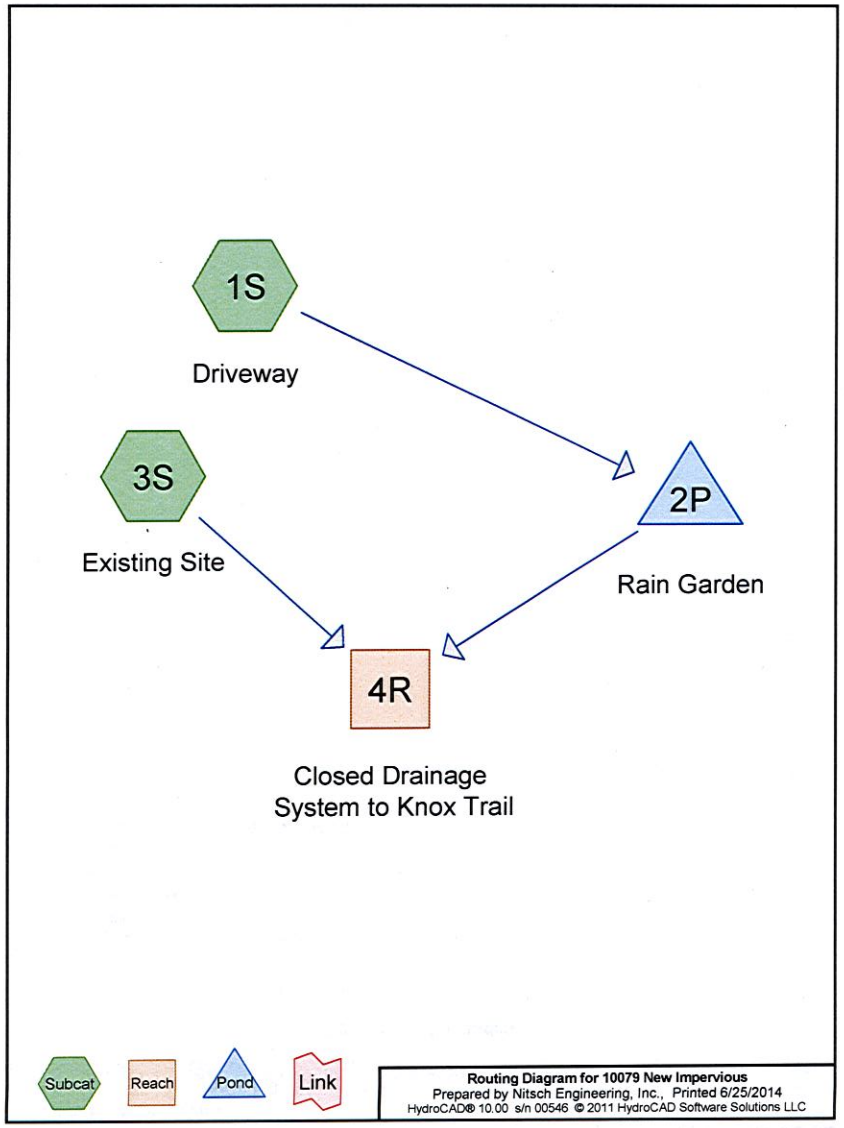


Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.507	30	Woods, Good, HSG A (3S)
0.399	98	Building and Parking Lot, HSG A (3S)
0.030	98	Paved parking, HSG A (1S)
0.935	**61**	**TOTAL AREA**

SUMMARY OF CALCULATIONS

PURPOSE:
DESIGN RAIN GARDEN FOR WATER QUALITY FOR NEW DRIVEWAY AND PORTIONS OF EXISTING DRIVEWAY.
DESIGN REDUCES BOTH STORMWATER RATE AND VOLUME IN THE PRE- AND POST-CONSTRUCTION CONDITION.

	Storm Event – Rate, cfs				
	2-year	**10-year**	**25-year**	**100-year**	**1 inch**
Existing					
	0.27	1.06	1.62	2.55	0.00
Proposed					
	0.22	0.95	1.48	2.36	0.00

	Storm Event – volume, a/f				
	2-year	**10-year**	**25-year**	**100-year**	**1 inch**
Existing					
	0.031	0.084	0.121	0.183	0.00
Proposed					
	0.028	0.077	0.112	0.172	0.00

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.935	HSG A	1S, 3S
0.000	HSG B	
0.000	HSG C	
0.000	HSG D	
0.000	Other	
0.935		**TOTAL AREA**

Ground Covers (all nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.399	0.000	0.000	0.000	0.000	0.399	Building and Parking Lot	3S
0.030	0.000	0.000	0.000	0.000	0.030	Paved parking	1S
0.507	0.000	0.000	0.000	0.000	0.507	Woods, Good	3S
0.935	**0.000**	**0.000**	**0.000**	**0.000**	**0.935**	**TOTAL AREA**	

Pipe Listing (all nodes)

Line#	Node Number	In-Invert (feet)	Out-Invert (feet)	Length (feet)	Slope (ft/ft)	n	Diam/Width (inches)	Height (inches)	Inside-Fill (inches)
1	2P	146.60	145.60	15.0	0.0667	0.013	8.0	0.0	0.0

Time span=0.00-24.00 hrs, dt=0.04 hrs, 601 points
Runoff by SCS TR-20 method, UH=SCS
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: Driveway Runoff Area=1,310 sf 100.00% Impervious Runoff Depth>2.87"
Tc=5.0 min CN=98 Runoff=0.09 cfs 0.007 af

Subcatchment 3S: Existing Site Runoff Area=39,431 sf 44.03% Impervious Runoff Depth>0.37"
Tc=5.0 min CN=60 Runoff=0.22 cfs 0.028 af

Reach 4R: Closed Drainage System to Knox Trail Inflow=0.22 cfs 0.028 af
Outflow=0.22 cfs 0.028 af

Pond 2P: Rain Garden Peak Elev=148.18' Storage=116 cf Inflow=0.09 cfs 0.007 af
Discarded=0.01 cfs 0.007 af Primary=0.00 cfs 0.000 af Outflow=0.01 cfs 0.007 af

Total Runoff Area = 0.935 ac Runoff Volume = 0.035 af Average Runoff Depth = 0.45"
54.17% Pervious = 0.507 ac 45.83% Impervious = 0.429 ac

Summary for Subcatchment 1S: Driveway

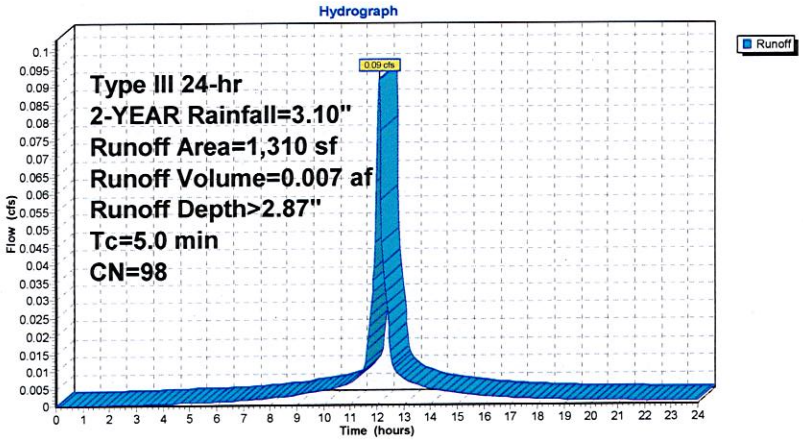
Runoff = 0.09 cfs @ 12.07 hrs, Volume= 0.007 af, Depth> 2.87"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.04 hrs
Type III 24-hr 2-YEAR Rainfall=3.10"

Area (sf)	CN	Description
1,310	98	Paved parking, HSG A
1,310		100.00% Impervious Area

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

Subcatchment 1S: Driveway



Summary for Subcatchment 3S: Existing Site

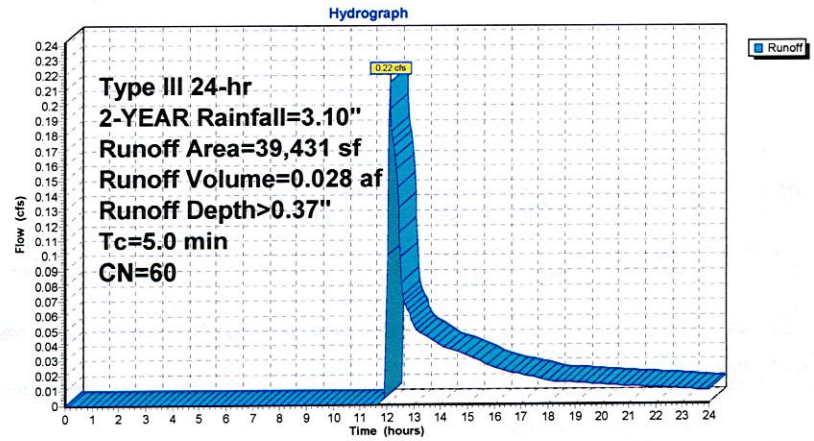
Runoff = 0.22 cfs @ 12.13 hrs, Volume= 0.028 af, Depth> 0.37"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.04 hrs
Type III 24-hr 2-YEAR Rainfall=3.10"

	Area (sf)	CN	Description
*	17,360	98	Building and Parking Lot, HSG A
	22,071	30	Woods, Good, HSG A
	39,431	60	Weighted Average
	22,071		55.97% Pervious Area
	17,360		44.03% Impervious Area

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

Subcatchment 3S: Existing Site



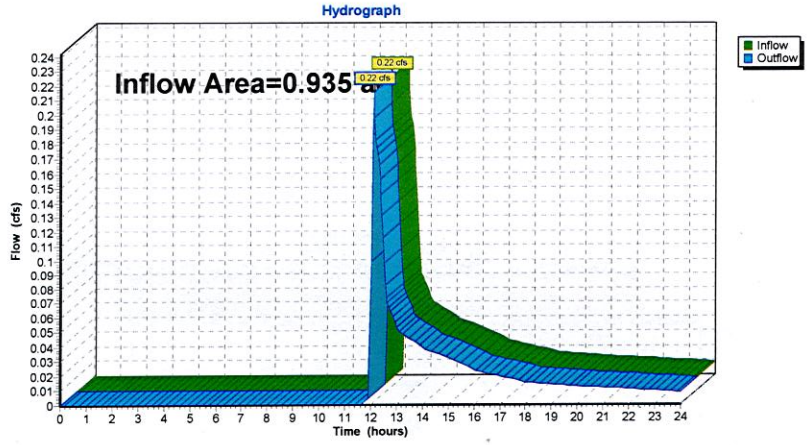
Summary for Reach 4R: Closed Drainage System to Knox Trail

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

Inflow Area = 0.935 ac, 45.83% Impervious, Inflow Depth > 0.36" for 2-YEAR event
Inflow = 0.22 cfs @ 12.13 hrs, Volume= 0.028 af
Outflow = 0.22 cfs @ 12.13 hrs, Volume= 0.028 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.04 hrs

Reach 4R: Closed Drainage System to Knox Trail



Summary for Pond 2P: Rain Garden

Inflow Area = 0.030 ac,100.00% Impervious, Inflow Depth > 2.87" for 2-YEAR event
Inflow = 0.09 cfs @ 12.07 hrs, Volume= 0.007 af
Outflow = 0.01 cfs @ 12.55 hrs, Volume= 0.007 af, Atten= 85%, Lag= 28.6 min
Discarded = 0.01 cfs @ 12.55 hrs, Volume= 0.007 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.04 hrs / 2
Peak Elev= 148.18' @ 12.55 hrs Surf.Area= 250 sf Storage= 116 cf

Plug-Flow detention time= 80.2 min calculated for 0.007 af (100% of inflow)
Center-of-Mass det. time= 79.3 min (835.1 - 755.8)

Volume	Invert	Avail.Storage	Storage Description
#1	147.25'	228 cf	**Rain Garden (Prismatic)** Listed below (Recalc)

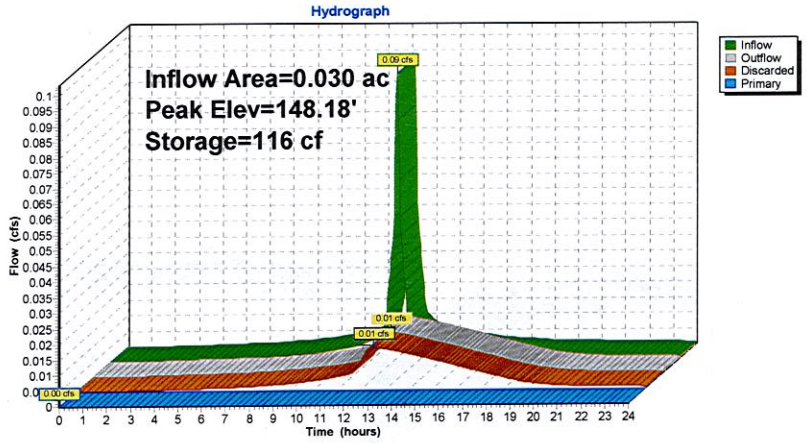
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
147.25	0	0	0
148.55	350	228	228

Device	Routing	Invert	Outlet Devices
#1	Discarded	147.25'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	146.60'	**8.0" Round New Drain to existing DMH** L= 15.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 146.60' / 145.60' S= 0.0667 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.35 sf
#3	Device 2	148.50'	**24.0" Horiz. Dome Grate** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.01 cfs @ 12.55 hrs HW=148.18' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.01 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=147.25' (Free Discharge)
└**2=New Drain to existing DMH** (Passes 0.00 cfs of 0.75 cfs potential flow)
└**3=Dome Grate** (Controls 0.00 cfs)

Pond 2P: Rain Garden



Time span=0.00-24.00 hrs, dt=0.04 hrs, 601 points
Runoff by SCS TR-20 method, UH=SCS
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: Driveway Runoff Area=1,310 sf 100.00% Impervious Runoff Depth>4.26"
Tc=5.0 min CN=98 Runoff=0.13 cfs 0.011 af

Subcatchment 3S: Existing Site Runoff Area=39,431 sf 44.03% Impervious Runoff Depth>1.02"
Tc=5.0 min CN=60 Runoff=0.95 cfs 0.077 af

Reach 4R: Closed Drainage System to Knox Trail Inflow=0.95 cfs 0.077 af
Outflow=0.95 cfs 0.077 af

Pond 2P: Rain Garden Peak Elev=148.41' Storage=183 cf Inflow=0.13 cfs 0.011 af
Discarded=0.02 cfs 0.011 af Primary=0.00 cfs 0.000 af Outflow=0.02 cfs 0.011 af

Total Runoff Area = 0.935 ac Runoff Volume = 0.088 af Average Runoff Depth = 1.12"
54.17% Pervious = 0.507 ac 45.83% Impervious = 0.429 ac

Summary for Subcatchment 1S: Driveway

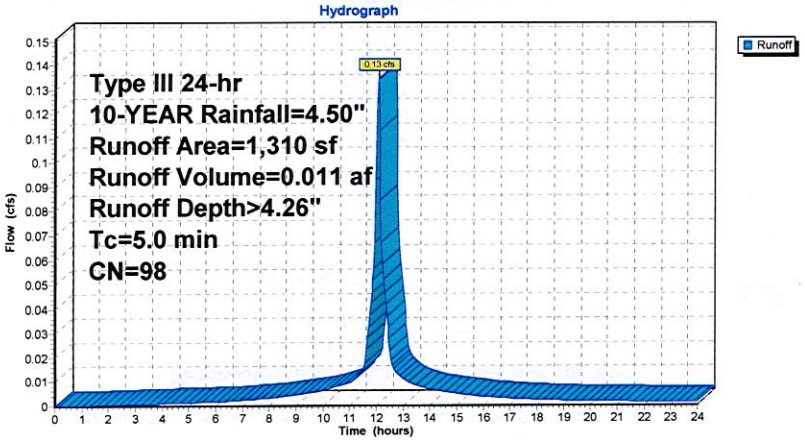
Runoff = 0.13 cfs @ 12.07 hrs, Volume= 0.011 af, Depth> 4.26"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.04 hrs
Type III 24-hr 10-YEAR Rainfall=4.50"

Area (sf)	CN	Description
1,310	98	Paved parking, HSG A
1,310		100.00% Impervious Area

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

Subcatchment 1S: Driveway



Summary for Subcatchment 3S: Existing Site

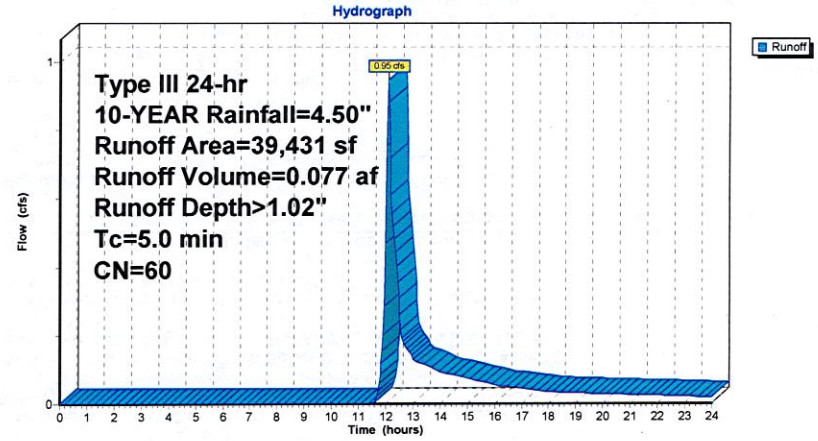
Runoff = 0.95 cfs @ 12.09 hrs, Volume= 0.077 af, Depth> 1.02"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.04 hrs
Type III 24-hr 10-YEAR Rainfall=4.50"

	Area (sf)	CN	Description
*	17,360	98	Building and Parking Lot, HSG A
	22,071	30	Woods, Good, HSG A
	39,431	60	Weighted Average
	22,071		55.97% Pervious Area
	17,360		44.03% Impervious Area

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

Subcatchment 3S: Existing Site



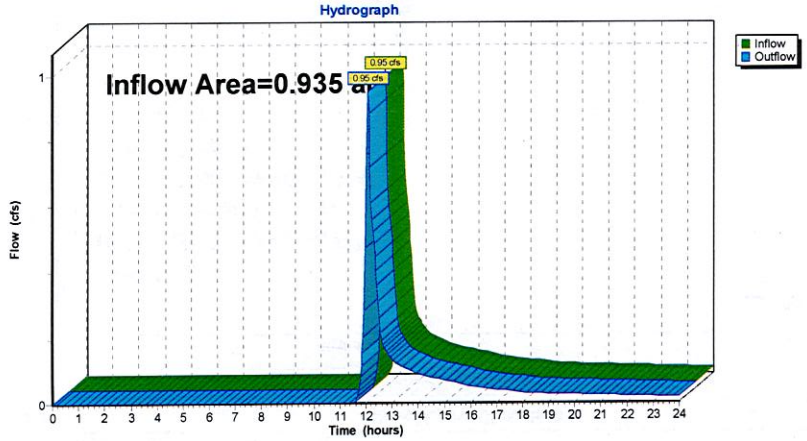
Summary for Reach 4R: Closed Drainage System to Knox Trail

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

Inflow Area =	0.935 ac,	45.83% Impervious,	Inflow Depth >	0.99"	for 10-YEAR event
Inflow =	0.95 cfs @	12.09 hrs,	Volume=	0.077 af	
Outflow =	0.95 cfs @	12.09 hrs,	Volume=	0.077 af,	Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.04 hrs

Reach 4R: Closed Drainage System to Knox Trail



Summary for Pond 2P: Rain Garden

Inflow Area =	0.030 ac,	100.00% Impervious,	Inflow Depth >	4.26"	for 10-YEAR event
Inflow =	0.13 cfs @	12.07 hrs,	Volume=	0.011 af	
Outflow =	0.02 cfs @	12.59 hrs,	Volume=	0.011 af,	Atten= 87%, Lag= 30.9 min
Discarded =	0.02 cfs @	12.59 hrs,	Volume=	0.011 af	
Primary =	0.00 cfs @	0.00 hrs,	Volume=	0.000 af	

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.04 hrs / 2
Peak Elev= 148.41' @ 12.59 hrs Surf.Area= 314 sf Storage= 183 cf

Plug-Flow detention time= 104.7 min calculated for 0.011 af (100% of inflow)
Center-of-Mass det. time= 103.2 min (851.8 - 748.5)

Volume	Invert	Avail.Storage	Storage Description
#1	147.25'	228 cf	**Rain Garden (Prismatic)** Listed below (Recalc)

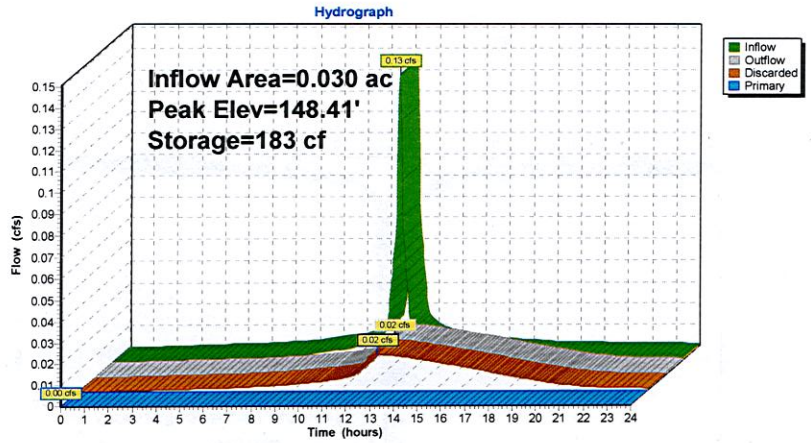
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
147.25	0	0	0
148.55	350	228	228

Device	Routing	Invert	Outlet Devices
#1	Discarded	147.25'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	146.60'	**8.0" Round New Drain to existing DMH** L= 15.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 146.60' / 145.60' S= 0.0667 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.35 sf
#3	Device 2	148.50'	**24.0" Horiz. Dome Grate** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.02 cfs @ 12.59 hrs HW=148.41' (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.02 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=147.25' (Free Discharge)
└─**2=New Drain to existing DMH** (Passes 0.00 cfs of 0.75 cfs potential flow)
└─**3=Dome Grate** (Controls 0.00 cfs)

Pond 2P: Rain Garden



Time span=0.00-24.00 hrs, dt=0.04 hrs, 601 points
Runoff by SCS TR-20 method, UH=SCS
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: Driveway Runoff Area=1,310 sf 100.00% Impervious Runoff Depth>5.06"
Tc=5.0 min CN=98 Runoff=0.16 cfs 0.013 af

Subcatchment 3S: Existing Site Runoff Area=39,431 sf 44.03% Impervious Runoff Depth>1.48"
Tc=5.0 min CN=60 Runoff=1.48 cfs 0.112 af

Reach 4R: Closed Drainage System to Knox Trail Inflow=1.48 cfs 0.112 af
Outflow=1.48 cfs 0.112 af

Pond 2P: Rain Garden Peak Elev=148.51' Storage=213 cf Inflow=0.16 cfs 0.013 af
Discarded=0.02 cfs 0.012 af Primary=0.02 cfs 0.000 af Outflow=0.04 cfs 0.013 af

Total Runoff Area = 0.935 ac Runoff Volume = 0.124 af Average Runoff Depth = 1.59"
54.17% Pervious = 0.507 ac 45.83% Impervious = 0.429 ac

Summary for Subcatchment 1S: Driveway

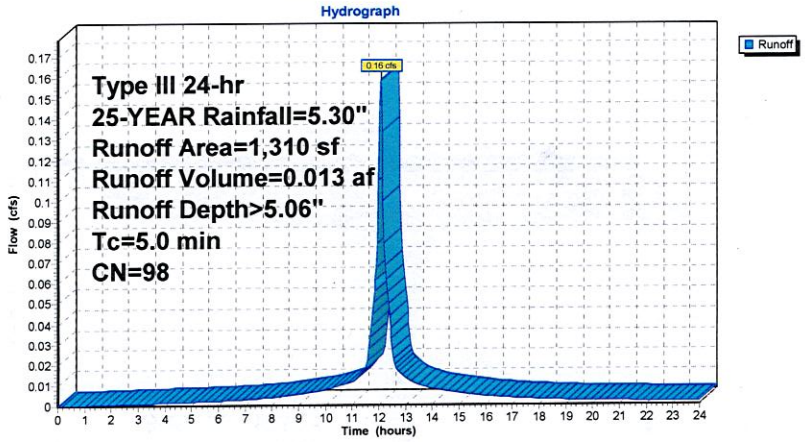
Runoff = 0.16 cfs @ 12.07 hrs, Volume= 0.013 af, Depth> 5.06"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.04 hrs
Type III 24-hr 25-YEAR Rainfall=5.30"

Area (sf)	CN	Description
1,310	98	Paved parking, HSG A
1,310		100.00% Impervious Area

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

Subcatchment 1S: Driveway



Summary for Subcatchment 3S: Existing Site

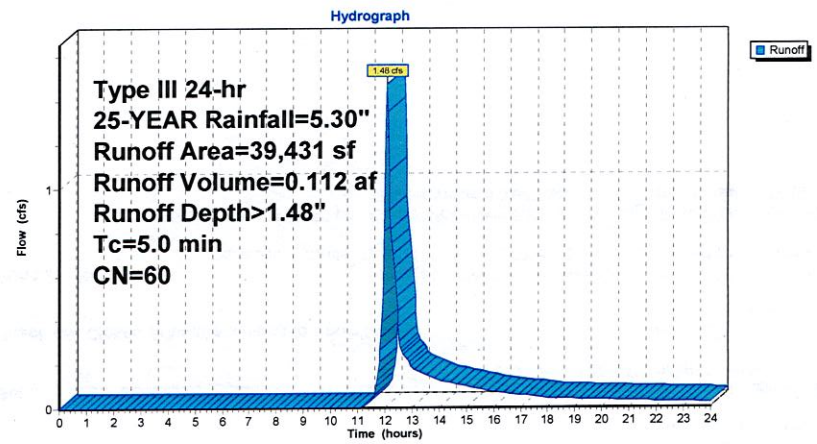
Runoff = 1.48 cfs @ 12.09 hrs, Volume= 0.112 af, Depth> 1.48"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.04 hrs
Type III 24-hr 25-YEAR Rainfall=5.30"

	Area (sf)	CN	Description
*	17,360	98	Building and Parking Lot, HSG A
	22,071	30	Woods, Good, HSG A
	39,431	60	Weighted Average
	22,071		55.97% Pervious Area
	17,360		44.03% Impervious Area

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

Subcatchment 3S: Existing Site



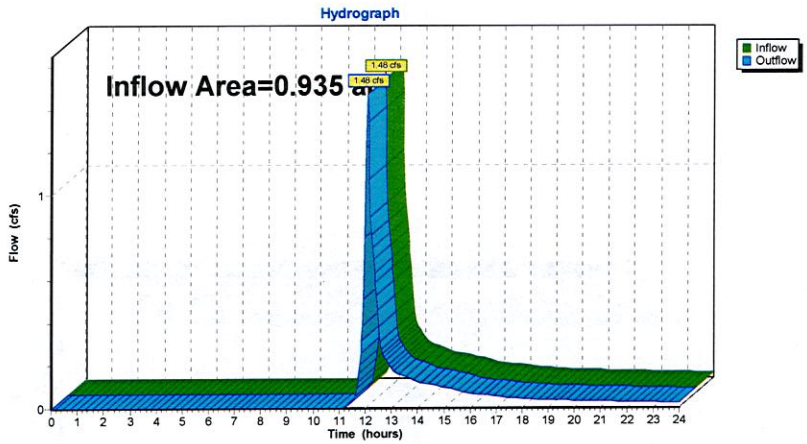
Summary for Reach 4R: Closed Drainage System to Knox Trail

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

Inflow Area = 0.935 ac, 45.83% Impervious, Inflow Depth > 1.43" for 25-YEAR event
Inflow = 1.48 cfs @ 12.09 hrs, Volume= 0.112 af
Outflow = 1.48 cfs @ 12.09 hrs, Volume= 0.112 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.04 hrs

Reach 4R: Closed Drainage System to Knox Trail



Summary for Pond 2P: Rain Garden

Inflow Area = 0.030 ac,100.00% Impervious, Inflow Depth > 5.06" for 25-YEAR event
Inflow = 0.16 cfs @ 12.07 hrs, Volume= 0.013 af
Outflow = 0.04 cfs @ 12.44 hrs, Volume= 0.013 af, Atten= 76%, Lag= 22.3 min
Discarded = 0.02 cfs @ 12.44 hrs, Volume= 0.012 af
Primary = 0.02 cfs @ 12.44 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.04 hrs / 2
Peak Elev= 148.51' @ 12.44 hrs Surf.Area= 339 sf Storage= 213 cf

Plug-Flow detention time= 112.2 min calculated for 0.013 af (100% of inflow)
Center-of-Mass det. time= 110.2 min (856.0 - 745.8)

Volume	Invert	Avail.Storage	Storage Description
#1	147.25'	228 cf	**Rain Garden (Prismatic)** Listed below (Recalc)

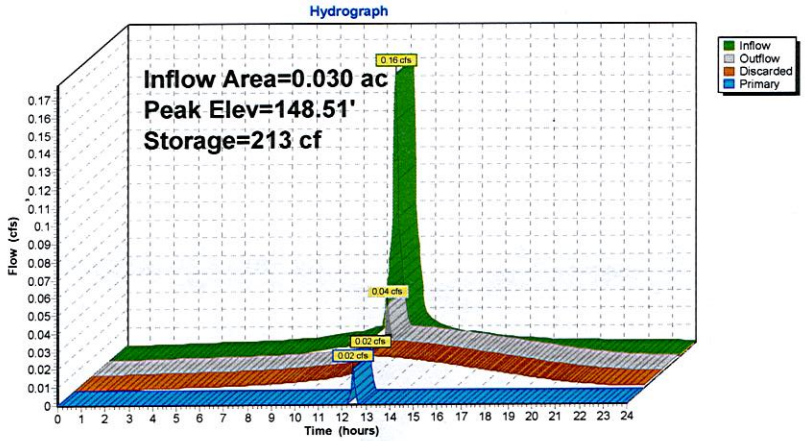
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
147.25	0	0	0
148.55	350	228	228

Device	Routing	Invert	Outlet Devices
#1	Discarded	147.25'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	146.60'	**8.0" Round New Drain to existing DMH** L= 15.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 146.60' / 145.60' S= 0.0667 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.35 sf
#3	Device 2	148.50'	**24.0" Horiz. Dome Grate** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.02 cfs @ 12.44 hrs HW=148.51' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.02 cfs)

Primary OutFlow Max=0.02 cfs @ 12.44 hrs HW=148.51' (Free Discharge)
└**2=New Drain to existing DMH** (Passes 0.02 cfs of 1.67 cfs potential flow)
└**3=Dome Grate** (Weir Controls 0.02 cfs @ 0.31 fps)

Pond 2P: Rain Garden



Time span=0.00-24.00 hrs, dt=0.04 hrs, 601 points
Runoff by SCS TR-20 method, UH=SCS
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: Driveway Runoff Area=1,310 sf 100.00% Impervious Runoff Depth>6.26"
Tc=5.0 min CN=98 Runoff=0.20 cfs 0.016 af

Subcatchment 3S: Existing Site Runoff Area=39,431 sf 44.03% Impervious Runoff Depth>2.25"
Tc=5.0 min CN=60 Runoff=2.36 cfs 0.170 af

Reach 4R: Closed Drainage System to Knox Trail Inflow=2.36 cfs 0.172 af
Outflow=2.36 cfs 0.172 af

Pond 2P: Rain Garden Peak Elev=148.53' Storage=219 cf Inflow=0.20 cfs 0.016 af
Discarded=0.02 cfs 0.014 af Primary=0.09 cfs 0.002 af Outflow=0.10 cfs 0.016 af

Total Runoff Area = 0.935 ac Runoff Volume = 0.186 af Average Runoff Depth = 2.38"
54.17% Pervious = 0.507 ac 45.83% Impervious = 0.429 ac

Summary for Subcatchment 1S: Driveway

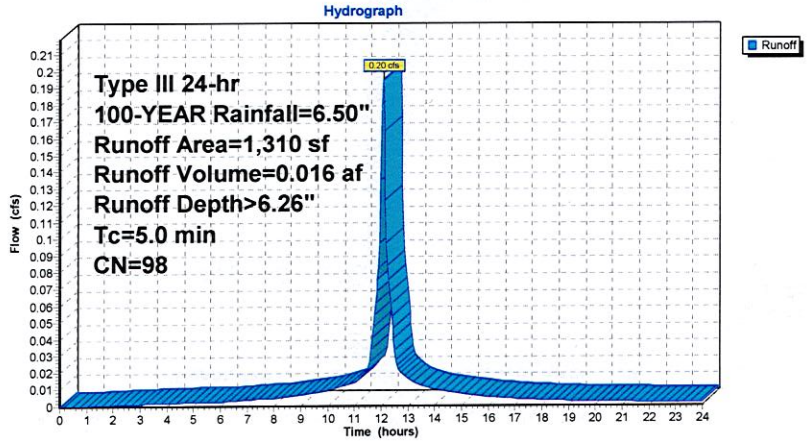
Runoff = 0.20 cfs @ 12.07 hrs, Volume= 0.016 af, Depth> 6.26"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.04 hrs
Type III 24-hr 100-YEAR Rainfall=6.50"

Area (sf)	CN	Description
1,310	98	Paved parking, HSG A
1,310		100.00% Impervious Area

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

Subcatchment 1S: Driveway



Summary for Subcatchment 3S: Existing Site

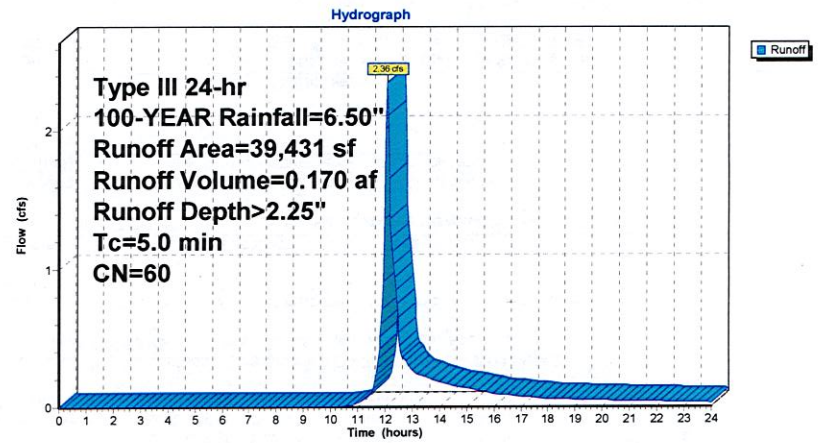
Runoff = 2.36 cfs @ 12.08 hrs, Volume= 0.170 af, Depth> 2.25"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.04 hrs
Type III 24-hr 100-YEAR Rainfall=6.50"

	Area (sf)	CN	Description
*	17,360	98	Building and Parking Lot, HSG A
	22,071	30	Woods, Good, HSG A
	39,431	60	Weighted Average
	22,071		55.97% Pervious Area
	17,360		44.03% Impervious Area

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

Subcatchment 3S: Existing Site



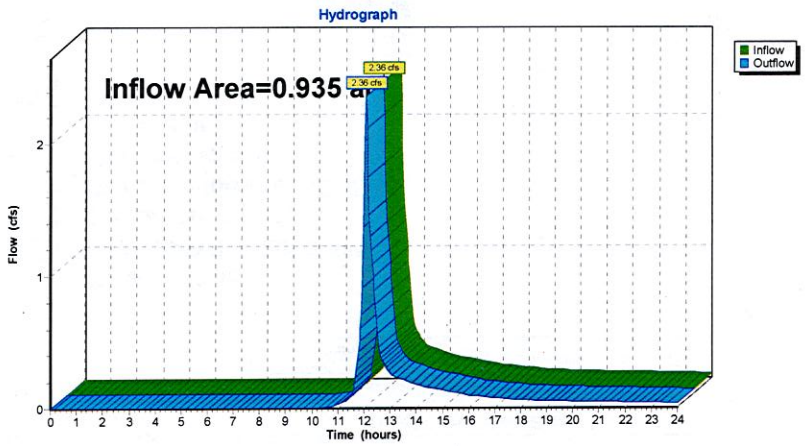
Summary for Reach 4R: Closed Drainage System to Knox Trail

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

Inflow Area =	0.935 ac,	45.83% Impervious,	Inflow Depth >	2.20"	for 100-YEAR event
Inflow =	2.36 cfs @	12.08 hrs,	Volume=	0.172 af	
Outflow =	2.36 cfs @	12.08 hrs,	Volume=	0.172 af,	Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.04 hrs

Reach 4R: Closed Drainage System to Knox Trail



Summary for Pond 2P: Rain Garden

Inflow Area =	0.030 ac,100.00% Impervious,	Inflow Depth >	6.26"	for 100-YEAR event	
Inflow =	0.20 cfs @	12.07 hrs,	Volume=	0.016 af	
Outflow =	0.10 cfs @	12.20 hrs,	Volume=	0.016 af,	Atten= 46%, Lag= 7.7 min
Discarded =	0.02 cfs @	12.20 hrs,	Volume=	0.014 af	
Primary =	0.09 cfs @	12.20 hrs,	Volume=	0.002 af	

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.04 hrs / 2
Peak Elev= 148.53' @ 12.20 hrs Surf.Area= 343 sf Storage= 219 cf

Plug-Flow detention time= 103.2 min calculated for 0.016 af (100% of inflow)
Center-of-Mass det. time= 101.6 min (844.3 - 742.7)

Volume	Invert	Avail.Storage	Storage Description
#1	147.25'	228 cf	**Rain Garden (Prismatic)** Listed below (Recalc)

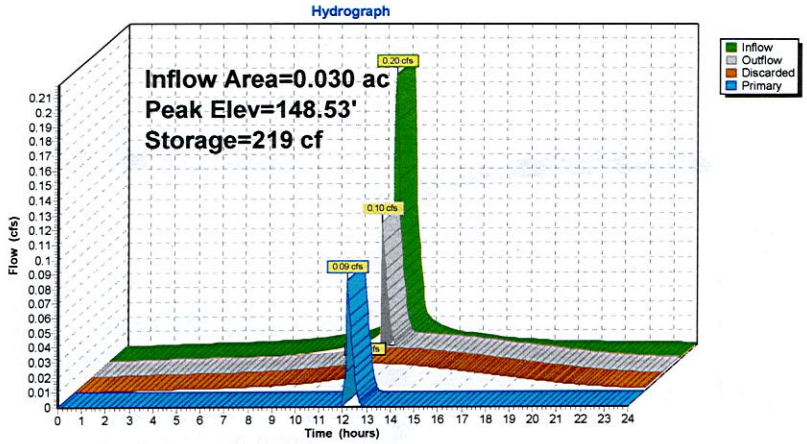
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
147.25	0	0	0
148.55	350	228	228

Device	Routing	Invert	Outlet Devices
#1	Discarded	147.25'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	146.60'	**8.0" Round New Drain to existing DMH** L= 15.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 146.60' / 145.60' S= 0.0667 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.35 sf
#3	Device 2	148.50'	**24.0" Horiz. Dome Grate** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.02 cfs @ 12.20 hrs HW=148.53' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.02 cfs)

Primary OutFlow Max=0.08 cfs @ 12.20 hrs HW=148.53' (Free Discharge)
└**2=New Drain to existing DMH** (Passes 0.08 cfs of 1.67 cfs potential flow)
└**3=Dome Grate** (Weir Controls 0.08 cfs @ 0.52 fps)

Pond 2P: Rain Garden



Time span=0.00-24.00 hrs, dt=0.04 hrs, 601 points
Runoff by SCS TR-20 method, UH=SCS
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: Driveway Runoff Area=1,310 sf 100.00% Impervious Runoff Depth>1.03"
Tc=5.0 min CN=98 Runoff=0.04 cfs 0.003 af

Subcatchment 3S: Existing Site Runoff Area=39,431 sf 44.03% Impervious Runoff Depth=0.00"
Tc=5.0 min CN=60 Runoff=0.00 cfs 0.000 af

Reach 4R: Closed Drainage System to Knox Trail Inflow=0.00 cfs 0.000 af
Outflow=0.00 cfs 0.000 af

Pond 2P: Rain Garden Peak Elev=147.76' Storage=35 cf Inflow=0.04 cfs 0.003 af
Discarded=0.01 cfs 0.003 af Primary=0.00 cfs 0.000 af Outflow=0.01 cfs 0.003 af

Total Runoff Area = 0.935 ac Runoff Volume = 0.003 af Average Runoff Depth = 0.03"
54.17% Pervious = 0.507 ac 45.83% Impervious = 0.429 ac

Summary for Subcatchment 1S: Driveway

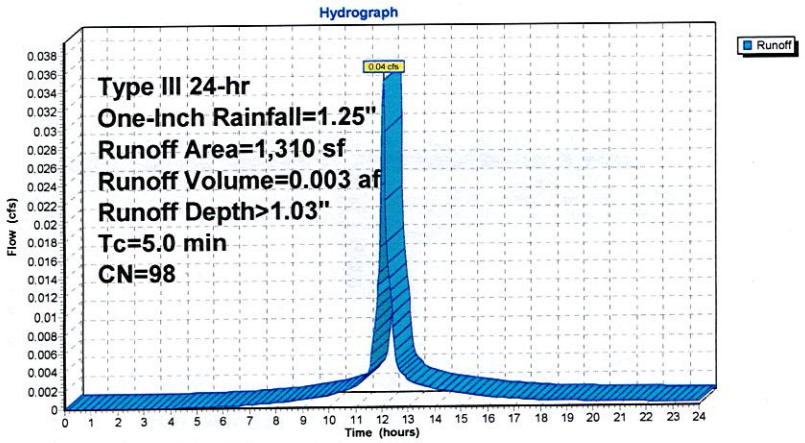
Runoff = 0.04 cfs @ 12.07 hrs, Volume= 0.003 af, Depth> 1.03"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.04 hrs
Type III 24-hr One-Inch Rainfall=1.25"

Area (sf)	CN	Description
1,310	98	Paved parking, HSG A
1,310		100.00% Impervious Area

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

Subcatchment 1S: Driveway



Summary for Subcatchment 3S: Existing Site

[45] Hint: Runoff=Zero

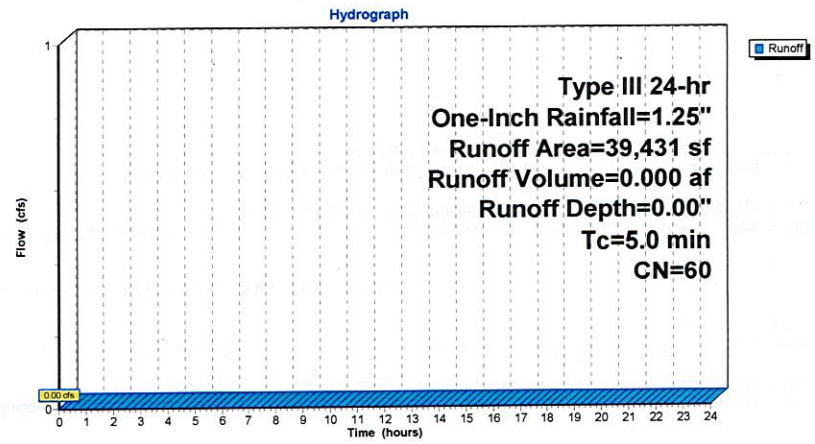
Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.04 hrs
Type III 24-hr One-Inch Rainfall=1.25"

	Area (sf)	CN	Description
*	17,360	98	Building and Parking Lot, HSG A
	22,071	30	Woods, Good, HSG A
	39,431	60	Weighted Average
	22,071		55.97% Pervious Area
	17,360		44.03% Impervious Area

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

Subcatchment 3S: Existing Site



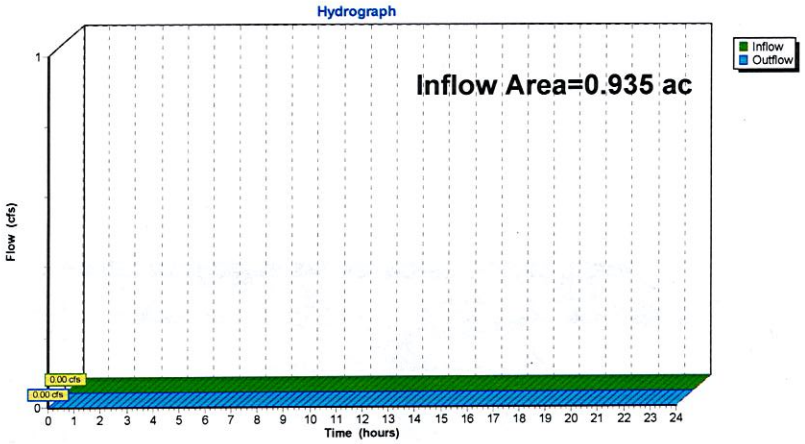
Summary for Reach 4R: Closed Drainage System to Knox Trail

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

Inflow Area =	0.935 ac,	45.83% Impervious,	Inflow Depth =	0.00"	for	One-Inch event
Inflow =	0.00 cfs @	0.00 hrs,	Volume=	0.000 af		
Outflow =	0.00 cfs @	0.00 hrs,	Volume=	0.000 af,	Atten= 0%,	Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.04 hrs

Reach 4R: Closed Drainage System to Knox Trail



Summary for Pond 2P: Rain Garden

Inflow Area =	0.030 ac,	100.00% Impervious,	Inflow Depth >	1.03"	for	One-Inch event
Inflow =	0.04 cfs @	12.07 hrs,	Volume=	0.003 af		
Outflow =	0.01 cfs @	12.47 hrs,	Volume=	0.003 af,	Atten= 78%,	Lag= 24.0 min
Discarded =	0.01 cfs @	12.47 hrs,	Volume=	0.003 af		
Primary =	0.00 cfs @	0.00 hrs,	Volume=	0.000 af		

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.04 hrs / 2
Peak Elev= 147.76' @ 12.47 hrs Surf.Area= 138 sf Storage= 35 cf

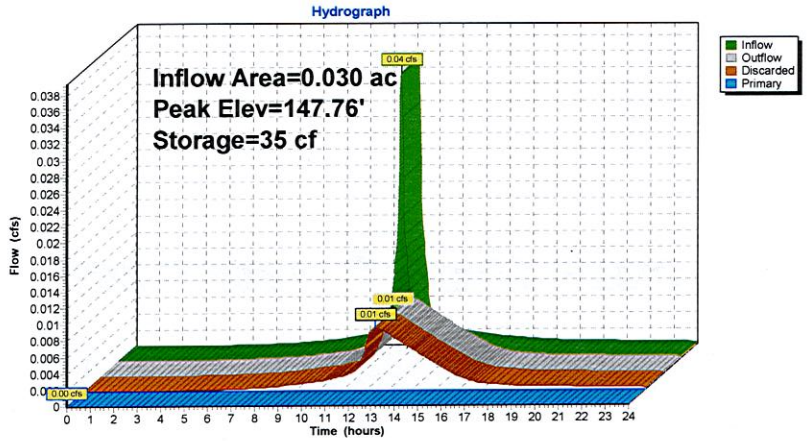
Plug-Flow detention time= 40.8 min calculated for 0.003 af (100% of inflow)
Center-of-Mass det. time= 40.3 min (819.7 - 779.4)

Volume	Invert	Avail.Storage	Storage Description
#1	147.25'	228 cf	**Rain Garden (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
147.25	0	0	0
148.55	350	228	228

Device	Routing	Invert	Outlet Devices
#1	Discarded	147.25'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	146.60'	**8.0" Round New Drain to existing DMH** L= 15.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 146.60' / 145.60' S= 0.0667 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.35 sf
#3	Device 2	148.50'	**24.0" Horiz. Dome Grate** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.01 cfs @ 12.47 hrs HW=147.76' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.01 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=147.25' (Free Discharge)
└**2=New Drain to existing DMH** (Passes 0.00 cfs of 0.75 cfs potential flow)
└**3=Dome Grate** (Controls 0.00 cfs)

Pond 2P: Rain Garden