STORMWATER MANAGEMENT REPORT

FOR THE PROPOSED DEVELOPMENT OF

PROPERTY LOCATED AT

32 KETTLE CREEK
WESTON, CT

PREPARED FOR

JON ROGERS

PREPARED ON: August 19, 2024

Revised 09-12-24

PREPARED BY:

J. EDWARDS & ASSOCIATES, LLC
227 STEPNEY ROAD, EASTON CT, 06612

Larry Edwards, P.E.

INTRODUCTION:

J. Edwards & Associates has prepared this report to demonstrate compliance with local and state engineering guidelines. These guidelines include drainage design, sediment and erosion control and site grading.

PROJECT OVERVIEW:

The property consists of 2.03 acres and is proposed for the construction of a new single family home. Based on the NRCS web soil survey the upland soils are classified in the C soil group. The site is currently undeveloped.

DRAINAGE ANALYSIS:

A Hydrologic analysis was completed using HydroCAD software which implements SCS-T20 methodology to compute runoff volumes. Rainfall intensities and depths were generated from the NOAA web site.

NOAA RAINFALL DEPTHS

EVENT	24 HR. DEPTH
2 YEAR	3.3
10 YEAR	5.0
25 YEAR	5.7
50 YEAR	6.4

The site was evaluated using SCS TR20 methodology for a 50 year 24 hour rainfall amount of 6.4 inches. The project will include the construction of a new house, driveway and pool. The study area of the lot is 36,144sf. The development of the site will result in a total of 4,864sf of impervious area.

The runoff from the newly created impervious areas will be collected by two separate subsurface infiltration systems. The driveway (1,738sf) runoff will be collected in a system of 4 Cultec 280HD units and the house roof and poll (3,126sf) runoff will be collected by a 12 Cultec 280HD unit system. This system will outlet to a splash pad on the subject property, along with the footing drain outlet.

The change in peak flows from existing conditions to proposed conditions is shown in the following table:

Event	Existing Q	Proposed Q	Change in Q
2 Year	0.89 cfs	0.76 cfs	-0.13 cfs
10 Year	1.92 cfs	1.64 cfs	-0.28 cfs
25 Year	2.37 cfs	2.02 cfs	-0.35 cfs
50 year	2.82 cfs	2.41 cfs	-0.41 cfs

Water Quality Volume (WQV) Calculation

PROJECT	JOB #3007	PREPARED BY	IE
DATE	8/19/2024	CHECKED BY	LE
SUBJECT	32 KETTLE CREEK ROAD, WESTON		
Notes:			

TOTAL SITE AREA (A) = 2.03 acres

DRAINAGE AREAS

Drainage Area	Impervious Area	
Subcatchment-1	0.14	
Subcatchment-2	0.00	
Subcatchment-3	0.00	
Total Impervious	0.14	6.7%

WATER QUALITY VOLUME (WQV) CALCULATION

Design Precipitation (P) =	1.3	inch
% Impervious Cover (I) =	6.7	
Volumetric Runoff Coefficient (R) =	0.110	

WQV =	**0.024**	**ac-ft**
	1052	**cu-ft**
1/2 WQV=	**0.012**	**ac-ft**
=	**526**	**cu-ft**

$$WQV = \frac{(1")(R)(A)}{12}$$

where:
- WQV = water quality volume (ac-ft)
- R = volumetric runoff coefficient = 0.05+0.009(I)
- I = percent impervious cover
- A = site area in acres

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Storage for Roof Drain System

SYSTEM STORAGE

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
282.50	**586**	0
282.60	586	23
282.70	586	47
282.80	586	70
282.90	586	94
283.00	586	117
283.10	586	161
283.20	586	204
283.30	586	247
283.40	586	289
283.50	586	332
283.60	586	374
283.70	586	415
283.80	586	456
283.90	586	497
284.00	586	537
284.10	586	578
284.20	586	617
284.30	586	656
284.40	586	694
284.50	586	731
284.60	586	768
284.70	586	803
284.80	586	837
284.90	586	869
285.00	586	899
285.10	586	925
285.20	586	950
285.30	586	973
285.40	586	996
285.50	586	1,020
285.60	586	1,043
285.70	586	1,067
285.80	586	1,090
285.90	586	1,114
286.00	586	1,137
286.10	586	1,160
286.20	586	**1,184**

Storage for Driveway Drain System

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
282.50	**244**	0
282.60	244	10
282.70	244	20
282.80	244	29
282.90	244	39
283.00	244	49
283.10	244	65
283.20	244	82
283.30	244	98
283.40	244	115
283.50	244	131
283.60	244	147
283.70	244	163
283.80	244	179
283.90	244	195
284.00	244	210
284.10	244	226
284.20	244	241
284.30	244	256
284.40	244	271
284.50	244	286
284.60	244	300
284.70	244	314
284.80	244	327
284.90	244	340
285.00	244	352
285.10	244	363
285.20	244	373
285.30	244	382
285.40	244	392
285.50	244	402
285.60	244	412
285.70	244	421
285.80	244	431
285.90	244	441
286.00	244	451
286.10	244	460
286.20	244	**470**

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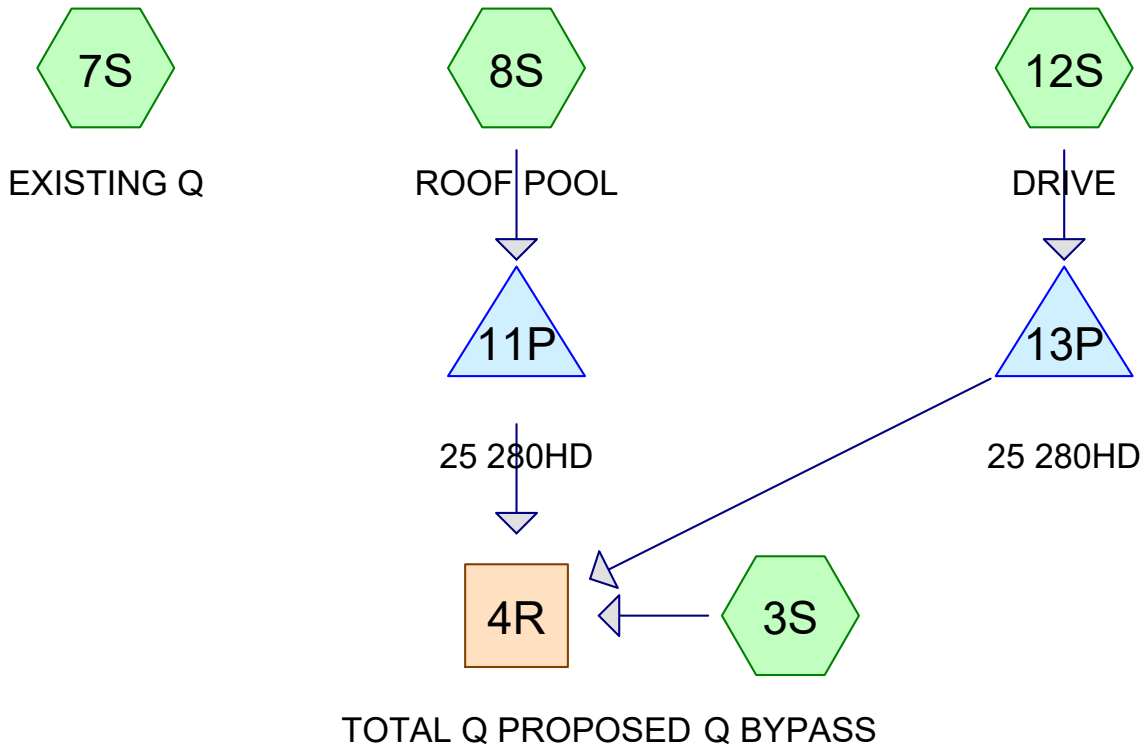
Outlet Protection

Outlet protection is provided by a 10'X10' stone pad for discharge from the subsurface stormwater infiltration system as well as the proposed house footing drain.

CONCLUSION

The proposed development will increase the amount of impervious area on the site, resulting in higher peak runoff rates. However, with the installation of the proposed detention system, the original flow patterns will be maintained and there will be no increase in peak runoff for the 2, 10, 25, and 50-year storm events.



Subcat Reach Pond Link

Routing Diagram for 3007-32-IE
Prepared by {enter your company name here}, Printed 9/12/2024

Rainfall Events Listing

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	2 yr	Type III 24-hr		Default	24.00	1	3.30	2
2	10 yr	Type III 24-hr		Default	24.00	1	5.00	2
3	25 yr	Type III 24-hr		Default	24.00	1	5.70	2
4	50yr	Type III 24-hr		Default	24.00	1	6.40	2

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.112	98	Unconnected pavement, HSG C (8S, 12S)
1.548	76	Woods/grass comb., Fair, HSG C (3S, 7S)
1.660	**77**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
0.000	HSG B	
1.660	HSG C	3S, 7S, 8S, 12S
0.000	HSG D	
0.000	Other	
1.660		**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
0.000	0.000	0.112	0.000	0.000	0.112	Unconnected pavement	8S, 12S
0.000	0.000	1.548	0.000	0.000	1.548	Woods/grass comb., Fair	3S, 7S
0.000	**0.000**	**1.660**	**0.000**	**0.000**	**1.660**	**TOTAL AREA**	

Time span=0.00-20.00 hrs, dt=0.05 hrs, 401 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 3S: Q BYPASS Runoff Area=31,280 sf 0.00% Impervious Runoff Depth>1.12"
Tc=14.2 min CN=76 Runoff=0.76 cfs 0.067 af

Subcatchment 7S: EXISTING Q Runoff Area=36,144 sf 0.00% Impervious Runoff Depth>1.12"
Flow Length=300' Tc=13.6 min CN=76 Runoff=0.89 cfs 0.077 af

Subcatchment 8S: ROOF POOL Runoff Area=3,126 sf 100.00% Impervious Runoff Depth>2.92"
Flow Length=500' Tc=12.8 min CN=98 Runoff=0.18 cfs 0.017 af

Subcatchment 12S: DRIVE Runoff Area=1,738 sf 100.00% Impervious Runoff Depth>2.92"
Flow Length=500' Tc=12.8 min CN=98 Runoff=0.10 cfs 0.010 af

Reach 4R: TOTAL Q PROPOSED Inflow=0.76 cfs 0.067 af
Outflow=0.76 cfs 0.067 af

Pond 11P: 25 280HD Peak Elev=283.52' Storage=341 cf Inflow=0.18 cfs 0.017 af
Discarded=0.01 cfs 0.013 af Primary=0.00 cfs 0.000 af Outflow=0.01 cfs 0.013 af

Pond 13P: 25 280HD Peak Elev=284.03' Storage=215 cf Inflow=0.10 cfs 0.010 af
Discarded=0.01 cfs 0.006 af Primary=0.00 cfs 0.000 af Outflow=0.01 cfs 0.006 af

Total Runoff Area = 1.660 ac Runoff Volume = 0.171 af Average Runoff Depth = 1.24"
93.27% Pervious = 1.548 ac 6.73% Impervious = 0.112 ac

Summary for Subcatchment 3S: Q BYPASS

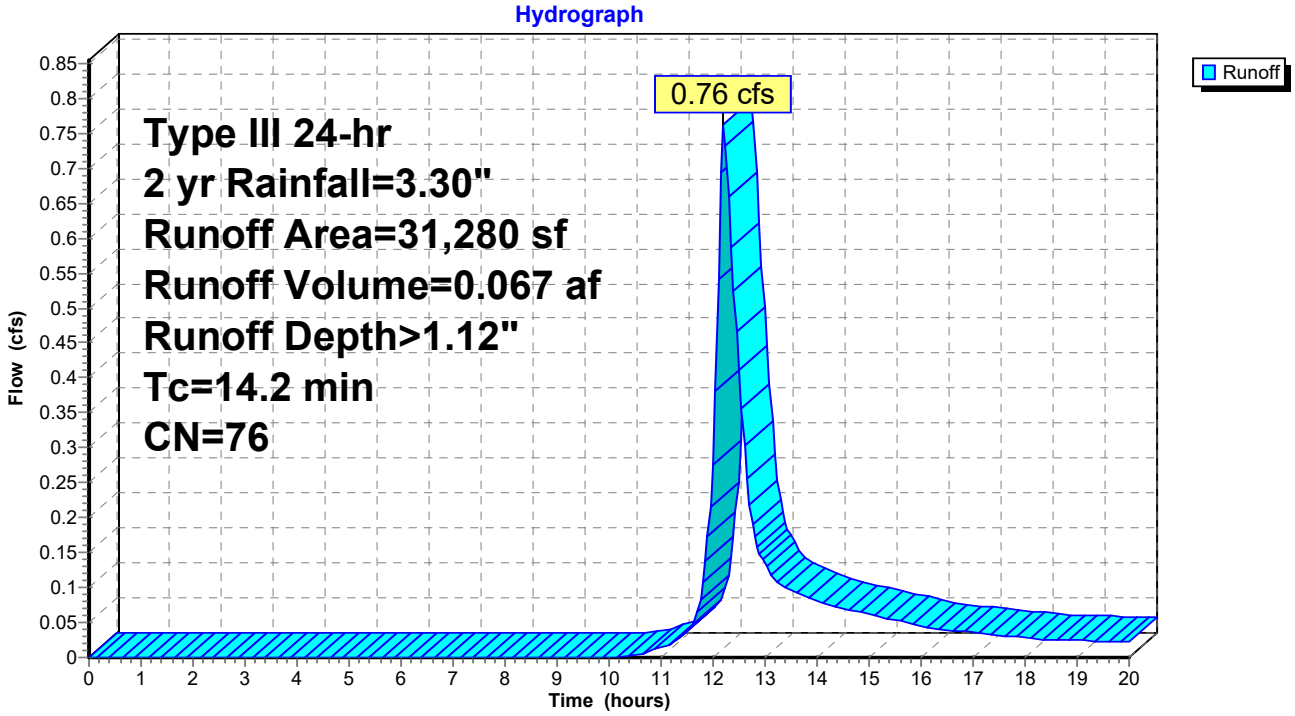
Runoff = 0.76 cfs @ 12.21 hrs, Volume= 0.067 af, Depth> 1.12"
Routed to Reach 4R : TOTAL Q PROPOSED

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 yr Rainfall=3.30"

Area (sf)	CN	Description
31,280	76	Woods/grass comb., Fair, HSG C
31,280		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.2					**Direct Entry, SAME AS EXISTING**

Subcatchment 3S: Q BYPASS



Summary for Subcatchment 7S: EXISTING Q

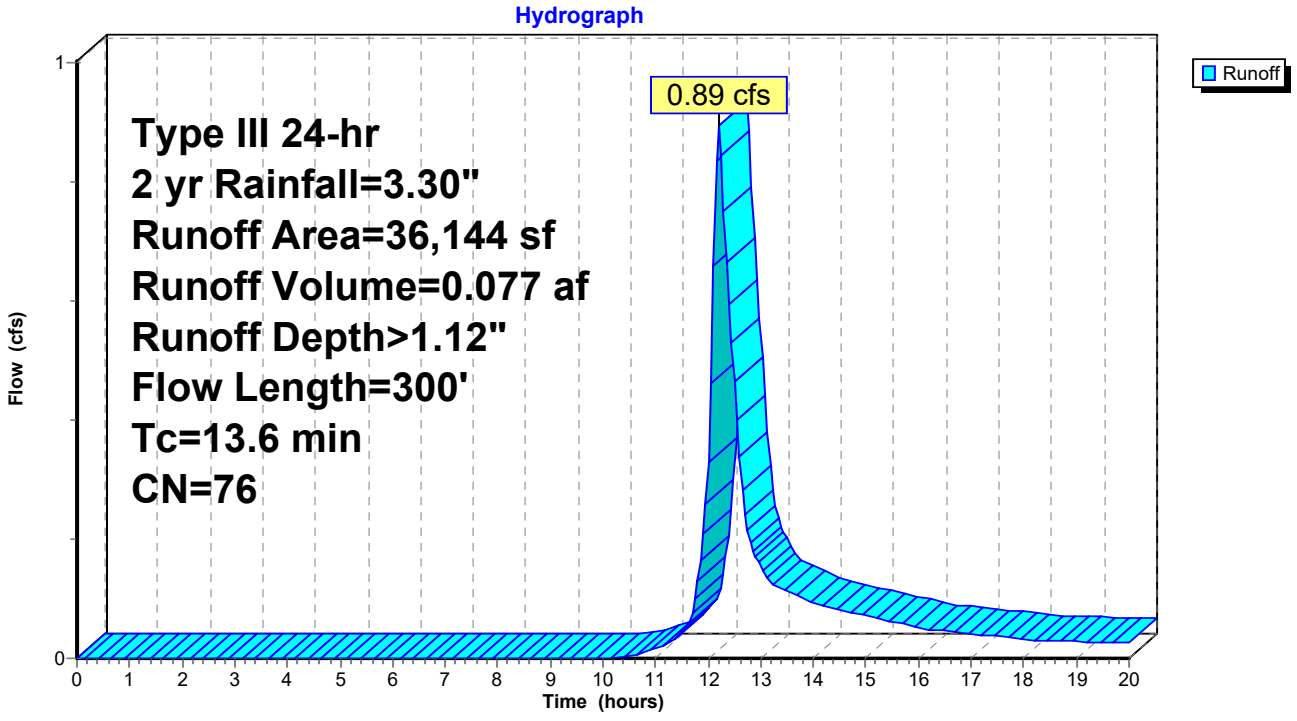
Runoff = 0.89 cfs @ 12.20 hrs, Volume= 0.077 af, Depth> 1.12"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 yr Rainfall=3.30"

Area (sf)	CN	Description
36,144	76	Woods/grass comb., Fair, HSG C
36,144		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.9	200	0.1000	0.26		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.30"
0.7	100	0.1200	2.42		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
13.6	300	Total			

Subcatchment 7S: EXISTING Q



Summary for Subcatchment 8S: ROOF POOL

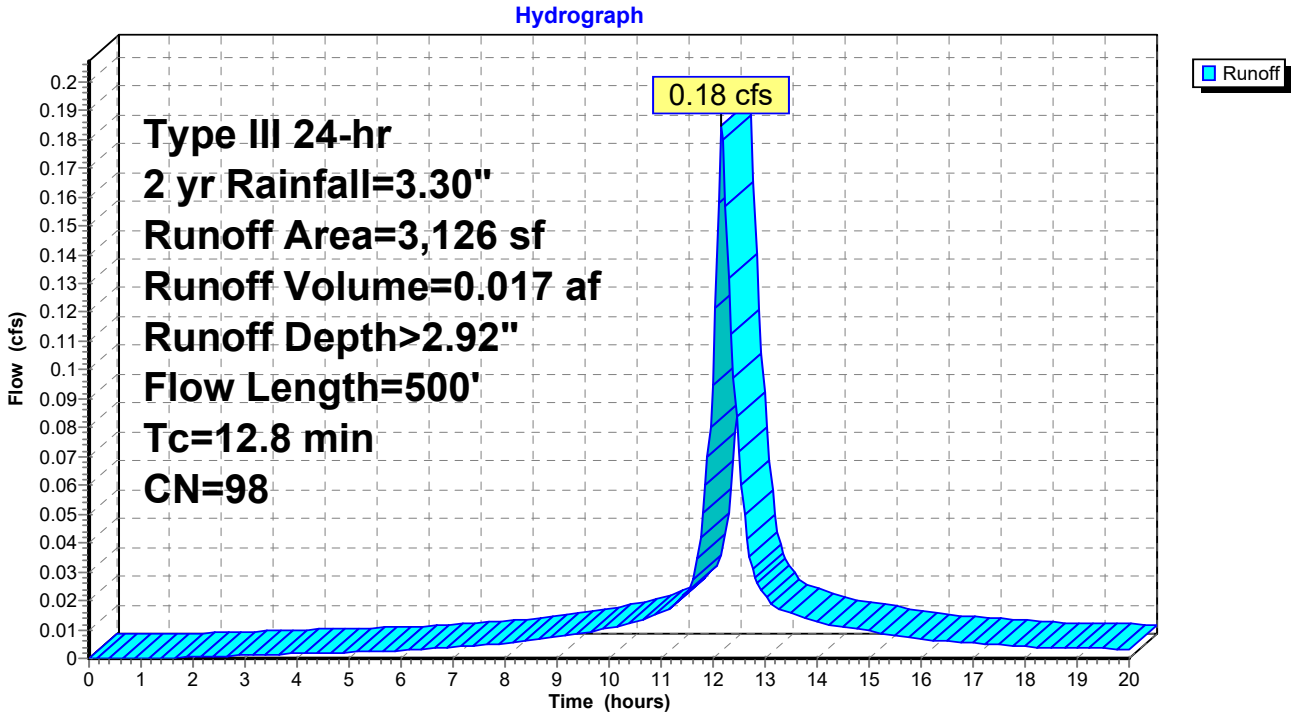
Runoff = 0.18 cfs @ 12.17 hrs, Volume= 0.017 af, Depth> 2.92"
Routed to Pond 11P : 25 280HD

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 yr Rainfall=3.30"

Area (sf)	CN	Description
3,126	98	Unconnected pavement, HSG C
3,126		100.00% Impervious Area
3,126		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.9	200	0.1200	0.28		**Sheet Flow, LAWN** Grass: Dense n= 0.240 P2= 3.30"
0.9	300	0.0800	5.74		**Shallow Concentrated Flow, DRIVE** Paved Kv= 20.3 fps
12.8	500	Total			

Subcatchment 8S: ROOF POOL



Summary for Subcatchment 12S: DRIVE

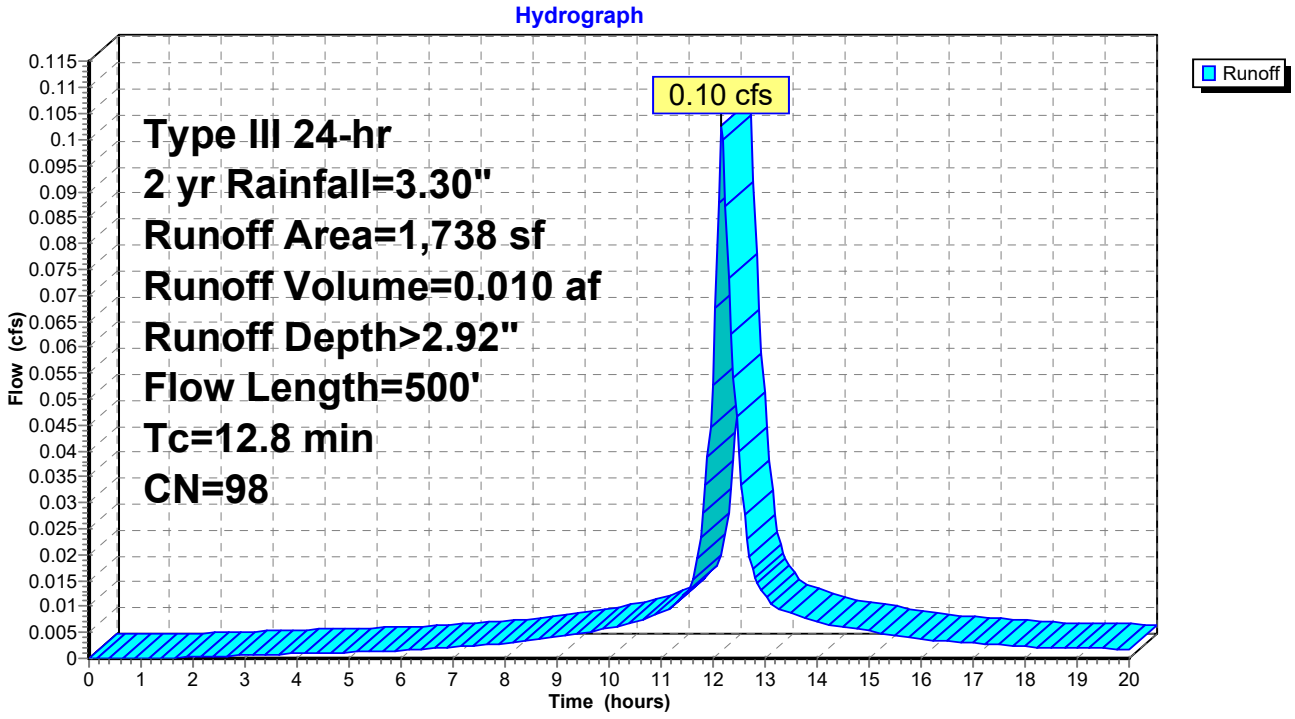
Runoff = 0.10 cfs @ 12.17 hrs, Volume= 0.010 af, Depth> 2.92"
Routed to Pond 13P : 25 280HD

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 yr Rainfall=3.30"

Area (sf)	CN	Description
1,738	98	Unconnected pavement, HSG C
1,738		100.00% Impervious Area
1,738		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.9	200	0.1200	0.28		**Sheet Flow, LAWN** Grass: Dense n= 0.240 P2= 3.30"
0.9	300	0.0800	5.74		**Shallow Concentrated Flow, DRIVE** Paved Kv= 20.3 fps
12.8	500	Total			

Subcatchment 12S: DRIVE



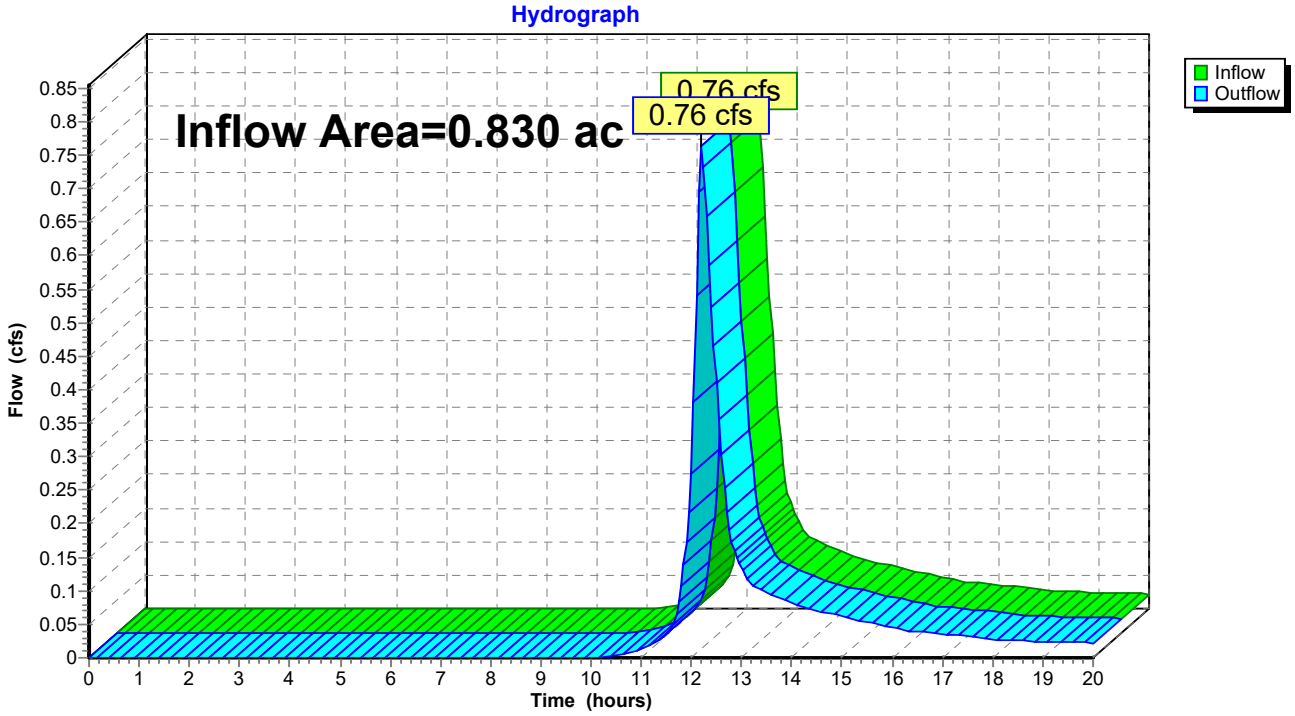
Summary for Reach 4R: TOTAL Q PROPOSED

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

Inflow Area = 0.830 ac, 13.46% Impervious, Inflow Depth > 0.97" for 2 yr event
Inflow = 0.76 cfs @ 12.21 hrs, Volume= 0.067 af
Outflow = 0.76 cfs @ 12.21 hrs, Volume= 0.067 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs

Reach 4R: TOTAL Q PROPOSED



Summary for Pond 11P: 25 280HD

Inflow Area = 0.072 ac,100.00% Impervious, Inflow Depth > 2.92" for 2 yr event
Inflow = 0.18 cfs @ 12.17 hrs, Volume= 0.017 af
Outflow = 0.01 cfs @ 10.85 hrs, Volume= 0.013 af, Atten= 93%, Lag= 0.0 min
Discarded = 0.01 cfs @ 10.85 hrs, Volume= 0.013 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Reach 4R : TOTAL Q PROPOSED

Routing by Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 283.52' @ 13.86 hrs Surf.Area= 586 sf Storage= 341 cf

Plug-Flow detention time= 155.2 min calculated for 0.013 af (76% of inflow)
Center-of-Mass det. time= 94.5 min (828.2 - 733.7)

Volume	Invert	Avail.Storage	Storage Description
#1A	282.50'	658 cf	**17.75'W x 33.00'L x 3.71'H Field A** 2,172 cf Overall - 528 cf Embedded = 1,644 cf x 40.0% Voids
#2A	283.00'	528 cf	**Cultec R-280HD** x 12 Inside #1 Effective Size= 46.9"W x 26.0"H => 6.07 sf x 7.00'L = 42.5 cf Overall Size= 47.0"W x 26.5"H x 8.00'L with 1.00' Overlap Row Length Adjustment= +1.00' x 6.07 sf x 3 rows
		1,186 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	282.50'	**1.000 in/hr OUT over Surface area**
#2	Primary	285.00'	**4.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.01 cfs @ 10.85 hrs HW=282.54' (Free Discharge)
↑—**1=OUT** (Exfiltration Controls 0.01 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=282.50' (Free Discharge)
↑—**2=Orifice/Grate** (Controls 0.00 cfs)

Pond 11P: 25 280HD - Chamber Wizard Field A

Chamber Model = Cultec R-280HD (Cultec Recharger® 280HD)
Effective Size= 46.9"W x 26.0"H => 6.07 sf x 7.00'L = 42.5 cf
Overall Size= 47.0"W x 26.5"H x 8.00'L with 1.00' Overlap
Row Length Adjustment= +1.00' x 6.07 sf x 3 rows

47.0" Wide + 12.0" Spacing = 59.0" C-C Row Spacing

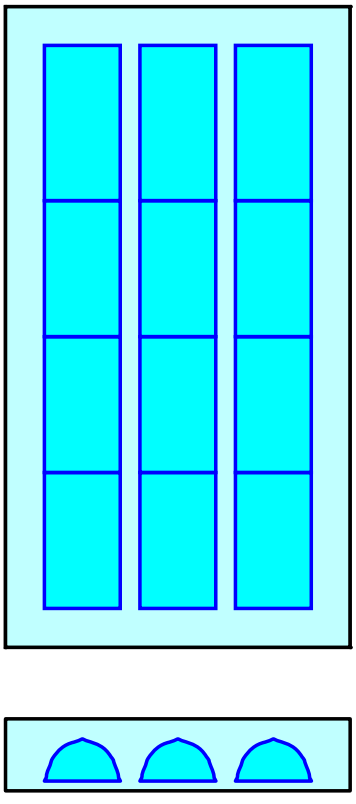
4 Chambers/Row x 7.00' Long +1.00' Row Adjustment = 29.00' Row Length +24.0" End Stone x 2 = 33.00' Base Length
3 Rows x 47.0" Wide + 12.0" Spacing x 2 + 24.0" Side Stone x 2 = 17.75' Base Width
6.0" Stone Base + 26.5" Chamber Height + 12.0" Stone Cover = 3.71' Field Height

12 Chambers x 42.5 cf +1.00' Row Adjustment x 6.07 sf x 3 Rows = 528.2 cf Chamber Storage

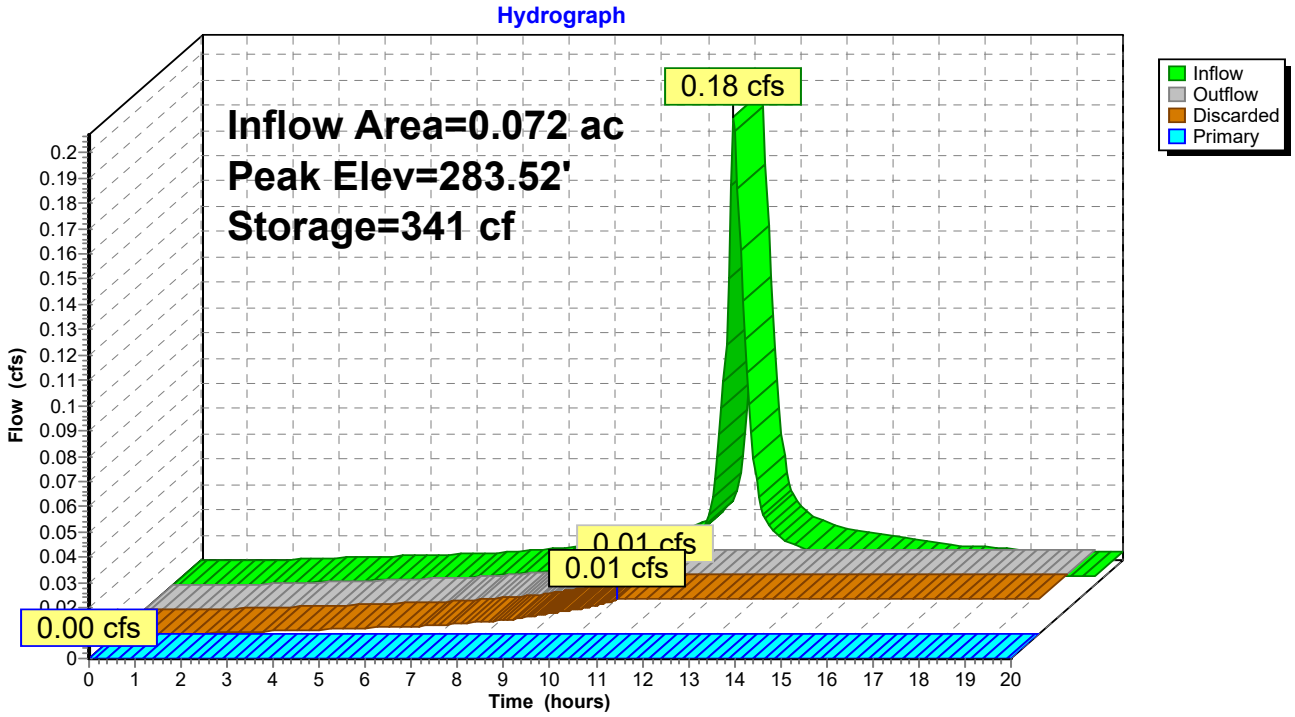
2,172.2 cf Field - 528.2 cf Chambers = 1,643.9 cf Stone x 40.0% Voids = 657.6 cf Stone Storage

Chamber Storage + Stone Storage = 1,185.8 cf = 0.027 af
Overall Storage Efficiency = 54.6%
Overall System Size = 33.00' x 17.75' x 3.71'

12 Chambers
80.5 cy Field
60.9 cy Stone



Pond 11P: 25 280HD



Summary for Pond 13P: 25 280HD

Inflow Area = 0.040 ac,100.00% Impervious, Inflow Depth > 2.92" for 2 yr event
Inflow = 0.10 cfs @ 12.17 hrs, Volume= 0.010 af
Outflow = 0.01 cfs @ 10.15 hrs, Volume= 0.006 af, Atten= 95%, Lag= 0.0 min
Discarded = 0.01 cfs @ 10.15 hrs, Volume= 0.006 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Reach 4R : TOTAL Q PROPOSED

Routing by Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 284.03' @ 14.74 hrs Surf.Area= 244 sf Storage= 215 cf

Plug-Flow detention time= 154.7 min calculated for 0.006 af (61% of inflow)
Center-of-Mass det. time= 72.5 min (806.2 - 733.7)

Volume	Invert	Avail.Storage	Storage Description
#1A	282.50'	289 cf	**12.83'W x 19.00'L x 3.71'H Field A** 904 cf Overall - 182 cf Embedded = 722 cf x 40.0% Voids
#2A	283.00'	182 cf	**Cultec R-280HD** x 4 Inside #1 Effective Size= 46.9"W x 26.0"H => 6.07 sf x 7.00'L = 42.5 cf Overall Size= 47.0"W x 26.5"H x 8.00'L with 1.00' Overlap Row Length Adjustment= +1.00' x 6.07 sf x 2 rows
		471 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	282.50'	**1.000 in/hr OUT over Surface area**
#2	Primary	285.00'	**4.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.01 cfs @ 10.15 hrs HW=282.54' (Free Discharge)
↑—**1=OUT** (Exfiltration Controls 0.01 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=282.50' (Free Discharge)
↑—**2=Orifice/Grate** (Controls 0.00 cfs)

Pond 13P: 25 280HD - Chamber Wizard Field A

Chamber Model = Cultec R-280HD (Cultec Recharger® 280HD)
Effective Size= 46.9"W x 26.0"H => 6.07 sf x 7.00'L = 42.5 cf
Overall Size= 47.0"W x 26.5"H x 8.00'L with 1.00' Overlap
Row Length Adjustment= +1.00' x 6.07 sf x 2 rows

47.0" Wide + 12.0" Spacing = 59.0" C-C Row Spacing

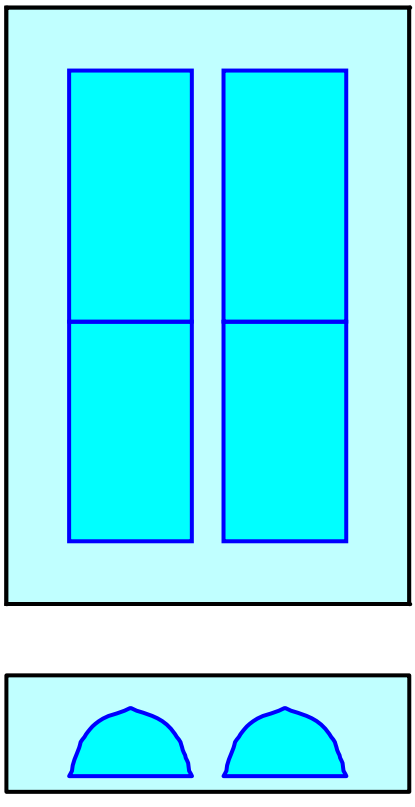
2 Chambers/Row x 7.00' Long +1.00' Row Adjustment = 15.00' Row Length +24.0" End Stone x 2 = 19.00' Base Length
2 Rows x 47.0" Wide + 12.0" Spacing x 1 + 24.0" Side Stone x 2 = 12.83' Base Width
6.0" Stone Base + 26.5" Chamber Height + 12.0" Stone Cover = 3.71' Field Height

4 Chambers x 42.5 cf +1.00' Row Adjustment x 6.07 sf x 2 Rows = 182.2 cf Chamber Storage

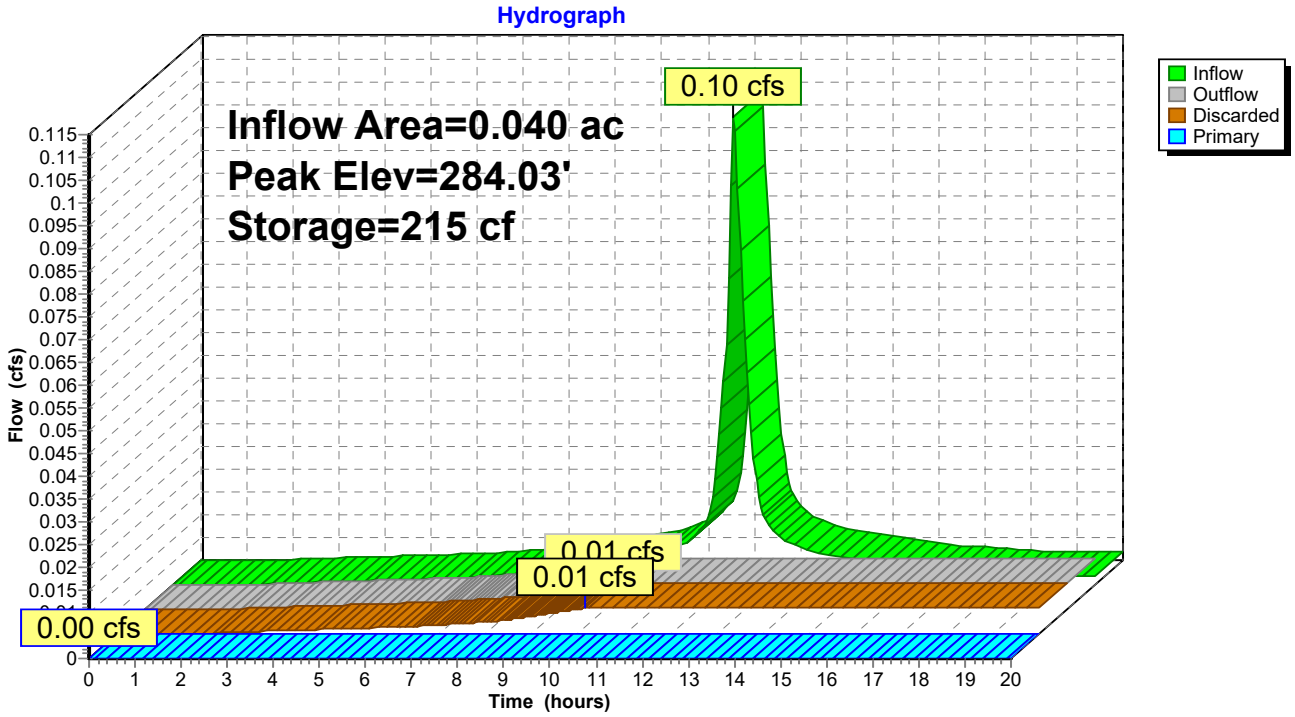
904.2 cf Field - 182.2 cf Chambers = 722.1 cf Stone x 40.0% Voids = 288.8 cf Stone Storage

Chamber Storage + Stone Storage = 471.0 cf = 0.011 af
Overall Storage Efficiency = 52.1%
Overall System Size = 19.00' x 12.83' x 3.71'

4 Chambers
33.5 cy Field
26.7 cy Stone



Pond 13P: 25 280HD



Time span=0.00-20.00 hrs, dt=0.05 hrs, 401 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 3S: Q BYPASS Runoff Area=31,280 sf 0.00% Impervious Runoff Depth>2.35"
Tc=14.2 min CN=76 Runoff=1.64 cfs 0.141 af

Subcatchment 7S: EXISTING Q Runoff Area=36,144 sf 0.00% Impervious Runoff Depth>2.35"
Flow Length=300' Tc=13.6 min CN=76 Runoff=1.92 cfs 0.162 af

Subcatchment 8S: ROOF POOL Runoff Area=3,126 sf 100.00% Impervious Runoff Depth>4.54"
Flow Length=500' Tc=12.8 min CN=98 Runoff=0.28 cfs 0.027 af

Subcatchment 12S: DRIVE Runoff Area=1,738 sf 100.00% Impervious Runoff Depth>4.54"
Flow Length=500' Tc=12.8 min CN=98 Runoff=0.16 cfs 0.015 af

Reach 4R: TOTAL Q PROPOSED Inflow=1.64 cfs 0.142 af
Outflow=1.64 cfs 0.142 af

Pond 11P: 25 280HD Peak Elev=284.23' Storage=629 cf Inflow=0.28 cfs 0.027 af
Discarded=0.01 cfs 0.015 af Primary=0.00 cfs 0.000 af Outflow=0.01 cfs 0.015 af

Pond 13P: 25 280HD Peak Elev=285.05' Storage=358 cf Inflow=0.16 cfs 0.015 af
Discarded=0.01 cfs 0.007 af Primary=0.01 cfs 0.001 af Outflow=0.01 cfs 0.008 af

Total Runoff Area = 1.660 ac Runoff Volume = 0.345 af Average Runoff Depth = 2.50"
93.27% Pervious = 1.548 ac 6.73% Impervious = 0.112 ac

Summary for Subcatchment 3S: Q BYPASS

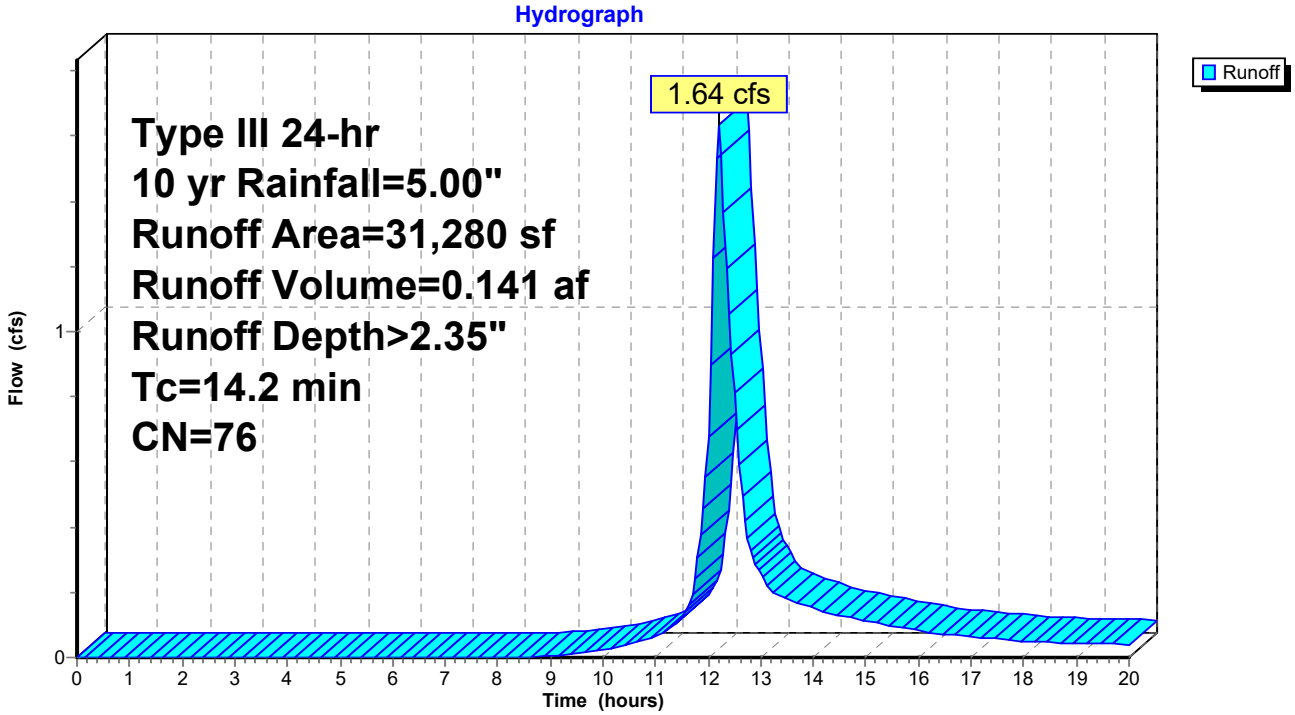
Runoff = 1.64 cfs @ 12.20 hrs, Volume= 0.141 af, Depth> 2.35"
Routed to Reach 4R : TOTAL Q PROPOSED

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 yr Rainfall=5.00"

Area (sf)	CN	Description
31,280	76	Woods/grass comb., Fair, HSG C
31,280		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.2					**Direct Entry, SAME AS EXISTING**

Subcatchment 3S: Q BYPASS



Summary for Subcatchment 7S: EXISTING Q

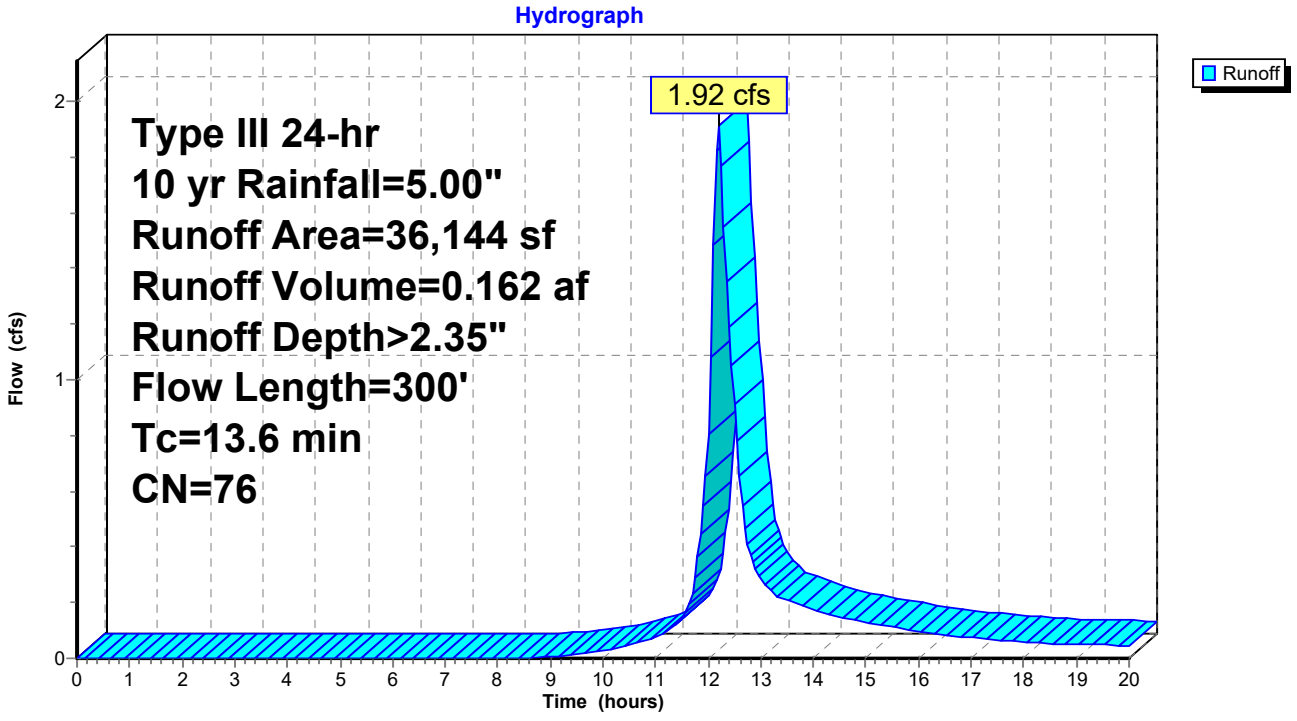
Runoff = 1.92 cfs @ 12.19 hrs, Volume= 0.162 af, Depth> 2.35"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 yr Rainfall=5.00"

Area (sf)	CN	Description
36,144	76	Woods/grass comb., Fair, HSG C
36,144		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.9	200	0.1000	0.26		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.30"
0.7	100	0.1200	2.42		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
13.6	300	Total			

Subcatchment 7S: EXISTING Q



Summary for Subcatchment 8S: ROOF POOL

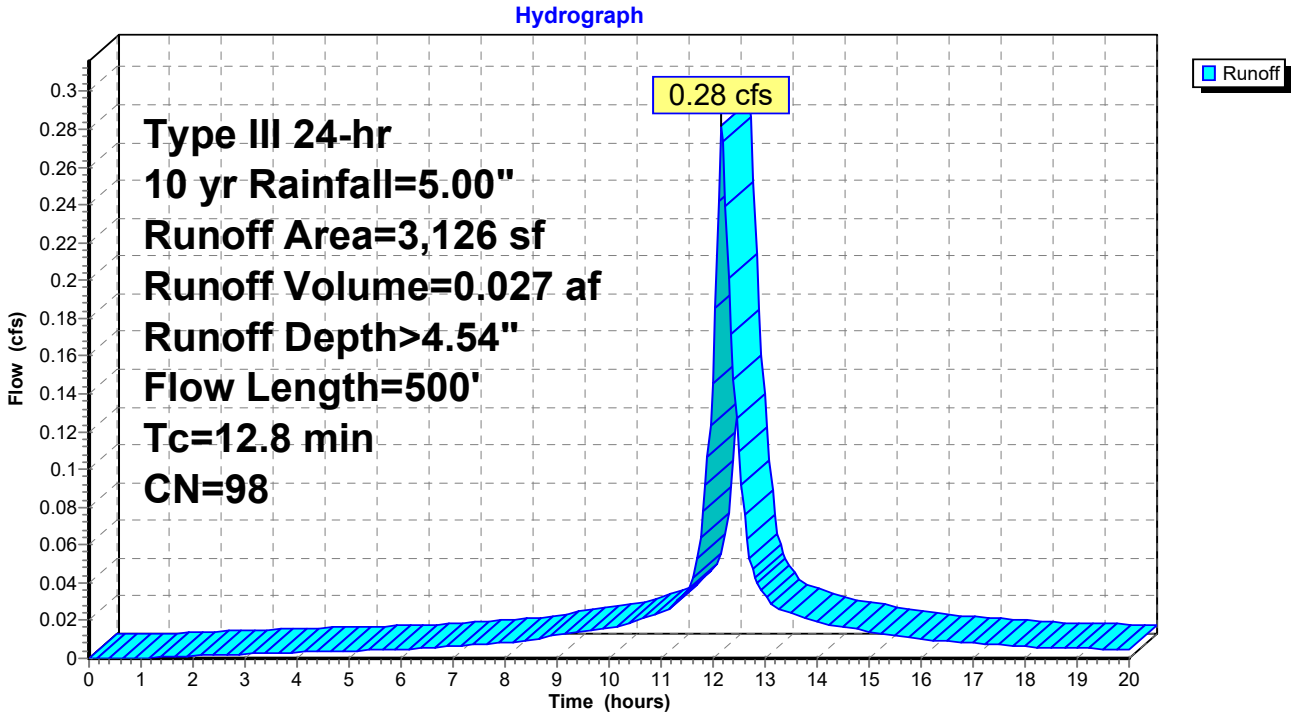
Runoff = 0.28 cfs @ 12.17 hrs, Volume= 0.027 af, Depth> 4.54"
Routed to Pond 11P : 25 280HD

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 yr Rainfall=5.00"

Area (sf)	CN	Description
3,126	98	Unconnected pavement, HSG C
3,126		100.00% Impervious Area
3,126		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.9	200	0.1200	0.28		**Sheet Flow, LAWN** Grass: Dense n= 0.240 P2= 3.30"
0.9	300	0.0800	5.74		**Shallow Concentrated Flow, DRIVE** Paved Kv= 20.3 fps
12.8	500	Total			

Subcatchment 8S: ROOF POOL



Summary for Subcatchment 12S: DRIVE

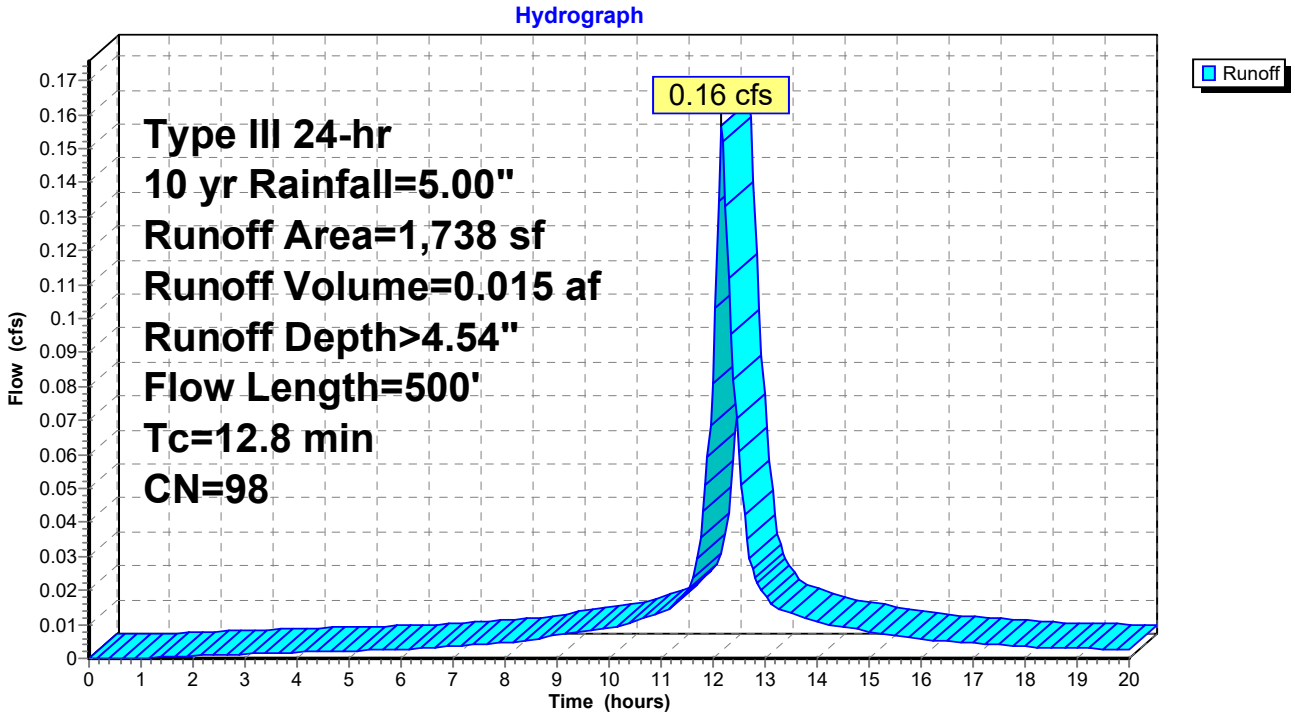
Runoff = 0.16 cfs @ 12.17 hrs, Volume= 0.015 af, Depth> 4.54"
Routed to Pond 13P : 25 280HD

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 yr Rainfall=5.00"

Area (sf)	CN	Description
1,738	98	Unconnected pavement, HSG C
1,738		100.00% Impervious Area
1,738		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.9	200	0.1200	0.28		**Sheet Flow, LAWN** Grass: Dense n= 0.240 P2= 3.30"
0.9	300	0.0800	5.74		**Shallow Concentrated Flow, DRIVE** Paved Kv= 20.3 fps
12.8	500	Total			

Subcatchment 12S: DRIVE



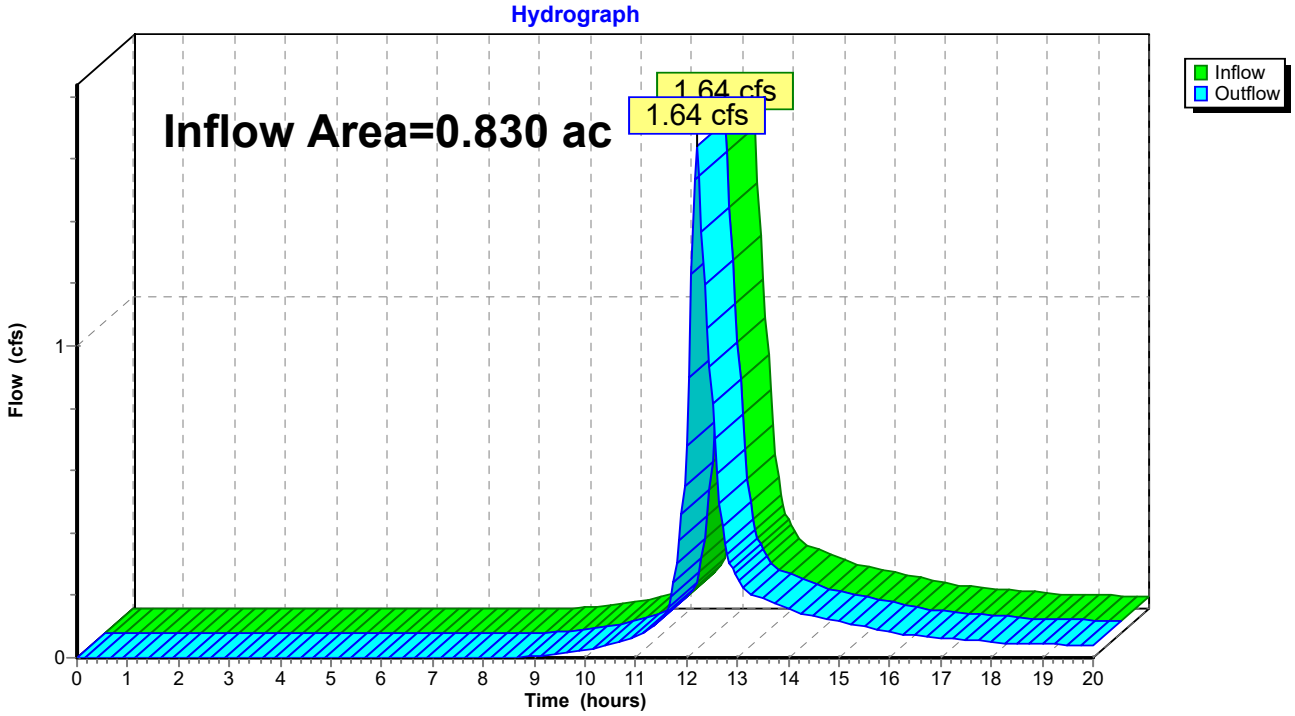
Summary for Reach 4R: TOTAL Q PROPOSED

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

Inflow Area = 0.830 ac, 13.46% Impervious, Inflow Depth > 2.05" for 10 yr event
Inflow = 1.64 cfs @ 12.20 hrs, Volume= 0.142 af
Outflow = 1.64 cfs @ 12.20 hrs, Volume= 0.142 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs

Reach 4R: TOTAL Q PROPOSED



Summary for Pond 11P: 25 280HD

Inflow Area = 0.072 ac,100.00% Impervious, Inflow Depth > 4.54" for 10 yr event
Inflow = 0.28 cfs @ 12.17 hrs, Volume= 0.027 af
Outflow = 0.01 cfs @ 9.55 hrs, Volume= 0.015 af, Atten= 95%, Lag= 0.0 min
Discarded = 0.01 cfs @ 9.55 hrs, Volume= 0.015 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Reach 4R : TOTAL Q PROPOSED

Routing by Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 284.23' @ 15.19 hrs Surf.Area= 586 sf Storage= 629 cf

Plug-Flow detention time= 150.9 min calculated for 0.015 af (56% of inflow)
Center-of-Mass det. time= 56.0 min (782.3 - 726.3)

Volume	Invert	Avail.Storage	Storage Description
#1A	282.50'	658 cf	**17.75'W x 33.00'L x 3.71'H Field A** 2,172 cf Overall - 528 cf Embedded = 1,644 cf x 40.0% Voids
#2A	283.00'	528 cf	**Cultec R-280HD** x 12 Inside #1 Effective Size= 46.9"W x 26.0"H => 6.07 sf x 7.00'L = 42.5 cf Overall Size= 47.0"W x 26.5"H x 8.00'L with 1.00' Overlap Row Length Adjustment= +1.00' x 6.07 sf x 3 rows
		1,186 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	282.50'	**1.000 in/hr OUT over Surface area**
#2	Primary	285.00'	**4.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.01 cfs @ 9.55 hrs HW=282.54' (Free Discharge)
↑—**1=OUT** (Exfiltration Controls 0.01 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=282.50' (Free Discharge)
↑—**2=Orifice/Grate** (Controls 0.00 cfs)

Pond 11P: 25 280HD - Chamber Wizard Field A

Chamber Model = Cultec R-280HD (Cultec Recharger® 280HD)
Effective Size= 46.9"W x 26.0"H => 6.07 sf x 7.00'L = 42.5 cf
Overall Size= 47.0"W x 26.5"H x 8.00'L with 1.00' Overlap
Row Length Adjustment= +1.00' x 6.07 sf x 3 rows

47.0" Wide + 12.0" Spacing = 59.0" C-C Row Spacing

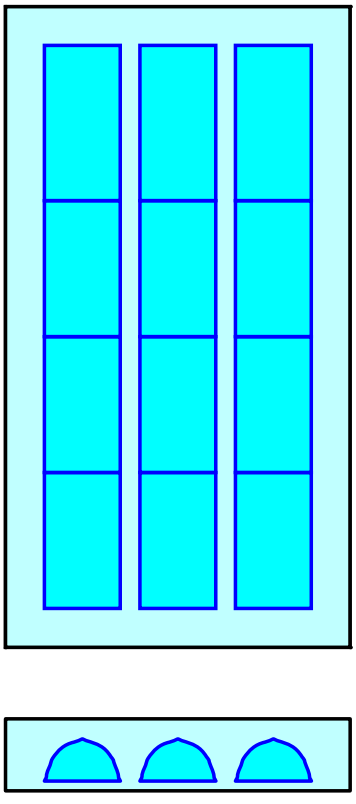
4 Chambers/Row x 7.00' Long +1.00' Row Adjustment = 29.00' Row Length +24.0" End Stone x 2 = 33.00' Base Length
3 Rows x 47.0" Wide + 12.0" Spacing x 2 + 24.0" Side Stone x 2 = 17.75' Base Width
6.0" Stone Base + 26.5" Chamber Height + 12.0" Stone Cover = 3.71' Field Height

12 Chambers x 42.5 cf +1.00' Row Adjustment x 6.07 sf x 3 Rows = 528.2 cf Chamber Storage

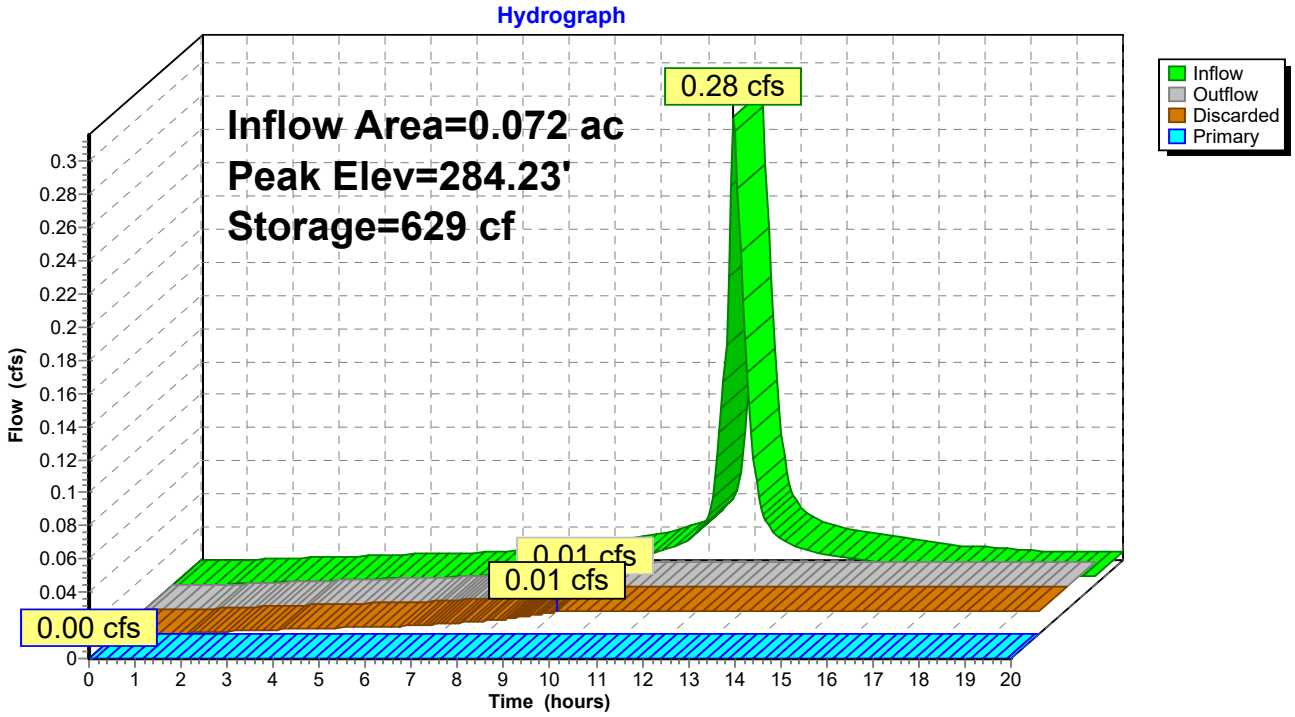
2,172.2 cf Field - 528.2 cf Chambers = 1,643.9 cf Stone x 40.0% Voids = 657.6 cf Stone Storage

Chamber Storage + Stone Storage = 1,185.8 cf = 0.027 af
Overall Storage Efficiency = 54.6%
Overall System Size = 33.00' x 17.75' x 3.71'

12 Chambers
80.5 cy Field
60.9 cy Stone



Pond 11P: 25 280HD



Summary for Pond 13P: 25 280HD

Inflow Area = 0.040 ac,100.00% Impervious, Inflow Depth > 4.54" for 10 yr event
Inflow = 0.16 cfs @ 12.17 hrs, Volume= 0.015 af
Outflow = 0.01 cfs @ 13.52 hrs, Volume= 0.008 af, Atten= 92%, Lag= 80.9 min
Discarded = 0.01 cfs @ 8.75 hrs, Volume= 0.007 af
Primary = 0.01 cfs @ 13.52 hrs, Volume= 0.001 af
Routed to Reach 4R : TOTAL Q PROPOSED

Routing by Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 285.05' @ 13.52 hrs Surf.Area= 244 sf Storage= 358 cf

Plug-Flow detention time= 149.1 min calculated for 0.008 af (50% of inflow)
Center-of-Mass det. time= 44.0 min (770.3 - 726.3)

Volume	Invert	Avail.Storage	Storage Description
#1A	282.50'	289 cf	**12.83'W x 19.00'L x 3.71'H Field A** 904 cf Overall - 182 cf Embedded = 722 cf x 40.0% Voids
#2A	283.00'	182 cf	**Cultec R-280HD** x 4 Inside #1 Effective Size= 46.9"W x 26.0"H => 6.07 sf x 7.00'L = 42.5 cf Overall Size= 47.0"W x 26.5"H x 8.00'L with 1.00' Overlap Row Length Adjustment= +1.00' x 6.07 sf x 2 rows
		471 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	282.50'	**1.000 in/hr OUT over Surface area**
#2	Primary	285.00'	**4.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.01 cfs @ 8.75 hrs HW=282.54' (Free Discharge)
↑—**1=OUT** (Exfiltration Controls 0.01 cfs)

Primary OutFlow Max=0.01 cfs @ 13.52 hrs HW=285.05' (Free Discharge)
↑—**2=Orifice/Grate** (Orifice Controls 0.01 cfs @ 0.79 fps)

Pond 13P: 25 280HD - Chamber Wizard Field A

Chamber Model = Cultec R-280HD (Cultec Recharger® 280HD)
Effective Size= 46.9"W x 26.0"H => 6.07 sf x 7.00'L = 42.5 cf
Overall Size= 47.0"W x 26.5"H x 8.00'L with 1.00' Overlap
Row Length Adjustment= +1.00' x 6.07 sf x 2 rows

47.0" Wide + 12.0" Spacing = 59.0" C-C Row Spacing

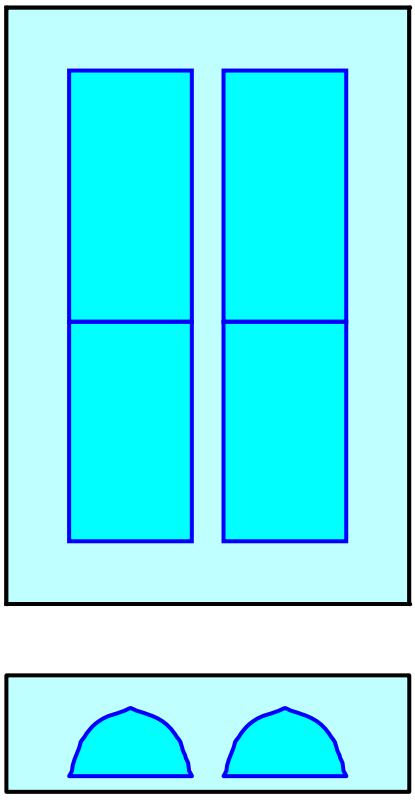
2 Chambers/Row x 7.00' Long +1.00' Row Adjustment = 15.00' Row Length +24.0" End Stone x 2 = 19.00' Base Length
2 Rows x 47.0" Wide + 12.0" Spacing x 1 + 24.0" Side Stone x 2 = 12.83' Base Width
6.0" Stone Base + 26.5" Chamber Height + 12.0" Stone Cover = 3.71' Field Height

4 Chambers x 42.5 cf +1.00' Row Adjustment x 6.07 sf x 2 Rows = 182.2 cf Chamber Storage

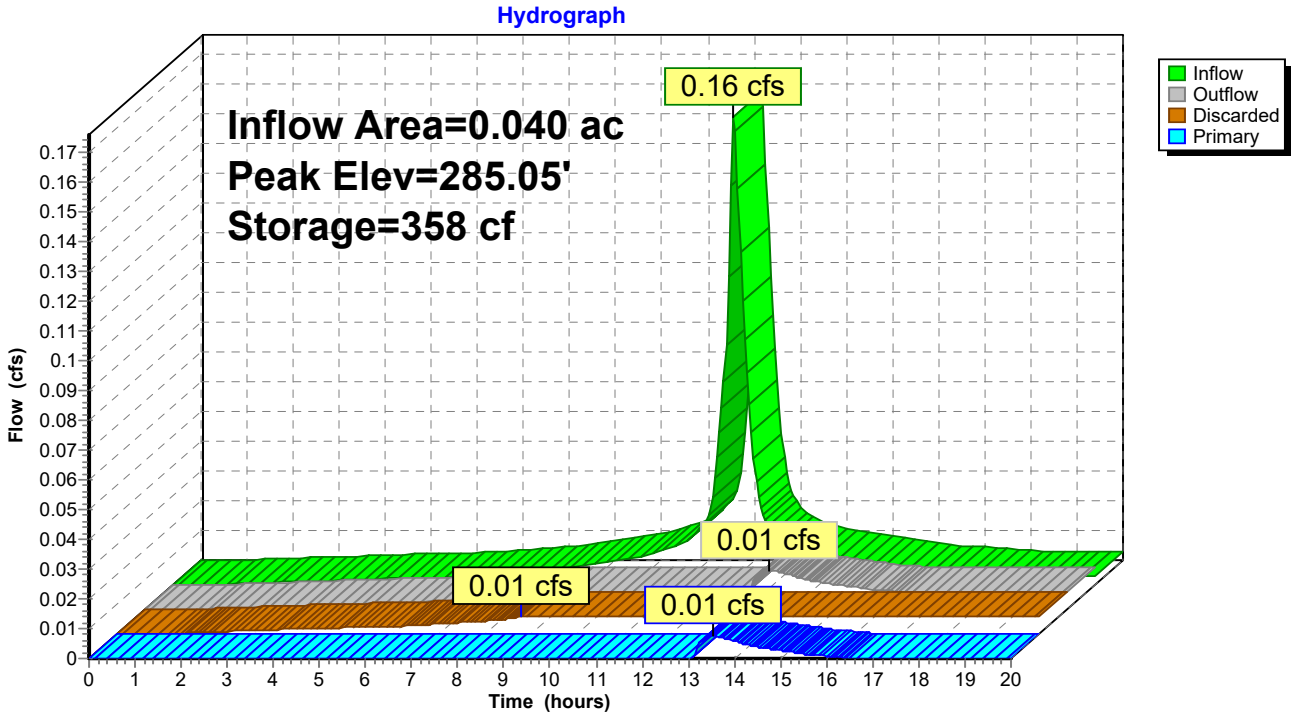
904.2 cf Field - 182.2 cf Chambers = 722.1 cf Stone x 40.0% Voids = 288.8 cf Stone Storage

Chamber Storage + Stone Storage = 471.0 cf = 0.011 af
Overall Storage Efficiency = 52.1%
Overall System Size = 19.00' x 12.83' x 3.71'

4 Chambers
33.5 cy Field
26.7 cy Stone



Pond 13P: 25 280HD



Time span=0.00-20.00 hrs, dt=0.05 hrs, 401 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 3S: Q BYPASS Runoff Area=31,280 sf 0.00% Impervious Runoff Depth>2.90"
Tc=14.2 min CN=76 Runoff=2.02 cfs 0.174 af

Subcatchment 7S: EXISTING Q Runoff Area=36,144 sf 0.00% Impervious Runoff Depth>2.90"
Flow Length=300' Tc=13.6 min CN=76 Runoff=2.37 cfs 0.201 af

Subcatchment 8S: ROOF POOL Runoff Area=3,126 sf 100.00% Impervious Runoff Depth>5.20"
Flow Length=500' Tc=12.8 min CN=98 Runoff=0.32 cfs 0.031 af

Subcatchment 12S: DRIVE Runoff Area=1,738 sf 100.00% Impervious Runoff Depth>5.20"
Flow Length=500' Tc=12.8 min CN=98 Runoff=0.18 cfs 0.017 af

Reach 4R: TOTAL Q PROPOSED Inflow=2.02 cfs 0.176 af
Outflow=2.02 cfs 0.176 af

Pond 11P: 25 280HD Peak Elev=284.58' Storage=761 cf Inflow=0.32 cfs 0.031 af
Discarded=0.01 cfs 0.016 af Primary=0.00 cfs 0.000 af Outflow=0.01 cfs 0.016 af

Pond 13P: 25 280HD Peak Elev=285.14' Storage=366 cf Inflow=0.18 cfs 0.017 af
Discarded=0.01 cfs 0.007 af Primary=0.04 cfs 0.003 af Outflow=0.05 cfs 0.010 af

Total Runoff Area = 1.660 ac Runoff Volume = 0.423 af Average Runoff Depth = 3.06"
93.27% Pervious = 1.548 ac 6.73% Impervious = 0.112 ac

Summary for Subcatchment 3S: Q BYPASS

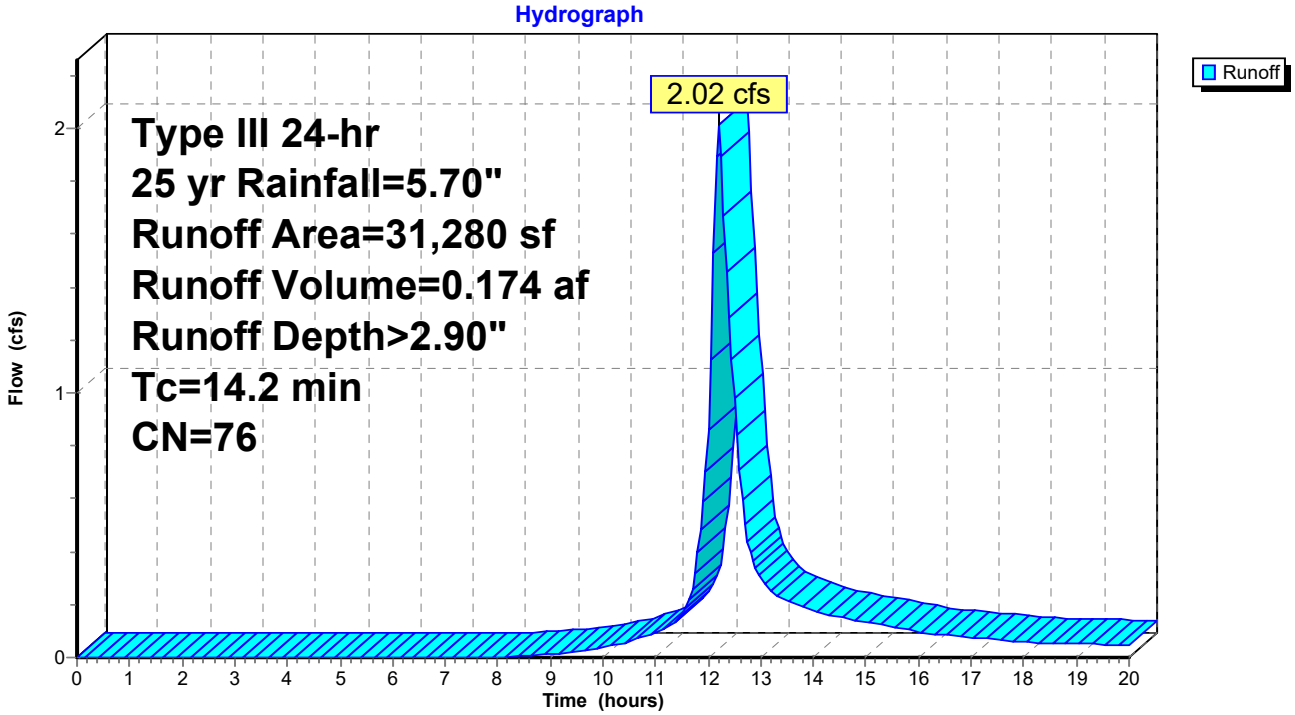
Runoff = 2.02 cfs @ 12.20 hrs, Volume= 0.174 af, Depth> 2.90"
Routed to Reach 4R : TOTAL Q PROPOSED

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 yr Rainfall=5.70"

Area (sf)	CN	Description
31,280	76	Woods/grass comb., Fair, HSG C
31,280		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.2					**Direct Entry, SAME AS EXISTING**

Subcatchment 3S: Q BYPASS



Summary for Subcatchment 7S: EXISTING Q

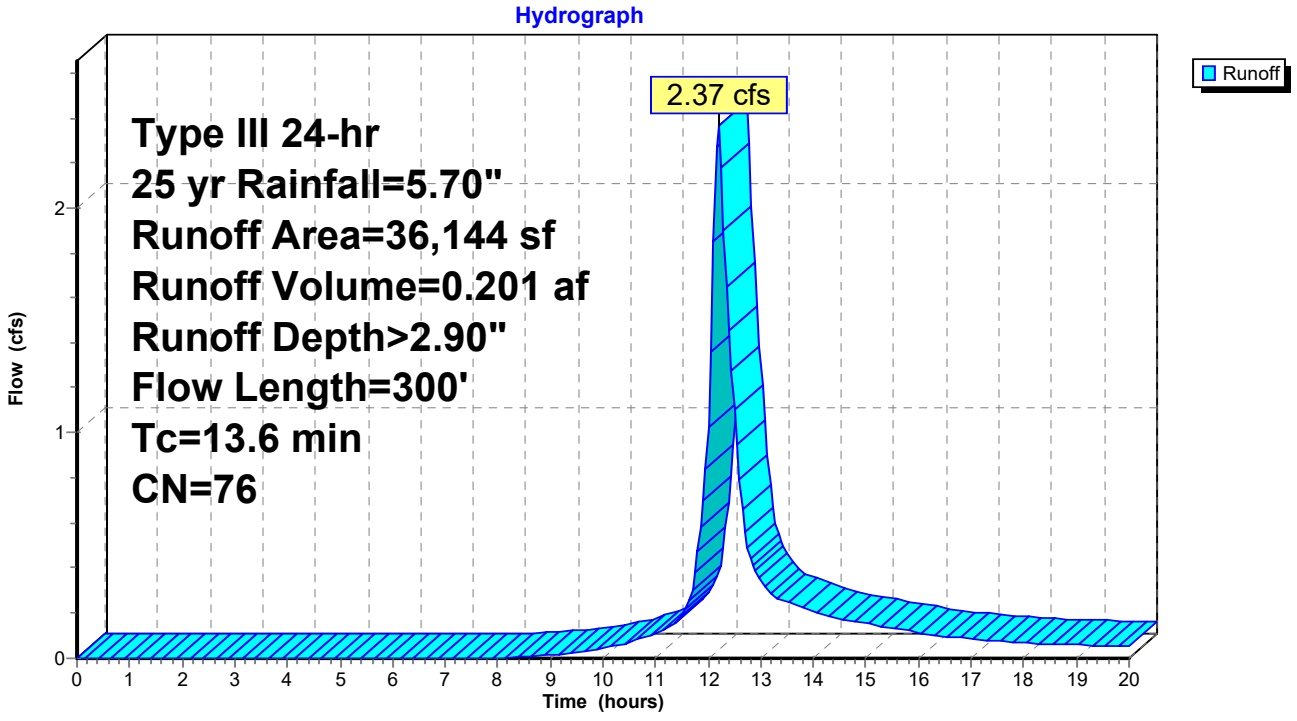
Runoff = 2.37 cfs @ 12.19 hrs, Volume= 0.201 af, Depth> 2.90"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 yr Rainfall=5.70"

Area (sf)	CN	Description
36,144	76	Woods/grass comb., Fair, HSG C
36,144		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.9	200	0.1000	0.26		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.30"
0.7	100	0.1200	2.42		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
13.6	300	Total			

Subcatchment 7S: EXISTING Q



Summary for Subcatchment 8S: ROOF POOL

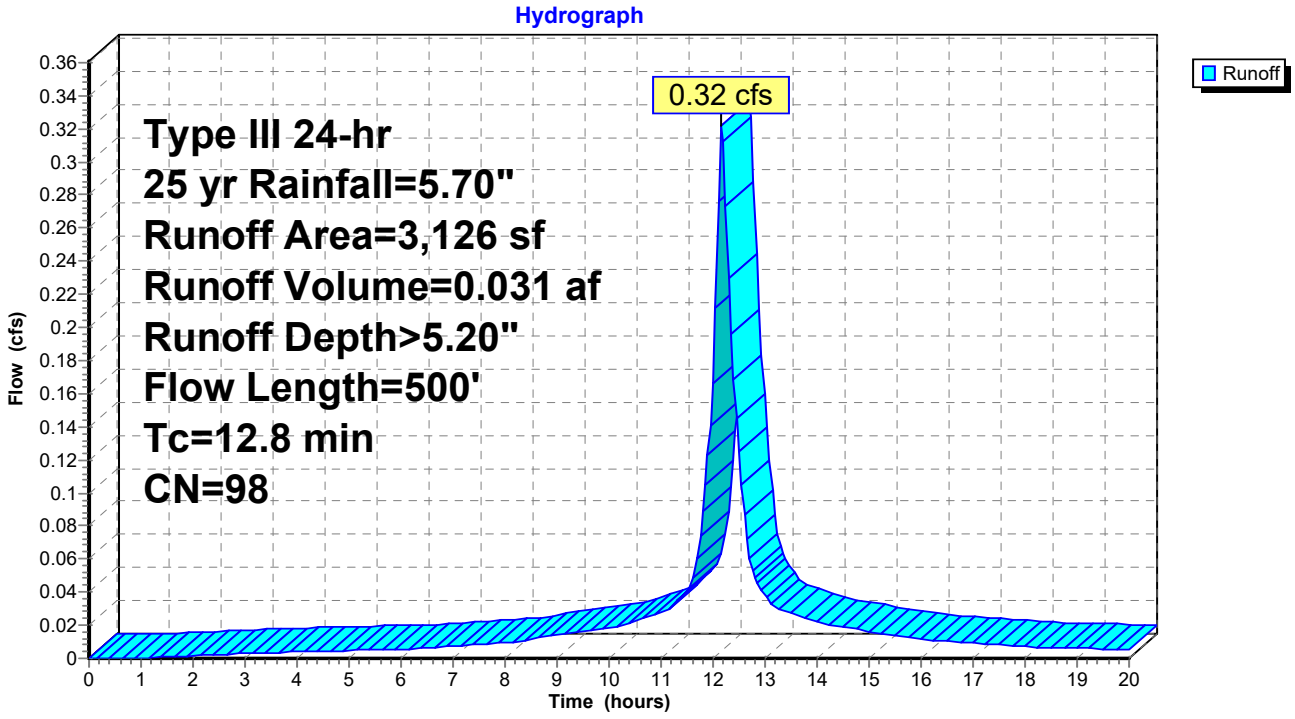
Runoff = 0.32 cfs @ 12.17 hrs, Volume= 0.031 af, Depth> 5.20"
Routed to Pond 11P : 25 280HD

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 yr Rainfall=5.70"

Area (sf)	CN	Description
3,126	98	Unconnected pavement, HSG C
3,126		100.00% Impervious Area
3,126		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.9	200	0.1200	0.28		**Sheet Flow, LAWN** Grass: Dense n= 0.240 P2= 3.30"
0.9	300	0.0800	5.74		**Shallow Concentrated Flow, DRIVE** Paved Kv= 20.3 fps
12.8	500	Total			

Subcatchment 8S: ROOF POOL



Summary for Subcatchment 12S: DRIVE

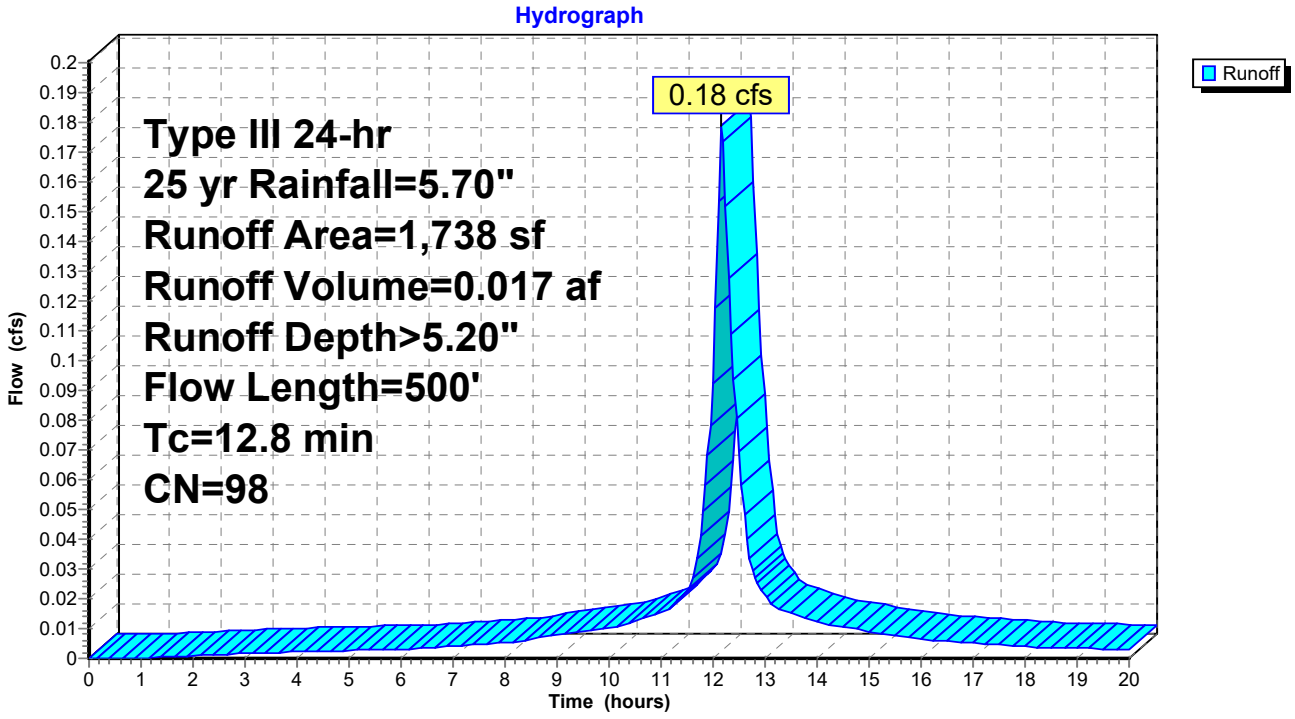
Runoff = 0.18 cfs @ 12.17 hrs, Volume= 0.017 af, Depth> 5.20"
Routed to Pond 13P : 25 280HD

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 yr Rainfall=5.70"

Area (sf)	CN	Description
1,738	98	Unconnected pavement, HSG C
1,738		100.00% Impervious Area
1,738		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.9	200	0.1200	0.28		**Sheet Flow, LAWN** Grass: Dense n= 0.240 P2= 3.30"
0.9	300	0.0800	5.74		**Shallow Concentrated Flow, DRIVE** Paved Kv= 20.3 fps
12.8	500	Total			

Subcatchment 12S: DRIVE



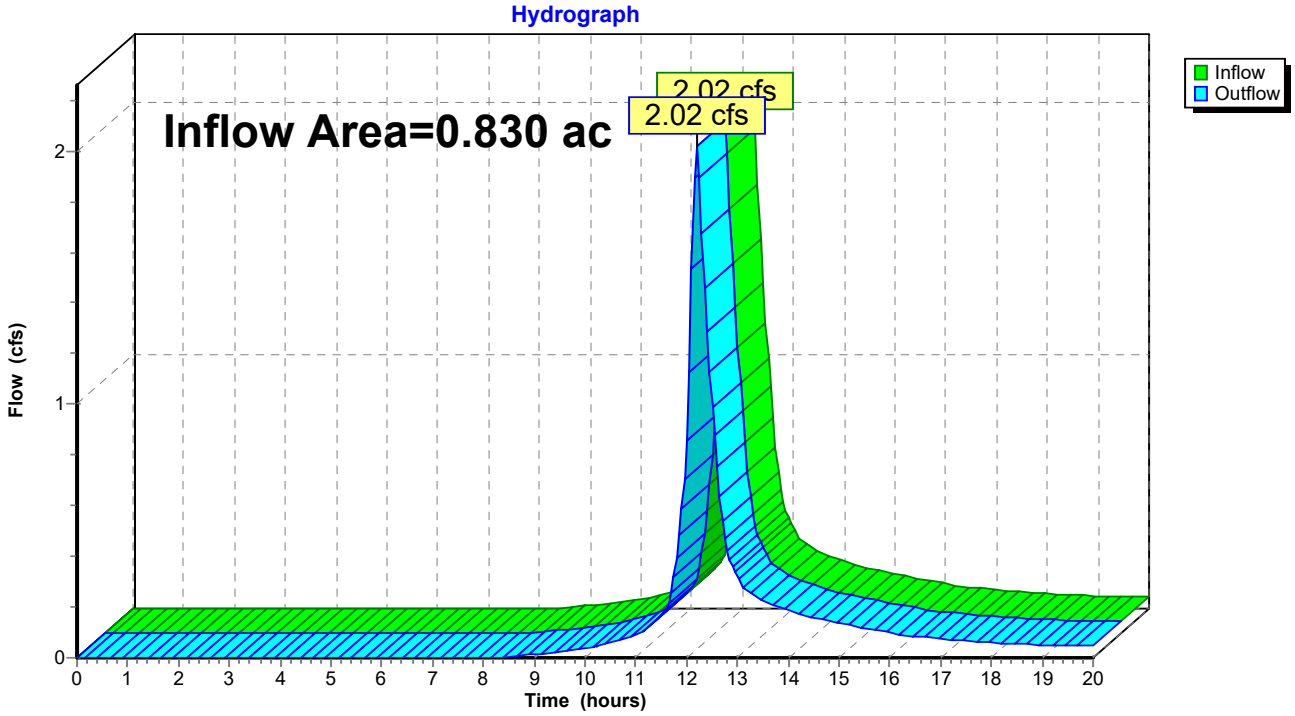
Summary for Reach 4R: TOTAL Q PROPOSED

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

Inflow Area = 0.830 ac, 13.46% Impervious, Inflow Depth > 2.55" for 25 yr event
Inflow = 2.02 cfs @ 12.20 hrs, Volume= 0.176 af
Outflow = 2.02 cfs @ 12.20 hrs, Volume= 0.176 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs

Reach 4R: TOTAL Q PROPOSED



Summary for Pond 11P: 25 280HD

Inflow Area = 0.072 ac,100.00% Impervious, Inflow Depth > 5.20" for 25 yr event
Inflow = 0.32 cfs @ 12.17 hrs, Volume= 0.031 af
Outflow = 0.01 cfs @ 9.15 hrs, Volume= 0.016 af, Atten= 96%, Lag= 0.0 min
Discarded = 0.01 cfs @ 9.15 hrs, Volume= 0.016 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Reach 4R : TOTAL Q PROPOSED

Routing by Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 284.58' @ 15.60 hrs Surf.Area= 586 sf Storage= 761 cf

Plug-Flow detention time= 150.3 min calculated for 0.016 af (50% of inflow)
Center-of-Mass det. time= 43.3 min (767.5 - 724.2)

Volume	Invert	Avail.Storage	Storage Description
#1A	282.50'	658 cf	**17.75'W x 33.00'L x 3.71'H Field A** 2,172 cf Overall - 528 cf Embedded = 1,644 cf x 40.0% Voids
#2A	283.00'	528 cf	**Cultec R-280HD** x 12 Inside #1 Effective Size= 46.9"W x 26.0"H => 6.07 sf x 7.00'L = 42.5 cf Overall Size= 47.0"W x 26.5"H x 8.00'L with 1.00' Overlap Row Length Adjustment= +1.00' x 6.07 sf x 3 rows
		1,186 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	282.50'	**1.000 in/hr OUT over Surface area**
#2	Primary	285.00'	**4.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.01 cfs @ 9.15 hrs HW=282.54' (Free Discharge)
↑—**1=OUT** (Exfiltration Controls 0.01 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=282.50' (Free Discharge)
↑—**2=Orifice/Grate** (Controls 0.00 cfs)

Pond 11P: 25 280HD - Chamber Wizard Field A

Chamber Model = Cultec R-280HD (Cultec Recharger® 280HD)
Effective Size= 46.9"W x 26.0"H => 6.07 sf x 7.00'L = 42.5 cf
Overall Size= 47.0"W x 26.5"H x 8.00'L with 1.00' Overlap
Row Length Adjustment= +1.00' x 6.07 sf x 3 rows

47.0" Wide + 12.0" Spacing = 59.0" C-C Row Spacing

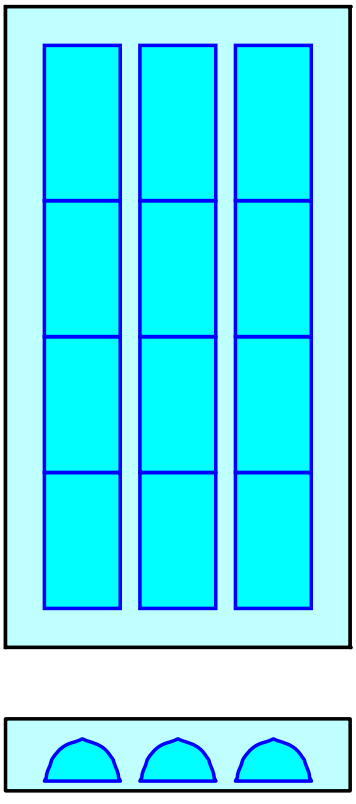
4 Chambers/Row x 7.00' Long +1.00' Row Adjustment = 29.00' Row Length +24.0" End Stone x 2 = 33.00' Base Length
3 Rows x 47.0" Wide + 12.0" Spacing x 2 + 24.0" Side Stone x 2 = 17.75' Base Width
6.0" Stone Base + 26.5" Chamber Height + 12.0" Stone Cover = 3.71' Field Height

12 Chambers x 42.5 cf +1.00' Row Adjustment x 6.07 sf x 3 Rows = 528.2 cf Chamber Storage

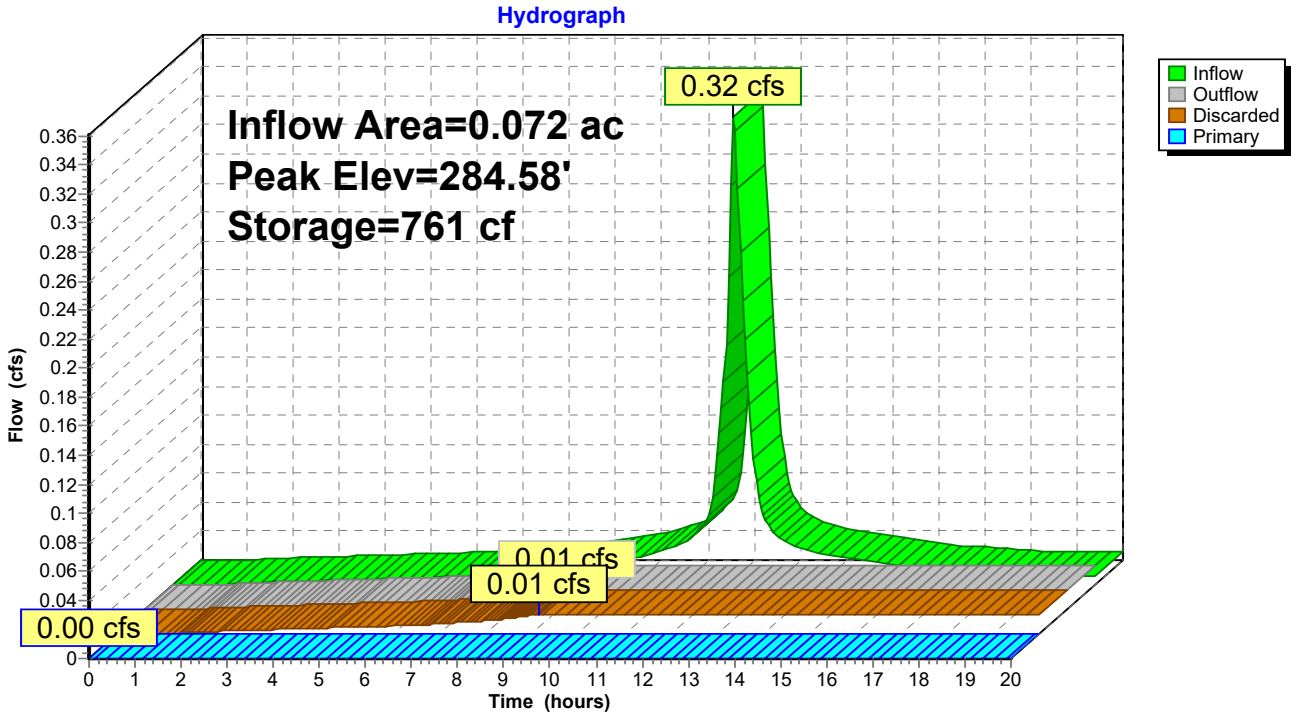
2,172.2 cf Field - 528.2 cf Chambers = 1,643.9 cf Stone x 40.0% Voids = 657.6 cf Stone Storage

Chamber Storage + Stone Storage = 1,185.8 cf = 0.027 af
Overall Storage Efficiency = 54.6%
Overall System Size = 33.00' x 17.75' x 3.71'

12 Chambers
80.5 cy Field
60.9 cy Stone



Pond 11P: 25 280HD



Summary for Pond 13P: 25 280HD

Inflow Area = 0.040 ac,100.00% Impervious, Inflow Depth > 5.20" for 25 yr event
Inflow = 0.18 cfs @ 12.17 hrs, Volume= 0.017 af
Outflow = 0.05 cfs @ 12.62 hrs, Volume= 0.010 af, Atten= 73%, Lag= 26.8 min
Discarded = 0.01 cfs @ 8.40 hrs, Volume= 0.007 af
Primary = 0.04 cfs @ 12.62 hrs, Volume= 0.003 af
Routed to Reach 4R : TOTAL Q PROPOSED

Routing by Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 285.14' @ 12.62 hrs Surf.Area= 244 sf Storage= 366 cf

Plug-Flow detention time= 134.1 min calculated for 0.010 af (56% of inflow)
Center-of-Mass det. time= 38.1 min (762.3 - 724.2)

Volume	Invert	Avail.Storage	Storage Description
#1A	282.50'	289 cf	**12.83'W x 19.00'L x 3.71'H Field A** 904 cf Overall - 182 cf Embedded = 722 cf x 40.0% Voids
#2A	283.00'	182 cf	**Cultec R-280HD** x 4 Inside #1 Effective Size= 46.9"W x 26.0"H => 6.07 sf x 7.00'L = 42.5 cf Overall Size= 47.0"W x 26.5"H x 8.00'L with 1.00' Overlap Row Length Adjustment= +1.00' x 6.07 sf x 2 rows
		471 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	282.50'	**1.000 in/hr OUT over Surface area**
#2	Primary	285.00'	**4.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.01 cfs @ 8.40 hrs HW=282.54' (Free Discharge)
↑—**1=OUT** (Exfiltration Controls 0.01 cfs)

Primary OutFlow Max=0.04 cfs @ 12.62 hrs HW=285.13' (Free Discharge)
↑—**2=Orifice/Grate** (Orifice Controls 0.04 cfs @ 1.25 fps)

Pond 13P: 25 280HD - Chamber Wizard Field A

Chamber Model = Cultec R-280HD (Cultec Recharger® 280HD)
Effective Size= 46.9"W x 26.0"H => 6.07 sf x 7.00'L = 42.5 cf
Overall Size= 47.0"W x 26.5"H x 8.00'L with 1.00' Overlap
Row Length Adjustment= +1.00' x 6.07 sf x 2 rows

47.0" Wide + 12.0" Spacing = 59.0" C-C Row Spacing

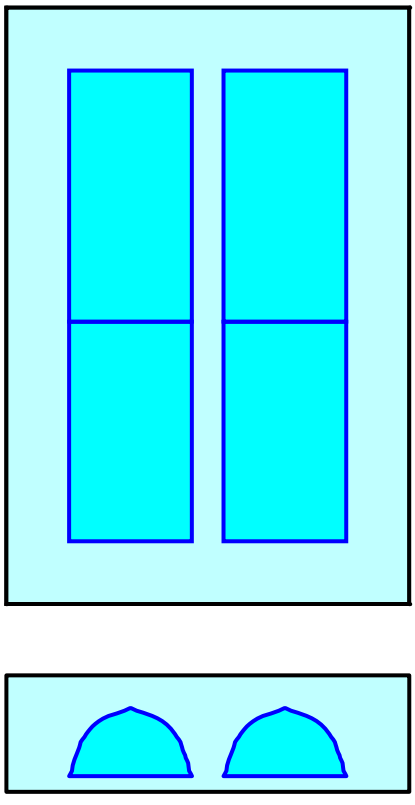
2 Chambers/Row x 7.00' Long +1.00' Row Adjustment = 15.00' Row Length +24.0" End Stone x 2 = 19.00' Base Length
2 Rows x 47.0" Wide + 12.0" Spacing x 1 + 24.0" Side Stone x 2 = 12.83' Base Width
6.0" Stone Base + 26.5" Chamber Height + 12.0" Stone Cover = 3.71' Field Height

4 Chambers x 42.5 cf +1.00' Row Adjustment x 6.07 sf x 2 Rows = 182.2 cf Chamber Storage

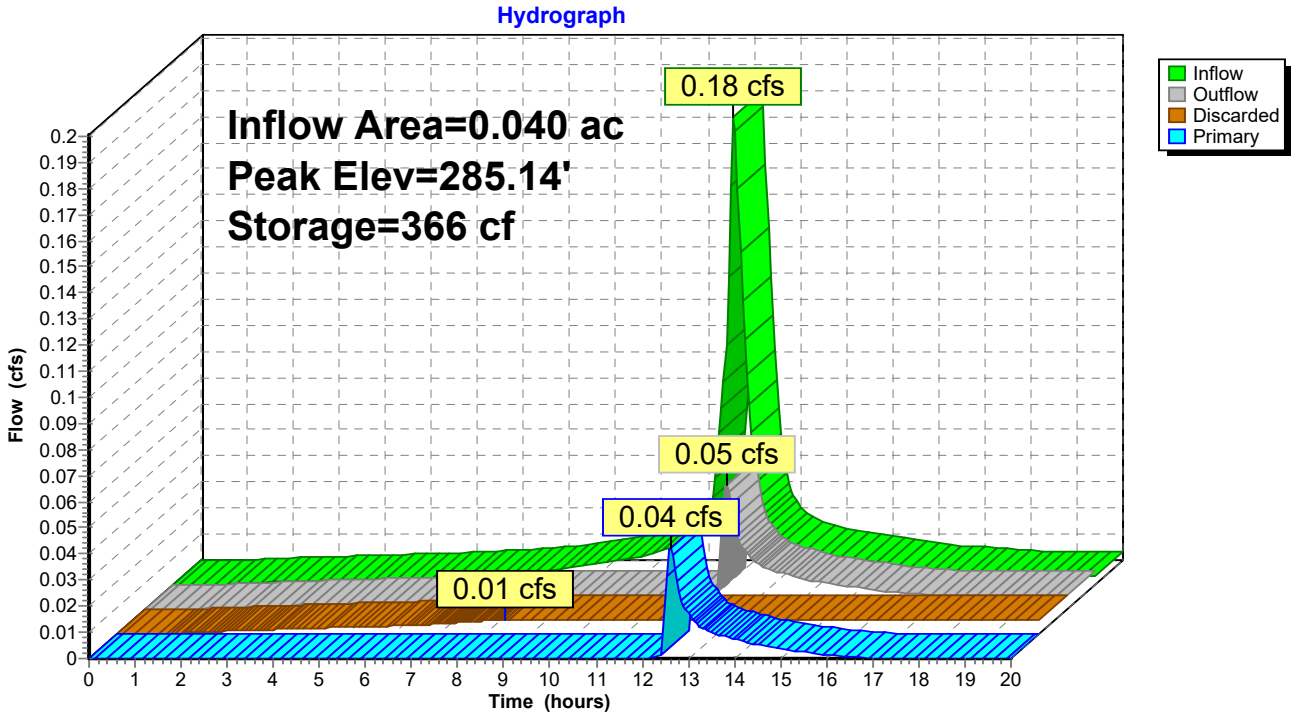
904.2 cf Field - 182.2 cf Chambers = 722.1 cf Stone x 40.0% Voids = 288.8 cf Stone Storage

Chamber Storage + Stone Storage = 471.0 cf = 0.011 af
Overall Storage Efficiency = 52.1%
Overall System Size = 19.00' x 12.83' x 3.71'

4 Chambers
33.5 cy Field
26.7 cy Stone



Pond 13P: 25 280HD



Time span=0.00-20.00 hrs, dt=0.05 hrs, 401 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 3S: Q BYPASS Runoff Area=31,280 sf 0.00% Impervious Runoff Depth>3.47"
Tc=14.2 min CN=76 Runoff=2.41 cfs 0.208 af

Subcatchment 7S: EXISTING Q Runoff Area=36,144 sf 0.00% Impervious Runoff Depth>3.47"
Flow Length=300' Tc=13.6 min CN=76 Runoff=2.82 cfs 0.240 af

Subcatchment 8S: ROOF POOL Runoff Area=3,126 sf 100.00% Impervious Runoff Depth>5.87"
Flow Length=500' Tc=12.8 min CN=98 Runoff=0.36 cfs 0.035 af

Subcatchment 12S: DRIVE Runoff Area=1,738 sf 100.00% Impervious Runoff Depth>5.87"
Flow Length=500' Tc=12.8 min CN=98 Runoff=0.20 cfs 0.020 af

Reach 4R: TOTAL Q PROPOSED Inflow=2.41 cfs 0.212 af
Outflow=2.41 cfs 0.212 af

Pond 11P: 25 280HD Peak Elev=284.99' Storage=897 cf Inflow=0.36 cfs 0.035 af
Discarded=0.01 cfs 0.016 af Primary=0.00 cfs 0.000 af Outflow=0.01 cfs 0.016 af

Pond 13P: 25 280HD Peak Elev=285.21' Storage=374 cf Inflow=0.20 cfs 0.020 af
Discarded=0.01 cfs 0.007 af Primary=0.09 cfs 0.005 af Outflow=0.10 cfs 0.012 af

Total Runoff Area = 1.660 ac Runoff Volume = 0.503 af Average Runoff Depth = 3.64"
93.27% Pervious = 1.548 ac 6.73% Impervious = 0.112 ac

Summary for Subcatchment 3S: Q BYPASS

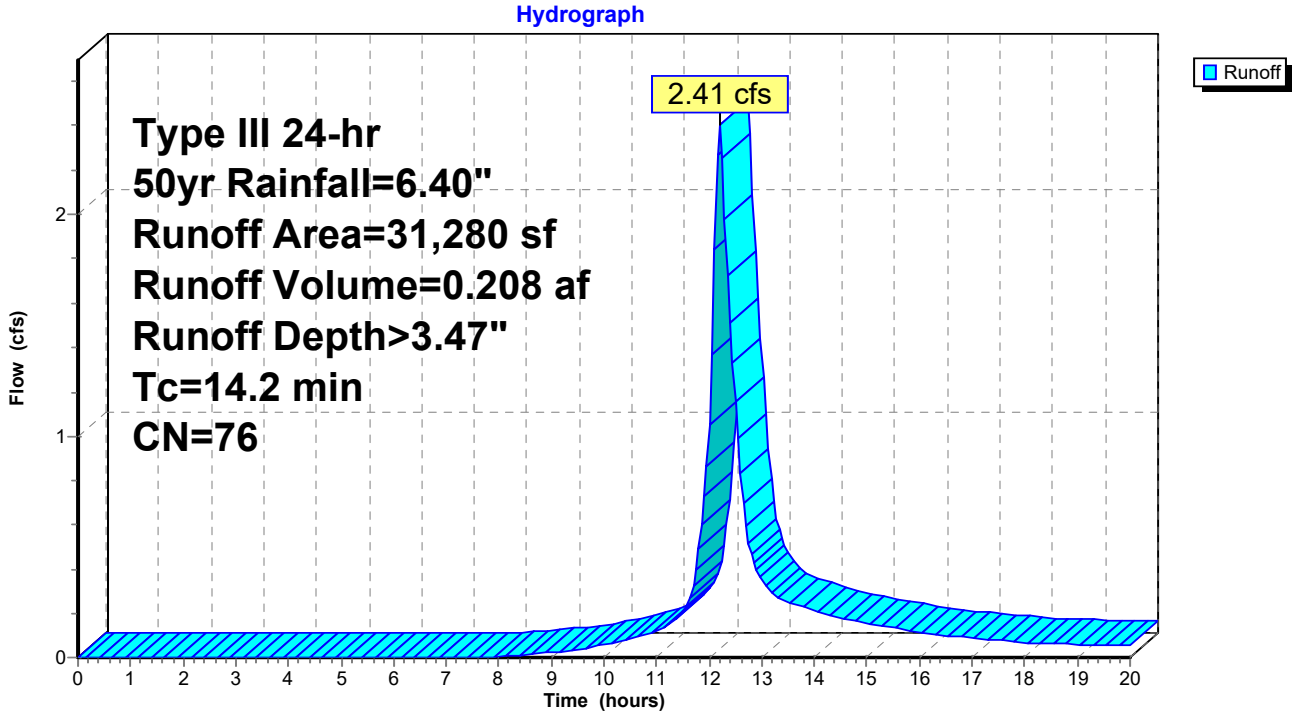
Runoff = 2.41 cfs @ 12.20 hrs, Volume= 0.208 af, Depth> 3.47"
Routed to Reach 4R : TOTAL Q PROPOSED

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 50yr Rainfall=6.40"

Area (sf)	CN	Description
31,280	76	Woods/grass comb., Fair, HSG C
31,280		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.2					**Direct Entry, SAME AS EXISTING**

Subcatchment 3S: Q BYPASS



Summary for Subcatchment 7S: EXISTING Q

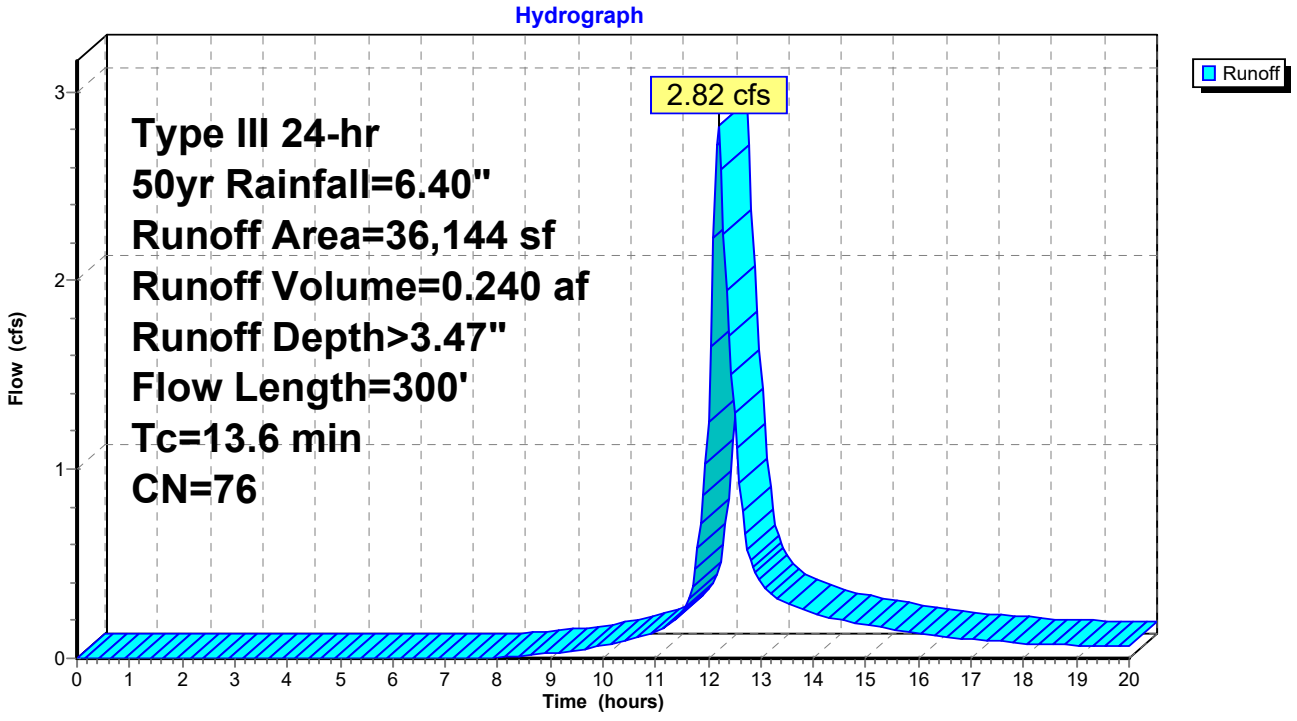
Runoff = 2.82 cfs @ 12.19 hrs, Volume= 0.240 af, Depth> 3.47"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 50yr Rainfall=6.40"

Area (sf)	CN	Description
36,144	76	Woods/grass comb., Fair, HSG C
36,144		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.9	200	0.1000	0.26		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.30"
0.7	100	0.1200	2.42		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
13.6	300	Total			

Subcatchment 7S: EXISTING Q



Summary for Subcatchment 8S: ROOF POOL

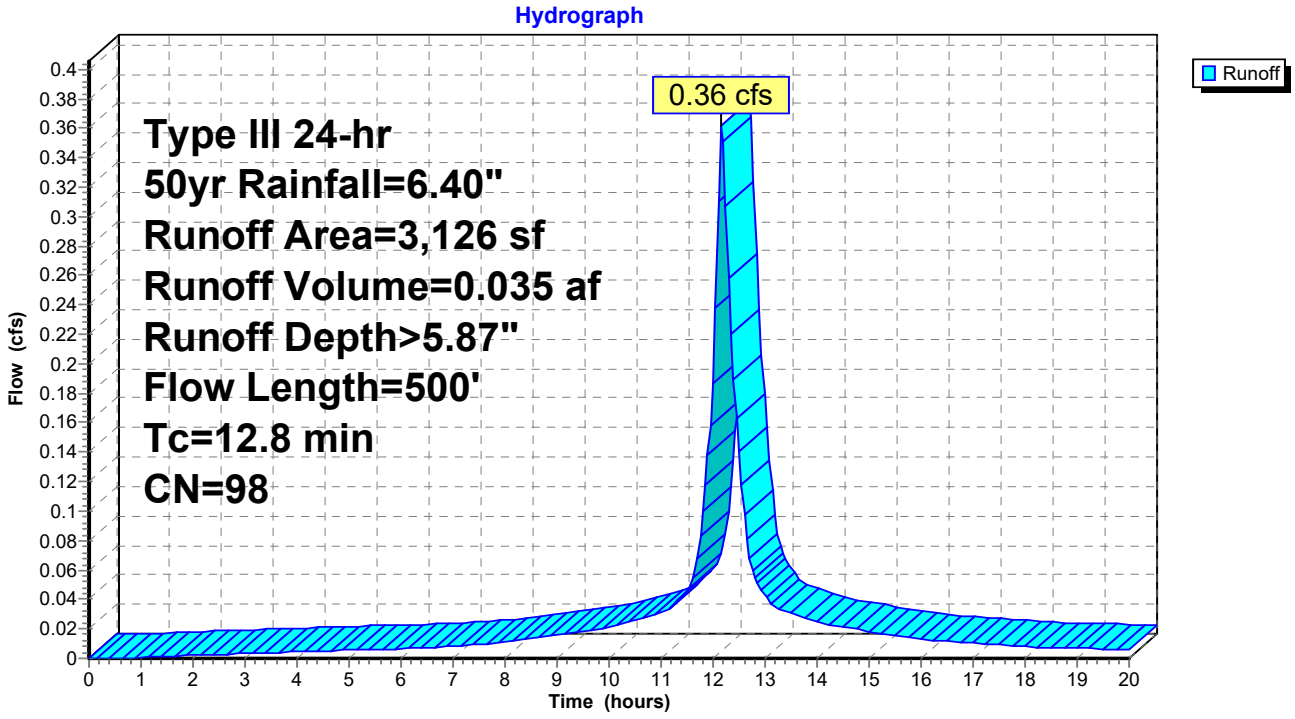
Runoff = 0.36 cfs @ 12.17 hrs, Volume= 0.035 af, Depth> 5.87"
Routed to Pond 11P : 25 280HD

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 50yr Rainfall=6.40"

Area (sf)	CN	Description
3,126	98	Unconnected pavement, HSG C
3,126		100.00% Impervious Area
3,126		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.9	200	0.1200	0.28		**Sheet Flow, LAWN** Grass: Dense n= 0.240 P2= 3.30"
0.9	300	0.0800	5.74		**Shallow Concentrated Flow, DRIVE** Paved Kv= 20.3 fps
12.8	500	Total			

Subcatchment 8S: ROOF POOL



Summary for Subcatchment 12S: DRIVE

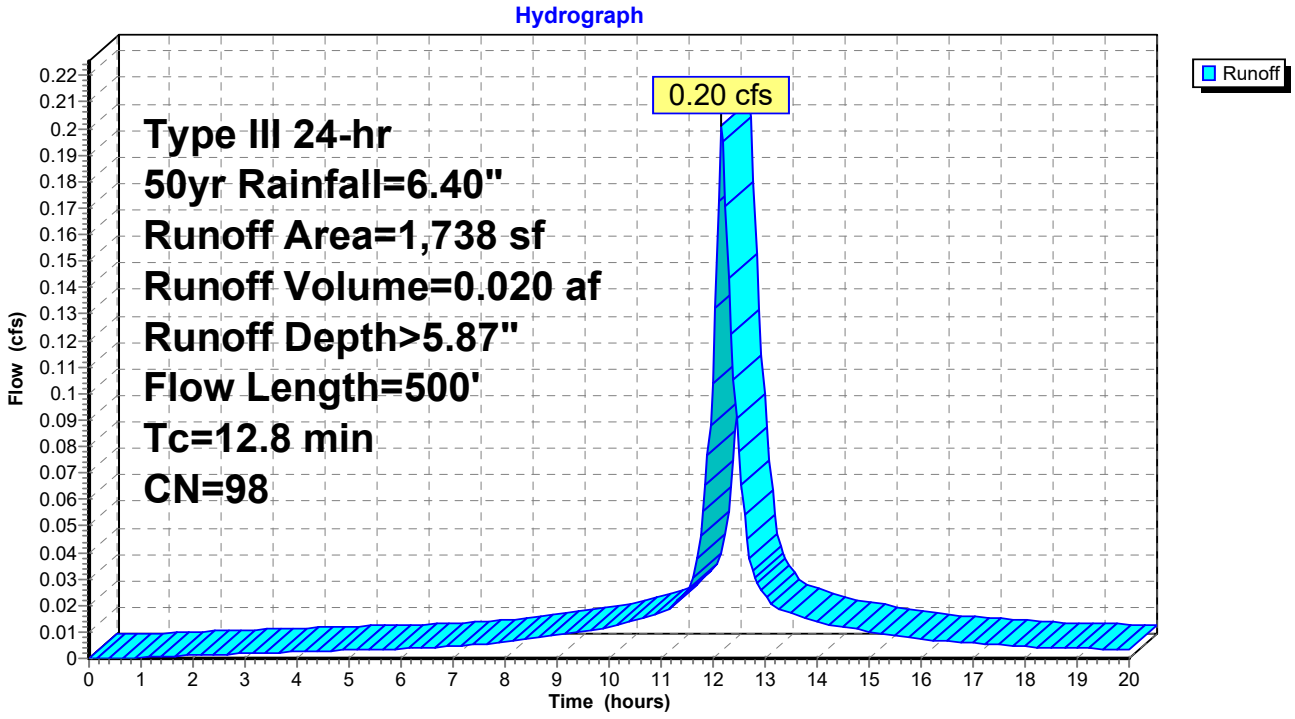
Runoff = 0.20 cfs @ 12.17 hrs, Volume= 0.020 af, Depth> 5.87"
Routed to Pond 13P : 25 280HD

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 50yr Rainfall=6.40"

Area (sf)	CN	Description
1,738	98	Unconnected pavement, HSG C
1,738		100.00% Impervious Area
1,738		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.9	200	0.1200	0.28		**Sheet Flow, LAWN** Grass: Dense n= 0.240 P2= 3.30"
0.9	300	0.0800	5.74		**Shallow Concentrated Flow, DRIVE** Paved Kv= 20.3 fps
12.8	500	Total			

Subcatchment 12S: DRIVE



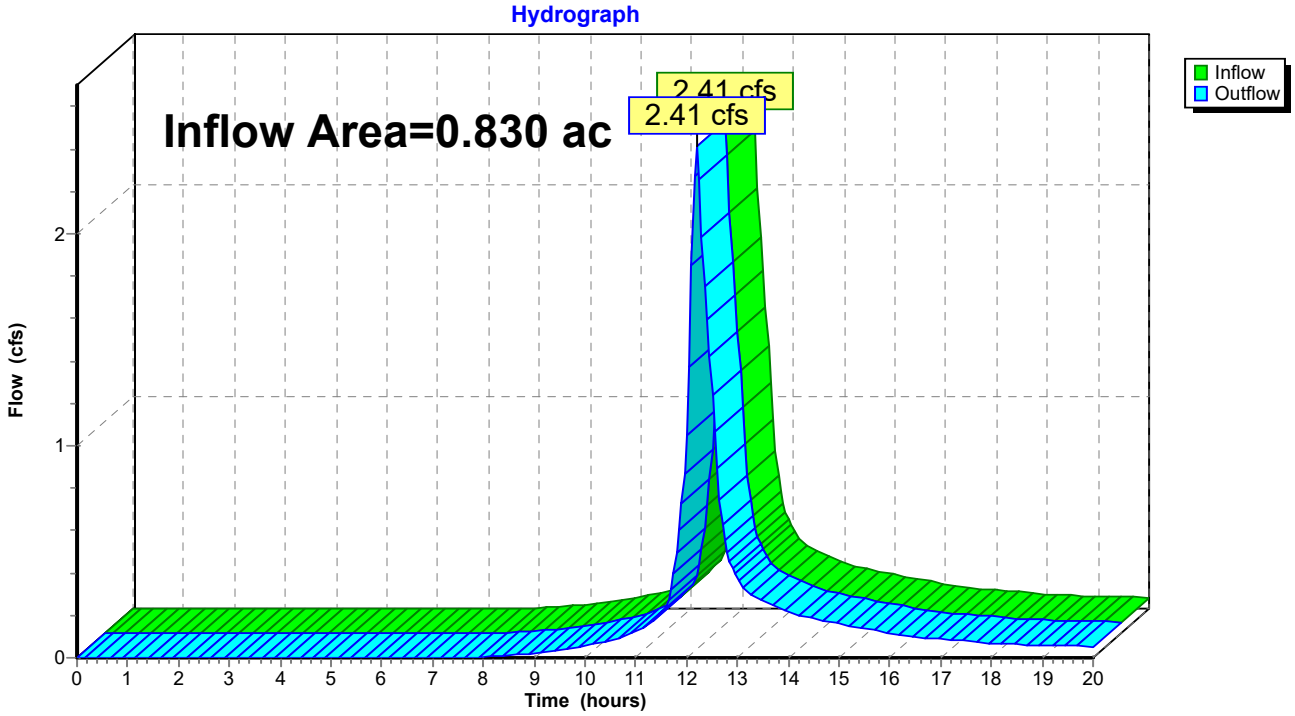
Summary for Reach 4R: TOTAL Q PROPOSED

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

Inflow Area = 0.830 ac, 13.46% Impervious, Inflow Depth > 3.07" for 50yr event
Inflow = 2.41 cfs @ 12.20 hrs, Volume= 0.212 af
Outflow = 2.41 cfs @ 12.20 hrs, Volume= 0.212 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs

Reach 4R: TOTAL Q PROPOSED



Summary for Pond 11P: 25 280HD

Inflow Area = 0.072 ac,100.00% Impervious, Inflow Depth > 5.87" for 50yr event
Inflow = 0.36 cfs @ 12.17 hrs, Volume= 0.035 af
Outflow = 0.01 cfs @ 8.80 hrs, Volume= 0.016 af, Atten= 96%, Lag= 0.0 min
Discarded = 0.01 cfs @ 8.80 hrs, Volume= 0.016 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Reach 4R : TOTAL Q PROPOSED

Routing by Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 284.99' @ 15.91 hrs Surf.Area= 586 sf Storage= 897 cf

Plug-Flow detention time= 151.4 min calculated for 0.016 af (46% of inflow)
Center-of-Mass det. time= 31.7 min (754.2 - 722.5)

Volume	Invert	Avail.Storage	Storage Description
#1A	282.50'	658 cf	**17.75'W x 33.00'L x 3.71'H Field A** 2,172 cf Overall - 528 cf Embedded = 1,644 cf x 40.0% Voids
#2A	283.00'	528 cf	**Cultec R-280HD** x 12 Inside #1 Effective Size= 46.9"W x 26.0"H => 6.07 sf x 7.00'L = 42.5 cf Overall Size= 47.0"W x 26.5"H x 8.00'L with 1.00' Overlap Row Length Adjustment= +1.00' x 6.07 sf x 3 rows
		1,186 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	282.50'	**1.000 in/hr OUT over Surface area**
#2	Primary	285.00'	**4.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.01 cfs @ 8.80 hrs HW=282.54' (Free Discharge)
↑—**1=OUT** (Exfiltration Controls 0.01 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=282.50' (Free Discharge)
↑—**2=Orifice/Grate** (Controls 0.00 cfs)

Pond 11P: 25 280HD - Chamber Wizard Field A

Chamber Model = Cultec R-280HD (Cultec Recharger® 280HD)
Effective Size= 46.9"W x 26.0"H => 6.07 sf x 7.00'L = 42.5 cf
Overall Size= 47.0"W x 26.5"H x 8.00'L with 1.00' Overlap
Row Length Adjustment= +1.00' x 6.07 sf x 3 rows

47.0" Wide + 12.0" Spacing = 59.0" C-C Row Spacing

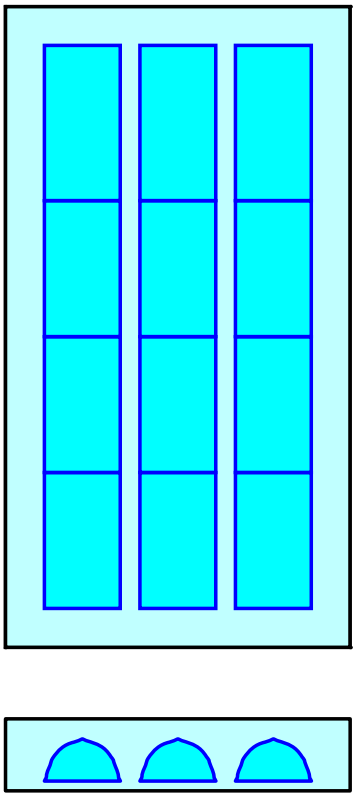
4 Chambers/Row x 7.00' Long +1.00' Row Adjustment = 29.00' Row Length +24.0" End Stone x 2 = 33.00' Base Length
3 Rows x 47.0" Wide + 12.0" Spacing x 2 + 24.0" Side Stone x 2 = 17.75' Base Width
6.0" Stone Base + 26.5" Chamber Height + 12.0" Stone Cover = 3.71' Field Height

12 Chambers x 42.5 cf +1.00' Row Adjustment x 6.07 sf x 3 Rows = 528.2 cf Chamber Storage

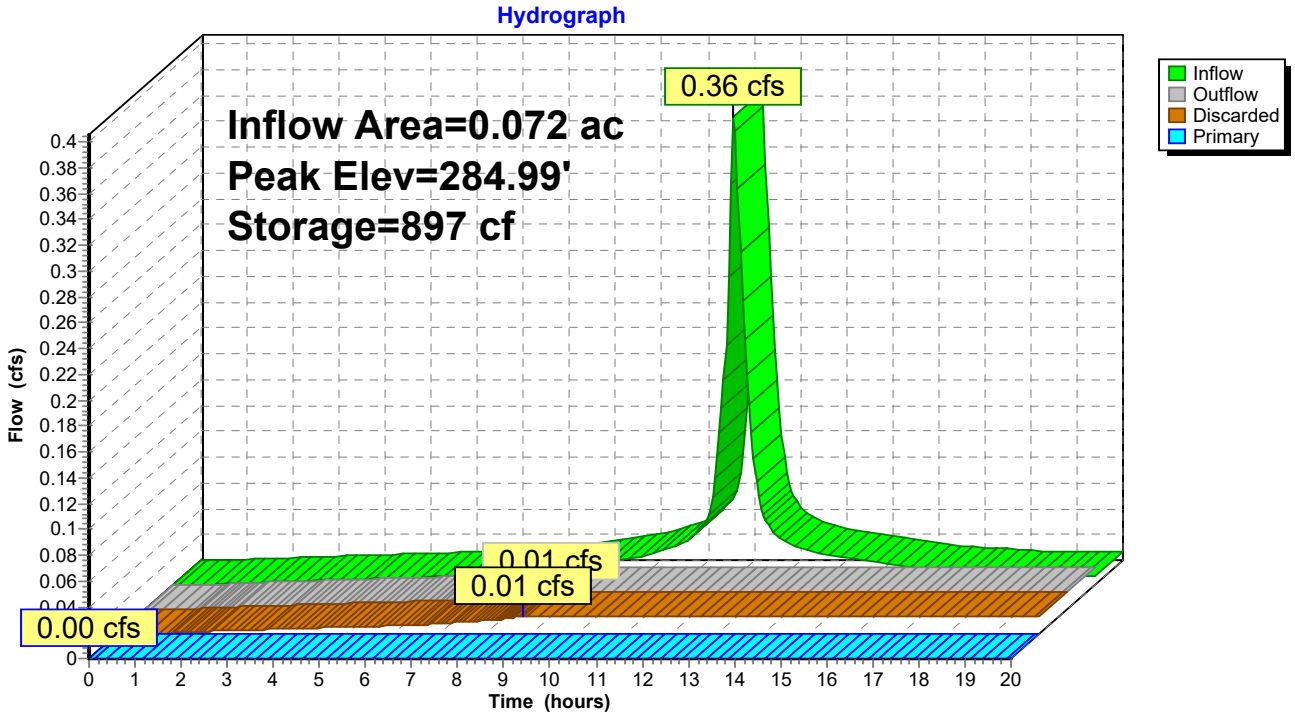
2,172.2 cf Field - 528.2 cf Chambers = 1,643.9 cf Stone x 40.0% Voids = 657.6 cf Stone Storage

Chamber Storage + Stone Storage = 1,185.8 cf = 0.027 af
Overall Storage Efficiency = 54.6%
Overall System Size = 33.00' x 17.75' x 3.71'

12 Chambers
80.5 cy Field
60.9 cy Stone



Pond 11P: 25 280HD



Summary for Pond 13P: 25 280HD

Inflow Area = 0.040 ac,100.00% Impervious, Inflow Depth > 5.87" for 50yr event
Inflow = 0.20 cfs @ 12.17 hrs, Volume= 0.020 af
Outflow = 0.10 cfs @ 12.45 hrs, Volume= 0.012 af, Atten= 53%, Lag= 16.9 min
Discarded = 0.01 cfs @ 7.90 hrs, Volume= 0.007 af
Primary = 0.09 cfs @ 12.45 hrs, Volume= 0.005 af
Routed to Reach 4R : TOTAL Q PROPOSED

Routing by Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 285.21' @ 12.45 hrs Surf.Area= 244 sf Storage= 374 cf

Plug-Flow detention time= 121.2 min calculated for 0.012 af (60% of inflow)
Center-of-Mass det. time= 33.2 min (755.7 - 722.5)

Volume	Invert	Avail.Storage	Storage Description
#1A	282.50'	289 cf	**12.83'W x 19.00'L x 3.71'H Field A** 904 cf Overall - 182 cf Embedded = 722 cf x 40.0% Voids
#2A	283.00'	182 cf	**Cultec R-280HD** x 4 Inside #1 Effective Size= 46.9"W x 26.0"H => 6.07 sf x 7.00'L = 42.5 cf Overall Size= 47.0"W x 26.5"H x 8.00'L with 1.00' Overlap Row Length Adjustment= +1.00' x 6.07 sf x 2 rows
		471 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	282.50'	**1.000 in/hr OUT over Surface area**
#2	Primary	285.00'	**4.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.01 cfs @ 7.90 hrs HW=282.54' (Free Discharge)
↑—**1=OUT** (Exfiltration Controls 0.01 cfs)

Primary OutFlow Max=0.09 cfs @ 12.45 hrs HW=285.21' (Free Discharge)
↑—**2=Orifice/Grate** (Orifice Controls 0.09 cfs @ 1.56 fps)

Pond 13P: 25 280HD - Chamber Wizard Field A

Chamber Model = Cultec R-280HD (Cultec Recharger® 280HD)
Effective Size= 46.9"W x 26.0"H => 6.07 sf x 7.00'L = 42.5 cf
Overall Size= 47.0"W x 26.5"H x 8.00'L with 1.00' Overlap
Row Length Adjustment= +1.00' x 6.07 sf x 2 rows

47.0" Wide + 12.0" Spacing = 59.0" C-C Row Spacing

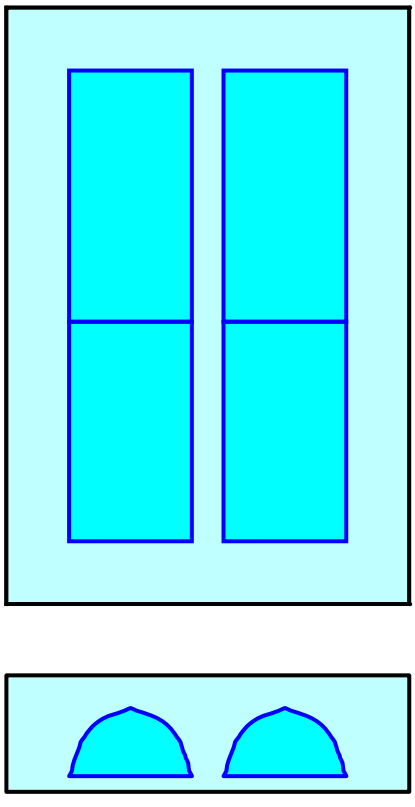
2 Chambers/Row x 7.00' Long +1.00' Row Adjustment = 15.00' Row Length +24.0" End Stone x 2 = 19.00' Base Length
2 Rows x 47.0" Wide + 12.0" Spacing x 1 + 24.0" Side Stone x 2 = 12.83' Base Width
6.0" Stone Base + 26.5" Chamber Height + 12.0" Stone Cover = 3.71' Field Height

4 Chambers x 42.5 cf +1.00' Row Adjustment x 6.07 sf x 2 Rows = 182.2 cf Chamber Storage

904.2 cf Field - 182.2 cf Chambers = 722.1 cf Stone x 40.0% Voids = 288.8 cf Stone Storage

Chamber Storage + Stone Storage = 471.0 cf = 0.011 af
Overall Storage Efficiency = 52.1%
Overall System Size = 19.00' x 12.83' x 3.71'

4 Chambers
33.5 cy Field
26.7 cy Stone



Pond 13P: 25 280HD