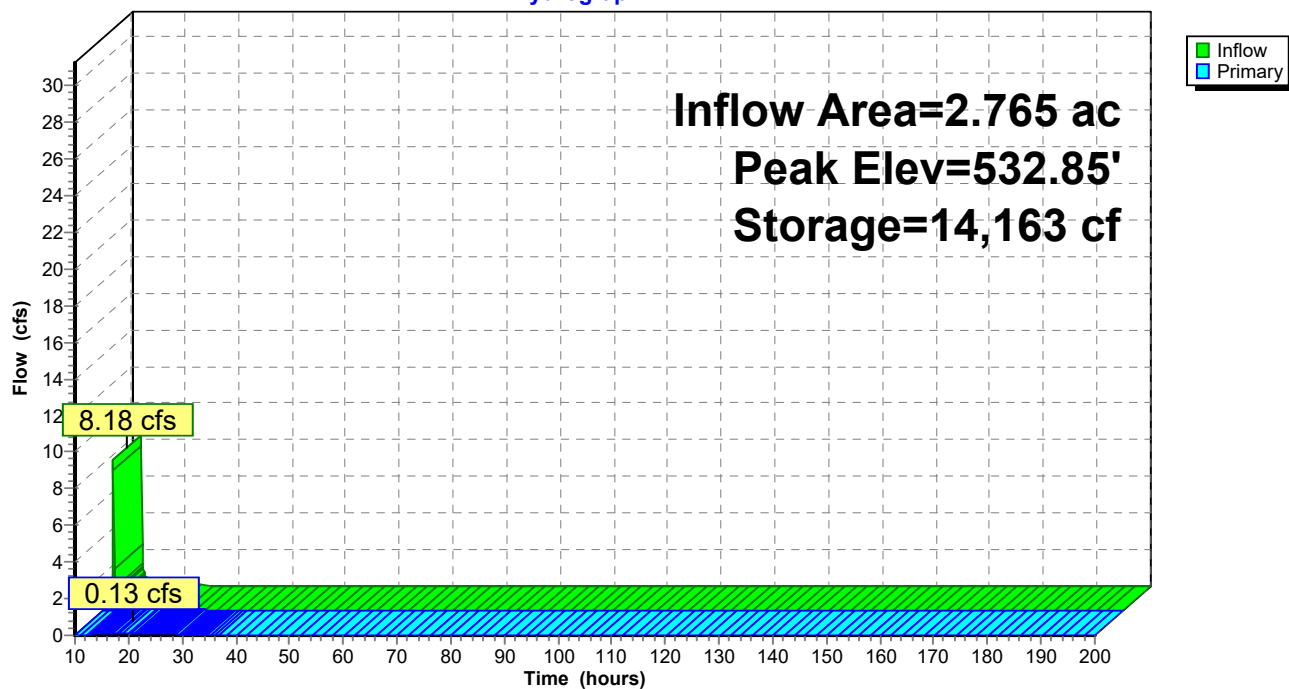
Device	Routing	Invert	Outlet Devices
#1	Primary	532.00'	36.0" Round Culvert L= 12.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 532.00' / 531.00' S= 0.0833 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 7.07 sf
#2	Device 1	532.10'	2.5" Vert. Drawdown C= 0.600 Limited to weir flow at low heads
#3	Device 1	533.60'	34.0" W x 5.0" H Vert. Main Orifice C= 0.600 Limited to weir flow at low heads
#4	Device 1	536.30'	25.0' long Overflow 2 End Contraction(s)

Primary OutFlow Max=0.13 cfs @ 18.36 hrs HW=532.85' (Free Discharge)

↑ **1=Culvert** (Passes 0.13 cfs of 5.21 cfs potential flow)
 ↑ **2=Drawdown** (Orifice Controls 0.13 cfs @ 3.88 fps)
 ↑ **3=Main Orifice** (Controls 0.00 cfs)
 ↑ **4=Overflow** (Controls 0.00 cfs)

Pond 6P: Sand Filter -SCM 3

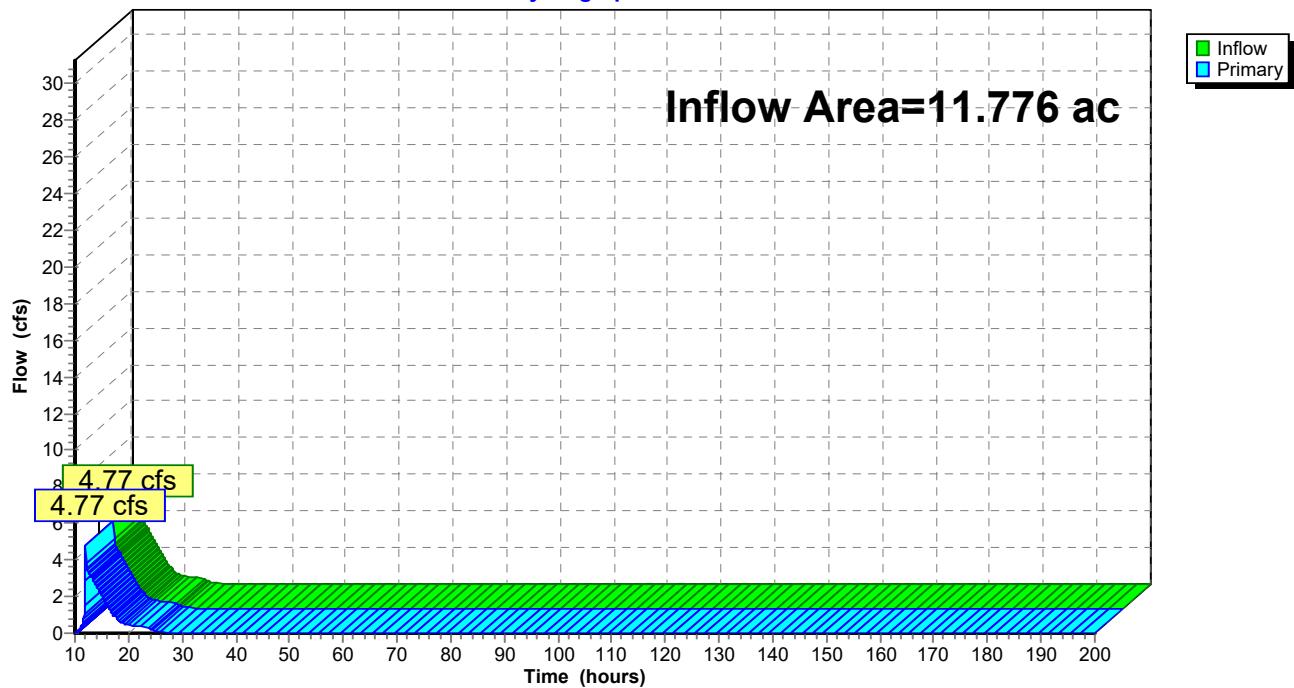
Hydrograph



Summary for Link 1L: POA 1

Inflow Area = 11.776 ac, 52.05% Impervious, Inflow Depth > 1.42" for 1-yr event
Inflow = 4.77 cfs @ 12.02 hrs, Volume= 1.397 af
Primary = 4.77 cfs @ 12.02 hrs, Volume= 1.397 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 10.00-200.00 hrs, dt= 0.10 hrs

Link 1L: POA 1**Hydrograph**

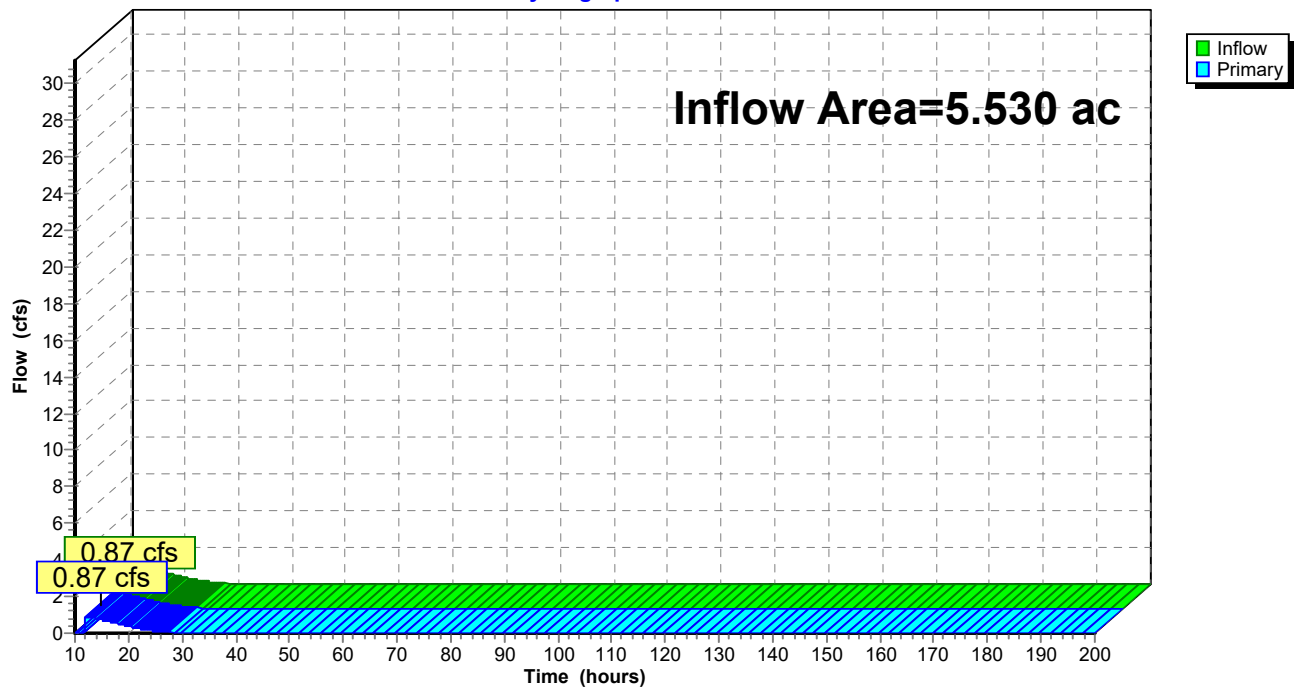
Summary for Link 2L: POA 2

Inflow Area = 5.530 ac, 55.03% Impervious, Inflow Depth > 1.29" for 1-yr event
Inflow = 0.87 cfs @ 12.38 hrs, Volume= 0.594 af
Primary = 0.87 cfs @ 12.38 hrs, Volume= 0.594 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 10.00-200.00 hrs, dt= 0.10 hrs

Link 2L: POA 2

Hydrograph



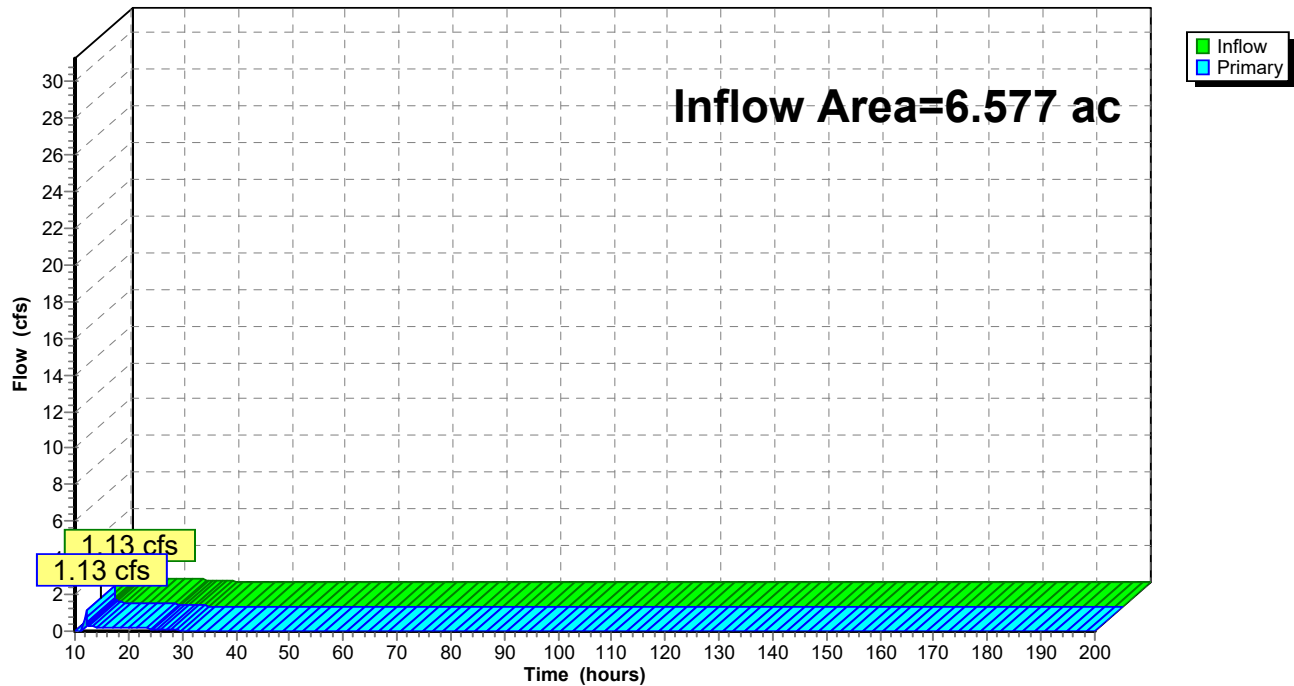
Summary for Link 3L: POA 4

Inflow Area = 6.577 ac, 32.63% Impervious, Inflow Depth = 0.51" for 1-yr event
Inflow = 1.13 cfs @ 12.10 hrs, Volume= 0.277 af
Primary = 1.13 cfs @ 12.10 hrs, Volume= 0.277 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 10.00-200.00 hrs, dt= 0.10 hrs

Link 3L: POA 4

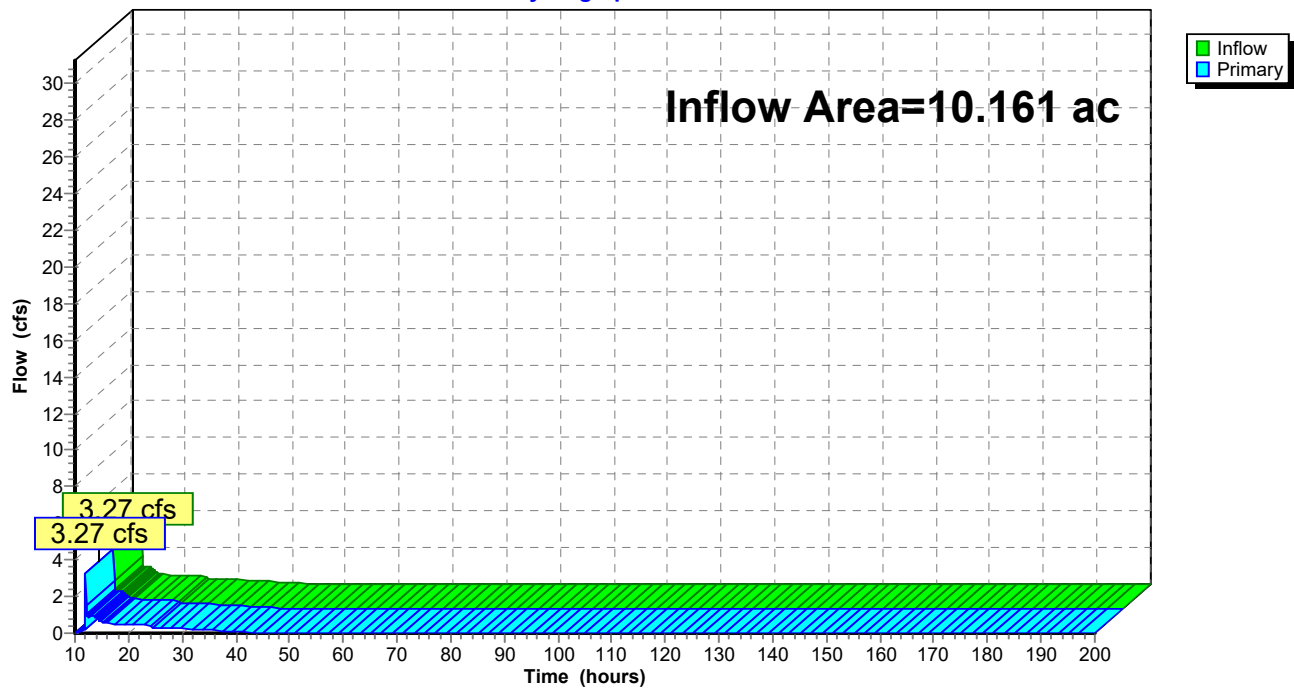
Hydrograph



Summary for Link 4L: POA 5

Inflow Area = 10.161 ac, 31.27% Impervious, Inflow Depth > 1.10" for 1-yr event
Inflow = 3.27 cfs @ 12.00 hrs, Volume= 0.933 af
Primary = 3.27 cfs @ 12.00 hrs, Volume= 0.933 af, Atten= 0%, Lag= 0.0 min

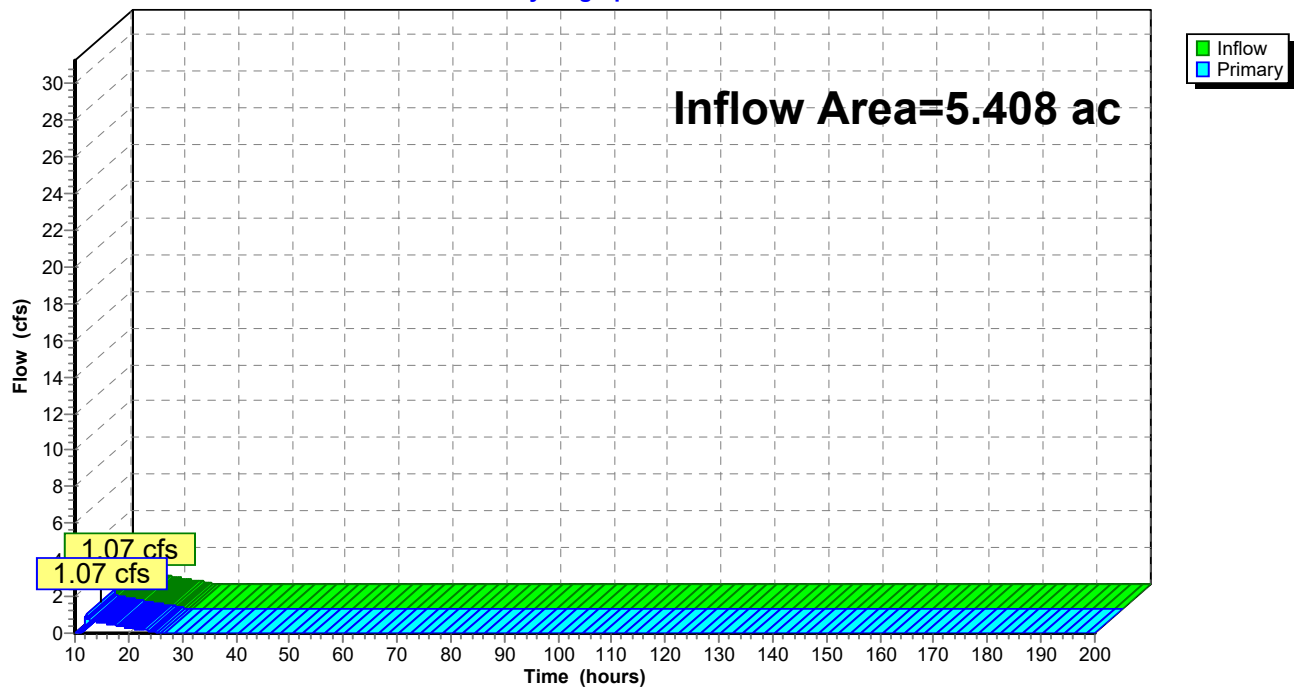
Primary outflow = Inflow, Time Span= 10.00-200.00 hrs, dt= 0.10 hrs

Link 4L: POA 5**Hydrograph**

Summary for Link 5L: POA 6

Inflow Area = 5.408 ac, 40.28% Impervious, Inflow Depth > 1.02" for 1-yr event
Inflow = 1.07 cfs @ 12.11 hrs, Volume= 0.458 af
Primary = 1.07 cfs @ 12.11 hrs, Volume= 0.458 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 10.00-200.00 hrs, dt= 0.10 hrs

Link 5L: POA 6**Hydrograph**

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Prepared by Thomas & Hutton

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Type II 24-hr 2-yr Rainfall=3.82"

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Time span=10.00-200.00 hrs, dt=0.10 hrs, 1901 points

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN

Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1S: Pre Dev. Basin 1	Runoff Area=366,801 sf 0.00% Impervious Runoff Depth>1.81"
Flow Length=560'	Slope=0.0630 '/' Tc=5.9 min CN=79 Runoff=24.78 cfs 1.271 af
Subcatchment2S: Pre Dev. Basin 2A	Runoff Area=250,337 sf 0.00% Impervious Runoff Depth>1.81"
Flow Length=803'	Slope=0.0650 '/' Tc=7.7 min CN=79 Runoff=16.53 cfs 0.868 af
Subcatchment3S: Pre Dev. Basin 2B	Runoff Area=132,113 sf 0.00% Impervious Runoff Depth=0.68"
Flow Length=577'	Slope=0.0451 '/' Tc=6.9 min CN=60 Runoff=2.85 cfs 0.171 af
Subcatchment4S: Pre Dev. Basin 2C	Runoff Area=467,737 sf 32.11% Impervious Runoff Depth>2.18"
Flow Length=753'	Slope=0.0633 '/' Tc=7.4 min CN=84 Runoff=37.49 cfs 1.947 af
Subcatchment6S: Pre Dev. Basin 3	Runoff Area=52,001 sf 0.00% Impervious Runoff Depth=1.27"
Flow Length=243'	Slope=0.0170 '/' Tc=5.1 min CN=71 Runoff=2.43 cfs 0.127 af
Subcatchment7S: Pre Dev. Basin 4	Runoff Area=130,388 sf 0.00% Impervious Runoff Depth=0.63"
Flow Length=561'	Slope=0.0221 '/' Tc=8.9 min CN=59 Runoff=2.26 cfs 0.157 af
Subcatchment8S: Pre Dev. Basin 5	Runoff Area=305,128 sf 0.00% Impervious Runoff Depth=0.63"
Flow Length=998'	Slope=0.0301 '/' Tc=12.3 min CN=59 Runoff=4.56 cfs 0.368 af
Subcatchment9S: Pre Dev. Basin 6	Runoff Area=441,055 sf 0.00% Impervious Runoff Depth=0.68"
Flow Length=1,222'	Slope=0.0441 '/' Tc=12.4 min CN=60 Runoff=7.29 cfs 0.570 af
Subcatchment10S: Pre Dev. Basin 7	Runoff Area=238,293 sf 0.00% Impervious Runoff Depth=0.54"
Flow Length=977'	Slope=0.0468 '/' Tc=10.2 min CN=57 Runoff=2.89 cfs 0.247 af
Subcatchment11S: Pre Dev. Basin 8	Runoff Area=289,814 sf 0.00% Impervious Runoff Depth=0.77"
Flow Length=826'	Slope=0.0447 '/' Tc=9.1 min CN=62 Runoff=6.67 cfs 0.428 af
Subcatchment12S: Post Basin 1 to SCM	Runoff Area=332,471 sf 78.15% Impervious Runoff Depth>2.55"
	Tc=5.0 min CN=89 Runoff=31.06 cfs 1.619 af
Subcatchment13S: Post Dev Bypass 1	Runoff Area=180,474 sf 3.97% Impervious Runoff Depth=0.68"
	Tc=5.0 min CN=60 Runoff=4.04 cfs 0.233 af
Subcatchment14S: Post Dev. Bypass 2A	Runoff Area=120,581 sf 0.00% Impervious Runoff Depth>1.81"
Flow Length=421'	Slope=0.0411 '/' Tc=5.6 min CN=79 Runoff=8.13 cfs 0.418 af
Subcatchment15S: Post Dev. Basin 2B	Runoff Area=182,292 sf 72.71% Impervious Runoff Depth>2.17"
	Tc=5.0 min CN=84 Runoff=14.62 cfs 0.758 af
Subcatchment16S: Post Dev. Bypass 2C	Runoff Area=414,715 sf 36.24% Impervious Runoff Depth>2.25"
Flow Length=760'	Slope=0.0633 '/' Tc=7.5 min CN=85 Runoff=34.31 cfs 1.785 af
Subcatchment18S: Post Dev Bypass 2B	Runoff Area=58,575 sf 0.00% Impervious Runoff Depth=0.42"
	Tc=5.0 min CN=54 Runoff=0.65 cfs 0.047 af

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Type II 24-hr 2-yr Rainfall=3.82"

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Subcatchment19S: Post Dev. Basin 3	Runoff Area=48,549 sf 0.00% Impervious Runoff Depth=1.21" Tc=5.0 min CN=70 Runoff=2.15 cfs 0.112 af
Subcatchment20S: Post Dev. Basin 4	Runoff Area=29,236 sf 11.81% Impervious Runoff Depth=0.77" Tc=5.0 min CN=62 Runoff=0.77 cfs 0.043 af
Subcatchment21S: Post Dev. Basin 5 to	Runoff Area=120,435 sf 67.31% Impervious Runoff Depth>2.40" Tc=5.0 min CN=87 Runoff=10.62 cfs 0.552 af
Subcatchment22S: Post Dev. Bypass 5	Runoff Area=166,064 sf 7.47% Impervious Runoff Depth=0.63" Tc=12.3 min CN=59 Runoff=2.48 cfs 0.200 af
Subcatchment23S: Post Dev. Basin 6 to	Runoff Area=181,059 sf 74.10% Impervious Runoff Depth>2.69" Tc=5.0 min CN=91 Runoff=17.82 cfs 0.932 af
Subcatchment24S: Post Dev. Bypass 6	Runoff Area=261,575 sf 1.63% Impervious Runoff Depth=0.68" Tc=5.0 min CN=60 Runoff=5.85 cfs 0.338 af
Subcatchment25S: Post Dev. Basin 7 to	Runoff Area=107,301 sf 73.79% Impervious Runoff Depth>2.47" Tc=5.0 min CN=88 Runoff=9.75 cfs 0.507 af
Subcatchment26S: Post Dev. Bypass 7	Runoff Area=128,254 sf 12.25% Impervious Runoff Depth=0.50" Tc=10.0 min CN=56 Runoff=1.37 cfs 0.123 af
Subcatchment27S: Post Dev. Bypass 8	Runoff Area=289,814 sf 1.87% Impervious Runoff Depth=0.77" Flow Length=826' Slope=0.0447 '/' Tc=9.1 min CN=62 Runoff=6.67 cfs 0.428 af
Pond 1P: Sand Filter -SCM 1	Peak Elev=528.87' Storage=33,270 cf Inflow=31.06 cfs 1.619 af Outflow=3.58 cfs 1.619 af
Pond 2P: Wet Pond SCM 2	Peak Elev=527.56' Storage=55,230 cf Inflow=14.62 cfs 0.758 af Outflow=2.63 cfs 0.758 af
Pond 4P: Wet Pond SCM 4	Peak Elev=525.27' Storage=33,175 cf Inflow=17.82 cfs 0.932 af Outflow=2.51 cfs 0.932 af
Pond 5P: Wet Pond SCM 5	Peak Elev=515.57' Storage=21,771 cf Inflow=9.75 cfs 0.507 af Outflow=1.54 cfs 0.507 af
Pond 6P: Sand Filter -SCM 3	Peak Elev=533.63' Storage=17,021 cf Inflow=10.62 cfs 0.552 af Outflow=0.28 cfs 0.291 af
Link 1L: POA 1	Inflow=7.16 cfs 1.852 af Primary=7.16 cfs 1.852 af
Link 2L: POA 2	Inflow=2.80 cfs 0.806 af Primary=2.80 cfs 0.806 af
Link 3L: POA 4	Inflow=2.55 cfs 0.491 af Primary=2.55 cfs 0.491 af

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Prepared by Thomas & Hutton

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Type II 24-hr 2-yr Rainfall=3.82"

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Link 4L: POA 5

Inflow=6.19 cfs 1.270 af

Primary=6.19 cfs 1.270 af

Link 5L: POA 6

Inflow=2.44 cfs 0.630 af

Primary=2.44 cfs 0.630 af

Total Runoff Area = 121.558 ac Runoff Volume = 14.250 af Average Runoff Depth = 1.41"
80.44% Pervious = 97.782 ac 19.56% Impervious = 23.776 ac

Summary for Subcatchment 1S: Pre Dev. Basin 1

Runoff = 24.78 cfs @ 11.97 hrs, Volume= 1.271 af, Depth> 1.81"

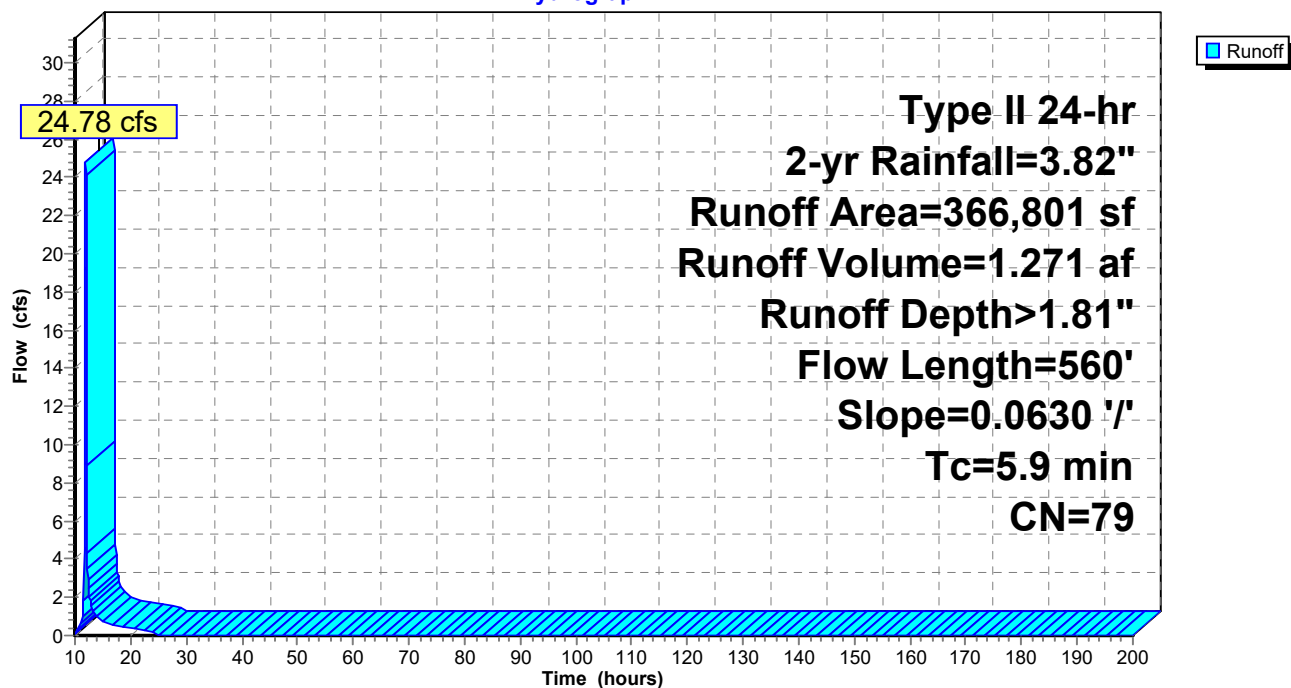
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-200.00 hrs, dt= 0.10 hrs
Type II 24-hr 2-yr Rainfall=3.82"

Area (sf)	CN	Description
342,042	79	Woods, Fair, HSG D
24,759	73	Brush, Good, HSG D
366,801	79	Weighted Average
366,801		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.9	560	0.0630	1.58		Kirpich Method, Estimated Tc General overland flow k= 2.00

Subcatchment 1S: Pre Dev. Basin 1

Hydrograph



Summary for Subcatchment 2S: Pre Dev. Basin 2A

Runoff = 16.53 cfs @ 11.99 hrs, Volume= 0.868 af, Depth> 1.81"

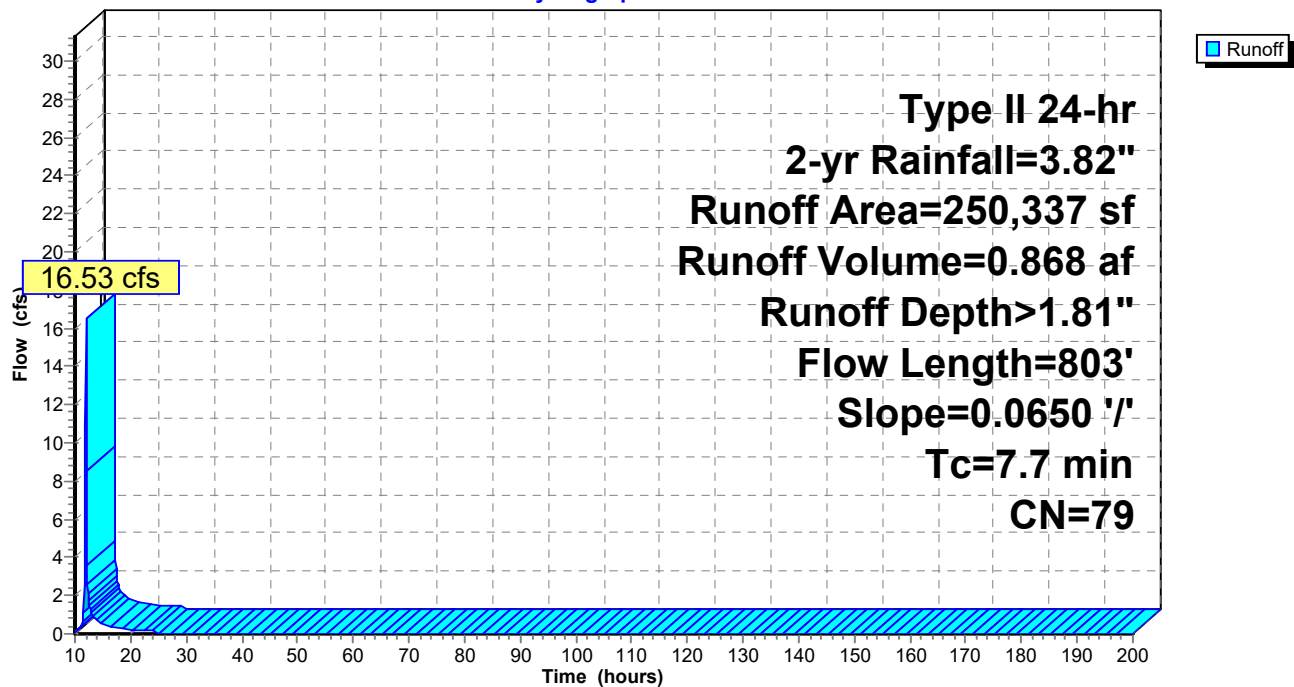
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-200.00 hrs, dt= 0.10 hrs
Type II 24-hr 2-yr Rainfall=3.82"

Area (sf)	CN	Description
250,337	79	Woods, Fair, HSG D
250,337		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.7	803	0.0650	1.74		Kirpich Method, Estimated Tc General overland flow k= 2.00

Subcatchment 2S: Pre Dev. Basin 2A

Hydrograph



Summary for Subcatchment 3S: Pre Dev. Basin 2B

Runoff = 2.85 cfs @ 12.00 hrs, Volume= 0.171 af, Depth= 0.68"

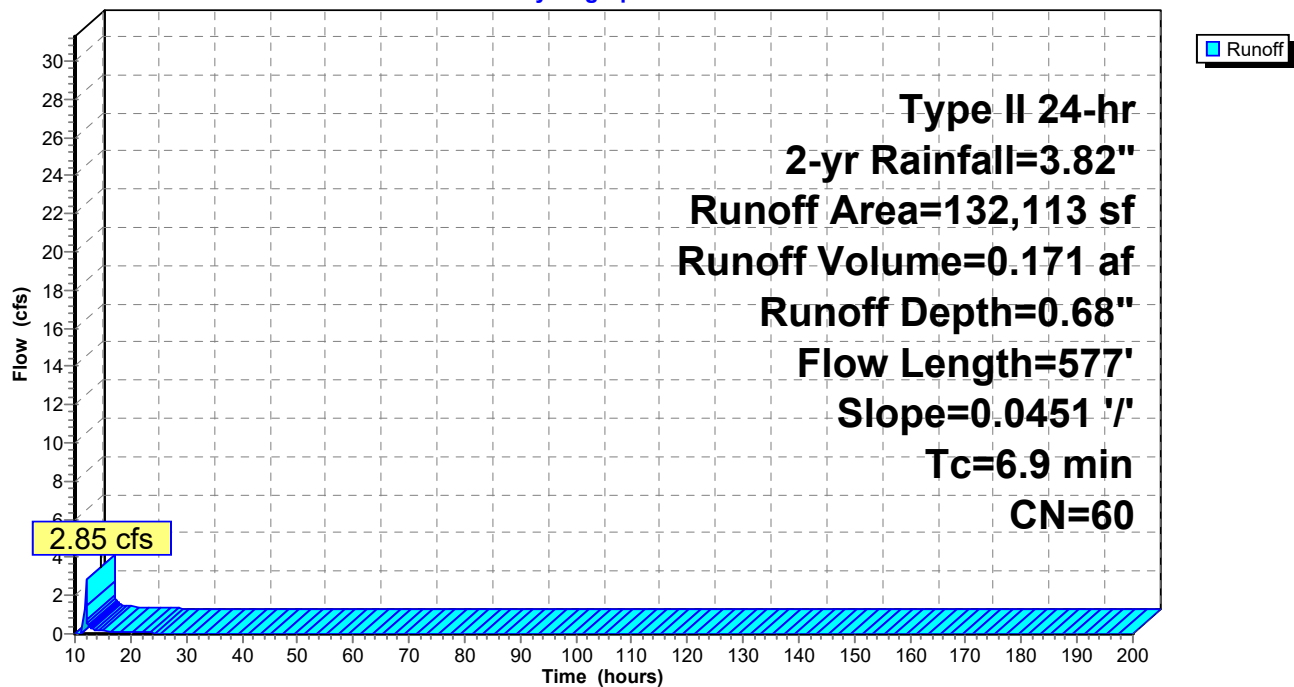
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-200.00 hrs, dt= 0.10 hrs
Type II 24-hr 2-yr Rainfall=3.82"

Area (sf)	CN	Description
132,113	60	Woods, Fair, HSG B
132,113		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.9	577	0.0451	1.40		Kirpich Method, Estimated Tc General overland flow k= 2.00

Subcatchment 3S: Pre Dev. Basin 2B

Hydrograph



Summary for Subcatchment 4S: Pre Dev. Basin 2C

Runoff = 37.49 cfs @ 11.99 hrs, Volume= 1.947 af, Depth> 2.18"

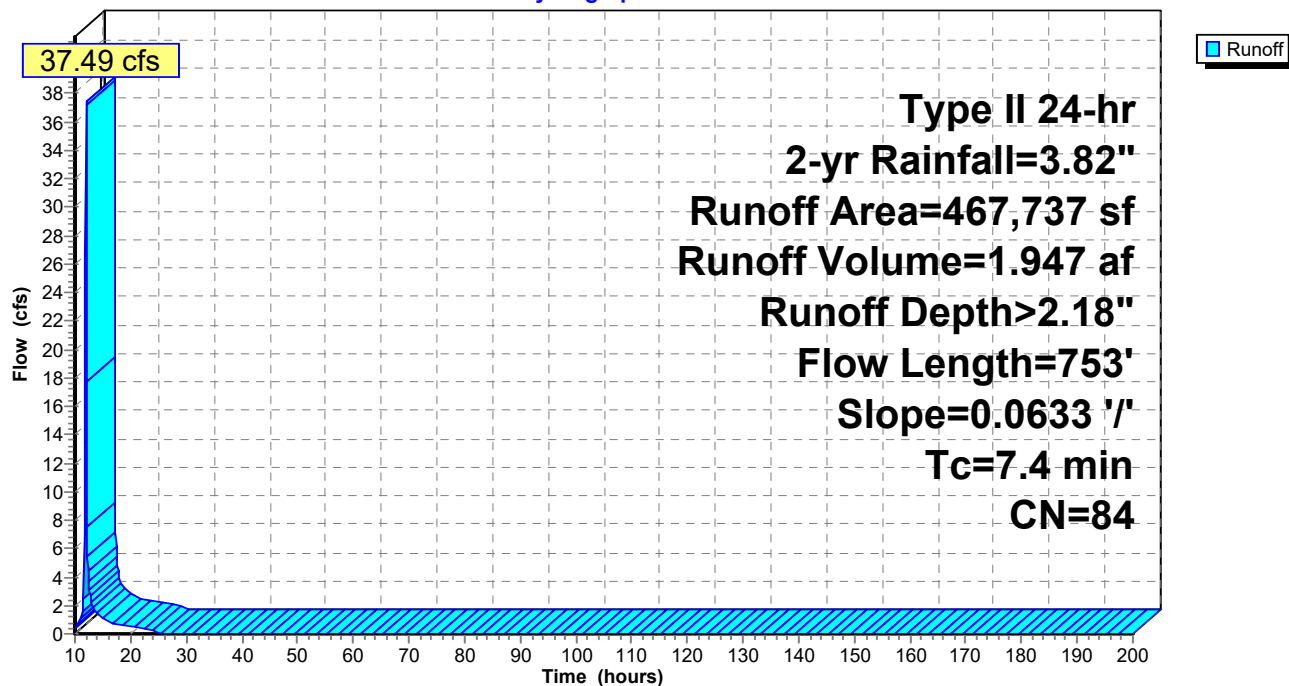
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-200.00 hrs, dt= 0.10 hrs
Type II 24-hr 2-yr Rainfall=3.82"

Area (sf)	CN	Description
173,689	79	Woods, Fair, HSG D
143,869	77	Brush, Fair, HSG D
90,721	98	Paved parking, HSG D
59,458	98	Roofs, HSG D
467,737	84	Weighted Average
317,558		67.89% Pervious Area
150,179		32.11% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.4	753	0.0633	1.69		Kirpich Method, Estimated Tc General overland flow k= 2.00

Subcatchment 4S: Pre Dev. Basin 2C

Hydrograph



Summary for Subcatchment 6S: Pre Dev. Basin 3

Runoff = 2.43 cfs @ 11.97 hrs, Volume= 0.127 af, Depth= 1.27"

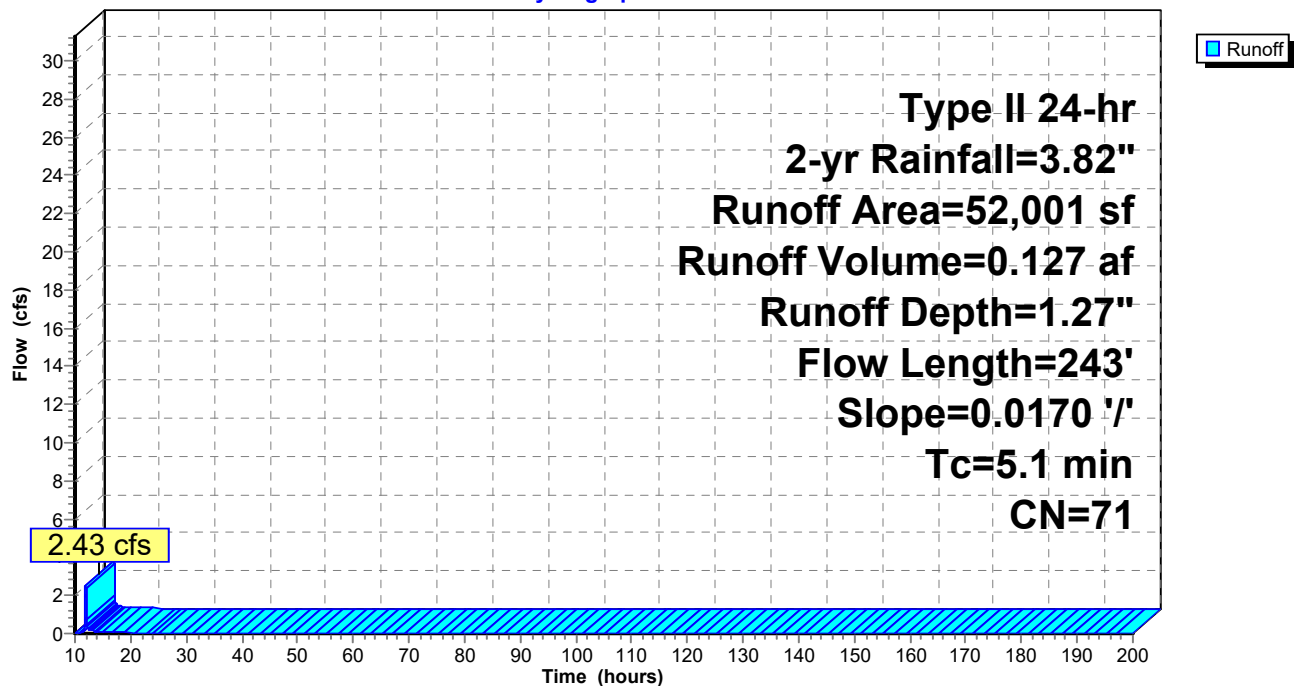
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-200.00 hrs, dt= 0.10 hrs
Type II 24-hr 2-yr Rainfall=3.82"

Area (sf)	CN	Description
9,925	73	Woods, Fair, HSG C
42,076	70	Brush, Fair, HSG C
52,001	71	Weighted Average
52,001		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.1	243	0.0170	0.79		Kirpich Method, Estimated Tc General overland flow k= 2.00

Subcatchment 6S: Pre Dev. Basin 3

Hydrograph



Summary for Subcatchment 7S: Pre Dev. Basin 4

Runoff = 2.26 cfs @ 12.03 hrs, Volume= 0.157 af, Depth= 0.63"

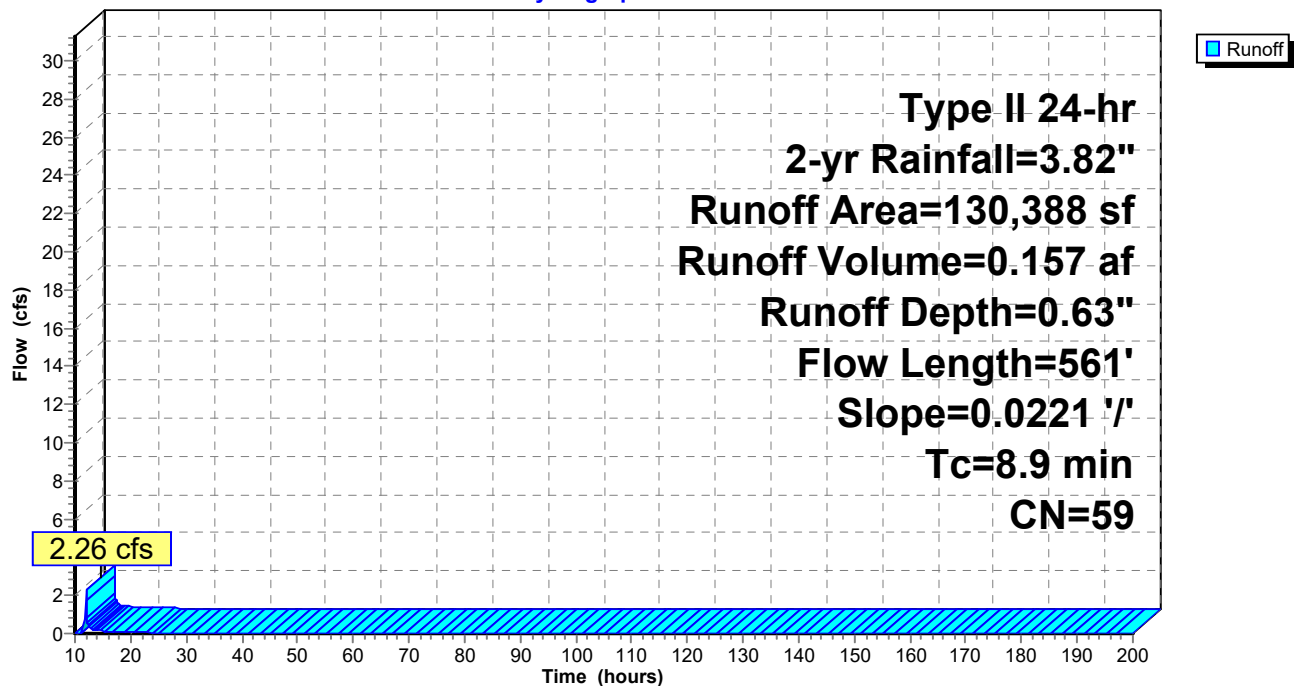
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-200.00 hrs, dt= 0.10 hrs
Type II 24-hr 2-yr Rainfall=3.82"

Area (sf)	CN	Description
104,102	60	Woods, Fair, HSG B
26,286	56	Brush, Fair, HSG B
130,388	59	Weighted Average
130,388		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.9	561	0.0221	1.06		Kirpich Method, General overland flow k= 2.00

Subcatchment 7S: Pre Dev. Basin 4

Hydrograph



Summary for Subcatchment 8S: Pre Dev. Basin 5

Runoff = 4.56 cfs @ 12.09 hrs, Volume= 0.368 af, Depth= 0.63"

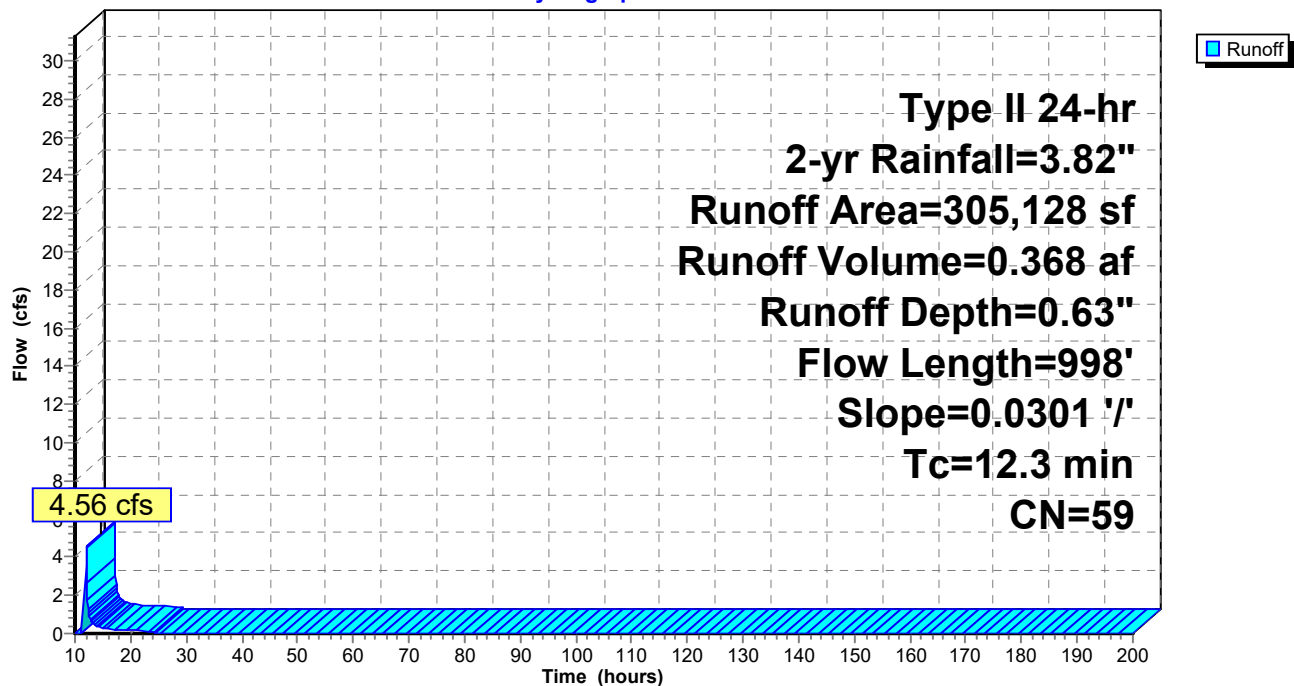
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-200.00 hrs, dt= 0.10 hrs
Type II 24-hr 2-yr Rainfall=3.82"

Area (sf)	CN	Description
267,919	60	Woods, Fair, HSG B
37,209	48	Brush, Good, HSG B
305,128	59	Weighted Average
305,128		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.3	998	0.0301	1.36		Kirpich Method, Estimated Tc General overland flow k= 2.00

Subcatchment 8S: Pre Dev. Basin 5

Hydrograph



Summary for Subcatchment 9S: Pre Dev. Basin 6

Runoff = 7.29 cfs @ 12.08 hrs, Volume= 0.570 af, Depth= 0.68"

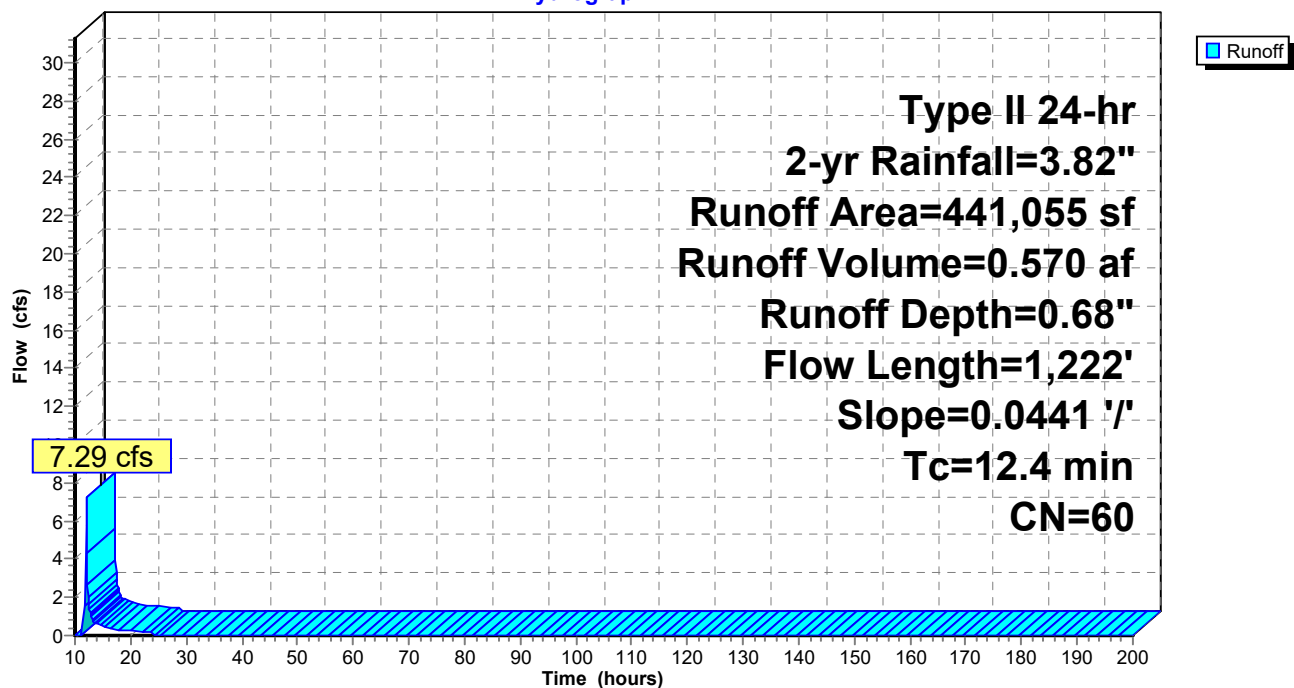
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-200.00 hrs, dt= 0.10 hrs
Type II 24-hr 2-yr Rainfall=3.82"

Area (sf)	CN	Description
401,238	60	Woods, Fair, HSG B
39,817	56	Brush, Fair, HSG B
441,055	60	Weighted Average
441,055		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.4	1,222	0.0441	1.65		Kirpich Method, Estimated Tc General overland flow k= 2.00

Subcatchment 9S: Pre Dev. Basin 6

Hydrograph



Summary for Subcatchment 10S: Pre Dev. Basin 7

Runoff = 2.89 cfs @ 12.06 hrs, Volume= 0.247 af, Depth= 0.54"

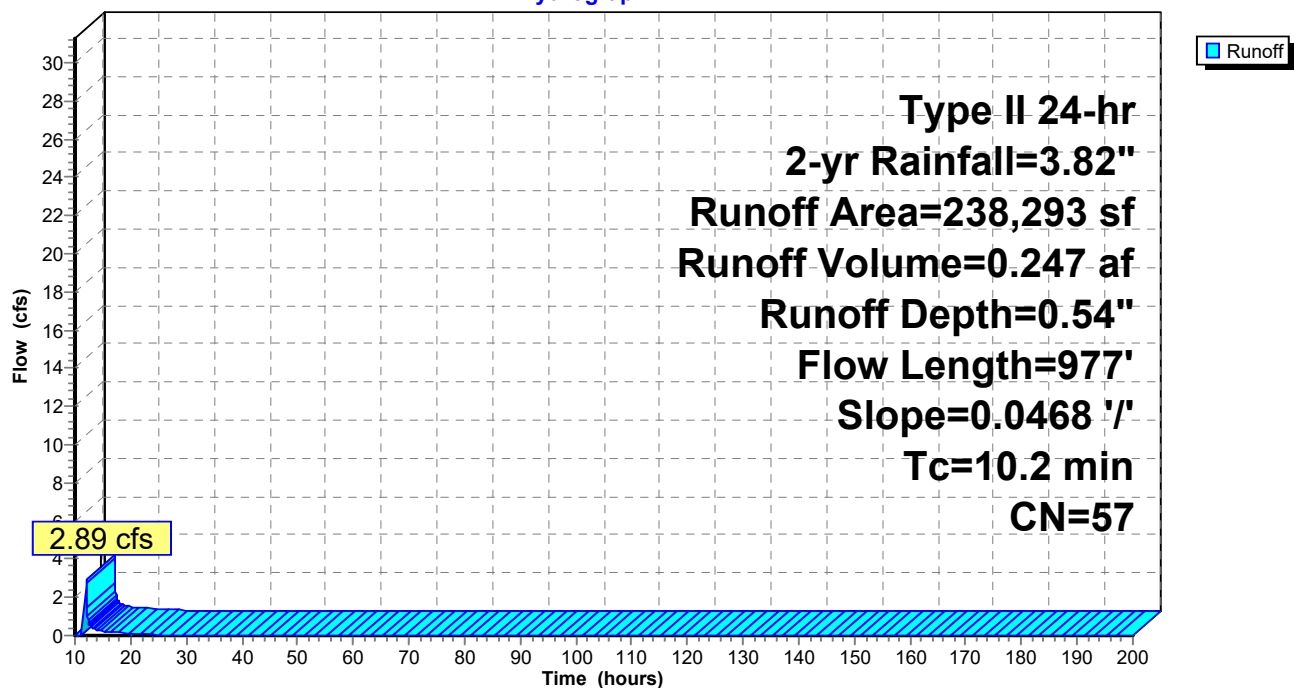
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-200.00 hrs, dt= 0.10 hrs
Type II 24-hr 2-yr Rainfall=3.82"

Area (sf)	CN	Description
207,447	55	Woods, Good, HSG B
30,846	69	Pasture/grassland/range, Fair, HSG B
238,293	57	Weighted Average
238,293		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.2	977	0.0468	1.60		Kirpich Method, Estimated Tc General overland flow k= 2.00

Subcatchment 10S: Pre Dev. Basin 7

Hydrograph



Summary for Subcatchment 11S: Pre Dev. Basin 8

Runoff = 6.67 cfs @ 12.02 hrs, Volume= 0.428 af, Depth= 0.77"

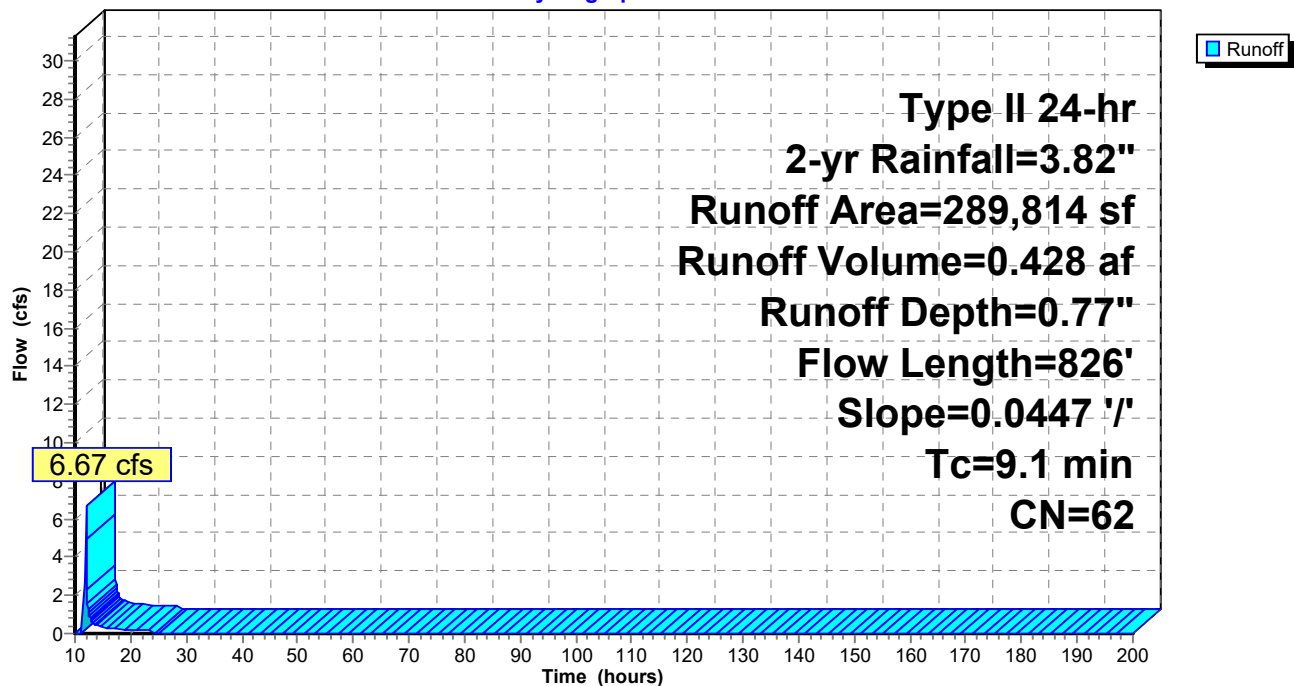
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-200.00 hrs, dt= 0.10 hrs
Type II 24-hr 2-yr Rainfall=3.82"

Area (sf)	CN	Description
230,959	60	Woods, Fair, HSG B
58,855	69	50-75% Grass cover, Fair, HSG B
289,814	62	Weighted Average
289,814		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.1	826	0.0447	1.51		Kirpich Method, General overland flow k= 2.00

Subcatchment 11S: Pre Dev. Basin 8

Hydrograph



Summary for Subcatchment 12S: Post Basin 1 to SCM

Runoff = 31.06 cfs @ 11.95 hrs, Volume= 1.619 af, Depth> 2.55"
 Routed to Pond 1P : Sand Filter -SCM 1

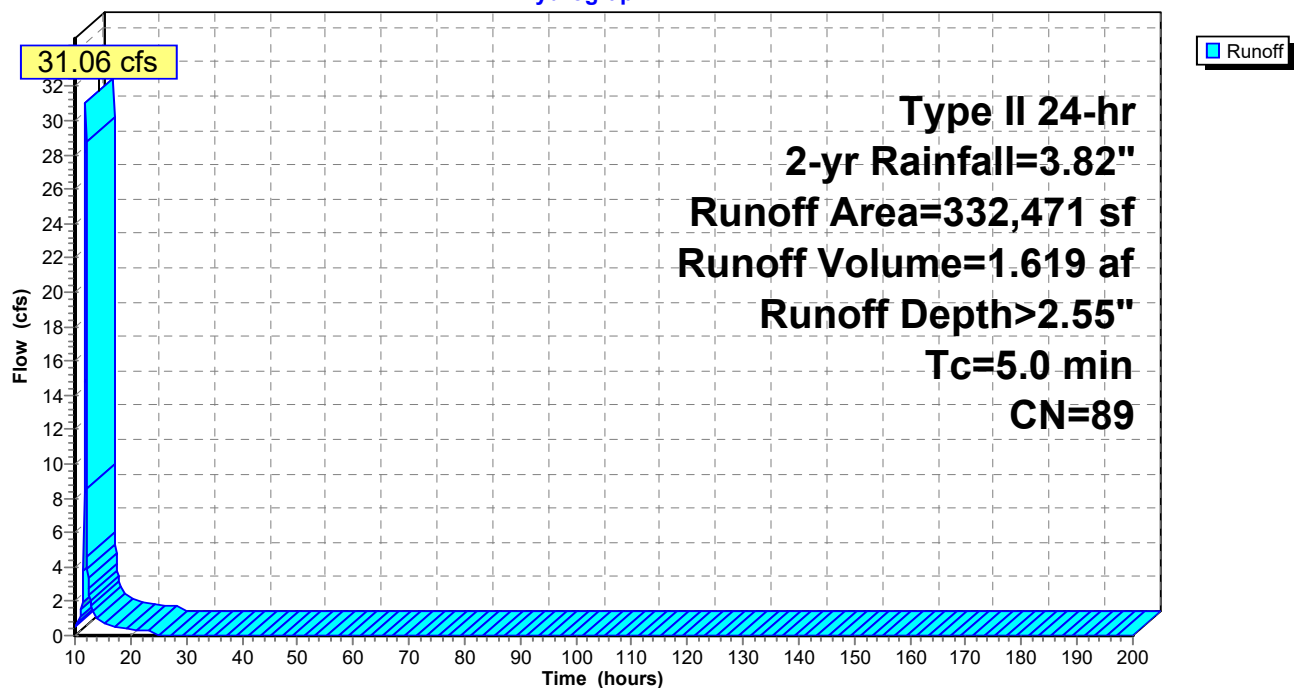
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-200.00 hrs, dt= 0.10 hrs
 Type II 24-hr 2-yr Rainfall=3.82"

Area (sf)	CN	Description
109,684	98	Paved parking, HSG A
72,655	56	Brush, Fair, HSG B
150,132	98	Roofs, HSG B
332,471	89	Weighted Average
72,655		21.85% Pervious Area
259,816		78.15% Impervious Area

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

Subcatchment 12S: Post Basin 1 to SCM

Hydrograph



Summary for Subcatchment 13S: Post Dev Bypass 1

Runoff = 4.04 cfs @ 11.99 hrs, Volume= 0.233 af, Depth= 0.68"
 Routed to Link 1L : POA 1

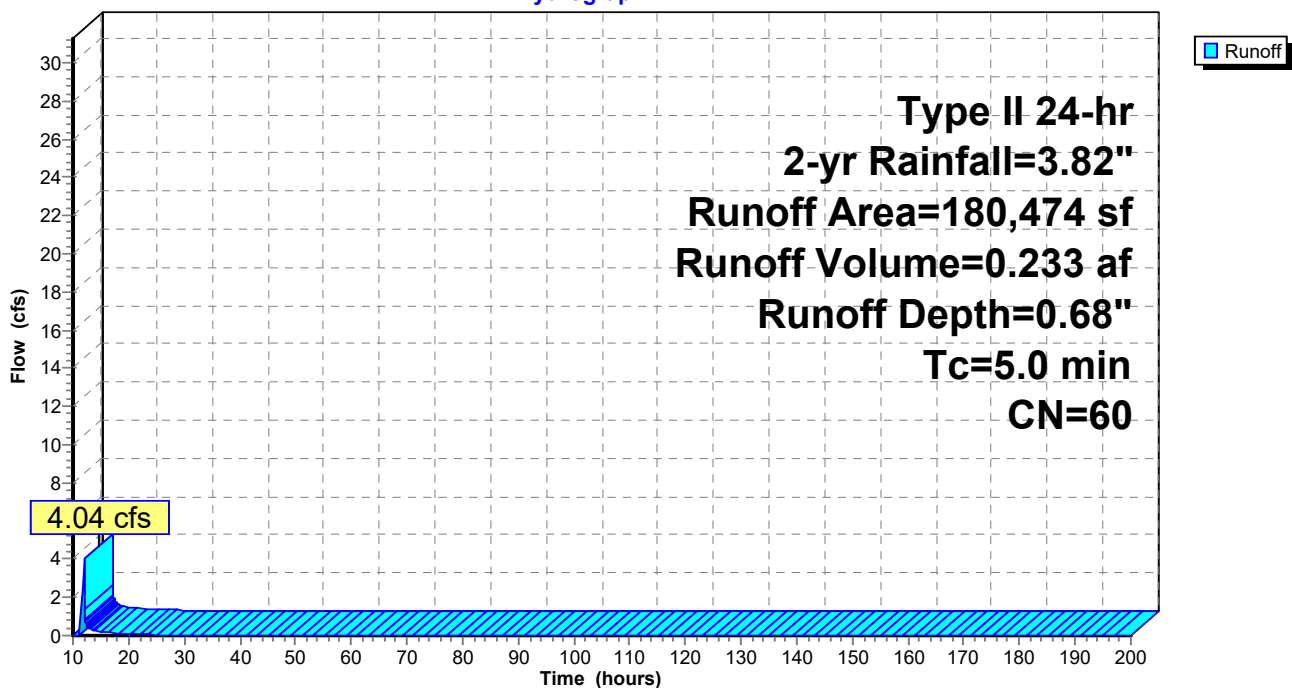
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-200.00 hrs, dt= 0.10 hrs
 Type II 24-hr 2-yr Rainfall=3.82"

Area (sf)	CN	Description
124,058	60	Woods, Fair, HSG B
49,243	56	Brush, Fair, HSG B
7,173	98	Paved parking, HSG B
180,474	60	Weighted Average
173,301		96.03% Pervious Area
7,173		3.97% Impervious Area

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

Subcatchment 13S: Post Dev Bypass 1

Hydrograph



Summary for Subcatchment 14S: Post Dev. Bypass 2A

Runoff = 8.13 cfs @ 11.97 hrs, Volume= 0.418 af, Depth> 1.81"

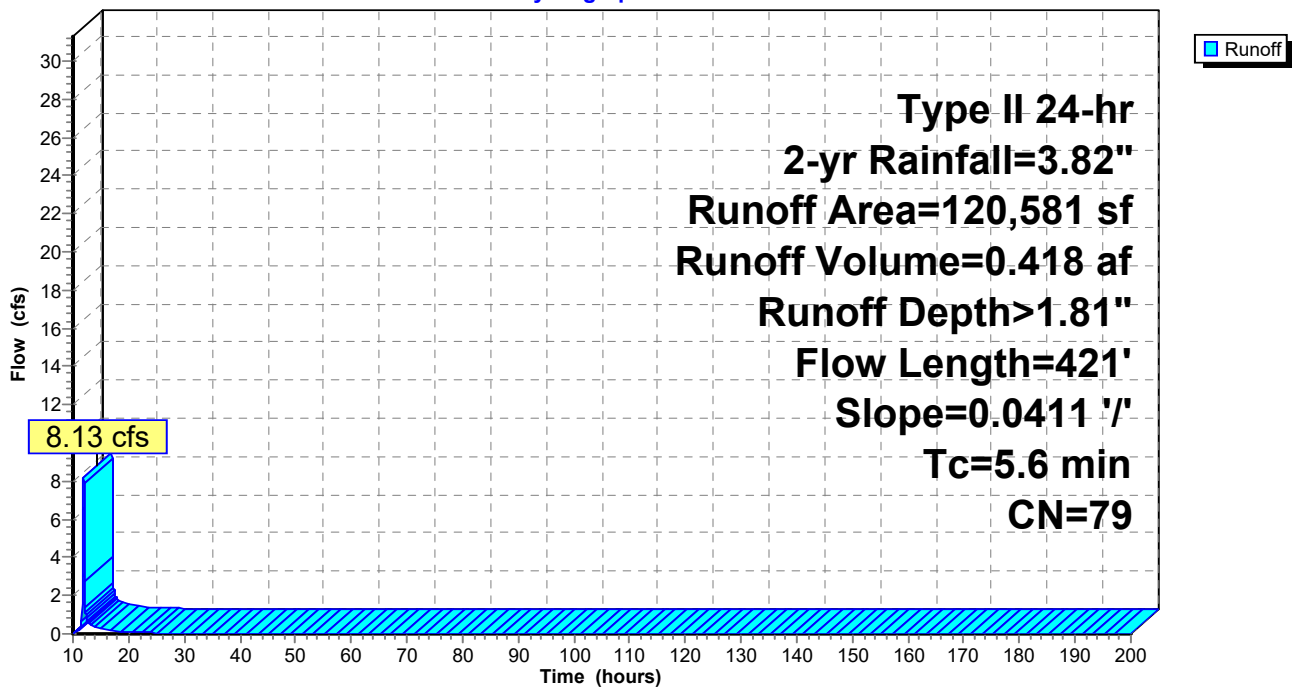
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-200.00 hrs, dt= 0.10 hrs
Type II 24-hr 2-yr Rainfall=3.82"

Area (sf)	CN	Description
120,581	79	Woods, Fair, HSG D
120,581		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.6	421	0.0411	1.25		Kirpich Method, Estimated Tc General overland flow k= 2.00

Subcatchment 14S: Post Dev. Bypass 2A

Hydrograph



Summary for Subcatchment 15S: Post Dev. Basin 2B to SCM

Runoff = 14.62 cfs @ 11.96 hrs, Volume= 0.758 af, Depth> 2.17"
 Routed to Pond 2P : Wet Pond SCM 2

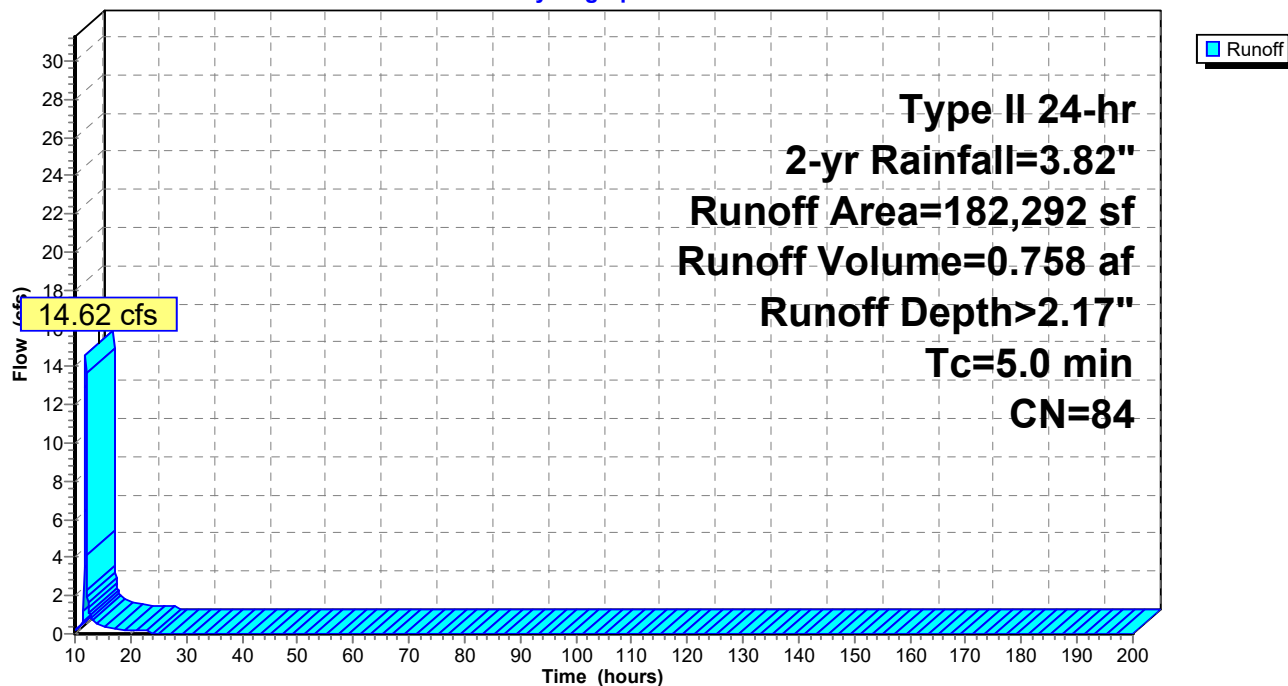
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-200.00 hrs, dt= 0.10 hrs
 Type II 24-hr 2-yr Rainfall=3.82"

Area (sf)	CN	Description
26,969	98	Paved parking, HSG B
49,749	48	Brush, Good, HSG B
95,673	98	Roofs, HSG B
9,901	98	Water Surface, HSG B
182,292	84	Weighted Average
49,749		27.29% Pervious Area
132,543		72.71% Impervious Area

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

Subcatchment 15S: Post Dev. Basin 2B to SCM

Hydrograph



Summary for Subcatchment 16S: Post Dev. Bypass 2C

Runoff = 34.31 cfs @ 11.99 hrs, Volume= 1.785 af, Depth> 2.25"

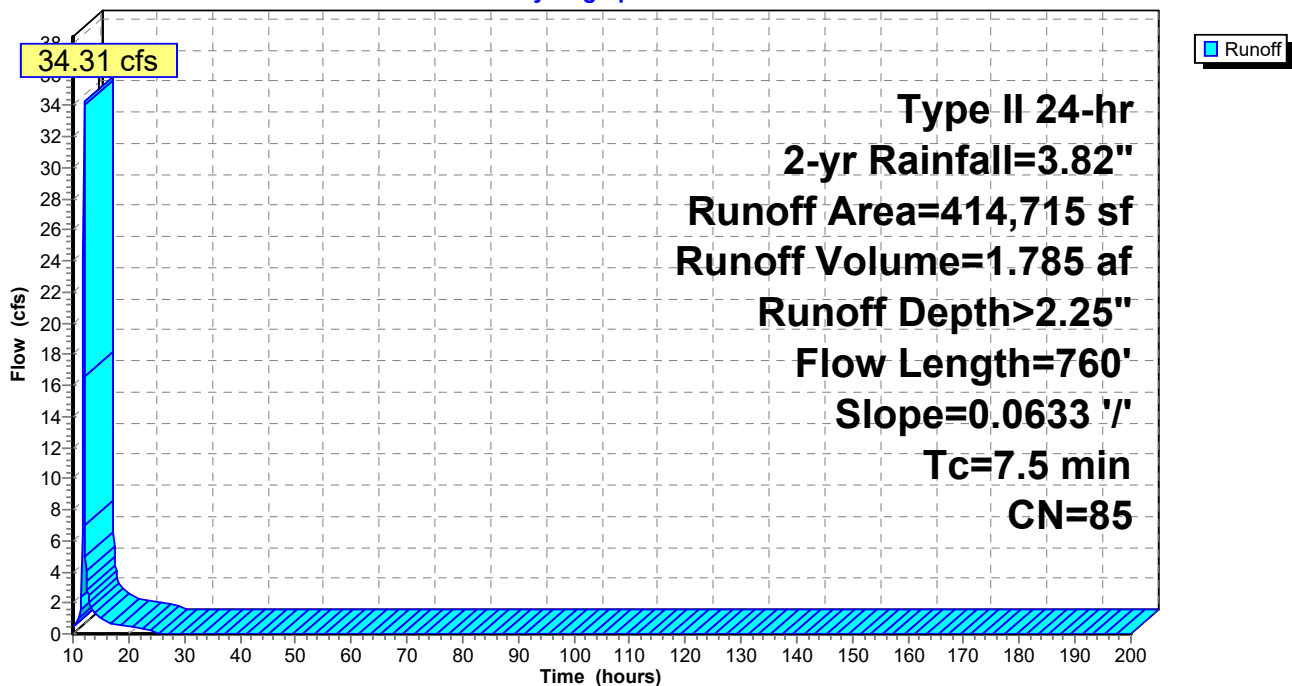
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-200.00 hrs, dt= 0.10 hrs
Type II 24-hr 2-yr Rainfall=3.82"

Area (sf)	CN	Description
173,689	79	Woods, Fair, HSG D
90,847	98	Paved parking, HSG D
90,721	77	Brush, Fair, HSG D
59,458	98	Roofs, HSG D
414,715	85	Weighted Average
264,410		63.76% Pervious Area
150,305		36.24% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.5	760	0.0633	1.70		Kirpich Method, Estimated Tc General overland flow k= 2.00

Subcatchment 16S: Post Dev. Bypass 2C

Hydrograph



Summary for Subcatchment 18S: Post Dev Bypass 2B

Runoff = 0.65 cfs @ 12.00 hrs, Volume= 0.047 af, Depth= 0.42"
 Routed to Link 2L : POA 2

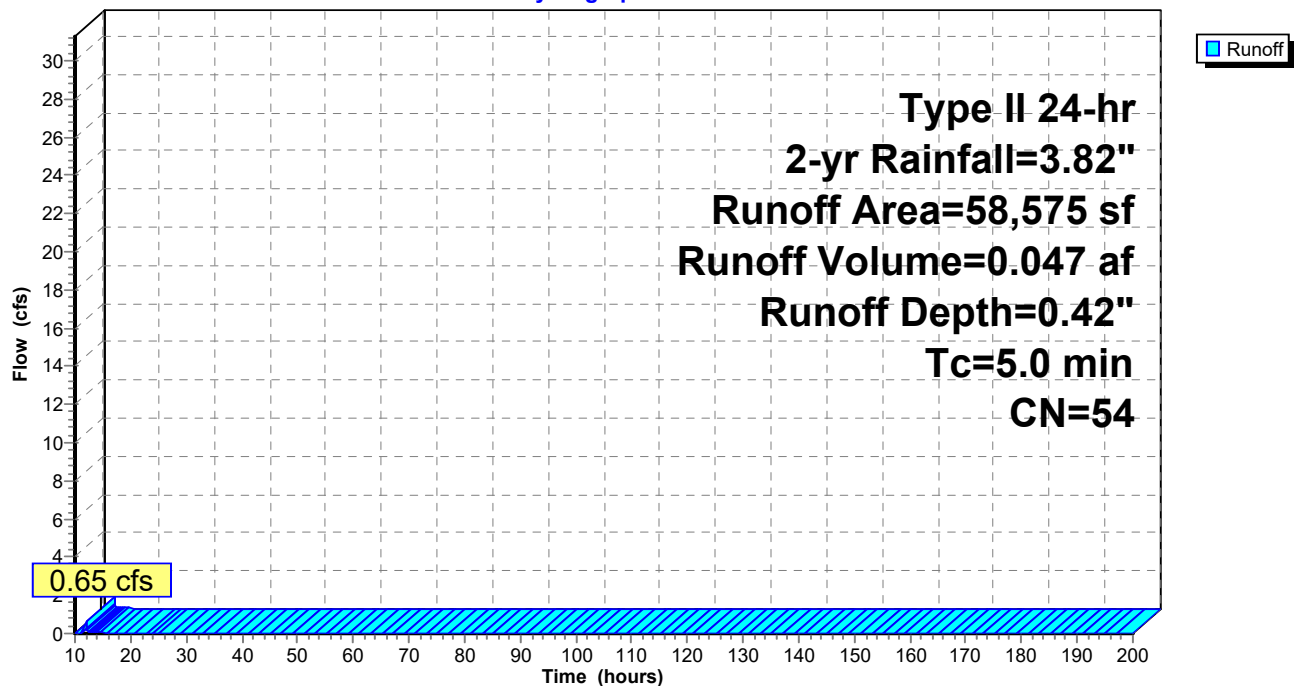
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-200.00 hrs, dt= 0.10 hrs
 Type II 24-hr 2-yr Rainfall=3.82"

Area (sf)	CN	Description
53,889	55	Woods, Good, HSG B
4,686	48	Brush, Good, HSG B
58,575	54	Weighted Average
58,575		100.00% Pervious Area

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

Subcatchment 18S: Post Dev Bypass 2B

Hydrograph



Summary for Subcatchment 19S: Post Dev. Basin 3

Runoff = 2.15 cfs @ 11.97 hrs, Volume= 0.112 af, Depth= 1.21"

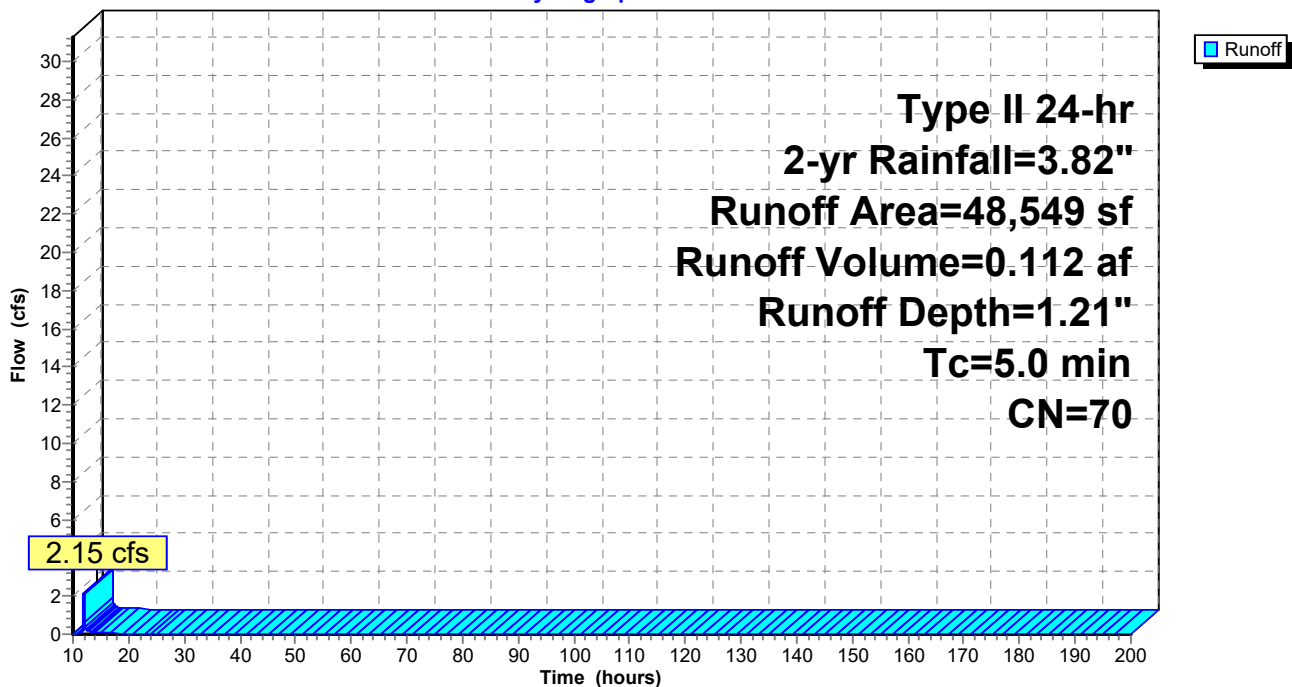
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-200.00 hrs, dt= 0.10 hrs
Type II 24-hr 2-yr Rainfall=3.82"

Area (sf)	CN	Description
48,549	70	Brush, Fair, HSG C
48,549		100.00% Pervious Area

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

Subcatchment 19S: Post Dev. Basin 3

Hydrograph



Summary for Subcatchment 20S: Post Dev. Basin 4

Runoff = 0.77 cfs @ 11.98 hrs, Volume= 0.043 af, Depth= 0.77"

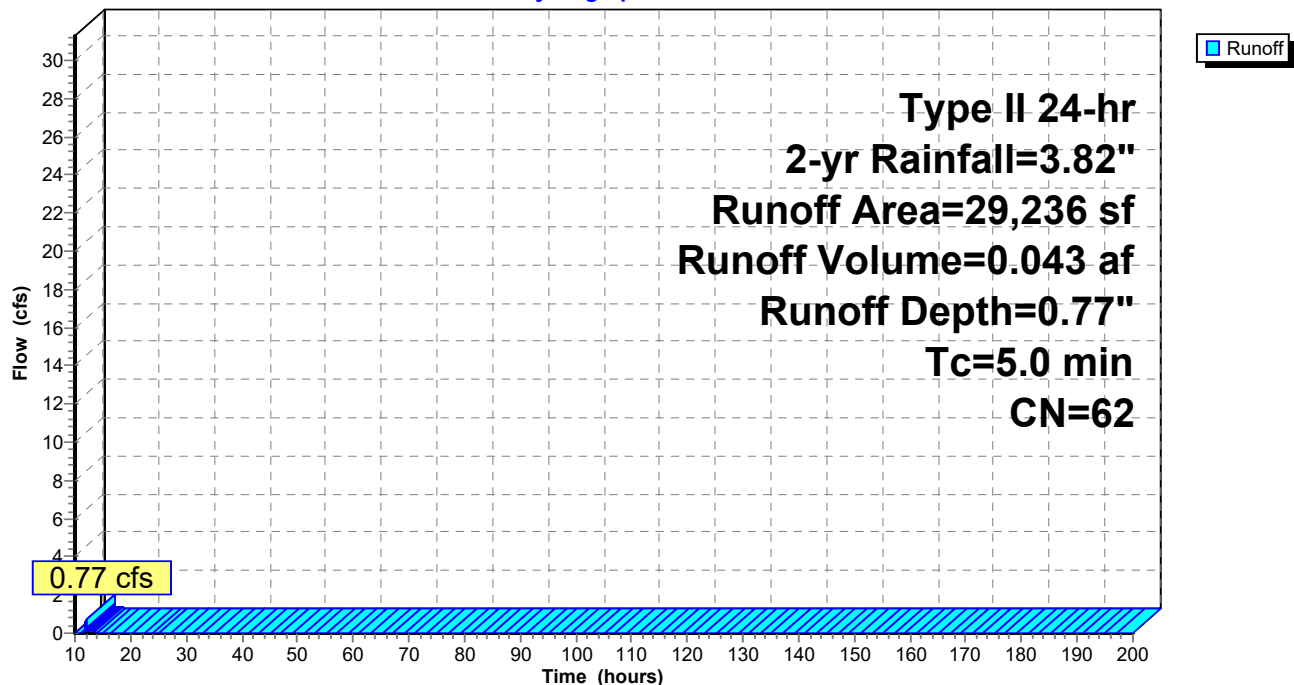
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-200.00 hrs, dt= 0.10 hrs
Type II 24-hr 2-yr Rainfall=3.82"

Area (sf)	CN	Description
6,194	60	Woods, Fair, HSG B
19,589	56	Brush, Fair, HSG B
3,453	98	Paved parking, HSG B
29,236	62	Weighted Average
25,783		88.19% Pervious Area
3,453		11.81% Impervious Area

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

Subcatchment 20S: Post Dev. Basin 4

Hydrograph



Summary for Subcatchment 21S: Post Dev. Basin 5 to SCM

Runoff = 10.62 cfs @ 11.95 hrs, Volume= 0.552 af, Depth> 2.40"
 Routed to Pond 6P : Sand Filter -SCM 3

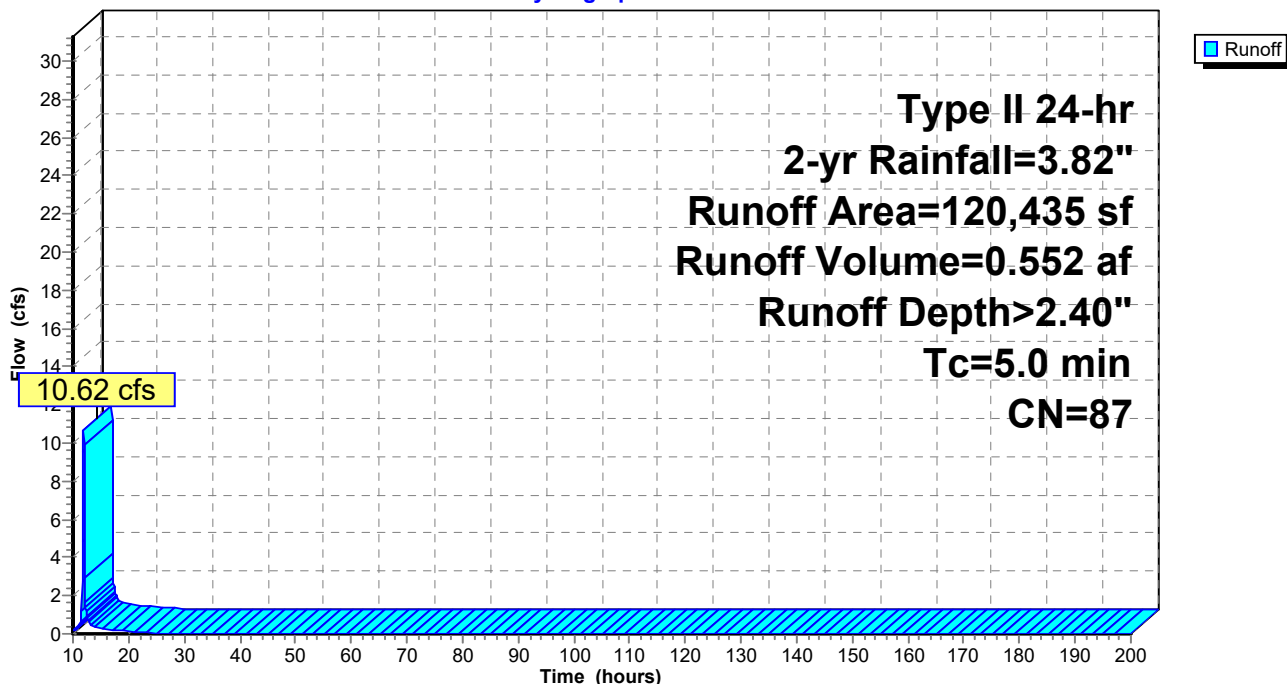
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-200.00 hrs, dt= 0.10 hrs
 Type II 24-hr 2-yr Rainfall=3.82"

Area (sf)	CN	Description
34,944	98	Roofs, HSG B
27,461	48	Brush, Good, HSG B
46,122	98	Paved parking, HSG B
11,908	98	Water Surface, 0% imp, HSG B
120,435	87	Weighted Average
39,369		32.69% Pervious Area
81,066		67.31% Impervious Area

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

Subcatchment 21S: Post Dev. Basin 5 to SCM

Hydrograph



Summary for Subcatchment 22S: Post Dev. Bypass 5

Runoff = 2.48 cfs @ 12.09 hrs, Volume= 0.200 af, Depth= 0.63"
 Routed to Link 3L : POA 4

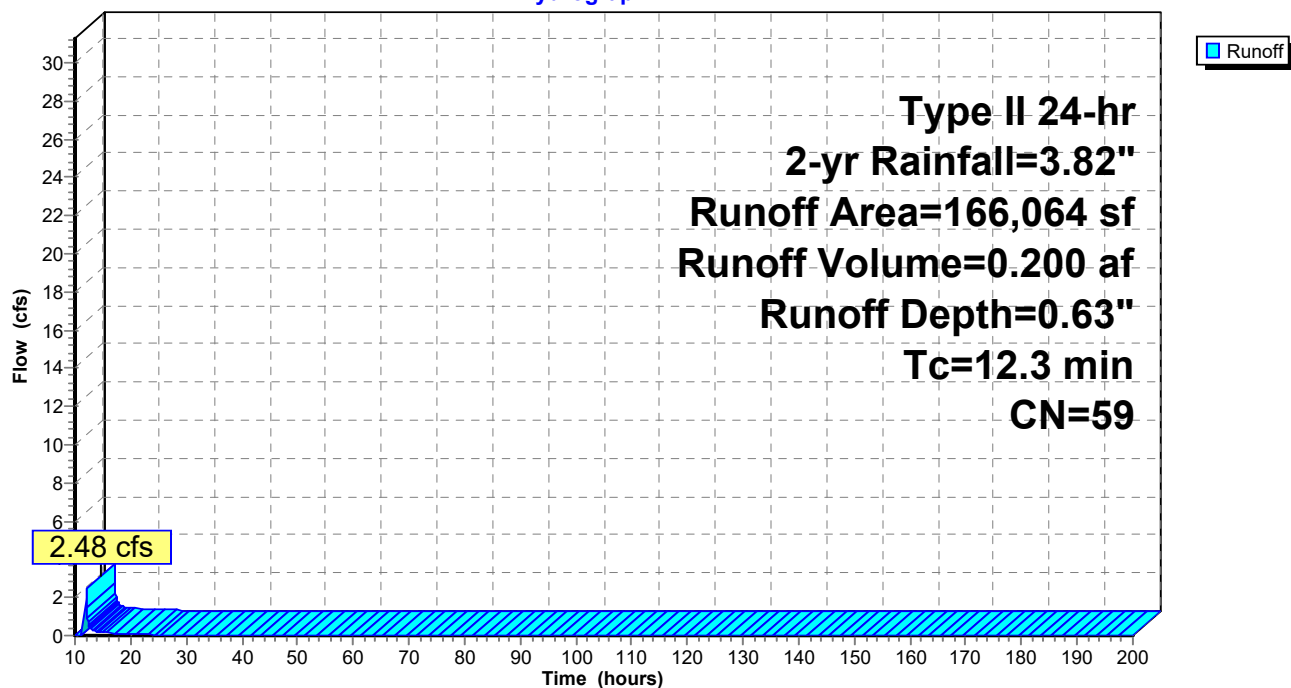
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-200.00 hrs, dt= 0.10 hrs
 Type II 24-hr 2-yr Rainfall=3.82"

Area (sf)	CN	Description
101,135	60	Woods, Fair, HSG B
52,516	48	Brush, Good, HSG B
12,413	98	Paved parking, HSG B
166,064	59	Weighted Average
153,651		92.53% Pervious Area
12,413		7.47% Impervious Area

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

Subcatchment 22S: Post Dev. Bypass 5

Hydrograph



Summary for Subcatchment 23S: Post Dev. Basin 6 to SCM

Runoff = 17.82 cfs @ 11.95 hrs, Volume= 0.932 af, Depth> 2.69"
 Routed to Pond 4P : Wet Pond SCM 4

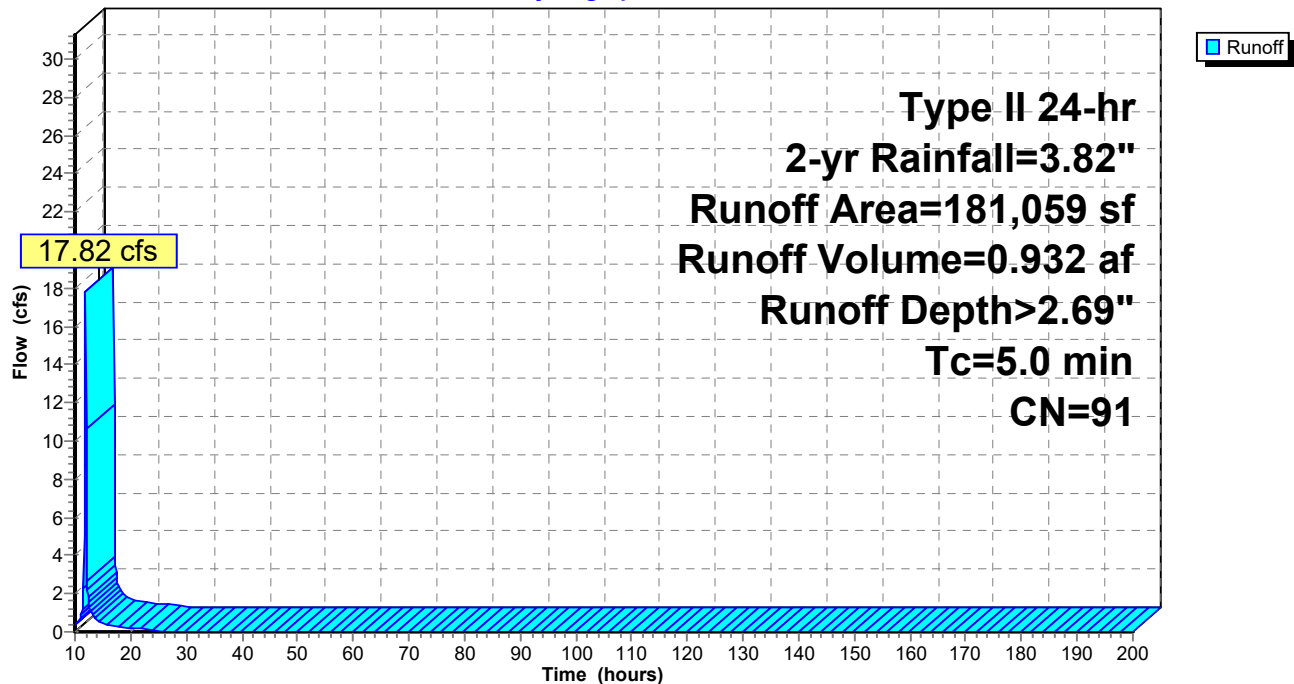
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-200.00 hrs, dt= 0.10 hrs
 Type II 24-hr 2-yr Rainfall=3.82"

Area (sf)	CN	Description
70,779	98	Paved parking, HSG B
32,683	61	>75% Grass cover, Good, HSG B
63,382	98	Roofs, HSG B
14,215	98	Water Surface, 0% imp, HSG B
181,059	91	Weighted Average
46,898		25.90% Pervious Area
134,161		74.10% Impervious Area

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

Subcatchment 23S: Post Dev. Basin 6 to SCM

Hydrograph



Summary for Subcatchment 24S: Post Dev. Bypass 6

Runoff = 5.85 cfs @ 11.99 hrs, Volume= 0.338 af, Depth= 0.68"
 Routed to Link 4L : POA 5

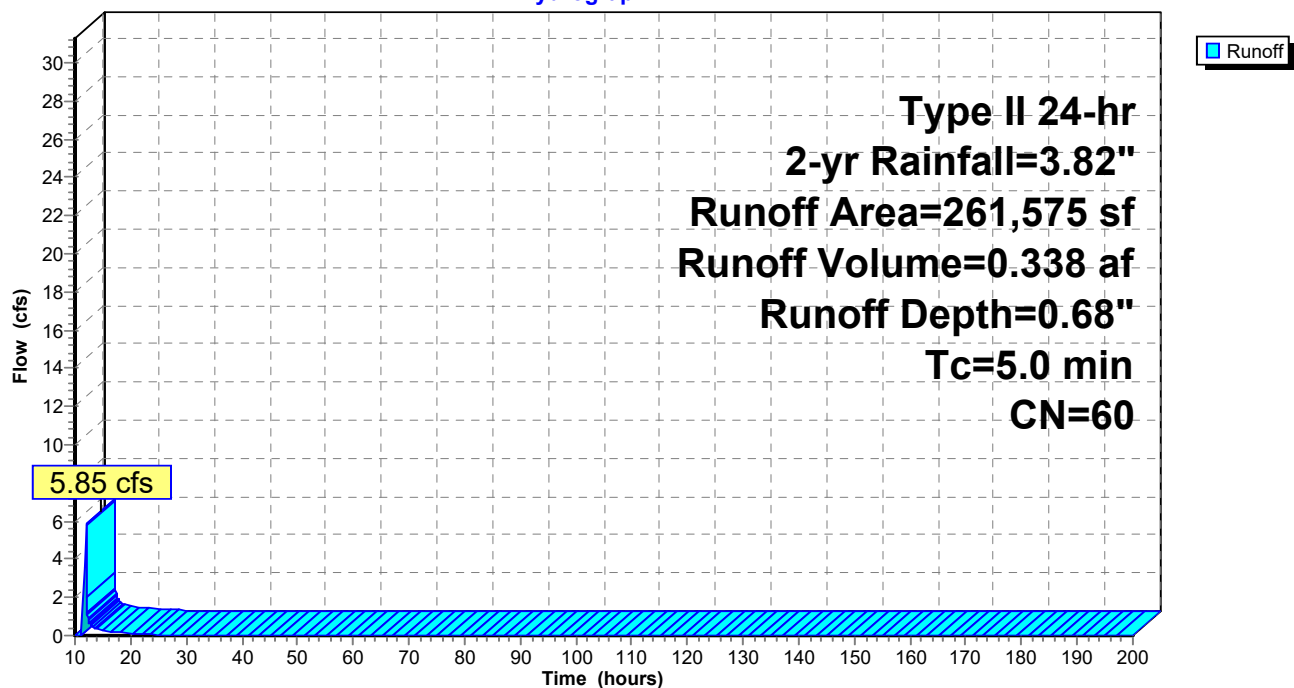
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-200.00 hrs, dt= 0.10 hrs
 Type II 24-hr 2-yr Rainfall=3.82"

Area (sf)	CN	Description
201,745	60	Woods, Fair, HSG B
55,562	56	Brush, Fair, HSG B
4,268	98	Paved parking, HSG B
261,575	60	Weighted Average
257,307		98.37% Pervious Area
4,268		1.63% Impervious Area

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

Subcatchment 24S: Post Dev. Bypass 6

Hydrograph



Summary for Subcatchment 25S: Post Dev. Basin 7 to SCM

Runoff = 9.75 cfs @ 11.95 hrs, Volume= 0.507 af, Depth> 2.47"
 Routed to Pond 5P : Wet Pond SCM 5

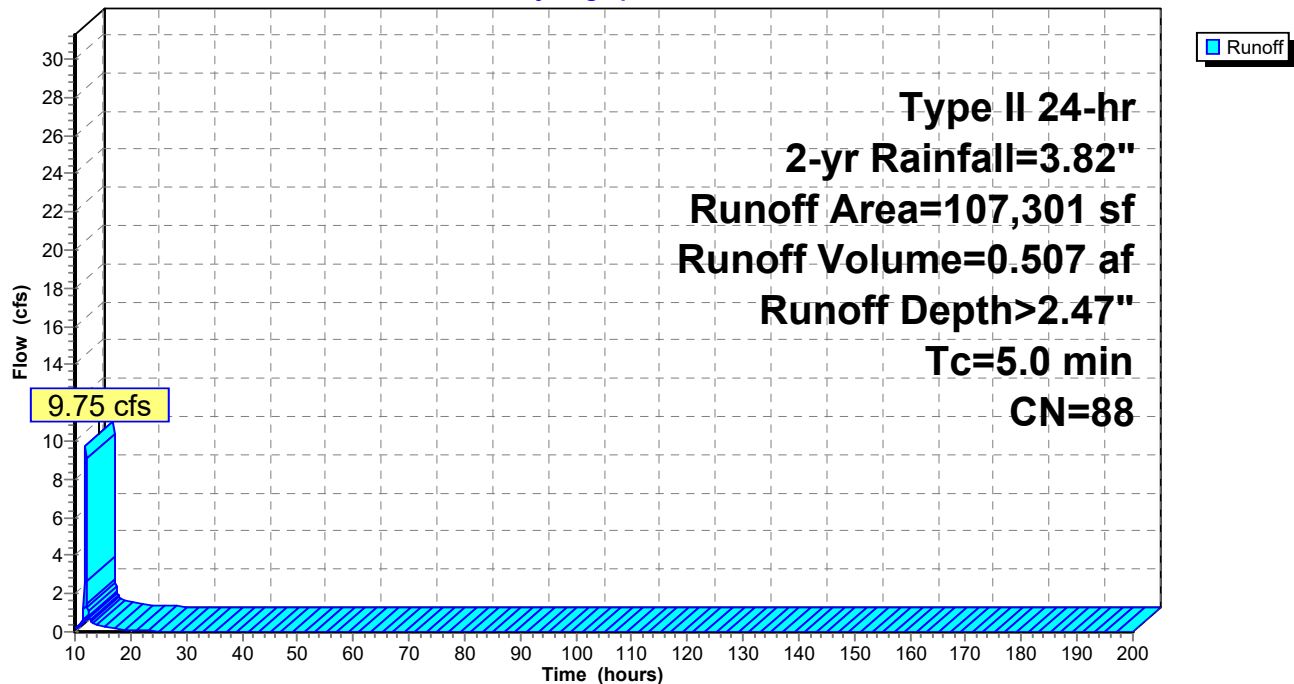
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-200.00 hrs, dt= 0.10 hrs
 Type II 24-hr 2-yr Rainfall=3.82"

Area (sf)	CN	Description
50,376	98	Paved parking, HSG B
21,628	48	Brush, Good, HSG B
28,800	98	Roofs, HSG B
6,497	98	Water Surface, 0% imp, HSG B
107,301	88	Weighted Average
28,125		26.21% Pervious Area
79,176		73.79% Impervious Area

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

Subcatchment 25S: Post Dev. Basin 7 to SCM

Hydrograph



Summary for Subcatchment 26S: Post Dev. Bypass 7

Runoff = 1.37 cfs @ 12.06 hrs, Volume= 0.123 af, Depth= 0.50"
 Routed to Link 5L : POA 6

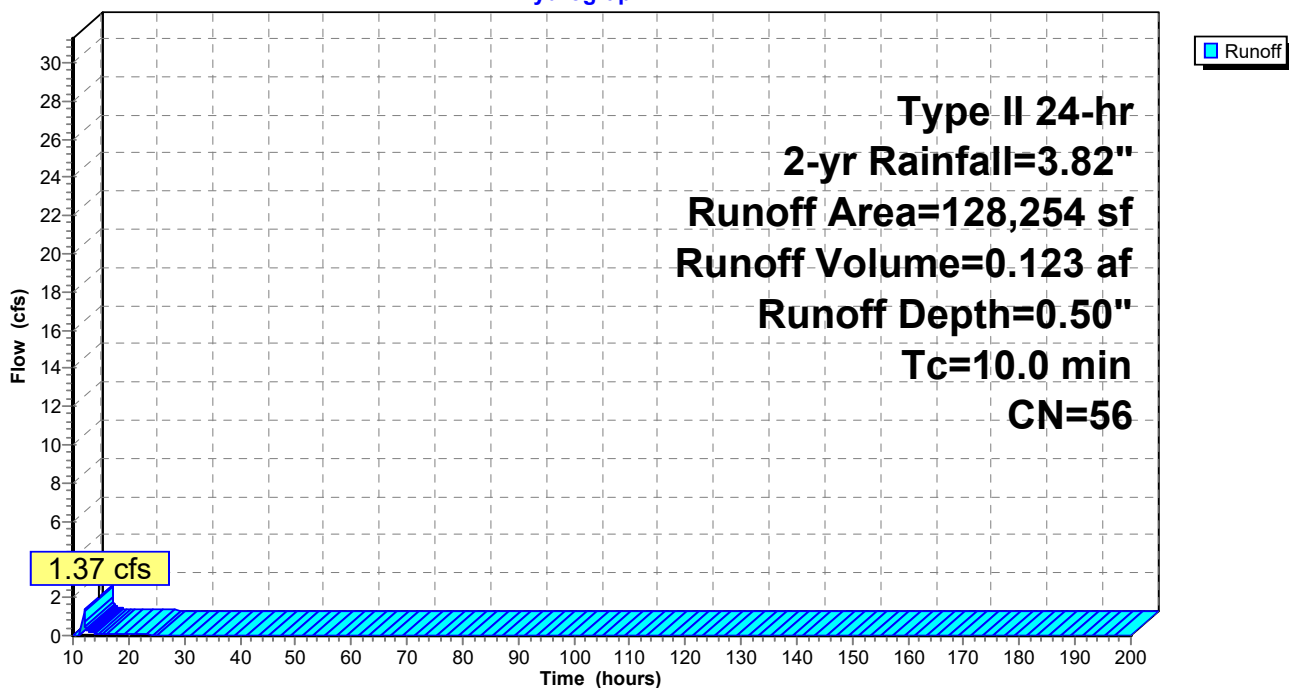
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-200.00 hrs, dt= 0.10 hrs
 Type II 24-hr 2-yr Rainfall=3.82"

Area (sf)	CN	Description
39,944	55	Woods, Good, HSG B
72,602	48	Brush, Good, HSG B
15,708	98	Paved parking, HSG B
128,254	56	Weighted Average
112,546		87.75% Pervious Area
15,708		12.25% Impervious Area

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

Subcatchment 26S: Post Dev. Bypass 7

Hydrograph



Summary for Subcatchment 27S: Post Dev. Bypass 8

Runoff = 6.67 cfs @ 12.02 hrs, Volume= 0.428 af, Depth= 0.77"

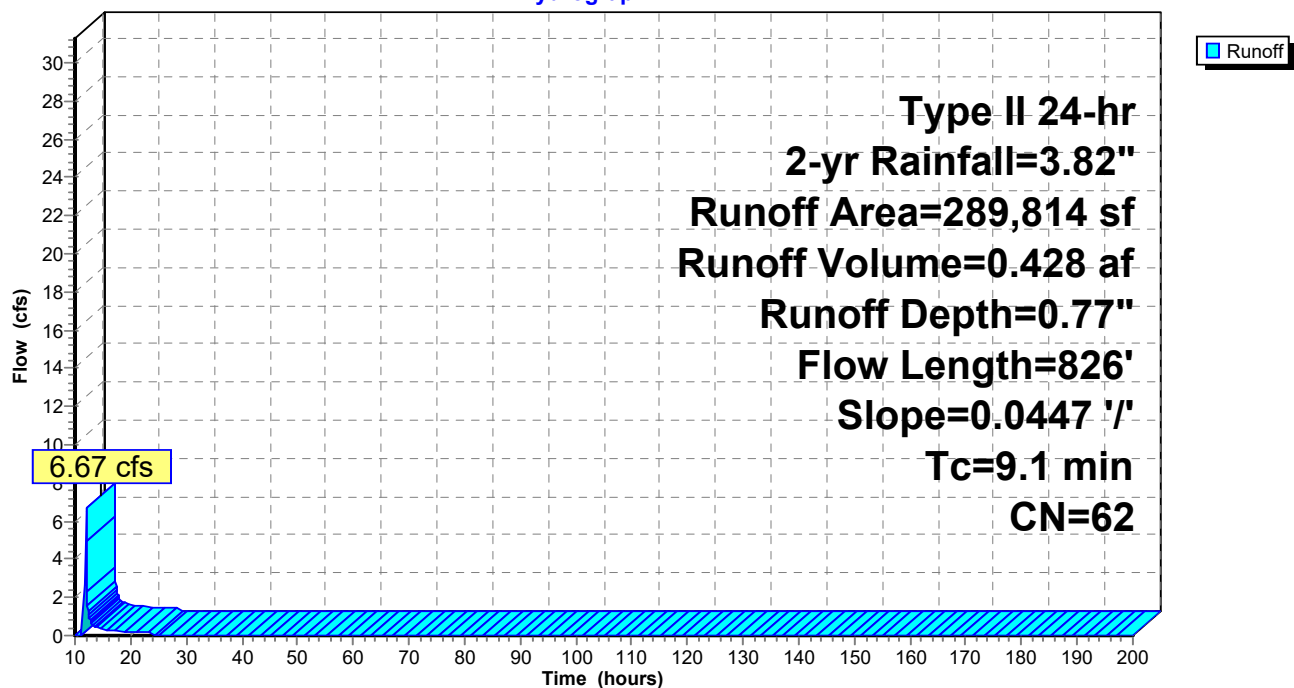
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-200.00 hrs, dt= 0.10 hrs
Type II 24-hr 2-yr Rainfall=3.82"

Area (sf)	CN	Description
230,959	60	Woods, Fair, HSG B
53,439	69	50-75% Grass cover, Fair, HSG B
5,416	98	Paved parking, HSG B
289,814	62	Weighted Average
284,398		98.13% Pervious Area
5,416		1.87% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.1	826	0.0447	1.51		Kirpich Method, General overland flow k= 2.00

Subcatchment 27S: Post Dev. Bypass 8

Hydrograph



Summary for Pond 1P: Sand Filter -SCM 1

Inflow Area = 7.632 ac, 78.15% Impervious, Inflow Depth > 2.55" for 2-yr event
 Inflow = 31.06 cfs @ 11.95 hrs, Volume= 1.619 af
 Outflow = 3.58 cfs @ 12.36 hrs, Volume= 1.619 af, Atten= 88%, Lag= 24.3 min
 Primary = 3.58 cfs @ 12.36 hrs, Volume= 1.619 af
 Routed to Link 1L : POA 1

Routing by Stor-Ind method, Time Span= 10.00-200.00 hrs, dt= 0.10 hrs
 Peak Elev= 528.87' @ 12.36 hrs Surf.Area= 6,825 sf Storage= 33,270 cf

Plug-Flow detention time= 122.2 min calculated for 1.616 af (100% of inflow)
 Center-of-Mass det. time= 121.6 min (934.0 - 812.4)

Volume	Invert	Avail.Storage	Storage Description
#1	524.00'	68,250 cf	Custom Stage Data (Prismatic) Listed below (Recalc) x 65

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
524.00	105	0	0
534.00	105	1,050	1,050

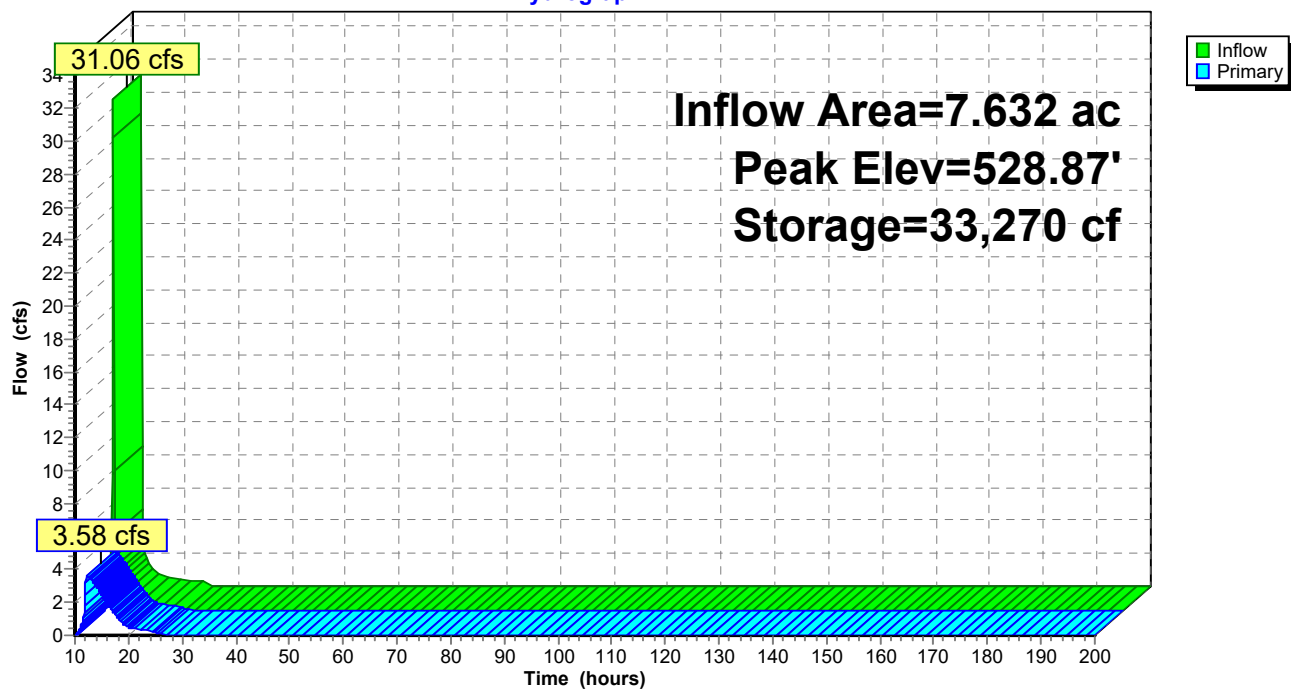
Device	Routing	Invert	Outlet Devices
#1	Primary	524.00'	36.0" Round Culvert L= 85.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 524.00' / 523.00' S= 0.0118 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 7.07 sf
#2	Device 1	524.00'	8.0" Vert. Drawdown C= 0.600 Limited to weir flow at low heads
#3	Device 1	528.90'	60.0" W x 8.0" H Vert. Main Orifice C= 0.600 Limited to weir flow at low heads
#4	Device 1	533.00'	25.0' long Overflow 2 End Contraction(s)

Primary OutFlow Max=3.58 cfs @ 12.36 hrs HW=528.87' (Free Discharge)

1=Culvert (Passes 3.58 cfs of 62.49 cfs potential flow)
 2=Drawdown (Orifice Controls 3.58 cfs @ 10.26 fps)
 3=Main Orifice (Controls 0.00 cfs)
 4=Overflow (Controls 0.00 cfs)

Pond 1P: Sand Filter -SCM 1

Hydrograph



Summary for Pond 2P: Wet Pond SCM 2

Inflow Area = 4.185 ac, 72.71% Impervious, Inflow Depth > 2.17" for 2-yr event
 Inflow = 14.62 cfs @ 11.96 hrs, Volume= 0.758 af
 Outflow = 2.63 cfs @ 12.21 hrs, Volume= 0.758 af, Atten= 82%, Lag= 15.1 min
 Primary = 2.63 cfs @ 12.21 hrs, Volume= 0.758 af
 Routed to Link 2L : POA 2

Routing by Stor-Ind method, Time Span= 10.00-200.00 hrs, dt= 0.10 hrs

Starting Elev= 526.00' Surf.Area= 9,300 sf Storage= 39,787 cf

Peak Elev= 527.56' @ 12.21 hrs Surf.Area= 10,487 sf Storage= 55,230 cf (15,443 cf above start)

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)

Center-of-Mass det. time= 224.7 min (1,047.1 - 822.5)

Volume	Invert	Avail.Storage	Storage Description
#1	521.00'	83,553 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
521.00	6,868	0	0
522.00	7,244	7,056	7,056
523.00	7,656	7,450	14,506
524.00	8,129	7,893	22,399
525.00	8,674	8,402	30,800
526.00	9,300	8,987	39,787
527.00	10,020	9,660	49,447
528.00	10,848	10,434	59,881
529.00	11,800	11,324	71,205
530.00	12,895	12,348	83,553

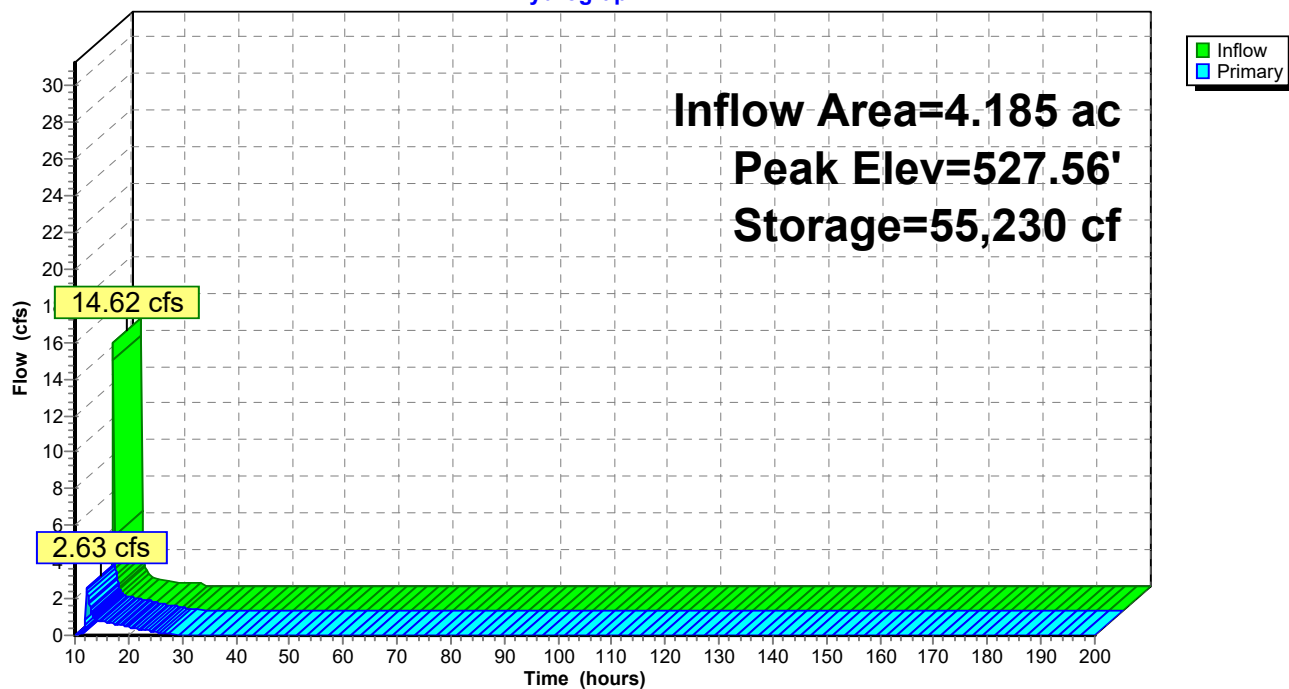
Device	Routing	Invert	Outlet Devices
#1	Primary	526.00'	36.0" Round Culvert L= 45.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 526.00' / 525.55' S= 0.0100 ' S= 0.0100 ' Cc= 0.900 n= 0.010 Concrete pipe, straight & clean, Flow Area= 7.07 sf
#2	Device 1	526.00'	5.5" Vert. Drawdown C= 0.600 Limited to weir flow at low heads
#3	Device 1	527.30'	24.0" W x 3.0" H Vert. Peakflow X 2.00 C= 0.600 Limited to weir flow at low heads
#4	Device 1	529.40'	48.0" x 48.0" Horiz. Overflow C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=2.62 cfs @ 12.21 hrs HW=527.56' (Free Discharge)

1=Culvert (Passes 2.62 cfs of 14.25 cfs potential flow)
 2=Drawdown (Orifice Controls 0.92 cfs @ 5.56 fps)
 3=Peakflow (Orifice Controls 1.71 cfs @ 1.71 fps)
 4=Overflow (Controls 0.00 cfs)

Pond 2P: Wet Pond SCM 2

Hydrograph



Summary for Pond 4P: Wet Pond SCM 4

Inflow Area = 4.157 ac, 74.10% Impervious, Inflow Depth > 2.69" for 2-yr event
 Inflow = 17.82 cfs @ 11.95 hrs, Volume= 0.932 af
 Outflow = 2.51 cfs @ 12.25 hrs, Volume= 0.932 af, Atten= 86%, Lag= 17.8 min
 Primary = 2.51 cfs @ 12.25 hrs, Volume= 0.932 af
 Routed to Link 4L : POA 5

Routing by Stor-Ind method, Time Span= 10.00-200.00 hrs, dt= 0.10 hrs
 Starting Elev= 522.00' Surf.Area= 5,116 sf Storage= 11,656 cf
 Peak Elev= 525.27' @ 12.20 hrs Surf.Area= 8,125 sf Storage= 33,175 cf (21,520 cf above start)

Plug-Flow detention time= 812.4 min calculated for 0.663 af (71% of inflow)
 Center-of-Mass det. time= 497.9 min (1,306.5 - 808.6)

Volume	Invert	Avail.Storage	Storage Description
#1	519.00'	59,179 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
519.00	2,769	0	0
520.00	3,460	3,115	3,115
521.00	4,253	3,857	6,971
522.00	5,116	4,685	11,656
523.00	5,998	5,557	17,213
524.00	6,912	6,455	23,668
525.00	7,862	7,387	31,055
526.00	8,852	8,357	39,412
527.00	9,875	9,364	48,775
528.00	10,932	10,404	59,179

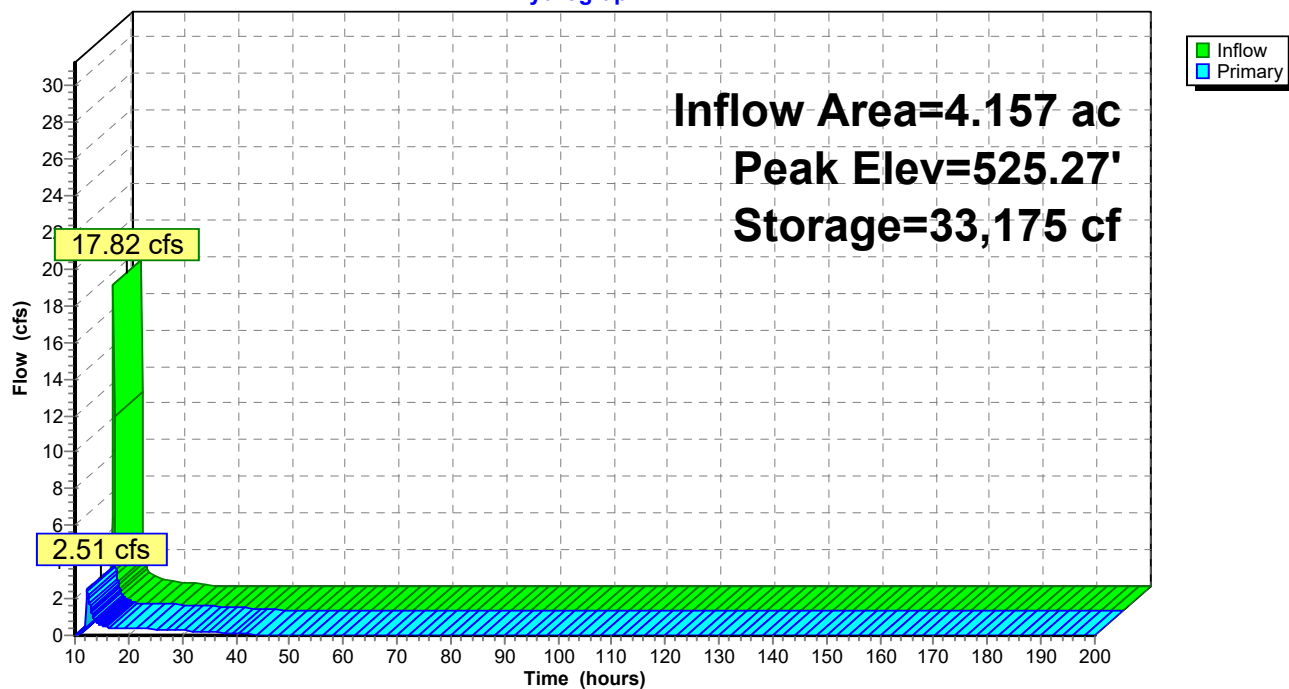
Device	Routing	Invert	Outlet Devices
#1	Primary	522.00'	36.0" Round Culvert L= 45.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 522.00' / 521.50' S= 0.0111 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 7.07 sf
#2	Device 1	522.00'	3.0" Vert. Drawdown C= 0.600 Limited to weir flow at low heads
#3	Device 1	524.90'	36.0" W x 4.0" H Vert. Peakflow C= 0.600 Limited to weir flow at low heads
#4	Device 1	527.10'	48.0" x 48.0" Horiz. Overflow C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=2.49 cfs @ 12.25 hrs HW=525.26' (Free Discharge)

- 1=Culvert (Passes 2.49 cfs of 43.87 cfs potential flow)
- 2=Drawdown (Orifice Controls 0.42 cfs @ 8.53 fps)
- 3=Peakflow (Orifice Controls 2.07 cfs @ 2.07 fps)
- 4=Overflow (Controls 0.00 cfs)

Pond 4P: Wet Pond SCM 4

Hydrograph



Summary for Pond 5P: Wet Pond SCM 5

Inflow Area = 2.463 ac, 73.79% Impervious, Inflow Depth > 2.47" for 2-yr event
 Inflow = 9.75 cfs @ 11.95 hrs, Volume= 0.507 af
 Outflow = 1.54 cfs @ 12.24 hrs, Volume= 0.507 af, Atten= 84%, Lag= 16.9 min
 Primary = 1.54 cfs @ 12.24 hrs, Volume= 0.507 af
 Routed to Link 5L : POA 6

Routing by Stor-Ind method, Time Span= 10.00-200.00 hrs, dt= 0.10 hrs
 Starting Elev= 513.00' Surf.Area= 3,681 sf Storage= 11,032 cf
 Peak Elev= 515.57' @ 12.24 hrs Surf.Area= 4,699 sf Storage= 21,771 cf (10,739 cf above start)

Plug-Flow detention time= 501.2 min calculated for 0.253 af (50% of inflow)
 Center-of-Mass det. time= 193.2 min (1,007.5 - 814.3)

Volume	Invert	Avail.Storage	Storage Description
#1	509.00'	34,456 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
509.00	1,925	0	0
510.00	2,310	2,118	2,118
511.00	2,731	2,521	4,638
512.00	3,188	2,960	7,598
513.00	3,681	3,435	11,032
514.00	4,062	3,872	14,904
515.00	4,462	4,262	19,166
516.00	4,879	4,671	23,836
517.00	5,315	5,097	28,933
518.00	5,731	5,523	34,456

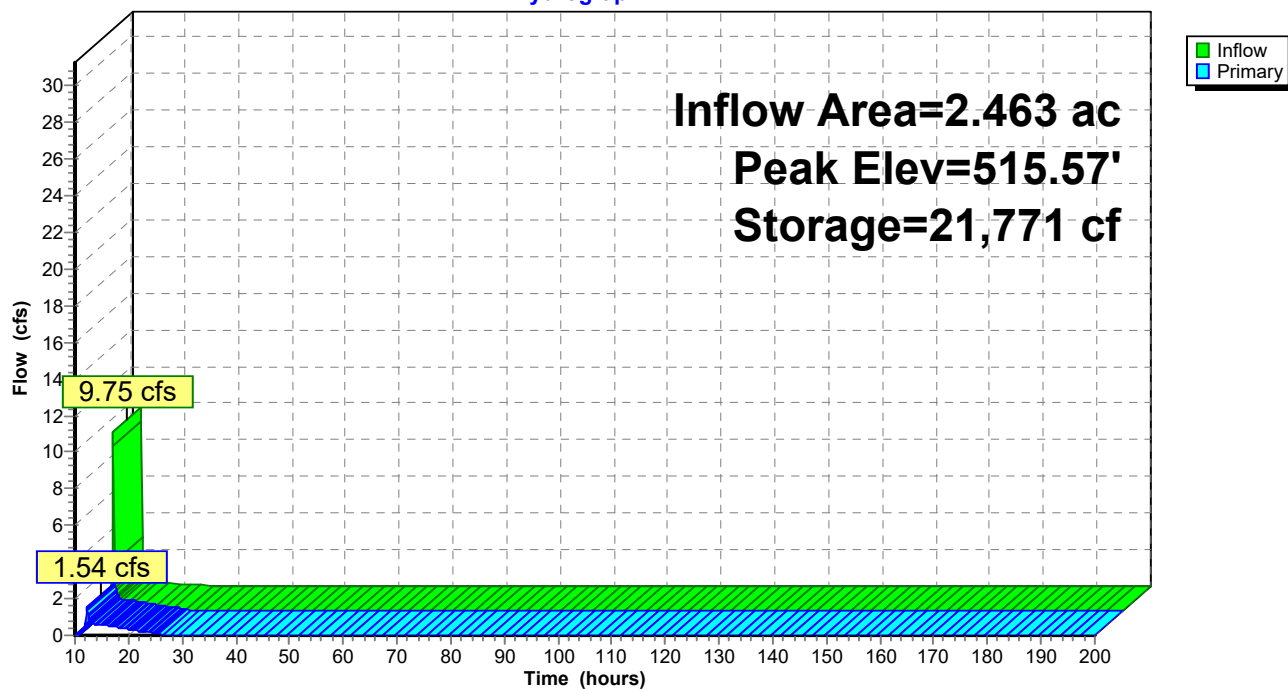
Device	Routing	Invert	Outlet Devices
#1	Primary	513.00'	36.0" Round Culvert L= 79.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 513.00' / 512.00' S= 0.0127 ' S= 0.0127 ' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 7.07 sf
#2	Device 1	513.00'	4.0" Vert. Drawdown C= 0.600 Limited to weir flow at low heads
#3	Device 1	515.40'	24.0" W x 3.5" H Vert. Peakflow Orifice X 2.00 C= 0.600 Limited to weir flow at low heads
#4	Device 1	517.50'	48.0" x 48.0" Horiz. Overflow C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=1.48 cfs @ 12.24 hrs HW=515.56' (Free Discharge)

1=Culvert (Passes 1.48 cfs of 34.92 cfs potential flow)
 2=Drawdown (Orifice Controls 0.65 cfs @ 7.45 fps)
 3=Peakflow Orifice (Orifice Controls 0.83 cfs @ 1.29 fps)
 4=Overflow (Controls 0.00 cfs)

Pond 5P: Wet Pond SCM 5

Hydrograph



Summary for Pond 6P: Sand Filter -SCM 3

Inflow Area = 2.765 ac, 67.31% Impervious, Inflow Depth > 2.40" for 2-yr event
 Inflow = 10.62 cfs @ 11.95 hrs, Volume= 0.552 af
 Outflow = 0.28 cfs @ 15.19 hrs, Volume= 0.291 af, Atten= 97%, Lag= 193.8 min
 Primary = 0.28 cfs @ 15.19 hrs, Volume= 0.291 af
 Routed to Link 3L : POA 4

Routing by Stor-Ind method, Time Span= 10.00-200.00 hrs, dt= 0.10 hrs
 Peak Elev= 533.63' @ 15.19 hrs Surf.Area= 3,675 sf Storage= 17,021 cf

Plug-Flow detention time= 615.5 min calculated for 0.290 af (53% of inflow)
 Center-of-Mass det. time= 501.7 min (1,318.0 - 816.3)

Volume	Invert	Avail.Storage	Storage Description
#1	529.00'	33,075 cf	Sediment Chamber (Prismatic) Listed below x 35

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
529.00	105	0	0
538.00	105	945	945

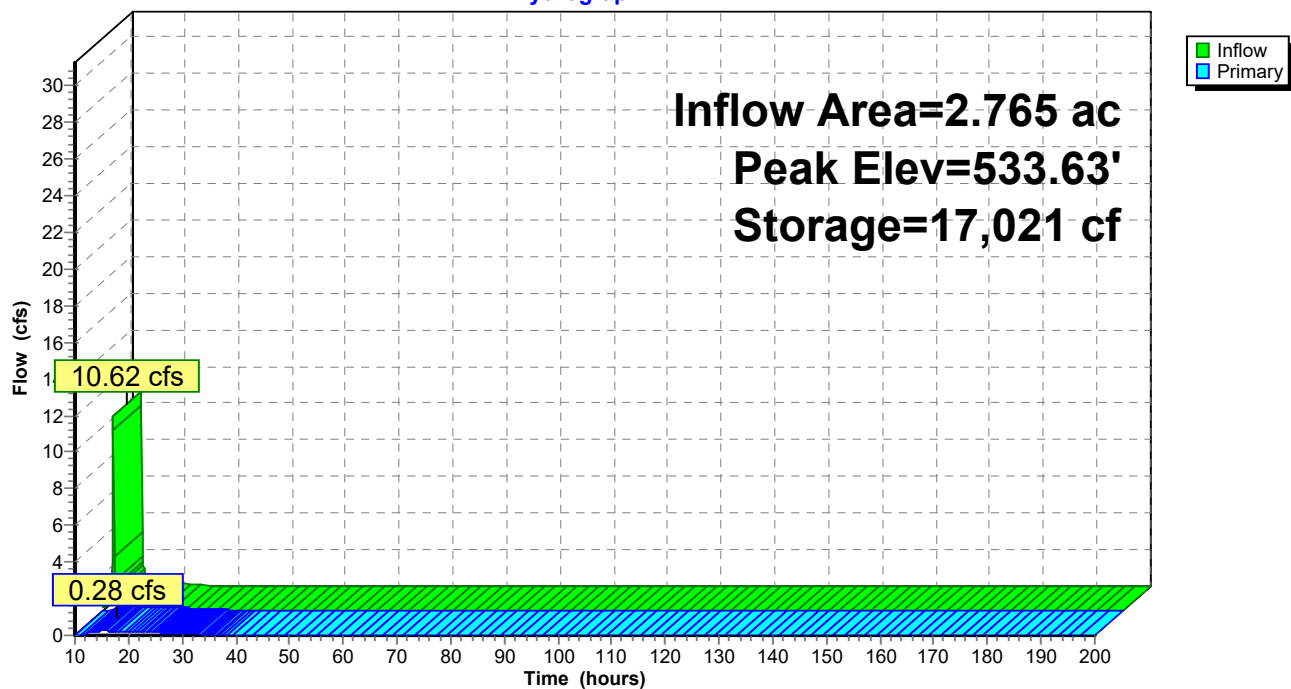
Device	Routing	Invert	Outlet Devices
#1	Primary	532.00'	36.0" Round Culvert L= 12.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 532.00' / 531.00' S= 0.0833 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 7.07 sf
#2	Device 1	532.10'	2.5" Vert. Drawdown C= 0.600 Limited to weir flow at low heads
#3	Device 1	533.60'	34.0" W x 5.0" H Vert. Main Orifice C= 0.600 Limited to weir flow at low heads
#4	Device 1	536.30'	25.0' long Overflow 2 End Contraction(s)

Primary OutFlow Max=0.25 cfs @ 15.19 hrs HW=533.63' (Free Discharge)

1=Culvert (Passes 0.25 cfs of 17.08 cfs potential flow)
 2=Drawdown (Orifice Controls 0.20 cfs @ 5.75 fps)
 3=Main Orifice (Orifice Controls 0.05 cfs @ 0.57 fps)
 4=Overflow (Controls 0.00 cfs)

Pond 6P: Sand Filter -SCM 3

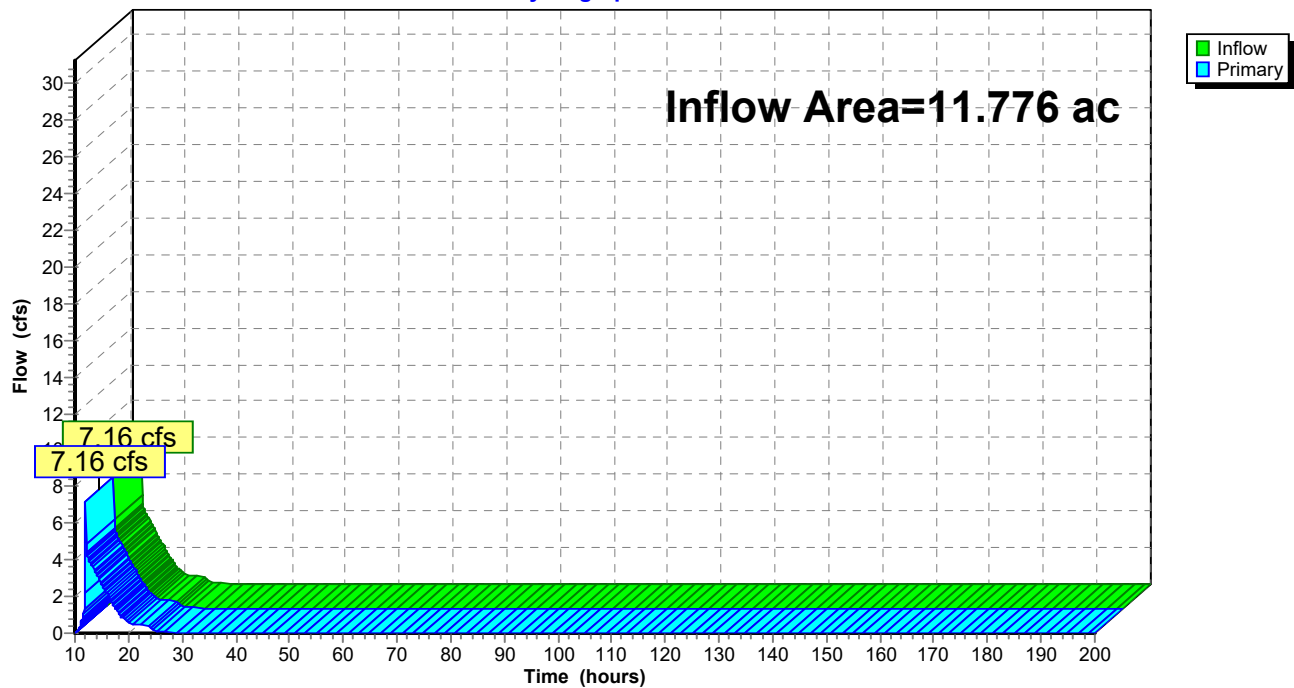
Hydrograph



Summary for Link 1L: POA 1

Inflow Area = 11.776 ac, 52.05% Impervious, Inflow Depth > 1.89" for 2-yr event
Inflow = 7.16 cfs @ 12.00 hrs, Volume= 1.852 af
Primary = 7.16 cfs @ 12.00 hrs, Volume= 1.852 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 10.00-200.00 hrs, dt= 0.10 hrs

Link 1L: POA 1**Hydrograph**

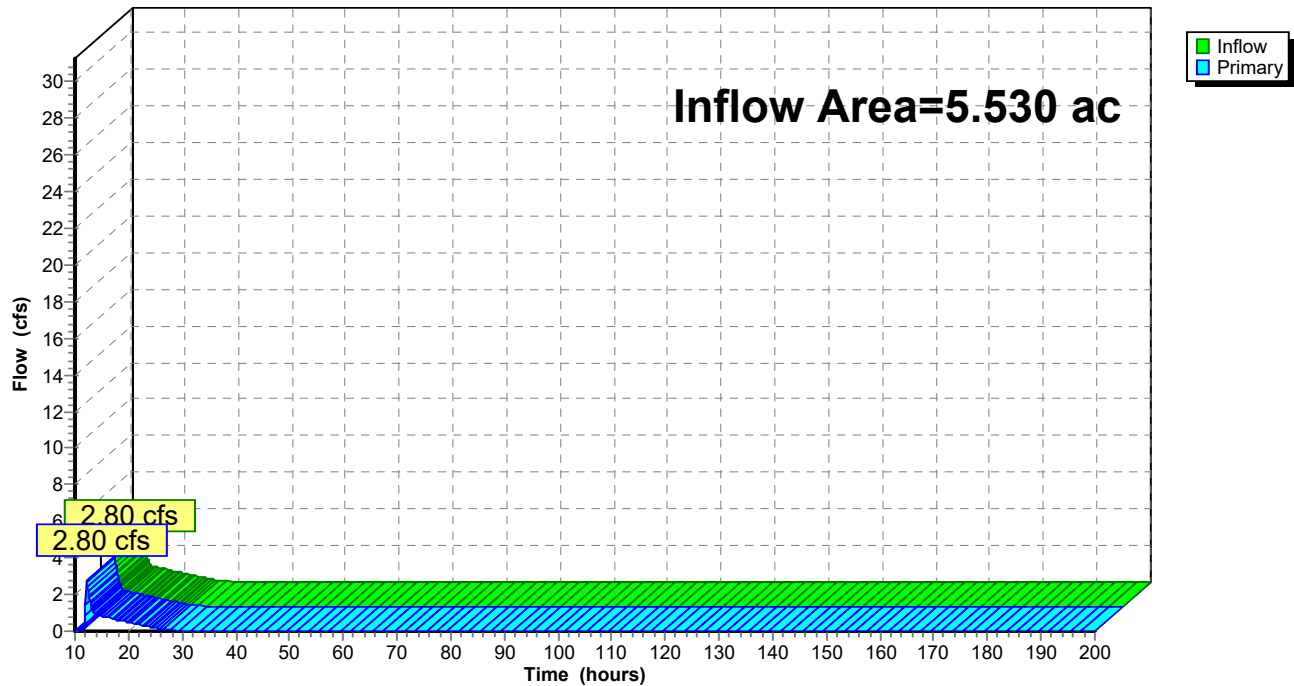
Summary for Link 2L: POA 2

Inflow Area = 5.530 ac, 55.03% Impervious, Inflow Depth > 1.75" for 2-yr event
Inflow = 2.80 cfs @ 12.19 hrs, Volume= 0.806 af
Primary = 2.80 cfs @ 12.19 hrs, Volume= 0.806 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 10.00-200.00 hrs, dt= 0.10 hrs

Link 2L: POA 2

Hydrograph



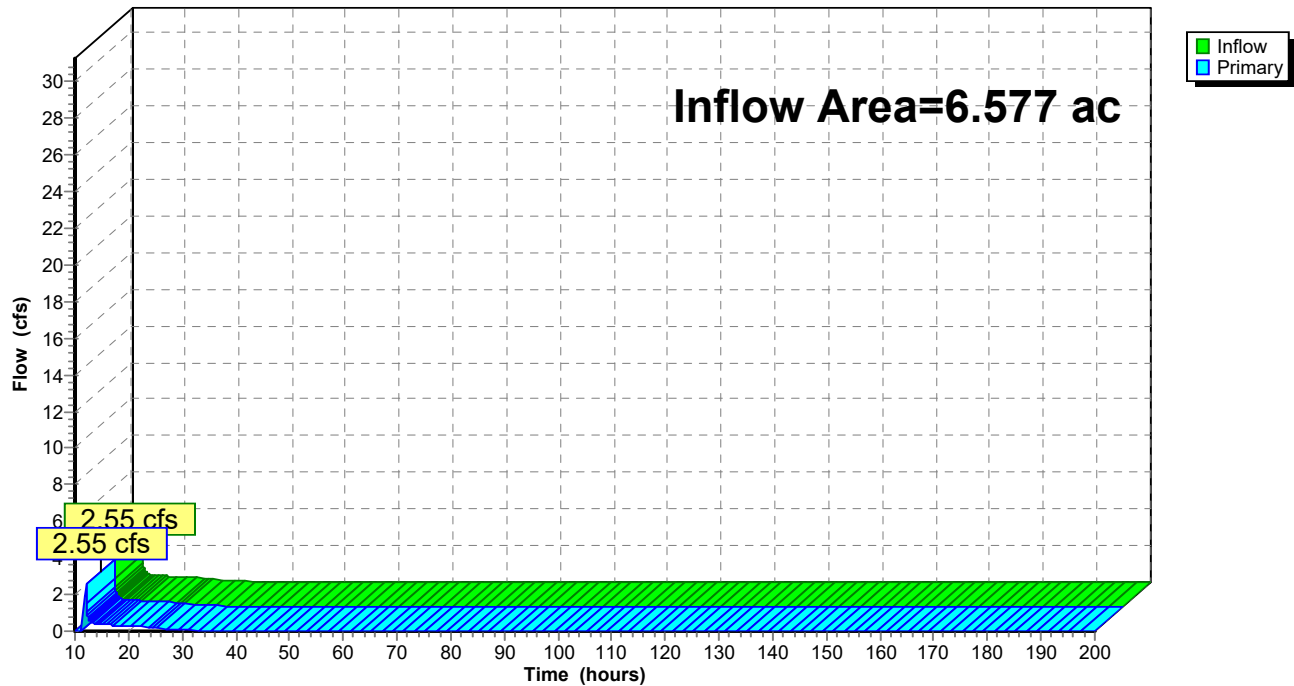
Summary for Link 3L: POA 4

Inflow Area = 6.577 ac, 32.63% Impervious, Inflow Depth = 0.90" for 2-yr event
Inflow = 2.55 cfs @ 12.09 hrs, Volume= 0.491 af
Primary = 2.55 cfs @ 12.09 hrs, Volume= 0.491 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 10.00-200.00 hrs, dt= 0.10 hrs

Link 3L: POA 4

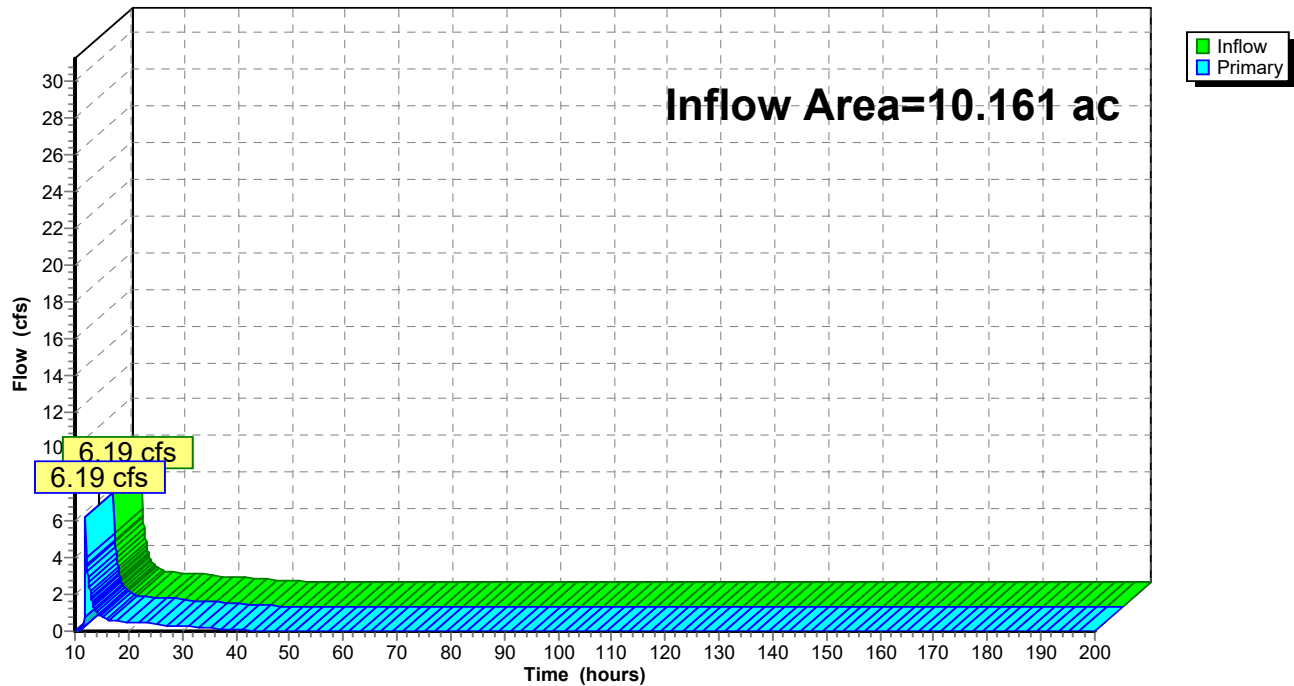
Hydrograph



Summary for Link 4L: POA 5

Inflow Area = 10.161 ac, 31.27% Impervious, Inflow Depth > 1.50" for 2-yr event
Inflow = 6.19 cfs @ 12.00 hrs, Volume= 1.270 af
Primary = 6.19 cfs @ 12.00 hrs, Volume= 1.270 af, Atten= 0%, Lag= 0.0 min

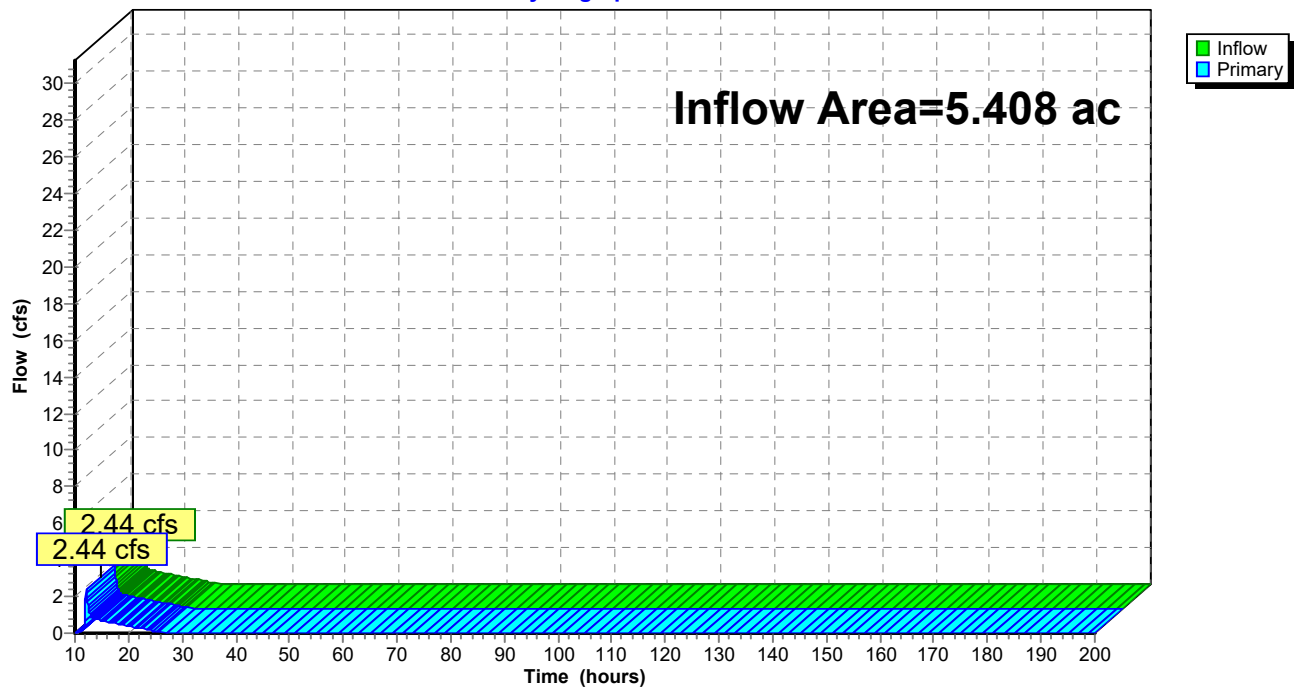
Primary outflow = Inflow, Time Span= 10.00-200.00 hrs, dt= 0.10 hrs

Link 4L: POA 5**Hydrograph**

Summary for Link 5L: POA 6

Inflow Area = 5.408 ac, 40.28% Impervious, Inflow Depth > 1.40" for 2-yr event
Inflow = 2.44 cfs @ 12.12 hrs, Volume= 0.630 af
Primary = 2.44 cfs @ 12.12 hrs, Volume= 0.630 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 10.00-200.00 hrs, dt= 0.10 hrs

Link 5L: POA 6**Hydrograph**

Time span=10.00-200.00 hrs, dt=0.10 hrs, 1901 points

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN

Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1S: Pre Dev. Basin 1	Runoff Area=366,801 sf 0.00% Impervious Runoff Depth>4.05"
Flow Length=560'	Slope=0.0630 '/' Tc=5.9 min CN=79 Runoff=55.25 cfs 2.842 af
Subcatchment2S: Pre Dev. Basin 2A	Runoff Area=250,337 sf 0.00% Impervious Runoff Depth>4.05"
Flow Length=803'	Slope=0.0650 '/' Tc=7.7 min CN=79 Runoff=37.13 cfs 1.940 af
Subcatchment3S: Pre Dev. Basin 2B	Runoff Area=132,113 sf 0.00% Impervious Runoff Depth=2.28"
Flow Length=577'	Slope=0.0451 '/' Tc=6.9 min CN=60 Runoff=11.06 cfs 0.577 af
Subcatchment4S: Pre Dev. Basin 2C	Runoff Area=467,737 sf 32.11% Impervious Runoff Depth>4.49"
Flow Length=753'	Slope=0.0633 '/' Tc=7.4 min CN=84 Runoff=77.04 cfs 4.015 af
Subcatchment6S: Pre Dev. Basin 3	Runoff Area=52,001 sf 0.00% Impervious Runoff Depth>3.31"
Flow Length=243'	Slope=0.0170 '/' Tc=5.1 min CN=71 Runoff=6.38 cfs 0.330 af
Subcatchment7S: Pre Dev. Basin 4	Runoff Area=130,388 sf 0.00% Impervious Runoff Depth=2.19"
Flow Length=561'	Slope=0.0221 '/' Tc=8.9 min CN=59 Runoff=9.74 cfs 0.547 af
Subcatchment8S: Pre Dev. Basin 5	Runoff Area=305,128 sf 0.00% Impervious Runoff Depth=2.19"
Flow Length=998'	Slope=0.0301 '/' Tc=12.3 min CN=59 Runoff=19.38 cfs 1.280 af
Subcatchment9S: Pre Dev. Basin 6	Runoff Area=441,055 sf 0.00% Impervious Runoff Depth=2.28"
Flow Length=1,222'	Slope=0.0441 '/' Tc=12.4 min CN=60 Runoff=29.27 cfs 1.927 af
Subcatchment10S: Pre Dev. Basin 7	Runoff Area=238,293 sf 0.00% Impervious Runoff Depth=2.01"
Flow Length=977'	Slope=0.0468 '/' Tc=10.2 min CN=57 Runoff=15.13 cfs 0.918 af
Subcatchment11S: Pre Dev. Basin 8	Runoff Area=289,814 sf 0.00% Impervious Runoff Depth=2.47"
Flow Length=826'	Slope=0.0447 '/' Tc=9.1 min CN=62 Runoff=24.46 cfs 1.368 af
Subcatchment12S: Post Basin 1 to SCM	Runoff Area=332,471 sf 78.15% Impervious Runoff Depth>4.88"
	Tc=5.0 min CN=89 Runoff=57.43 cfs 3.102 af
Subcatchment13S: Post Dev Bypass 1	Runoff Area=180,474 sf 3.97% Impervious Runoff Depth=2.28"
	Tc=5.0 min CN=60 Runoff=15.16 cfs 0.788 af
Subcatchment14S: Post Dev. Bypass 2A	Runoff Area=120,581 sf 0.00% Impervious Runoff Depth>4.05"
Flow Length=421'	Slope=0.0411 '/' Tc=5.6 min CN=79 Runoff=18.12 cfs 0.934 af
Subcatchment15S: Post Dev. Basin 2B	Runoff Area=182,292 sf 72.71% Impervious Runoff Depth>4.48"
	Tc=5.0 min CN=84 Runoff=29.94 cfs 1.563 af
Subcatchment16S: Post Dev. Bypass 2C	Runoff Area=414,715 sf 36.24% Impervious Runoff Depth>4.57"
Flow Length=760'	Slope=0.0633 '/' Tc=7.5 min CN=85 Runoff=69.39 cfs 3.626 af
Subcatchment18S: Post Dev Bypass 2B	Runoff Area=58,575 sf 0.00% Impervious Runoff Depth=1.75"
	Tc=5.0 min CN=54 Runoff=3.69 cfs 0.196 af

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Type II 24-hr 25-yr Rainfall=6.54"

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Subcatchment19S: Post Dev. Basin 3	Runoff Area=48,549 sf 0.00% Impervious Runoff Depth>3.22" Tc=5.0 min CN=70 Runoff=5.78 cfs 0.299 af
Subcatchment20S: Post Dev. Basin 4	Runoff Area=29,236 sf 11.81% Impervious Runoff Depth=2.47" Tc=5.0 min CN=62 Runoff=2.66 cfs 0.138 af
Subcatchment21S: Post Dev. Basin 5 to	Runoff Area=120,435 sf 67.31% Impervious Runoff Depth>4.73" Tc=5.0 min CN=87 Runoff=20.19 cfs 1.089 af
Subcatchment22S: Post Dev. Bypass 5	Runoff Area=166,064 sf 7.47% Impervious Runoff Depth=2.19" Tc=12.3 min CN=59 Runoff=10.55 cfs 0.696 af
Subcatchment23S: Post Dev. Basin 6 to	Runoff Area=181,059 sf 74.10% Impervious Runoff Depth>5.02" Tc=5.0 min CN=91 Runoff=32.11 cfs 1.738 af
Subcatchment24S: Post Dev. Bypass 6	Runoff Area=261,575 sf 1.63% Impervious Runoff Depth=2.28" Tc=5.0 min CN=60 Runoff=21.97 cfs 1.143 af
Subcatchment25S: Post Dev. Basin 7 to	Runoff Area=107,301 sf 73.79% Impervious Runoff Depth>4.80" Tc=5.0 min CN=88 Runoff=18.27 cfs 0.986 af
Subcatchment26S: Post Dev. Bypass 7	Runoff Area=128,254 sf 12.25% Impervious Runoff Depth=1.92" Tc=10.0 min CN=56 Runoff=7.80 cfs 0.472 af
Subcatchment27S: Post Dev. Bypass 8 Flow Length=826'	Runoff Area=289,814 sf 1.87% Impervious Runoff Depth=2.47" Slope=0.0447 '/' Tc=9.1 min CN=62 Runoff=24.46 cfs 1.368 af
Pond 1P: Sand Filter -SCM 1	Peak Elev=531.58' Storage=51,717 cf Inflow=57.43 cfs 3.102 af Outflow=29.10 cfs 3.102 af
Pond 2P: Wet Pond SCM 2	Peak Elev=528.94' Storage=70,497 cf Inflow=29.94 cfs 1.563 af Outflow=7.24 cfs 1.563 af
Pond 4P: Wet Pond SCM 4	Peak Elev=527.05' Storage=49,241 cf Inflow=32.11 cfs 1.738 af Outflow=7.31 cfs 1.738 af
Pond 5P: Wet Pond SCM 5	Peak Elev=516.94' Storage=28,603 cf Inflow=18.27 cfs 0.986 af Outflow=7.44 cfs 0.986 af
Pond 6P: Sand Filter -SCM 3	Peak Elev=535.27' Storage=23,028 cf Inflow=20.19 cfs 1.089 af Outflow=7.16 cfs 0.827 af
Link 1L: POA 1	Inflow=42.33 cfs 3.891 af Primary=42.33 cfs 3.891 af
Link 2L: POA 2	Inflow=9.99 cfs 1.759 af Primary=9.99 cfs 1.759 af
Link 3L: POA 4	Inflow=17.33 cfs 1.524 af Primary=17.33 cfs 1.524 af

32044.0000 - CZ COPY*Type II 24-hr 25-yr Rainfall=6.54"*

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Link 4L: POA 5

Inflow=27.76 cfs 2.881 af

Primary=27.76 cfs 2.881 af

Link 5L: POA 6

Inflow=15.02 cfs 1.458 af

Primary=15.02 cfs 1.458 af

Total Runoff Area = 121.558 ac Runoff Volume = 33.882 af Average Runoff Depth = 3.34"
80.44% Pervious = 97.782 ac 19.56% Impervious = 23.776 ac

Summary for Subcatchment 1S: Pre Dev. Basin 1

Runoff = 55.25 cfs @ 11.97 hrs, Volume= 2.842 af, Depth> 4.05"

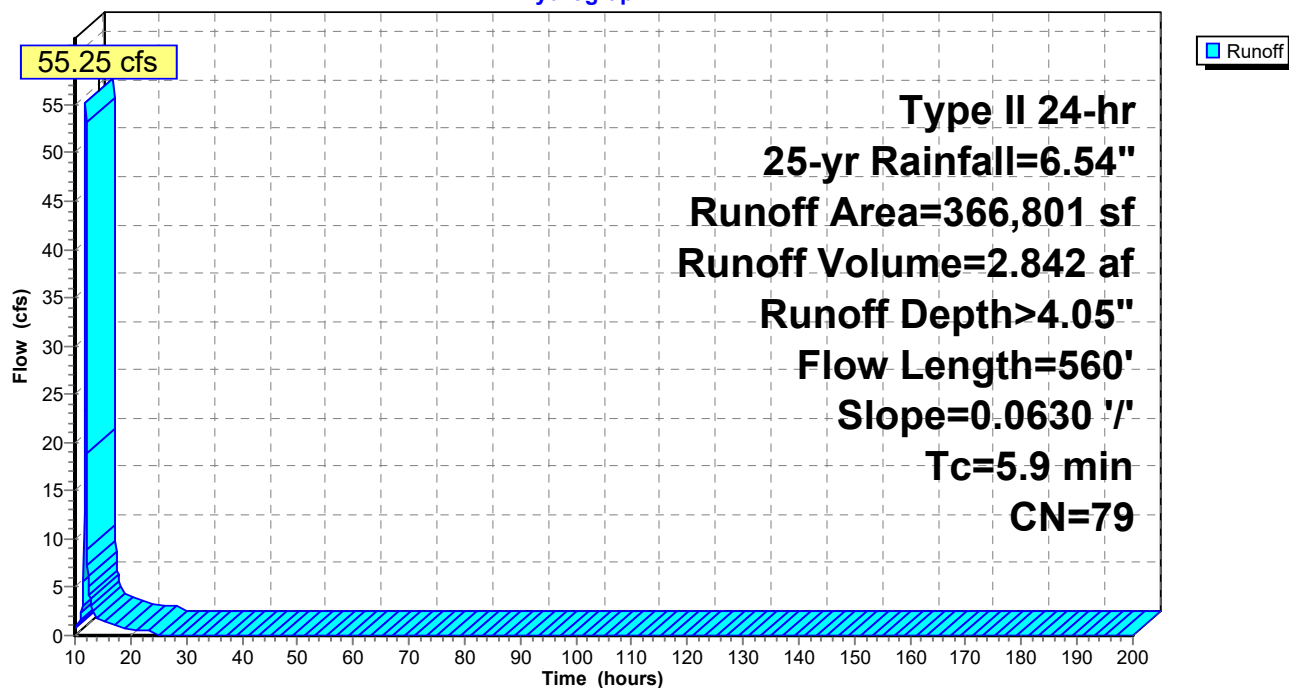
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-200.00 hrs, dt= 0.10 hrs
Type II 24-hr 25-yr Rainfall=6.54"

Area (sf)	CN	Description
342,042	79	Woods, Fair, HSG D
24,759	73	Brush, Good, HSG D
366,801	79	Weighted Average
366,801		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.9	560	0.0630	1.58		Kirpich Method, Estimated Tc General overland flow k= 2.00

Subcatchment 1S: Pre Dev. Basin 1

Hydrograph



Summary for Subcatchment 2S: Pre Dev. Basin 2A

Runoff = 37.13 cfs @ 11.99 hrs, Volume= 1.940 af, Depth> 4.05"

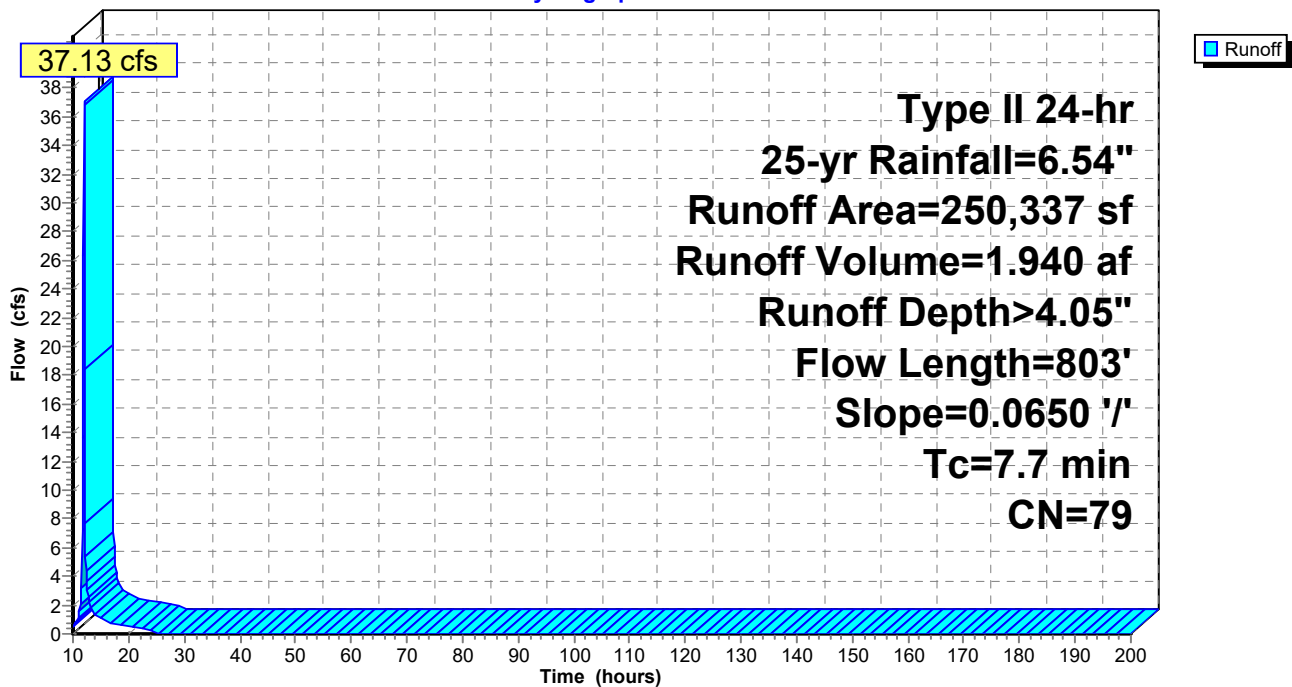
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-200.00 hrs, dt= 0.10 hrs
Type II 24-hr 25-yr Rainfall=6.54"

Area (sf)	CN	Description
250,337	79	Woods, Fair, HSG D
250,337		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.7	803	0.0650	1.74		Kirpich Method, Estimated Tc General overland flow k= 2.00

Subcatchment 2S: Pre Dev. Basin 2A

Hydrograph



Summary for Subcatchment 3S: Pre Dev. Basin 2B

Runoff = 11.06 cfs @ 11.99 hrs, Volume= 0.577 af, Depth= 2.28"

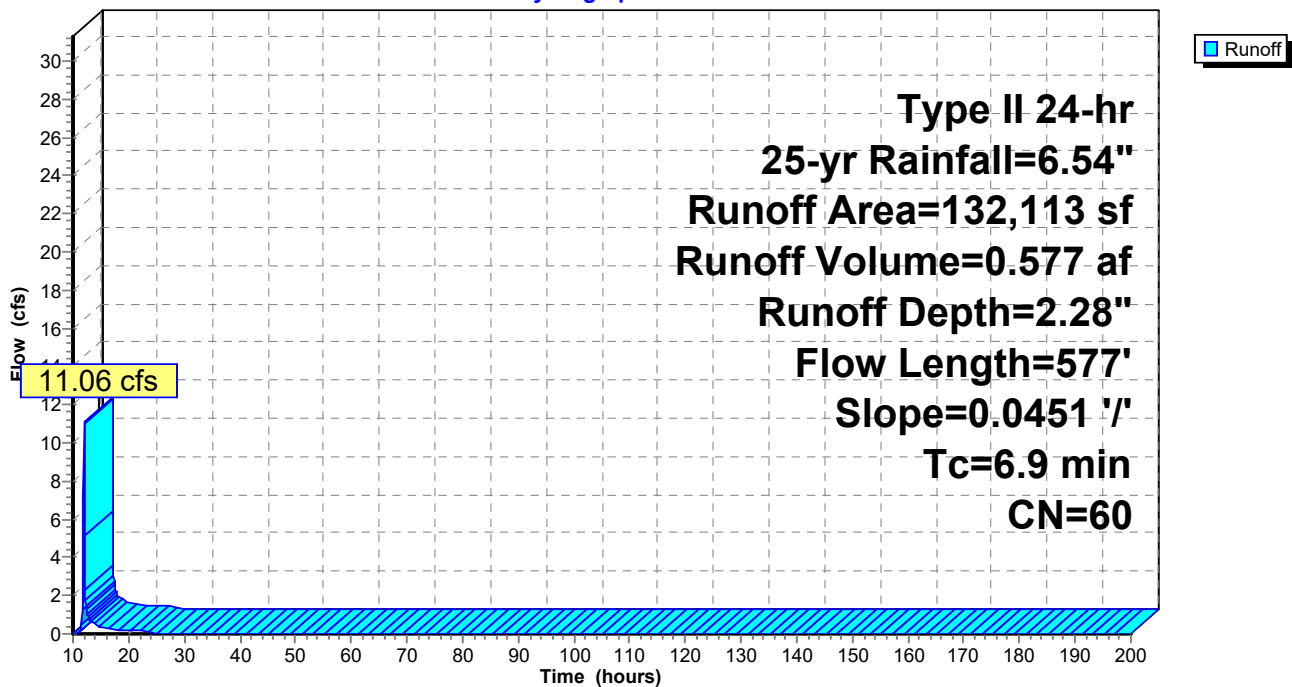
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-200.00 hrs, dt= 0.10 hrs
Type II 24-hr 25-yr Rainfall=6.54"

Area (sf)	CN	Description
132,113	60	Woods, Fair, HSG B
132,113		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.9	577	0.0451	1.40		Kirpich Method, Estimated Tc General overland flow k= 2.00

Subcatchment 3S: Pre Dev. Basin 2B

Hydrograph



Summary for Subcatchment 4S: Pre Dev. Basin 2C

Runoff = 77.04 cfs @ 11.98 hrs, Volume= 4.015 af, Depth> 4.49"

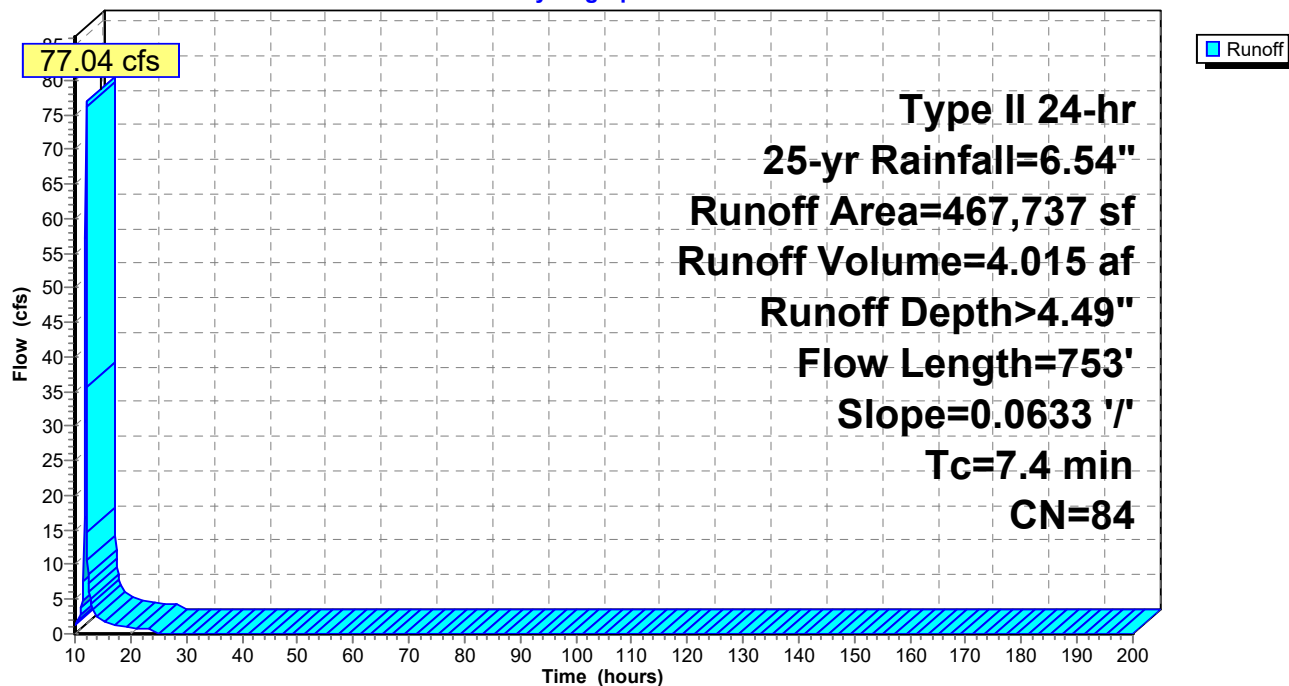
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-200.00 hrs, dt= 0.10 hrs
Type II 24-hr 25-yr Rainfall=6.54"

Area (sf)	CN	Description
173,689	79	Woods, Fair, HSG D
143,869	77	Brush, Fair, HSG D
90,721	98	Paved parking, HSG D
59,458	98	Roofs, HSG D
467,737	84	Weighted Average
317,558		67.89% Pervious Area
150,179		32.11% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.4	753	0.0633	1.69		Kirpich Method, Estimated Tc General overland flow k= 2.00

Subcatchment 4S: Pre Dev. Basin 2C

Hydrograph



Summary for Subcatchment 6S: Pre Dev. Basin 3

Runoff = 6.38 cfs @ 11.96 hrs, Volume= 0.330 af, Depth> 3.31"

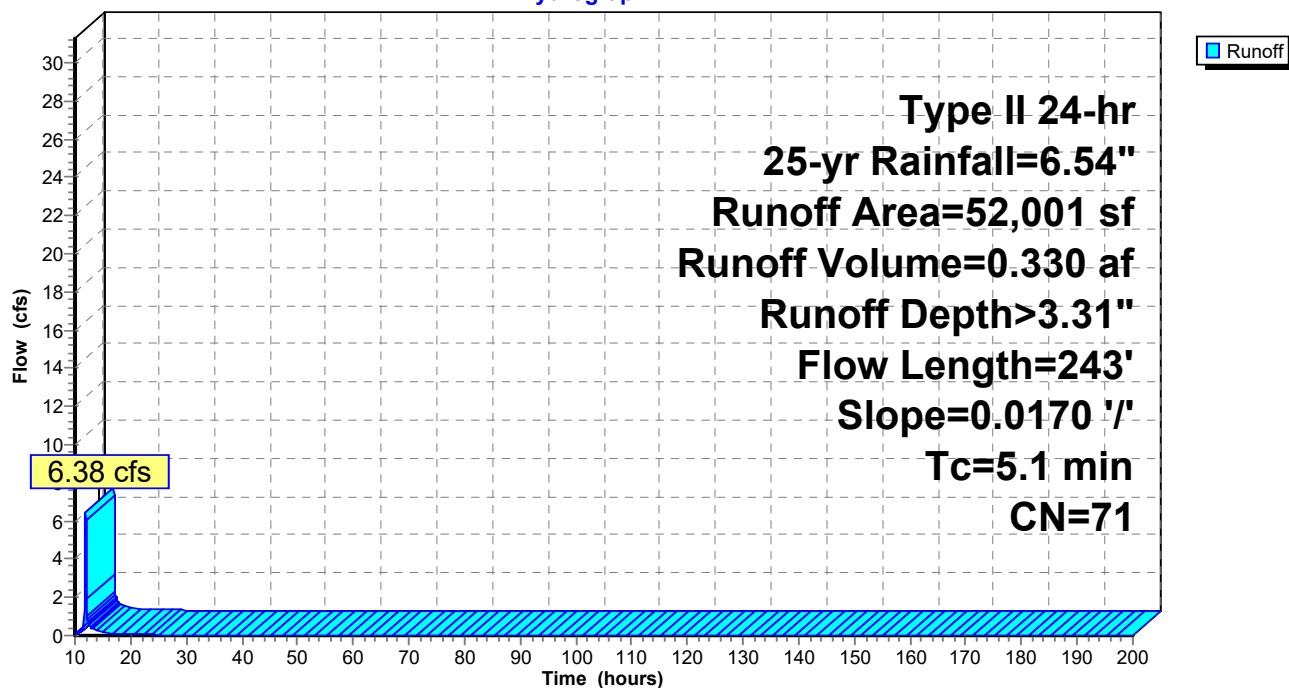
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-200.00 hrs, dt= 0.10 hrs
Type II 24-hr 25-yr Rainfall=6.54"

Area (sf)	CN	Description
9,925	73	Woods, Fair, HSG C
42,076	70	Brush, Fair, HSG C
52,001	71	Weighted Average
52,001		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.1	243	0.0170	0.79		Kirpich Method, Estimated Tc General overland flow k= 2.00

Subcatchment 6S: Pre Dev. Basin 3

Hydrograph



Summary for Subcatchment 7S: Pre Dev. Basin 4

Runoff = 9.74 cfs @ 12.01 hrs, Volume= 0.547 af, Depth= 2.19"

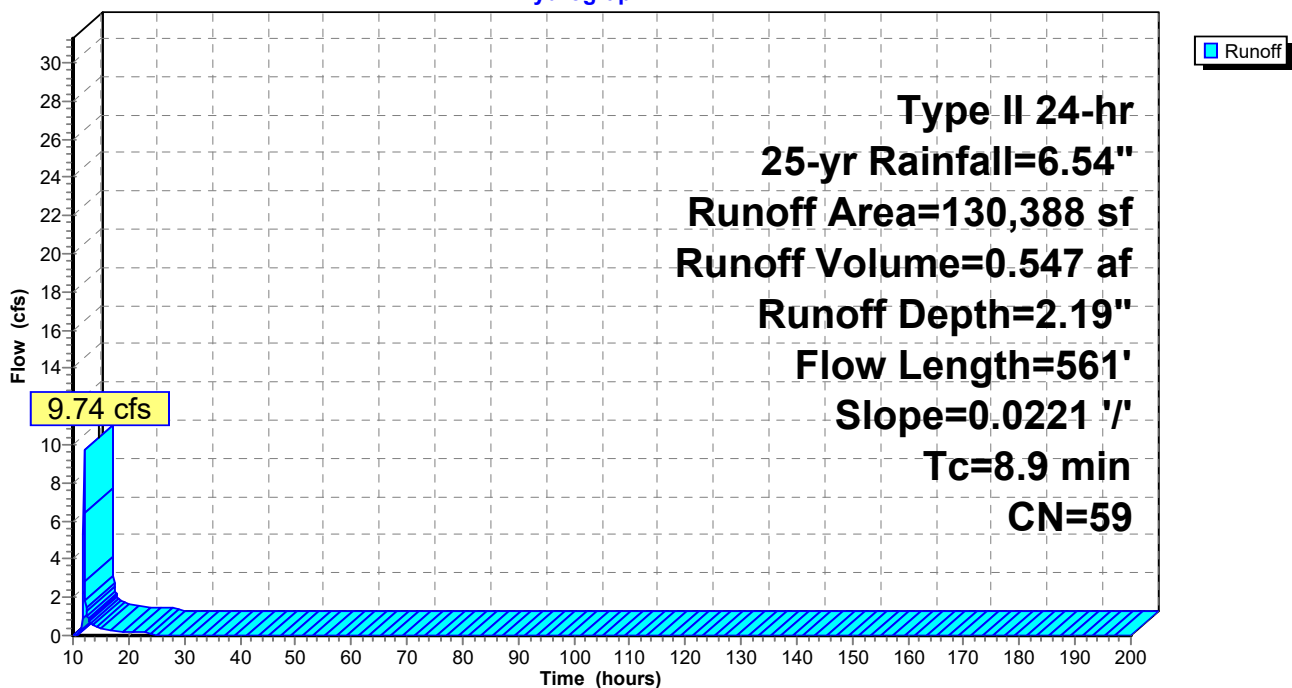
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-200.00 hrs, dt= 0.10 hrs
Type II 24-hr 25-yr Rainfall=6.54"

Area (sf)	CN	Description
104,102	60	Woods, Fair, HSG B
26,286	56	Brush, Fair, HSG B
130,388	59	Weighted Average
130,388		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.9	561	0.0221	1.06		Kirpich Method, General overland flow k= 2.00

Subcatchment 7S: Pre Dev. Basin 4

Hydrograph



Summary for Subcatchment 8S: Pre Dev. Basin 5

Runoff = 19.38 cfs @ 12.05 hrs, Volume= 1.280 af, Depth= 2.19"

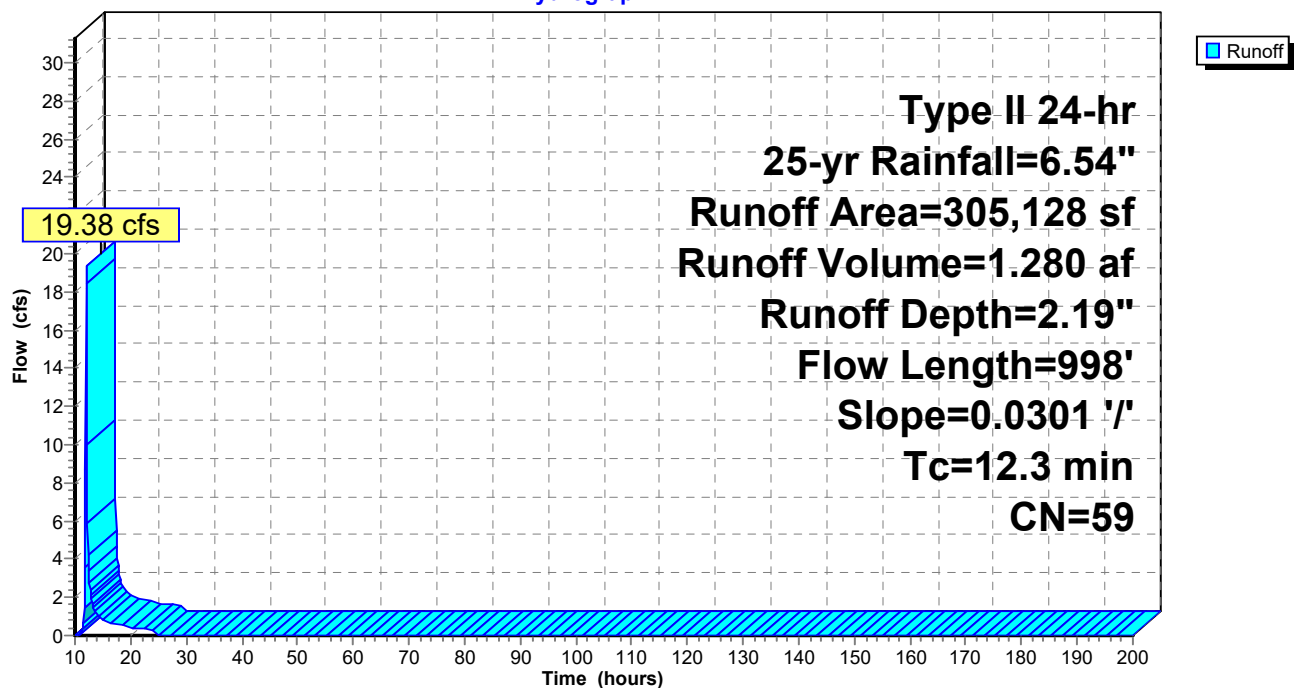
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-200.00 hrs, dt= 0.10 hrs
Type II 24-hr 25-yr Rainfall=6.54"

Area (sf)	CN	Description
267,919	60	Woods, Fair, HSG B
37,209	48	Brush, Good, HSG B
305,128	59	Weighted Average
305,128		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.3	998	0.0301	1.36		Kirpich Method, Estimated Tc General overland flow k= 2.00

Subcatchment 8S: Pre Dev. Basin 5

Hydrograph



Summary for Subcatchment 9S: Pre Dev. Basin 6

Runoff = 29.27 cfs @ 12.05 hrs, Volume= 1.927 af, Depth= 2.28"

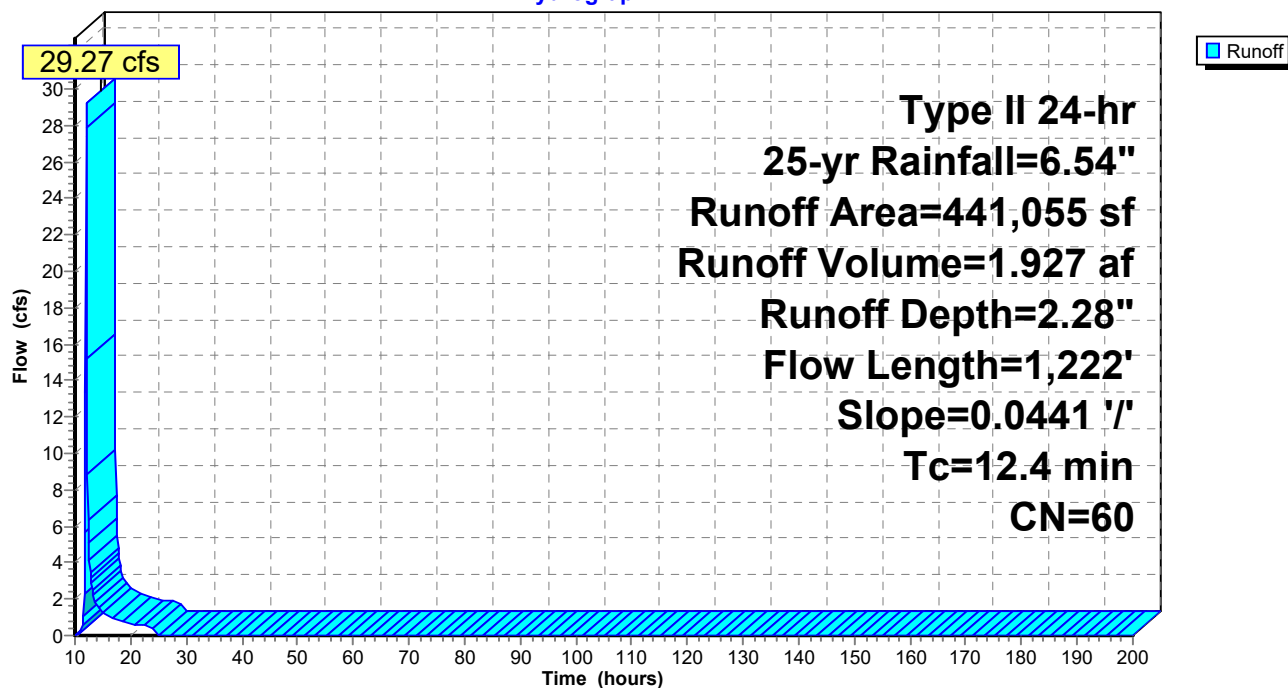
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-200.00 hrs, dt= 0.10 hrs
Type II 24-hr 25-yr Rainfall=6.54"

Area (sf)	CN	Description
401,238	60	Woods, Fair, HSG B
39,817	56	Brush, Fair, HSG B
441,055	60	Weighted Average
441,055		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.4	1,222	0.0441	1.65		Kirpich Method, Estimated Tc General overland flow k= 2.00

Subcatchment 9S: Pre Dev. Basin 6

Hydrograph



Summary for Subcatchment 10S: Pre Dev. Basin 7

Runoff = 15.13 cfs @ 12.02 hrs, Volume= 0.918 af, Depth= 2.01"

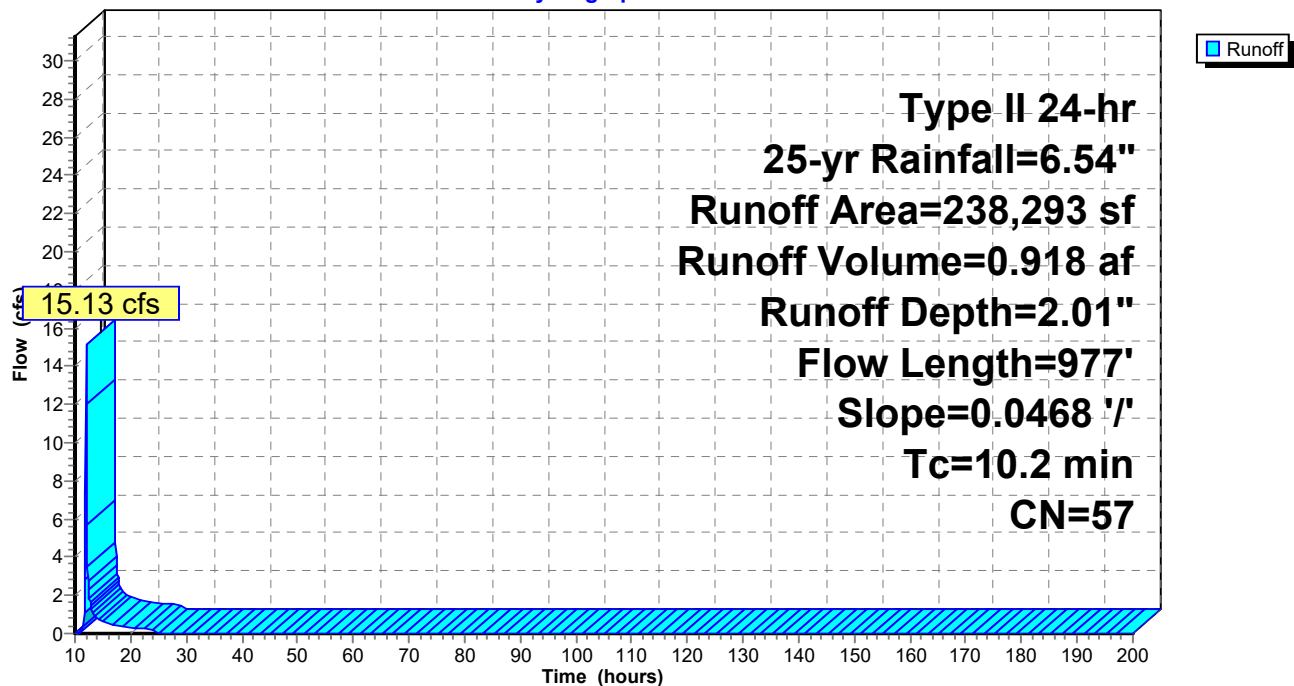
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-200.00 hrs, dt= 0.10 hrs
Type II 24-hr 25-yr Rainfall=6.54"

Area (sf)	CN	Description
207,447	55	Woods, Good, HSG B
30,846	69	Pasture/grassland/range, Fair, HSG B
238,293	57	Weighted Average
238,293		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.2	977	0.0468	1.60		Kirpich Method, Estimated Tc General overland flow k= 2.00

Subcatchment 10S: Pre Dev. Basin 7

Hydrograph



Summary for Subcatchment 11S: Pre Dev. Basin 8

Runoff = 24.46 cfs @ 12.01 hrs, Volume= 1.368 af, Depth= 2.47"

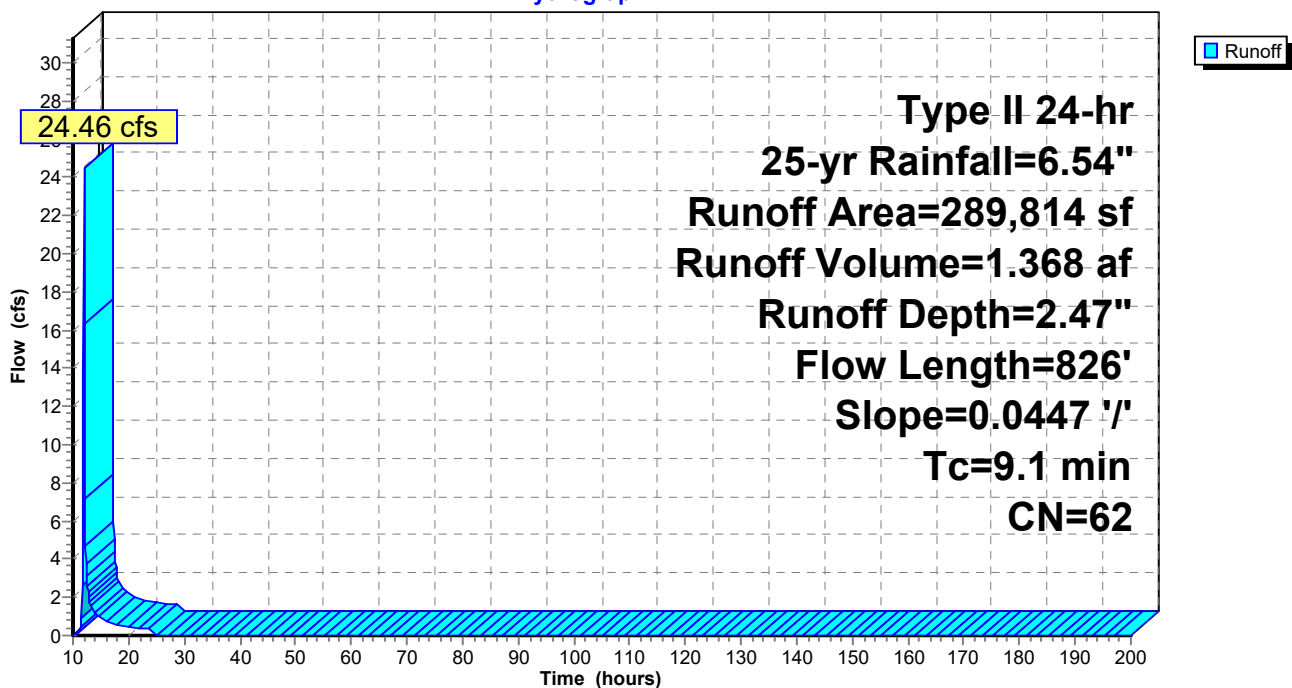
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-200.00 hrs, dt= 0.10 hrs
Type II 24-hr 25-yr Rainfall=6.54"

Area (sf)	CN	Description
230,959	60	Woods, Fair, HSG B
58,855	69	50-75% Grass cover, Fair, HSG B
289,814	62	Weighted Average
289,814		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.1	826	0.0447	1.51		Kirpich Method, General overland flow k= 2.00

Subcatchment 11S: Pre Dev. Basin 8

Hydrograph



Summary for Subcatchment 12S: Post Basin 1 to SCM

Runoff = 57.43 cfs @ 11.95 hrs, Volume= 3.102 af, Depth> 4.88"
 Routed to Pond 1P : Sand Filter -SCM 1

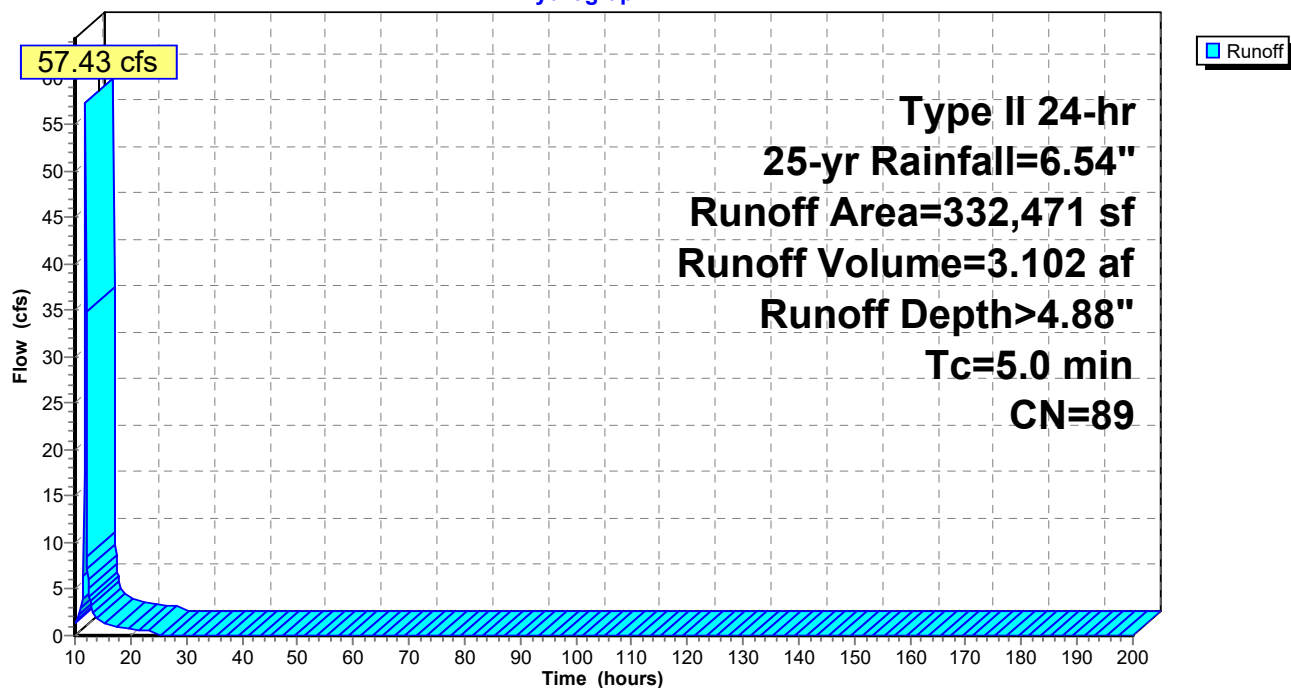
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-200.00 hrs, dt= 0.10 hrs
 Type II 24-hr 25-yr Rainfall=6.54"

Area (sf)	CN	Description
109,684	98	Paved parking, HSG A
72,655	56	Brush, Fair, HSG B
150,132	98	Roofs, HSG B
332,471	89	Weighted Average
72,655		21.85% Pervious Area
259,816		78.15% Impervious Area

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

Subcatchment 12S: Post Basin 1 to SCM

Hydrograph



Summary for Subcatchment 13S: Post Dev Bypass 1

Runoff = 15.16 cfs @ 11.97 hrs, Volume= 0.788 af, Depth= 2.28"
 Routed to Link 1L : POA 1

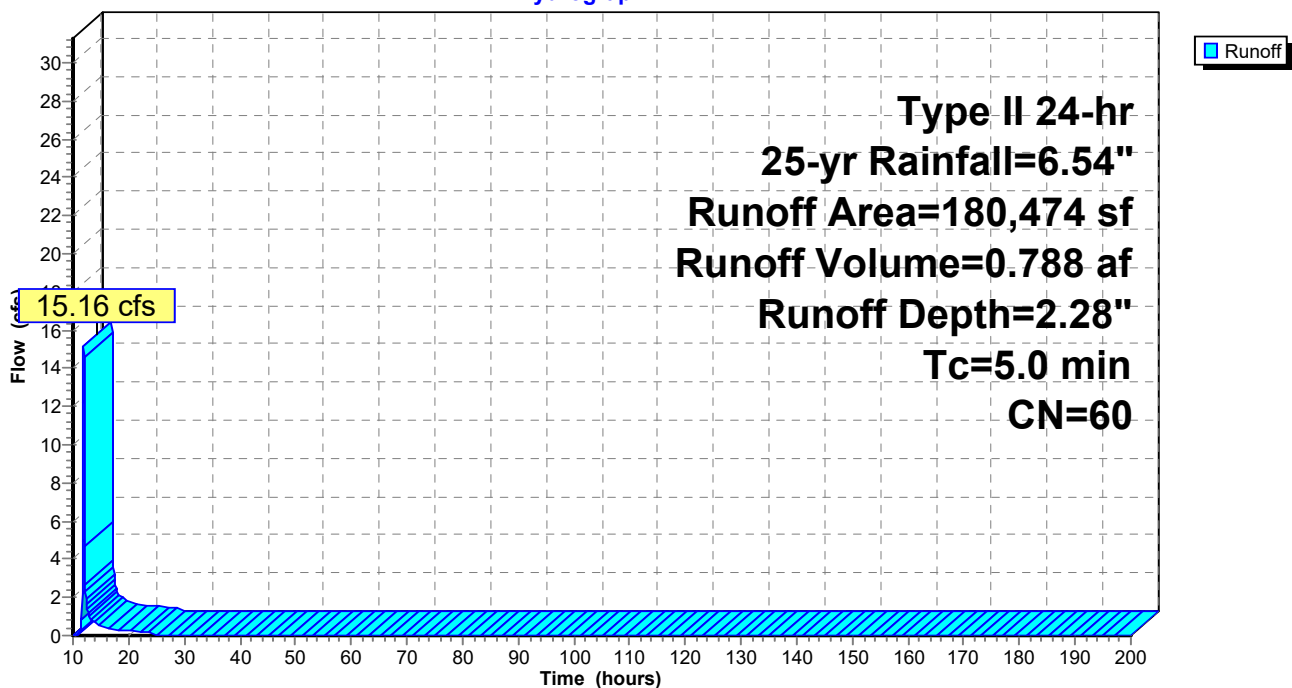
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-200.00 hrs, dt= 0.10 hrs
 Type II 24-hr 25-yr Rainfall=6.54"

Area (sf)	CN	Description
124,058	60	Woods, Fair, HSG B
49,243	56	Brush, Fair, HSG B
7,173	98	Paved parking, HSG B
180,474	60	Weighted Average
173,301		96.03% Pervious Area
7,173		3.97% Impervious Area

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

Subcatchment 13S: Post Dev Bypass 1

Hydrograph



Summary for Subcatchment 14S: Post Dev. Bypass 2A

Runoff = 18.12 cfs @ 11.96 hrs, Volume= 0.934 af, Depth> 4.05"

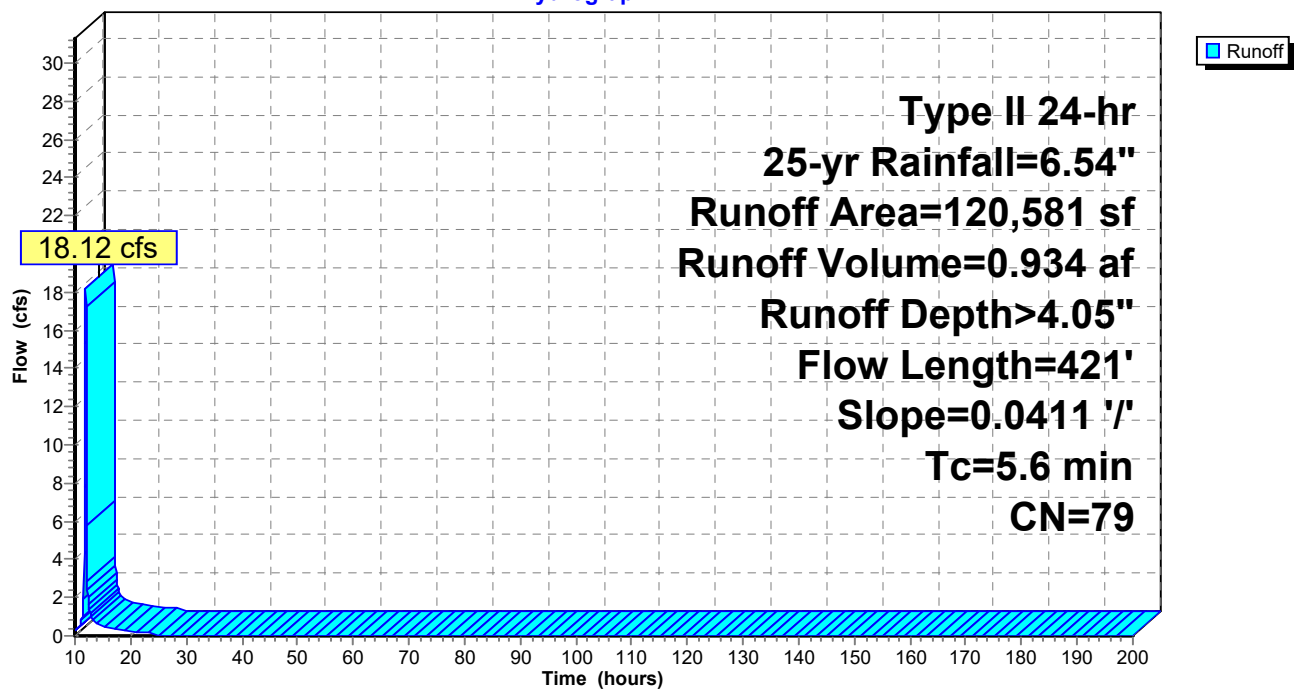
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-200.00 hrs, dt= 0.10 hrs
Type II 24-hr 25-yr Rainfall=6.54"

Area (sf)	CN	Description
120,581	79	Woods, Fair, HSG D
120,581		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.6	421	0.0411	1.25		Kirpich Method, Estimated Tc General overland flow k= 2.00

Subcatchment 14S: Post Dev. Bypass 2A

Hydrograph



Summary for Subcatchment 15S: Post Dev. Basin 2B to SCM

Runoff = 29.94 cfs @ 11.95 hrs, Volume= 1.563 af, Depth> 4.48"
 Routed to Pond 2P : Wet Pond SCM 2

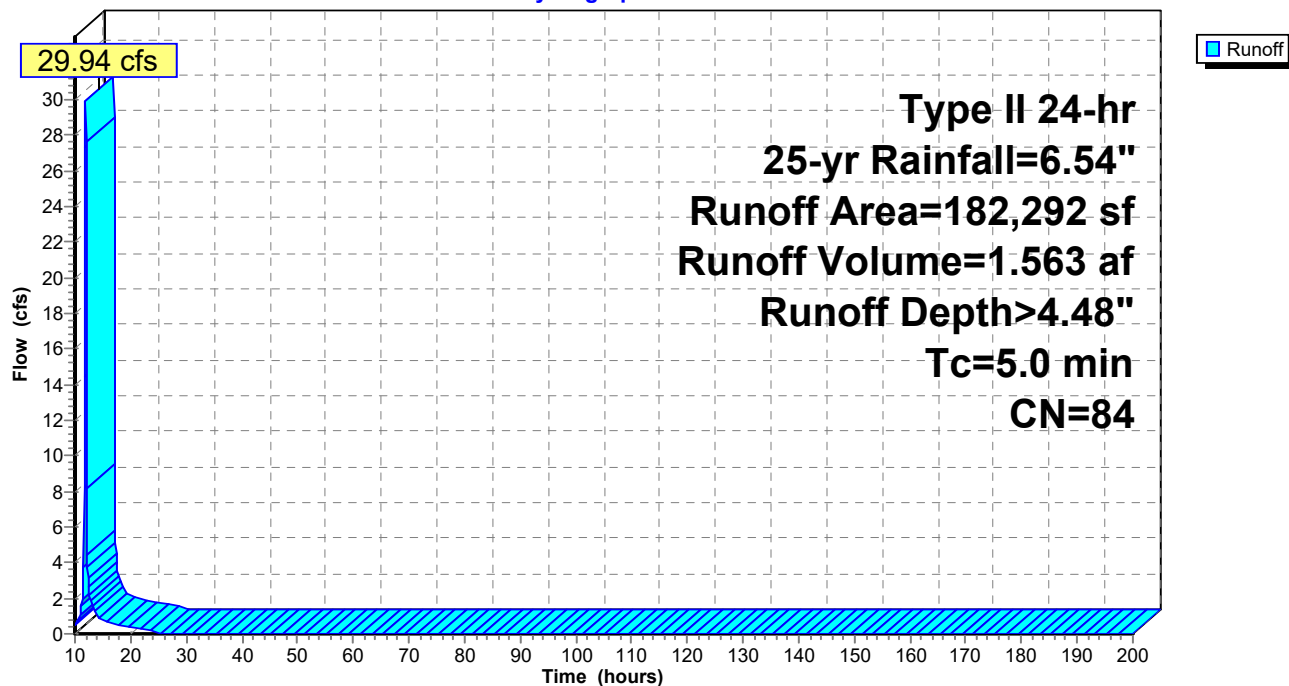
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-200.00 hrs, dt= 0.10 hrs
 Type II 24-hr 25-yr Rainfall=6.54"

Area (sf)	CN	Description
26,969	98	Paved parking, HSG B
49,749	48	Brush, Good, HSG B
95,673	98	Roofs, HSG B
9,901	98	Water Surface, HSG B
182,292	84	Weighted Average
49,749		27.29% Pervious Area
132,543		72.71% Impervious Area

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

Subcatchment 15S: Post Dev. Basin 2B to SCM

Hydrograph



Summary for Subcatchment 16S: Post Dev. Bypass 2C

Runoff = 69.39 cfs @ 11.98 hrs, Volume= 3.626 af, Depth> 4.57"

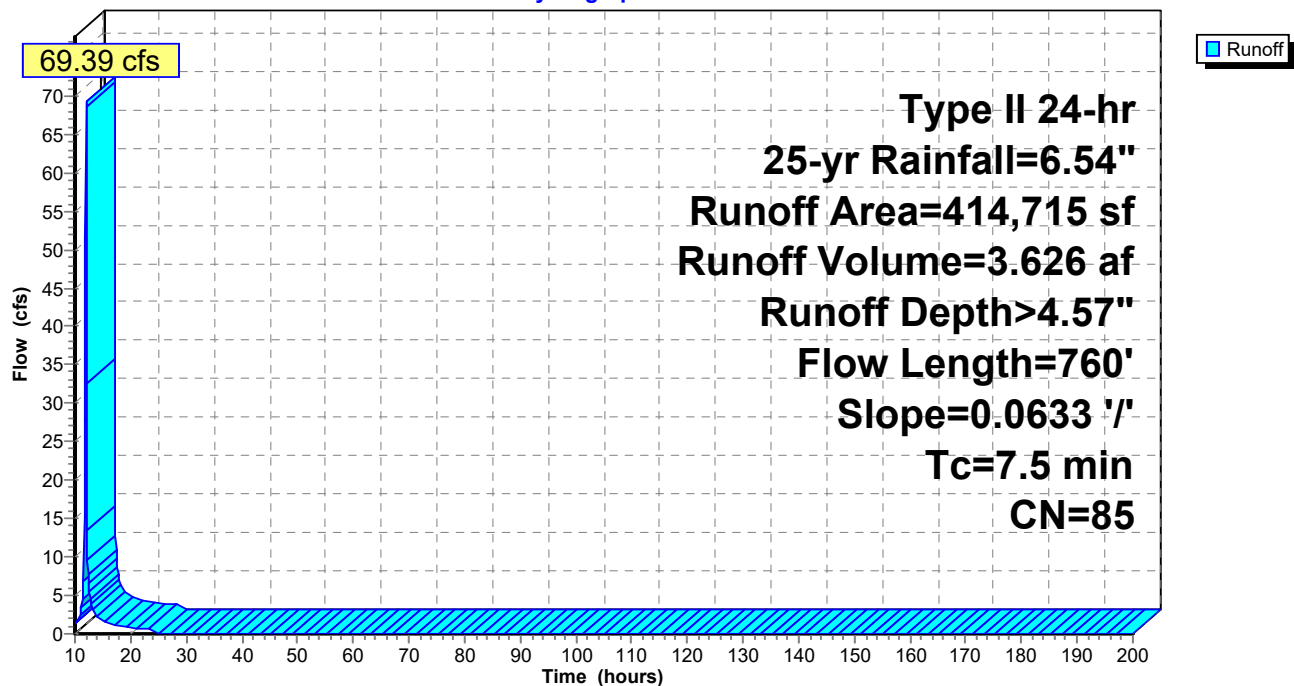
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-200.00 hrs, dt= 0.10 hrs
Type II 24-hr 25-yr Rainfall=6.54"

Area (sf)	CN	Description
173,689	79	Woods, Fair, HSG D
90,847	98	Paved parking, HSG D
90,721	77	Brush, Fair, HSG D
59,458	98	Roofs, HSG D
414,715	85	Weighted Average
264,410		63.76% Pervious Area
150,305		36.24% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.5	760	0.0633	1.70		Kirpich Method, Estimated Tc General overland flow k= 2.00

Subcatchment 16S: Post Dev. Bypass 2C

Hydrograph



Summary for Subcatchment 18S: Post Dev Bypass 2B

Runoff = 3.69 cfs @ 11.98 hrs, Volume= 0.196 af, Depth= 1.75"
 Routed to Link 2L : POA 2

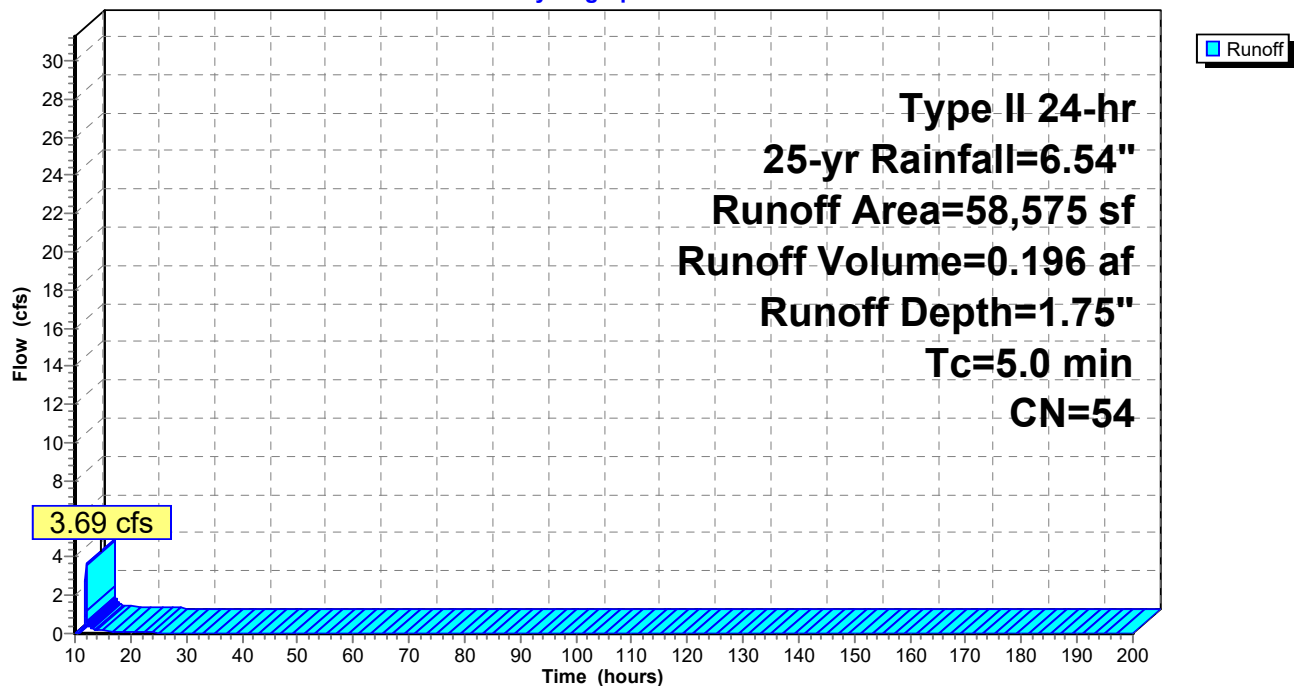
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-200.00 hrs, dt= 0.10 hrs
 Type II 24-hr 25-yr Rainfall=6.54"

Area (sf)	CN	Description
53,889	55	Woods, Good, HSG B
4,686	48	Brush, Good, HSG B
58,575	54	Weighted Average
58,575		100.00% Pervious Area

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

Subcatchment 18S: Post Dev Bypass 2B

Hydrograph



Summary for Subcatchment 19S: Post Dev. Basin 3

Runoff = 5.78 cfs @ 11.96 hrs, Volume= 0.299 af, Depth> 3.22"

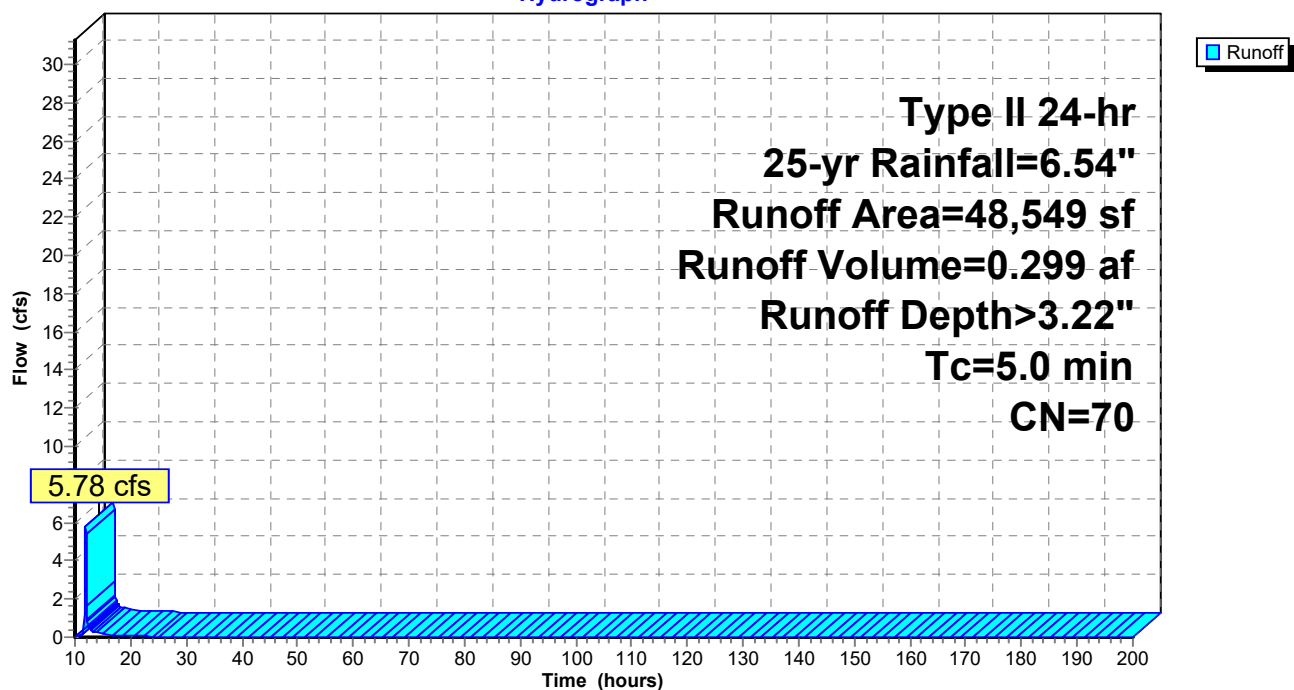
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-200.00 hrs, dt= 0.10 hrs
Type II 24-hr 25-yr Rainfall=6.54"

Area (sf)	CN	Description
48,549	70	Brush, Fair, HSG C
48,549		100.00% Pervious Area

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

Subcatchment 19S: Post Dev. Basin 3

Hydrograph



Summary for Subcatchment 20S: Post Dev. Basin 4

Runoff = 2.66 cfs @ 11.97 hrs, Volume= 0.138 af, Depth= 2.47"

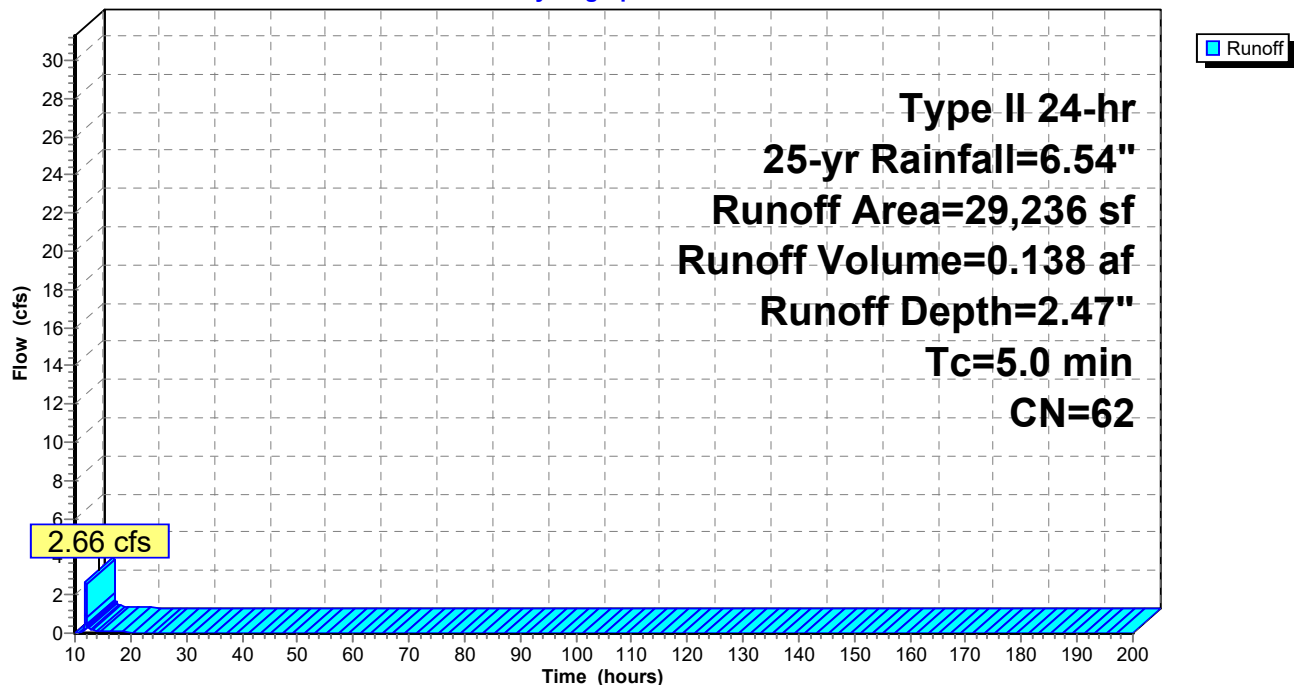
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-200.00 hrs, dt= 0.10 hrs
Type II 24-hr 25-yr Rainfall=6.54"

Area (sf)	CN	Description
6,194	60	Woods, Fair, HSG B
19,589	56	Brush, Fair, HSG B
3,453	98	Paved parking, HSG B
29,236	62	Weighted Average
25,783		88.19% Pervious Area
3,453		11.81% Impervious Area

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

Subcatchment 20S: Post Dev. Basin 4

Hydrograph



Summary for Subcatchment 21S: Post Dev. Basin 5 to SCM

Runoff = 20.19 cfs @ 11.95 hrs, Volume= 1.089 af, Depth> 4.73"
 Routed to Pond 6P : Sand Filter -SCM 3

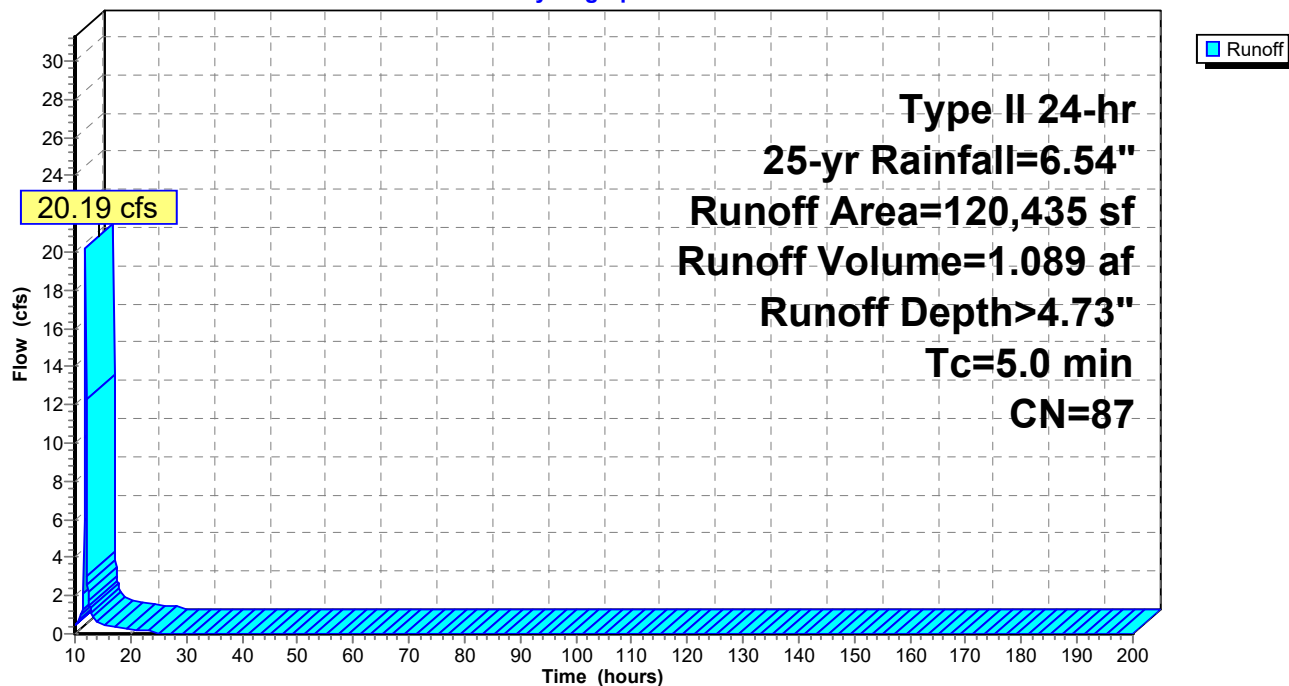
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-200.00 hrs, dt= 0.10 hrs
 Type II 24-hr 25-yr Rainfall=6.54"

Area (sf)	CN	Description
34,944	98	Roofs, HSG B
27,461	48	Brush, Good, HSG B
46,122	98	Paved parking, HSG B
11,908	98	Water Surface, 0% imp, HSG B
120,435	87	Weighted Average
39,369		32.69% Pervious Area
81,066		67.31% Impervious Area

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

Subcatchment 21S: Post Dev. Basin 5 to SCM

Hydrograph



Summary for Subcatchment 22S: Post Dev. Bypass 5

Runoff = 10.55 cfs @ 12.05 hrs, Volume= 0.696 af, Depth= 2.19"
 Routed to Link 3L : POA 4

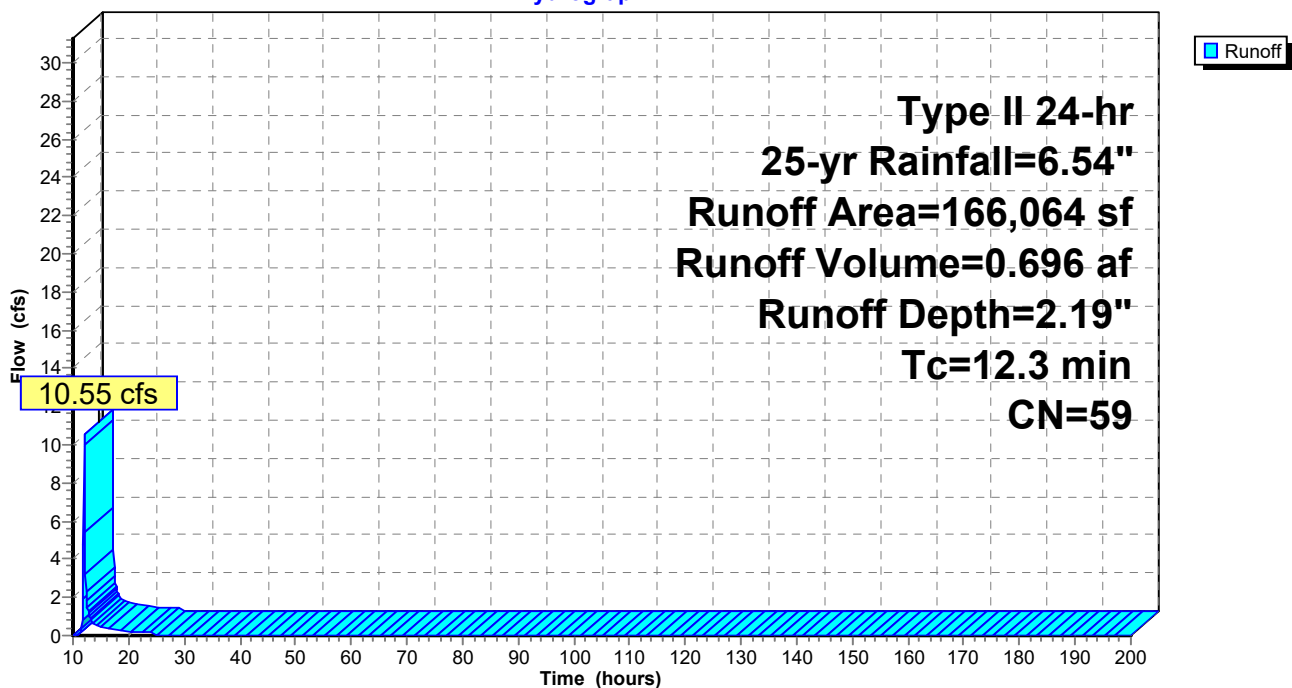
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-200.00 hrs, dt= 0.10 hrs
 Type II 24-hr 25-yr Rainfall=6.54"

Area (sf)	CN	Description
101,135	60	Woods, Fair, HSG B
52,516	48	Brush, Good, HSG B
12,413	98	Paved parking, HSG B
166,064	59	Weighted Average
153,651		92.53% Pervious Area
12,413		7.47% Impervious Area

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

Subcatchment 22S: Post Dev. Bypass 5

Hydrograph



Summary for Subcatchment 23S: Post Dev. Basin 6 to SCM

Runoff = 32.11 cfs @ 11.95 hrs, Volume= 1.738 af, Depth> 5.02"
 Routed to Pond 4P : Wet Pond SCM 4

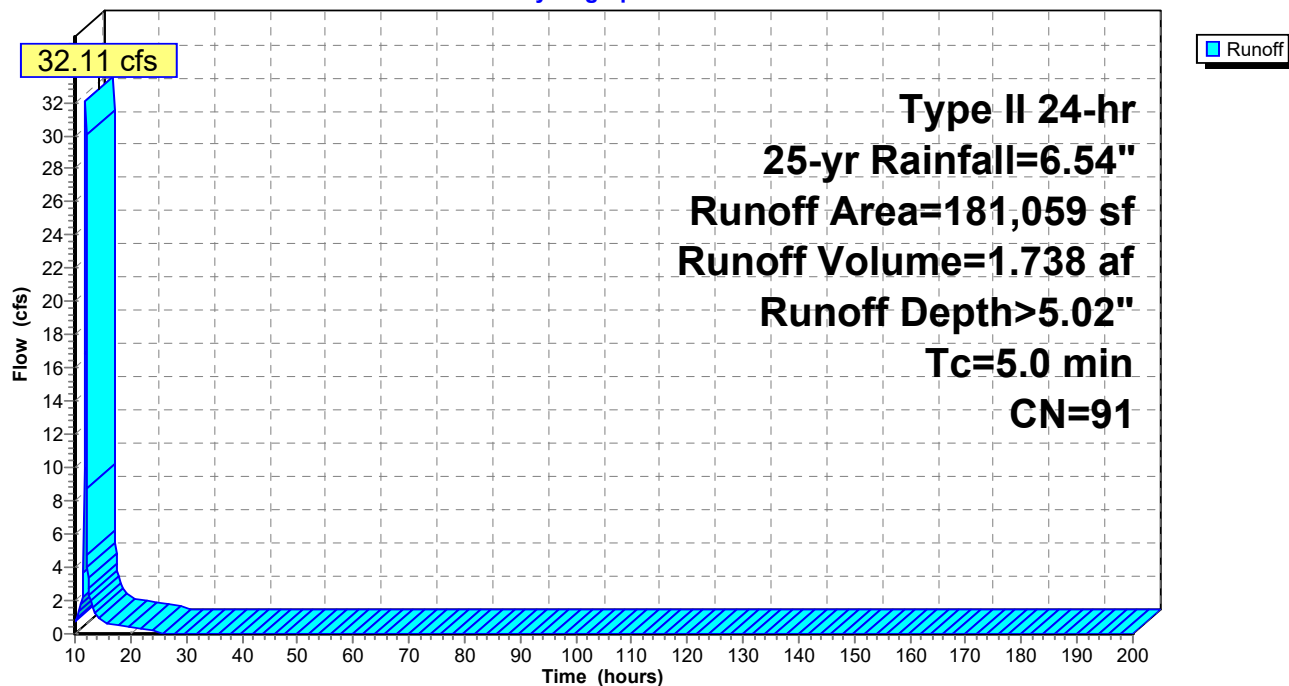
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-200.00 hrs, dt= 0.10 hrs
 Type II 24-hr 25-yr Rainfall=6.54"

Area (sf)	CN	Description
70,779	98	Paved parking, HSG B
32,683	61	>75% Grass cover, Good, HSG B
63,382	98	Roofs, HSG B
14,215	98	Water Surface, 0% imp, HSG B
181,059	91	Weighted Average
46,898		25.90% Pervious Area
134,161		74.10% Impervious Area

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

Subcatchment 23S: Post Dev. Basin 6 to SCM

Hydrograph



Summary for Subcatchment 24S: Post Dev. Bypass 6

Runoff = 21.97 cfs @ 11.97 hrs, Volume= 1.143 af, Depth= 2.28"
 Routed to Link 4L : POA 5

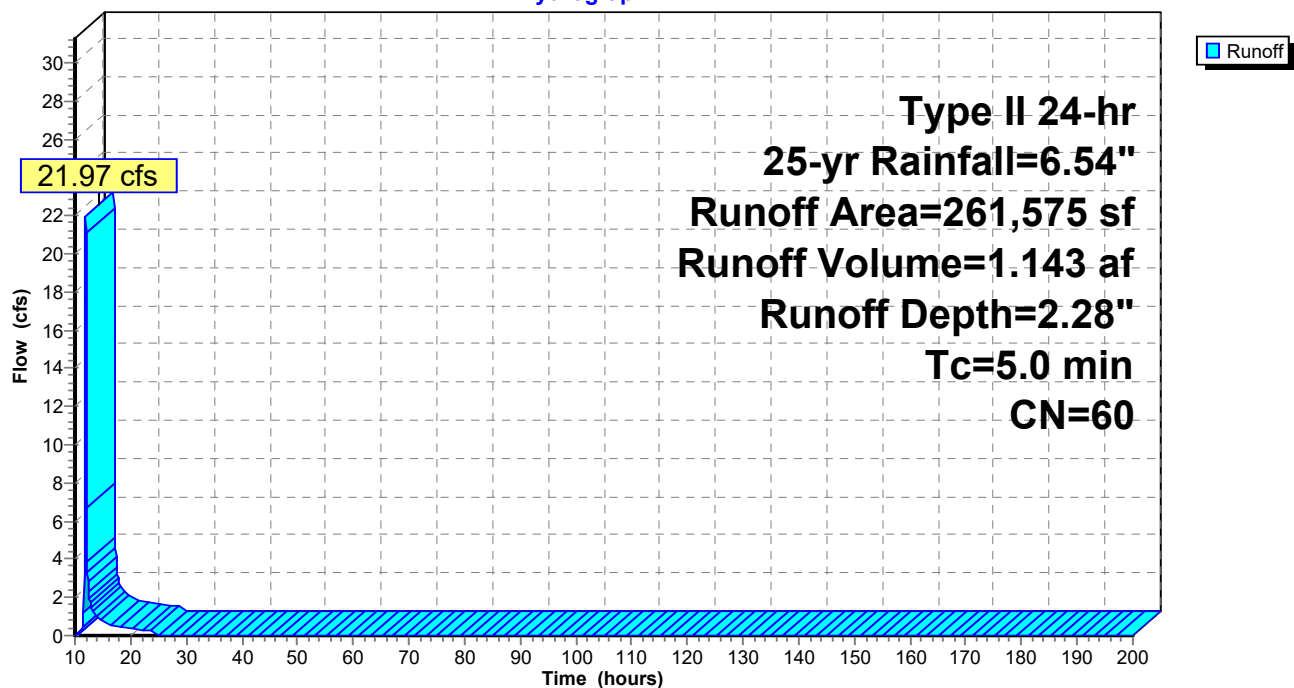
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-200.00 hrs, dt= 0.10 hrs
 Type II 24-hr 25-yr Rainfall=6.54"

Area (sf)	CN	Description
201,745	60	Woods, Fair, HSG B
55,562	56	Brush, Fair, HSG B
4,268	98	Paved parking, HSG B
261,575	60	Weighted Average
257,307		98.37% Pervious Area
4,268		1.63% Impervious Area

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

Subcatchment 24S: Post Dev. Bypass 6

Hydrograph



Summary for Subcatchment 25S: Post Dev. Basin 7 to SCM

Runoff = 18.27 cfs @ 11.95 hrs, Volume= 0.986 af, Depth> 4.80"
 Routed to Pond 5P : Wet Pond SCM 5

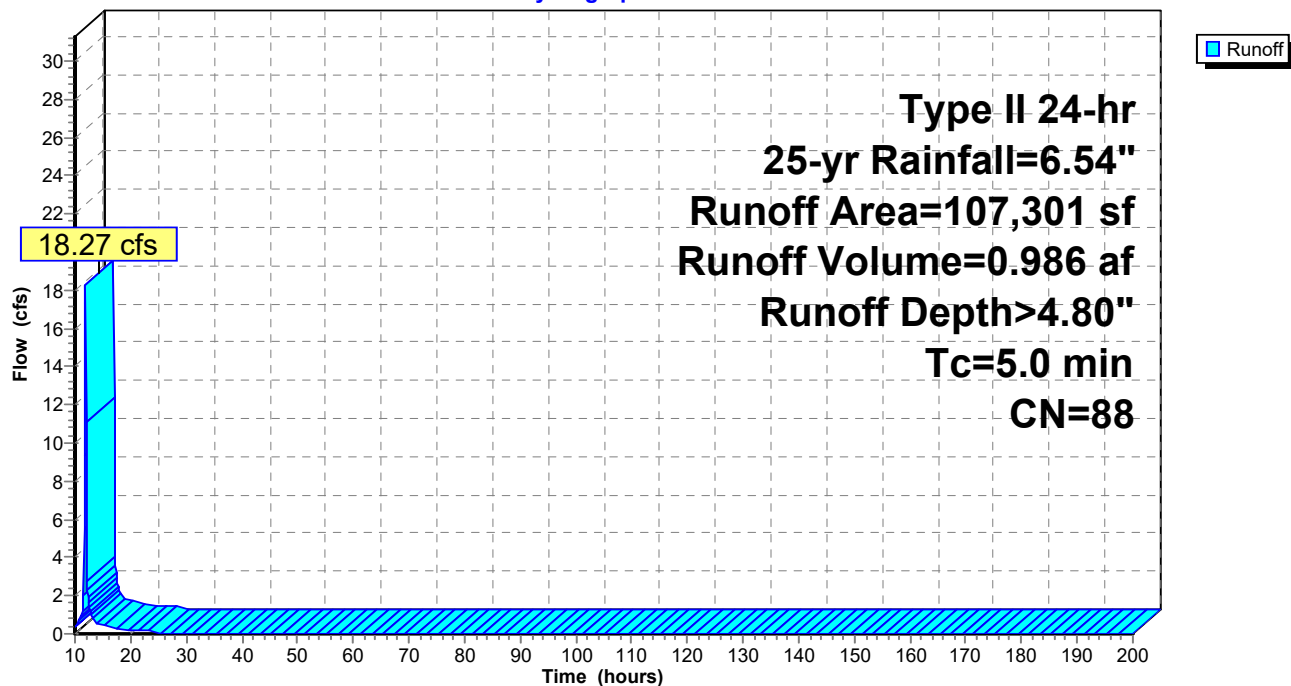
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-200.00 hrs, dt= 0.10 hrs
 Type II 24-hr 25-yr Rainfall=6.54"

Area (sf)	CN	Description
50,376	98	Paved parking, HSG B
21,628	48	Brush, Good, HSG B
28,800	98	Roofs, HSG B
6,497	98	Water Surface, 0% imp, HSG B
107,301	88	Weighted Average
28,125		26.21% Pervious Area
79,176		73.79% Impervious Area

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

Subcatchment 25S: Post Dev. Basin 7 to SCM

Hydrograph



Summary for Subcatchment 26S: Post Dev. Bypass 7

Runoff = 7.80 cfs @ 12.02 hrs, Volume= 0.472 af, Depth= 1.92"
 Routed to Link 5L : POA 6

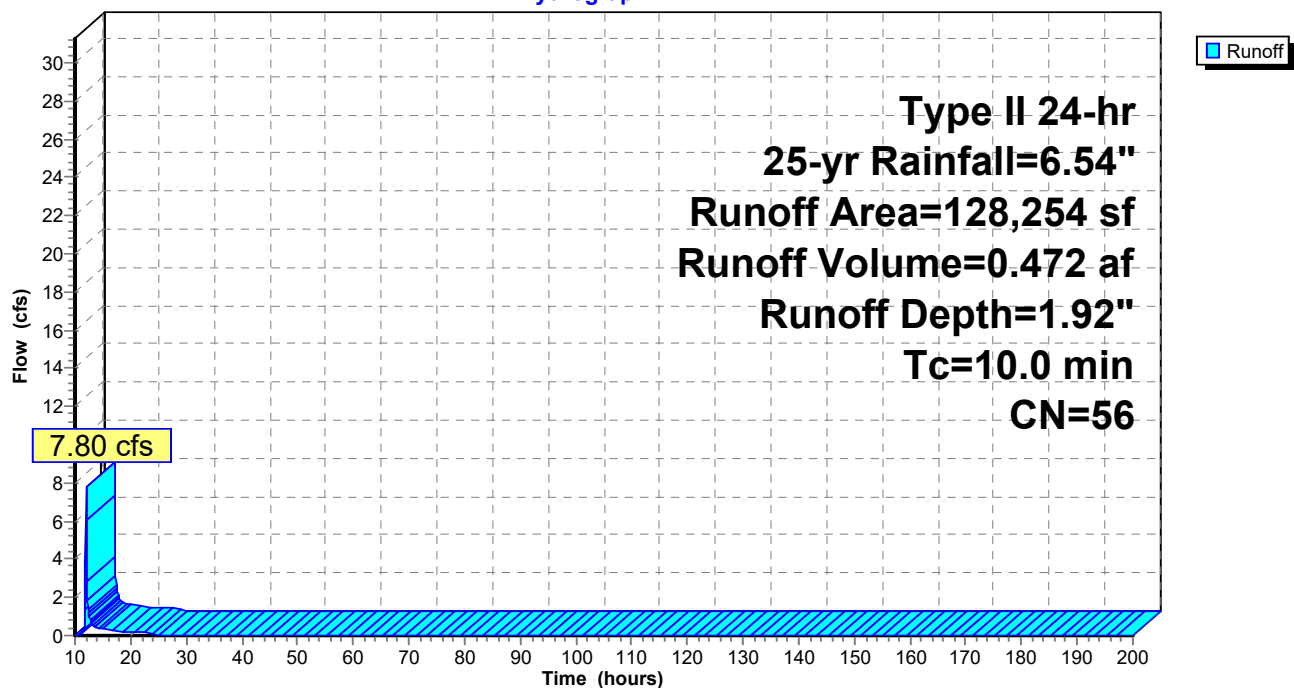
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-200.00 hrs, dt= 0.10 hrs
 Type II 24-hr 25-yr Rainfall=6.54"

Area (sf)	CN	Description
39,944	55	Woods, Good, HSG B
72,602	48	Brush, Good, HSG B
15,708	98	Paved parking, HSG B
128,254	56	Weighted Average
112,546		87.75% Pervious Area
15,708		12.25% Impervious Area

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

Subcatchment 26S: Post Dev. Bypass 7

Hydrograph



Summary for Subcatchment 27S: Post Dev. Bypass 8

Runoff = 24.46 cfs @ 12.01 hrs, Volume= 1.368 af, Depth= 2.47"

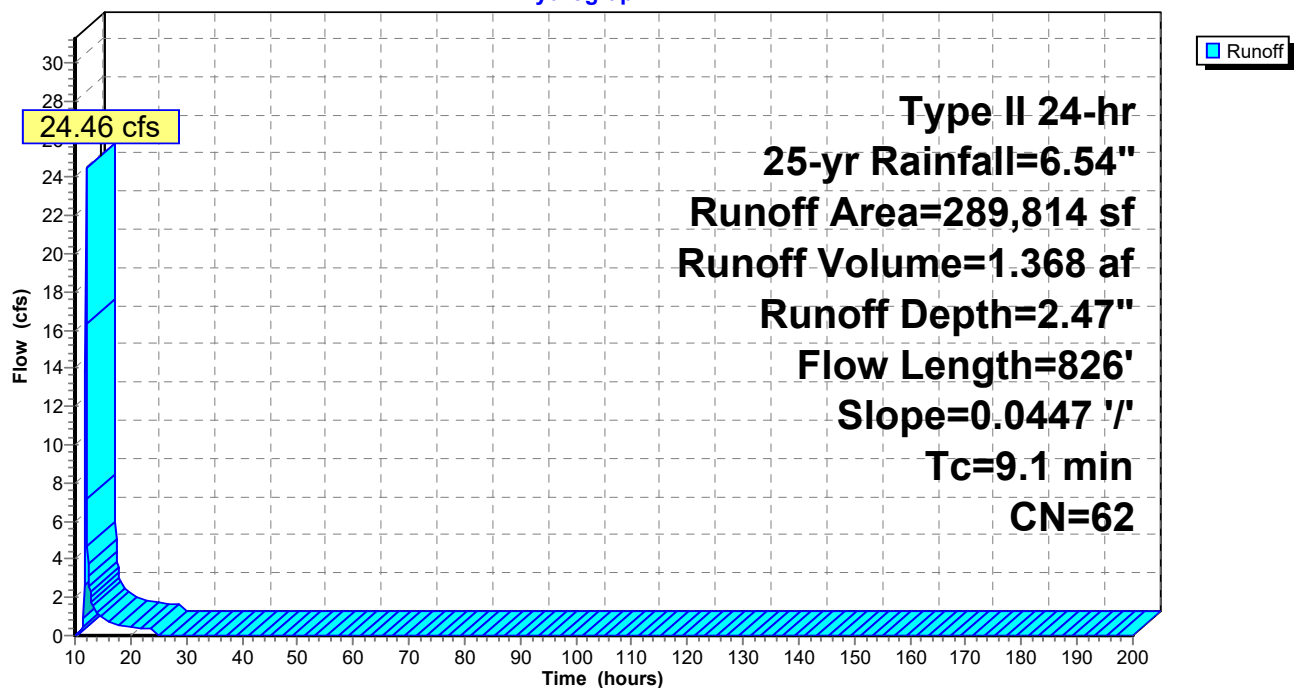
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-200.00 hrs, dt= 0.10 hrs
Type II 24-hr 25-yr Rainfall=6.54"

Area (sf)	CN	Description
230,959	60	Woods, Fair, HSG B
53,439	69	50-75% Grass cover, Fair, HSG B
5,416	98	Paved parking, HSG B
289,814	62	Weighted Average
284,398		98.13% Pervious Area
5,416		1.87% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.1	826	0.0447	1.51		Kirpich Method, General overland flow k= 2.00

Subcatchment 27S: Post Dev. Bypass 8

Hydrograph



Summary for Pond 1P: Sand Filter -SCM 1

Inflow Area = 7.632 ac, 78.15% Impervious, Inflow Depth > 4.88" for 25-yr event
 Inflow = 57.43 cfs @ 11.95 hrs, Volume= 3.102 af
 Outflow = 29.10 cfs @ 12.08 hrs, Volume= 3.102 af, Atten= 49%, Lag= 8.0 min
 Primary = 29.10 cfs @ 12.08 hrs, Volume= 3.102 af
 Routed to Link 1L : POA 1

Routing by Stor-Ind method, Time Span= 10.00-200.00 hrs, dt= 0.10 hrs
 Peak Elev= 531.58' @ 12.08 hrs Surf.Area= 6,825 sf Storage= 51,717 cf

Plug-Flow detention time= 92.0 min calculated for 3.095 af (100% of inflow)
 Center-of-Mass det. time= 91.0 min (895.6 - 804.6)

Volume	Invert	Avail.Storage	Storage Description
#1	524.00'	68,250 cf	Custom Stage Data (Prismatic) Listed below (Recalc) x 65

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
524.00	105	0	0
534.00	105	1,050	1,050

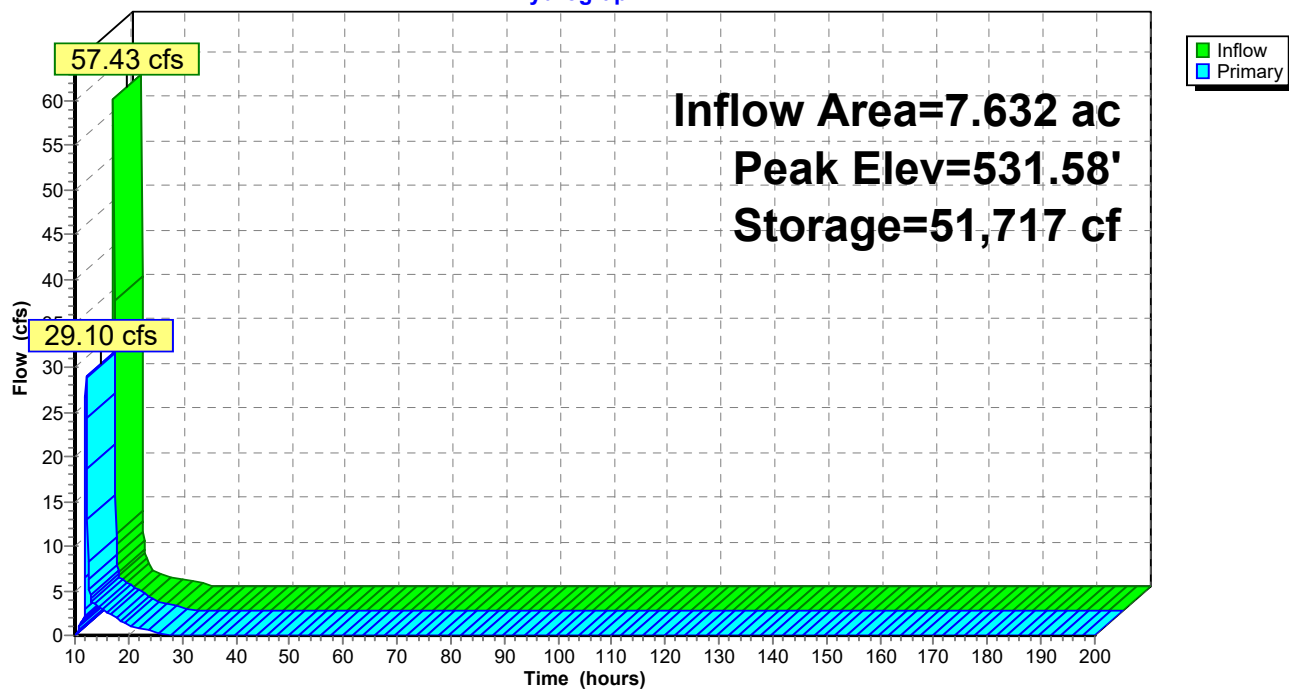
Device	Routing	Invert	Outlet Devices
#1	Primary	524.00'	36.0" Round Culvert L= 85.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 524.00' / 523.00' S= 0.0118 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 7.07 sf
#2	Device 1	524.00'	8.0" Vert. Drawdown C= 0.600 Limited to weir flow at low heads
#3	Device 1	528.90'	60.0" W x 8.0" H Vert. Main Orifice C= 0.600 Limited to weir flow at low heads
#4	Device 1	533.00'	25.0' long Overflow 2 End Contraction(s)

Primary OutFlow Max=28.60 cfs @ 12.08 hrs HW=531.49' (Free Discharge)

↑ **1=Culvert** (Passes 28.60 cfs of 83.31 cfs potential flow)
 ↑ **2=Drawdown** (Orifice Controls 4.50 cfs @ 12.88 fps)
 ↑ **3=Main Orifice** (Orifice Controls 24.10 cfs @ 7.23 fps)
 ↑ **4=Overflow** (Controls 0.00 cfs)

Pond 1P: Sand Filter -SCM 1

Hydrograph



Summary for Pond 2P: Wet Pond SCM 2

Inflow Area = 4.185 ac, 72.71% Impervious, Inflow Depth > 4.48" for 25-yr event
 Inflow = 29.94 cfs @ 11.95 hrs, Volume= 1.563 af
 Outflow = 7.24 cfs @ 12.14 hrs, Volume= 1.563 af, Atten= 76%, Lag= 11.5 min
 Primary = 7.24 cfs @ 12.14 hrs, Volume= 1.563 af
 Routed to Link 2L : POA 2

Routing by Stor-Ind method, Time Span= 10.00-200.00 hrs, dt= 0.10 hrs

Starting Elev= 526.00' Surf.Area= 9,300 sf Storage= 39,787 cf

Peak Elev= 528.94' @ 12.14 hrs Surf.Area= 11,743 sf Storage= 70,497 cf (30,710 cf above start)

Plug-Flow detention time= 551.8 min calculated for 0.647 af (41% of inflow)

Center-of-Mass det. time= 157.7 min (968.2 - 810.5)

Volume	Invert	Avail.Storage	Storage Description
#1	521.00'	83,553 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
521.00	6,868	0	0
522.00	7,244	7,056	7,056
523.00	7,656	7,450	14,506
524.00	8,129	7,893	22,399
525.00	8,674	8,402	30,800
526.00	9,300	8,987	39,787
527.00	10,020	9,660	49,447
528.00	10,848	10,434	59,881
529.00	11,800	11,324	71,205
530.00	12,895	12,348	83,553

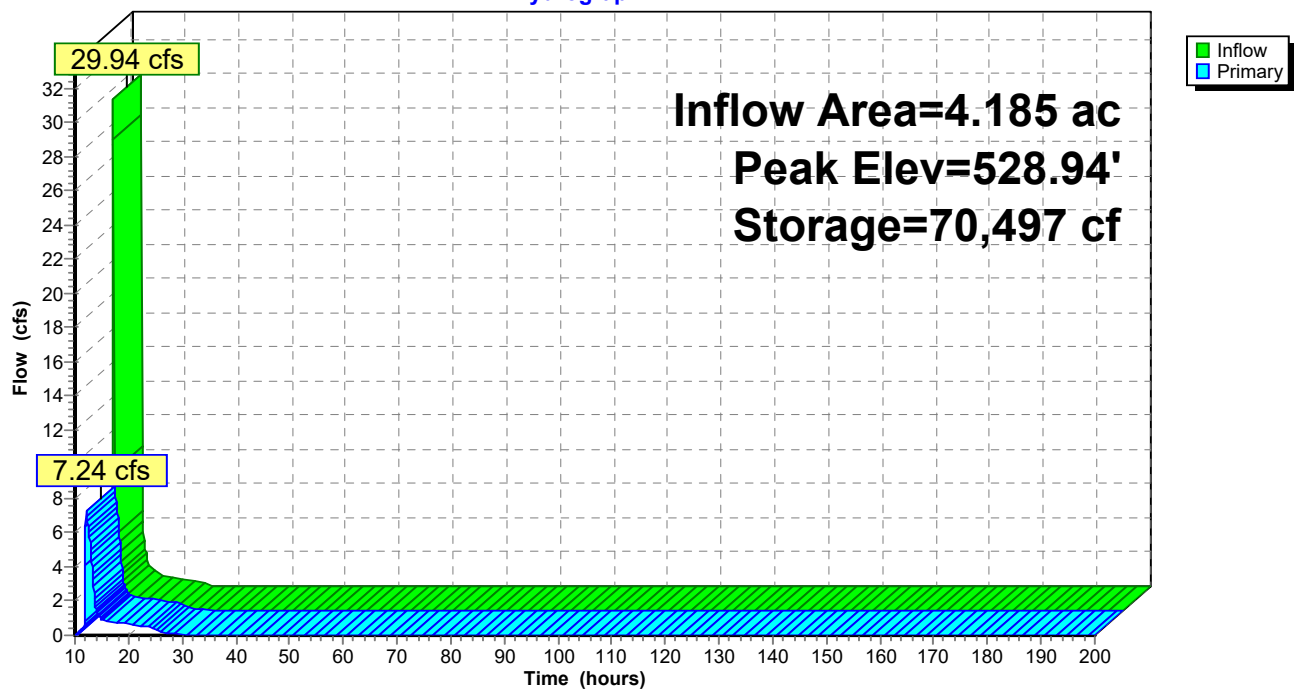
Device	Routing	Invert	Outlet Devices
#1	Primary	526.00'	36.0" Round Culvert L= 45.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 526.00' / 525.55' S= 0.0100 ' S= 0.0100 ' Cc= 0.900 n= 0.010 Concrete pipe, straight & clean, Flow Area= 7.07 sf
#2	Device 1	526.00'	5.5" Vert. Drawdown C= 0.600 Limited to weir flow at low heads
#3	Device 1	527.30'	24.0" W x 3.0" H Vert. Peakflow X 2.00 C= 0.600 Limited to weir flow at low heads
#4	Device 1	529.40'	48.0" x 48.0" Horiz. Overflow C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=7.13 cfs @ 12.14 hrs HW=528.89' (Free Discharge)

1=Culvert (Passes 7.13 cfs of 37.04 cfs potential flow)
 2=Drawdown (Orifice Controls 1.30 cfs @ 7.86 fps)
 3=Peakflow (Orifice Controls 5.83 cfs @ 5.83 fps)
 4=Overflow (Controls 0.00 cfs)

Pond 2P: Wet Pond SCM 2

Hydrograph



Summary for Pond 4P: Wet Pond SCM 4

Inflow Area = 4.157 ac, 74.10% Impervious, Inflow Depth > 5.02" for 25-yr event
 Inflow = 32.11 cfs @ 11.95 hrs, Volume= 1.738 af
 Outflow = 7.31 cfs @ 12.15 hrs, Volume= 1.738 af, Atten= 77%, Lag= 12.0 min
 Primary = 7.31 cfs @ 12.15 hrs, Volume= 1.738 af
 Routed to Link 4L : POA 5

Routing by Stor-Ind method, Time Span= 10.00-200.00 hrs, dt= 0.10 hrs
 Starting Elev= 522.00' Surf.Area= 5,116 sf Storage= 11,656 cf
 Peak Elev= 527.05' @ 12.15 hrs Surf.Area= 9,925 sf Storage= 49,241 cf (37,586 cf above start)

Plug-Flow detention time= 468.5 min calculated for 1.467 af (84% of inflow)
 Center-of-Mass det. time= 327.5 min (1,130.0 - 802.5)

Volume	Invert	Avail.Storage	Storage Description
#1	519.00'	59,179 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
519.00	2,769	0	0
520.00	3,460	3,115	3,115
521.00	4,253	3,857	6,971
522.00	5,116	4,685	11,656
523.00	5,998	5,557	17,213
524.00	6,912	6,455	23,668
525.00	7,862	7,387	31,055
526.00	8,852	8,357	39,412
527.00	9,875	9,364	48,775
528.00	10,932	10,404	59,179

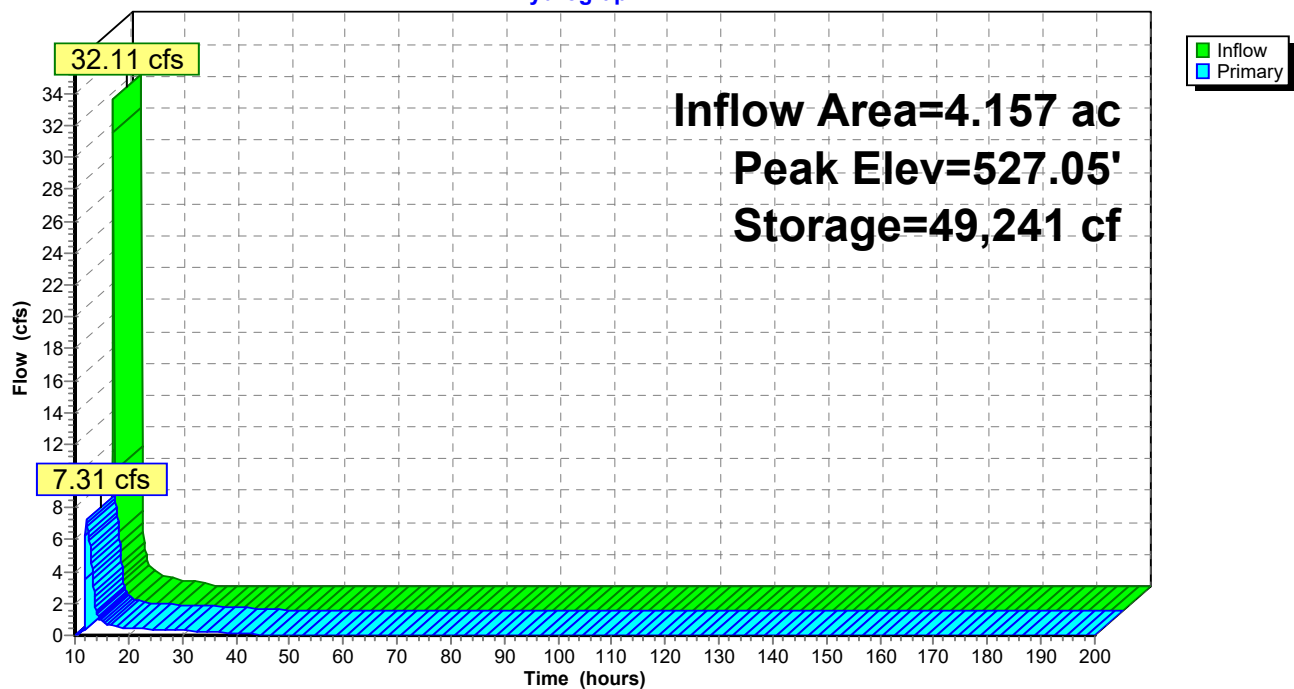
Device	Routing	Invert	Outlet Devices
#1	Primary	522.00'	36.0" Round Culvert L= 45.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 522.00' / 521.50' S= 0.0111 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 7.07 sf
#2	Device 1	522.00'	3.0" Vert. Drawdown C= 0.600 Limited to weir flow at low heads
#3	Device 1	524.90'	36.0" W x 4.0" H Vert. Peakflow C= 0.600 Limited to weir flow at low heads
#4	Device 1	527.10'	48.0" x 48.0" Horiz. Overflow C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=7.19 cfs @ 12.15 hrs HW=526.99' (Free Discharge)

- 1=Culvert (Passes 7.19 cfs of 63.55 cfs potential flow)
- 2=Drawdown (Orifice Controls 0.52 cfs @ 10.62 fps)
- 3=Peakflow (Orifice Controls 6.67 cfs @ 6.67 fps)
- 4=Overflow (Controls 0.00 cfs)

Pond 4P: Wet Pond SCM 4

Hydrograph



Summary for Pond 5P: Wet Pond SCM 5

Inflow Area = 2.463 ac, 73.79% Impervious, Inflow Depth > 4.80" for 25-yr event
 Inflow = 18.27 cfs @ 11.95 hrs, Volume= 0.986 af
 Outflow = 7.44 cfs @ 12.11 hrs, Volume= 0.986 af, Atten= 59%, Lag= 9.4 min
 Primary = 7.44 cfs @ 12.11 hrs, Volume= 0.986 af
 Routed to Link 5L : POA 6

Routing by Stor-Ind method, Time Span= 10.00-200.00 hrs, dt= 0.10 hrs
 Starting Elev= 513.00' Surf.Area= 3,681 sf Storage= 11,032 cf
 Peak Elev= 516.94' @ 12.11 hrs Surf.Area= 5,288 sf Storage= 28,603 cf (17,571 cf above start)

Plug-Flow detention time= 311.1 min calculated for 0.731 af (74% of inflow)
 Center-of-Mass det. time= 140.9 min (946.6 - 805.7)

Volume	Invert	Avail.Storage	Storage Description
#1	509.00'	34,456 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
509.00	1,925	0	0
510.00	2,310	2,118	2,118
511.00	2,731	2,521	4,638
512.00	3,188	2,960	7,598
513.00	3,681	3,435	11,032
514.00	4,062	3,872	14,904
515.00	4,462	4,262	19,166
516.00	4,879	4,671	23,836
517.00	5,315	5,097	28,933
518.00	5,731	5,523	34,456

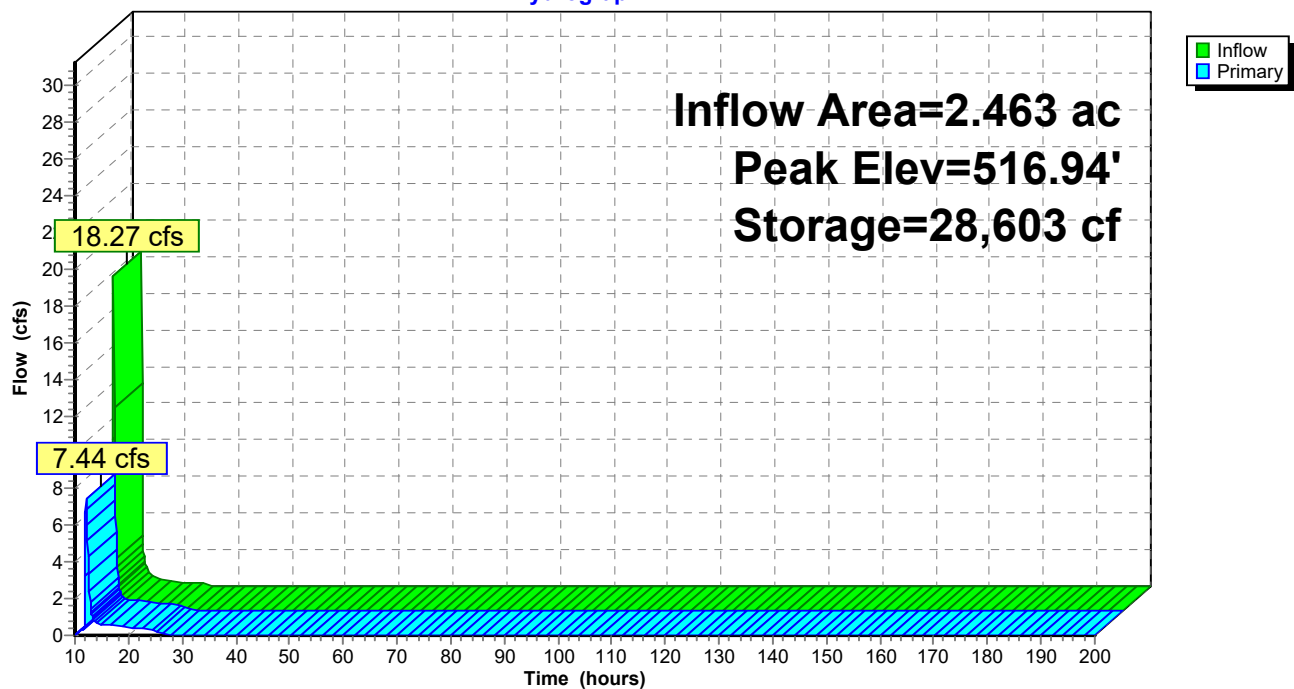
Device	Routing	Invert	Outlet Devices
#1	Primary	513.00'	36.0" Round Culvert L= 79.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 513.00' / 512.00' S= 0.0127 ' S= 0.0127 ' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 7.07 sf
#2	Device 1	513.00'	4.0" Vert. Drawdown C= 0.600 Limited to weir flow at low heads
#3	Device 1	515.40'	24.0" W x 3.5" H Vert. Peakflow Orifice X 2.00 C= 0.600 Limited to weir flow at low heads
#4	Device 1	517.50'	48.0" x 48.0" Horiz. Overflow C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=7.41 cfs @ 12.11 hrs HW=516.92' (Free Discharge)

1=Culvert (Passes 7.41 cfs of 52.99 cfs potential flow)
 2=Drawdown (Orifice Controls 0.81 cfs @ 9.33 fps)
 3=Peakflow Orifice (Orifice Controls 6.59 cfs @ 5.65 fps)
 4=Overflow (Controls 0.00 cfs)

Pond 5P: Wet Pond SCM 5

Hydrograph



Summary for Pond 6P: Sand Filter -SCM 3

Inflow Area = 2.765 ac, 67.31% Impervious, Inflow Depth > 4.73" for 25-yr event
 Inflow = 20.19 cfs @ 11.95 hrs, Volume= 1.089 af
 Outflow = 7.16 cfs @ 12.12 hrs, Volume= 0.827 af, Atten= 65%, Lag= 10.4 min
 Primary = 7.16 cfs @ 12.12 hrs, Volume= 0.827 af
 Routed to Link 3L : POA 4

Routing by Stor-Ind method, Time Span= 10.00-200.00 hrs, dt= 0.10 hrs
 Peak Elev= 535.27' @ 12.12 hrs Surf.Area= 3,675 sf Storage= 23,028 cf

Plug-Flow detention time= 301.3 min calculated for 0.825 af (76% of inflow)
 Center-of-Mass det. time= 215.8 min (1,022.6 - 806.8)

Volume	Invert	Avail.Storage	Storage Description
#1	529.00'	33,075 cf	Sediment Chamber (Prismatic) Listed below x 35

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
529.00	105	0	0
538.00	105	945	945

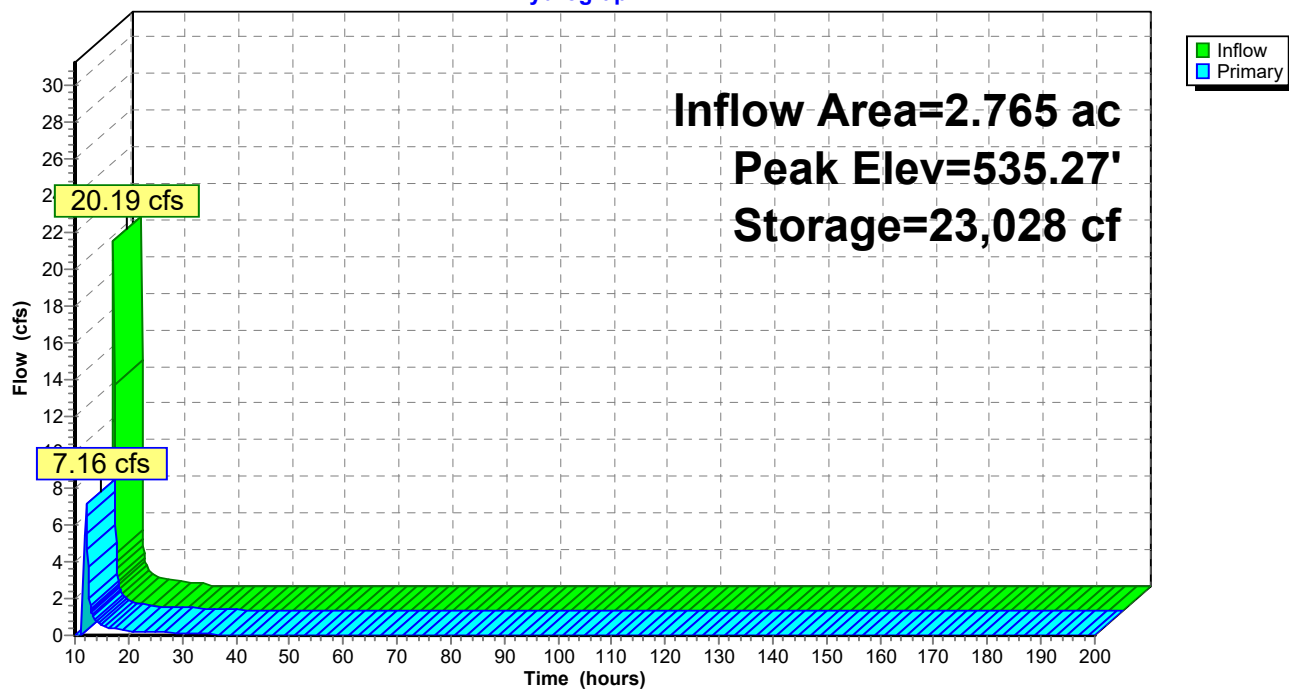
Device	Routing	Invert	Outlet Devices
#1	Primary	532.00'	36.0" Round Culvert L= 12.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 532.00' / 531.00' S= 0.0833 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 7.07 sf
#2	Device 1	532.10'	2.5" Vert. Drawdown C= 0.600 Limited to weir flow at low heads
#3	Device 1	533.60'	34.0" W x 5.0" H Vert. Main Orifice C= 0.600 Limited to weir flow at low heads
#4	Device 1	536.30'	25.0' long Overflow 2 End Contraction(s)

Primary OutFlow Max=6.97 cfs @ 12.12 hrs HW=535.19' (Free Discharge)

1=Culvert (Passes 6.97 cfs of 44.29 cfs potential flow)
 2=Drawdown (Orifice Controls 0.28 cfs @ 8.32 fps)
 3=Main Orifice (Orifice Controls 6.68 cfs @ 5.66 fps)
 4=Overflow (Controls 0.00 cfs)

Pond 6P: Sand Filter -SCM 3

Hydrograph



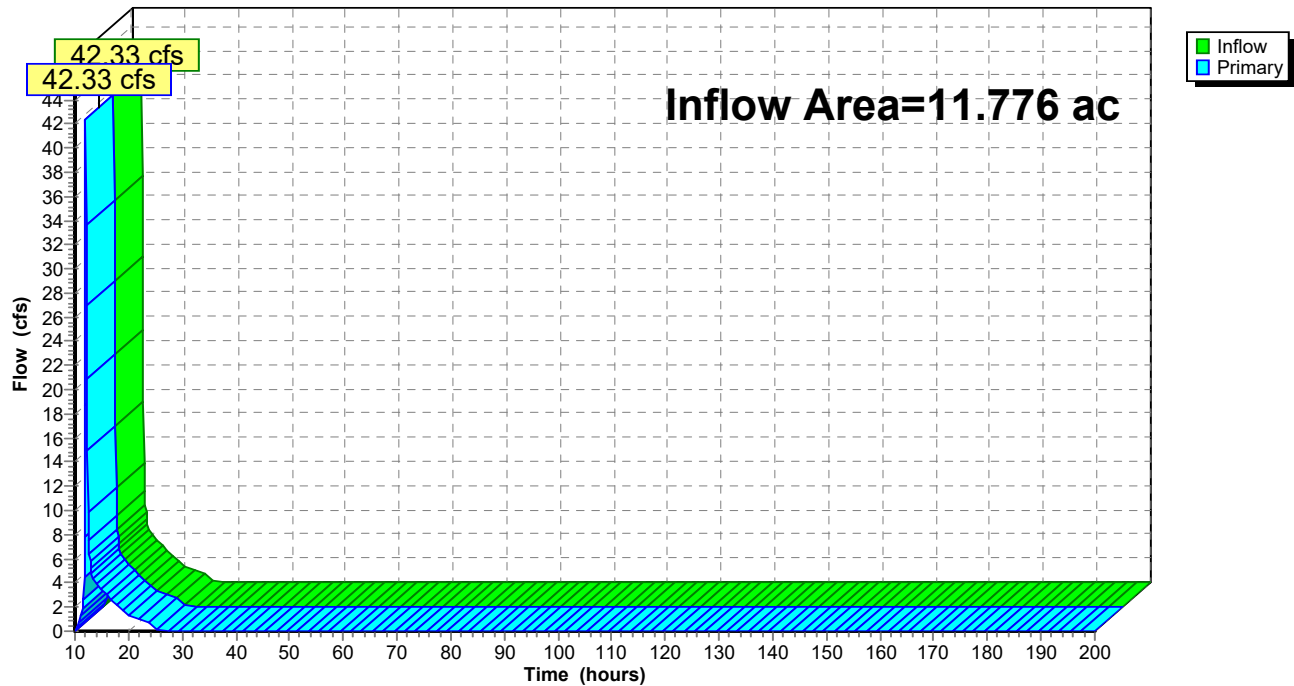
Summary for Link 1L: POA 1

Inflow Area = 11.776 ac, 52.05% Impervious, Inflow Depth > 3.96" for 25-yr event
Inflow = 42.33 cfs @ 12.02 hrs, Volume= 3.891 af
Primary = 42.33 cfs @ 12.02 hrs, Volume= 3.891 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 10.00-200.00 hrs, dt= 0.10 hrs

Link 1L: POA 1

Hydrograph



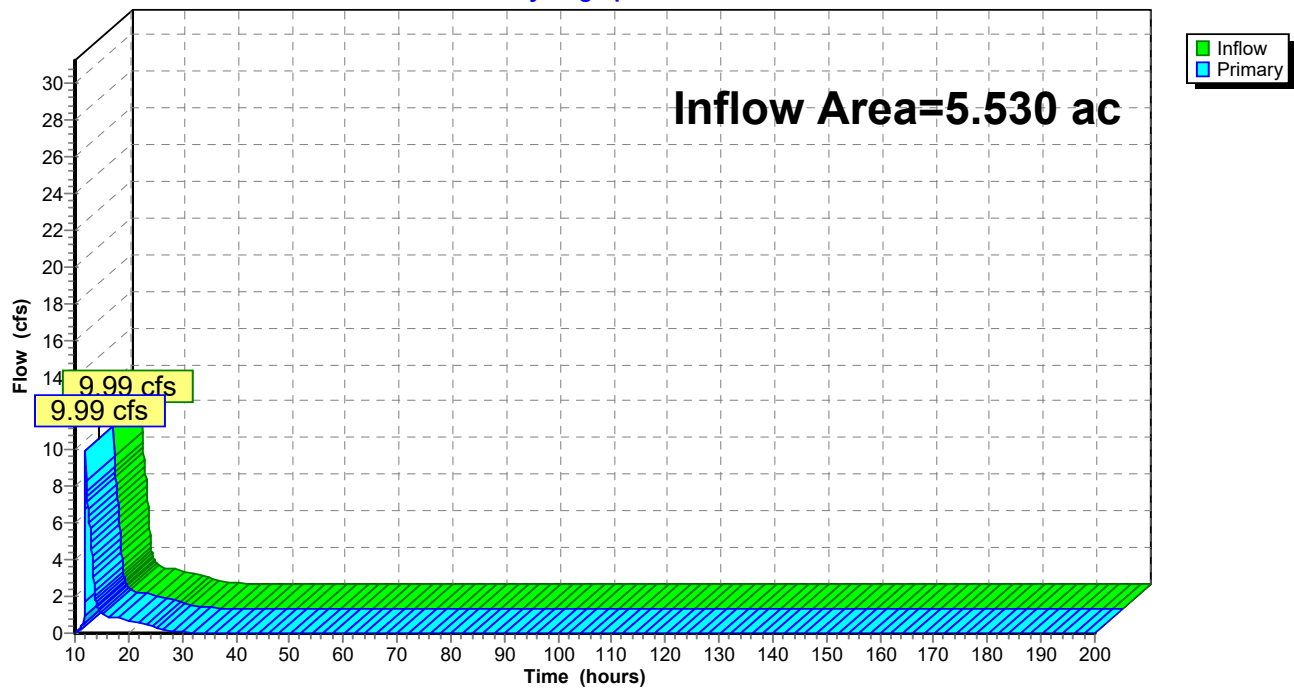
Summary for Link 2L: POA 2

Inflow Area = 5.530 ac, 55.03% Impervious, Inflow Depth > 3.82" for 25-yr event
Inflow = 9.99 cfs @ 12.02 hrs, Volume= 1.759 af
Primary = 9.99 cfs @ 12.02 hrs, Volume= 1.759 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 10.00-200.00 hrs, dt= 0.10 hrs

Link 2L: POA 2

Hydrograph



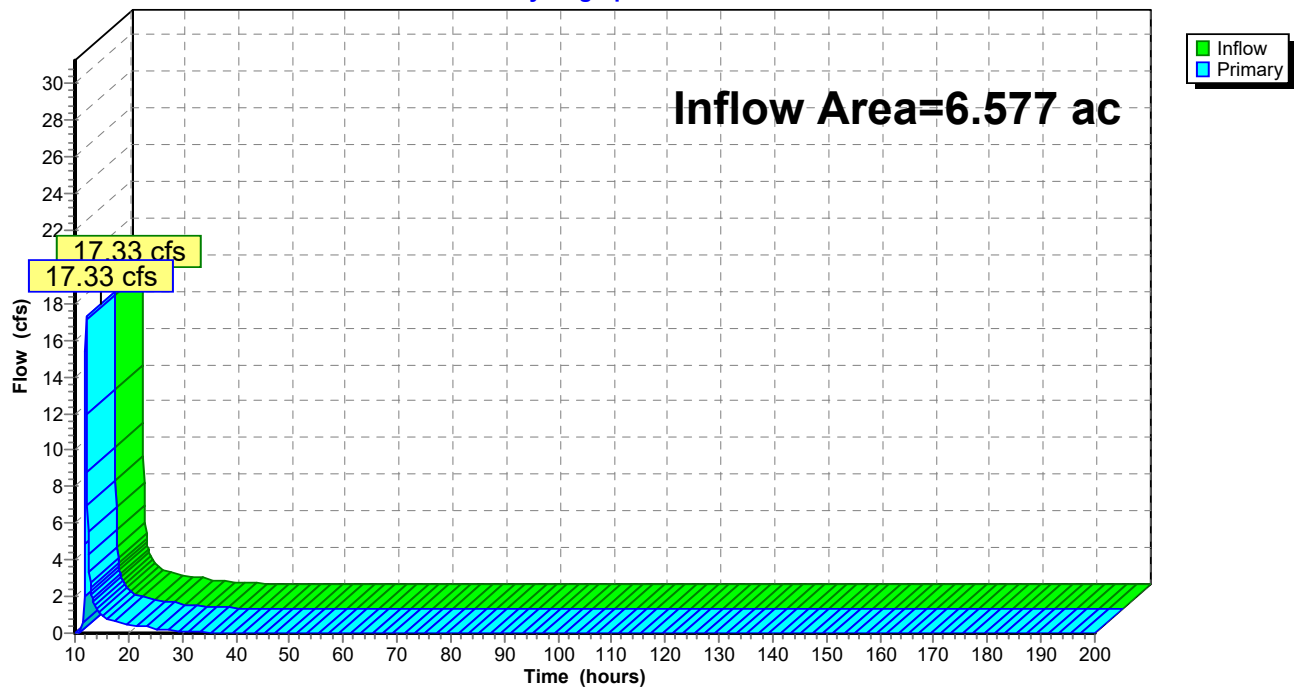
Summary for Link 3L: POA 4

Inflow Area = 6.577 ac, 32.63% Impervious, Inflow Depth = 2.78" for 25-yr event
Inflow = 17.33 cfs @ 12.08 hrs, Volume= 1.524 af
Primary = 17.33 cfs @ 12.08 hrs, Volume= 1.524 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 10.00-200.00 hrs, dt= 0.10 hrs

Link 3L: POA 4

Hydrograph



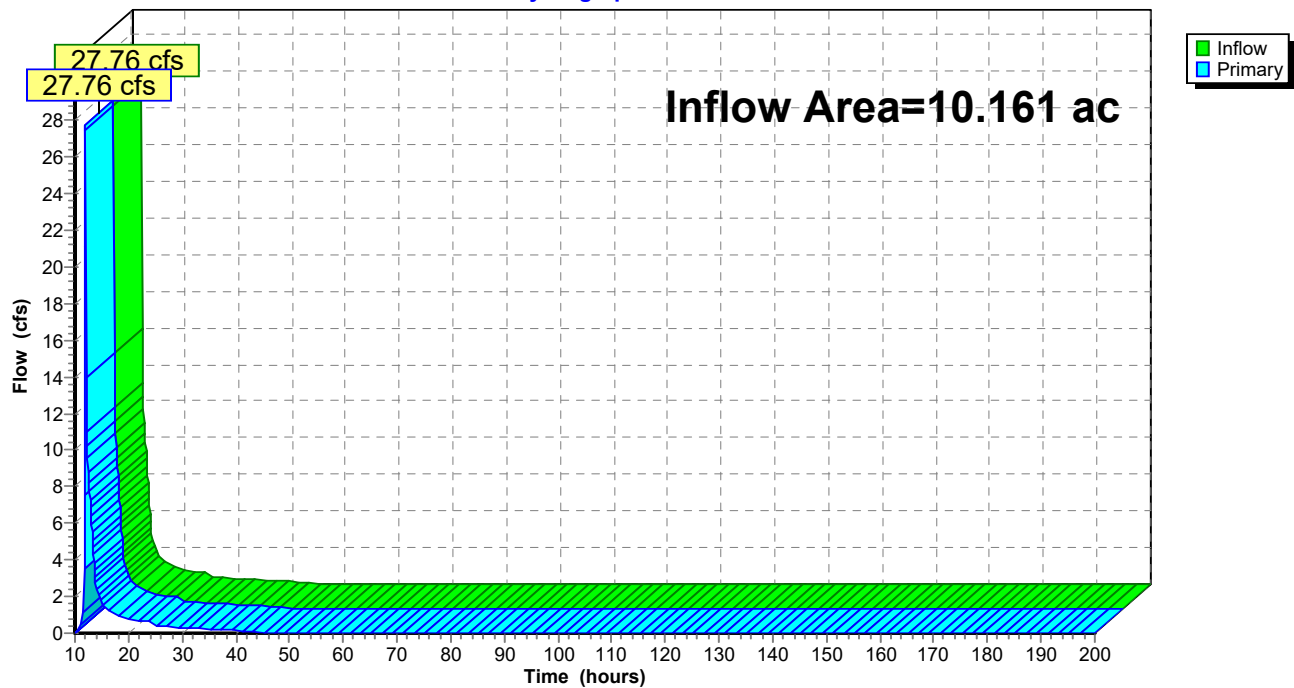
Summary for Link 4L: POA 5

Inflow Area = 10.161 ac, 31.27% Impervious, Inflow Depth > 3.40" for 25-yr event
Inflow = 27.76 cfs @ 11.98 hrs, Volume= 2.881 af
Primary = 27.76 cfs @ 11.98 hrs, Volume= 2.881 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 10.00-200.00 hrs, dt= 0.10 hrs

Link 4L: POA 5

Hydrograph



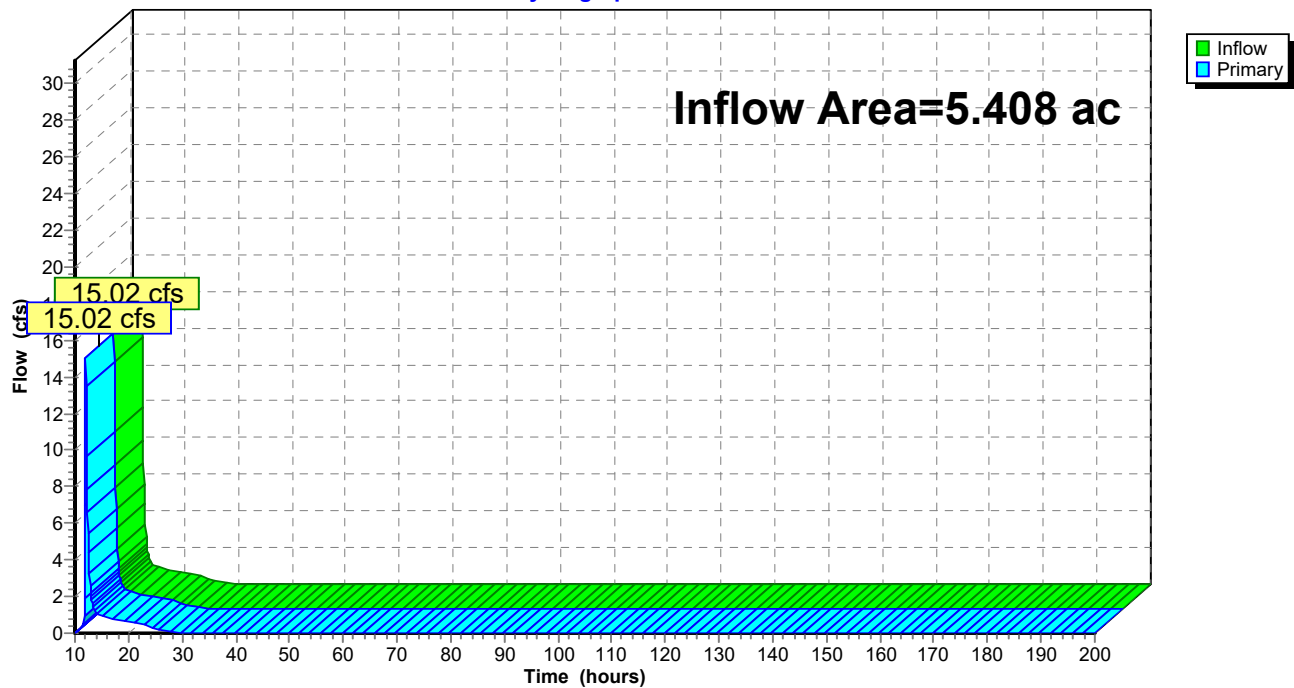
Summary for Link 5L: POA 6

Inflow Area = 5.408 ac, 40.28% Impervious, Inflow Depth > 3.24" for 25-yr event
Inflow = 15.02 cfs @ 12.04 hrs, Volume= 1.458 af
Primary = 15.02 cfs @ 12.04 hrs, Volume= 1.458 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 10.00-200.00 hrs, dt= 0.10 hrs

Link 5L: POA 6

Hydrograph



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Type II 24-hr 100-yr Rainfall=8.17"

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Time span=10.00-200.00 hrs, dt=0.10 hrs, 1901 points

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN

Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1S: Pre Dev. Basin 1	Runoff Area=366,801 sf 0.00% Impervious Runoff Depth>5.44"
Flow Length=560'	Slope=0.0630 '/' Tc=5.9 min CN=79 Runoff=73.94 cfs 3.816 af
Subcatchment2S: Pre Dev. Basin 2A	Runoff Area=250,337 sf 0.00% Impervious Runoff Depth>5.44"
Flow Length=803'	Slope=0.0650 '/' Tc=7.7 min CN=79 Runoff=49.79 cfs 2.606 af
Subcatchment3S: Pre Dev. Basin 2B	Runoff Area=132,113 sf 0.00% Impervious Runoff Depth>3.46"
Flow Length=577'	Slope=0.0451 '/' Tc=6.9 min CN=60 Runoff=16.90 cfs 0.874 af
Subcatchment4S: Pre Dev. Basin 2C	Runoff Area=467,737 sf 32.11% Impervious Runoff Depth>5.89"
Flow Length=753'	Slope=0.0633 '/' Tc=7.4 min CN=84 Runoff=100.77 cfs 5.268 af
Subcatchment6S: Pre Dev. Basin 3	Runoff Area=52,001 sf 0.00% Impervious Runoff Depth>4.65"
Flow Length=243'	Slope=0.0170 '/' Tc=5.1 min CN=71 Runoff=8.93 cfs 0.462 af
Subcatchment7S: Pre Dev. Basin 4	Runoff Area=130,388 sf 0.00% Impervious Runoff Depth>3.35"
Flow Length=561'	Slope=0.0221 '/' Tc=8.9 min CN=59 Runoff=15.15 cfs 0.835 af
Subcatchment8S: Pre Dev. Basin 5	Runoff Area=305,128 sf 0.00% Impervious Runoff Depth>3.35"
Flow Length=998'	Slope=0.0301 '/' Tc=12.3 min CN=59 Runoff=30.46 cfs 1.954 af
Subcatchment9S: Pre Dev. Basin 6	Runoff Area=441,055 sf 0.00% Impervious Runoff Depth>3.46"
Flow Length=1,222'	Slope=0.0441 '/' Tc=12.4 min CN=60 Runoff=45.48 cfs 2.920 af
Subcatchment10S: Pre Dev. Basin 7	Runoff Area=238,293 sf 0.00% Impervious Runoff Depth=3.12"
Flow Length=977'	Slope=0.0468 '/' Tc=10.2 min CN=57 Runoff=24.22 cfs 1.424 af
Subcatchment11S: Pre Dev. Basin 8	Runoff Area=289,814 sf 0.00% Impervious Runoff Depth>3.68"
Flow Length=826'	Slope=0.0447 '/' Tc=9.1 min CN=62 Runoff=36.97 cfs 2.042 af
Subcatchment12S: Post Basin 1 to SCM	Runoff Area=332,471 sf 78.15% Impervious Runoff Depth>6.27"
	Tc=5.0 min CN=89 Runoff=73.65 cfs 3.987 af
Subcatchment13S: Post Dev Bypass 1	Runoff Area=180,474 sf 3.97% Impervious Runoff Depth>3.46"
	Tc=5.0 min CN=60 Runoff=23.05 cfs 1.195 af
Subcatchment14S: Post Dev. Bypass 2A	Runoff Area=120,581 sf 0.00% Impervious Runoff Depth>5.44"
Flow Length=421'	Slope=0.0411 '/' Tc=5.6 min CN=79 Runoff=24.25 cfs 1.254 af
Subcatchment15S: Post Dev. Basin 2B	Runoff Area=182,292 sf 72.71% Impervious Runoff Depth>5.88"
	Tc=5.0 min CN=84 Runoff=38.03 cfs 2.051 af
Subcatchment16S: Post Dev. Bypass 2C	Runoff Area=414,715 sf 36.24% Impervious Runoff Depth>5.97"
Flow Length=760'	Slope=0.0633 '/' Tc=7.5 min CN=85 Runoff=90.37 cfs 4.737 af
Subcatchment18S: Post Dev Bypass 2B	Runoff Area=58,575 sf 0.00% Impervious Runoff Depth=2.79"
	Tc=5.0 min CN=54 Runoff=6.01 cfs 0.313 af

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Type II 24-hr 100-yr Rainfall=8.17"

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Subcatchment19S: Post Dev. Basin 3	Runoff Area=48,549 sf 0.00% Impervious Runoff Depth>4.54" Tc=5.0 min CN=70 Runoff=8.14 cfs 0.422 af
Subcatchment20S: Post Dev. Basin 4	Runoff Area=29,236 sf 11.81% Impervious Runoff Depth>3.68" Tc=5.0 min CN=62 Runoff=3.97 cfs 0.206 af
Subcatchment21S: Post Dev. Basin 5 to	Runoff Area=120,435 sf 67.31% Impervious Runoff Depth>6.12" Tc=5.0 min CN=87 Runoff=26.10 cfs 1.411 af
Subcatchment22S: Post Dev. Bypass 5	Runoff Area=166,064 sf 7.47% Impervious Runoff Depth>3.35" Tc=12.3 min CN=59 Runoff=16.58 cfs 1.064 af
Subcatchment23S: Post Dev. Basin 6 to	Runoff Area=181,059 sf 74.10% Impervious Runoff Depth>6.40" Tc=5.0 min CN=91 Runoff=40.87 cfs 2.218 af
Subcatchment24S: Post Dev. Bypass 6	Runoff Area=261,575 sf 1.63% Impervious Runoff Depth>3.46" Tc=5.0 min CN=60 Runoff=33.41 cfs 1.731 af
Subcatchment25S: Post Dev. Basin 7 to	Runoff Area=107,301 sf 73.79% Impervious Runoff Depth>6.20" Tc=5.0 min CN=88 Runoff=23.52 cfs 1.272 af
Subcatchment26S: Post Dev. Bypass 7	Runoff Area=128,254 sf 12.25% Impervious Runoff Depth=3.01" Tc=10.0 min CN=56 Runoff=12.64 cfs 0.739 af
Subcatchment27S: Post Dev. Bypass 8 Flow Length=826'	Runoff Area=289,814 sf 1.87% Impervious Runoff Depth>3.68" Slope=0.0447 '/' Tc=9.1 min CN=62 Runoff=36.97 cfs 2.042 af
Pond 1P: Sand Filter -SCM 1	Peak Elev=533.14' Storage=62,353 cf Inflow=73.65 cfs 3.987 af Outflow=39.21 cfs 3.987 af
Pond 2P: Wet Pond SCM 2	Peak Elev=529.64' Storage=78,983 cf Inflow=38.03 cfs 2.051 af Outflow=14.32 cfs 2.051 af
Pond 4P: Wet Pond SCM 4	Peak Elev=527.54' Storage=54,281 cf Inflow=40.87 cfs 2.218 af Outflow=23.47 cfs 2.218 af
Pond 5P: Wet Pond SCM 5	Peak Elev=517.69' Storage=32,725 cf Inflow=23.52 cfs 1.272 af Outflow=13.46 cfs 1.272 af
Pond 6P: Sand Filter -SCM 3	Peak Elev=536.45' Storage=27,381 cf Inflow=26.10 cfs 1.411 af Outflow=14.33 cfs 1.149 af
Link 1L: POA 1	Inflow=56.77 cfs 5.182 af Primary=56.77 cfs 5.182 af
Link 2L: POA 2	Inflow=16.20 cfs 2.364 af Primary=16.20 cfs 2.364 af
Link 3L: POA 4	Inflow=30.16 cfs 2.213 af Primary=30.16 cfs 2.213 af

32044.0000 - CZ COPY*Type II 24-hr 100-yr Rainfall=8.17"*

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Link 4L: POA 5

Inflow=45.27 cfs 3.949 af

Primary=45.27 cfs 3.949 af

Link 5L: POA 6

Inflow=23.78 cfs 2.011 af

Primary=23.78 cfs 2.011 af

Total Runoff Area = 121.558 ac Runoff Volume = 46.843 af Average Runoff Depth = 4.62"
80.44% Pervious = 97.782 ac 19.56% Impervious = 23.776 ac

Summary for Subcatchment 1S: Pre Dev. Basin 1

Runoff = 73.94 cfs @ 11.97 hrs, Volume= 3.816 af, Depth> 5.44"

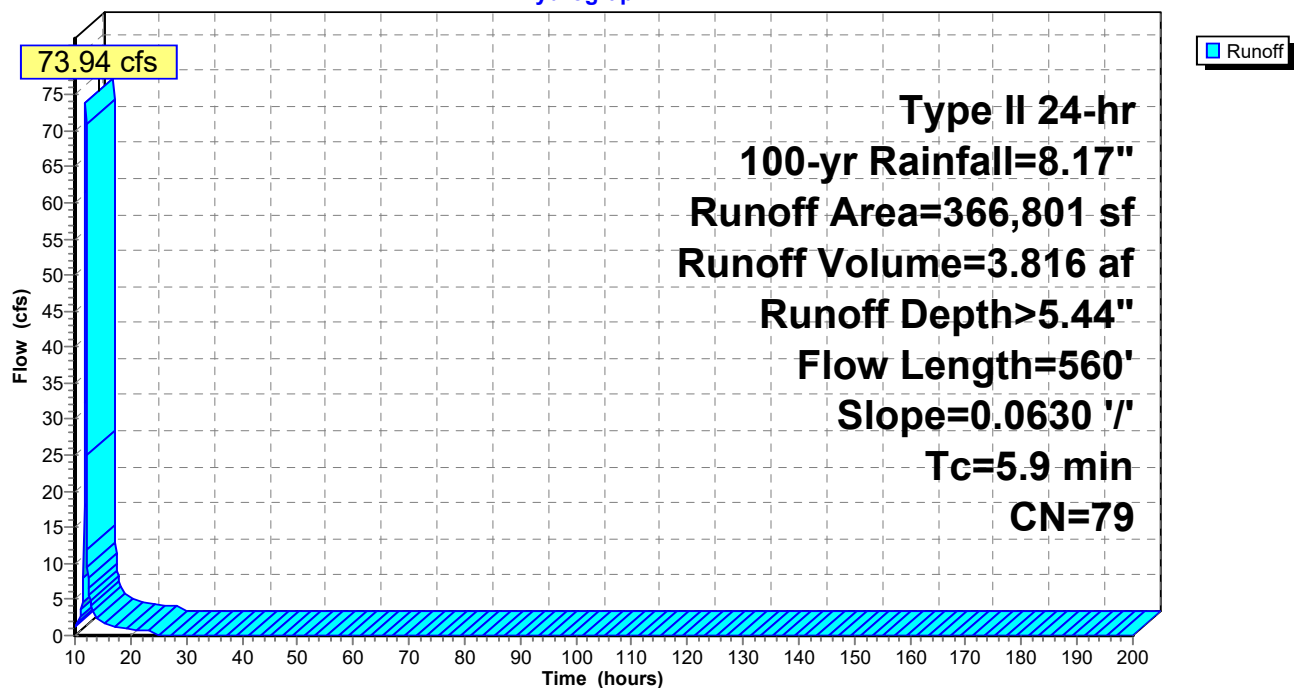
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-200.00 hrs, dt= 0.10 hrs
Type II 24-hr 100-yr Rainfall=8.17"

Area (sf)	CN	Description
342,042	79	Woods, Fair, HSG D
24,759	73	Brush, Good, HSG D
366,801	79	Weighted Average
366,801		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.9	560	0.0630	1.58		Kirpich Method, Estimated Tc General overland flow k= 2.00

Subcatchment 1S: Pre Dev. Basin 1

Hydrograph



Summary for Subcatchment 2S: Pre Dev. Basin 2A

Runoff = 49.79 cfs @ 11.99 hrs, Volume= 2.606 af, Depth> 5.44"

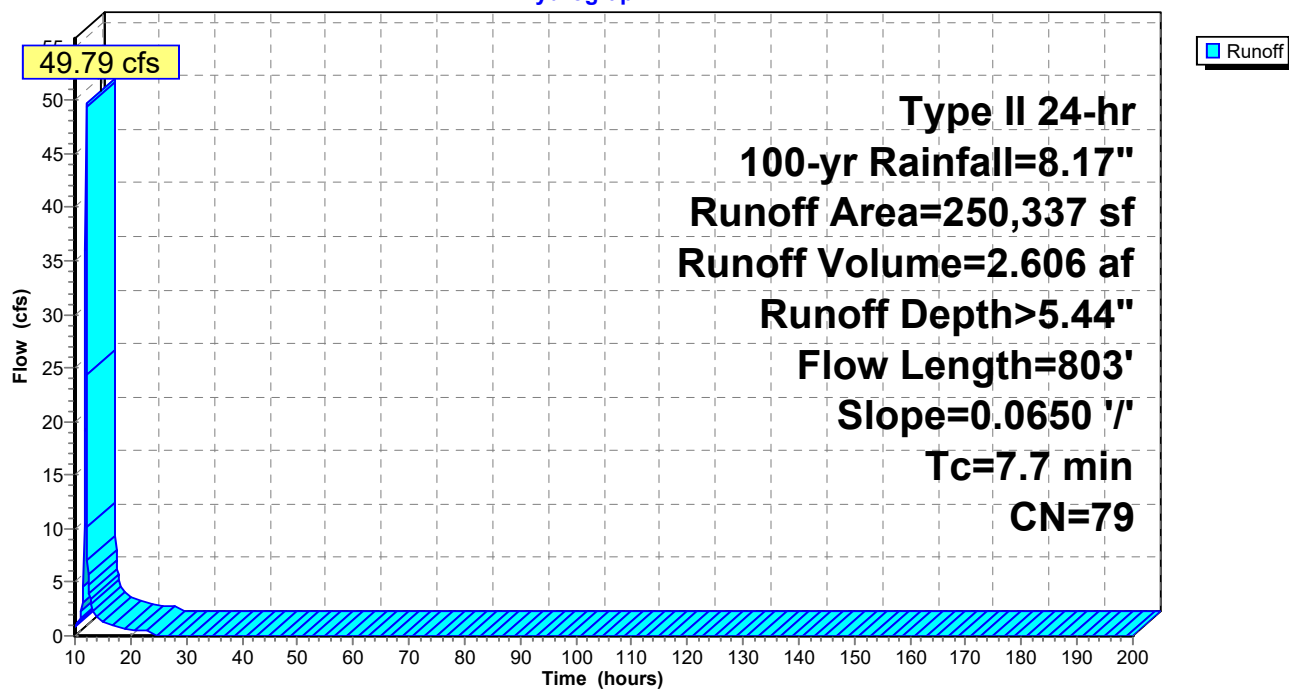
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-200.00 hrs, dt= 0.10 hrs
Type II 24-hr 100-yr Rainfall=8.17"

Area (sf)	CN	Description
250,337	79	Woods, Fair, HSG D
250,337		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.7	803	0.0650	1.74		Kirpich Method, Estimated Tc General overland flow k= 2.00

Subcatchment 2S: Pre Dev. Basin 2A

Hydrograph



Summary for Subcatchment 3S: Pre Dev. Basin 2B

Runoff = 16.90 cfs @ 11.99 hrs, Volume= 0.874 af, Depth> 3.46"

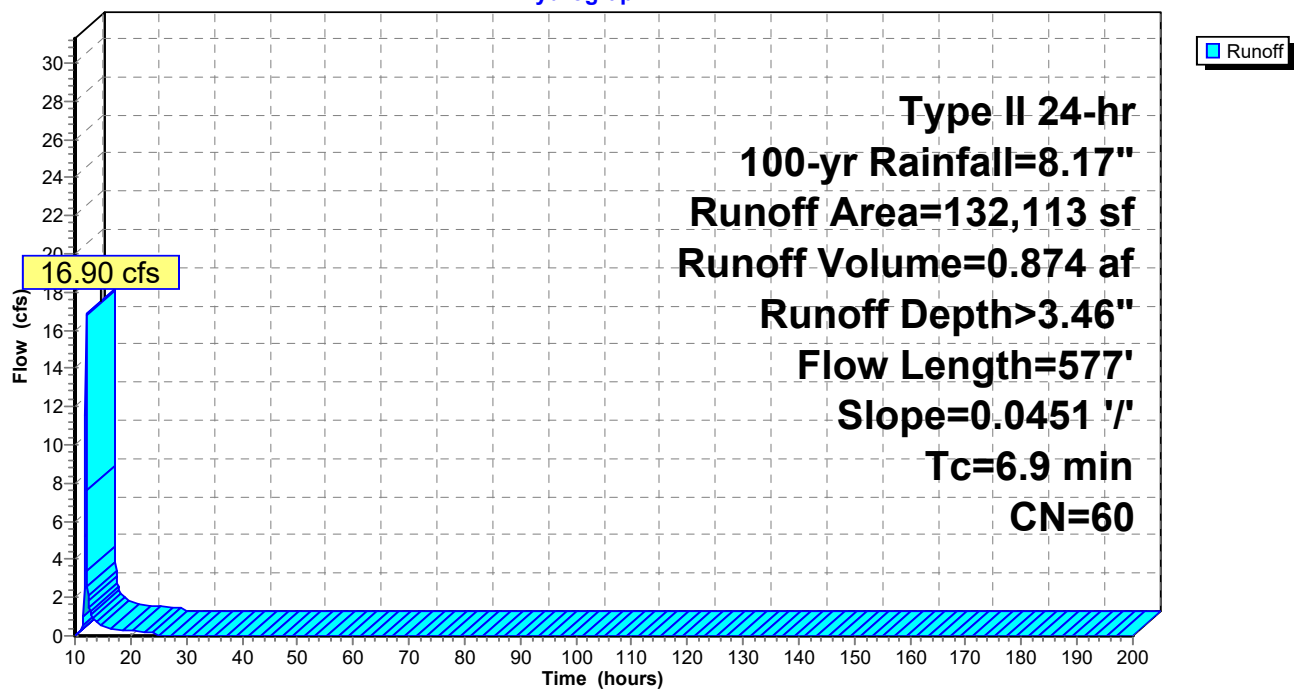
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-200.00 hrs, dt= 0.10 hrs
Type II 24-hr 100-yr Rainfall=8.17"

Area (sf)	CN	Description
132,113	60	Woods, Fair, HSG B
132,113		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.9	577	0.0451	1.40		Kirpich Method, Estimated Tc General overland flow k= 2.00

Subcatchment 3S: Pre Dev. Basin 2B

Hydrograph



Summary for Subcatchment 4S: Pre Dev. Basin 2C

Runoff = 100.77 cfs @ 11.98 hrs, Volume= 5.268 af, Depth> 5.89"

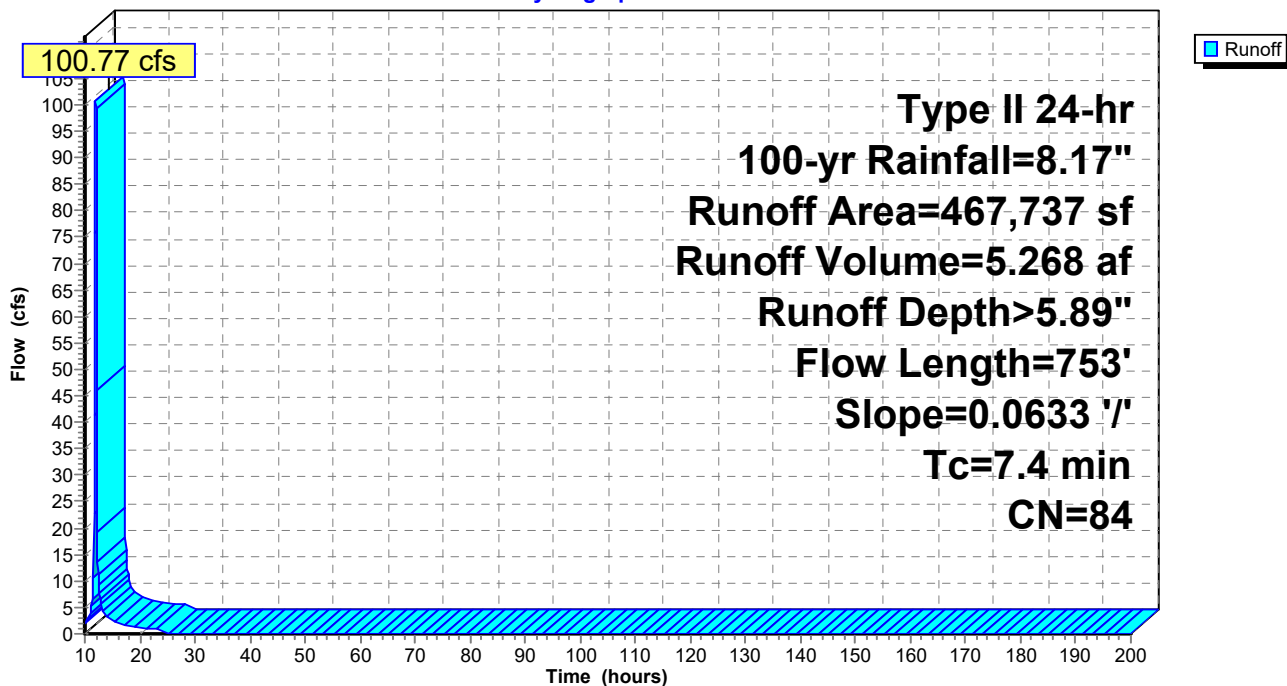
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-200.00 hrs, dt= 0.10 hrs
Type II 24-hr 100-yr Rainfall=8.17"

Area (sf)	CN	Description
173,689	79	Woods, Fair, HSG D
143,869	77	Brush, Fair, HSG D
90,721	98	Paved parking, HSG D
59,458	98	Roofs, HSG D
467,737	84	Weighted Average
317,558		67.89% Pervious Area
150,179		32.11% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.4	753	0.0633	1.69		Kirpich Method, Estimated Tc General overland flow k= 2.00

Subcatchment 4S: Pre Dev. Basin 2C

Hydrograph



Summary for Subcatchment 6S: Pre Dev. Basin 3

Runoff = 8.93 cfs @ 11.96 hrs, Volume= 0.462 af, Depth> 4.65"

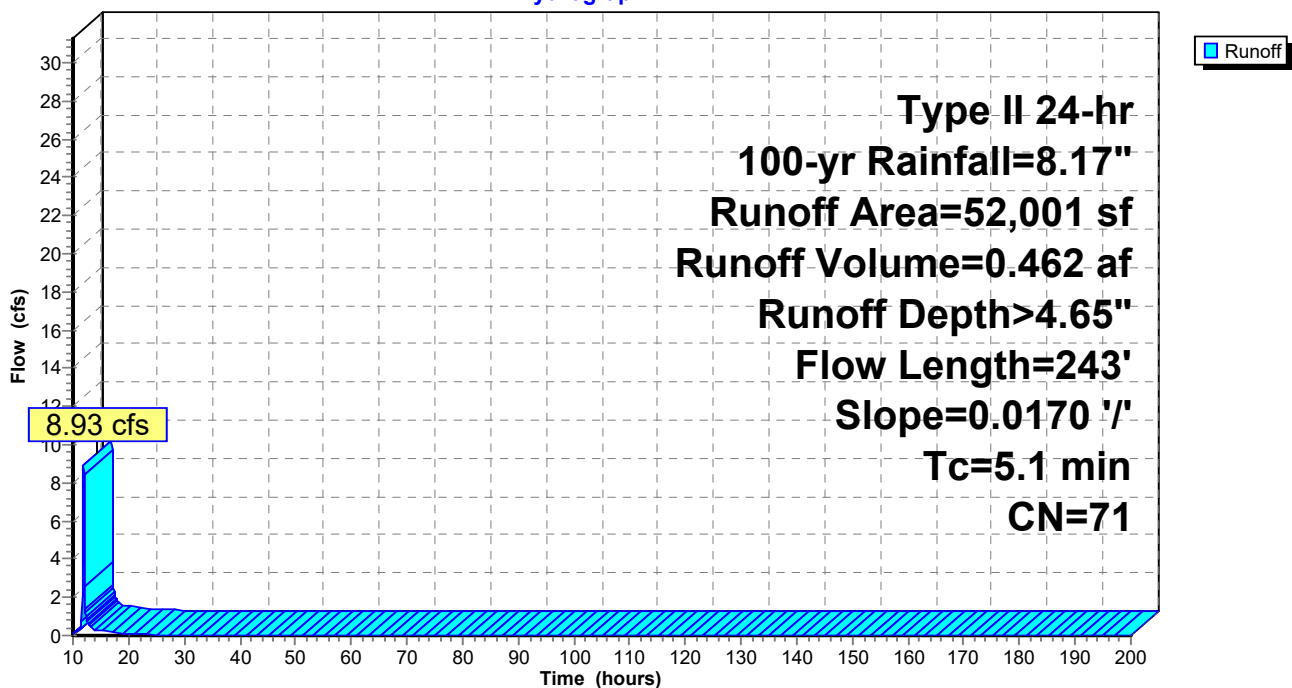
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-200.00 hrs, dt= 0.10 hrs
Type II 24-hr 100-yr Rainfall=8.17"

Area (sf)	CN	Description
9,925	73	Woods, Fair, HSG C
42,076	70	Brush, Fair, HSG C
52,001	71	Weighted Average
52,001		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.1	243	0.0170	0.79		Kirpich Method, Estimated Tc General overland flow k= 2.00

Subcatchment 6S: Pre Dev. Basin 3

Hydrograph



Summary for Subcatchment 7S: Pre Dev. Basin 4

Runoff = 15.15 cfs @ 12.00 hrs, Volume= 0.835 af, Depth> 3.35"

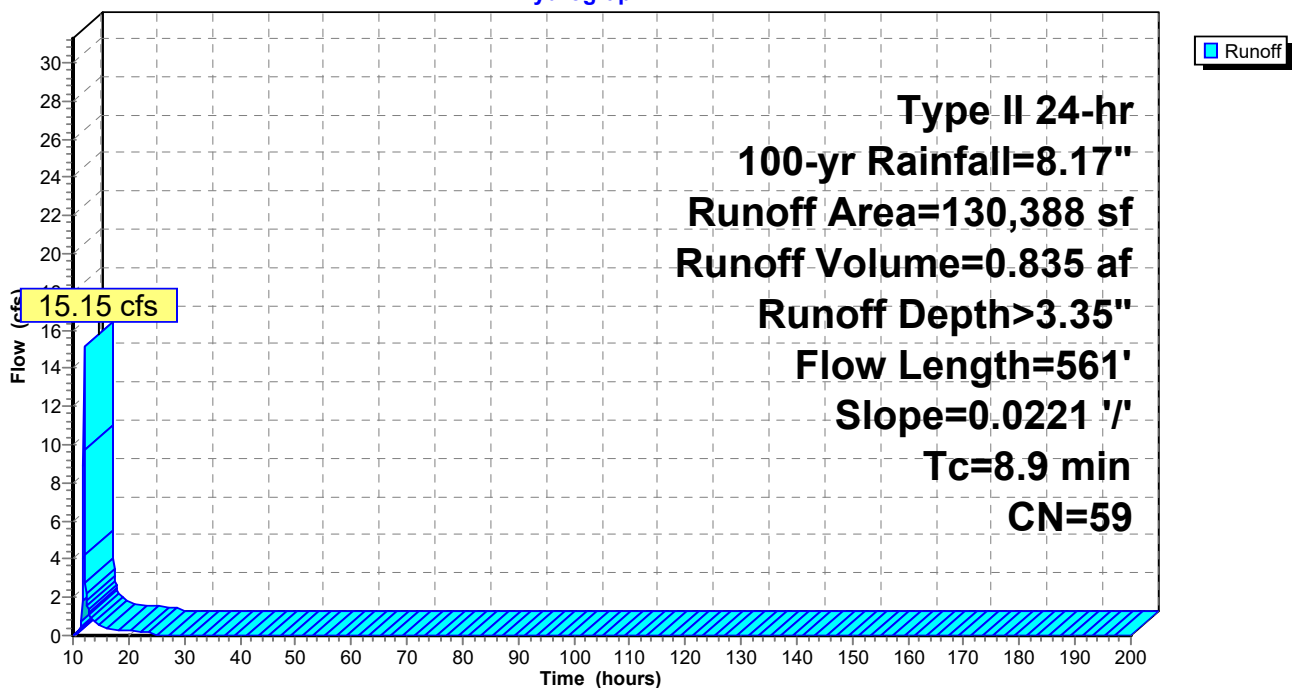
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-200.00 hrs, dt= 0.10 hrs
Type II 24-hr 100-yr Rainfall=8.17"

Area (sf)	CN	Description
104,102	60	Woods, Fair, HSG B
26,286	56	Brush, Fair, HSG B
130,388	59	Weighted Average
130,388		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.9	561	0.0221	1.06		Kirpich Method, General overland flow k= 2.00

Subcatchment 7S: Pre Dev. Basin 4

Hydrograph



Summary for Subcatchment 8S: Pre Dev. Basin 5

Runoff = 30.46 cfs @ 12.05 hrs, Volume= 1.954 af, Depth> 3.35"

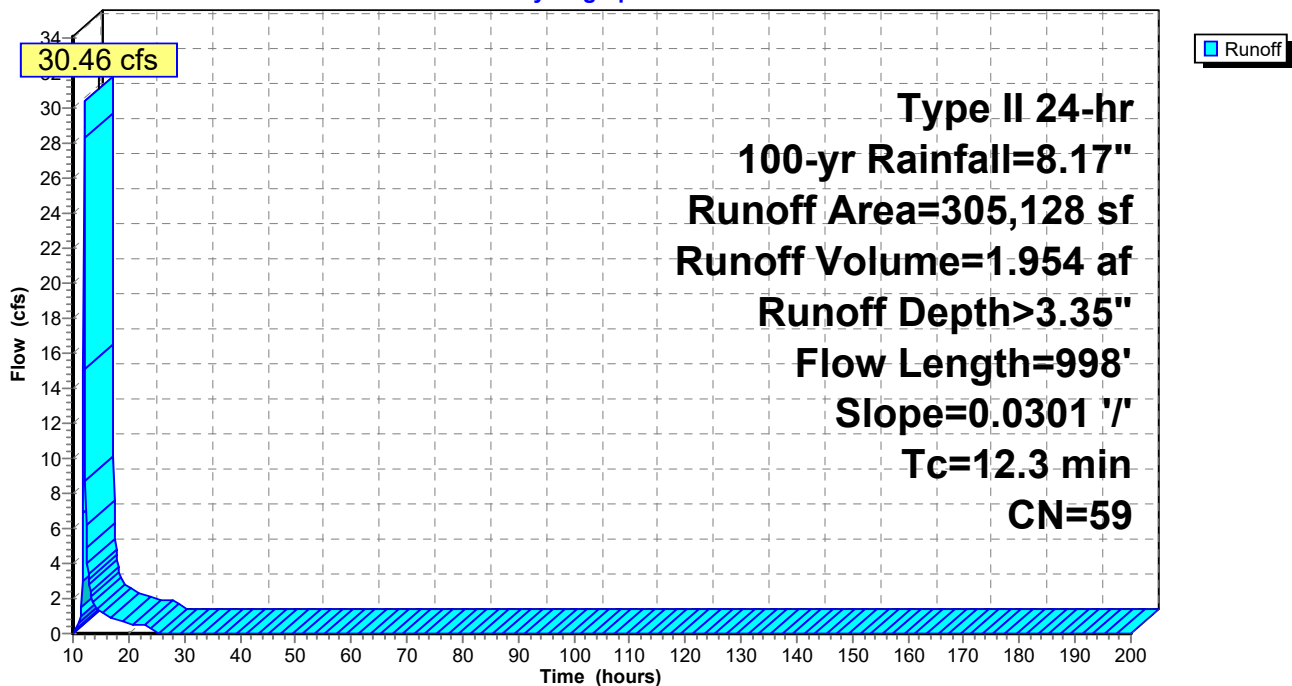
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-200.00 hrs, dt= 0.10 hrs
Type II 24-hr 100-yr Rainfall=8.17"

Area (sf)	CN	Description
267,919	60	Woods, Fair, HSG B
37,209	48	Brush, Good, HSG B
305,128	59	Weighted Average
305,128		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.3	998	0.0301	1.36		Kirpich Method, Estimated Tc General overland flow k= 2.00

Subcatchment 8S: Pre Dev. Basin 5

Hydrograph



Summary for Subcatchment 9S: Pre Dev. Basin 6

Runoff = 45.48 cfs @ 12.05 hrs, Volume= 2.920 af, Depth> 3.46"

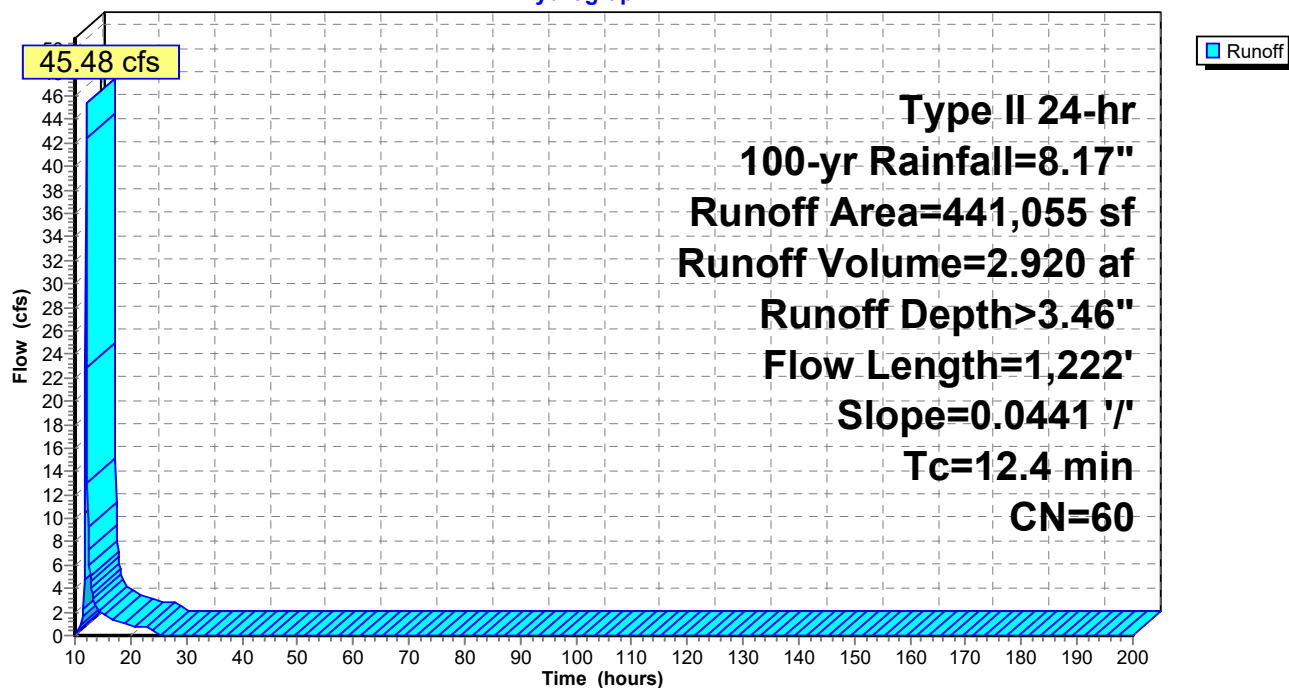
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-200.00 hrs, dt= 0.10 hrs
Type II 24-hr 100-yr Rainfall=8.17"

Area (sf)	CN	Description
401,238	60	Woods, Fair, HSG B
39,817	56	Brush, Fair, HSG B
441,055	60	Weighted Average
441,055		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.4	1,222	0.0441	1.65		Kirpich Method, Estimated Tc General overland flow k= 2.00

Subcatchment 9S: Pre Dev. Basin 6

Hydrograph



Summary for Subcatchment 10S: Pre Dev. Basin 7

Runoff = 24.22 cfs @ 12.02 hrs, Volume= 1.424 af, Depth= 3.12"

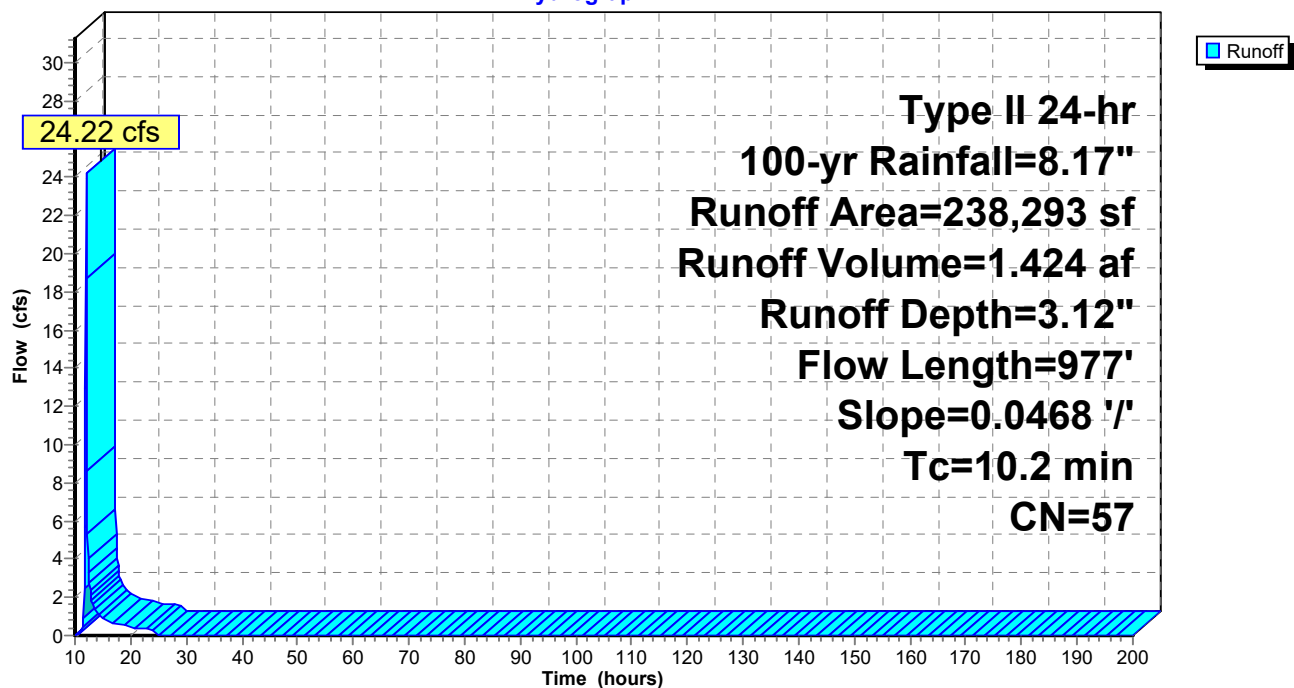
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-200.00 hrs, dt= 0.10 hrs
Type II 24-hr 100-yr Rainfall=8.17"

Area (sf)	CN	Description
207,447	55	Woods, Good, HSG B
30,846	69	Pasture/grassland/range, Fair, HSG B
238,293	57	Weighted Average
238,293		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.2	977	0.0468	1.60		Kirpich Method, Estimated Tc General overland flow k= 2.00

Subcatchment 10S: Pre Dev. Basin 7

Hydrograph



Summary for Subcatchment 11S: Pre Dev. Basin 8

Runoff = 36.97 cfs @ 12.00 hrs, Volume= 2.042 af, Depth> 3.68"

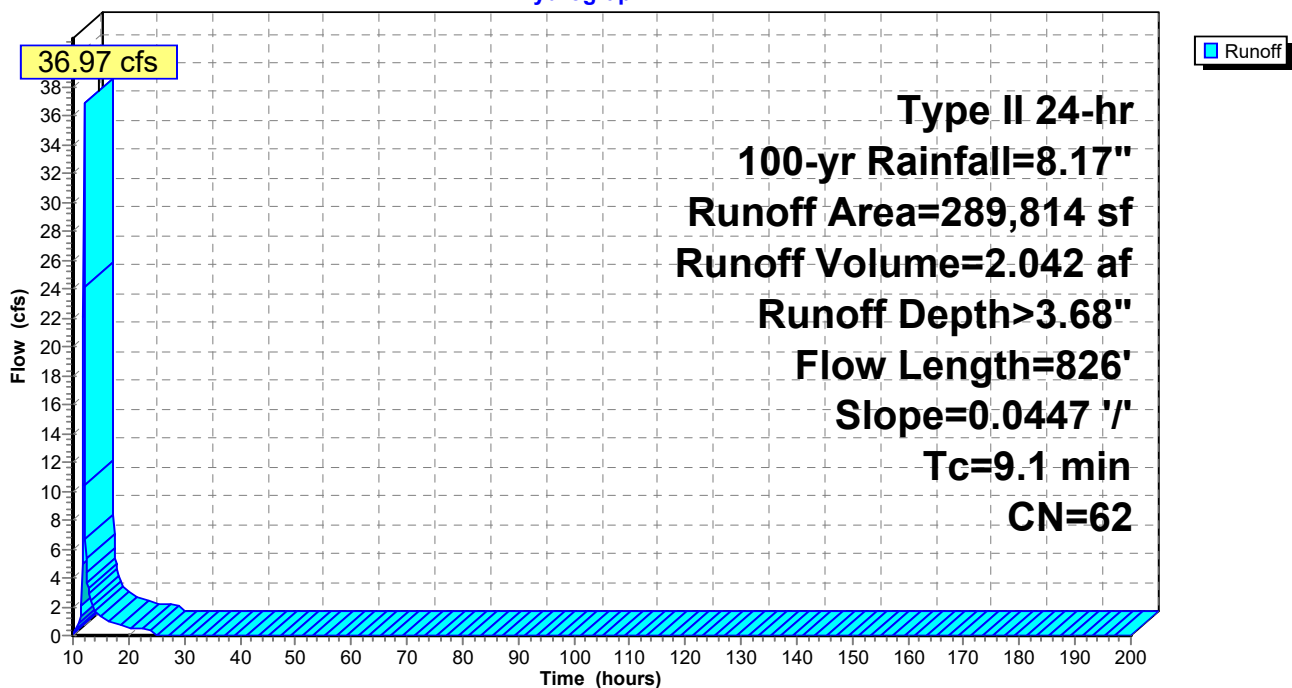
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-200.00 hrs, dt= 0.10 hrs
Type II 24-hr 100-yr Rainfall=8.17"

Area (sf)	CN	Description
230,959	60	Woods, Fair, HSG B
58,855	69	50-75% Grass cover, Fair, HSG B
289,814	62	Weighted Average
289,814		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.1	826	0.0447	1.51		Kirpich Method, General overland flow k= 2.00

Subcatchment 11S: Pre Dev. Basin 8

Hydrograph



Summary for Subcatchment 12S: Post Basin 1 to SCM

Runoff = 73.65 cfs @ 11.95 hrs, Volume= 3.987 af, Depth> 6.27"
 Routed to Pond 1P : Sand Filter -SCM 1

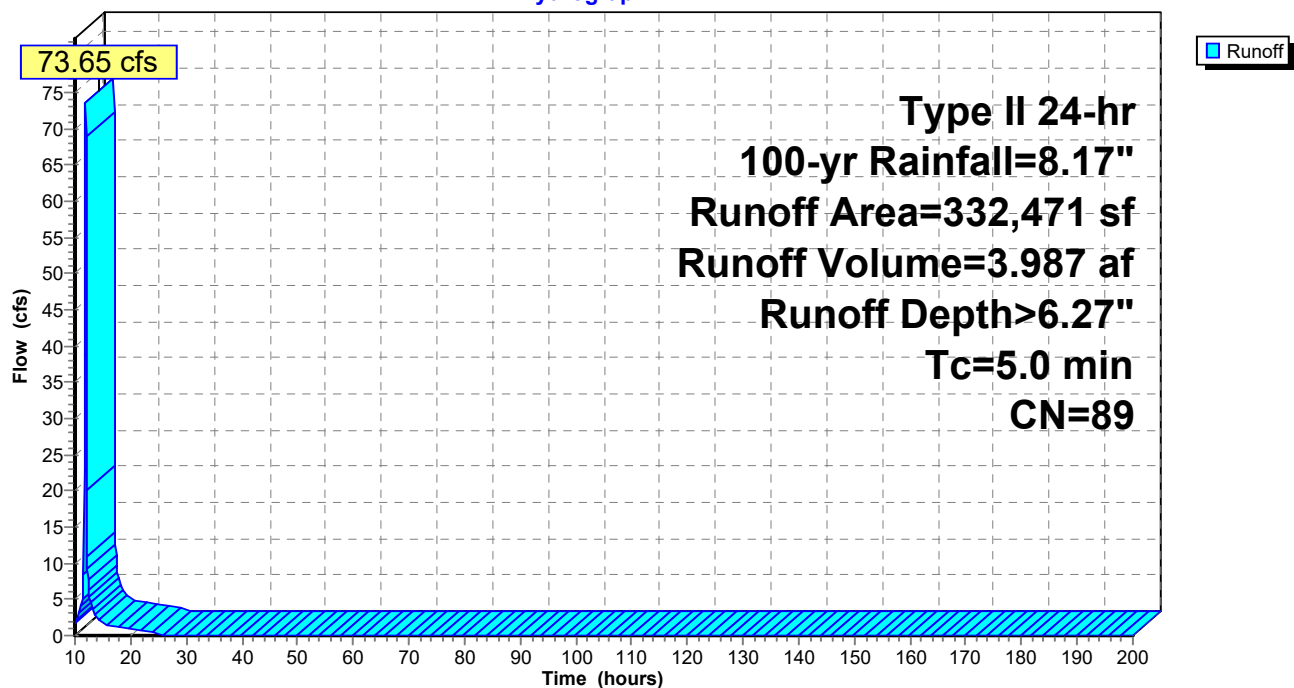
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-200.00 hrs, dt= 0.10 hrs
 Type II 24-hr 100-yr Rainfall=8.17"

Area (sf)	CN	Description
109,684	98	Paved parking, HSG A
72,655	56	Brush, Fair, HSG B
150,132	98	Roofs, HSG B
332,471	89	Weighted Average
72,655		21.85% Pervious Area
259,816		78.15% Impervious Area

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

Subcatchment 12S: Post Basin 1 to SCM

Hydrograph



Summary for Subcatchment 13S: Post Dev Bypass 1

Runoff = 23.05 cfs @ 11.96 hrs, Volume= 1.195 af, Depth> 3.46"
 Routed to Link 1L : POA 1

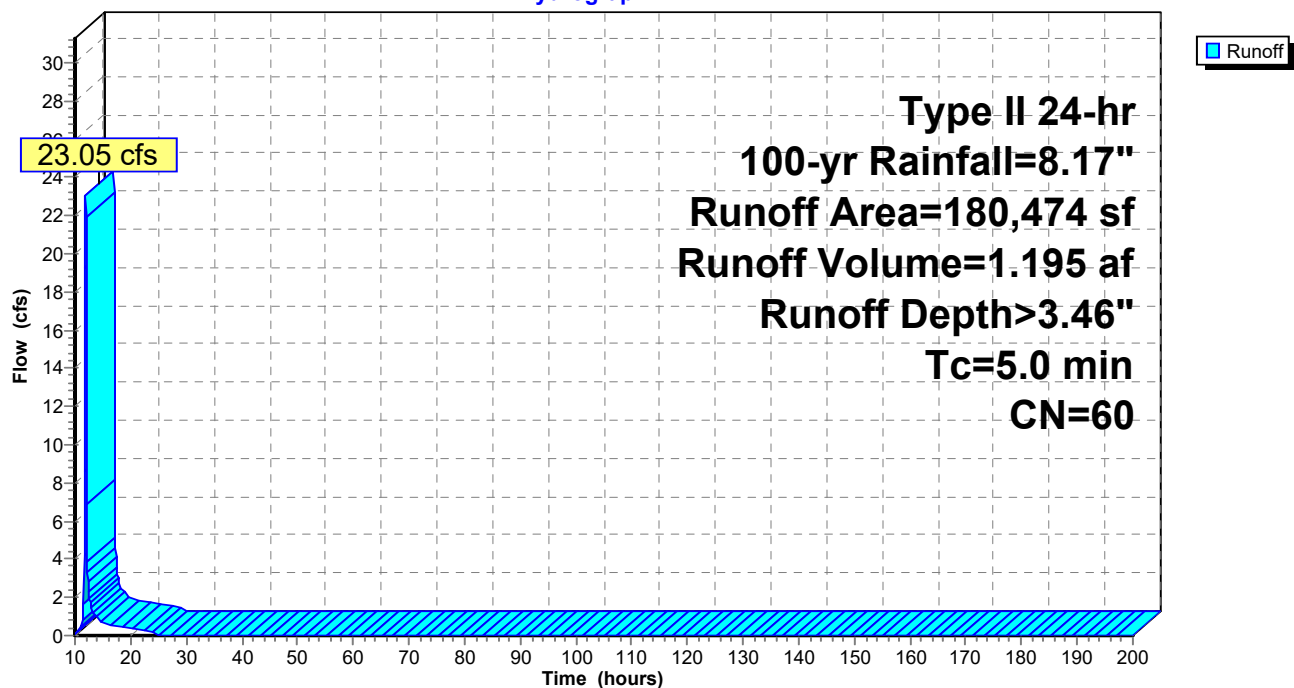
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-200.00 hrs, dt= 0.10 hrs
 Type II 24-hr 100-yr Rainfall=8.17"

Area (sf)	CN	Description
124,058	60	Woods, Fair, HSG B
49,243	56	Brush, Fair, HSG B
7,173	98	Paved parking, HSG B
180,474	60	Weighted Average
173,301		96.03% Pervious Area
7,173		3.97% Impervious Area

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

Subcatchment 13S: Post Dev Bypass 1

Hydrograph



Summary for Subcatchment 14S: Post Dev. Bypass 2A

Runoff = 24.25 cfs @ 11.96 hrs, Volume= 1.254 af, Depth> 5.44"

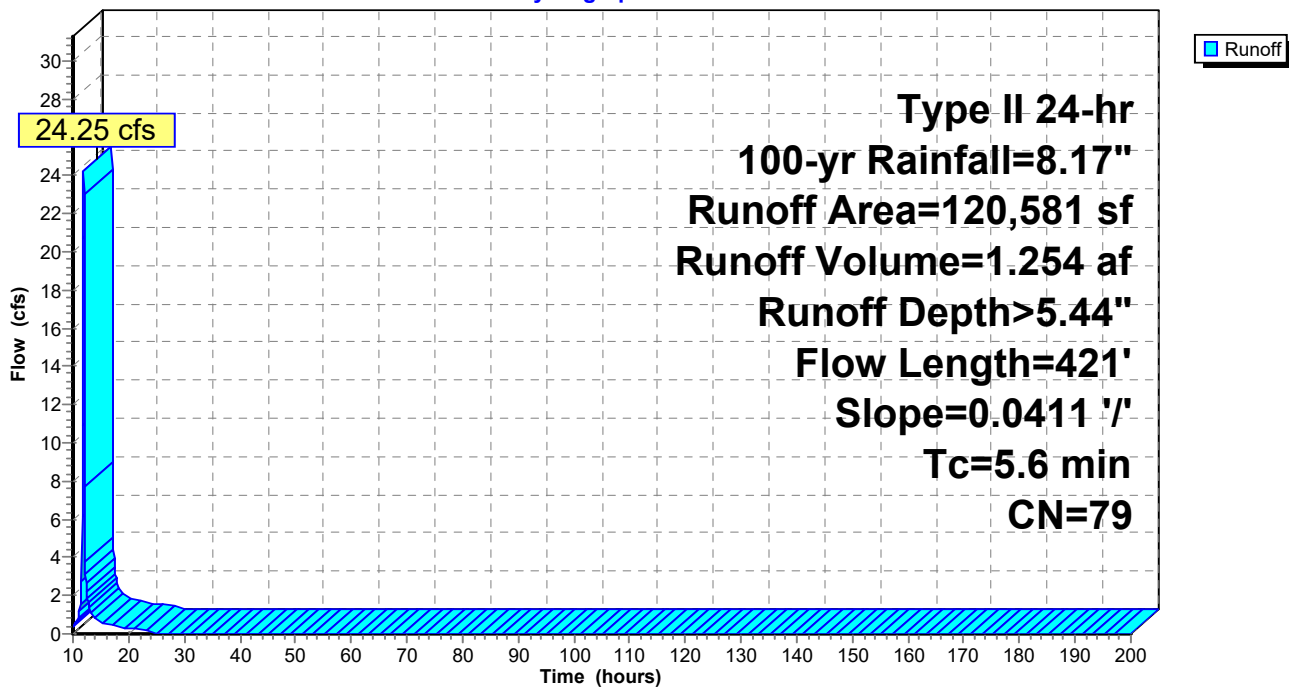
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-200.00 hrs, dt= 0.10 hrs
Type II 24-hr 100-yr Rainfall=8.17"

Area (sf)	CN	Description
120,581	79	Woods, Fair, HSG D
120,581		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.6	421	0.0411	1.25		Kirpich Method, Estimated Tc General overland flow k= 2.00

Subcatchment 14S: Post Dev. Bypass 2A

Hydrograph



Summary for Subcatchment 15S: Post Dev. Basin 2B to SCM

Runoff = 38.03 cfs @ 11.95 hrs, Volume= 2.051 af, Depth> 5.88"
 Routed to Pond 2P : Wet Pond SCM 2

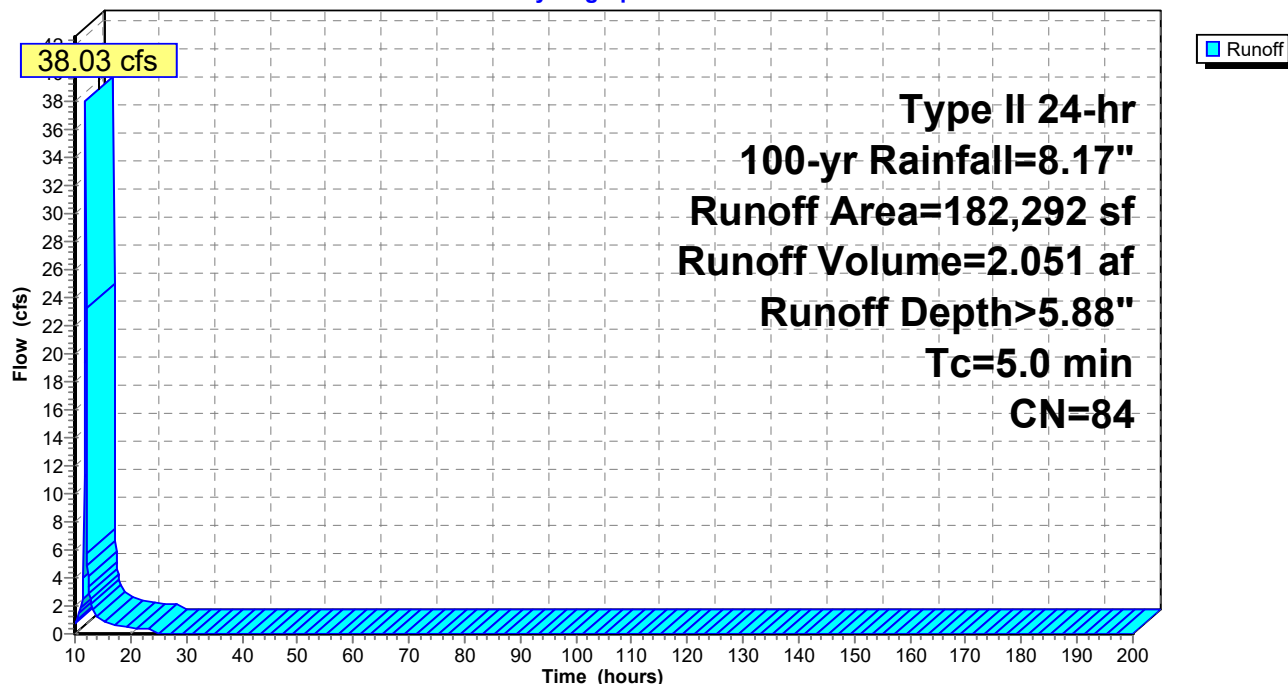
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-200.00 hrs, dt= 0.10 hrs
 Type II 24-hr 100-yr Rainfall=8.17"

Area (sf)	CN	Description
26,969	98	Paved parking, HSG B
49,749	48	Brush, Good, HSG B
95,673	98	Roofs, HSG B
9,901	98	Water Surface, HSG B
182,292	84	Weighted Average
49,749		27.29% Pervious Area
132,543		72.71% Impervious Area

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

Subcatchment 15S: Post Dev. Basin 2B to SCM

Hydrograph



Summary for Subcatchment 16S: Post Dev. Bypass 2C

Runoff = 90.37 cfs @ 11.98 hrs, Volume= 4.737 af, Depth> 5.97"

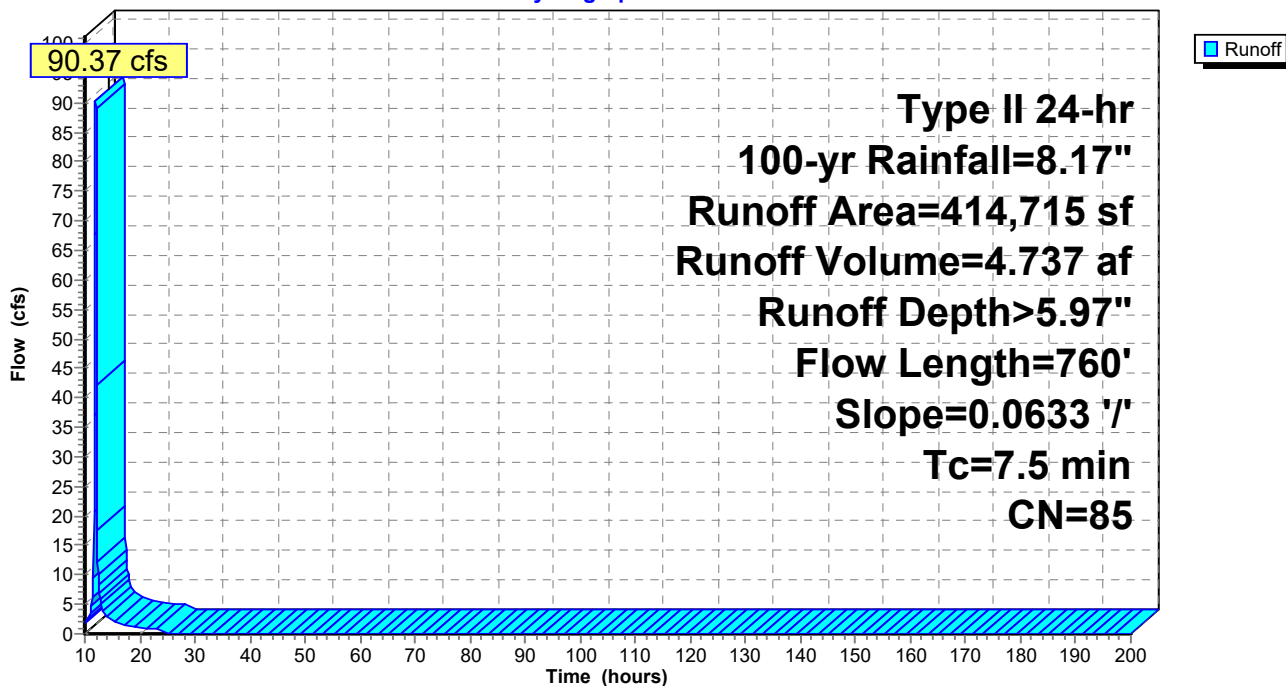
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-200.00 hrs, dt= 0.10 hrs
Type II 24-hr 100-yr Rainfall=8.17"

Area (sf)	CN	Description
173,689	79	Woods, Fair, HSG D
90,847	98	Paved parking, HSG D
90,721	77	Brush, Fair, HSG D
59,458	98	Roofs, HSG D
414,715	85	Weighted Average
264,410		63.76% Pervious Area
150,305		36.24% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.5	760	0.0633	1.70		Kirpich Method, Estimated Tc General overland flow k= 2.00

Subcatchment 16S: Post Dev. Bypass 2C

Hydrograph



Summary for Subcatchment 18S: Post Dev Bypass 2B

Runoff = 6.01 cfs @ 11.97 hrs, Volume= 0.313 af, Depth= 2.79"
 Routed to Link 2L : POA 2

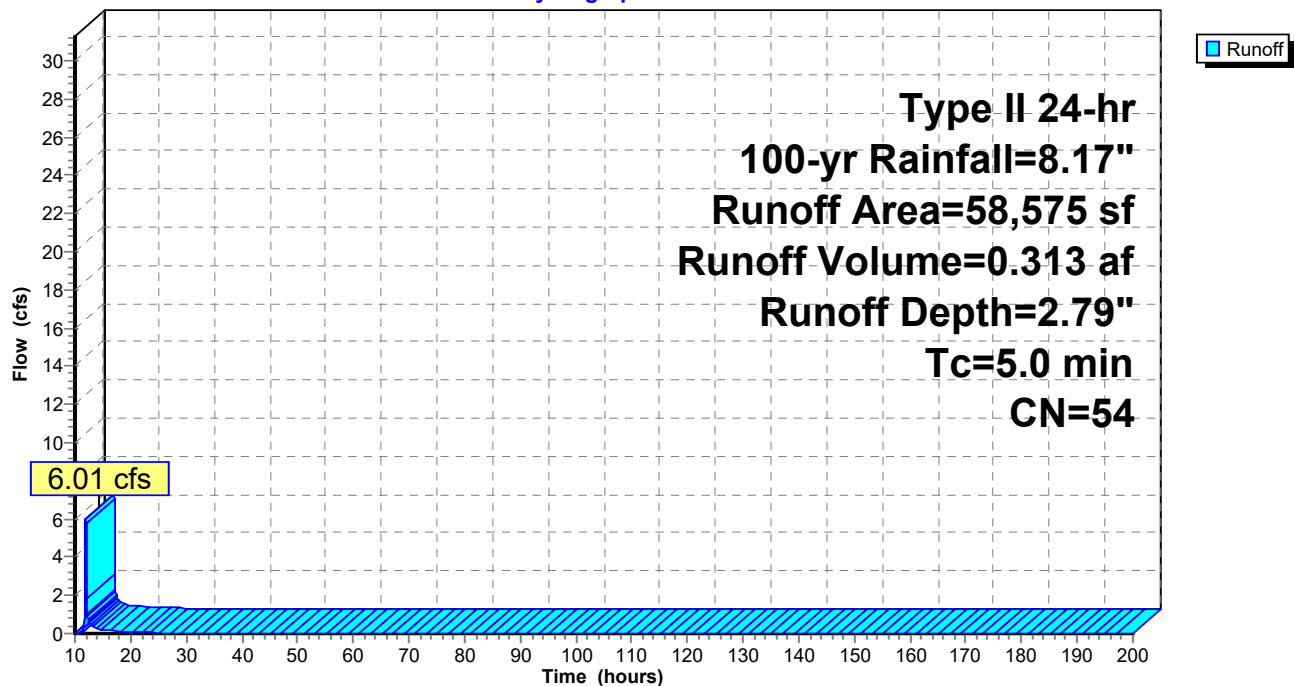
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-200.00 hrs, dt= 0.10 hrs
 Type II 24-hr 100-yr Rainfall=8.17"

Area (sf)	CN	Description
53,889	55	Woods, Good, HSG B
4,686	48	Brush, Good, HSG B
58,575	54	Weighted Average
58,575		100.00% Pervious Area

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

Subcatchment 18S: Post Dev Bypass 2B

Hydrograph



Summary for Subcatchment 19S: Post Dev. Basin 3

Runoff = 8.14 cfs @ 11.96 hrs, Volume= 0.422 af, Depth> 4.54"

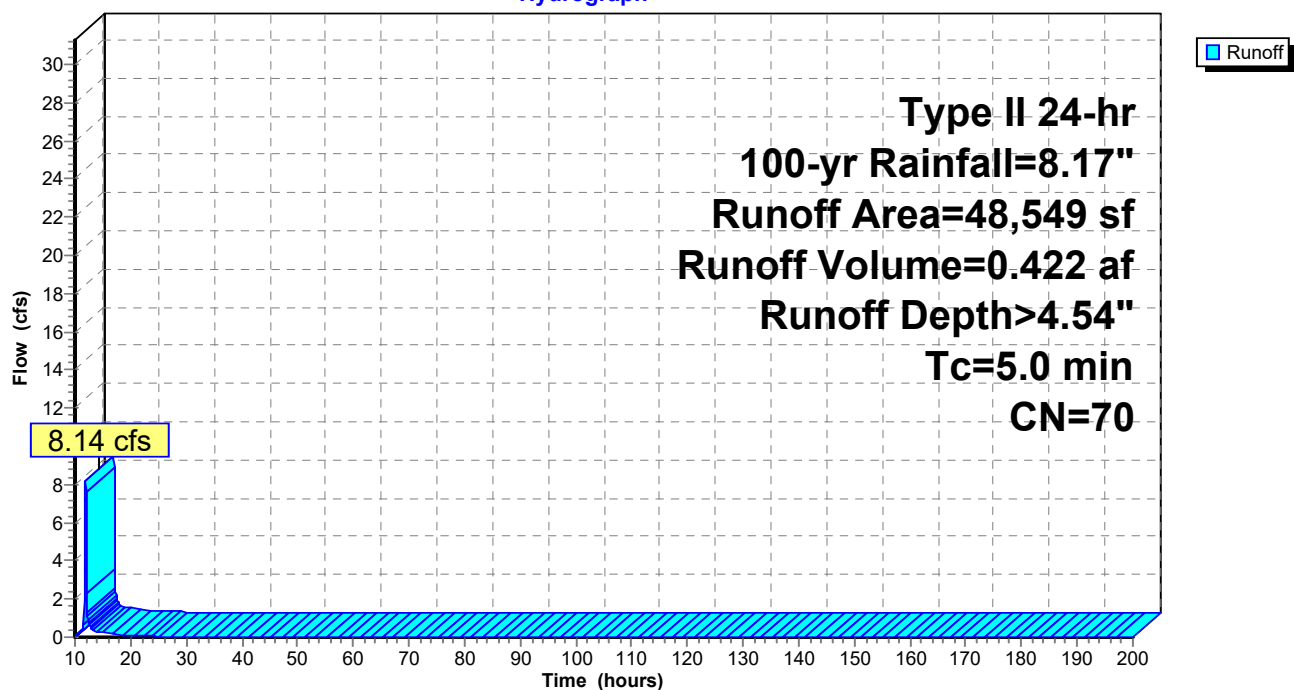
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-200.00 hrs, dt= 0.10 hrs
Type II 24-hr 100-yr Rainfall=8.17"

Area (sf)	CN	Description
48,549	70	Brush, Fair, HSG C
48,549		100.00% Pervious Area

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

Subcatchment 19S: Post Dev. Basin 3

Hydrograph



Summary for Subcatchment 20S: Post Dev. Basin 4

Runoff = 3.97 cfs @ 11.96 hrs, Volume= 0.206 af, Depth> 3.68"

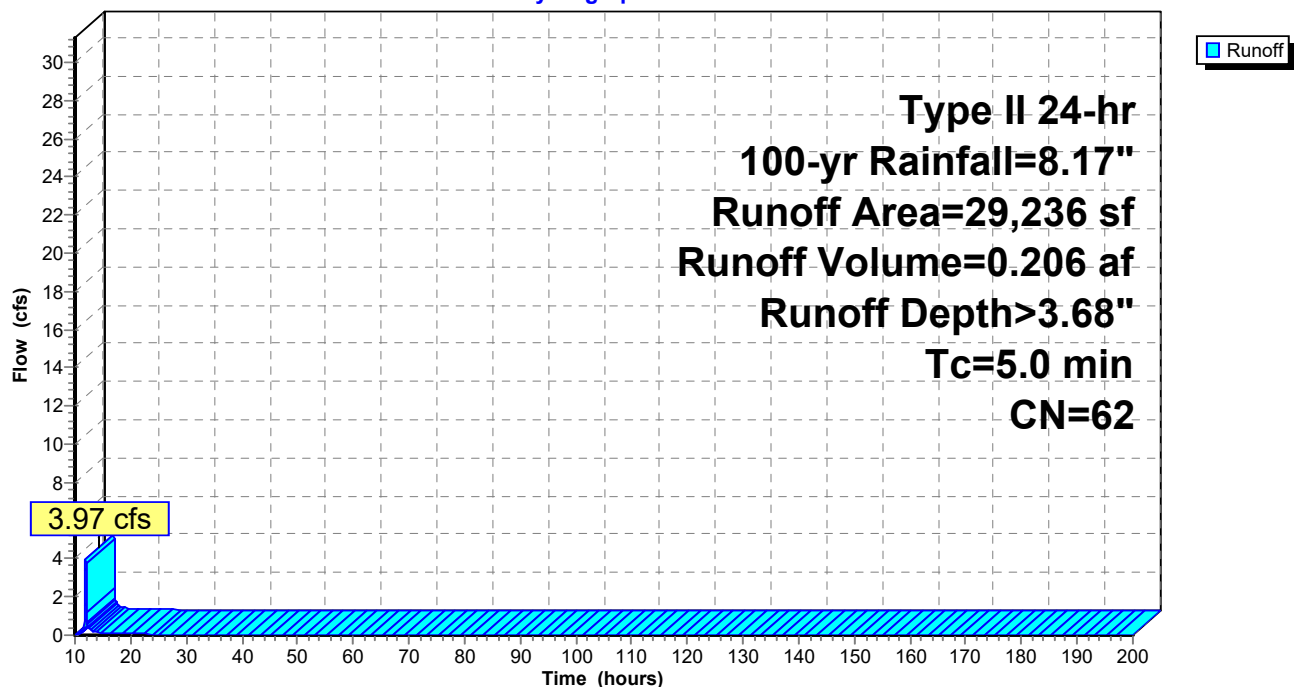
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-200.00 hrs, dt= 0.10 hrs
Type II 24-hr 100-yr Rainfall=8.17"

Area (sf)	CN	Description
6,194	60	Woods, Fair, HSG B
19,589	56	Brush, Fair, HSG B
3,453	98	Paved parking, HSG B
29,236	62	Weighted Average
25,783		88.19% Pervious Area
3,453		11.81% Impervious Area

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

Subcatchment 20S: Post Dev. Basin 4

Hydrograph



Summary for Subcatchment 21S: Post Dev. Basin 5 to SCM

Runoff = 26.10 cfs @ 11.95 hrs, Volume= 1.411 af, Depth> 6.12"
 Routed to Pond 6P : Sand Filter -SCM 3

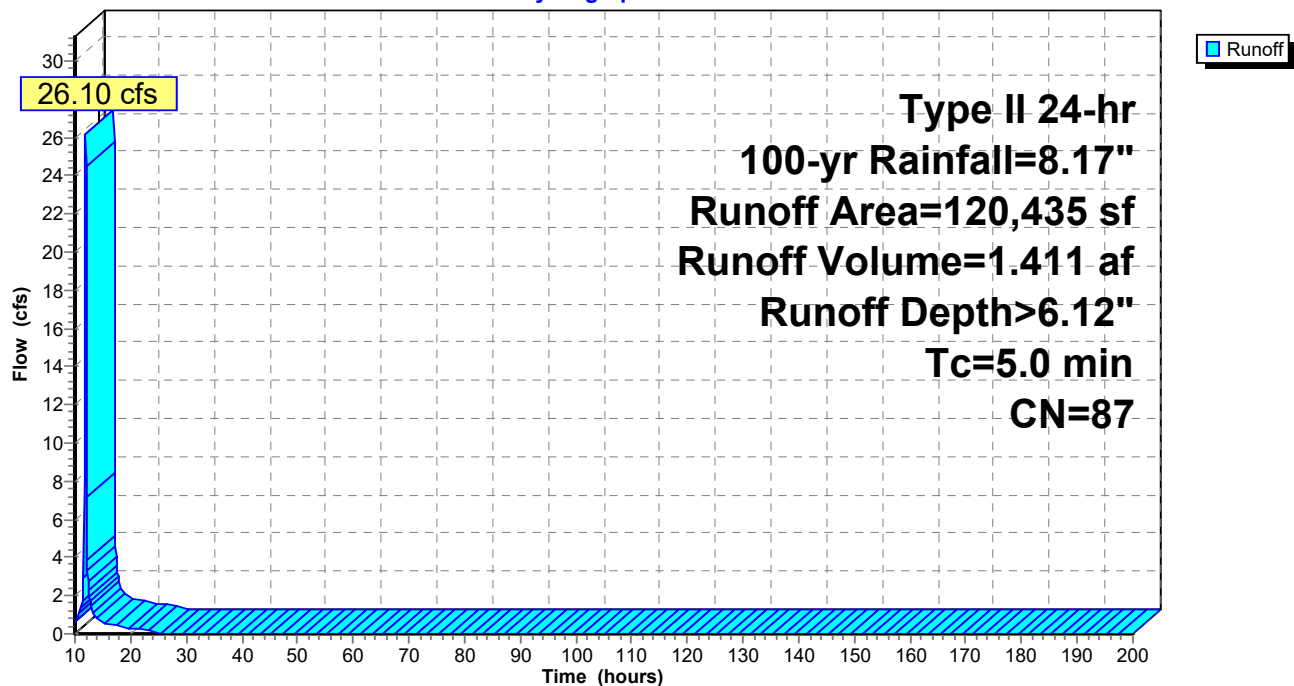
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-200.00 hrs, dt= 0.10 hrs
 Type II 24-hr 100-yr Rainfall=8.17"

Area (sf)	CN	Description
34,944	98	Roofs, HSG B
27,461	48	Brush, Good, HSG B
46,122	98	Paved parking, HSG B
11,908	98	Water Surface, 0% imp, HSG B
120,435	87	Weighted Average
39,369		32.69% Pervious Area
81,066		67.31% Impervious Area

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

Subcatchment 21S: Post Dev. Basin 5 to SCM

Hydrograph



Summary for Subcatchment 22S: Post Dev. Bypass 5

Runoff = 16.58 cfs @ 12.05 hrs, Volume= 1.064 af, Depth> 3.35"
 Routed to Link 3L : POA 4

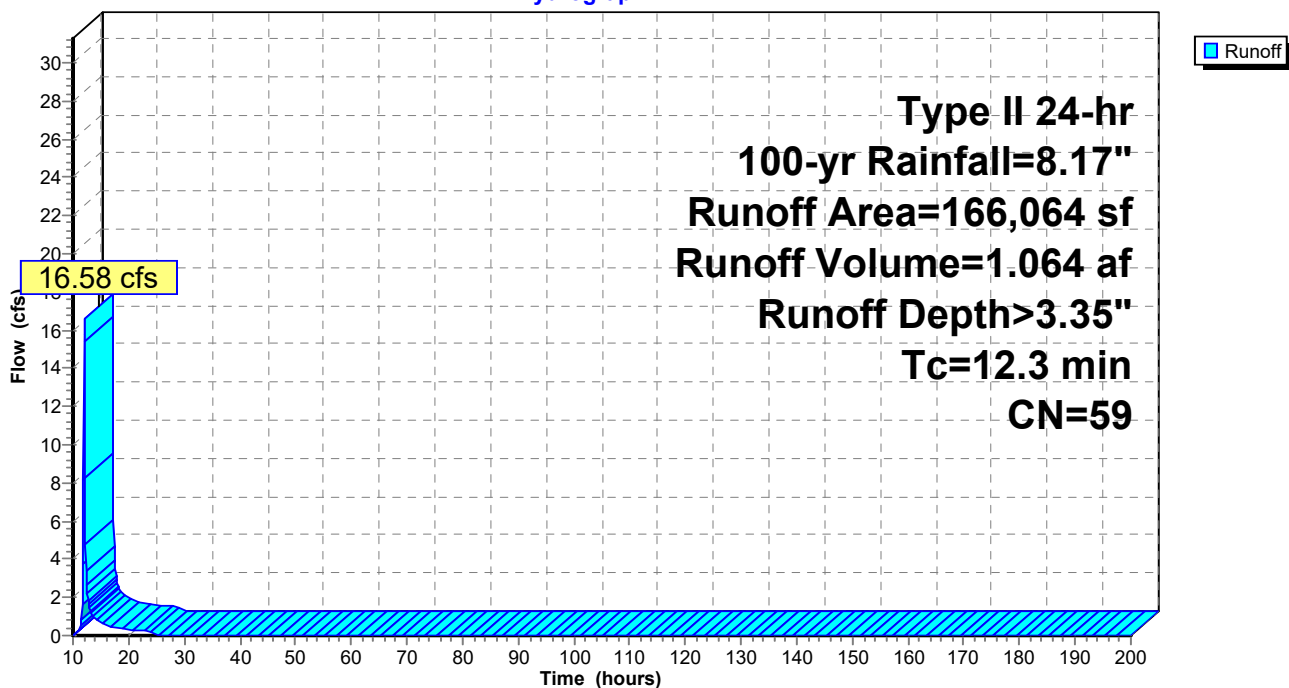
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-200.00 hrs, dt= 0.10 hrs
 Type II 24-hr 100-yr Rainfall=8.17"

Area (sf)	CN	Description
101,135	60	Woods, Fair, HSG B
52,516	48	Brush, Good, HSG B
12,413	98	Paved parking, HSG B
166,064	59	Weighted Average
153,651		92.53% Pervious Area
12,413		7.47% Impervious Area

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

Subcatchment 22S: Post Dev. Bypass 5

Hydrograph



Summary for Subcatchment 23S: Post Dev. Basin 6 to SCM

Runoff = 40.87 cfs @ 11.95 hrs, Volume= 2.218 af, Depth> 6.40"
 Routed to Pond 4P : Wet Pond SCM 4

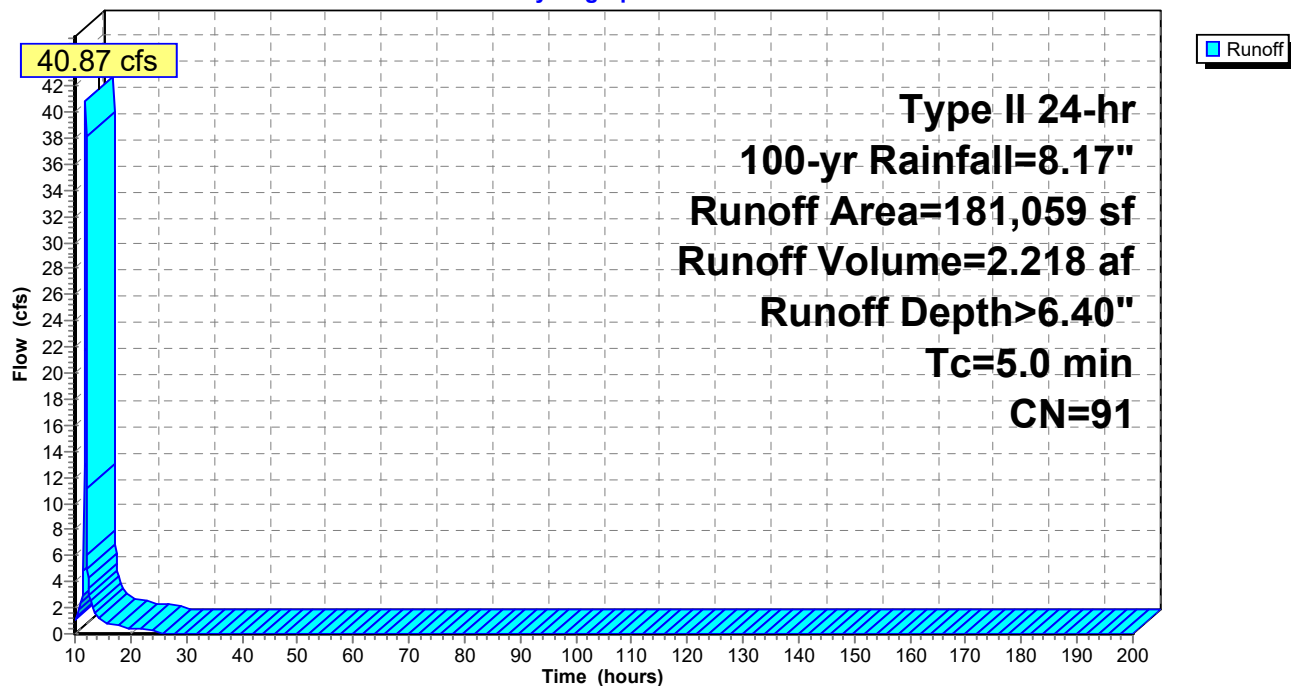
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-200.00 hrs, dt= 0.10 hrs
 Type II 24-hr 100-yr Rainfall=8.17"

Area (sf)	CN	Description
70,779	98	Paved parking, HSG B
32,683	61	>75% Grass cover, Good, HSG B
63,382	98	Roofs, HSG B
14,215	98	Water Surface, 0% imp, HSG B
181,059	91	Weighted Average
46,898		25.90% Pervious Area
134,161		74.10% Impervious Area

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

Subcatchment 23S: Post Dev. Basin 6 to SCM

Hydrograph



Summary for Subcatchment 24S: Post Dev. Bypass 6

Runoff = 33.41 cfs @ 11.96 hrs, Volume= 1.731 af, Depth> 3.46"
 Routed to Link 4L : POA 5

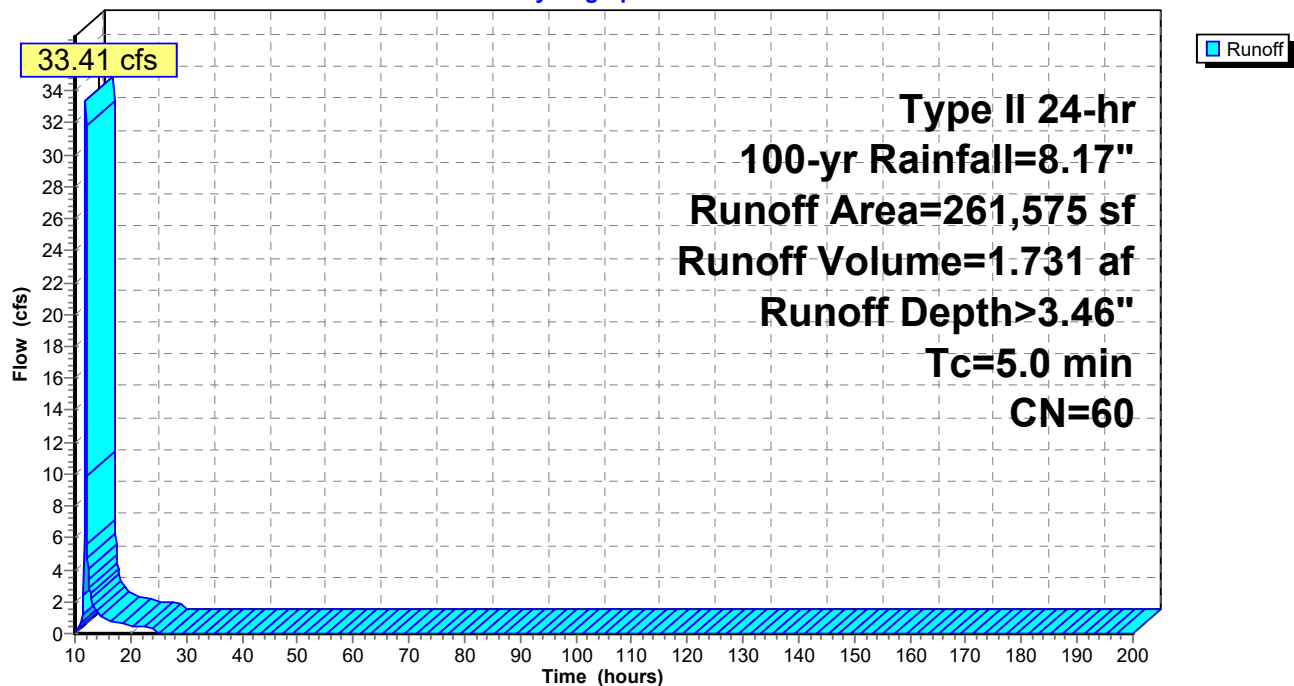
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-200.00 hrs, dt= 0.10 hrs
 Type II 24-hr 100-yr Rainfall=8.17"

Area (sf)	CN	Description
201,745	60	Woods, Fair, HSG B
55,562	56	Brush, Fair, HSG B
4,268	98	Paved parking, HSG B
261,575	60	Weighted Average
257,307		98.37% Pervious Area
4,268		1.63% Impervious Area

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

Subcatchment 24S: Post Dev. Bypass 6

Hydrograph



Summary for Subcatchment 25S: Post Dev. Basin 7 to SCM

Runoff = 23.52 cfs @ 11.95 hrs, Volume= 1.272 af, Depth> 6.20"
 Routed to Pond 5P : Wet Pond SCM 5

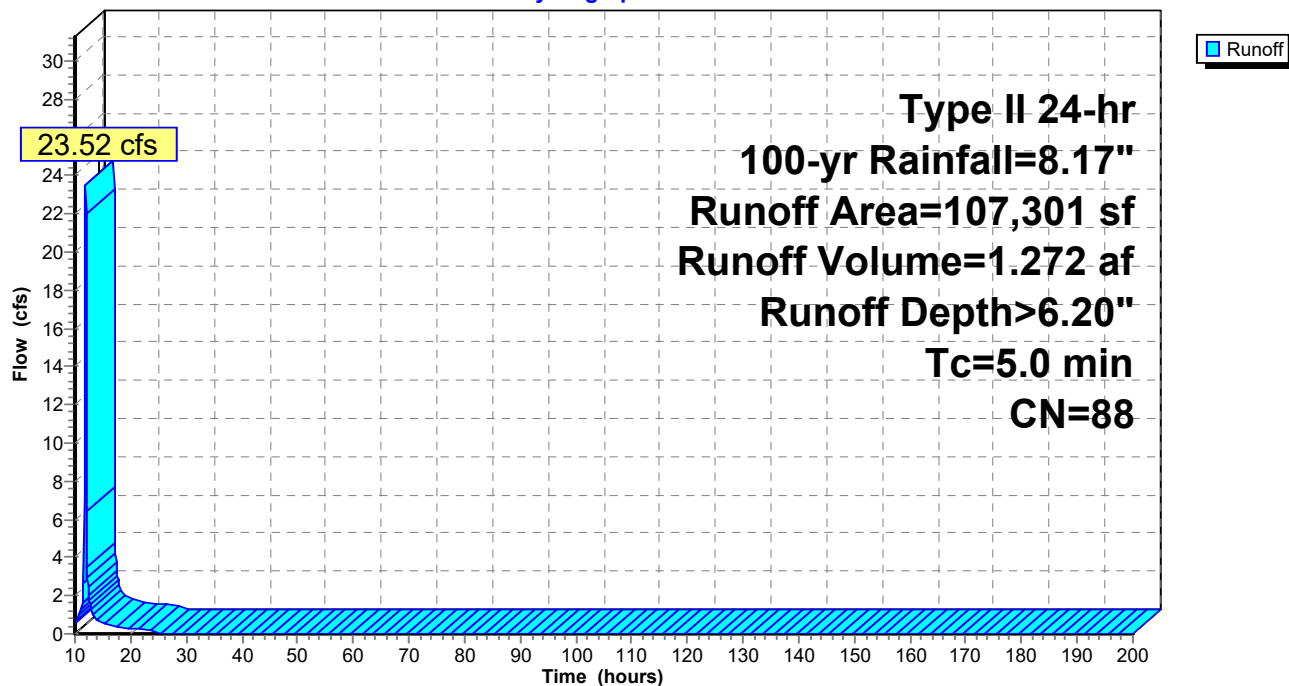
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-200.00 hrs, dt= 0.10 hrs
 Type II 24-hr 100-yr Rainfall=8.17"

Area (sf)	CN	Description
50,376	98	Paved parking, HSG B
21,628	48	Brush, Good, HSG B
28,800	98	Roofs, HSG B
6,497	98	Water Surface, 0% imp, HSG B
107,301	88	Weighted Average
28,125		26.21% Pervious Area
79,176		73.79% Impervious Area

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

Subcatchment 25S: Post Dev. Basin 7 to SCM

Hydrograph



Summary for Subcatchment 26S: Post Dev. Bypass 7

Runoff = 12.64 cfs @ 12.02 hrs, Volume= 0.739 af, Depth= 3.01"
 Routed to Link 5L : POA 6

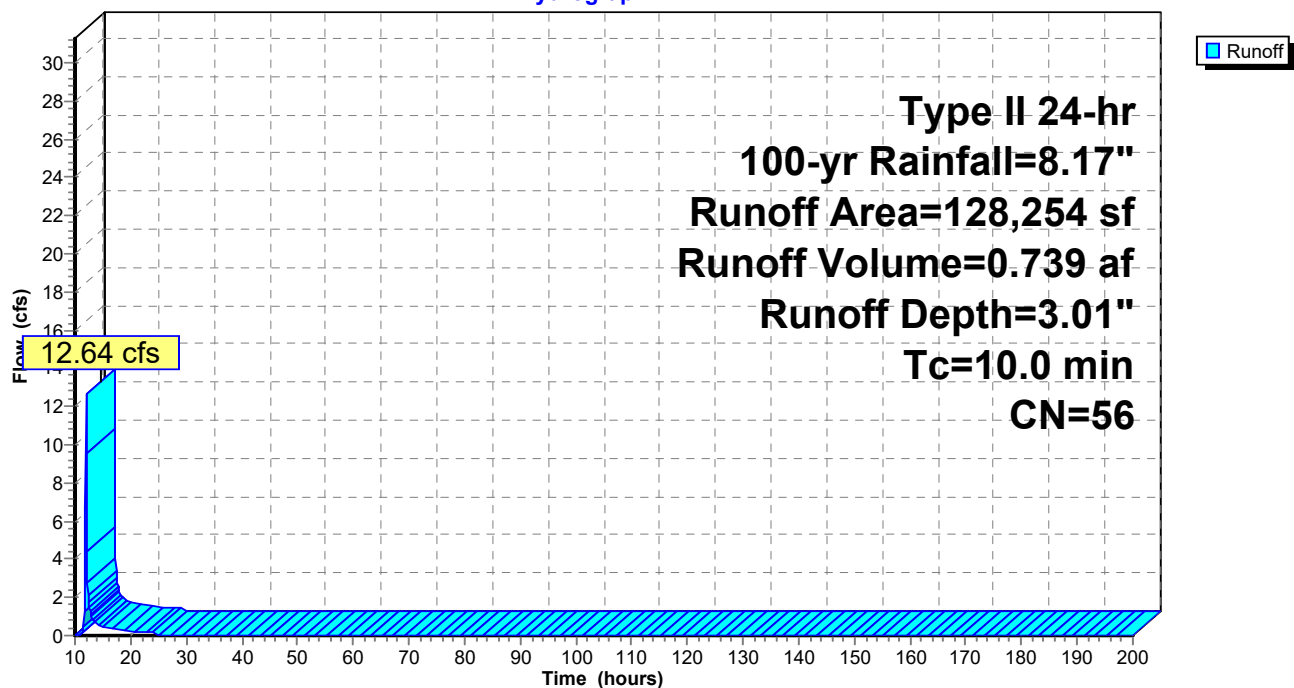
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-200.00 hrs, dt= 0.10 hrs
 Type II 24-hr 100-yr Rainfall=8.17"

Area (sf)	CN	Description
39,944	55	Woods, Good, HSG B
72,602	48	Brush, Good, HSG B
15,708	98	Paved parking, HSG B
128,254	56	Weighted Average
112,546		87.75% Pervious Area
15,708		12.25% Impervious Area

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

Subcatchment 26S: Post Dev. Bypass 7

Hydrograph



Summary for Subcatchment 27S: Post Dev. Bypass 8

Runoff = 36.97 cfs @ 12.00 hrs, Volume= 2.042 af, Depth> 3.68"

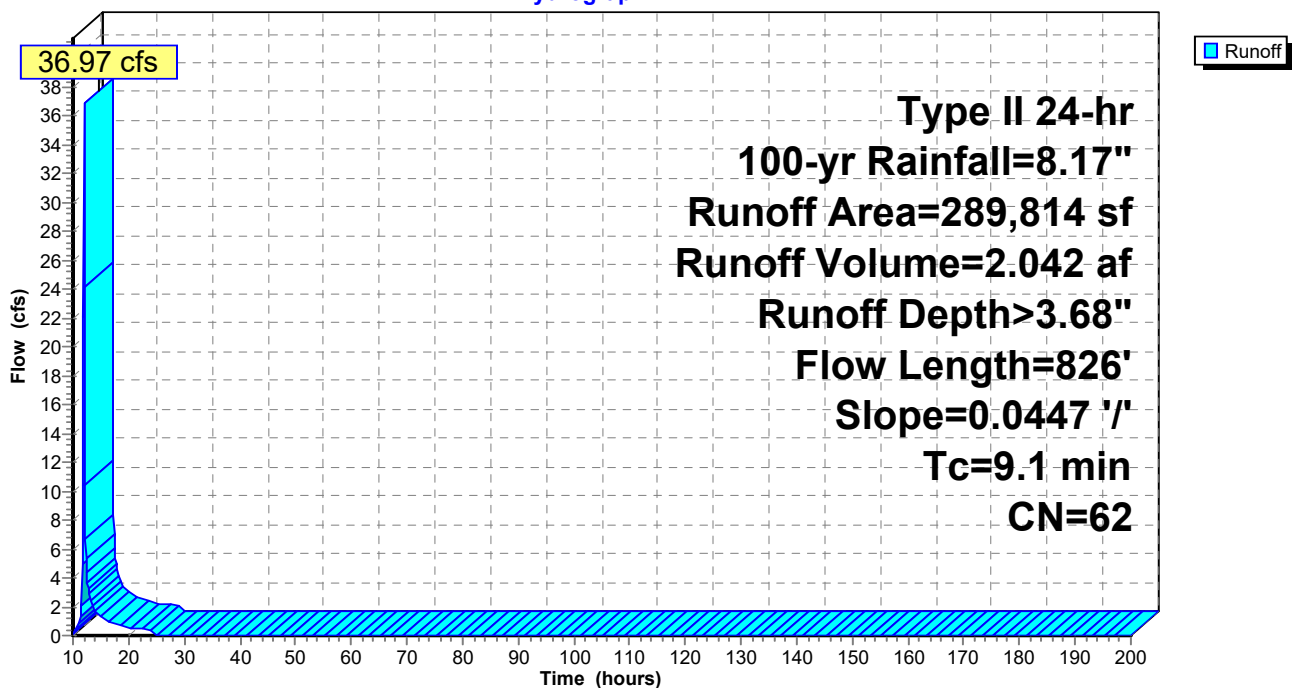
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-200.00 hrs, dt= 0.10 hrs
Type II 24-hr 100-yr Rainfall=8.17"

Area (sf)	CN	Description
230,959	60	Woods, Fair, HSG B
53,439	69	50-75% Grass cover, Fair, HSG B
5,416	98	Paved parking, HSG B
289,814	62	Weighted Average
284,398		98.13% Pervious Area
5,416		1.87% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.1	826	0.0447	1.51		Kirpich Method, General overland flow k= 2.00

Subcatchment 27S: Post Dev. Bypass 8

Hydrograph



Summary for Pond 1P: Sand Filter -SCM 1

Inflow Area = 7.632 ac, 78.15% Impervious, Inflow Depth > 6.27" for 100-yr event
 Inflow = 73.65 cfs @ 11.95 hrs, Volume= 3.987 af
 Outflow = 39.21 cfs @ 12.09 hrs, Volume= 3.987 af, Atten= 47%, Lag= 8.4 min
 Primary = 39.21 cfs @ 12.09 hrs, Volume= 3.987 af
 Routed to Link 1L : POA 1

Routing by Stor-Ind method, Time Span= 10.00-200.00 hrs, dt= 0.10 hrs
 Peak Elev= 533.14' @ 12.08 hrs Surf.Area= 6,825 sf Storage= 62,353 cf

Plug-Flow detention time= 83.8 min calculated for 3.978 af (100% of inflow)
 Center-of-Mass det. time= 82.7 min (885.2 - 802.5)

Volume	Invert	Avail.Storage	Storage Description
#1	524.00'	68,250 cf	Custom Stage Data (Prismatic) Listed below (Recalc) x 65

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
524.00	105	0	0
534.00	105	1,050	1,050

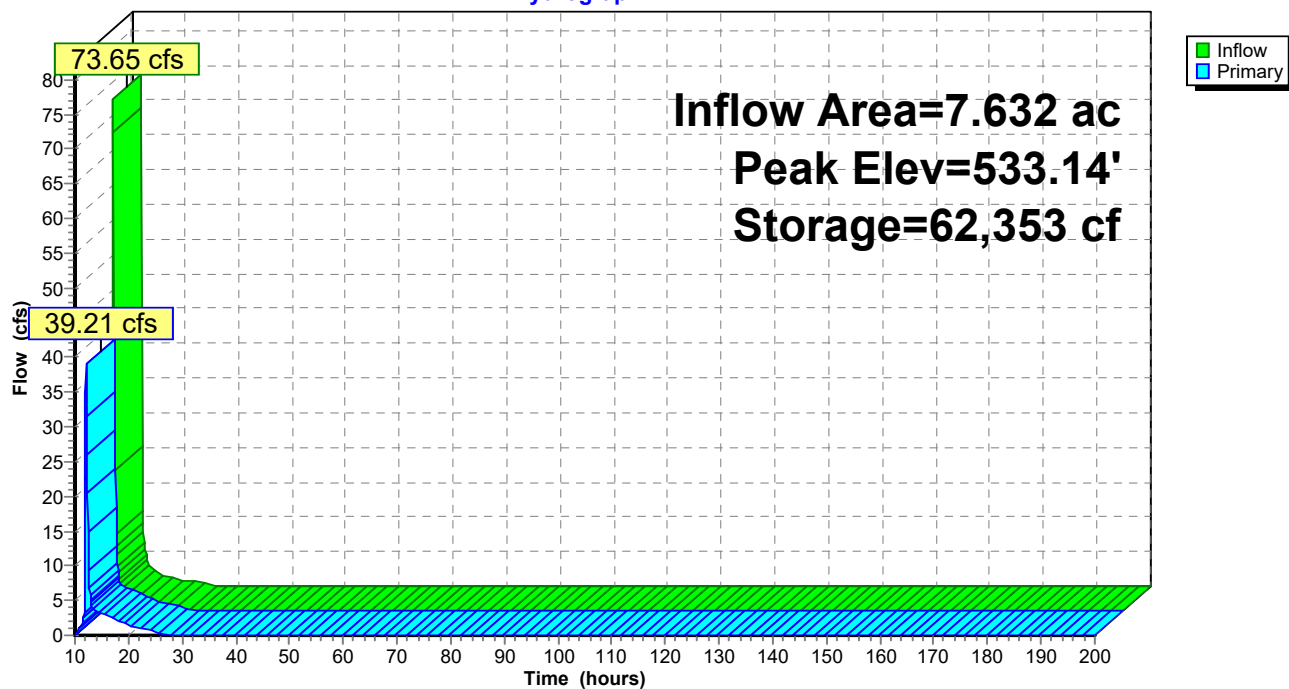
Device	Routing	Invert	Outlet Devices
#1	Primary	524.00'	36.0" Round Culvert L= 85.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 524.00' / 523.00' S= 0.0118 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 7.07 sf
#2	Device 1	524.00'	8.0" Vert. Drawdown C= 0.600 Limited to weir flow at low heads
#3	Device 1	528.90'	60.0" W x 8.0" H Vert. Main Orifice C= 0.600 Limited to weir flow at low heads
#4	Device 1	533.00'	25.0' long Overflow 2 End Contraction(s)

Primary OutFlow Max=37.13 cfs @ 12.09 hrs HW=533.05' (Free Discharge)

↑ **1=Culvert** (Passes 37.13 cfs of 93.50 cfs potential flow)
 ↑ **2=Drawdown** (Orifice Controls 4.96 cfs @ 14.21 fps)
 ↑ **3=Main Orifice** (Orifice Controls 31.33 cfs @ 9.40 fps)
 ↑ **4=Overflow** (Weir Controls 0.83 cfs @ 0.71 fps)

Pond 1P: Sand Filter -SCM 1

Hydrograph



Summary for Pond 2P: Wet Pond SCM 2

Inflow Area = 4.185 ac, 72.71% Impervious, Inflow Depth > 5.88" for 100-yr event
 Inflow = 38.03 cfs @ 11.95 hrs, Volume= 2.051 af
 Outflow = 14.32 cfs @ 12.11 hrs, Volume= 2.051 af, Atten= 62%, Lag= 9.7 min
 Primary = 14.32 cfs @ 12.11 hrs, Volume= 2.051 af
 Routed to Link 2L : POA 2

Routing by Stor-Ind method, Time Span= 10.00-200.00 hrs, dt= 0.10 hrs

Starting Elev= 526.00' Surf.Area= 9,300 sf Storage= 39,787 cf

Peak Elev= 529.64' @ 12.12 hrs Surf.Area= 12,501 sf Storage= 78,983 cf (39,196 cf above start)

Plug-Flow detention time= 407.9 min calculated for 1.134 af (55% of inflow)

Center-of-Mass det. time= 141.3 min (948.4 - 807.1)

Volume	Invert	Avail.Storage	Storage Description
#1	521.00'	83,553 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
521.00	6,868	0	0
522.00	7,244	7,056	7,056
523.00	7,656	7,450	14,506
524.00	8,129	7,893	22,399
525.00	8,674	8,402	30,800
526.00	9,300	8,987	39,787
527.00	10,020	9,660	49,447
528.00	10,848	10,434	59,881
529.00	11,800	11,324	71,205
530.00	12,895	12,348	83,553

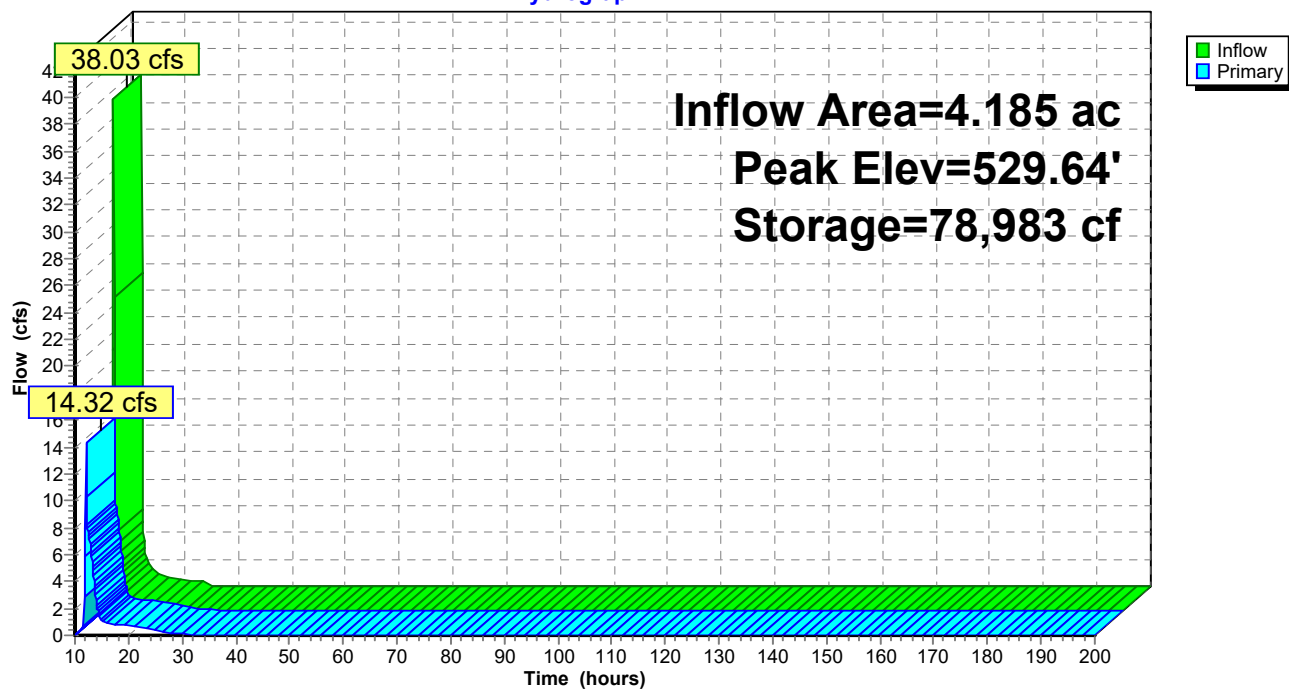
Device	Routing	Invert	Outlet Devices
#1	Primary	526.00'	36.0" Round Culvert L= 45.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 526.00' / 525.55' S= 0.0100 ' S= 0.0100 ' Cc= 0.900 n= 0.010 Concrete pipe, straight & clean, Flow Area= 7.07 sf
#2	Device 1	526.00'	5.5" Vert. Drawdown C= 0.600 Limited to weir flow at low heads
#3	Device 1	527.30'	24.0" W x 3.0" H Vert. Peakflow X 2.00 C= 0.600 Limited to weir flow at low heads
#4	Device 1	529.40'	48.0" x 48.0" Horiz. Overflow C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=13.67 cfs @ 12.11 hrs HW=529.61' (Free Discharge)

1=Culvert (Passes 13.67 cfs of 48.76 cfs potential flow)
 2=Drawdown (Orifice Controls 1.46 cfs @ 8.86 fps)
 3=Peakflow (Orifice Controls 7.12 cfs @ 7.12 fps)
 4=Overflow (Weir Controls 5.09 cfs @ 1.50 fps)

Pond 2P: Wet Pond SCM 2

Hydrograph



Summary for Pond 4P: Wet Pond SCM 4

Inflow Area = 4.157 ac, 74.10% Impervious, Inflow Depth > 6.40" for 100-yr event
 Inflow = 40.87 cfs @ 11.95 hrs, Volume= 2.218 af
 Outflow = 23.47 cfs @ 12.09 hrs, Volume= 2.218 af, Atten= 43%, Lag= 8.9 min
 Primary = 23.47 cfs @ 12.09 hrs, Volume= 2.218 af
 Routed to Link 4L : POA 5

Routing by Stor-Ind method, Time Span= 10.00-200.00 hrs, dt= 0.10 hrs

Starting Elev= 522.00' Surf.Area= 5,116 sf Storage= 11,656 cf

Peak Elev= 527.54' @ 12.09 hrs Surf.Area= 10,448 sf Storage= 54,281 cf (42,625 cf above start)

Plug-Flow detention time= 381.2 min calculated for 1.946 af (88% of inflow)

Center-of-Mass det. time= 271.8 min (1,072.6 - 800.8)

Volume	Invert	Avail.Storage	Storage Description
#1	519.00'	59,179 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
519.00	2,769	0	0
520.00	3,460	3,115	3,115
521.00	4,253	3,857	6,971
522.00	5,116	4,685	11,656
523.00	5,998	5,557	17,213
524.00	6,912	6,455	23,668
525.00	7,862	7,387	31,055
526.00	8,852	8,357	39,412
527.00	9,875	9,364	48,775
528.00	10,932	10,404	59,179

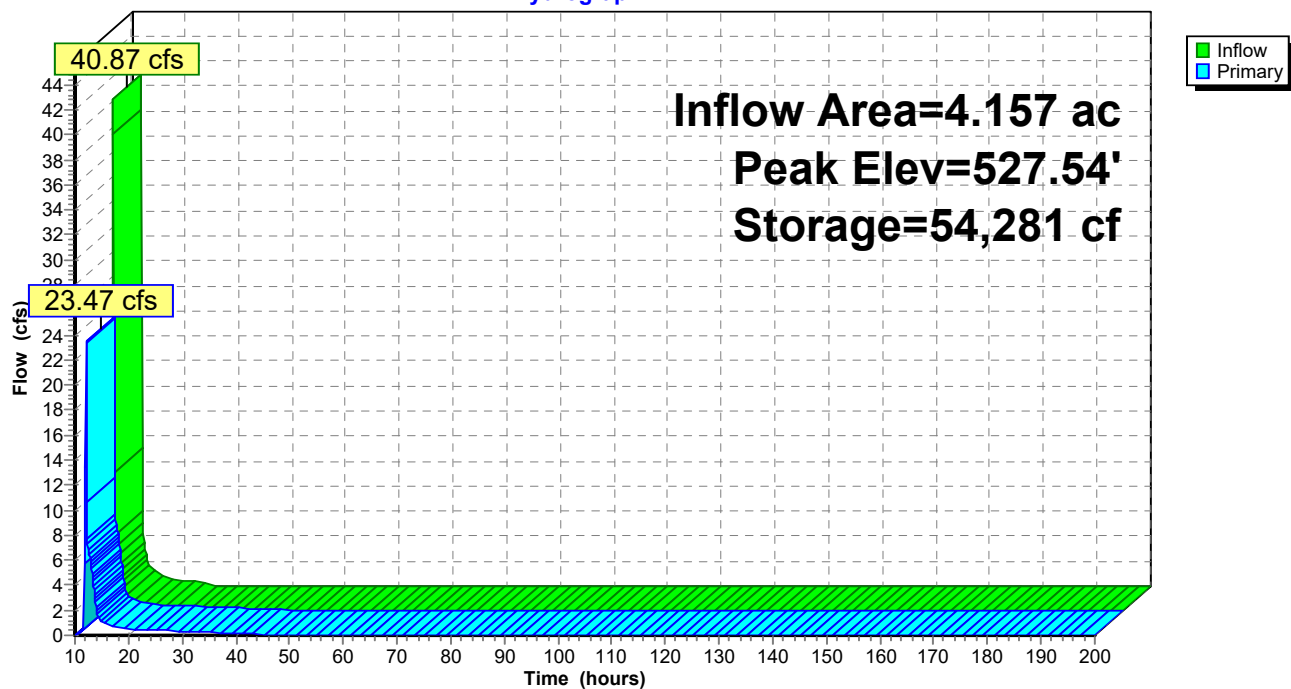
Device	Routing	Invert	Outlet Devices
#1	Primary	522.00'	36.0" Round Culvert L= 45.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 522.00' / 521.50' S= 0.0111 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 7.07 sf
#2	Device 1	522.00'	3.0" Vert. Drawdown C= 0.600 Limited to weir flow at low heads
#3	Device 1	524.90'	36.0" W x 4.0" H Vert. Peakflow C= 0.600 Limited to weir flow at low heads
#4	Device 1	527.10'	48.0" x 48.0" Horiz. Overflow C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=22.69 cfs @ 12.09 hrs HW=527.53' (Free Discharge)

1=Culvert (Passes 22.69 cfs of 68.30 cfs potential flow)
 2=Drawdown (Orifice Controls 0.55 cfs @ 11.19 fps)
 3=Peakflow (Orifice Controls 7.55 cfs @ 7.55 fps)
 4=Overflow (Weir Controls 14.59 cfs @ 2.14 fps)

Pond 4P: Wet Pond SCM 4

Hydrograph



Summary for Pond 5P: Wet Pond SCM 5

Inflow Area = 2.463 ac, 73.79% Impervious, Inflow Depth > 6.20" for 100-yr event
 Inflow = 23.52 cfs @ 11.95 hrs, Volume= 1.272 af
 Outflow = 13.46 cfs @ 12.10 hrs, Volume= 1.272 af, Atten= 43%, Lag= 9.1 min
 Primary = 13.46 cfs @ 12.10 hrs, Volume= 1.272 af
 Routed to Link 5L : POA 6

Routing by Stor-Ind method, Time Span= 10.00-200.00 hrs, dt= 0.10 hrs
 Starting Elev= 513.00' Surf.Area= 3,681 sf Storage= 11,032 cf
 Peak Elev= 517.69' @ 12.08 hrs Surf.Area= 5,604 sf Storage= 32,725 cf (21,693 cf above start)

Plug-Flow detention time= 258.8 min calculated for 1.016 af (80% of inflow)
 Center-of-Mass det. time= 127.0 min (930.4 - 803.3)

Volume	Invert	Avail.Storage	Storage Description
#1	509.00'	34,456 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
509.00	1,925	0	0
510.00	2,310	2,118	2,118
511.00	2,731	2,521	4,638
512.00	3,188	2,960	7,598
513.00	3,681	3,435	11,032
514.00	4,062	3,872	14,904
515.00	4,462	4,262	19,166
516.00	4,879	4,671	23,836
517.00	5,315	5,097	28,933
518.00	5,731	5,523	34,456

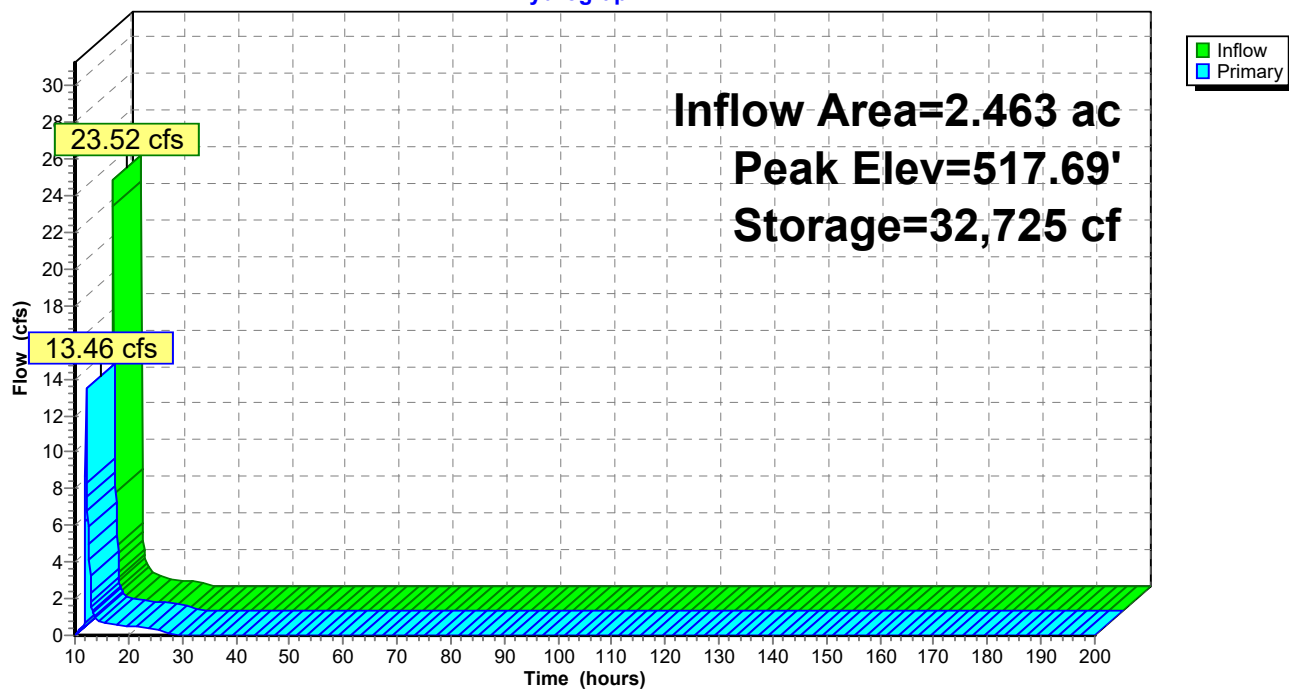
Device	Routing	Invert	Outlet Devices
#1	Primary	513.00'	36.0" Round Culvert L= 79.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 513.00' / 512.00' S= 0.0127 ' S= 0.0127 ' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 7.07 sf
#2	Device 1	513.00'	4.0" Vert. Drawdown C= 0.600 Limited to weir flow at low heads
#3	Device 1	515.40'	24.0" W x 3.5" H Vert. Peakflow Orifice X 2.00 C= 0.600 Limited to weir flow at low heads
#4	Device 1	517.50'	48.0" x 48.0" Horiz. Overflow C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=13.22 cfs @ 12.10 hrs HW=517.68' (Free Discharge)

1=Culvert (Passes 13.22 cfs of 60.73 cfs potential flow)
 2=Drawdown (Orifice Controls 0.89 cfs @ 10.23 fps)
 3=Peakflow Orifice (Orifice Controls 8.21 cfs @ 7.04 fps)
 4=Overflow (Weir Controls 4.12 cfs @ 1.40 fps)

Pond 5P: Wet Pond SCM 5

Hydrograph



Summary for Pond 6P: Sand Filter -SCM 3

Inflow Area = 2.765 ac, 67.31% Impervious, Inflow Depth > 6.12" for 100-yr event
 Inflow = 26.10 cfs @ 11.95 hrs, Volume= 1.411 af
 Outflow = 14.33 cfs @ 12.10 hrs, Volume= 1.149 af, Atten= 45%, Lag= 9.1 min
 Primary = 14.33 cfs @ 12.10 hrs, Volume= 1.149 af
 Routed to Link 3L : POA 4

Routing by Stor-Ind method, Time Span= 10.00-200.00 hrs, dt= 0.10 hrs
 Peak Elev= 536.45' @ 12.09 hrs Surf.Area= 3,675 sf Storage= 27,381 cf

Plug-Flow detention time= 236.7 min calculated for 1.146 af (81% of inflow)
 Center-of-Mass det. time= 162.2 min (966.4 - 804.2)

Volume	Invert	Avail.Storage	Storage Description
#1	529.00'	33,075 cf	Sediment Chamber (Prismatic) Listed below x 35

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
529.00	105	0	0
538.00	105	945	945

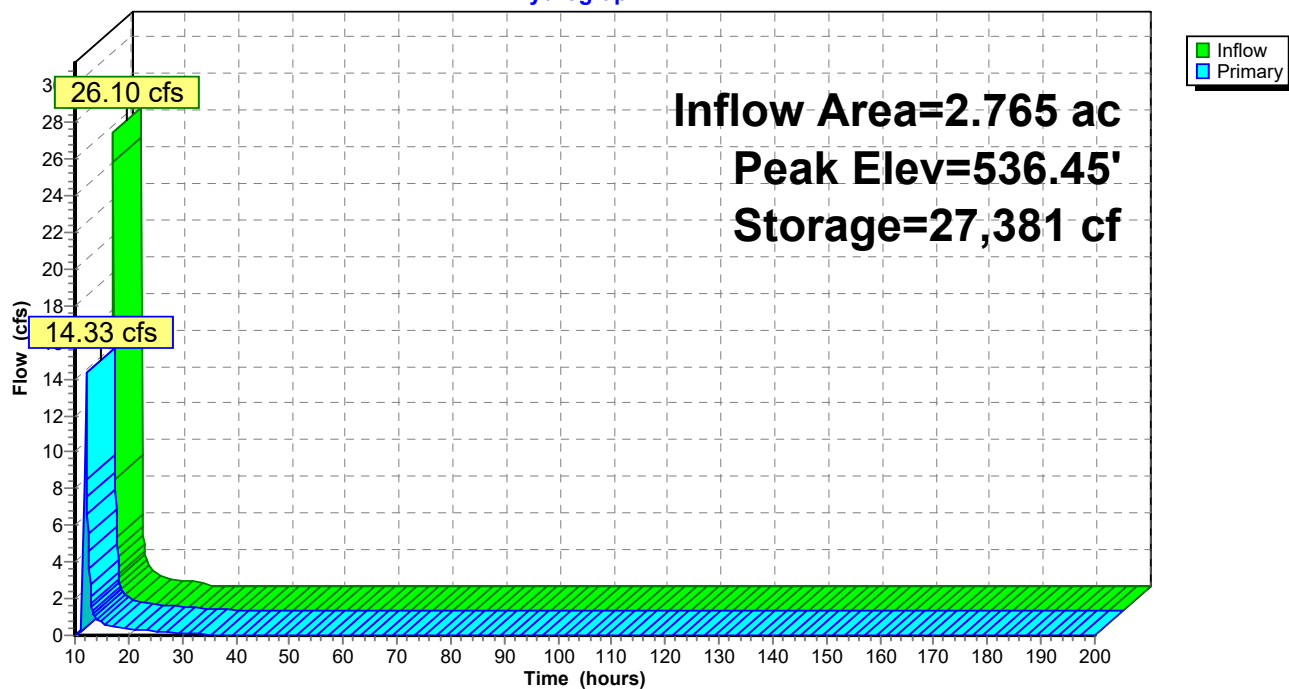
Device	Routing	Invert	Outlet Devices
#1	Primary	532.00'	36.0" Round Culvert L= 12.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 532.00' / 531.00' S= 0.0833 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 7.07 sf
#2	Device 1	532.10'	2.5" Vert. Drawdown C= 0.600 Limited to weir flow at low heads
#3	Device 1	533.60'	34.0" W x 5.0" H Vert. Main Orifice C= 0.600 Limited to weir flow at low heads
#4	Device 1	536.30'	25.0' long Overflow 2 End Contraction(s)

Primary OutFlow Max=13.93 cfs @ 12.10 hrs HW=536.44' (Free Discharge)

↑ **1=Culvert** (Passes 13.93 cfs of 58.38 cfs potential flow)
 ↑ **2=Drawdown** (Orifice Controls 0.34 cfs @ 9.91 fps)
 ↑ **3=Main Orifice** (Orifice Controls 9.22 cfs @ 7.81 fps)
 ↑ **4=Overflow** (Weir Controls 4.37 cfs @ 1.23 fps)

Pond 6P: Sand Filter -SCM 3

Hydrograph



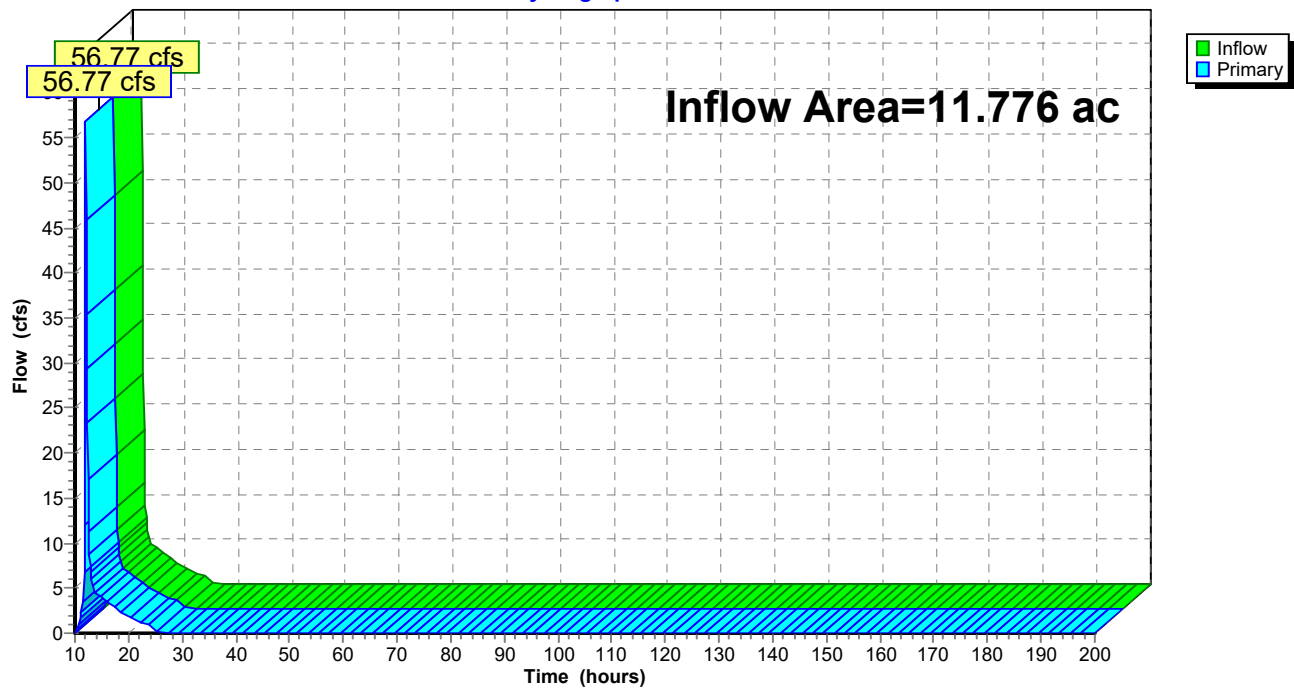
Summary for Link 1L: POA 1

Inflow Area = 11.776 ac, 52.05% Impervious, Inflow Depth > 5.28" for 100-yr event
Inflow = 56.77 cfs @ 12.01 hrs, Volume= 5.182 af
Primary = 56.77 cfs @ 12.01 hrs, Volume= 5.182 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 10.00-200.00 hrs, dt= 0.10 hrs

Link 1L: POA 1

Hydrograph



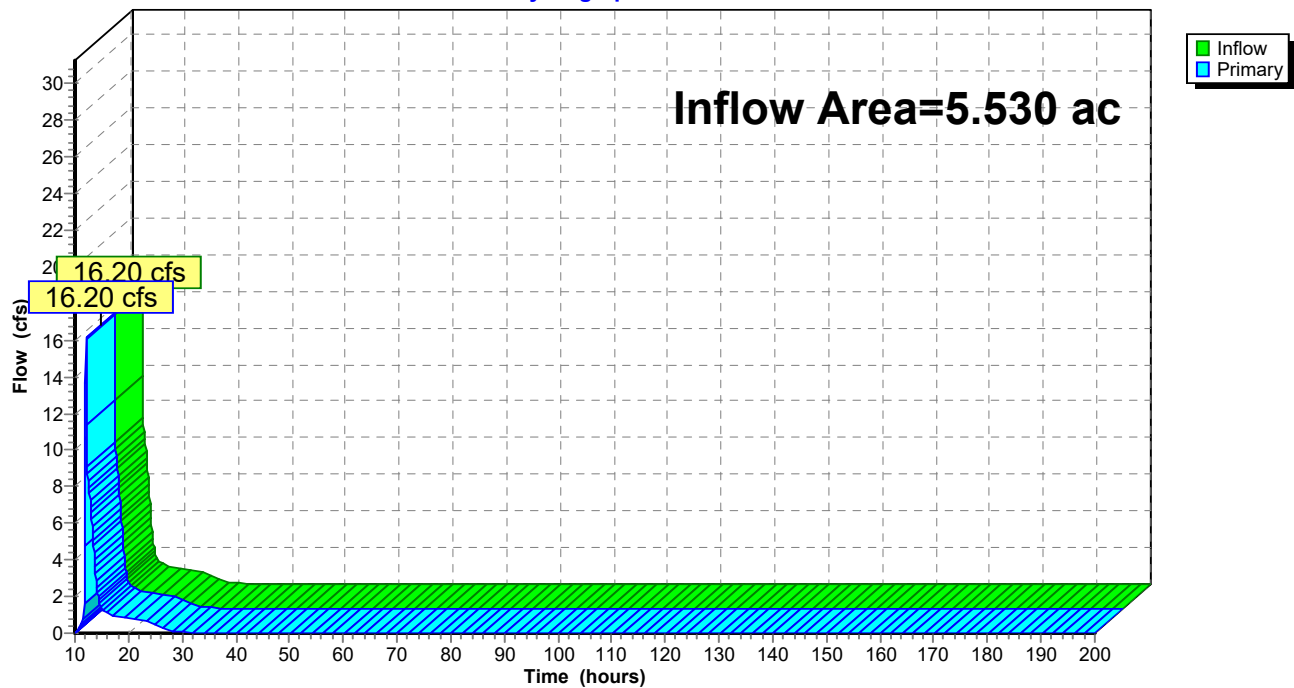
Summary for Link 2L: POA 2

Inflow Area = 5.530 ac, 55.03% Impervious, Inflow Depth > 5.13" for 100-yr event
Inflow = 16.20 cfs @ 12.08 hrs, Volume= 2.364 af
Primary = 16.20 cfs @ 12.08 hrs, Volume= 2.364 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 10.00-200.00 hrs, dt= 0.10 hrs

Link 2L: POA 2

Hydrograph



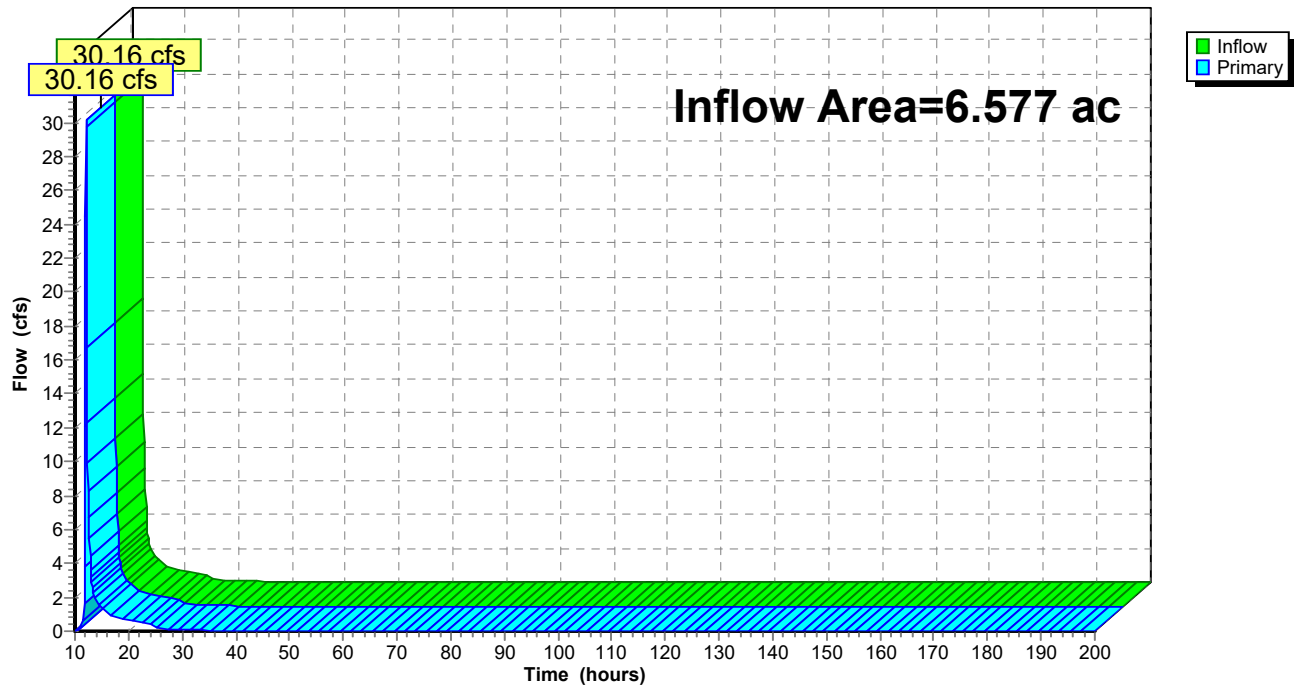
Summary for Link 3L: POA 4

Inflow Area = 6.577 ac, 32.63% Impervious, Inflow Depth > 4.04" for 100-yr event
Inflow = 30.16 cfs @ 12.08 hrs, Volume= 2.213 af
Primary = 30.16 cfs @ 12.08 hrs, Volume= 2.213 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 10.00-200.00 hrs, dt= 0.10 hrs

Link 3L: POA 4

Hydrograph



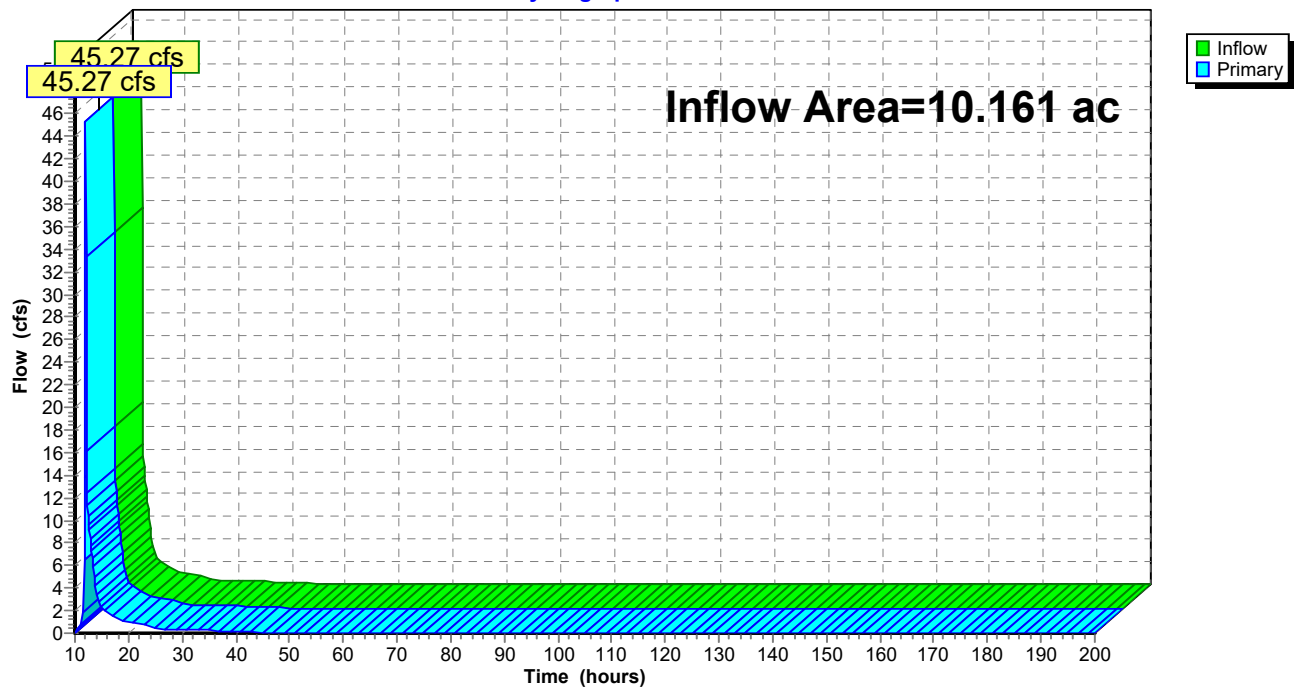
Summary for Link 4L: POA 5

Inflow Area = 10.161 ac, 31.27% Impervious, Inflow Depth > 4.66" for 100-yr event
Inflow = 45.27 cfs @ 12.00 hrs, Volume= 3.949 af
Primary = 45.27 cfs @ 12.00 hrs, Volume= 3.949 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 10.00-200.00 hrs, dt= 0.10 hrs

Link 4L: POA 5

Hydrograph



Summary for Link 5L: POA 6

Inflow Area = 5.408 ac, 40.28% Impervious, Inflow Depth > 4.46" for 100-yr event
Inflow = 23.78 cfs @ 12.06 hrs, Volume= 2.011 af
Primary = 23.78 cfs @ 12.06 hrs, Volume= 2.011 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 10.00-200.00 hrs, dt= 0.10 hrs

Link 5L: POA 6

Hydrograph

