



DA 1: CN w/ IC areas Bioretention Basin 1



DA 2: CN w/ IC areas Bioretention Basin 2



DA 3: CN w/ IC areas Bioretention Basin 3



DA 4: CN w/ IC areas PP (w/ underdrain) w/ UG storage 1



DA 5: CN w/ IC areas PP (w/ underdrain) w/ UG storage 2



DA 6: CN w/ IC areas PP (w/ underdrain) w/ UG storage 3



DA 7: CN w/ IC areas PP (w/ underdrain) w/ UG storage 4



DA 8: CN w/ IC areas



DA 9: CN w/ IC areas Existing Basin 2



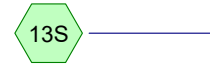
DA 10: CN w/ IC areas PP (w/ underdrain) w/ UG storage 5



DA 11: CN w/ IC areas PP (w/ underdrain) w/ UG storage 6

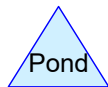
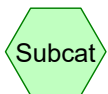
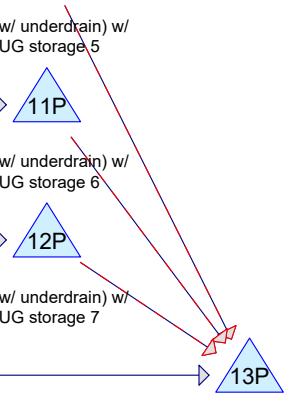
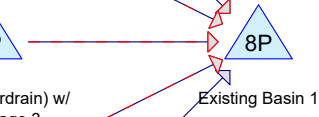


DA 12: CN w/ IC areas PP (w/ underdrain) w/ UG storage 7



DA 13: CN w/ IC areas

Bioretention Basin 4



Routing Diagram for Site 10_20240629

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Site 10_20240629

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Project Notes

Rainfall events imported from "NRCS-Rain.txt" for 6600 NJ Atlantic-C

Rainfall events imported from "NRCS-Rain.txt" for 7614 PA Chester-C

Rainfall events imported from "NRCS-Rain.txt" for 6617 NJ Somerset-C

Rainfall events imported from "20240207_PartridgeFarmRd_HCAD_175SF RG.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	2-Year_2100	NOAA 24-hr	C	Default	24.00	1	3.97	2
2	2-Year_Current	NOAA 24-hr	C	Default	24.00	1	3.34	2
3	10-Year_2100	NOAA 24-hr	C	Default	24.00	1	6.21	2
4	10-Year_Current	NOAA 24-hr	C	Default	24.00	1	5.16	2
5	100-Year_2100	NOAA 24-hr	C	Default	24.00	1	12.15	2
6	100-Year_Current	NOAA 24-hr	C	Default	24.00	1	8.95	2

Area Listing (all nodes)

Area (sq-ft)	CN	Description (subcatchment-numbers)
31,206	70	Brush (fair) HSG C (1S, 5S, 8S)
626,499	98	Impervious HSG C (1S, 2S, 3S, 4S, 5S, 6S, 7S, 8S, 9S, 10S, 11S, 12S, 13S)
177,173	79	Open Space (fair) HSG C (1S, 2S, 3S, 4S, 5S, 6S, 7S, 8S, 9S, 10S, 11S, 12S, 13S)
85,546	74	Open Space (good) HSG C (1S, 2S, 3S, 4S, 5S, 6S, 7S, 8S, 9S, 10S, 11S, 12S, 13S)
47,650	73	Woods (fair) HSG C (1S, 8S)
68,603	70	Woods, Good, HSG C (13S)
1,036,677	89	TOTAL AREA

Site 10_20240629

Soil Listing (all nodes)

Area (sq-ft)	Soil Group	Subcatchment Numbers
0	HSG A	
0	HSG B	
1,036,677	HSG C	1S, 2S, 3S, 4S, 5S, 6S, 7S, 8S, 9S, 10S, 11S, 12S, 13S
0	HSG D	
0	Other	
1,036,677		TOTAL AREA

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Ground Covers (all nodes)

HSG-A (sq-ft)	HSG-B (sq-ft)	HSG-C (sq-ft)	HSG-D (sq-ft)	Other (sq-ft)	Total (sq-ft)	Ground Cover	Subcatchment Numbers
0	0	31,206	0	0	31,206	Brush (fair)	
0	0	626,499	0	0	626,499	Impervious	
0	0	177,173	0	0	177,173	Open Space (fair)	
0	0	85,546	0	0	85,546	Open Space (good)	
0	0	47,650	0	0	47,650	Woods (fair)	
0	0	68,603	0	0	68,603	Woods, Good	
0	0	1,036,677	0	0	1,036,677	TOTAL AREA	

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Pipe Listing (all nodes)

Line#	Node Number	In-Invert (feet)	Out-Invert (feet)	Length (feet)	Slope (ft/ft)	n	Width (inches)	Diam/Height (inches)	Inside-Fill (inches)
1	4P	92.17	90.37	359.0	0.0050	0.020	0.0	6.0	0.0
2	5P	92.17	90.37	359.0	0.0050	0.020	0.0	6.0	0.0
3	6P	92.17	90.37	359.0	0.0050	0.020	0.0	6.0	0.0
4	7P	92.17	90.37	359.0	0.0050	0.020	0.0	6.0	0.0
5	10P	92.17	90.37	359.0	0.0050	0.020	0.0	6.0	0.0
6	11P	92.17	90.37	359.0	0.0050	0.020	0.0	6.0	0.0
7	12P	92.17	90.37	359.0	0.0050	0.020	0.0	6.0	0.0

Time span=0.00-150.00 hrs, dt=0.02 hrs, 7501 points
 Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious
 Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: DA 1: CN w/ IC areas	Runoff Area=141,085 sf 17.73% Impervious Runoff Depth=2.01" Tc=18.6 min CN=75/98 Runoff=5.42 cfs 23,690 cf
Subcatchment 2S: DA 2: CN w/ IC areas	Runoff Area=21,583 sf 64.54% Impervious Runoff Depth=3.07" Tc=1.4 min CN=78/98 Runoff=1.97 cfs 5,524 cf
Subcatchment 3S: DA 3: CN w/ IC areas	Runoff Area=40,101 sf 65.65% Impervious Runoff Depth=3.07" Tc=3.5 min CN=77/98 Runoff=3.54 cfs 10,247 cf
Subcatchment 4S: DA 4: CN w/ IC areas	Runoff Area=84,260 sf 73.22% Impervious Runoff Depth=3.21" Tc=3.2 min CN=77/98 Runoff=7.79 cfs 22,567 cf
Subcatchment 5S: DA 5: CN w/ IC areas	Runoff Area=52,282 sf 79.56% Impervious Runoff Depth=3.35" Tc=2.5 min CN=78/98 Runoff=5.12 cfs 14,606 cf
Subcatchment 6S: DA 6: CN w/ IC areas	Runoff Area=76,785 sf 82.96% Impervious Runoff Depth=3.43" Tc=3.2 min CN=79/98 Runoff=7.50 cfs 21,942 cf
Subcatchment 7S: DA 7: CN w/ IC areas	Runoff Area=120,233 sf 94.05% Impervious Runoff Depth=3.62" Tc=3.5 min CN=78/98 Runoff=12.17 cfs 36,308 cf
Subcatchment 8S: DA 8: CN w/ IC areas	Runoff Area=111,353 sf 71.87% Impervious Runoff Depth=3.11" Tc=2.0 min CN=73/98 Runoff=10.30 cfs 28,842 cf
Subcatchment 9S: DA 9: CN w/ IC areas	Runoff Area=59,019 sf 68.70% Impervious Runoff Depth=3.15" Tc=2.8 min CN=78/98 Runoff=5.45 cfs 15,488 cf
Subcatchment 10S: DA 10: CN w/ IC areas	Runoff Area=48,527 sf 85.53% Impervious Runoff Depth=3.42" Tc=5.8 min CN=74/98 Runoff=4.37 cfs 13,840 cf
Subcatchment 11S: DA 11: CN w/ IC areas	Runoff Area=57,652 sf 78.51% Impervious Runoff Depth=3.30" Tc=2.5 min CN=76/98 Runoff=5.55 cfs 15,860 cf
Subcatchment 12S: DA 12: CN w/ IC areas	Runoff Area=67,756 sf 72.56% Impervious Runoff Depth=3.20" Tc=2.9 min CN=77/98 Runoff=6.30 cfs 18,074 cf
Subcatchment 13S: DA 13: CN w/ IC areas	Runoff Area=156,041 sf 15.80% Impervious Runoff Depth=1.92" Tc=24.6 min CN=74/98 Runoff=4.98 cfs 24,910 cf
Pond 1P: Bioretention Basin 1	Peak Elev=64.20' Storage=10,526 cf Inflow=5.42 cfs 23,690 cf Primary=0.36 cfs 20,625 cf Secondary=0.59 cfs 3,064 cf Tertiary=0.00 cfs 0 cf Outflow=0.95 cfs 23,690 cf
Pond 2P: Bioretention Basin 2	Peak Elev=69.45' Storage=2,561 cf Inflow=1.97 cfs 5,524 cf Primary=0.24 cfs 5,183 cf Secondary=0.00 cfs 0 cf Tertiary=0.00 cfs 0 cf Outflow=0.24 cfs 5,183 cf
Pond 3P: Bioretention Basin 3	Peak Elev=66.10' Storage=5,164 cf Inflow=3.54 cfs 10,247 cf Primary=0.31 cfs 9,787 cf Secondary=0.00 cfs 0 cf Tertiary=0.00 cfs 0 cf Outflow=0.31 cfs 9,787 cf

Pond 4P: PP (w/ underdrain) w/ UG storage Peak Elev=95.62' Storage=10,670 cf Inflow=7.79 cfs 22,567 cf
Primary=0.36 cfs 22,567 cf Secondary=0.00 cfs 0 cf Outflow=0.36 cfs 22,567 cf

Pond 5P: PP (w/ underdrain) w/ UG storage 2 Peak Elev=95.62' Storage=7,334 cf Inflow=5.12 cfs 14,606 cf
Primary=0.20 cfs 14,606 cf Secondary=0.00 cfs 0 cf Outflow=0.20 cfs 14,606 cf

Pond 6P: PP (w/ underdrain) w/ UG storage Peak Elev=95.65' Storage=12,645 cf Inflow=7.50 cfs 21,942 cf
Primary=0.20 cfs 21,942 cf Secondary=0.00 cfs 0 cf Outflow=0.20 cfs 21,942 cf

Pond 7P: PP (w/ underdrain) w/ UG Peak Elev=95.68' Storage=20,146 cf Inflow=12.17 cfs 36,308 cf
Primary=0.36 cfs 36,308 cf Secondary=0.00 cfs 0 cf Outflow=0.36 cfs 36,308 cf

Pond 8P: Existing Basin 1 Peak Elev=59.16' Storage=5,439 cf Inflow=11.35 cfs 124,265 cf
Primary=6.92 cfs 124,265 cf Secondary=0.00 cfs 0 cf Tertiary=0.00 cfs 0 cf Outflow=6.92 cfs 124,265 cf

Pond 9P: Existing Basin 2 Peak Elev=66.91' Storage=5,666 cf Inflow=5.45 cfs 15,488 cf
Primary=0.35 cfs 12,537 cf Secondary=0.70 cfs 2,952 cf Tertiary=0.00 cfs 0 cf Outflow=1.05 cfs 15,488 cf

Pond 10P: PP (w/ underdrain) w/ UG storage Peak Elev=95.86' Storage=5,241 cf Inflow=4.37 cfs 13,840 cf
Primary=0.37 cfs 13,840 cf Secondary=0.00 cfs 0 cf Outflow=0.37 cfs 13,840 cf

Pond 11P: PP (w/ underdrain) w/ UG storage Peak Elev=95.67' Storage=6,485 cf Inflow=5.55 cfs 15,860 cf
Primary=0.36 cfs 15,860 cf Secondary=0.00 cfs 0 cf Outflow=0.36 cfs 15,860 cf

Pond 12P: PP (w/ underdrain) w/ UG storage Peak Elev=95.59' Storage=7,878 cf Inflow=6.30 cfs 18,074 cf
Primary=0.36 cfs 18,074 cf Secondary=0.00 cfs 0 cf Outflow=0.36 cfs 18,074 cf

Pond 13P: Bioretention Basin 4 Peak Elev=51.61' Storage=18,950 cf Inflow=6.05 cfs 72,685 cf
Primary=0.35 cfs 30,021 cf Secondary=3.04 cfs 41,402 cf Tertiary=0.00 cfs 0 cf Outflow=3.39 cfs 71,423 cf

Total Runoff Area = 1,036,677 sf Runoff Volume = 251,900 cf Average Runoff Depth = 2.92"
39.57% Pervious = 410,178 sf 60.43% Impervious = 626,499 sf

Summary for Subcatchment 1S: DA 1: CN w/ IC areas

Runoff = 5.42 cfs @ 12.28 hrs, Volume= 23,690 cf, Depth= 2.01"
 Routed to Pond 1P : Bioretention Basin 1

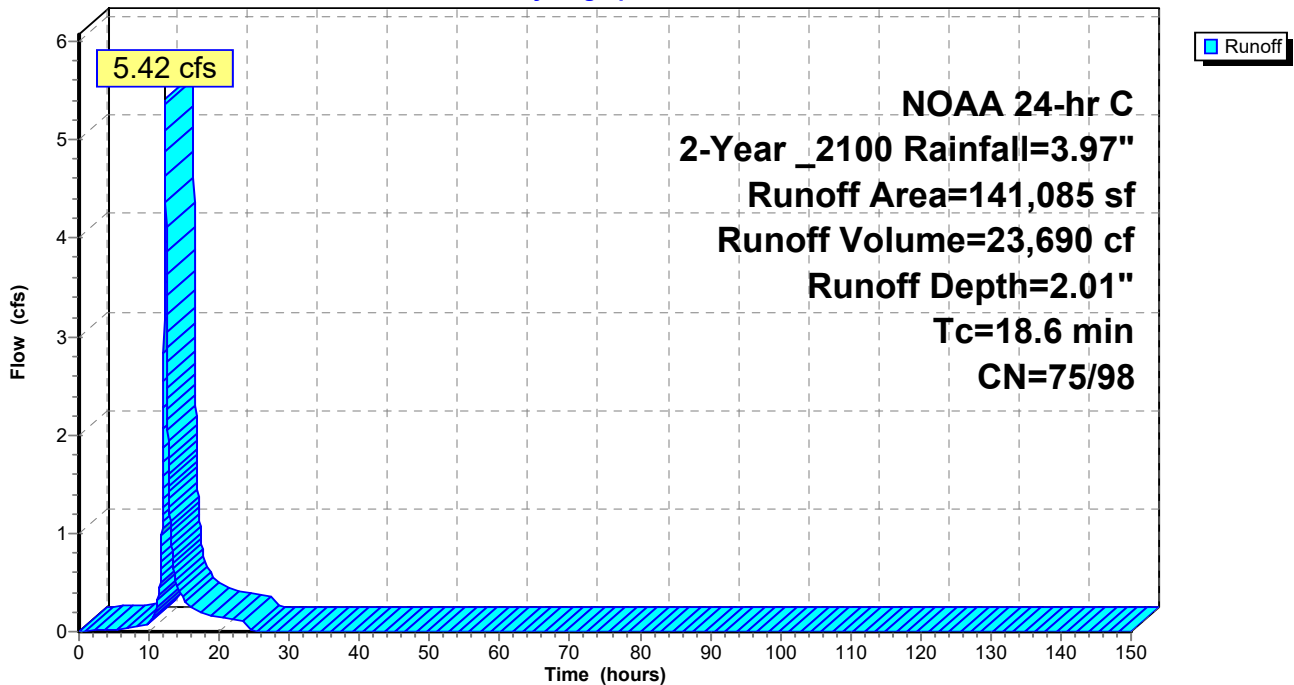
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-150.00 hrs, dt= 0.00
 NOAA 24-hr C 2-Year _2100 Rainfall=3.97"

	Area (sf)	CN	Description
*	25,014	98	Impervious HSG C
	26,886	70	Brush (fair) HSG C
	45,464	79	Open Space (fair) HSG C
*	10,665	74	Open Space (good) HSG C
*	33,056	73	Woods (fair) HSG C
	141,085	79	Weighted Average
	116,071	75	82.27% Pervious Area
	25,014	98	17.73% Impervious Area

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

Subcatchment 1S: DA 1: CN w/ IC areas

Hydrograph



Summary for Subcatchment 2S: DA 2: CN w/ IC areas

[49] Hint: Tc<2dt may require smaller dt

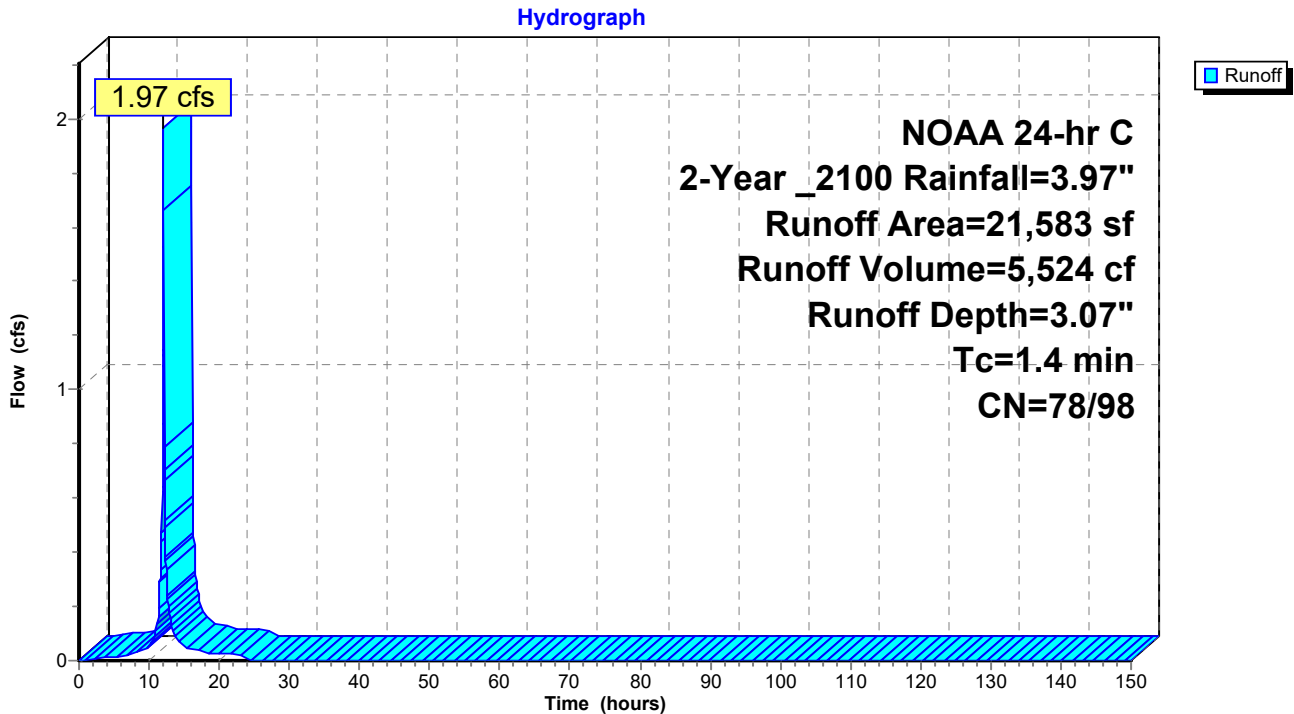
Runoff = 1.97 cfs @ 12.10 hrs, Volume= 5,524 cf, Depth= 3.07"
 Routed to Pond 2P : Bioretention Basin 2

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-150.00 hrs, dt= 0.0
 NOAA 24-hr C 2-Year _2100 Rainfall=3.97"

	Area (sf)	CN	Description
*	13,929	98	Impervious HSG C
	6,668	79	Open Space (fair) HSG C
*	986	74	Open Space (good) HSG C
	21,583	91	Weighted Average
	7,654	78	35.46% Pervious Area
	13,929	98	64.54% Impervious Area

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

Subcatchment 2S: DA 2: CN w/ IC areas



Summary for Subcatchment 3S: DA 3: CN w/ IC areas

Runoff = 3.54 cfs @ 12.10 hrs, Volume= 10,247 cf, Depth= 3.07"
 Routed to Pond 3P : Bioretention Basin 3

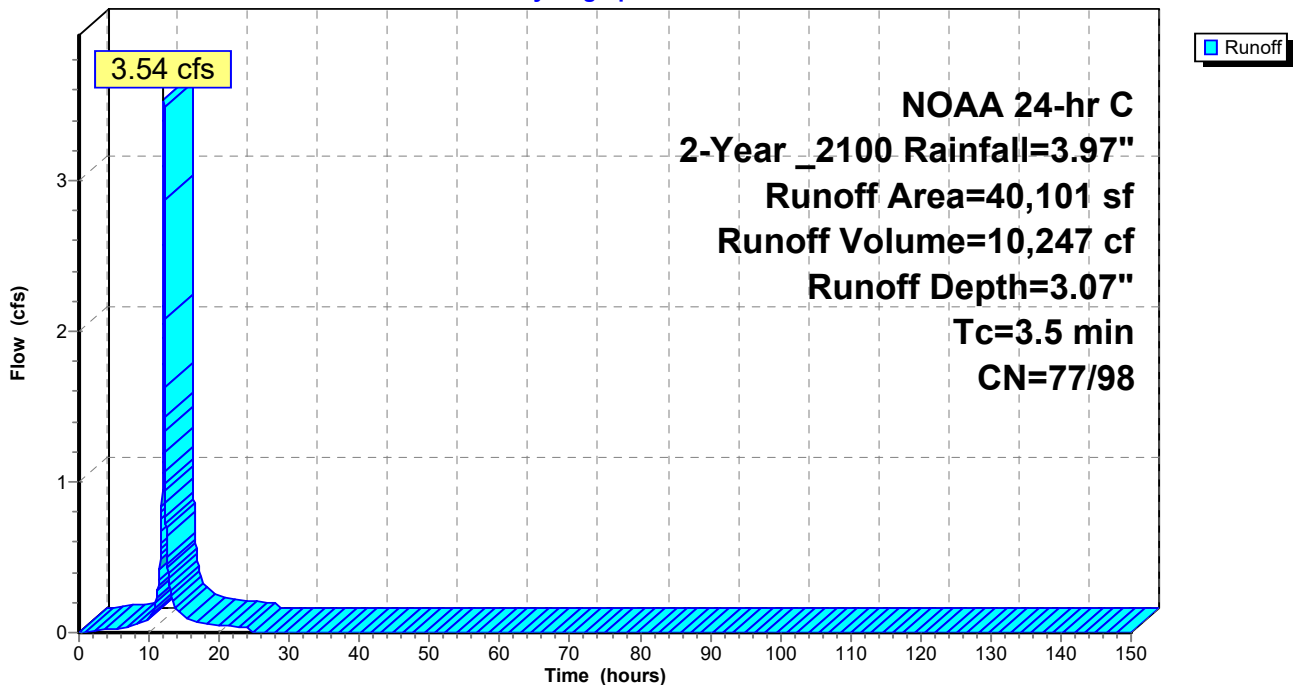
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-150.00 hrs, dt= 0.0
 NOAA 24-hr C 2-Year _2100 Rainfall=3.97"

	Area (sf)	CN	Description
*	26,326	98	Impervious HSG C
	9,202	79	Open Space (fair) HSG C
*	4,573	74	Open Space (good) HSG C
	40,101	91	Weighted Average
	13,775	77	34.35% Pervious Area
	26,326	98	65.65% Impervious Area

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

Subcatchment 3S: DA 3: CN w/ IC areas

Hydrograph



Summary for Subcatchment 4S: DA 4: CN w/ IC areas

Runoff = 7.79 cfs @ 12.10 hrs, Volume= 22,567 cf, Depth= 3.21"

Routed to Pond 4P : PP (w/ underdrain) w/ UG storage 1

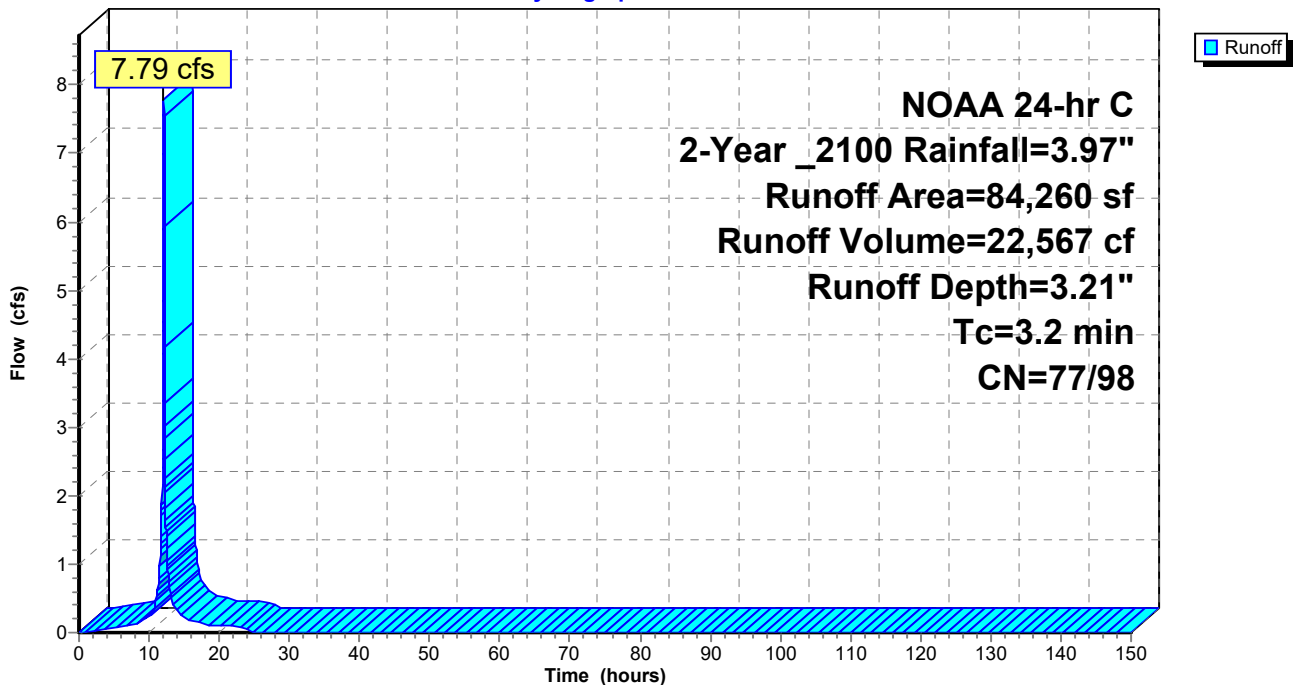
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-150.00 hrs, dt= 0.00
 NOAA 24-hr C 2-Year _2100 Rainfall=3.97"

	Area (sf)	CN	Description
*	61,698	98	Impervious HSG C
	13,143	79	Open Space (fair) HSG C
*	9,419	74	Open Space (good) HSG C
	84,260	92	Weighted Average
	22,562	77	26.78% Pervious Area
	61,698	98	73.22% Impervious Area

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

Subcatchment 4S: DA 4: CN w/ IC areas

Hydrograph



Summary for Subcatchment 5S: DA 5: CN w/ IC areas

Runoff = 5.12 cfs @ 12.09 hrs, Volume= 14,606 cf, Depth= 3.35"

Routed to Pond 5P : PP (w/ underdrain) w/ UG storage 2

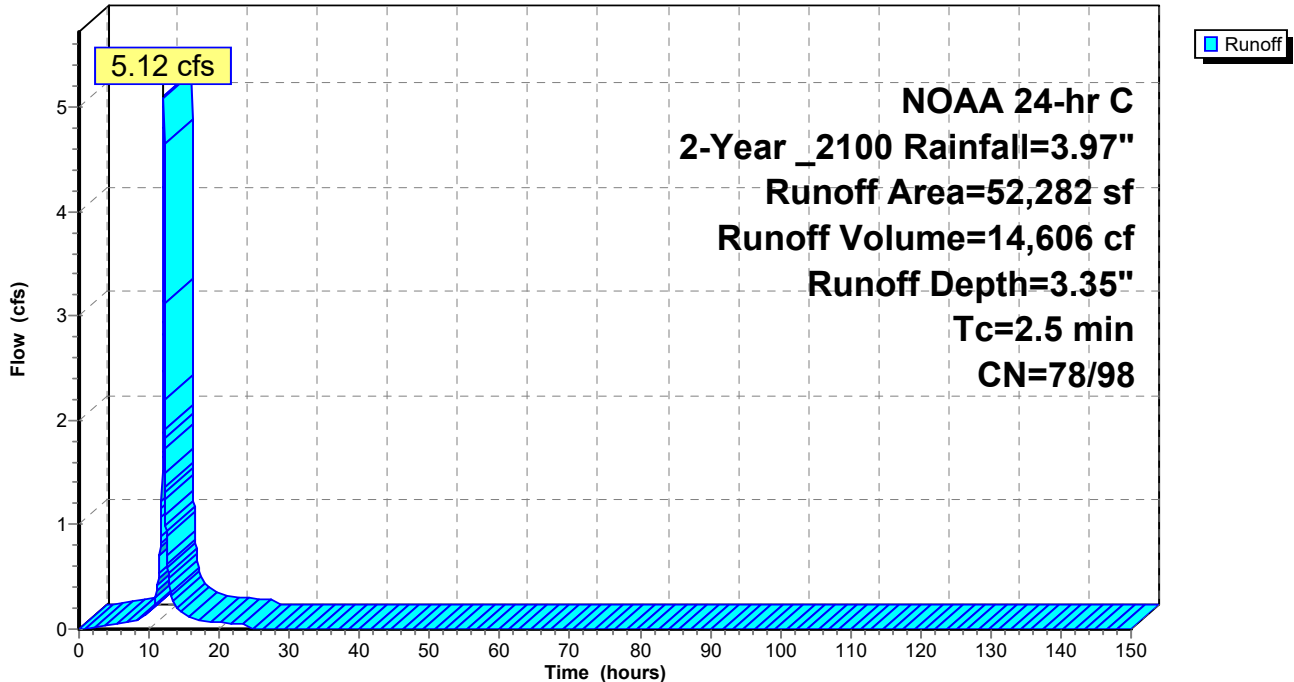
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-150.00 hrs, dt= 0.00
 NOAA 24-hr C 2-Year _2100 Rainfall=3.97"

	Area (sf)	CN	Description
*	41,595	98	Impervious HSG C
	444	70	Brush (fair) HSG C
	9,377	79	Open Space (fair) HSG C
*	866	74	Open Space (good) HSG C
	52,282	94	Weighted Average
	10,687	78	20.44% Pervious Area
	41,595	98	79.56% Impervious Area

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

Subcatchment 5S: DA 5: CN w/ IC areas

Hydrograph



Summary for Subcatchment 6S: DA 6: CN w/ IC areas

Runoff = 7.50 cfs @ 12.10 hrs, Volume= 21,942 cf, Depth= 3.43"

Routed to Pond 6P : PP (w/ underdrain) w/ UG storage 3

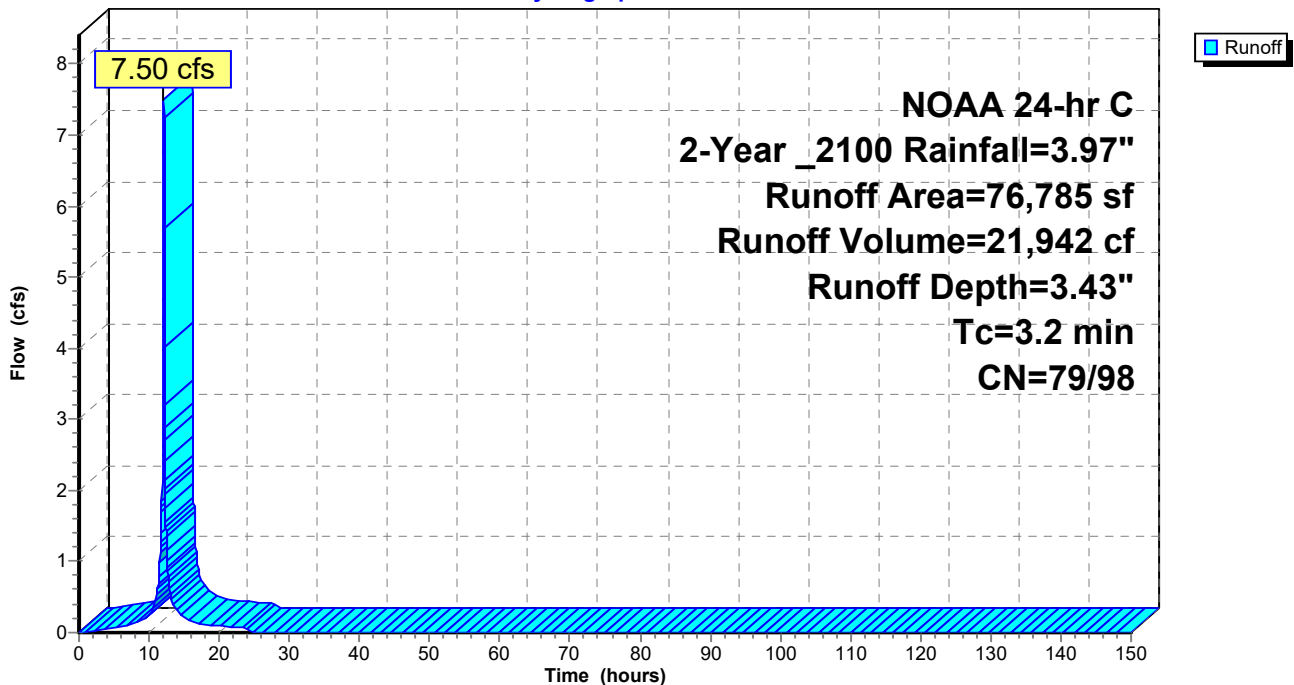
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 NOAA 24-hr C 2-Year _2100 Rainfall=3.97"

	Area (sf)	CN	Description
*	63,699	98	Impervious HSG C
	12,708	79	Open Space (fair) HSG C
*	378	74	Open Space (good) HSG C
	76,785	95	Weighted Average
	13,086	79	17.04% Pervious Area
	63,699	98	82.96% Impervious Area

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

Subcatchment 6S: DA 6: CN w/ IC areas

Hydrograph



Summary for Subcatchment 7S: DA 7: CN w/ IC areas

Runoff = 12.17 cfs @ 12.10 hrs, Volume= 36,308 cf, Depth= 3.62"

Routed to Pond 7P : PP (w/ underdrain) w/ UG storage 4

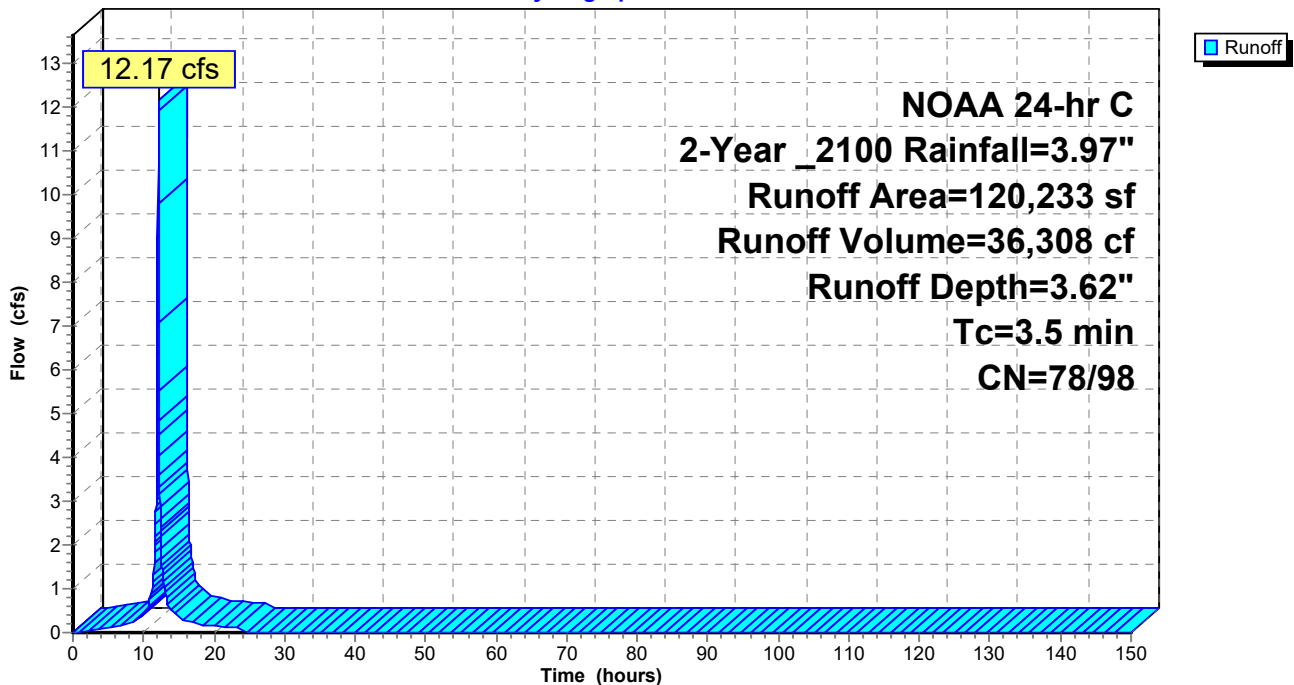
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-150.00 hrs, dt= 0.0
 NOAA 24-hr C 2-Year _2100 Rainfall=3.97"

	Area (sf)	CN	Description
*	113,075	98	Impervious HSG C
	5,111	79	Open Space (fair) HSG C
*	2,047	74	Open Space (good) HSG C
	120,233	97	Weighted Average
	7,158	78	5.95% Pervious Area
	113,075	98	94.05% Impervious Area

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

Subcatchment 7S: DA 7: CN w/ IC areas

Hydrograph



Summary for Subcatchment 8S: DA 8: CN w/ IC areas

[49] Hint: Tc<2dt may require smaller dt

Runoff = 10.30 cfs @ 12.09 hrs, Volume= 28,842 cf, Depth= 3.11"
 Routed to Pond 8P : Existing Basin 1

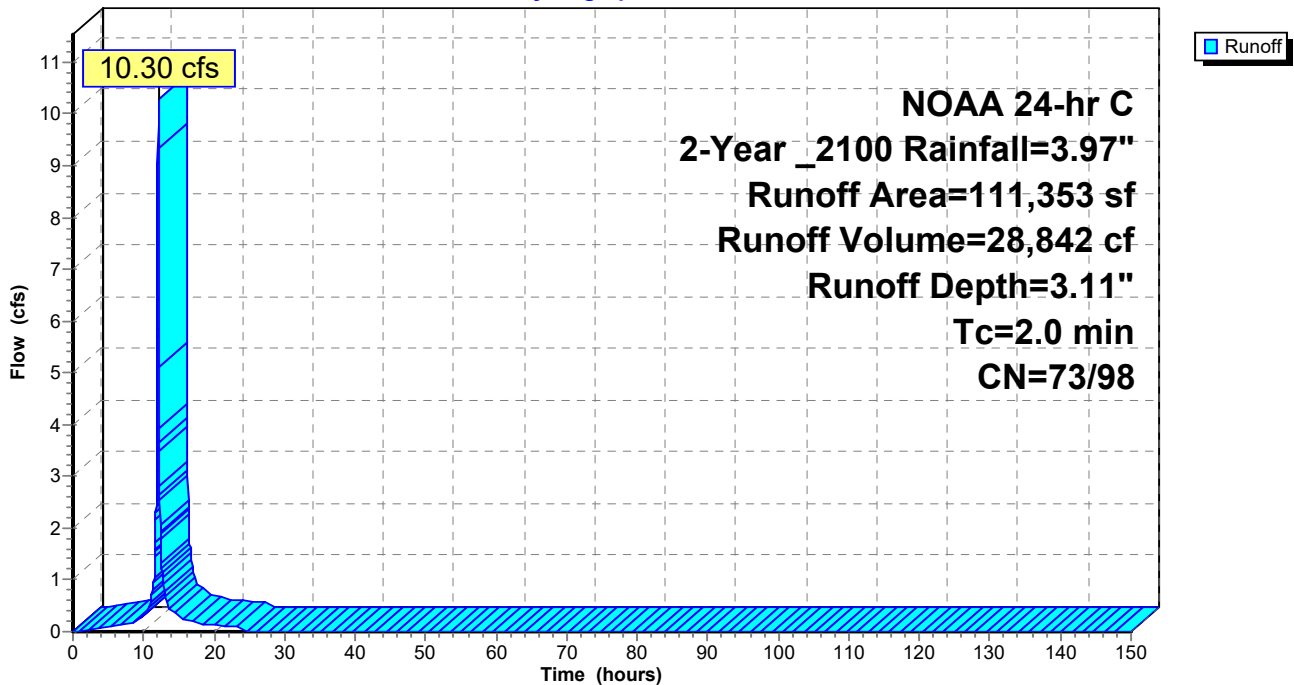
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-150.00 hrs, dt= 0.0
 NOAA 24-hr C 2-Year _2100 Rainfall=3.97"

	Area (sf)	CN	Description
*	80,033	98	Impervious HSG C
	3,876	70	Brush (fair) HSG C
	419	79	Open Space (fair) HSG C
*	12,431	74	Open Space (good) HSG C
*	14,594	73	Woods (fair) HSG C
	111,353	91	Weighted Average
	31,320	73	28.13% Pervious Area
	80,033	98	71.87% Impervious Area

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

Subcatchment 8S: DA 8: CN w/ IC areas

Hydrograph



Summary for Subcatchment 9S: DA 9: CN w/ IC areas

Runoff = 5.45 cfs @ 12.10 hrs, Volume= 15,488 cf, Depth= 3.15"
 Routed to Pond 9P : Existing Basin 2

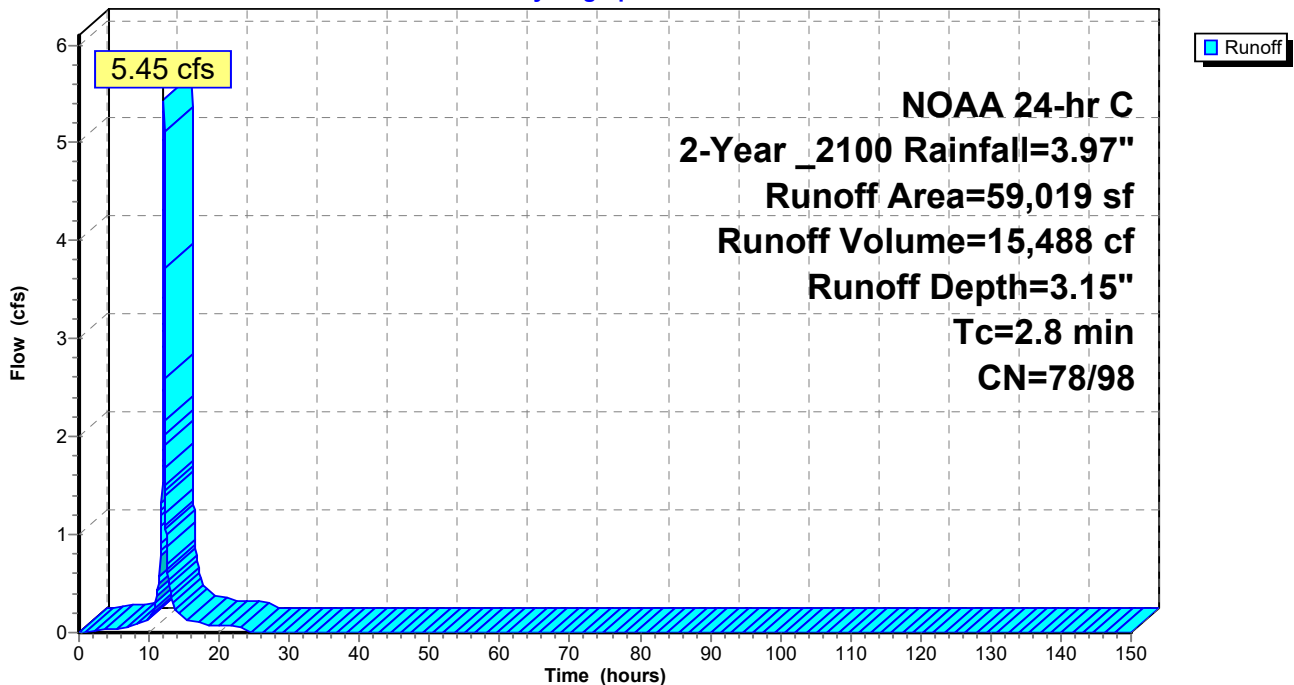
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 NOAA 24-hr C 2-Year _2100 Rainfall=3.97"

	Area (sf)	CN	Description
*	40,544	98	Impervious HSG C
	15,969	79	Open Space (fair) HSG C
*	2,506	74	Open Space (good) HSG C
	59,019	92	Weighted Average
	18,475	78	31.30% Pervious Area
	40,544	98	68.70% Impervious Area

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

Subcatchment 9S: DA 9: CN w/ IC areas

Hydrograph



Summary for Subcatchment 10S: DA 10: CN w/ IC areas

Runoff = 4.37 cfs @ 12.13 hrs, Volume= 13,840 cf, Depth= 3.42"

Routed to Pond 10P : PP (w/ underdrain) w/ UG storage 5

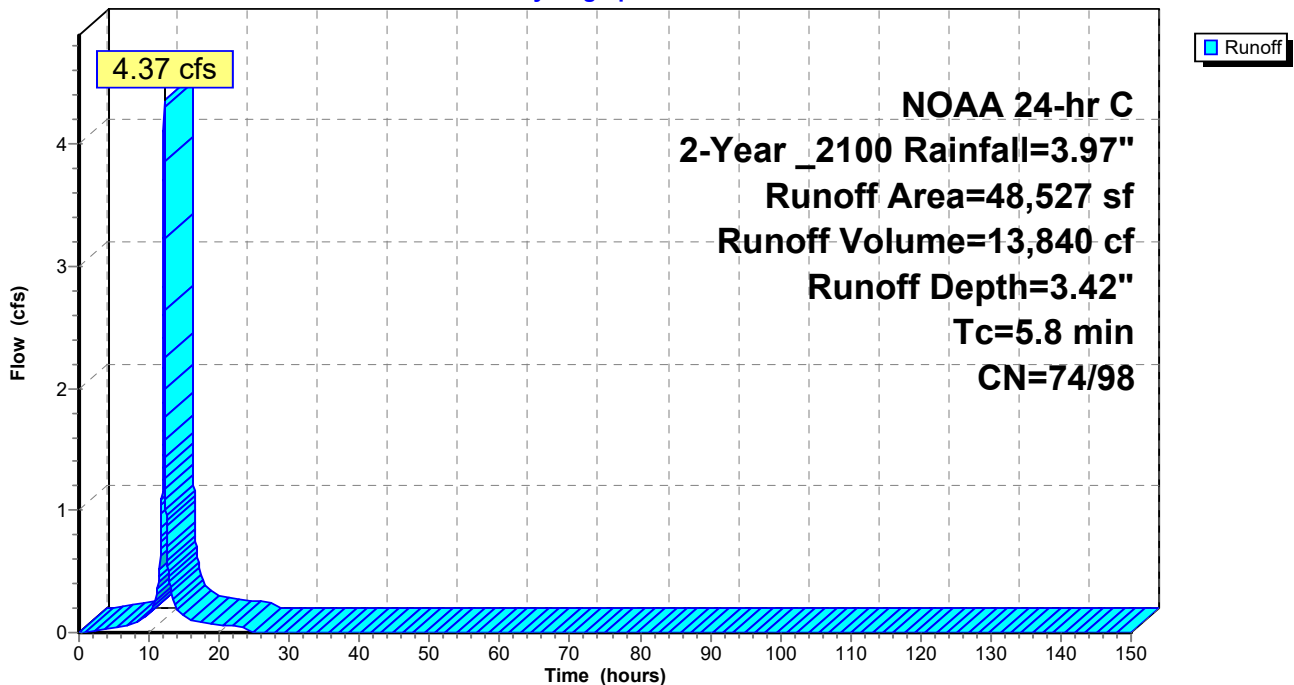
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-150.00 hrs, dt= 0.0
 NOAA 24-hr C 2-Year _2100 Rainfall=3.97"

	Area (sf)	CN	Description
*	41,506	98	Impervious HSG C
	60	79	Open Space (fair) HSG C
*	6,961	74	Open Space (good) HSG C
	48,527	95	Weighted Average
	7,021	74	14.47% Pervious Area
	41,506	98	85.53% Impervious Area

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

Subcatchment 10S: DA 10: CN w/ IC areas

Hydrograph



Summary for Subcatchment 11S: DA 11: CN w/ IC areas

Runoff = 5.55 cfs @ 12.09 hrs, Volume= 15,860 cf, Depth= 3.30"

Routed to Pond 11P : PP (w/ underdrain) w/ UG storage 6

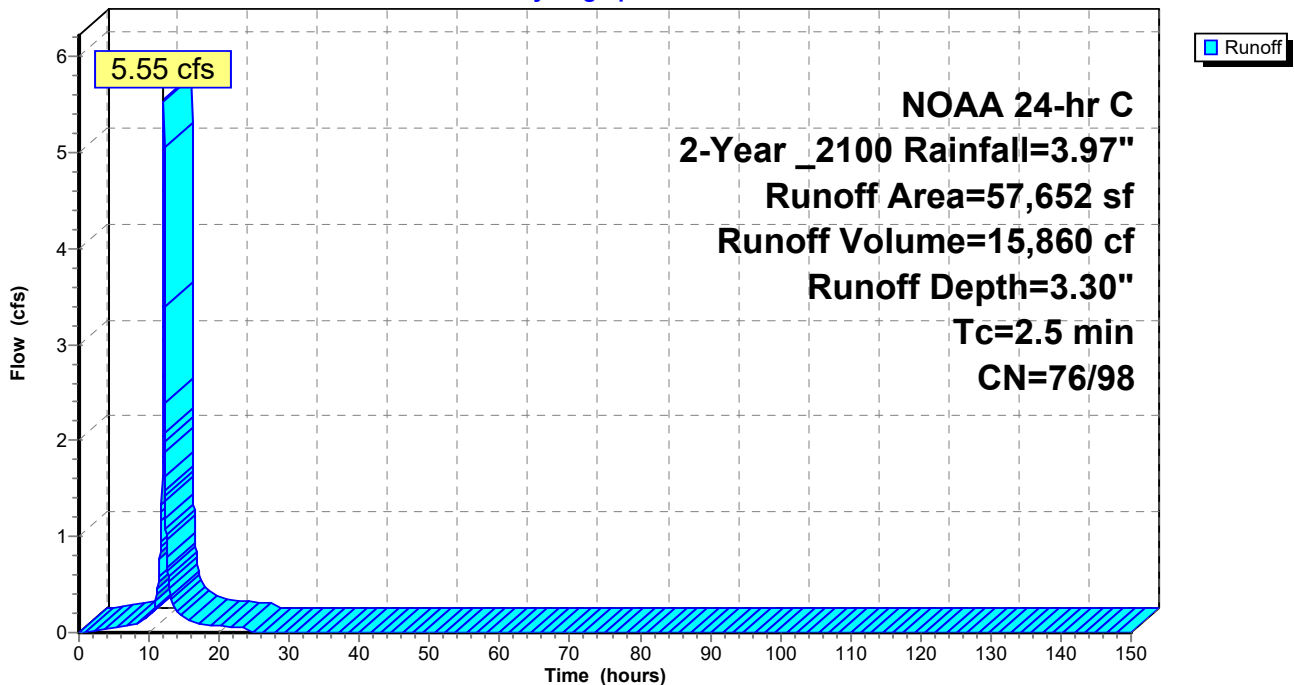
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-150.00 hrs, dt= 0.00
 NOAA 24-hr C 2-Year _2100 Rainfall=3.97"

	Area (sf)	CN	Description
*	45,264	98	Impervious HSG C
	5,795	79	Open Space (fair) HSG C
*	6,593	74	Open Space (good) HSG C
	57,652	93	Weighted Average
	12,388	76	21.49% Pervious Area
	45,264	98	78.51% Impervious Area

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

Subcatchment 11S: DA 11: CN w/ IC areas

Hydrograph



Summary for Subcatchment 12S: DA 12: CN w/ IC areas

Runoff = 6.30 cfs @ 12.10 hrs, Volume= 18,074 cf, Depth= 3.20"

Routed to Pond 12P : PP (w/ underdrain) w/ UG storage 7

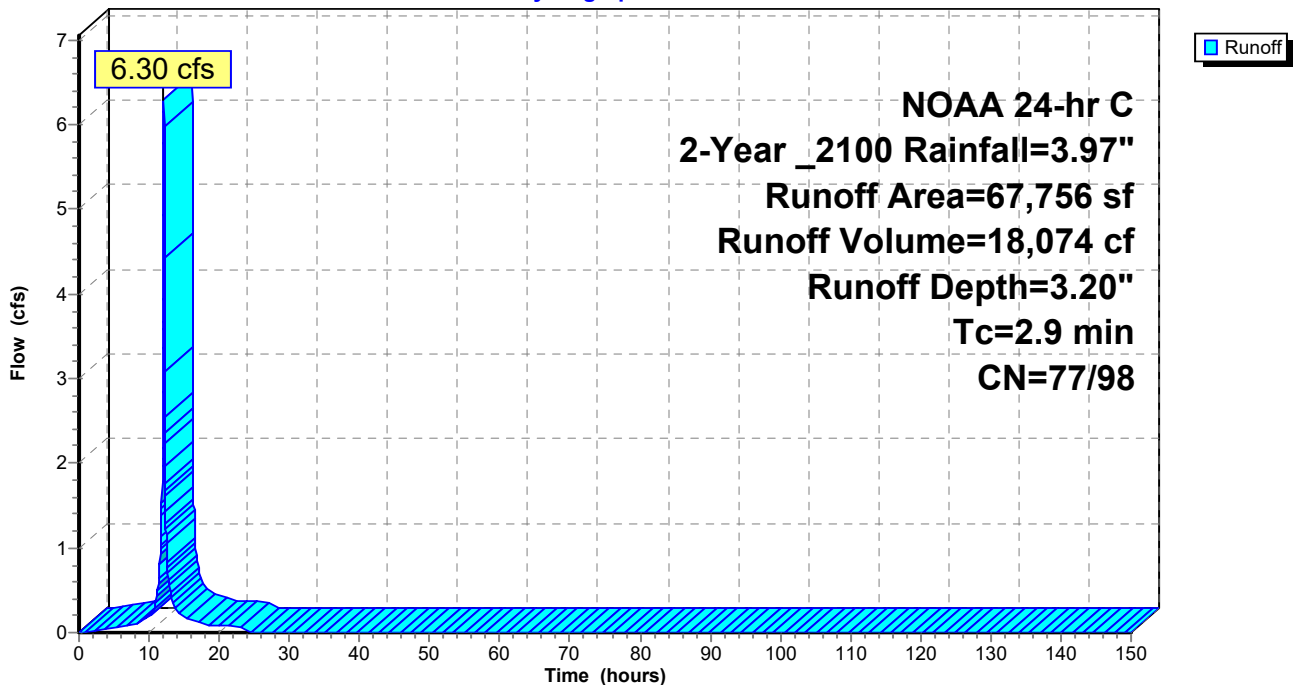
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-150.00 hrs, dt= 0.01
 NOAA 24-hr C 2-Year _2100 Rainfall=3.97"

	Area (sf)	CN	Description
*	49,166	98	Impervious HSG C
	11,017	79	Open Space (fair) HSG C
*	7,573	74	Open Space (good) HSG C
	67,756	92	Weighted Average
	18,590	77	27.44% Pervious Area
	49,166	98	72.56% Impervious Area

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

Subcatchment 12S: DA 12: CN w/ IC areas

Hydrograph



Summary for Subcatchment 13S: DA 13: CN w/ IC areas

Runoff = 4.98 cfs @ 12.36 hrs, Volume= 24,910 cf, Depth= 1.92"
 Routed to Pond 13P : Bioretention Basin 4

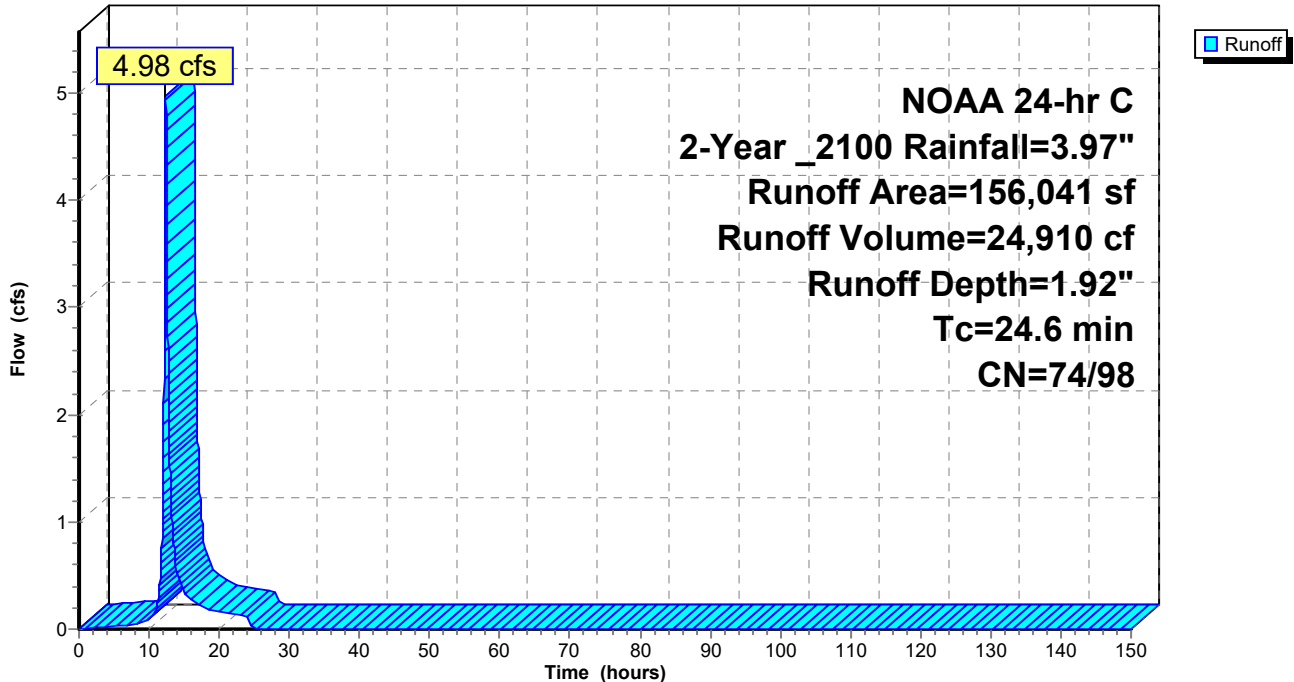
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-150.00 hrs, dt= 0.0
 NOAA 24-hr C 2-Year _2100 Rainfall=3.97"

	Area (sf)	CN	Description
*	24,650	98	Impervious HSG C
	42,240	79	Open Space (fair) HSG C
*	20,548	74	Open Space (good) HSG C
	68,603	70	Woods, Good, HSG C
	156,041	77	Weighted Average
	131,391	74	84.20% Pervious Area
	24,650	98	15.80% Impervious Area

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

Subcatchment 13S: DA 13: CN w/ IC areas

Hydrograph



Summary for Pond 1P: Bioretention Basin 1

[44] Hint: Outlet device #1 is below defined storage

Inflow Area = 141,085 sf, 17.73% Impervious, Inflow Depth = 2.01" for 2-Year _2100 event
 Inflow = 5.42 cfs @ 12.28 hrs, Volume= 23,690 cf
 Outflow = 0.95 cfs @ 13.13 hrs, Volume= 23,690 cf, Atten= 82%, Lag= 50.9 min
 Primary = 0.36 cfs @ 13.13 hrs, Volume= 20,625 cf
 Routed to nonexistent node 5R
 Secondary = 0.59 cfs @ 13.13 hrs, Volume= 3,064 cf
 Routed to nonexistent node 5R
 Tertiary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
 Routed to nonexistent node 5R

Routing by Stor-Ind method, Time Span= 0.00-150.00 hrs, dt= 0.02 hrs / 2
 Peak Elev= 64.20' @ 13.13 hrs Surf.Area= 7,554 sf Storage= 10,526 cf

Plug-Flow detention time= 261.5 min calculated for 23,690 cf (100% of inflow)
 Center-of-Mass det. time= 261.4 min (1,091.3 - 829.8)

Volume	Invert	Avail.Storage	Storage Description
#1	62.50'	37,960 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
62.50	4,800	0	0
67.00	12,071	37,960	37,960

Device	Routing	Invert	Outlet Devices
#1	Primary	61.75'	3.0" Vert. Low Flow Orifice C= 0.600 Limited to weir flow at low heads
#2	Secondary	64.00'	24.0" W x 18.0" H Vert. SECONDARY OUTLET C= 0.600 Limited to weir flow at low heads
#3	Tertiary	66.25'	60.0" x 60.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads

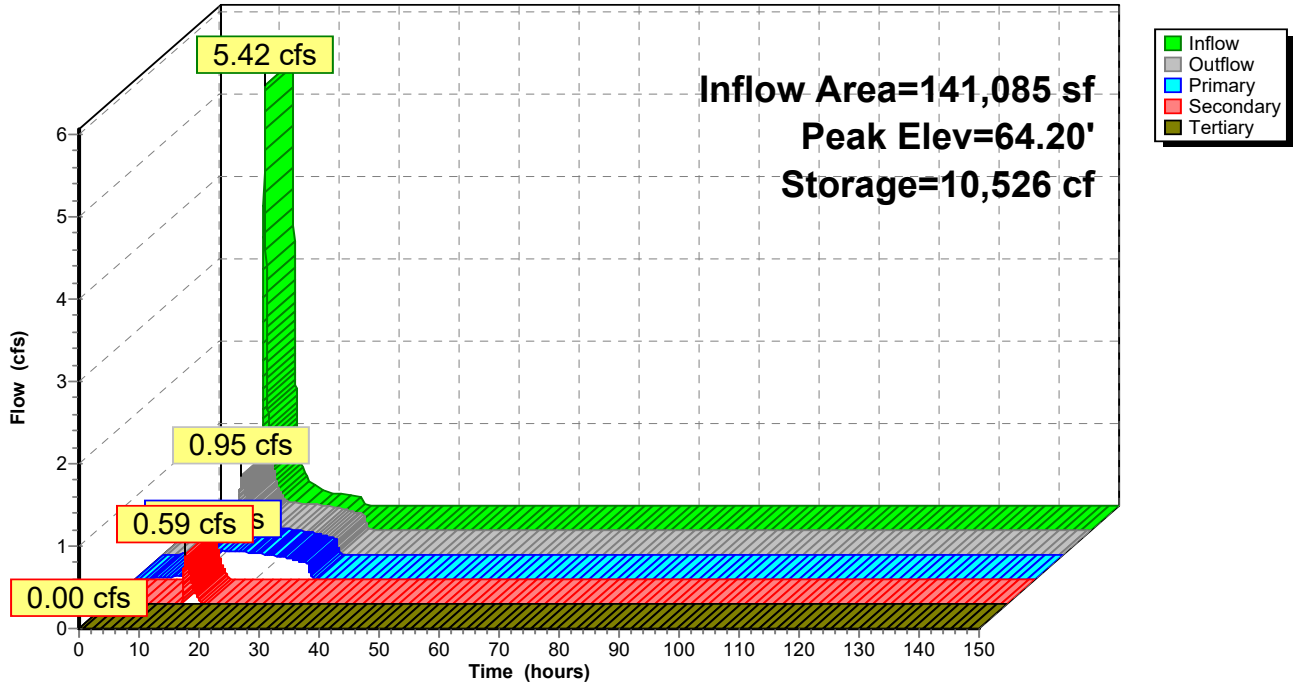
Primary OutFlow Max=0.36 cfs @ 13.13 hrs HW=64.20' (Free Discharge)
 ↖**1=Low Flow Orifice** (Orifice Controls 0.36 cfs @ 7.35 fps)

Secondary OutFlow Max=0.59 cfs @ 13.13 hrs HW=64.20' (Free Discharge)
 ↖**2=SECONDARY OUTLET** (Orifice Controls 0.59 cfs @ 1.45 fps)

Tertiary OutFlow Max=0.00 cfs @ 0.00 hrs HW=62.50' (Free Discharge)
 ↖**3=Orifice/Grate** (Controls 0.00 cfs)

Pond 1P: Bioretention Basin 1

Hydrograph



Summary for Pond 2P: Bioretention Basin 2

Inflow Area = 21,583 sf, 64.54% Impervious, Inflow Depth = 3.07" for 2-Year_2100 event
 Inflow = 1.97 cfs @ 12.10 hrs, Volume= 5,524 cf
 Outflow = 0.24 cfs @ 12.54 hrs, Volume= 5,183 cf, Atten= 88%, Lag= 26.6 min
 Primary = 0.24 cfs @ 12.54 hrs, Volume= 5,183 cf
 Routed to nonexistent node 5R
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
 Routed to nonexistent node 5R
 Tertiary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
 Routed to nonexistent node 5R

Routing by Stor-Ind method, Time Span= 0.00-150.00 hrs, dt= 0.02 hrs / 2
 Peak Elev= 69.45' @ 12.54 hrs Surf.Area= 2,255 sf Storage= 2,561 cf

Plug-Flow detention time= 180.7 min calculated for 5,182 cf (94% of inflow)
 Center-of-Mass det. time= 145.3 min (913.1 - 767.8)

Volume	Invert	Avail.Storage	Storage Description
#1	68.00'	14,805 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
68.00	1,281	0	0
73.00	4,641	14,805	14,805

Device	Routing	Invert	Outlet Devices
#1	Primary	68.25'	3.0" Vert. Low Flow Orifice C= 0.600 Limited to weir flow at low heads
#2	Secondary	70.50'	24.0" W x 18.0" H Vert. SECONDARY OUTLET C= 0.600 Limited to weir flow at low heads
#3	Tertiary	72.75'	60.0" x 60.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads

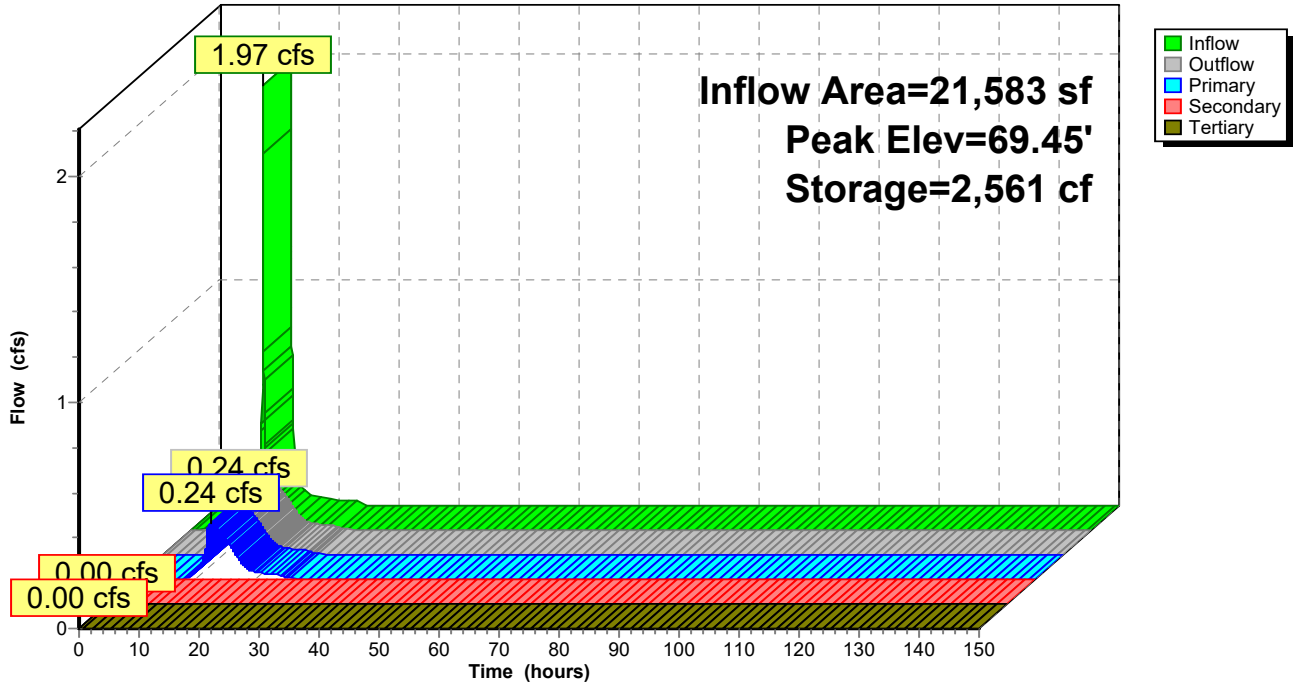
Primary OutFlow Max=0.24 cfs @ 12.54 hrs HW=69.45' (Free Discharge)
 ↑1=Low Flow Orifice (Orifice Controls 0.24 cfs @ 4.99 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=68.00' (Free Discharge)
 ↑2=SECONDARY OUTLET (Controls 0.00 cfs)

Tertiary OutFlow Max=0.00 cfs @ 0.00 hrs HW=68.00' (Free Discharge)
 ↑3=Orifice/Grate (Controls 0.00 cfs)

Pond 2P: Bioretention Basin 2

Hydrograph



Summary for Pond 3P: Bioretention Basin 3

Inflow Area = 40,101 sf, 65.65% Impervious, Inflow Depth = 3.07" for 2-Year_2100 event
 Inflow = 3.54 cfs @ 12.10 hrs, Volume= 10,247 cf
 Outflow = 0.31 cfs @ 12.96 hrs, Volume= 9,787 cf, Atten= 91%, Lag= 51.1 min
 Primary = 0.31 cfs @ 12.96 hrs, Volume= 9,787 cf
 Routed to nonexistent node 5R
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
 Routed to nonexistent node 5R
 Tertiary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
 Routed to nonexistent node 5R

Routing by Stor-Ind method, Time Span= 0.00-150.00 hrs, dt= 0.02 hrs / 2
 Peak Elev= 66.10' @ 12.96 hrs Surf.Area= 3,163 sf Storage= 5,164 cf

Plug-Flow detention time= 231.9 min calculated for 9,787 cf (96% of inflow)
 Center-of-Mass det. time= 204.5 min (973.5 - 769.0)

Volume	Invert	Avail.Storage	Storage Description
#1	64.00'	17,160 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
64.00	1,760	0	0
69.00	5,104	17,160	17,160

Device	Routing	Invert	Outlet Devices
#1	Primary	64.25'	3.0" Vert. Low Flow Orifice C= 0.600 Limited to weir flow at low heads
#2	Secondary	66.50'	24.0" W x 18.0" H Vert. SECONDARY OUTLET C= 0.600 Limited to weir flow at low heads
#3	Tertiary	68.75'	60.0" x 60.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads

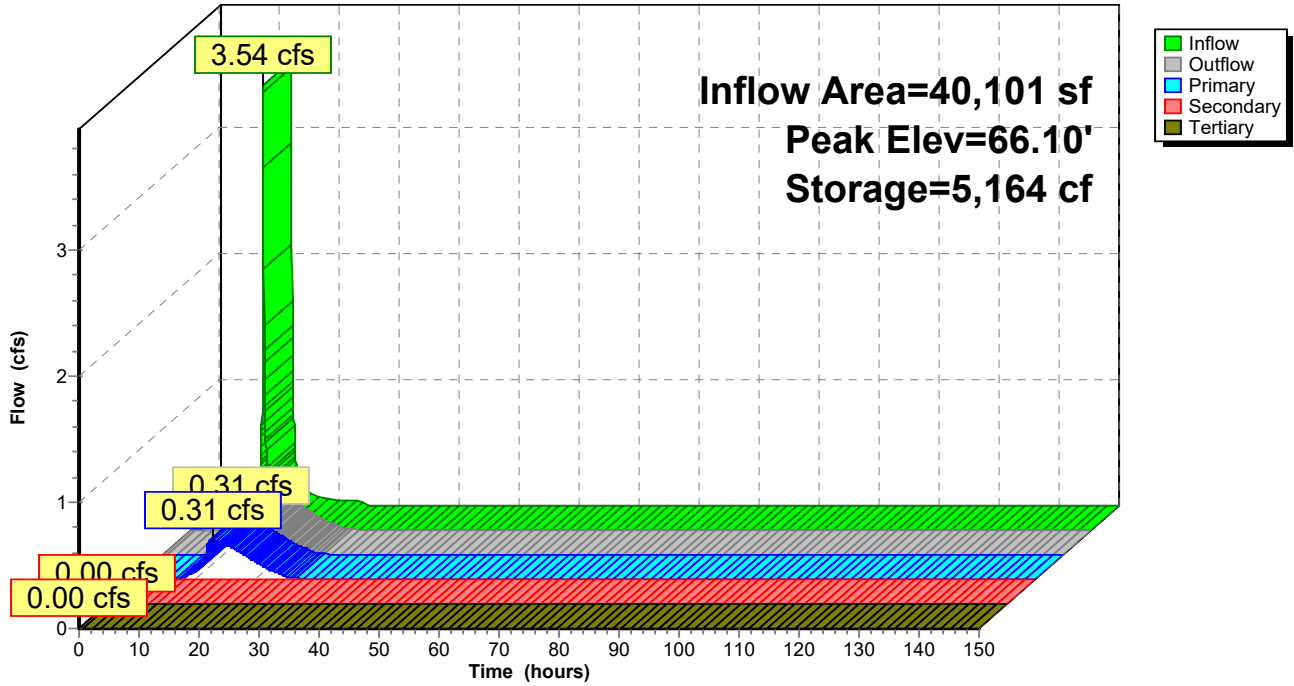
Primary OutFlow Max=0.31 cfs @ 12.96 hrs HW=66.10' (Free Discharge)
 ↑1=**Low Flow Orifice** (Orifice Controls 0.31 cfs @ 6.32 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=64.00' (Free Discharge)
 ↑2=**SECONDARY OUTLET** (Controls 0.00 cfs)

Tertiary OutFlow Max=0.00 cfs @ 0.00 hrs HW=64.00' (Free Discharge)
 ↑3=**Orifice/Grate** (Controls 0.00 cfs)

Pond 3P: Bioretention Basin 3

Hydrograph



Summary for Pond 4P: PP (w/ underdrain) w/ UG storage 1

[44] Hint: Outlet device #3 is below defined storage

Inflow Area = 84,260 sf, 73.22% Impervious, Inflow Depth = 3.21" for 2-Year _2100 event
 Inflow = 7.79 cfs @ 12.10 hrs, Volume= 22,567 cf
 Outflow = 0.36 cfs @ 13.63 hrs, Volume= 22,567 cf, Atten= 95%, Lag= 91.8 min
 Primary = 0.36 cfs @ 13.63 hrs, Volume= 22,567 cf
 Routed to Pond 8P : Existing Basin 1
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
 Routed to Pond 8P : Existing Basin 1

Routing by Stor-Ind method, Time Span= 0.00-150.00 hrs, dt= 0.02 hrs
 Peak Elev= 95.62' @ 13.63 hrs Surf.Area= 14,771 sf Storage= 10,670 cf

Plug-Flow detention time= 261.1 min calculated for 22,567 cf (100% of inflow)
 Center-of-Mass det. time= 261.0 min (1,025.1 - 764.1)

Volume	Invert	Avail.Storage	Storage Description
#1	97.00'	3,624 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
#2A	94.50'	12,961 cf	68.00'W x 217.22'L x 3.50'H Field A 51,698 cf Overall - 19,295 cf Embedded = 32,403 cf x 40.0% Voids
#3A	95.00'	19,295 cf	ADS_StormTech SC-740 +Cap x 420 Inside #2 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 420 Chambers in 14 Rows
		35,880 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
97.00	6,787	0.0	0	0
97.67	6,787	35.0	1,592	1,592
97.83	6,787	15.0	163	1,754
98.00	6,787	15.0	173	1,928
98.25	6,787	100.0	1,697	3,624

Device	Routing	Invert	Outlet Devices
#1	Primary	92.07'	3.0" Vert. Restriction Orifice C= 0.600 Limited to weir flow at low heads
#2	Device 1	92.17'	6.0" Round 6" HDPE Underdrain L= 359.0' Ke= 0.500 Inlet / Outlet Invert= 92.17' / 90.37' S= 0.0050 ' S= 0.0050 ' Cc= 0.900 n= 0.020 Corrugated PE, corrugated interior, Flow Area= 0.20 sf
#3	Device 2	92.17'	0.9" x 0.1" Horiz. Perforations X 400.00 columns X 3 rows C= 0.600 Limited to weir flow at low heads
#4	Secondary	98.00'	67.0' long x 2.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Primary OutFlow Max=0.36 cfs @ 13.63 hrs HW=95.62' (Free Discharge)

↑**1=Restriction Orifice** (Passes 0.36 cfs of 0.44 cfs potential flow)

↑**2=6" HDPE Underdrain** (Outlet Controls 0.36 cfs @ 1.82 fps)

↑**3=Perforations** (Passes 0.36 cfs of 6.71 cfs potential flow)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=94.50' (Free Discharge)

↑**4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 4P: PP (w/ underdrain) w/ UG storage 1 - Chamber Wizard Field A

Chamber Model = ADS_StormTech SC-740 +Cap (ADS StormTech® SC-740 with cap length)

Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf

Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap

51.0" Wide + 6.0" Spacing = 57.0" C-C Row Spacing

30 Chambers/Row x 7.12' Long +0.81' Cap Length x 2 = 215.22' Row Length +12.0" End Stone x 2 =

217.22' Base Length

14 Rows x 51.0" Wide + 6.0" Spacing x 13 + 12.0" Side Stone x 2 = 68.00' Base Width

6.0" Stone Base + 30.0" Chamber Height + 6.0" Stone Cover = 3.50' Field Height

420 Chambers x 45.9 cf = 19,294.8 cf Chamber Storage

51,697.6 cf Field - 19,294.8 cf Chambers = 32,402.8 cf Stone x 40.0% Voids = 12,961.1 cf Stone Storage

Chamber Storage + Stone Storage = 32,255.9 cf = 0.740 af

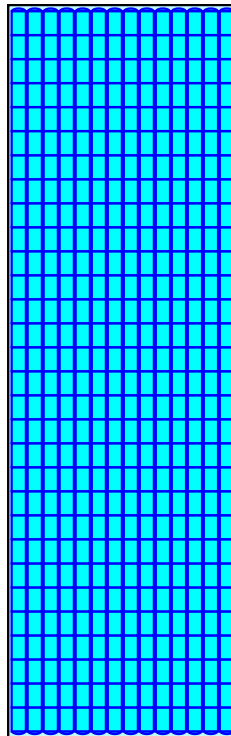
Overall Storage Efficiency = 62.4%

Overall System Size = 217.22' x 68.00' x 3.50'

420 Chambers

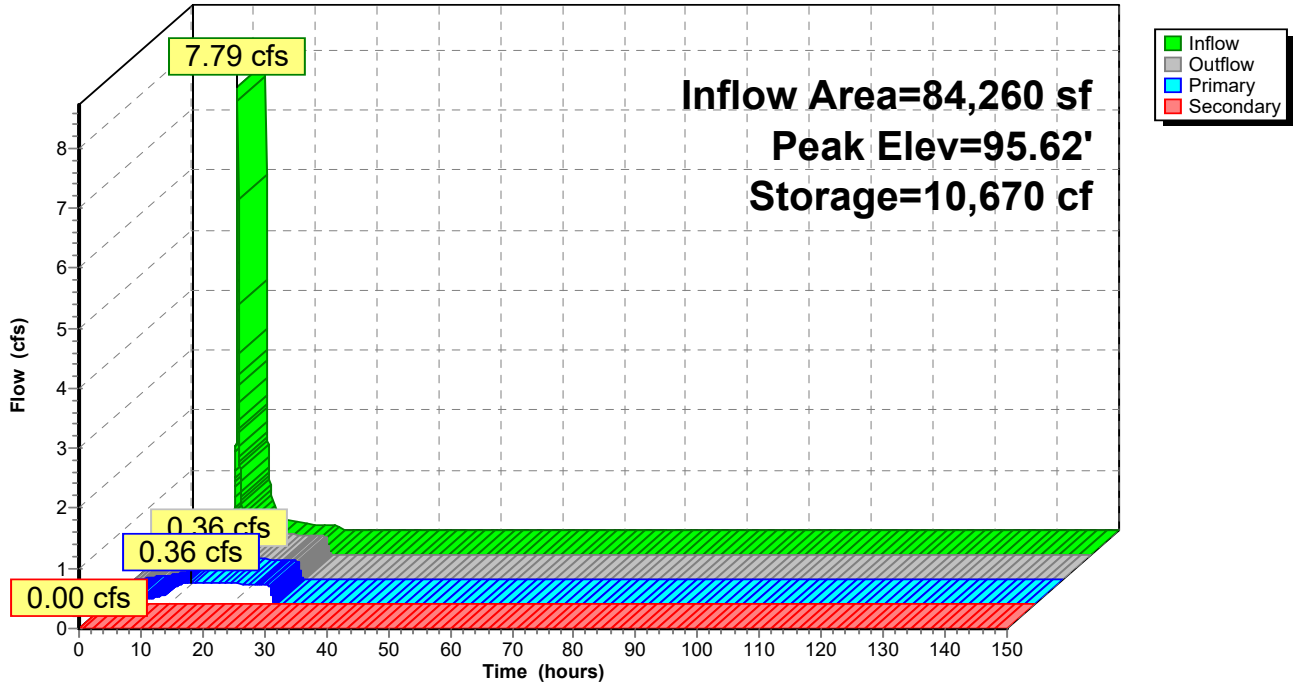
1,914.7 cy Field

1,200.1 cy Stone



Pond 4P: PP (w/ underdrain) w/ UG storage 1

Hydrograph



Summary for Pond 5P: PP (w/ underdrain) w/ UG storage 2

[44] Hint: Outlet device #3 is below defined storage

Inflow Area = 52,282 sf, 79.56% Impervious, Inflow Depth = 3.35" for 2-Year_2100 event
 Inflow = 5.12 cfs @ 12.09 hrs, Volume= 14,606 cf
 Outflow = 0.20 cfs @ 14.07 hrs, Volume= 14,606 cf, Atten= 96%, Lag= 118.5 min
 Primary = 0.20 cfs @ 14.07 hrs, Volume= 14,606 cf
 Routed to Pond 8P : Existing Basin 1
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
 Routed to Pond 8P : Existing Basin 1

Routing by Stor-Ind method, Time Span= 0.00-150.00 hrs, dt= 0.02 hrs
 Peak Elev= 95.62' @ 14.07 hrs Surf.Area= 10,213 sf Storage= 7,334 cf

Plug-Flow detention time= 336.0 min calculated for 14,604 cf (100% of inflow)
 Center-of-Mass det. time= 336.0 min (1,095.8 - 759.9)

Volume	Invert	Avail.Storage	Storage Description
#1	97.00'	2,510 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
#2A	94.50'	9,005 cf	77.50'W x 131.78'L x 3.50'H Field A 35,744 cf Overall - 13,231 cf Embedded = 22,514 cf x 40.0% Voids
#3A	95.00'	13,231 cf	ADS_StormTech SC-740 +Cap x 288 Inside #2 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 288 Chambers in 16 Rows
		24,746 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
97.00	4,700	0.0	0	0
97.67	4,700	35.0	1,102	1,102
97.83	4,700	15.0	113	1,215
98.00	4,700	15.0	120	1,335
98.25	4,700	100.0	1,175	2,510

Device	Routing	Invert	Outlet Devices
#1	Primary	92.07'	2.0" Vert. Restriction Orifice C= 0.600 Limited to weir flow at low heads
#2	Device 1	92.17'	6.0" Round 6" HDPE Underdrain L= 359.0' Ke= 0.500 Inlet / Outlet Invert= 92.17' / 90.37' S= 0.0050 ' S= 0.0050 ' Cc= 0.900 n= 0.020 Corrugated PE, corrugated interior, Flow Area= 0.20 sf
#3	Device 2	92.17'	0.9" x 0.1" Horiz. Perforations X 400.00 columns X 3 rows C= 0.600 Limited to weir flow at low heads
#4	Secondary	98.00'	132.0' long x 2.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Primary OutFlow Max=0.20 cfs @ 14.07 hrs HW=95.62' (Free Discharge)

↑1=**Restriction Orifice** (Orifice Controls 0.20 cfs @ 8.97 fps)

↑2=**6" HDPE Underdrain** (Passes 0.20 cfs of 0.36 cfs potential flow)

↑3=**Perforations** (Passes 0.20 cfs of 6.71 cfs potential flow)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=94.50' (Free Discharge)

↑4=**Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 5P: PP (w/ underdrain) w/ UG storage 2 - Chamber Wizard Field A

Chamber Model = ADS_StormTech SC-740 +Cap (ADS StormTech® SC-740 with cap length)

Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf

Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap

51.0" Wide + 6.0" Spacing = 57.0" C-C Row Spacing

18 Chambers/Row x 7.12' Long +0.81' Cap Length x 2 = 129.78' Row Length +12.0" End Stone x 2 =

131.78' Base Length

16 Rows x 51.0" Wide + 6.0" Spacing x 15 + 12.0" Side Stone x 2 = 77.50' Base Width

6.0" Stone Base + 30.0" Chamber Height + 6.0" Stone Cover = 3.50' Field Height

288 Chambers x 45.9 cf = 13,230.7 cf Chamber Storage

35,744.4 cf Field - 13,230.7 cf Chambers = 22,513.7 cf Stone x 40.0% Voids = 9,005.5 cf Stone Storage

Chamber Storage + Stone Storage = 22,236.2 cf = 0.510 af

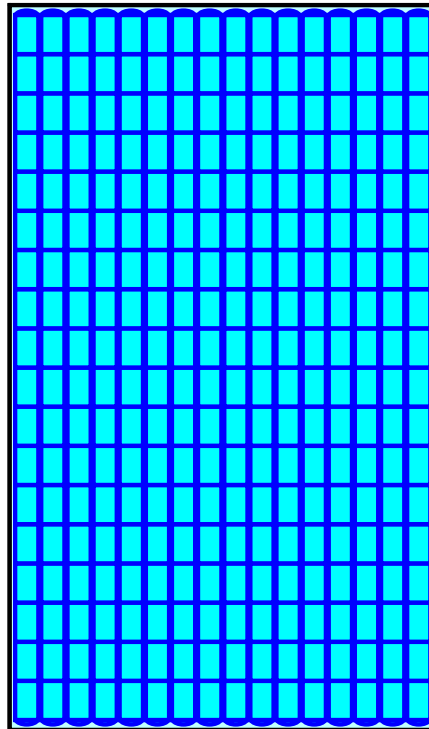
Overall Storage Efficiency = 62.2%

Overall System Size = 131.78' x 77.50' x 3.50'

288 Chambers

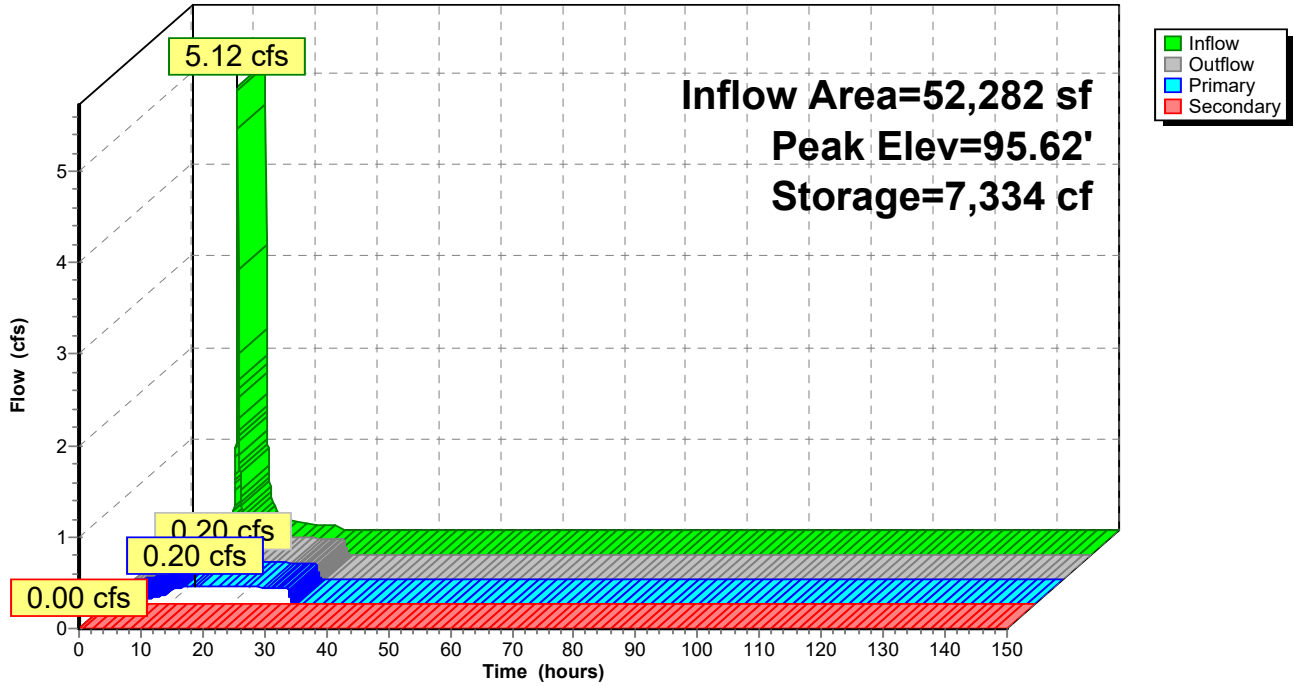
1,323.9 cy Field

833.8 cy Stone



Pond 5P: PP (w/ underdrain) w/ UG storage 2

Hydrograph



Summary for Pond 6P: PP (w/ underdrain) w/ UG storage 3

[44] Hint: Outlet device #3 is below defined storage

Inflow Area = 76,785 sf, 82.96% Impervious, Inflow Depth = 3.43" for 2-Year_2100 event
 Inflow = 7.50 cfs @ 12.10 hrs, Volume= 21,942 cf
 Outflow = 0.20 cfs @ 15.03 hrs, Volume= 21,942 cf, Atten= 97%, Lag= 176.1 min
 Primary = 0.20 cfs @ 15.03 hrs, Volume= 21,942 cf
 Routed to Pond 8P : Existing Basin 1
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
 Routed to Pond 8P : Existing Basin 1

Routing by Stor-Ind method, Time Span= 0.00-150.00 hrs, dt= 0.02 hrs
 Peak Elev= 95.65' @ 15.03 hrs Surf.Area= 16,925 sf Storage= 12,645 cf

Plug-Flow detention time= 595.2 min calculated for 21,942 cf (100% of inflow)
 Center-of-Mass det. time= 595.2 min (1,353.9 - 758.7)

Volume	Invert	Avail.Storage	Storage Description
#1	97.00'	2,054 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
#2A	94.50'	14,875 cf	144.00'W x 117.54'L x 3.50'H Field A 59,238 cf Overall - 22,051 cf Embedded = 37,187 cf x 40.0% Voids
#3A	95.00'	22,051 cf	ADS_StormTech SC-740 +Cap x 480 Inside #2 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 480 Chambers in 30 Rows
		38,980 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
97.00	3,240	0.0	0	0
97.67	3,240	35.0	760	760
97.83	3,240	15.0	78	838
98.00	3,240	15.0	83	920
98.35	3,240	100.0	1,134	2,054

Device	Routing	Invert	Outlet Devices
#1	Primary	92.07'	2.0" Vert. Restriction Orifice C= 0.600 Limited to weir flow at low heads
#2	Device 1	92.17'	6.0" Round 6" HDPE Underdrain L= 359.0' Ke= 0.500 Inlet / Outlet Invert= 92.17' / 90.37' S= 0.0050 ' S= 0.0050 ' Cc= 0.900 n= 0.020 Corrugated PE, corrugated interior, Flow Area= 0.20 sf
#3	Device 2	92.17'	0.9" x 0.1" Horiz. Perforations X 400.00 columns X 3 rows C= 0.600 Limited to weir flow at low heads
#4	Secondary	98.00'	19.0' long x 2.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Primary OutFlow Max=0.20 cfs @ 15.03 hrs HW=95.65' (Free Discharge)

↑1=**Restriction Orifice** (Orifice Controls 0.20 cfs @ 9.01 fps)

↑2=**6" HDPE Underdrain** (Passes 0.20 cfs of 0.36 cfs potential flow)

↑3=**Perforations** (Passes 0.20 cfs of 6.74 cfs potential flow)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=94.50' (Free Discharge)

↑4=**Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 6P: PP (w/ underdrain) w/ UG storage 3 - Chamber Wizard Field A

Chamber Model = ADS_StormTech SC-740 +Cap (ADS StormTech® SC-740 with cap length)

Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf

Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap

51.0" Wide + 6.0" Spacing = 57.0" C-C Row Spacing

16 Chambers/Row x 7.12' Long +0.81' Cap Length x 2 = 115.54' Row Length +12.0" End Stone x 2 = 117.54' Base Length

30 Rows x 51.0" Wide + 6.0" Spacing x 29 + 12.0" Side Stone x 2 = 144.00' Base Width

6.0" Stone Base + 30.0" Chamber Height + 6.0" Stone Cover = 3.50' Field Height

480 Chambers x 45.9 cf = 22,051.2 cf Chamber Storage

59,238.5 cf Field - 22,051.2 cf Chambers = 37,187.3 cf Stone x 40.0% Voids = 14,874.9 cf Stone Storage

Chamber Storage + Stone Storage = 36,926.1 cf = 0.848 af

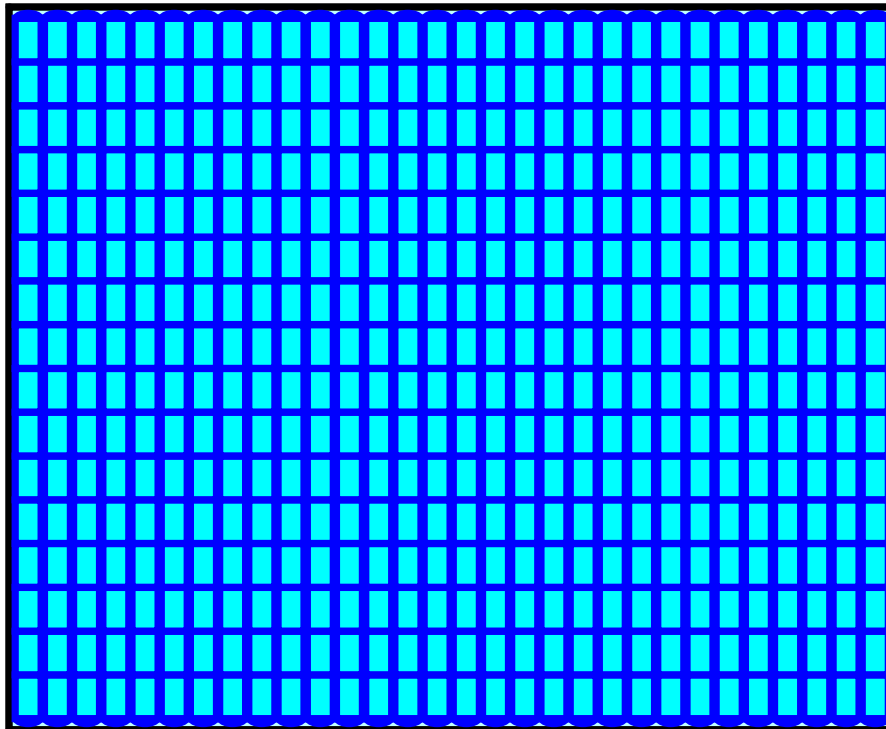
Overall Storage Efficiency = 62.3%

Overall System Size = 117.54' x 144.00' x 3.50'

480 Chambers

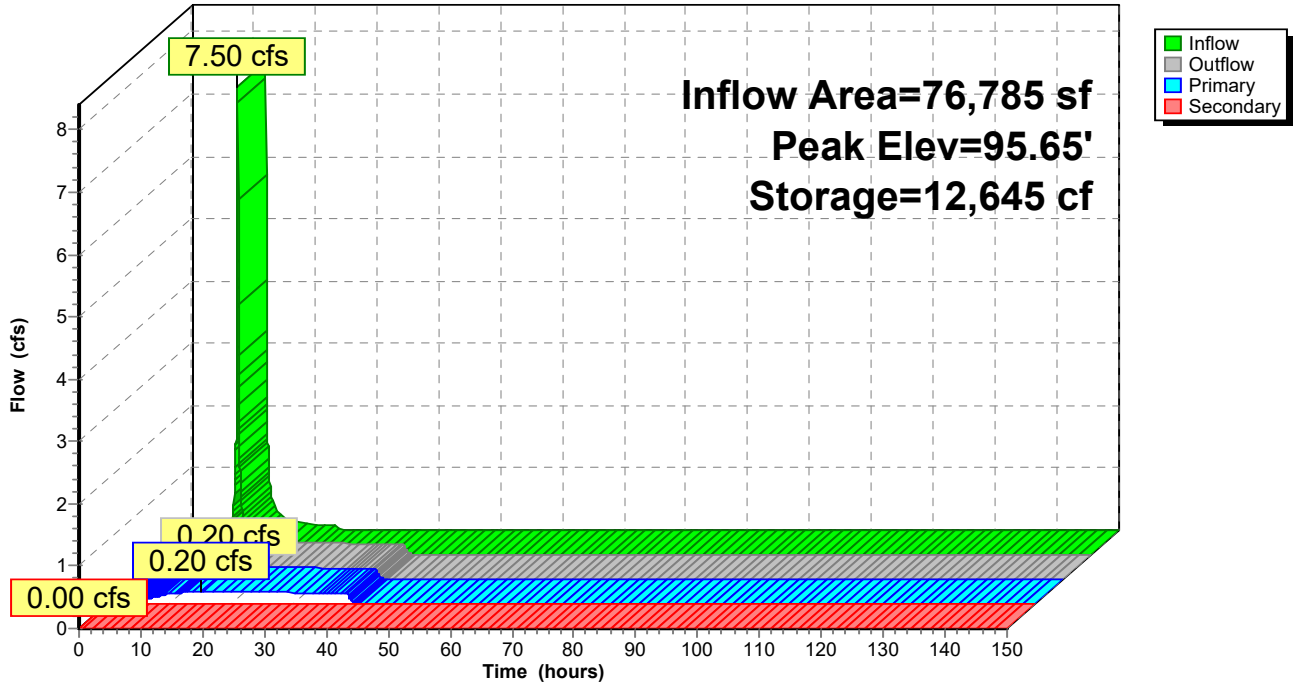
2,194.0 cy Field

1,377.3 cy Stone



Pond 6P: PP (w/ underdrain) w/ UG storage 3

Hydrograph



Summary for Pond 7P: PP (w/ underdrain) w/ UG storage 4

[44] Hint: Outlet device #3 is below defined storage

Inflow Area = 120,233 sf, 94.05% Impervious, Inflow Depth = 3.62" for 2-Year _2100 event
 Inflow = 12.17 cfs @ 12.10 hrs, Volume= 36,308 cf
 Outflow = 0.36 cfs @ 14.75 hrs, Volume= 36,308 cf, Atten= 97%, Lag= 158.9 min
 Primary = 0.36 cfs @ 14.75 hrs, Volume= 36,308 cf
 Routed to Pond 8P : Existing Basin 1
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
 Routed to Pond 8P : Existing Basin 1

Routing by Stor-Ind method, Time Span= 0.00-150.00 hrs, dt= 0.02 hrs
 Peak Elev= 95.68' @ 14.75 hrs Surf.Area= 26,122 sf Storage= 20,146 cf

Plug-Flow detention time= 507.2 min calculated for 36,308 cf (100% of inflow)
 Center-of-Mass det. time= 507.2 min (1,260.7 - 753.5)

Volume	Invert	Avail.Storage	Storage Description
#1	97.00'	2,980 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
#2A	94.50'	22,825 cf	163.00'W x 160.26'L x 3.50'H Field A 91,426 cf Overall - 34,363 cf Embedded = 57,063 cf x 40.0% Voids
#3A	95.00'	34,363 cf	ADS_StormTech SC-740 +Cap x 748 Inside #2 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 748 Chambers in 34 Rows
		60,168 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
97.00	4,700	0.0	0	0
97.67	4,700	35.0	1,102	1,102
97.83	4,700	15.0	113	1,215
98.00	4,700	15.0	120	1,335
98.35	4,700	100.0	1,645	2,980

Device	Routing	Invert	Outlet Devices
#1	Primary	92.07'	3.0" Vert. Restriction Orifice C= 0.600 Limited to weir flow at low heads
#2	Device 1	92.17'	6.0" Round 6" HDPE Underdrain L= 359.0' Ke= 0.500 Inlet / Outlet Invert= 92.17' / 90.37' S= 0.0050 ' S= 0.0050 ' Cc= 0.900 n= 0.020 Corrugated PE, corrugated interior, Flow Area= 0.20 sf
#3	Device 2	92.17'	0.9" x 0.1" Horiz. Perforations X 400.00 columns X 3 rows C= 0.600 Limited to weir flow at low heads
#4	Secondary	98.00'	19.0' long x 2.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Primary OutFlow Max=0.36 cfs @ 14.75 hrs HW=95.68' (Free Discharge)

↑1=**Restriction Orifice** (Passes 0.36 cfs of 0.44 cfs potential flow)

↑2=**6" HDPE Underdrain** (Outlet Controls 0.36 cfs @ 1.84 fps)

↑3=**Perforations** (Passes 0.36 cfs of 6.77 cfs potential flow)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=94.50' (Free Discharge)

↑4=**Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 7P: PP (w/ underdrain) w/ UG storage 4 - Chamber Wizard Field A

Chamber Model = ADS_StormTech SC-740 +Cap (ADS StormTech® SC-740 with cap length)

Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf

Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap

51.0" Wide + 6.0" Spacing = 57.0" C-C Row Spacing

22 Chambers/Row x 7.12' Long +0.81' Cap Length x 2 = 158.26' Row Length +12.0" End Stone x 2 = 160.26' Base Length

34 Rows x 51.0" Wide + 6.0" Spacing x 33 + 12.0" Side Stone x 2 = 163.00' Base Width

6.0" Stone Base + 30.0" Chamber Height + 6.0" Stone Cover = 3.50' Field Height

748 Chambers x 45.9 cf = 34,363.1 cf Chamber Storage

91,426.4 cf Field - 34,363.1 cf Chambers = 57,063.3 cf Stone x 40.0% Voids = 22,825.3 cf Stone Storage

Chamber Storage + Stone Storage = 57,188.5 cf = 1.313 af

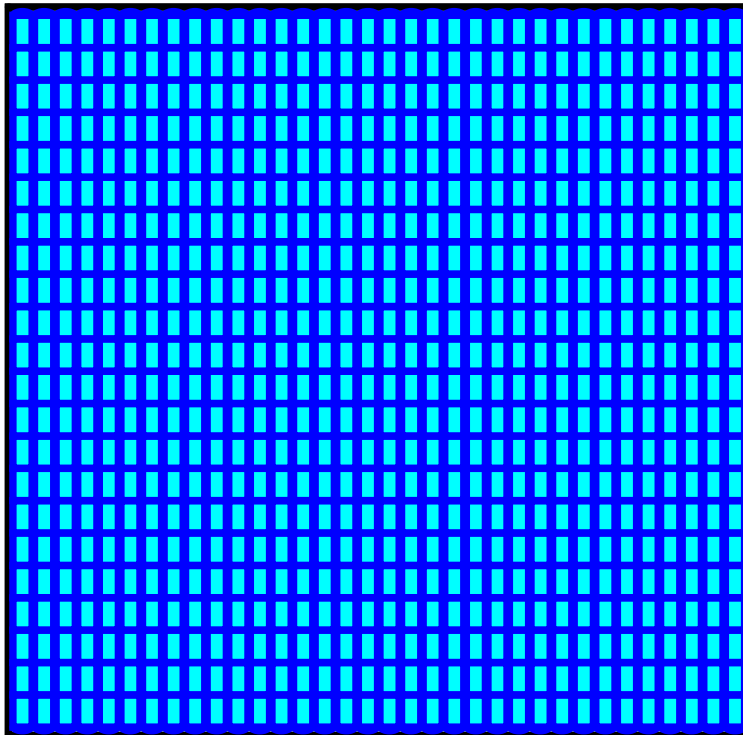
Overall Storage Efficiency = 62.6%

Overall System Size = 160.26' x 163.00' x 3.50'

748 Chambers

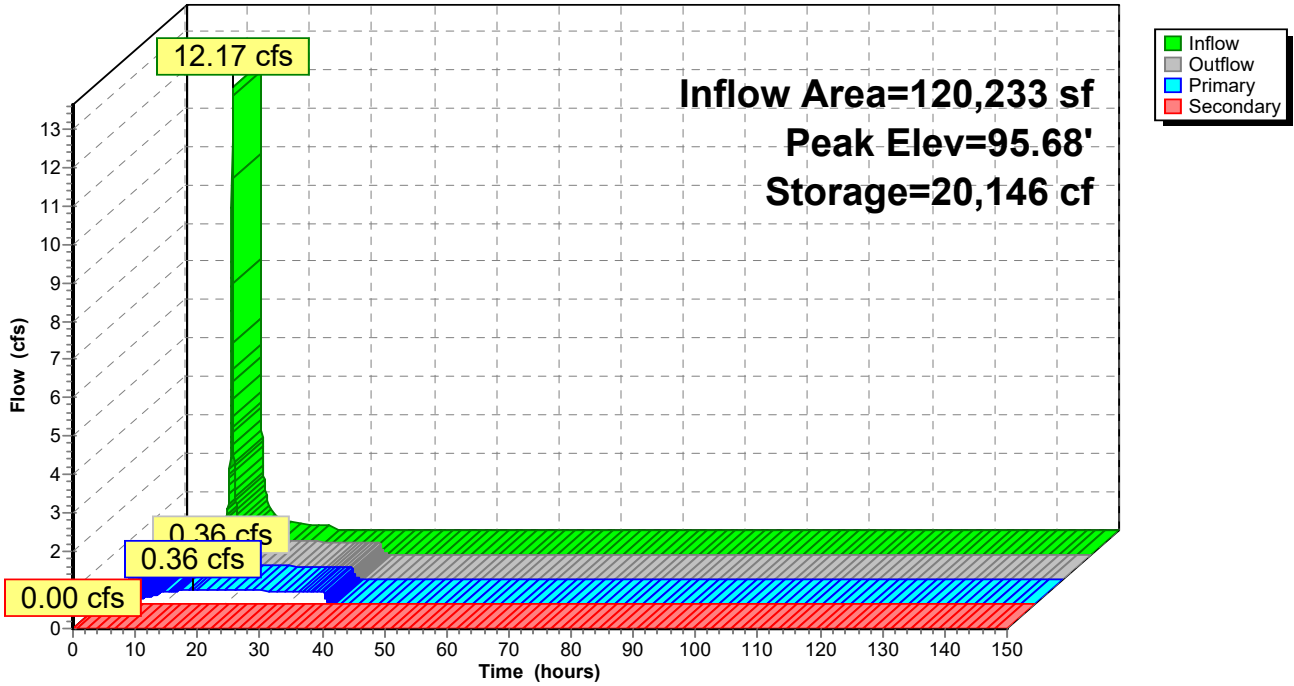
3,386.2 cy Field

2,113.5 cy Stone



Pond 7P: PP (w/ underdrain) w/ UG storage 4

Hydrograph



Summary for Pond 8P: Existing Basin 1

Inflow Area = 444,913 sf, 80.94% Impervious, Inflow Depth = 3.35" for 2-Year_2100 event
 Inflow = 11.35 cfs @ 12.09 hrs, Volume= 124,265 cf
 Outflow = 6.92 cfs @ 12.14 hrs, Volume= 124,265 cf, Atten= 39%, Lag= 2.9 min
 Primary = 6.92 cfs @ 12.14 hrs, Volume= 124,265 cf
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
 Routed to nonexistent node 67L
 Tertiary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
 Routed to nonexistent node 67L

Routing by Stor-Ind method, Time Span= 0.00-150.00 hrs, dt= 0.02 hrs / 2
 Peak Elev= 59.16' @ 12.14 hrs Surf.Area= 7,965 sf Storage= 5,439 cf

Plug-Flow detention time= 17.1 min calculated for 124,248 cf (100% of inflow)
 Center-of-Mass det. time= 17.2 min (1,116.7 - 1,099.6)

Volume	Invert	Avail.Storage	Storage Description
#1	58.00'	33,881 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
58.00	1,339	0	0
59.00	7,134	4,237	4,237
60.00	12,352	9,743	13,980
61.00	18,300	15,326	29,306
61.25	18,300	4,575	33,881

Device	Routing	Invert	Outlet Devices
#1	Primary	58.00'	24.0" Vert. Low Flow Orifice C= 0.600 Limited to weir flow at low heads
#2	Secondary	60.00'	24.0" W x 18.0" H Vert. 2-YR Orifice C= 0.600 Limited to weir flow at low heads
#3	Tertiary	60.75'	48.0" x 48.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#4	Tertiary	61.00'	100.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)

Primary OutFlow Max=6.92 cfs @ 12.14 hrs HW=59.16' (Free Discharge)

↳ **1=Low Flow Orifice** (Orifice Controls 6.92 cfs @ 3.66 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=58.00' (Free Discharge)

↳ **2=2-YR Orifice** (Controls 0.00 cfs)

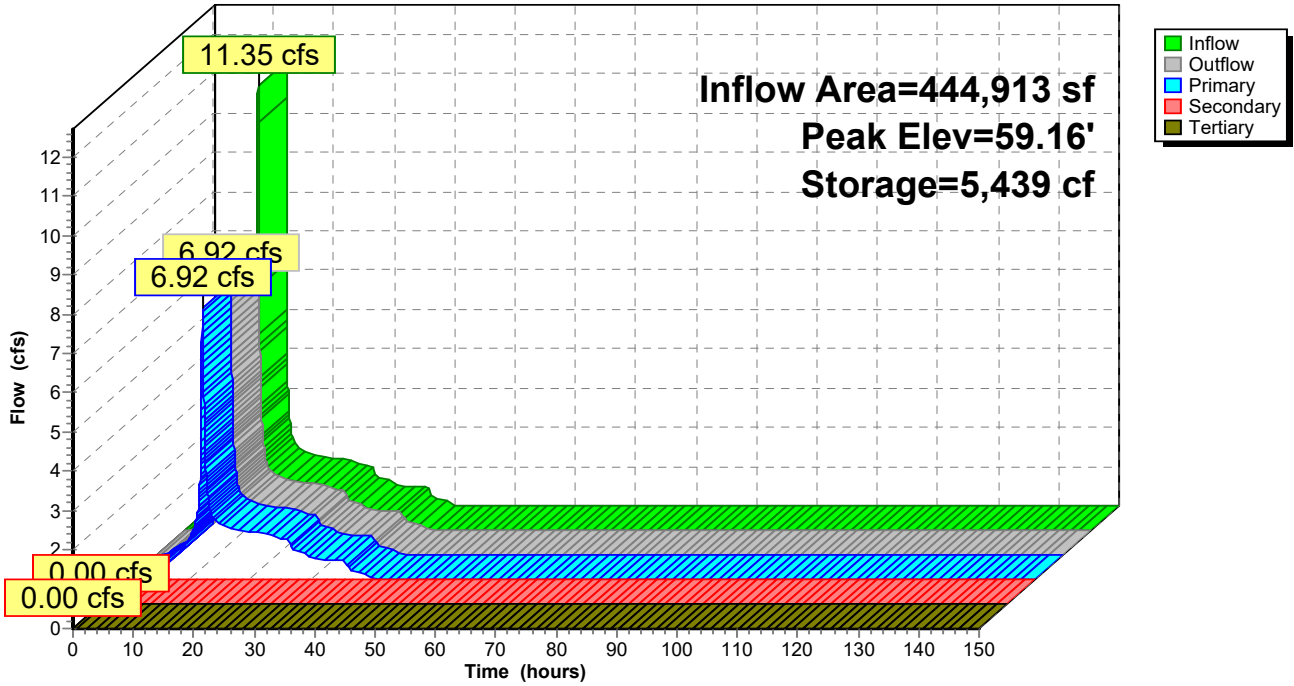
Tertiary OutFlow Max=0.00 cfs @ 0.00 hrs HW=58.00' (Free Discharge)

↳ **3=Orifice/Grate** (Controls 0.00 cfs)

↳ **4=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 8P: Existing Basin 1

Hydrograph



Summary for Pond 9P: Existing Basin 2

<https://hydro.rutgers.edu/view-project/100596/>

Inflow Area = 59,019 sf, 68.70% Impervious, Inflow Depth = 3.15" for 2-Year_2100 event
 Inflow = 5.45 cfs @ 12.10 hrs, Volume= 15,488 cf
 Outflow = 1.05 cfs @ 12.39 hrs, Volume= 15,488 cf, Atten= 81%, Lag= 17.5 min
 Primary = 0.35 cfs @ 12.39 hrs, Volume= 12,537 cf
 Secondary = 0.70 cfs @ 12.39 hrs, Volume= 2,952 cf
 Tertiary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.00-150.00 hrs, dt= 0.02 hrs / 2
 Peak Elev= 66.91' @ 12.39 hrs Surf.Area= 4,092 sf Storage= 5,666 cf

Plug-Flow detention time= 100.8 min calculated for 15,486 cf (100% of inflow)
 Center-of-Mass det. time= 100.8 min (867.3 - 766.5)

Volume	Invert	Avail.Storage	Storage Description
#1	64.60'	13,401 cf	Custom Stage Data (Prismatic) Listed below

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
64.60	0	0	0
65.00	647	129	129
66.00	2,768	1,708	1,837
68.00	5,693	8,461	10,298
68.50	6,718	3,103	13,401

Device	Routing	Invert	Outlet Devices
#1	Primary	64.60'	3.0" Vert. 3" Orifice C= 0.600 Limited to weir flow at low heads
#2	Secondary	66.40'	0.7' long 8" Sharp-Crested Rectangular Weir 2 End Contraction(s)
#3	Tertiary	67.75'	48.0" x 48.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads

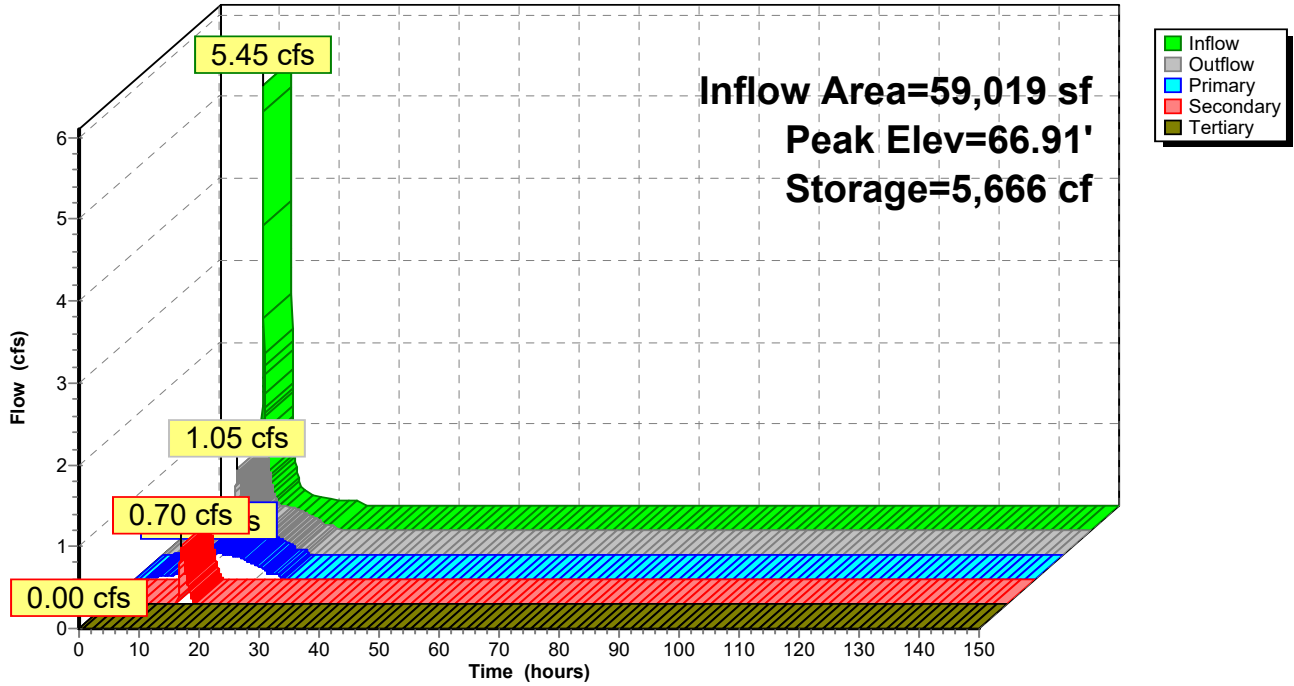
Primary OutFlow Max=0.35 cfs @ 12.39 hrs HW=66.91' (Free Discharge)
 ↑1=3" Orifice (Orifice Controls 0.35 cfs @ 7.11 fps)

Secondary OutFlow Max=0.70 cfs @ 12.39 hrs HW=66.91' (Free Discharge)
 ↑2=8" Sharp-Crested Rectangular Weir (Weir Controls 0.70 cfs @ 2.32 fps)

Tertiary OutFlow Max=0.00 cfs @ 0.00 hrs HW=64.60' (Free Discharge)
 ↑3=Orifice/Grate (Controls 0.00 cfs)

Pond 9P: Existing Basin 2

Hydrograph



Summary for Pond 10P: PP (w/ underdrain) w/ UG storage 5

[44] Hint: Outlet device #3 is below defined storage

Inflow Area = 48,527 sf, 85.53% Impervious, Inflow Depth = 3.42" for 2-Year_2100 event
 Inflow = 4.37 cfs @ 12.13 hrs, Volume= 13,840 cf
 Outflow = 0.37 cfs @ 13.06 hrs, Volume= 13,840 cf, Atten= 92%, Lag= 56.1 min
 Primary = 0.37 cfs @ 13.06 hrs, Volume= 13,840 cf
 Routed to Pond 13P : Bioretention Basin 4
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
 Routed to Pond 13P : Bioretention Basin 4

Routing by Stor-Ind method, Time Span= 0.00-150.00 hrs, dt= 0.02 hrs
 Peak Elev= 95.86' @ 13.06 hrs Surf.Area= 5,816 sf Storage= 5,241 cf

Plug-Flow detention time= 105.4 min calculated for 13,839 cf (100% of inflow)
 Center-of-Mass det. time= 105.4 min (865.0 - 759.5)

Volume	Invert	Avail.Storage	Storage Description
#1	97.00'	3,687 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
#2A	94.50'	5,184 cf	34.75'W x 167.38'L x 3.50'H Field A 20,357 cf Overall - 7,396 cf Embedded = 12,961 cf x 40.0% Voids
#3A	95.00'	7,396 cf	ADS_StormTech SC-740 +Cap x 161 Inside #2 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 161 Chambers in 7 Rows
		16,268 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
97.00	5,816	0.0	0	0
97.67	5,816	35.0	1,364	1,364
97.83	5,816	15.0	140	1,503
98.00	5,816	15.0	148	1,652
98.35	5,816	100.0	2,036	3,687

Device	Routing	Invert	Outlet Devices
#1	Primary	92.07'	3.0" Vert. Restriction Orifice C= 0.600 Limited to weir flow at low heads
#2	Device 1	92.17'	6.0" Round 6" HDPE Underdrain L= 359.0' Ke= 0.500 Inlet / Outlet Invert= 92.17' / 90.37' S= 0.0050 ' S= 0.0050 ' Cc= 0.900 n= 0.020 Corrugated PE, corrugated interior, Flow Area= 0.20 sf
#3	Device 2	92.17'	0.9" x 0.1" Horiz. Perforations X 400.00 columns X 3 rows C= 0.600 Limited to weir flow at low heads
#4	Secondary	98.00'	168.0' long x 2.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Primary OutFlow Max=0.37 cfs @ 13.06 hrs HW=95.86' (Free Discharge)

↑1=**Restriction Orifice** (Passes 0.37 cfs of 0.45 cfs potential flow)

↑2=**6" HDPE Underdrain** (Outlet Controls 0.37 cfs @ 1.88 fps)

↑3=**Perforations** (Passes 0.37 cfs of 6.93 cfs potential flow)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=94.50' (Free Discharge)

↑4=**Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 10P: PP (w/ underdrain) w/ UG storage 5 - Chamber Wizard Field A

Chamber Model = ADS_StormTech SC-740 +Cap (ADS StormTech® SC-740 with cap length)

Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf

Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap

51.0" Wide + 6.0" Spacing = 57.0" C-C Row Spacing

23 Chambers/Row x 7.12' Long +0.81' Cap Length x 2 = 165.38' Row Length +12.0" End Stone x 2 = 167.38' Base Length

7 Rows x 51.0" Wide + 6.0" Spacing x 6 + 12.0" Side Stone x 2 = 34.75' Base Width

6.0" Stone Base + 30.0" Chamber Height + 6.0" Stone Cover = 3.50' Field Height

161 Chambers x 45.9 cf = 7,396.3 cf Chamber Storage

20,357.2 cf Field - 7,396.3 cf Chambers = 12,960.8 cf Stone x 40.0% Voids = 5,184.3 cf Stone Storage

Chamber Storage + Stone Storage = 12,580.7 cf = 0.289 af

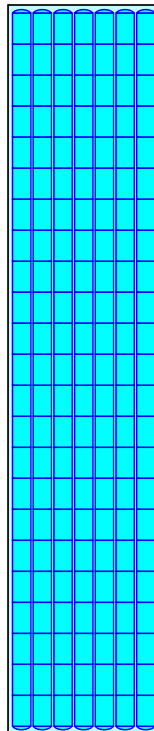
Overall Storage Efficiency = 61.8%

Overall System Size = 167.38' x 34.75' x 3.50'

161 Chambers

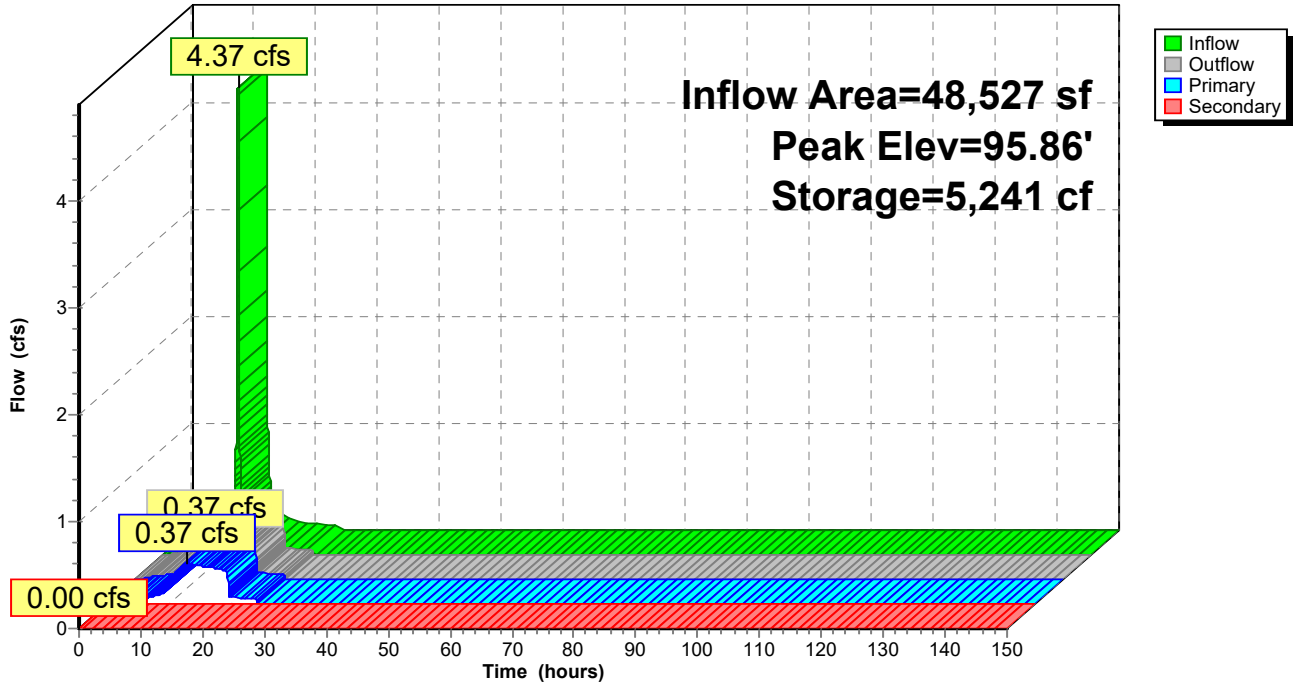
754.0 cy Field

480.0 cy Stone



Pond 10P: PP (w/ underdrain) w/ UG storage 5

Hydrograph



Summary for Pond 11P: PP (w/ underdrain) w/ UG storage 6

[44] Hint: Outlet device #3 is below defined storage

Inflow Area = 57,652 sf, 78.51% Impervious, Inflow Depth = 3.30" for 2-Year_2100 event
 Inflow = 5.55 cfs @ 12.09 hrs, Volume= 15,860 cf
 Outflow = 0.36 cfs @ 13.20 hrs, Volume= 15,860 cf, Atten= 94%, Lag= 66.6 min
 Primary = 0.36 cfs @ 13.20 hrs, Volume= 15,860 cf
 Routed to Pond 13P : Bioretention Basin 4
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
 Routed to Pond 13P : Bioretention Basin 4

Routing by Stor-Ind method, Time Span= 0.00-150.00 hrs, dt= 0.02 hrs
 Peak Elev= 95.67' @ 13.20 hrs Surf.Area= 8,594 sf Storage= 6,485 cf

Plug-Flow detention time= 141.3 min calculated for 15,860 cf (100% of inflow)
 Center-of-Mass det. time= 141.3 min (901.7 - 760.3)

Volume	Invert	Avail.Storage	Storage Description
#1	97.00'	2,144 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
#2A	94.50'	7,621 cf	96.50'W x 89.06'L x 3.50'H Field A 30,079 cf Overall - 11,026 cf Embedded = 19,053 cf x 40.0% Voids
#3A	95.00'	11,026 cf	ADS_StormTech SC-740 +Cap x 240 Inside #2 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 240 Chambers in 20 Rows
		20,791 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
97.00	3,382	0.0	0	0
97.67	3,382	35.0	793	793
97.83	3,382	15.0	81	874
98.00	3,382	15.0	86	960
98.35	3,382	100.0	1,184	2,144

Device	Routing	Invert	Outlet Devices
#1	Primary	92.07'	3.0" Vert. Restriction Orifice C= 0.600 Limited to weir flow at low heads
#2	Device 1	92.17'	6.0" Round 6" HDPE Underdrain L= 359.0' Ke= 0.500 Inlet / Outlet Invert= 92.17' / 90.37' S= 0.0050 ' S= 0.0050 ' Cc= 0.900 n= 0.020 Corrugated PE, corrugated interior, Flow Area= 0.20 sf
#3	Device 2	92.17'	0.9" x 0.1" Horiz. Perforations X 400.00 columns X 3 rows C= 0.600 Limited to weir flow at low heads
#4	Secondary	98.00'	168.0' long x 2.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Primary OutFlow Max=0.36 cfs @ 13.20 hrs HW=95.67' (Free Discharge)

↑1=Restriction Orifice (Passes 0.36 cfs of 0.44 cfs potential flow)

↑2=6" HDPE Underdrain (Outlet Controls 0.36 cfs @ 1.84 fps)

↑3=Perforations (Passes 0.36 cfs of 6.75 cfs potential flow)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=94.50' (Free Discharge)

↑4=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Pond 11P: PP (w/ underdrain) w/ UG storage 6 - Chamber Wizard Field A

Chamber Model = ADS_StormTech SC-740 +Cap (ADS StormTech® SC-740 with cap length)

Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf

Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap

51.0" Wide + 6.0" Spacing = 57.0" C-C Row Spacing

12 Chambers/Row x 7.12' Long +0.81' Cap Length x 2 = 87.06' Row Length +12.0" End Stone x 2 = 89.06' Base Length

20 Rows x 51.0" Wide + 6.0" Spacing x 19 + 12.0" Side Stone x 2 = 96.50' Base Width

6.0" Stone Base + 30.0" Chamber Height + 6.0" Stone Cover = 3.50' Field Height

240 Chambers x 45.9 cf = 11,025.6 cf Chamber Storage

30,078.9 cf Field - 11,025.6 cf Chambers = 19,053.3 cf Stone x 40.0% Voids = 7,621.3 cf Stone Storage

Chamber Storage + Stone Storage = 18,646.9 cf = 0.428 af

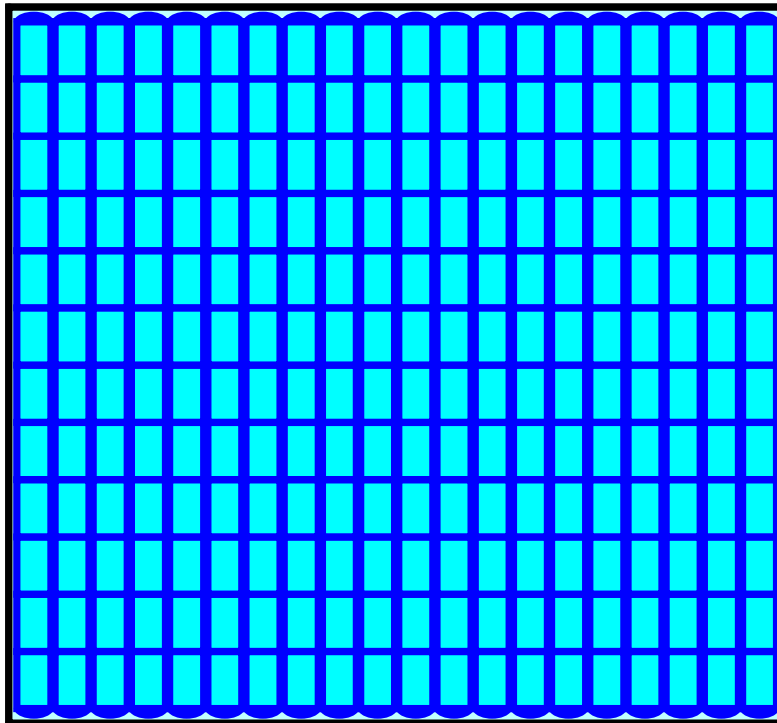
Overall Storage Efficiency = 62.0%

Overall System Size = 89.06' x 96.50' x 3.50'

240 Chambers

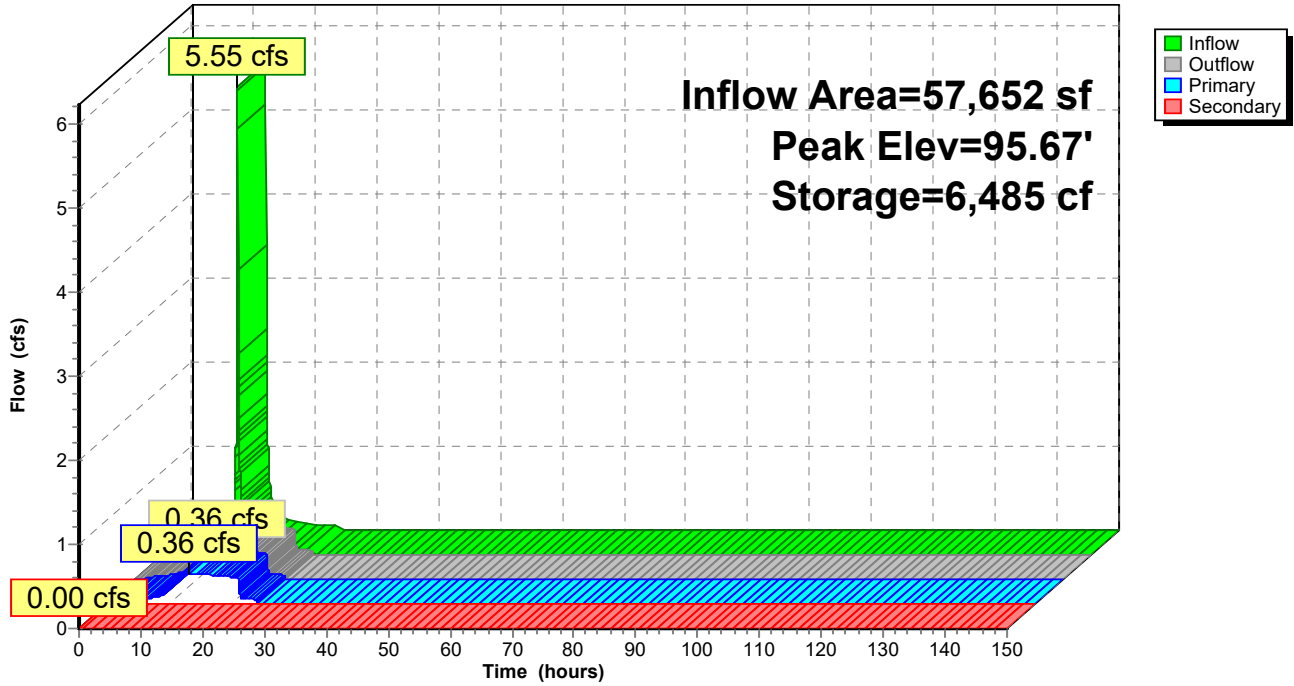
1,114.0 cy Field

705.7 cy Stone



Pond 11P: PP (w/ underdrain) w/ UG storage 6

Hydrograph



Summary for Pond 12P: PP (w/ underdrain) w/ UG storage 7

[44] Hint: Outlet device #3 is below defined storage

Inflow Area = 67,756 sf, 72.56% Impervious, Inflow Depth = 3.20" for 2-Year _2100 event
 Inflow = 6.30 cfs @ 12.10 hrs, Volume= 18,074 cf
 Outflow = 0.36 cfs @ 13.38 hrs, Volume= 18,074 cf, Atten= 94%, Lag= 77.0 min
 Primary = 0.36 cfs @ 13.38 hrs, Volume= 18,074 cf
 Routed to Pond 13P : Bioretention Basin 4
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
 Routed to Pond 13P : Bioretention Basin 4

Routing by Stor-Ind method, Time Span= 0.00-150.00 hrs, dt= 0.02 hrs
 Peak Elev= 95.59' @ 13.38 hrs Surf.Area= 11,316 sf Storage= 7,878 cf

Plug-Flow detention time= 182.7 min calculated for 18,072 cf (100% of inflow)
 Center-of-Mass det. time= 182.6 min (946.8 - 764.2)

Volume	Invert	Avail.Storage	Storage Description
#1	97.00'	935 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
#2A	94.50'	9,962 cf	77.50'W x 146.02'L x 3.50'H Field A 39,607 cf Overall - 14,701 cf Embedded = 24,906 cf x 40.0% Voids
#3A	95.00'	14,701 cf	ADS_StormTech SC-740 +Cap x 320 Inside #2 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 320 Chambers in 16 Rows
		25,598 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
97.00	1,474	0.0	0	0
97.67	1,474	35.0	346	346
97.83	1,474	15.0	35	381
98.00	1,474	15.0	38	419
98.35	1,474	100.0	516	935

Device	Routing	Invert	Outlet Devices
#1	Primary	92.07'	3.0" Vert. Restriction Orifice C= 0.600 Limited to weir flow at low heads
#2	Device 1	92.17'	6.0" Round 6" HDPE Underdrain L= 359.0' Ke= 0.500 Inlet / Outlet Invert= 92.17' / 90.37' S= 0.0050 ' S= 0.0050 ' Cc= 0.900 n= 0.020 Corrugated PE, corrugated interior, Flow Area= 0.20 sf
#3	Device 2	92.17'	0.9" x 0.1" Horiz. Perforations X 400.00 columns X 3 rows C= 0.600 Limited to weir flow at low heads
#4	Secondary	98.00'	168.0' long x 2.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Primary OutFlow Max=0.36 cfs @ 13.38 hrs HW=95.59' (Free Discharge)

↑1=**Restriction Orifice** (Passes 0.36 cfs of 0.44 cfs potential flow)

↑2=**6" HDPE Underdrain** (Outlet Controls 0.36 cfs @ 1.82 fps)

↑3=**Perforations** (Passes 0.36 cfs of 6.68 cfs potential flow)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=94.50' (Free Discharge)

↑4=**Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 12P: PP (w/ underdrain) w/ UG storage 7 - Chamber Wizard Field A

Chamber Model = ADS_StormTech SC-740 +Cap (ADS StormTech® SC-740 with cap length)

Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf

Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap

51.0" Wide + 6.0" Spacing = 57.0" C-C Row Spacing

20 Chambers/Row x 7.12' Long +0.81' Cap Length x 2 = 144.02' Row Length +12.0" End Stone x 2 = 146.02' Base Length

16 Rows x 51.0" Wide + 6.0" Spacing x 15 + 12.0" Side Stone x 2 = 77.50' Base Width

6.0" Stone Base + 30.0" Chamber Height + 6.0" Stone Cover = 3.50' Field Height

320 Chambers x 45.9 cf = 14,700.8 cf Chamber Storage

39,607.0 cf Field - 14,700.8 cf Chambers = 24,906.2 cf Stone x 40.0% Voids = 9,962.5 cf Stone Storage

Chamber Storage + Stone Storage = 24,663.3 cf = 0.566 af

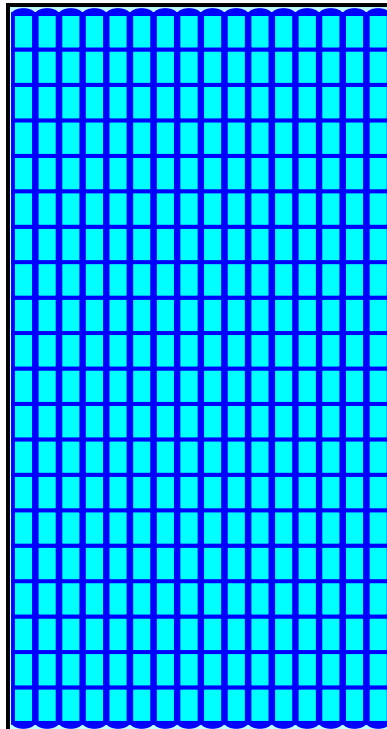
Overall Storage Efficiency = 62.3%

Overall System Size = 146.02' x 77.50' x 3.50'

320 Chambers

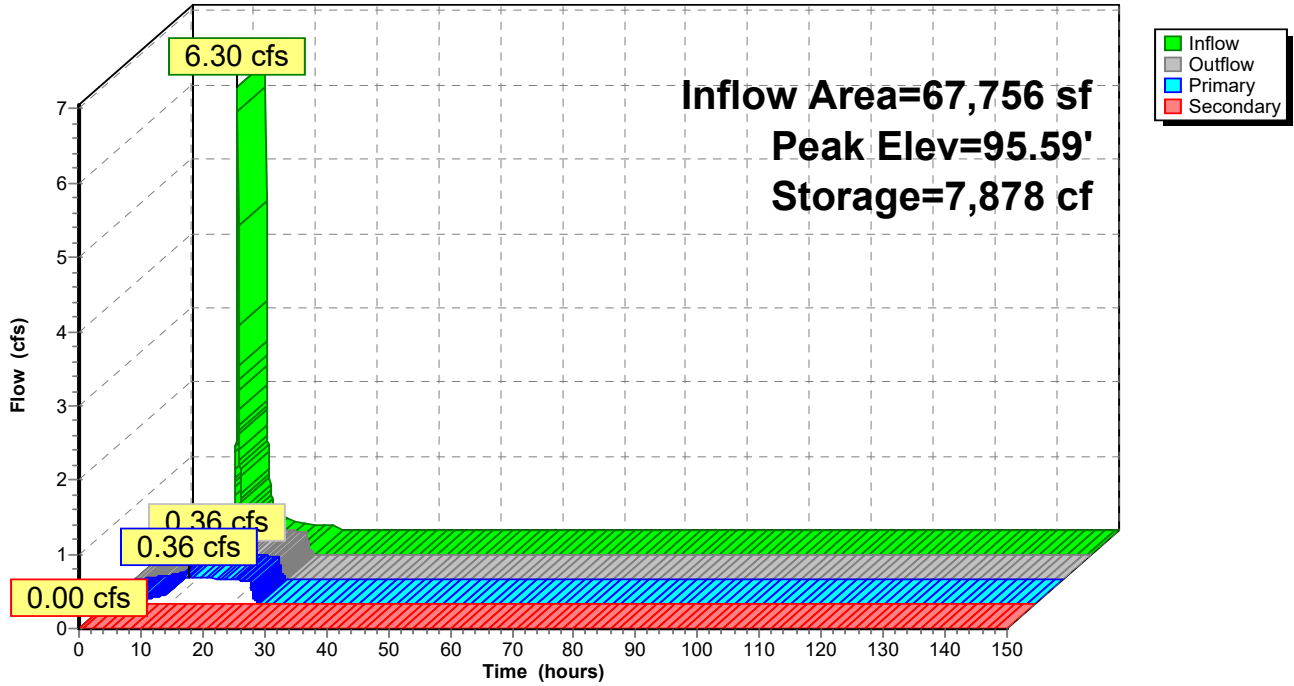
1,466.9 cy Field

922.5 cy Stone



Pond 12P: PP (w/ underdrain) w/ UG storage 7

Hydrograph



Summary for Pond 13P: Bioretention Basin 4

Inflow Area = 329,976 sf, 48.67% Impervious, Inflow Depth = 2.64" for 2-Year_2100 event
 Inflow = 6.05 cfs @ 12.36 hrs, Volume= 72,685 cf
 Outflow = 3.39 cfs @ 12.76 hrs, Volume= 71,423 cf, Atten= 44%, Lag= 23.6 min
 Primary = 0.35 cfs @ 12.76 hrs, Volume= 30,021 cf
 Routed to nonexistent node 5R
 Secondary = 3.04 cfs @ 12.76 hrs, Volume= 41,402 cf
 Routed to nonexistent node 5R
 Tertiary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
 Routed to nonexistent node 5R

Routing by Stor-Ind method, Time Span= 0.00-150.00 hrs, dt= 0.02 hrs / 2
 Peak Elev= 51.61' @ 12.76 hrs Surf.Area= 9,735 sf Storage= 18,950 cf

Plug-Flow detention time= 273.4 min calculated for 71,413 cf (98% of inflow)
 Center-of-Mass det. time= 264.7 min (1,149.3 - 884.6)

Volume	Invert	Avail.Storage	Storage Description
#1	49.00'	33,395 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
49.00	4,800	0	0
52.00	10,478	22,917	22,917
53.00	10,478	10,478	33,395

Device	Routing	Invert	Outlet Devices
#1	Primary	49.25'	3.0" Vert. Low Flow Orifice C= 0.600 Limited to weir flow at low heads
#2	Secondary	51.00'	24.0" W x 18.0" H Vert. SECONDARY OUTLET C= 0.600 Limited to weir flow at low heads
#3	Tertiary	52.00'	60.0" x 60.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.35 cfs @ 12.76 hrs HW=51.61' (Free Discharge)

↑**1=Low Flow Orifice** (Orifice Controls 0.35 cfs @ 7.19 fps)

Secondary OutFlow Max=3.04 cfs @ 12.76 hrs HW=51.61' (Free Discharge)

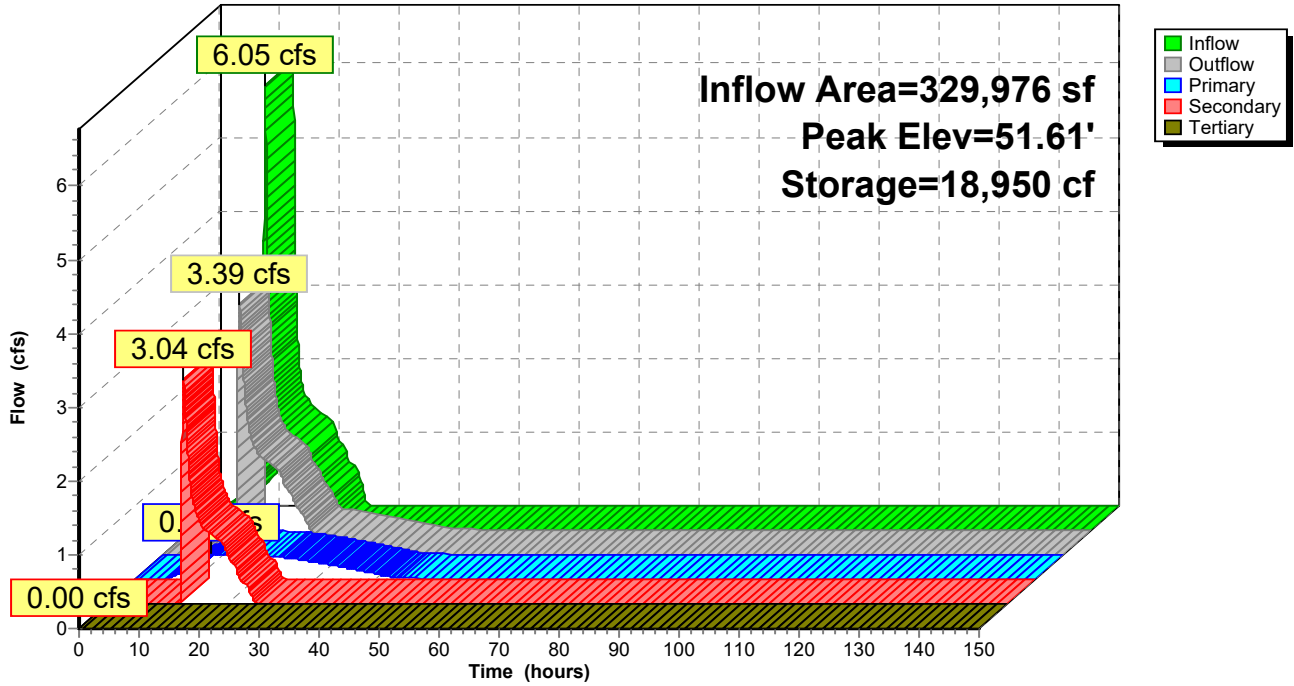
↑**2=SECONDARY OUTLET** (Orifice Controls 3.04 cfs @ 2.50 fps)

Tertiary OutFlow Max=0.00 cfs @ 0.00 hrs HW=49.00' (Free Discharge)

↑**3=Orifice/Grate** (Controls 0.00 cfs)

Pond 13P: Bioretention Basin 4

Hydrograph



Time span=0.00-150.00 hrs, dt=0.02 hrs, 7501 points
 Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious
 Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: DA 1: CN w/ IC areas	Runoff Area=141,085 sf 17.73% Impervious Runoff Depth=1.53" Tc=18.6 min CN=75/98 Runoff=4.06 cfs 17,985 cf
Subcatchment 2S: DA 2: CN w/ IC areas	Runoff Area=21,583 sf 64.54% Impervious Runoff Depth=2.49" Tc=1.4 min CN=78/98 Runoff=1.61 cfs 4,485 cf
Subcatchment 3S: DA 3: CN w/ IC areas	Runoff Area=40,101 sf 65.65% Impervious Runoff Depth=2.49" Tc=3.5 min CN=77/98 Runoff=2.88 cfs 8,323 cf
Subcatchment 4S: DA 4: CN w/ IC areas	Runoff Area=84,260 sf 73.22% Impervious Runoff Depth=2.63" Tc=3.2 min CN=77/98 Runoff=6.39 cfs 18,443 cf
Subcatchment 5S: DA 5: CN w/ IC areas	Runoff Area=52,282 sf 79.56% Impervious Runoff Depth=2.75" Tc=2.5 min CN=78/98 Runoff=4.22 cfs 11,996 cf
Subcatchment 6S: DA 6: CN w/ IC areas	Runoff Area=76,785 sf 82.96% Impervious Runoff Depth=2.82" Tc=3.2 min CN=79/98 Runoff=6.21 cfs 18,066 cf
Subcatchment 7S: DA 7: CN w/ IC areas	Runoff Area=120,233 sf 94.05% Impervious Runoff Depth=3.00" Tc=3.5 min CN=78/98 Runoff=10.17 cfs 30,098 cf
Subcatchment 8S: DA 8: CN w/ IC areas	Runoff Area=111,353 sf 71.87% Impervious Runoff Depth=2.54" Tc=2.0 min CN=73/98 Runoff=8.42 cfs 23,523 cf
Subcatchment 9S: DA 9: CN w/ IC areas	Runoff Area=59,019 sf 68.70% Impervious Runoff Depth=2.57" Tc=2.8 min CN=78/98 Runoff=4.45 cfs 12,617 cf
Subcatchment 10S: DA 10: CN w/ IC areas	Runoff Area=48,527 sf 85.53% Impervious Runoff Depth=2.82" Tc=5.8 min CN=74/98 Runoff=3.62 cfs 11,408 cf
Subcatchment 11S: DA 11: CN w/ IC areas	Runoff Area=57,652 sf 78.51% Impervious Runoff Depth=2.71" Tc=2.5 min CN=76/98 Runoff=4.58 cfs 13,010 cf
Subcatchment 12S: DA 12: CN w/ IC areas	Runoff Area=67,756 sf 72.56% Impervious Runoff Depth=2.61" Tc=2.9 min CN=77/98 Runoff=5.17 cfs 14,764 cf
Subcatchment 13S: DA 13: CN w/ IC areas	Runoff Area=156,041 sf 15.80% Impervious Runoff Depth=1.44" Tc=24.6 min CN=74/98 Runoff=3.68 cfs 18,764 cf
Pond 1P: Bioretention Basin 1	Peak Elev=63.94' Storage=8,600 cf Inflow=4.06 cfs 17,985 cf Primary=0.34 cfs 17,985 cf Secondary=0.00 cfs 0 cf Tertiary=0.00 cfs 0 cf Outflow=0.34 cfs 17,985 cf
Pond 2P: Bioretention Basin 2	Peak Elev=69.24' Storage=2,095 cf Inflow=1.61 cfs 4,485 cf Primary=0.22 cfs 4,143 cf Secondary=0.00 cfs 0 cf Tertiary=0.00 cfs 0 cf Outflow=0.22 cfs 4,143 cf
Pond 3P: Bioretention Basin 3	Peak Elev=65.77' Storage=4,166 cf Inflow=2.88 cfs 8,323 cf Primary=0.28 cfs 7,862 cf Secondary=0.00 cfs 0 cf Tertiary=0.00 cfs 0 cf Outflow=0.28 cfs 7,862 cf

Pond 4P: PP (w/ underdrain) w/ UG storage 1 Peak Elev=95.42' Storage=8,208 cf Inflow=6.39 cfs 18,443 cf
Primary=0.35 cfs 18,443 cf Secondary=0.00 cfs 0 cf Outflow=0.35 cfs 18,443 cf

Pond 5P: PP (w/ underdrain) w/ UG storage 2 Peak Elev=95.43' Storage=5,703 cf Inflow=4.22 cfs 11,996 cf
Primary=0.19 cfs 11,996 cf Secondary=0.00 cfs 0 cf Outflow=0.19 cfs 11,996 cf

Pond 6P: PP (w/ underdrain) w/ UG storage 3 Peak Elev=95.46' Storage=9,922 cf Inflow=6.21 cfs 18,066 cf
Primary=0.19 cfs 18,066 cf Secondary=0.00 cfs 0 cf Outflow=0.19 cfs 18,066 cf

Pond 7P: PP (w/ underdrain) w/ UG Peak Elev=95.48' Storage=15,922 cf Inflow=10.17 cfs 30,098 cf
Primary=0.35 cfs 30,098 cf Secondary=0.00 cfs 0 cf Outflow=0.35 cfs 30,098 cf

Pond 8P: Existing Basin 1 Peak Elev=59.05' Storage=4,615 cf Inflow=9.45 cfs 102,126 cf
Primary=5.85 cfs 102,126 cf Secondary=0.00 cfs 0 cf Tertiary=0.00 cfs 0 cf Outflow=5.85 cfs 102,126 cf

Pond 9P: Existing Basin 2 Peak Elev=66.70' Storage=4,801 cf Inflow=4.45 cfs 12,617 cf
Primary=0.33 cfs 11,249 cf Secondary=0.35 cfs 1,368 cf Tertiary=0.00 cfs 0 cf Outflow=0.68 cfs 12,617 cf

Pond 10P: PP (w/ underdrain) w/ UG storage Peak Elev=95.59' Storage=4,010 cf Inflow=3.62 cfs 11,408 cf
Primary=0.36 cfs 11,408 cf Secondary=0.00 cfs 0 cf Outflow=0.36 cfs 11,408 cf

Pond 11P: PP (w/ underdrain) w/ UG storage Peak Elev=95.45' Storage=4,956 cf Inflow=4.58 cfs 13,010 cf
Primary=0.35 cfs 13,010 cf Secondary=0.00 cfs 0 cf Outflow=0.35 cfs 13,010 cf

Pond 12P: PP (w/ underdrain) w/ UG storage Peak Elev=95.39' Storage=6,005 cf Inflow=5.17 cfs 14,764 cf
Primary=0.35 cfs 14,764 cf Secondary=0.00 cfs 0 cf Outflow=0.35 cfs 14,764 cf

Pond 13P: Bioretention Basin 4 Peak Elev=51.43' Storage=17,279 cf Inflow=4.72 cfs 57,946 cf
Primary=0.34 cfs 28,380 cf Secondary=1.83 cfs 28,304 cf Tertiary=0.00 cfs 0 cf Outflow=2.17 cfs 56,684 cf

Total Runoff Area = 1,036,677 sf Runoff Volume = 203,482 cf Average Runoff Depth = 2.36"
39.57% Pervious = 410,178 sf 60.43% Impervious = 626,499 sf

Summary for Subcatchment 1S: DA 1: CN w/ IC areas

Runoff = 4.06 cfs @ 12.28 hrs, Volume= 17,985 cf, Depth= 1.53"
 Routed to Pond 1P : Bioretention Basin 1

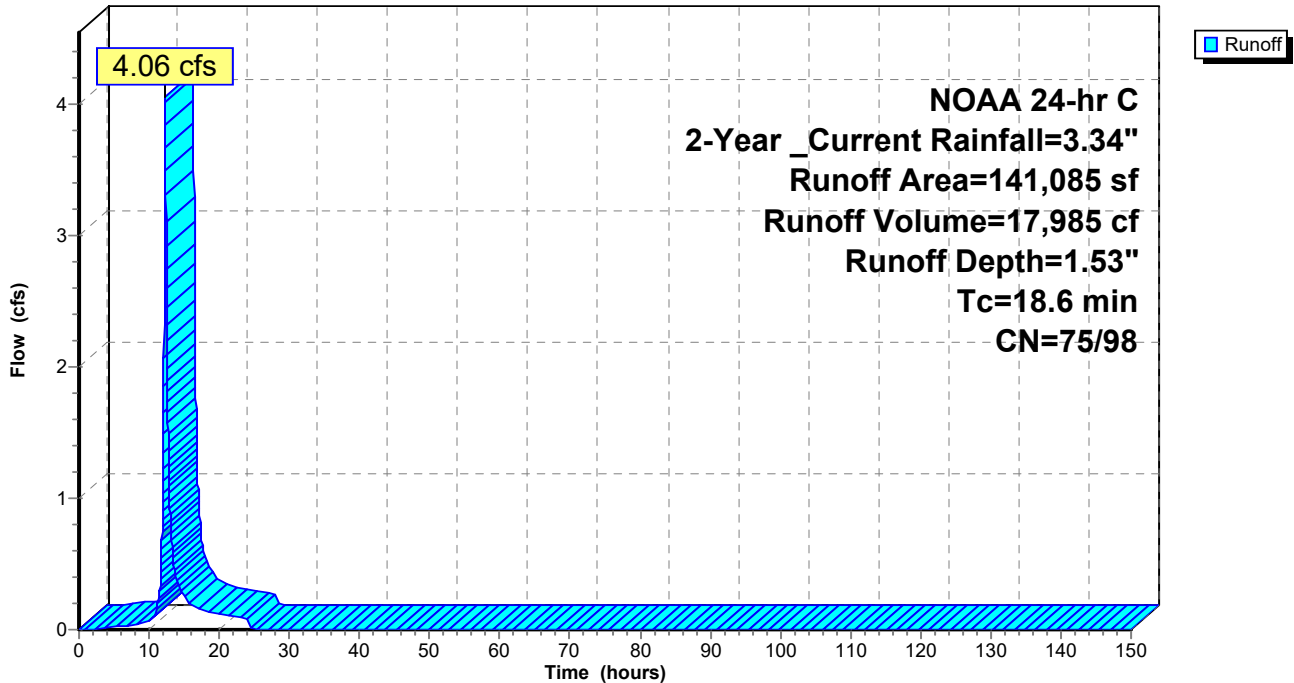
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-150.00 hrs, dt= 0.00
 NOAA 24-hr C 2-Year _Current Rainfall=3.34"

	Area (sf)	CN	Description
*	25,014	98	Impervious HSG C
	26,886	70	Brush (fair) HSG C
	45,464	79	Open Space (fair) HSG C
*	10,665	74	Open Space (good) HSG C
*	33,056	73	Woods (fair) HSG C
	141,085	79	Weighted Average
	116,071	75	82.27% Pervious Area
	25,014	98	17.73% Impervious Area

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

Subcatchment 1S: DA 1: CN w/ IC areas

Hydrograph



Summary for Subcatchment 2S: DA 2: CN w/ IC areas

[49] Hint: Tc<2dt may require smaller dt

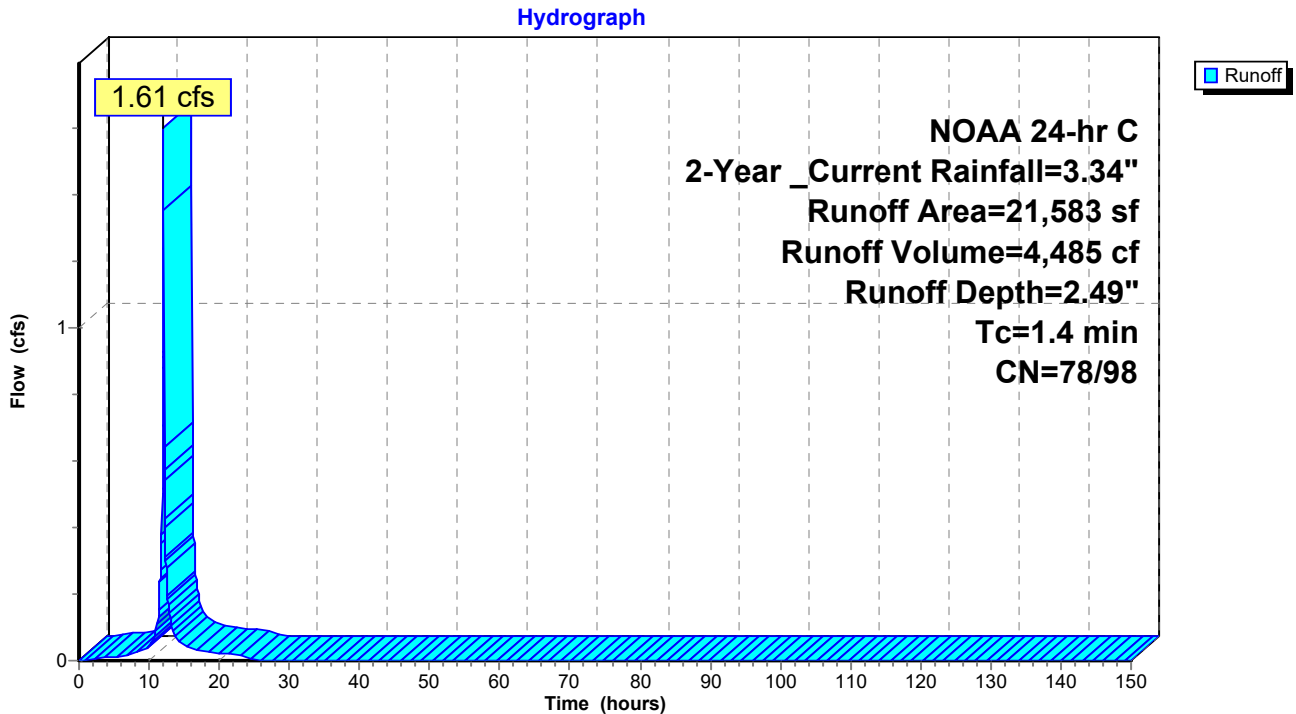
Runoff = 1.61 cfs @ 12.10 hrs, Volume= 4,485 cf, Depth= 2.49"
 Routed to Pond 2P : Bioretention Basin 2

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-150.00 hrs, dt= 0.0
 NOAA 24-hr C 2-Year _Current Rainfall=3.34"

	Area (sf)	CN	Description
*	13,929	98	Impervious HSG C
	6,668	79	Open Space (fair) HSG C
*	986	74	Open Space (good) HSG C
	21,583	91	Weighted Average
	7,654	78	35.46% Pervious Area
	13,929	98	64.54% Impervious Area

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

Subcatchment 2S: DA 2: CN w/ IC areas



Summary for Subcatchment 3S: DA 3: CN w/ IC areas

Runoff = 2.88 cfs @ 12.11 hrs, Volume= 8,323 cf, Depth= 2.49"
 Routed to Pond 3P : Bioretention Basin 3

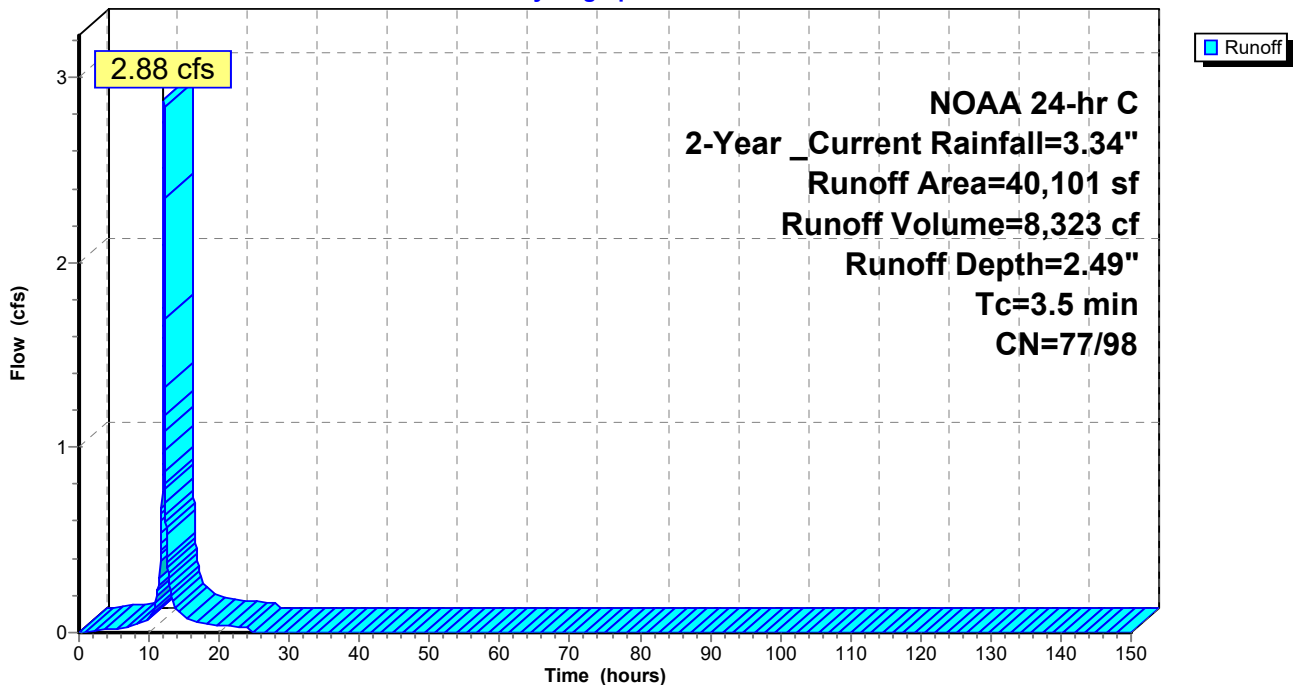
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-150.00 hrs, dt= 0.00
 NOAA 24-hr C 2-Year _Current Rainfall=3.34"

	Area (sf)	CN	Description
*	26,326	98	Impervious HSG C
	9,202	79	Open Space (fair) HSG C
*	4,573	74	Open Space (good) HSG C
	40,101	91	Weighted Average
	13,775	77	34.35% Pervious Area
	26,326	98	65.65% Impervious Area

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

Subcatchment 3S: DA 3: CN w/ IC areas

Hydrograph



Summary for Subcatchment 4S: DA 4: CN w/ IC areas

Runoff = 6.39 cfs @ 12.10 hrs, Volume= 18,443 cf, Depth= 2.63"

Routed to Pond 4P : PP (w/ underdrain) w/ UG storage 1

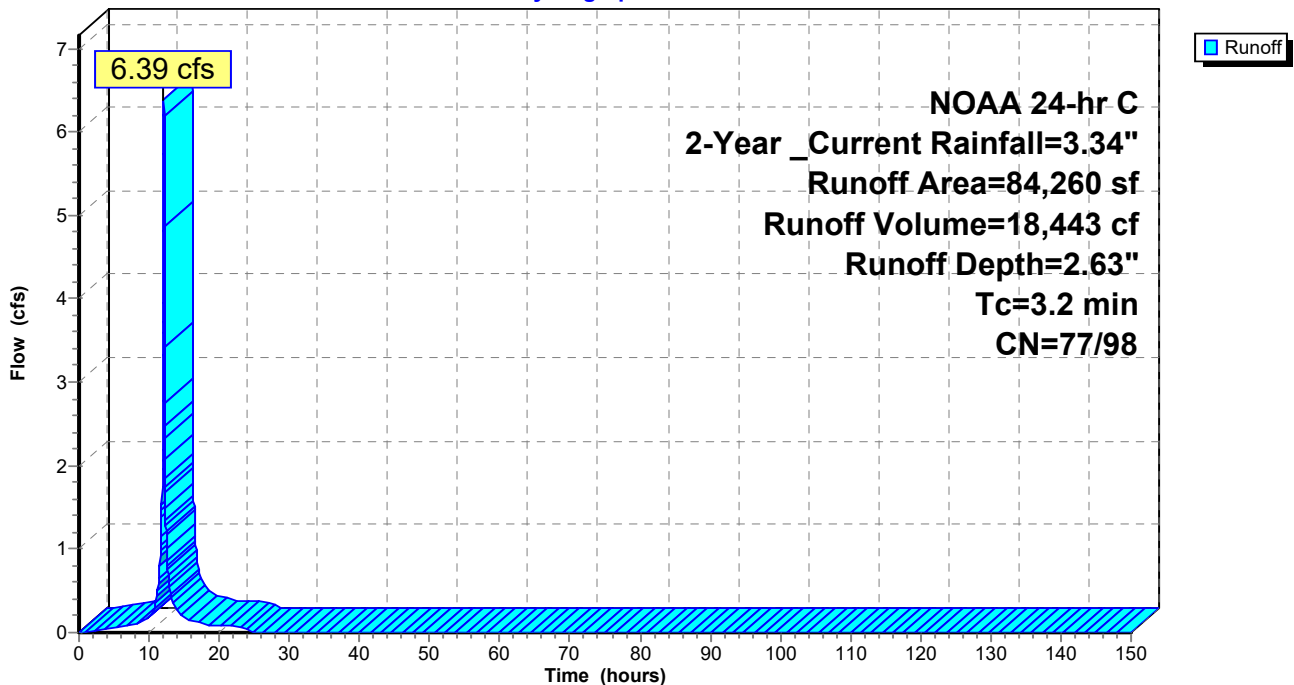
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-150.00 hrs, dt= 0.00
 NOAA 24-hr C 2-Year _Current Rainfall=3.34"

	Area (sf)	CN	Description
*	61,698	98	Impervious HSG C
	13,143	79	Open Space (fair) HSG C
*	9,419	74	Open Space (good) HSG C
	84,260	92	Weighted Average
	22,562	77	26.78% Pervious Area
	61,698	98	73.22% Impervious Area

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

Subcatchment 4S: DA 4: CN w/ IC areas

Hydrograph



Summary for Subcatchment 5S: DA 5: CN w/ IC areas

Runoff = 4.22 cfs @ 12.09 hrs, Volume= 11,996 cf, Depth= 2.75"

Routed to Pond 5P : PP (w/ underdrain) w/ UG storage 2

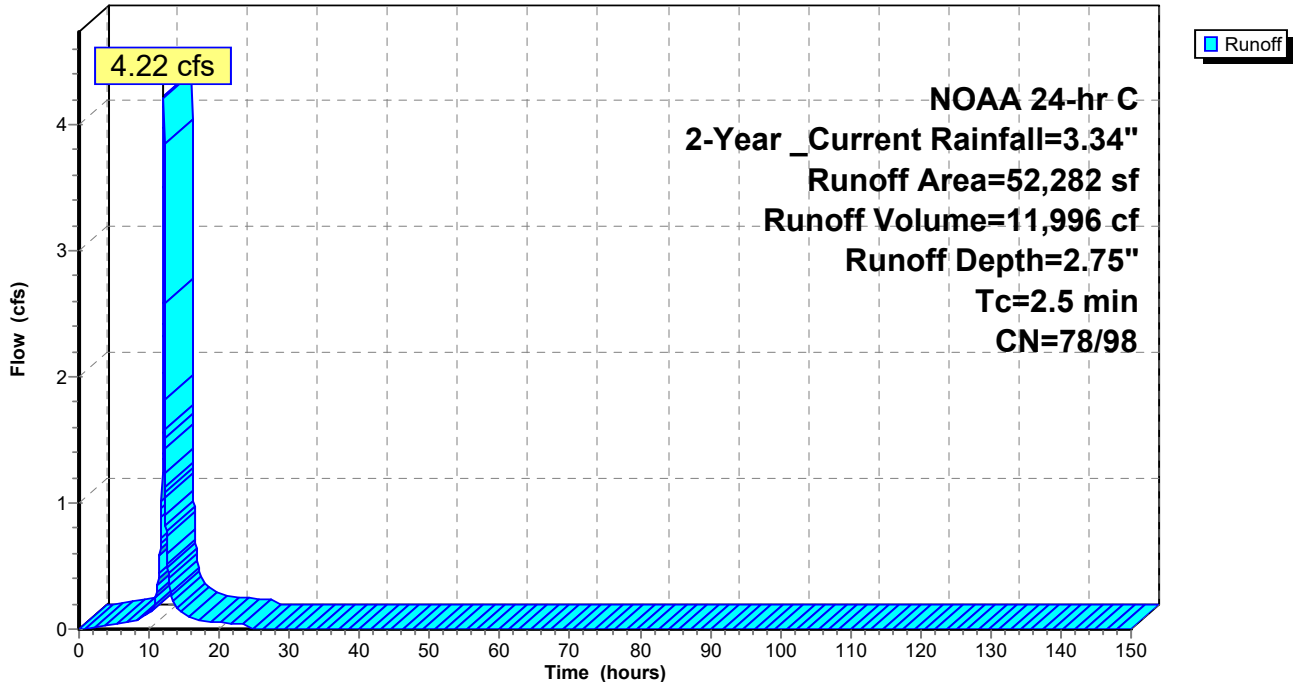
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-150.00 hrs, dt= 0.0
 NOAA 24-hr C 2-Year _Current Rainfall=3.34"

	Area (sf)	CN	Description
*	41,595	98	Impervious HSG C
	444	70	Brush (fair) HSG C
	9,377	79	Open Space (fair) HSG C
*	866	74	Open Space (good) HSG C
	52,282	94	Weighted Average
	10,687	78	20.44% Pervious Area
	41,595	98	79.56% Impervious Area

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

Subcatchment 5S: DA 5: CN w/ IC areas

Hydrograph



Summary for Subcatchment 6S: DA 6: CN w/ IC areas

Runoff = 6.21 cfs @ 12.10 hrs, Volume= 18,066 cf, Depth= 2.82"

Routed to Pond 6P : PP (w/ underdrain) w/ UG storage 3

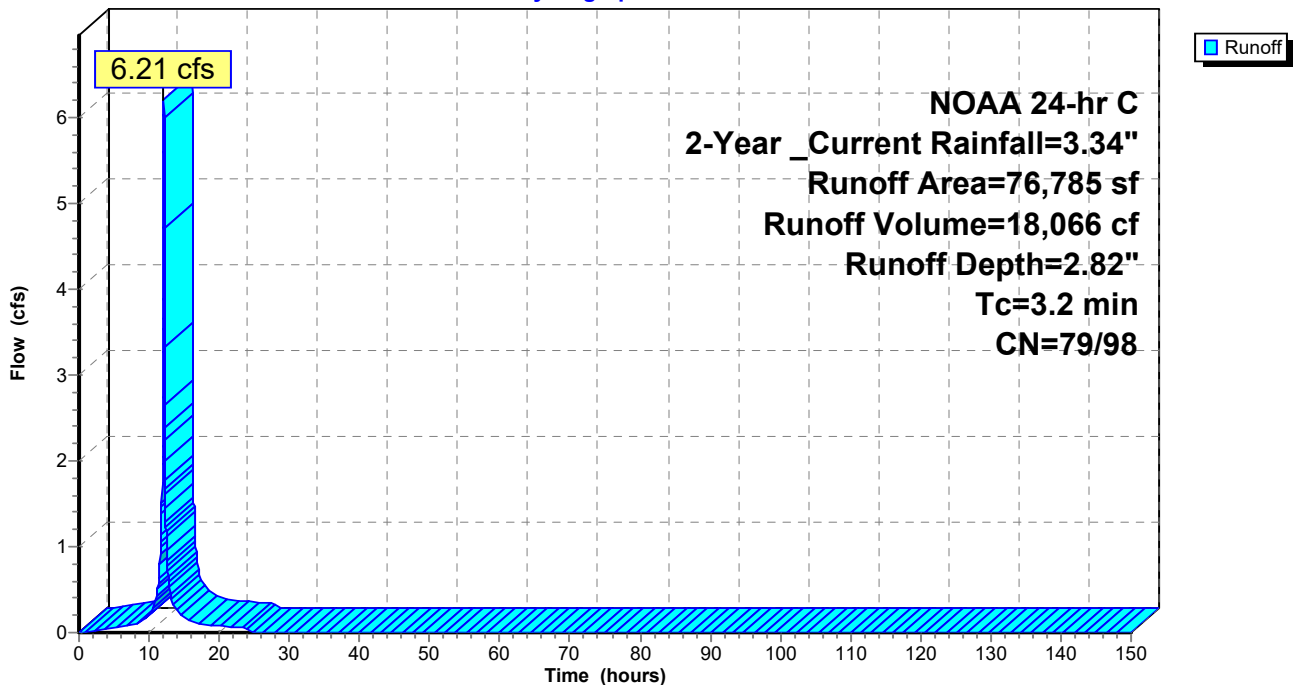
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-150.00 hrs, dt= 0.00
 NOAA 24-hr C 2-Year _Current Rainfall=3.34"

	Area (sf)	CN	Description
*	63,699	98	Impervious HSG C
	12,708	79	Open Space (fair) HSG C
*	378	74	Open Space (good) HSG C
	76,785	95	Weighted Average
	13,086	79	17.04% Pervious Area
	63,699	98	82.96% Impervious Area

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

Subcatchment 6S: DA 6: CN w/ IC areas

Hydrograph



Summary for Subcatchment 7S: DA 7: CN w/ IC areas

Runoff = 10.17 cfs @ 12.10 hrs, Volume= 30,098 cf, Depth= 3.00"

Routed to Pond 7P : PP (w/ underdrain) w/ UG storage 4

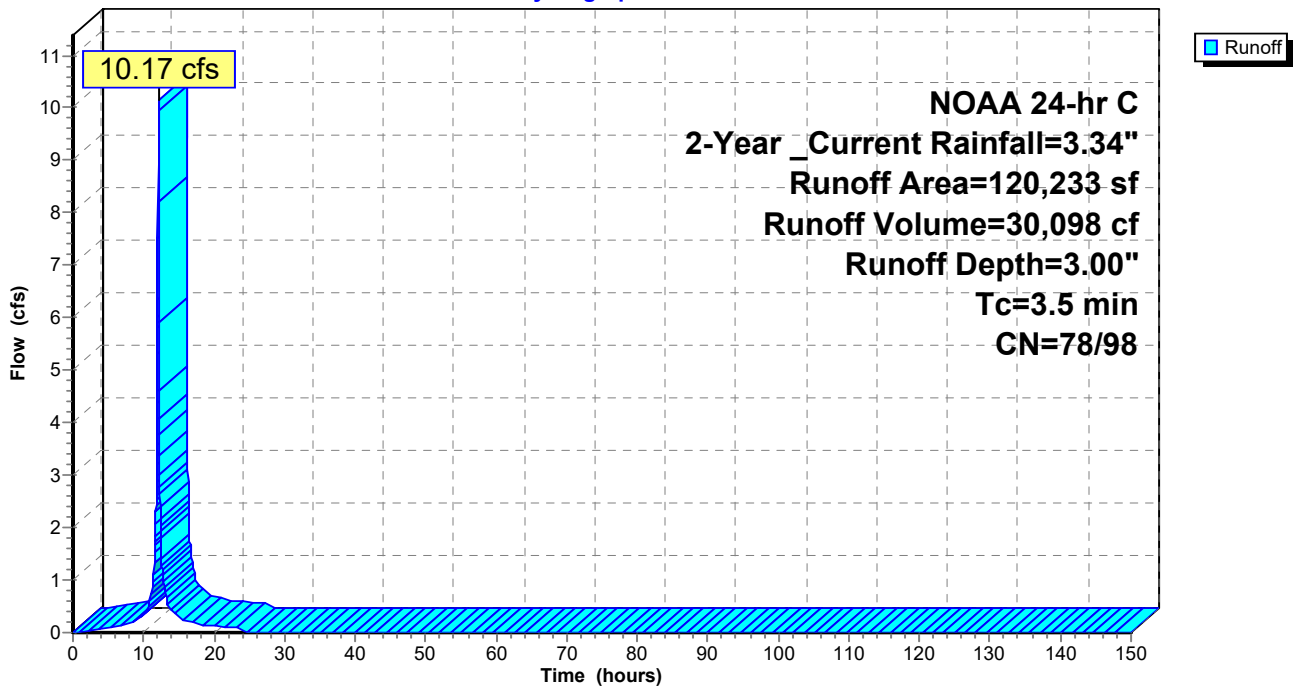
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-150.00 hrs, dt= 0.00
 NOAA 24-hr C 2-Year _Current Rainfall=3.34"

	Area (sf)	CN	Description
*	113,075	98	Impervious HSG C
	5,111	79	Open Space (fair) HSG C
*	2,047	74	Open Space (good) HSG C
	120,233	97	Weighted Average
	7,158	78	5.95% Pervious Area
	113,075	98	94.05% Impervious Area

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

Subcatchment 7S: DA 7: CN w/ IC areas

Hydrograph



Summary for Subcatchment 8S: DA 8: CN w/ IC areas

[49] Hint: Tc<2dt may require smaller dt

Runoff = 8.42 cfs @ 12.09 hrs, Volume= 23,523 cf, Depth= 2.54"
 Routed to Pond 8P : Existing Basin 1

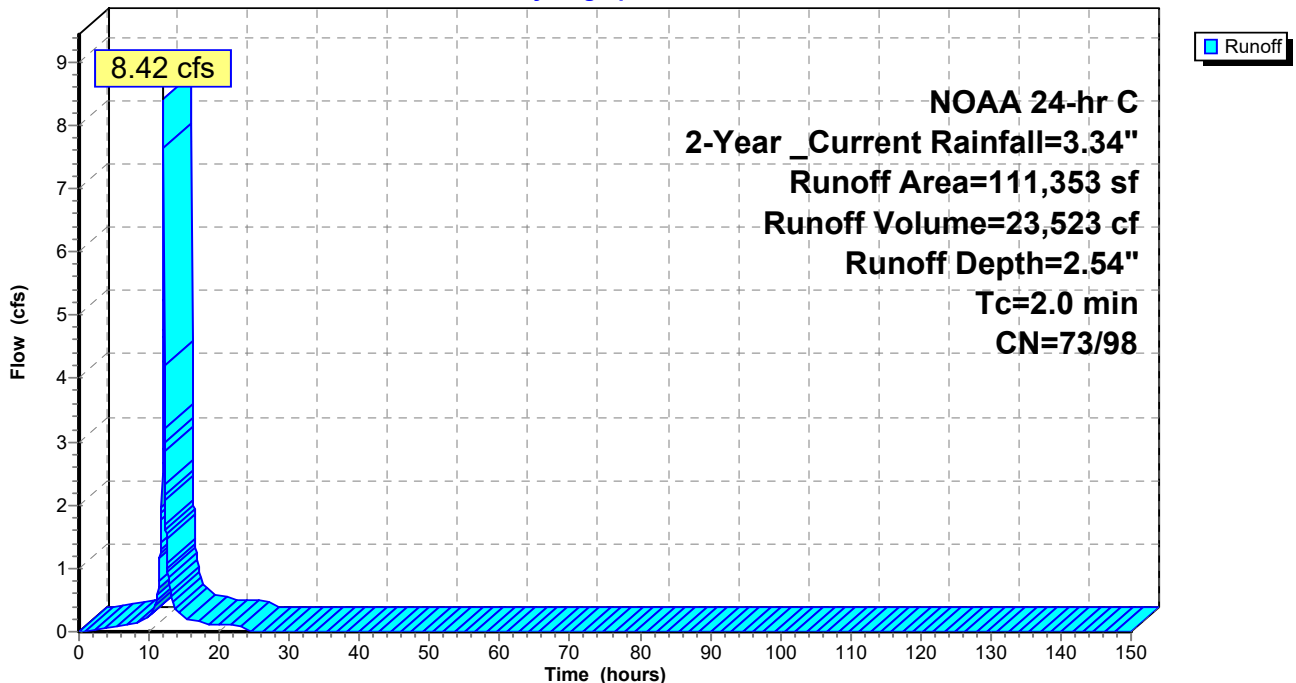
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-150.00 hrs, dt= 0.00
 NOAA 24-hr C 2-Year _Current Rainfall=3.34"

	Area (sf)	CN	Description
*	80,033	98	Impervious HSG C
	3,876	70	Brush (fair) HSG C
	419	79	Open Space (fair) HSG C
*	12,431	74	Open Space (good) HSG C
*	14,594	73	Woods (fair) HSG C
	111,353	91	Weighted Average
	31,320	73	28.13% Pervious Area
	80,033	98	71.87% Impervious Area

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

Subcatchment 8S: DA 8: CN w/ IC areas

Hydrograph



Summary for Subcatchment 9S: DA 9: CN w/ IC areas

Runoff = 4.45 cfs @ 12.10 hrs, Volume= 12,617 cf, Depth= 2.57"
 Routed to Pond 9P : Existing Basin 2

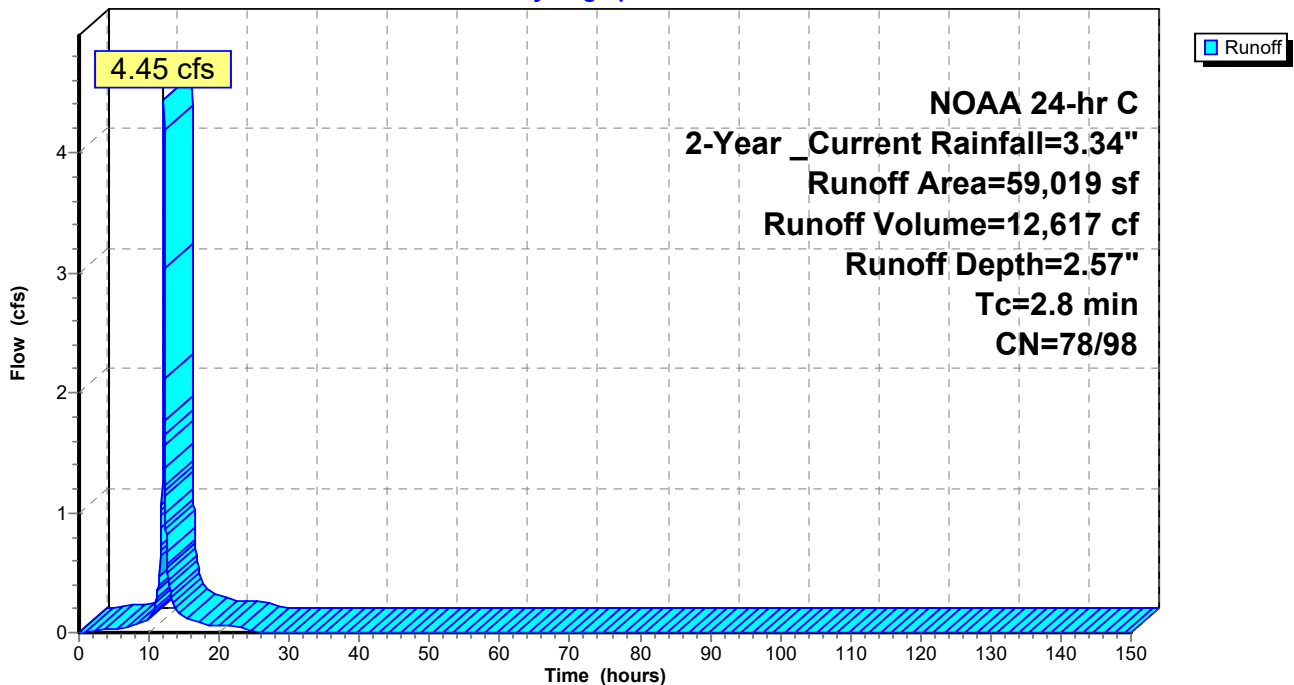
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-150.00 hrs, dt= 0.00
 NOAA 24-hr C 2-Year _Current Rainfall=3.34"

	Area (sf)	CN	Description
*	40,544	98	Impervious HSG C
	15,969	79	Open Space (fair) HSG C
*	2,506	74	Open Space (good) HSG C
	59,019	92	Weighted Average
	18,475	78	31.30% Pervious Area
	40,544	98	68.70% Impervious Area

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

Subcatchment 9S: DA 9: CN w/ IC areas

Hydrograph



Summary for Subcatchment 10S: DA 10: CN w/ IC areas

Runoff = 3.62 cfs @ 12.13 hrs, Volume= 11,408 cf, Depth= 2.82"

Routed to Pond 10P : PP (w/ underdrain) w/ UG storage 5

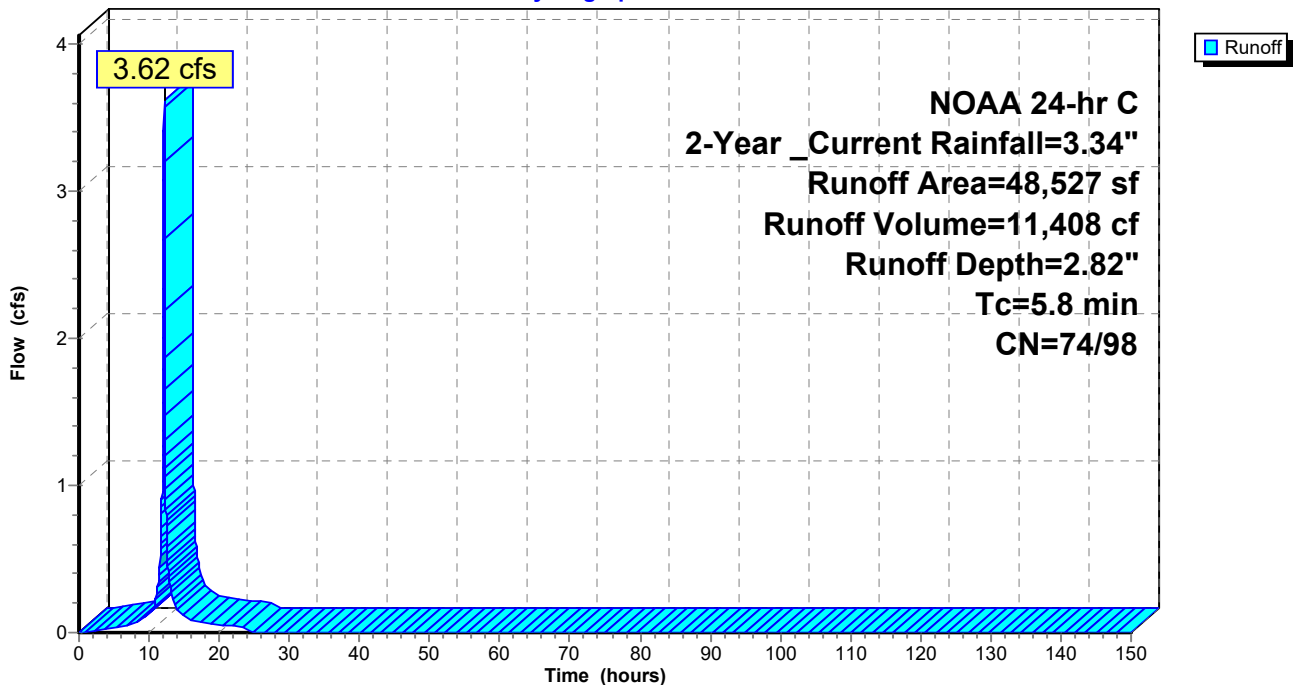
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-150.00 hrs, dt= 0.00
 NOAA 24-hr C 2-Year _Current Rainfall=3.34"

	Area (sf)	CN	Description
*	41,506	98	Impervious HSG C
	60	79	Open Space (fair) HSG C
*	6,961	74	Open Space (good) HSG C
	48,527	95	Weighted Average
	7,021	74	14.47% Pervious Area
	41,506	98	85.53% Impervious Area

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

Subcatchment 10S: DA 10: CN w/ IC areas

Hydrograph



Summary for Subcatchment 11S: DA 11: CN w/ IC areas

Runoff = 4.58 cfs @ 12.09 hrs, Volume= 13,010 cf, Depth= 2.71"

Routed to Pond 11P : PP (w/ underdrain) w/ UG storage 6

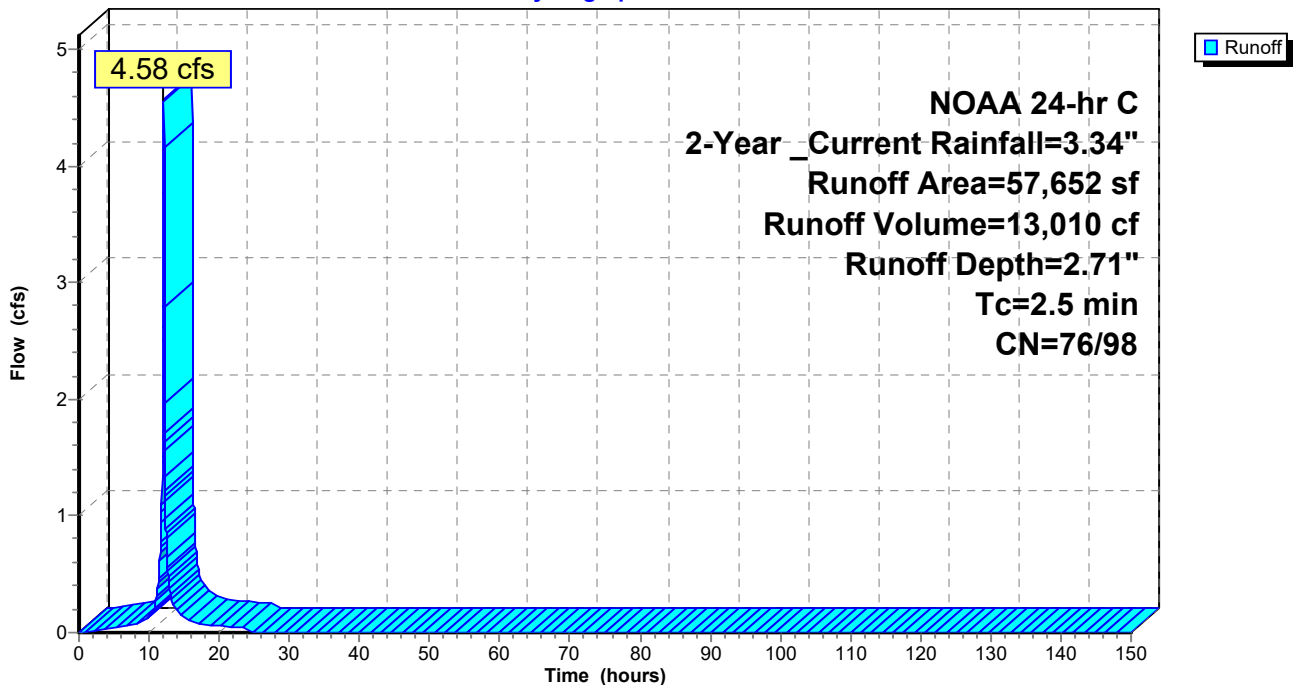
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-150.00 hrs, dt= 0.00
 NOAA 24-hr C 2-Year _Current Rainfall=3.34"

	Area (sf)	CN	Description
*	45,264	98	Impervious HSG C
	5,795	79	Open Space (fair) HSG C
*	6,593	74	Open Space (good) HSG C
	57,652	93	Weighted Average
	12,388	76	21.49% Pervious Area
	45,264	98	78.51% Impervious Area

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

Subcatchment 11S: DA 11: CN w/ IC areas

Hydrograph



Summary for Subcatchment 12S: DA 12: CN w/ IC areas

Runoff = 5.17 cfs @ 12.10 hrs, Volume= 14,764 cf, Depth= 2.61"

Routed to Pond 12P : PP (w/ underdrain) w/ UG storage 7

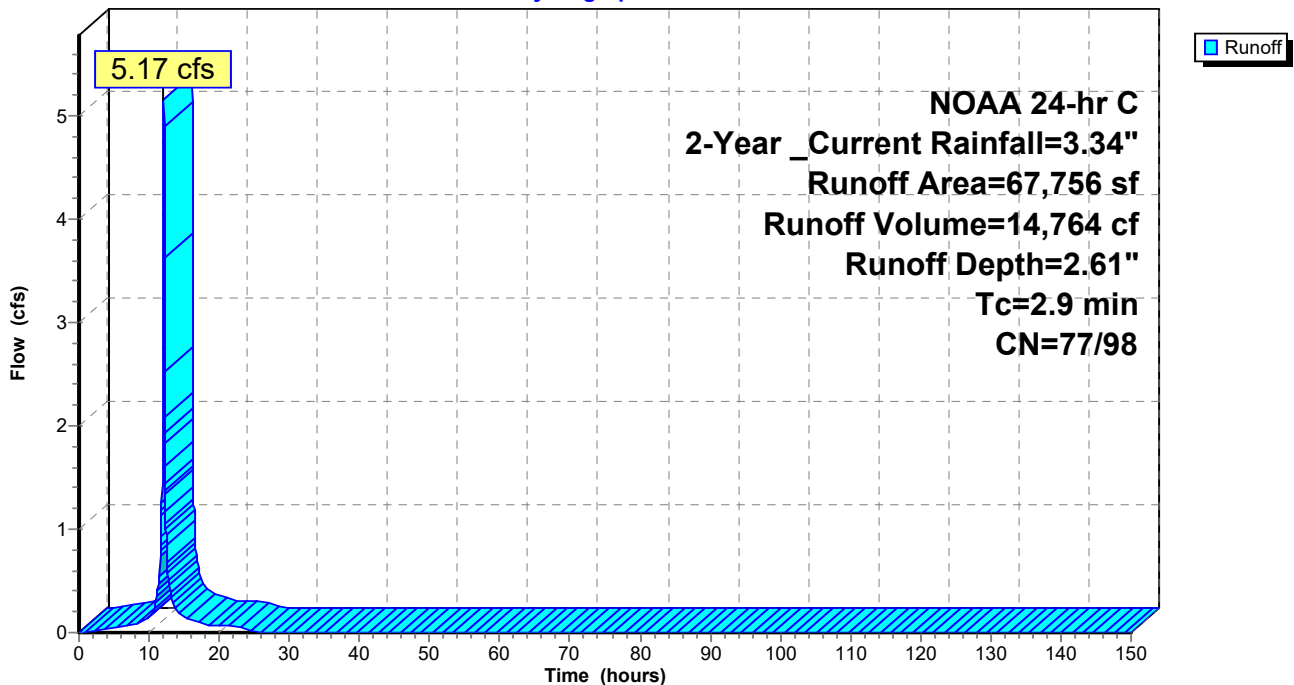
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-150.00 hrs, dt= 0.00
 NOAA 24-hr C 2-Year _Current Rainfall=3.34"

	Area (sf)	CN	Description
*	49,166	98	Impervious HSG C
	11,017	79	Open Space (fair) HSG C
*	7,573	74	Open Space (good) HSG C
	67,756	92	Weighted Average
	18,590	77	27.44% Pervious Area
	49,166	98	72.56% Impervious Area

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

Subcatchment 12S: DA 12: CN w/ IC areas

Hydrograph



Summary for Subcatchment 13S: DA 13: CN w/ IC areas

Runoff = 3.68 cfs @ 12.37 hrs, Volume= 18,764 cf, Depth= 1.44"
 Routed to Pond 13P : Bioretention Basin 4

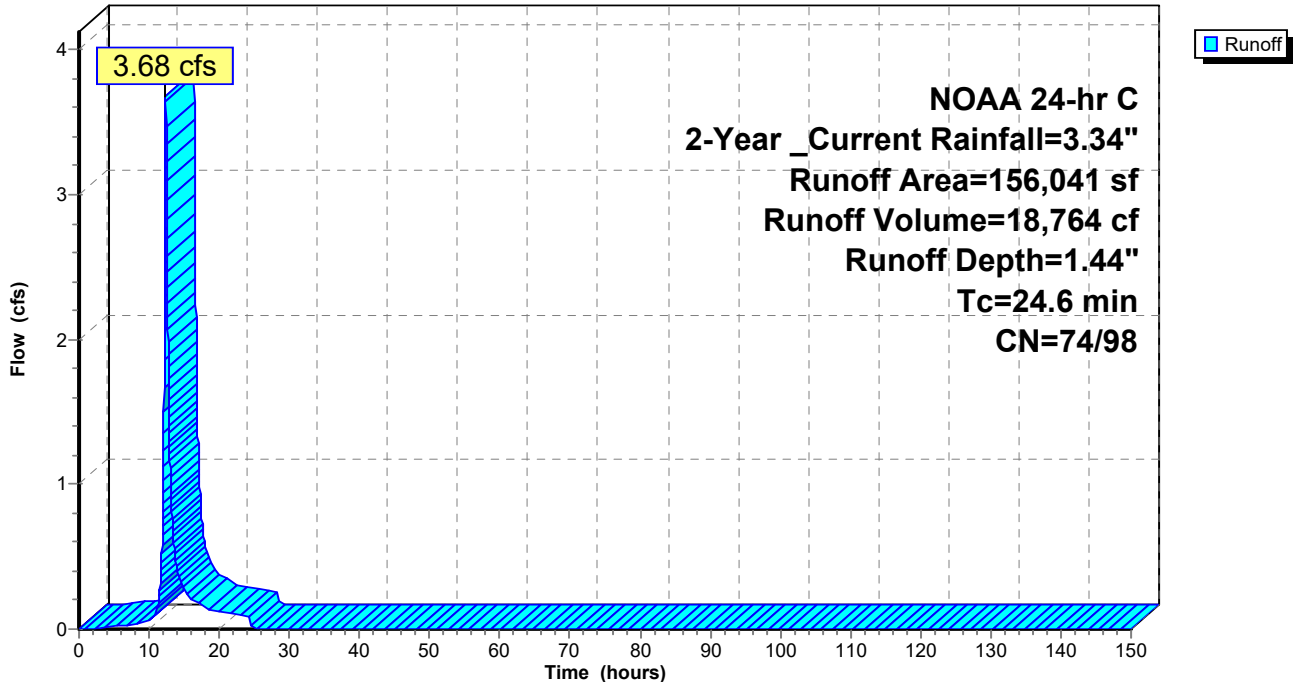
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-150.00 hrs, dt= 0.0
 NOAA 24-hr C 2-Year _Current Rainfall=3.34"

	Area (sf)	CN	Description
*	24,650	98	Impervious HSG C
	42,240	79	Open Space (fair) HSG C
*	20,548	74	Open Space (good) HSG C
	68,603	70	Woods, Good, HSG C
	156,041	77	Weighted Average
	131,391	74	84.20% Pervious Area
	24,650	98	15.80% Impervious Area

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

Subcatchment 13S: DA 13: CN w/ IC areas

Hydrograph



Summary for Pond 1P: Bioretention Basin 1

[44] Hint: Outlet device #1 is below defined storage

Inflow Area = 141,085 sf, 17.73% Impervious, Inflow Depth = 1.53" for 2-Year _Current event
 Inflow = 4.06 cfs @ 12.28 hrs, Volume= 17,985 cf
 Outflow = 0.34 cfs @ 14.17 hrs, Volume= 17,985 cf, Atten= 92%, Lag= 113.6 min
 Primary = 0.34 cfs @ 14.17 hrs, Volume= 17,985 cf
 Routed to nonexistent node 5R
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
 Routed to nonexistent node 5R
 Tertiary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
 Routed to nonexistent node 5R

Routing by Stor-Ind method, Time Span= 0.00-150.00 hrs, dt= 0.02 hrs / 2
 Peak Elev= 63.94' @ 14.17 hrs Surf.Area= 7,130 sf Storage= 8,600 cf

Plug-Flow detention time= 269.5 min calculated for 17,983 cf (100% of inflow)
 Center-of-Mass det. time= 269.5 min (1,103.8 - 834.3)

Volume	Invert	Avail.Storage	Storage Description
#1	62.50'	37,960 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
62.50	4,800	0	0
67.00	12,071	37,960	37,960

Device	Routing	Invert	Outlet Devices
#1	Primary	61.75'	3.0" Vert. Low Flow Orifice C= 0.600 Limited to weir flow at low heads
#2	Secondary	64.00'	24.0" W x 18.0" H Vert. SECONDARY OUTLET C= 0.600 Limited to weir flow at low heads
#3	Tertiary	66.25'	60.0" x 60.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads

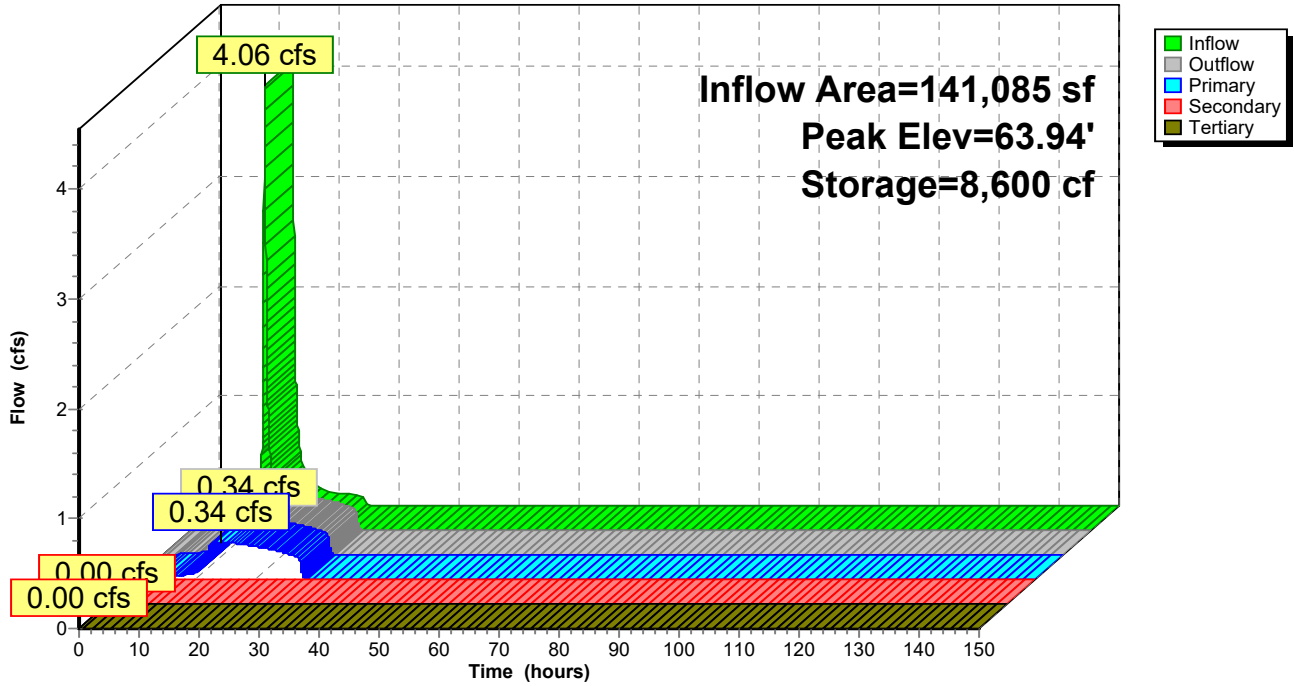
Primary OutFlow Max=0.34 cfs @ 14.17 hrs HW=63.94' (Free Discharge)
 ↑1=**Low Flow Orifice** (Orifice Controls 0.34 cfs @ 6.92 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=62.50' (Free Discharge)
 ↑2=**SECONDARY OUTLET** (Controls 0.00 cfs)

Tertiary OutFlow Max=0.00 cfs @ 0.00 hrs HW=62.50' (Free Discharge)
 ↑3=**Orifice/Grate** (Controls 0.00 cfs)

Pond 1P: Bioretention Basin 1

Hydrograph



Summary for Pond 2P: Bioretention Basin 2

Inflow Area = 21,583 sf, 64.54% Impervious, Inflow Depth = 2.49" for 2-Year _Current event
 Inflow = 1.61 cfs @ 12.10 hrs, Volume= 4,485 cf
 Outflow = 0.22 cfs @ 12.53 hrs, Volume= 4,143 cf, Atten= 86%, Lag= 25.8 min
 Primary = 0.22 cfs @ 12.53 hrs, Volume= 4,143 cf
 Routed to nonexistent node 5R
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
 Routed to nonexistent node 5R
 Tertiary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
 Routed to nonexistent node 5R

Routing by Stor-Ind method, Time Span= 0.00-150.00 hrs, dt= 0.02 hrs / 2
 Peak Elev= 69.24' @ 12.53 hrs Surf.Area= 2,111 sf Storage= 2,095 cf

Plug-Flow detention time= 185.1 min calculated for 4,143 cf (92% of inflow)
 Center-of-Mass det. time= 142.5 min (913.2 - 770.7)

Volume	Invert	Avail.Storage	Storage Description
#1	68.00'	14,805 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
68.00	1,281	0	0
73.00	4,641	14,805	14,805

Device	Routing	Invert	Outlet Devices
#1	Primary	68.25'	3.0" Vert. Low Flow Orifice C= 0.600 Limited to weir flow at low heads
#2	Secondary	70.50'	24.0" W x 18.0" H Vert. SECONDARY OUTLET C= 0.600 Limited to weir flow at low heads
#3	Tertiary	72.75'	60.0" x 60.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads

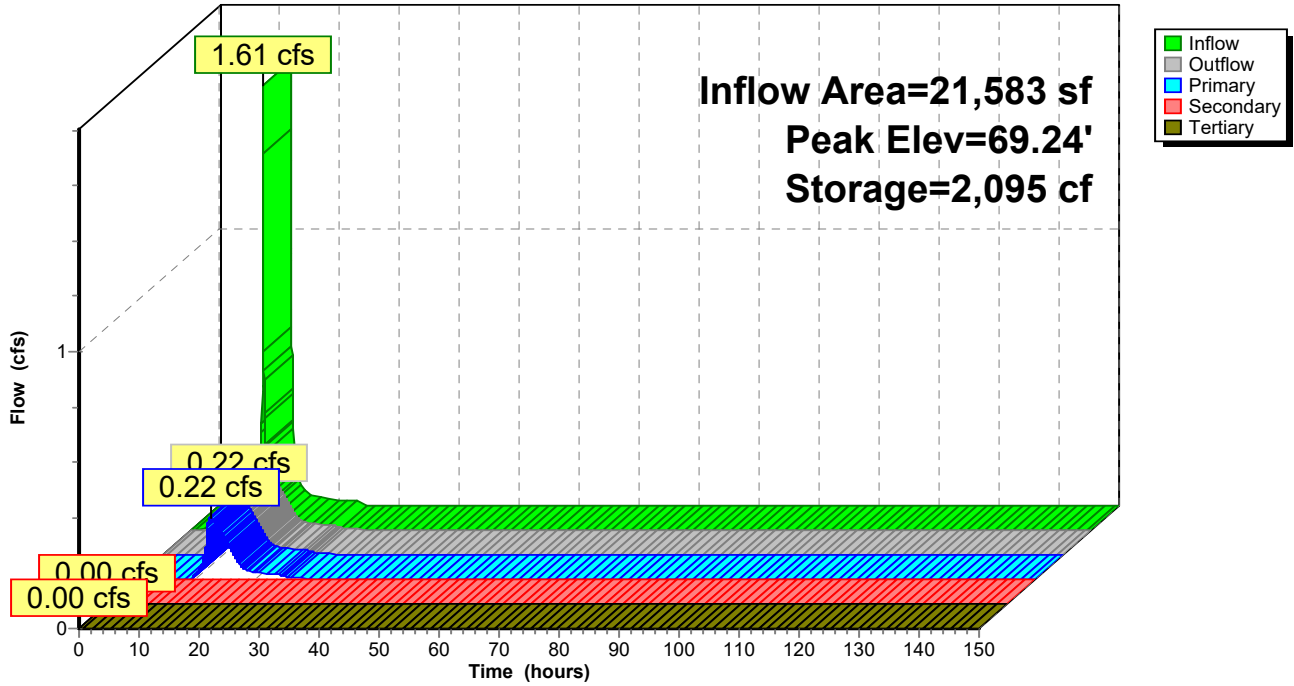
Primary OutFlow Max=0.22 cfs @ 12.53 hrs HW=69.24' (Free Discharge)
 ↖1=Low Flow Orifice (Orifice Controls 0.22 cfs @ 4.47 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=68.00' (Free Discharge)
 ↖2=SECONDARY OUTLET (Controls 0.00 cfs)

Tertiary OutFlow Max=0.00 cfs @ 0.00 hrs HW=68.00' (Free Discharge)
 ↖3=Orifice/Grate (Controls 0.00 cfs)

Pond 2P: Bioretention Basin 2

Hydrograph



Summary for Pond 3P: Bioretention Basin 3

Inflow Area = 40,101 sf, 65.65% Impervious, Inflow Depth = 2.49" for 2-Year _Current event
 Inflow = 2.88 cfs @ 12.11 hrs, Volume= 8,323 cf
 Outflow = 0.28 cfs @ 12.87 hrs, Volume= 7,862 cf, Atten= 90%, Lag= 45.7 min
 Primary = 0.28 cfs @ 12.87 hrs, Volume= 7,862 cf
 Routed to nonexistent node 5R
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
 Routed to nonexistent node 5R
 Tertiary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
 Routed to nonexistent node 5R

Routing by Stor-Ind method, Time Span= 0.00-150.00 hrs, dt= 0.02 hrs / 2
 Peak Elev= 65.77' @ 12.87 hrs Surf.Area= 2,944 sf Storage= 4,166 cf

Plug-Flow detention time= 223.7 min calculated for 7,862 cf (94% of inflow)
 Center-of-Mass det. time= 191.0 min (962.8 - 771.8)

Volume	Invert	Avail.Storage	Storage Description
#1	64.00'	17,160 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
64.00	1,760	0	0
69.00	5,104	17,160	17,160

Device	Routing	Invert	Outlet Devices
#1	Primary	64.25'	3.0" Vert. Low Flow Orifice C= 0.600 Limited to weir flow at low heads
#2	Secondary	66.50'	24.0" W x 18.0" H Vert. SECONDARY OUTLET C= 0.600 Limited to weir flow at low heads
#3	Tertiary	68.75'	60.0" x 60.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads

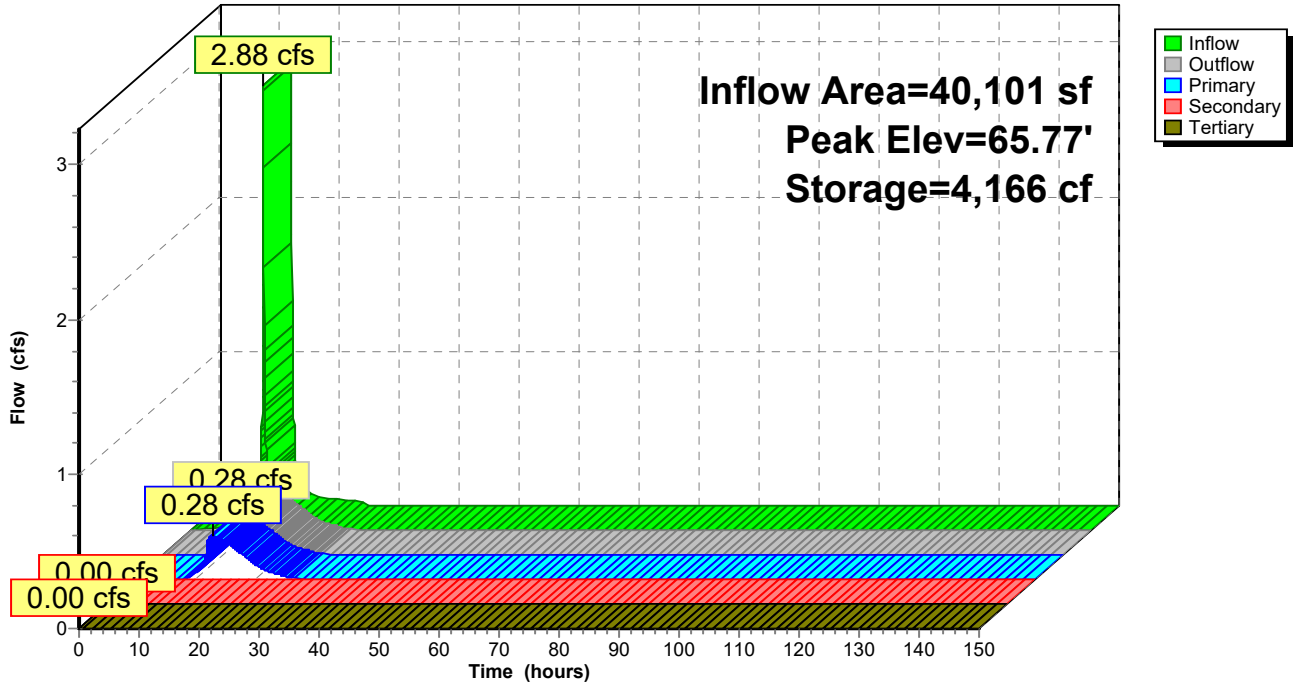
Primary OutFlow Max=0.28 cfs @ 12.87 hrs HW=65.77' (Free Discharge)
 ↑1=Low Flow Orifice (Orifice Controls 0.28 cfs @ 5.69 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=64.00' (Free Discharge)
 ↑2=SECONDARY OUTLET (Controls 0.00 cfs)

Tertiary OutFlow Max=0.00 cfs @ 0.00 hrs HW=64.00' (Free Discharge)
 ↑3=Orifice/Grate (Controls 0.00 cfs)

Pond 3P: Bioretention Basin 3

Hydrograph



Summary for Pond 4P: PP (w/ underdrain) w/ UG storage 1

[44] Hint: Outlet device #3 is below defined storage

Inflow Area = 84,260 sf, 73.22% Impervious, Inflow Depth = 2.63" for 2-Year_Current event
 Inflow = 6.39 cfs @ 12.10 hrs, Volume= 18,443 cf
 Outflow = 0.35 cfs @ 13.45 hrs, Volume= 18,443 cf, Atten= 95%, Lag= 80.7 min
 Primary = 0.35 cfs @ 13.45 hrs, Volume= 18,443 cf
 Routed to Pond 8P : Existing Basin 1
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
 Routed to Pond 8P : Existing Basin 1

Routing by Stor-Ind method, Time Span= 0.00-150.00 hrs, dt= 0.02 hrs
 Peak Elev= 95.42' @ 13.45 hrs Surf.Area= 14,771 sf Storage= 8,208 cf

Plug-Flow detention time= 198.2 min calculated for 18,440 cf (100% of inflow)
 Center-of-Mass det. time= 198.1 min (965.1 - 767.0)

Volume	Invert	Avail.Storage	Storage Description
#1	97.00'	3,624 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
#2A	94.50'	12,961 cf	68.00'W x 217.22'L x 3.50'H Field A 51,698 cf Overall - 19,295 cf Embedded = 32,403 cf x 40.0% Voids
#3A	95.00'	19,295 cf	ADS_StormTech SC-740 +Cap x 420 Inside #2 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 420 Chambers in 14 Rows
		35,880 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
97.00	6,787	0.0	0	0
97.67	6,787	35.0	1,592	1,592
97.83	6,787	15.0	163	1,754
98.00	6,787	15.0	173	1,928
98.25	6,787	100.0	1,697	3,624

Device	Routing	Invert	Outlet Devices
#1	Primary	92.07'	3.0" Vert. Restriction Orifice C= 0.600 Limited to weir flow at low heads
#2	Device 1	92.17'	6.0" Round 6" HDPE Underdrain L= 359.0' Ke= 0.500 Inlet / Outlet Invert= 92.17' / 90.37' S= 0.0050 ' S= 0.0050 ' Cc= 0.900 n= 0.020 Corrugated PE, corrugated interior, Flow Area= 0.20 sf
#3	Device 2	92.17'	0.9" x 0.1" Horiz. Perforations X 400.00 columns X 3 rows C= 0.600 Limited to weir flow at low heads
#4	Secondary	98.00'	67.0' long x 2.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Primary OutFlow Max=0.35 cfs @ 13.45 hrs HW=95.42' (Free Discharge)

↑**1=Restriction Orifice** (Passes 0.35 cfs of 0.42 cfs potential flow)

↑**2=6" HDPE Underdrain** (Outlet Controls 0.35 cfs @ 1.77 fps)

↑**3=Perforations** (Passes 0.35 cfs of 6.51 cfs potential flow)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=94.50' (Free Discharge)

↑**4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 4P: PP (w/ underdrain) w/ UG storage 1 - Chamber Wizard Field A

Chamber Model = ADS_StormTech SC-740 +Cap (ADS StormTech® SC-740 with cap length)

Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf

Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap

51.0" Wide + 6.0" Spacing = 57.0" C-C Row Spacing

30 Chambers/Row x 7.12' Long +0.81' Cap Length x 2 = 215.22' Row Length +12.0" End Stone x 2 =

217.22' Base Length

14 Rows x 51.0" Wide + 6.0" Spacing x 13 + 12.0" Side Stone x 2 = 68.00' Base Width

6.0" Stone Base + 30.0" Chamber Height + 6.0" Stone Cover = 3.50' Field Height

420 Chambers x 45.9 cf = 19,294.8 cf Chamber Storage

51,697.6 cf Field - 19,294.8 cf Chambers = 32,402.8 cf Stone x 40.0% Voids = 12,961.1 cf Stone Storage

Chamber Storage + Stone Storage = 32,255.9 cf = 0.740 af

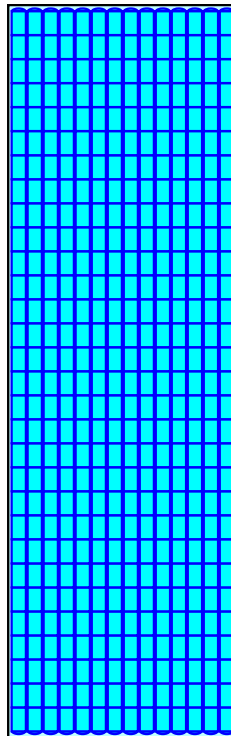
Overall Storage Efficiency = 62.4%

Overall System Size = 217.22' x 68.00' x 3.50'

420 Chambers

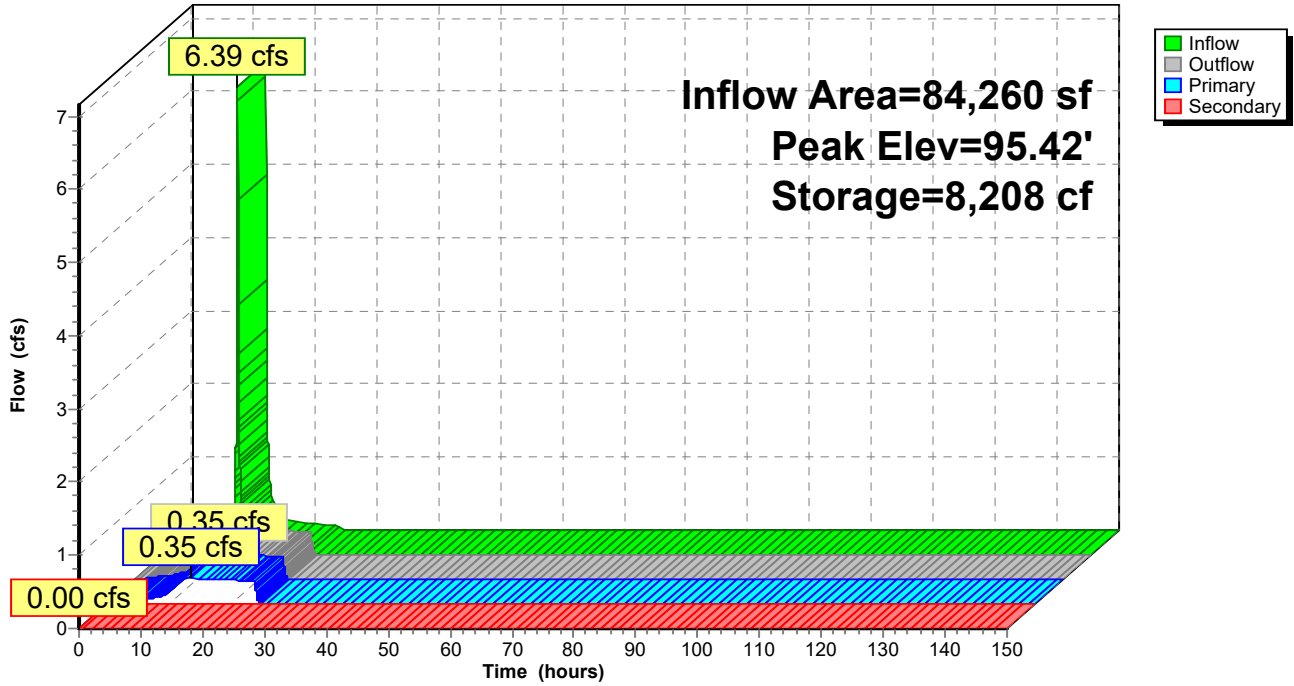
1,914.7 cy Field

1,200.1 cy Stone



Pond 4P: PP (w/ underdrain) w/ UG storage 1

Hydrograph



Summary for Pond 5P: PP (w/ underdrain) w/ UG storage 2

[44] Hint: Outlet device #3 is below defined storage

Inflow Area = 52,282 sf, 79.56% Impervious, Inflow Depth = 2.75" for 2-Year _Current event
 Inflow = 4.22 cfs @ 12.09 hrs, Volume= 11,996 cf
 Outflow = 0.19 cfs @ 13.60 hrs, Volume= 11,996 cf, Atten= 96%, Lag= 90.4 min
 Primary = 0.19 cfs @ 13.60 hrs, Volume= 11,996 cf
 Routed to Pond 8P : Existing Basin 1
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
 Routed to Pond 8P : Existing Basin 1

Routing by Stor-Ind method, Time Span= 0.00-150.00 hrs, dt= 0.02 hrs
 Peak Elev= 95.43' @ 13.60 hrs Surf.Area= 10,213 sf Storage= 5,703 cf

Plug-Flow detention time= 262.1 min calculated for 11,994 cf (100% of inflow)
 Center-of-Mass det. time= 262.1 min (1,025.1 - 763.0)

Volume	Invert	Avail.Storage	Storage Description
#1	97.00'	2,510 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
#2A	94.50'	9,005 cf	77.50'W x 131.78'L x 3.50'H Field A 35,744 cf Overall - 13,231 cf Embedded = 22,514 cf x 40.0% Voids
#3A	95.00'	13,231 cf	ADS_StormTech SC-740 +Cap x 288 Inside #2 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 288 Chambers in 16 Rows
		24,746 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
97.00	4,700	0.0	0	0
97.67	4,700	35.0	1,102	1,102
97.83	4,700	15.0	113	1,215
98.00	4,700	15.0	120	1,335
98.25	4,700	100.0	1,175	2,510

Device	Routing	Invert	Outlet Devices
#1	Primary	92.07'	2.0" Vert. Restriction Orifice C= 0.600 Limited to weir flow at low heads
#2	Device 1	92.17'	6.0" Round 6" HDPE Underdrain L= 359.0' Ke= 0.500 Inlet / Outlet Invert= 92.17' / 90.37' S= 0.0050 ' S= 0.0050 ' Cc= 0.900 n= 0.020 Corrugated PE, corrugated interior, Flow Area= 0.20 sf
#3	Device 2	92.17'	0.9" x 0.1" Horiz. Perforations X 400.00 columns X 3 rows C= 0.600 Limited to weir flow at low heads
#4	Secondary	98.00'	132.0' long x 2.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Primary OutFlow Max=0.19 cfs @ 13.60 hrs HW=95.43' (Free Discharge)

↑**1=Restriction Orifice** (Orifice Controls 0.19 cfs @ 8.71 fps)

↑**2=6" HDPE Underdrain** (Passes 0.19 cfs of 0.35 cfs potential flow)

↑**3=Perforations** (Passes 0.19 cfs of 6.52 cfs potential flow)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=94.50' (Free Discharge)

↑**4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 5P: PP (w/ underdrain) w/ UG storage 2 - Chamber Wizard Field A

Chamber Model = ADS_StormTech SC-740 +Cap (ADS StormTech® SC-740 with cap length)

Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf

Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap

51.0" Wide + 6.0" Spacing = 57.0" C-C Row Spacing

18 Chambers/Row x 7.12' Long +0.81' Cap Length x 2 = 129.78' Row Length +12.0" End Stone x 2 =

131.78' Base Length

16 Rows x 51.0" Wide + 6.0" Spacing x 15 + 12.0" Side Stone x 2 = 77.50' Base Width

6.0" Stone Base + 30.0" Chamber Height + 6.0" Stone Cover = 3.50' Field Height

288 Chambers x 45.9 cf = 13,230.7 cf Chamber Storage

35,744.4 cf Field - 13,230.7 cf Chambers = 22,513.7 cf Stone x 40.0% Voids = 9,005.5 cf Stone Storage

Chamber Storage + Stone Storage = 22,236.2 cf = 0.510 af

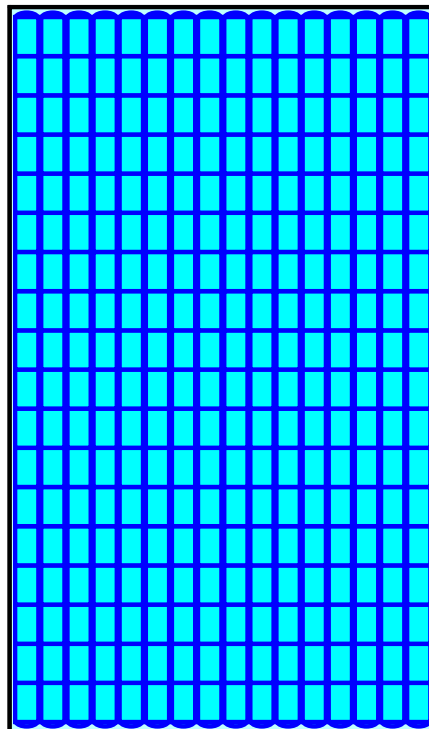
Overall Storage Efficiency = 62.2%

Overall System Size = 131.78' x 77.50' x 3.50'

288 Chambers

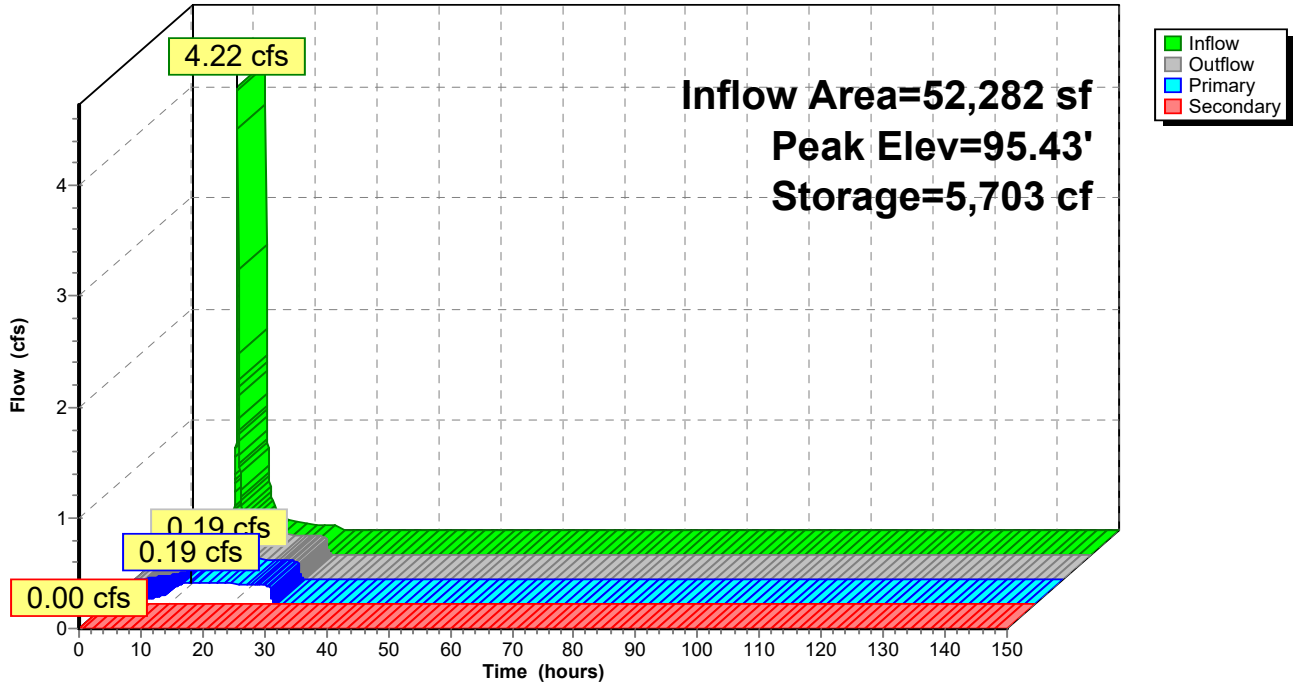
1,323.9 cy Field

833.8 cy Stone



Pond 5P: PP (w/ underdrain) w/ UG storage 2

Hydrograph



Summary for Pond 6P: PP (w/ underdrain) w/ UG storage 3

[44] Hint: Outlet device #3 is below defined storage

Inflow Area = 76,785 sf, 82.96% Impervious, Inflow Depth = 2.82" for 2-Year_Current event
 Inflow = 6.21 cfs @ 12.10 hrs, Volume= 18,066 cf
 Outflow = 0.19 cfs @ 14.71 hrs, Volume= 18,066 cf, Atten= 97%, Lag= 156.7 min
 Primary = 0.19 cfs @ 14.71 hrs, Volume= 18,066 cf
 Routed to Pond 8P : Existing Basin 1
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
 Routed to Pond 8P : Existing Basin 1

Routing by Stor-Ind method, Time Span= 0.00-150.00 hrs, dt= 0.02 hrs
 Peak Elev= 95.46' @ 14.71 hrs Surf.Area= 16,925 sf Storage= 9,922 cf

Plug-Flow detention time= 477.2 min calculated for 18,066 cf (100% of inflow)
 Center-of-Mass det. time= 477.1 min (1,239.0 - 761.9)

Volume	Invert	Avail.Storage	Storage Description
#1	97.00'	2,054 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
#2A	94.50'	14,875 cf	144.00'W x 117.54'L x 3.50'H Field A 59,238 cf Overall - 22,051 cf Embedded = 37,187 cf x 40.0% Voids
#3A	95.00'	22,051 cf	ADS_StormTech SC-740 +Cap x 480 Inside #2 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 480 Chambers in 30 Rows
		38,980 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
97.00	3,240	0.0	0	0
97.67	3,240	35.0	760	760
97.83	3,240	15.0	78	838
98.00	3,240	15.0	83	920
98.35	3,240	100.0	1,134	2,054

Device	Routing	Invert	Outlet Devices
#1	Primary	92.07'	2.0" Vert. Restriction Orifice C= 0.600 Limited to weir flow at low heads
#2	Device 1	92.17'	6.0" Round 6" HDPE Underdrain L= 359.0' Ke= 0.500 Inlet / Outlet Invert= 92.17' / 90.37' S= 0.0050 ' S= 0.0050 ' Cc= 0.900 n= 0.020 Corrugated PE, corrugated interior, Flow Area= 0.20 sf
#3	Device 2	92.17'	0.9" x 0.1" Horiz. Perforations X 400.00 columns X 3 rows C= 0.600 Limited to weir flow at low heads
#4	Secondary	98.00'	19.0' long x 2.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Primary OutFlow Max=0.19 cfs @ 14.71 hrs HW=95.46' (Free Discharge)

↑1=**Restriction Orifice** (Orifice Controls 0.19 cfs @ 8.75 fps)

↑2=**6" HDPE Underdrain** (Passes 0.19 cfs of 0.35 cfs potential flow)

↑3=**Perforations** (Passes 0.19 cfs of 6.55 cfs potential flow)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=94.50' (Free Discharge)

↑4=**Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 6P: PP (w/ underdrain) w/ UG storage 3 - Chamber Wizard Field A

Chamber Model = ADS_StormTech SC-740 +Cap (ADS StormTech® SC-740 with cap length)

Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf

Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap

51.0" Wide + 6.0" Spacing = 57.0" C-C Row Spacing

16 Chambers/Row x 7.12' Long +0.81' Cap Length x 2 = 115.54' Row Length +12.0" End Stone x 2 = 117.54' Base Length

30 Rows x 51.0" Wide + 6.0" Spacing x 29 + 12.0" Side Stone x 2 = 144.00' Base Width

6.0" Stone Base + 30.0" Chamber Height + 6.0" Stone Cover = 3.50' Field Height

480 Chambers x 45.9 cf = 22,051.2 cf Chamber Storage

59,238.5 cf Field - 22,051.2 cf Chambers = 37,187.3 cf Stone x 40.0% Voids = 14,874.9 cf Stone Storage

Chamber Storage + Stone Storage = 36,926.1 cf = 0.848 af

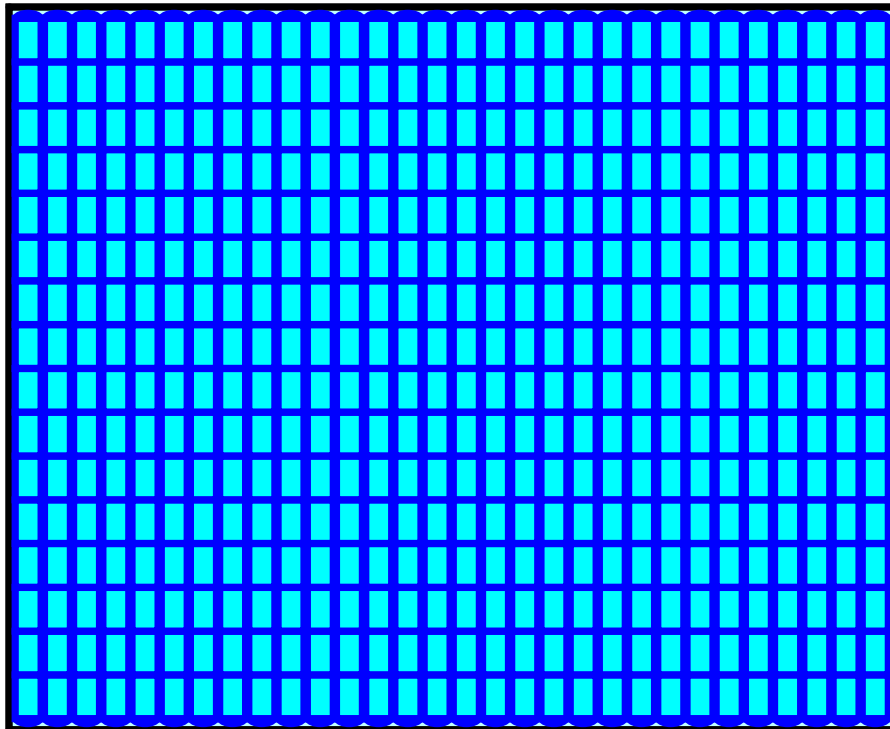
Overall Storage Efficiency = 62.3%

Overall System Size = 117.54' x 144.00' x 3.50'

480 Chambers

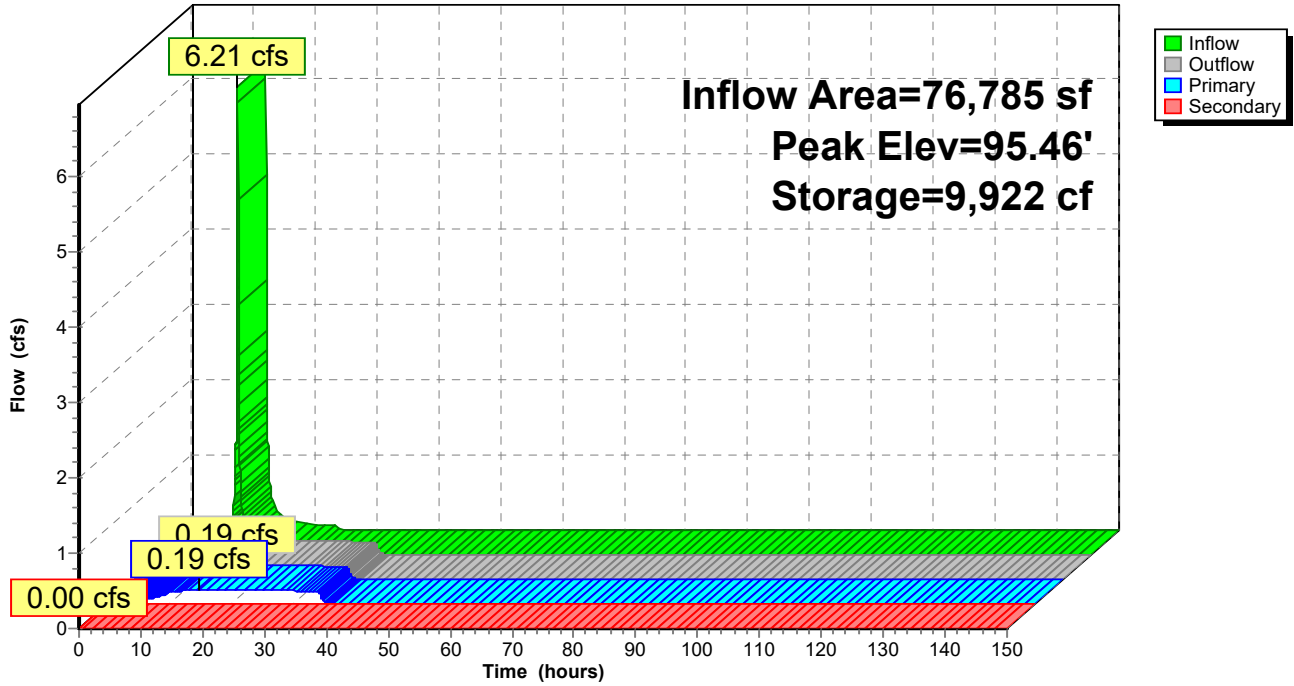
2,194.0 cy Field

1,377.3 cy Stone



Pond 6P: PP (w/ underdrain) w/ UG storage 3

Hydrograph



Summary for Pond 7P: PP (w/ underdrain) w/ UG storage 4

[44] Hint: Outlet device #3 is below defined storage

Inflow Area = 120,233 sf, 94.05% Impervious, Inflow Depth = 3.00" for 2-Year _Current event
 Inflow = 10.17 cfs @ 12.10 hrs, Volume= 30,098 cf
 Outflow = 0.35 cfs @ 14.39 hrs, Volume= 30,098 cf, Atten= 97%, Lag= 137.1 min
 Primary = 0.35 cfs @ 14.39 hrs, Volume= 30,098 cf
 Routed to Pond 8P : Existing Basin 1
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
 Routed to Pond 8P : Existing Basin 1

Routing by Stor-Ind method, Time Span= 0.00-150.00 hrs, dt= 0.02 hrs
 Peak Elev= 95.48' @ 14.39 hrs Surf.Area= 26,122 sf Storage= 15,922 cf

Plug-Flow detention time= 408.1 min calculated for 30,098 cf (100% of inflow)
 Center-of-Mass det. time= 408.1 min (1,165.0 - 756.9)

Volume	Invert	Avail.Storage	Storage Description
#1	97.00'	2,980 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
#2A	94.50'	22,825 cf	163.00'W x 160.26'L x 3.50'H Field A 91,426 cf Overall - 34,363 cf Embedded = 57,063 cf x 40.0% Voids
#3A	95.00'	34,363 cf	ADS_StormTech SC-740 +Cap x 748 Inside #2 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 748 Chambers in 34 Rows
		60,168 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
97.00	4,700	0.0	0	0
97.67	4,700	35.0	1,102	1,102
97.83	4,700	15.0	113	1,215
98.00	4,700	15.0	120	1,335
98.35	4,700	100.0	1,645	2,980

Device	Routing	Invert	Outlet Devices
#1	Primary	92.07'	3.0" Vert. Restriction Orifice C= 0.600 Limited to weir flow at low heads
#2	Device 1	92.17'	6.0" Round 6" HDPE Underdrain L= 359.0' Ke= 0.500 Inlet / Outlet Invert= 92.17' / 90.37' S= 0.0050 ' S= 0.0050 ' Cc= 0.900 n= 0.020 Corrugated PE, corrugated interior, Flow Area= 0.20 sf
#3	Device 2	92.17'	0.9" x 0.1" Horiz. Perforations X 400.00 columns X 3 rows C= 0.600 Limited to weir flow at low heads
#4	Secondary	98.00'	19.0' long x 2.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Primary OutFlow Max=0.35 cfs @ 14.39 hrs HW=95.48' (Free Discharge)

↑1=**Restriction Orifice** (Passes 0.35 cfs of 0.43 cfs potential flow)

↑2=**6" HDPE Underdrain** (Outlet Controls 0.35 cfs @ 1.79 fps)

↑3=**Perforations** (Passes 0.35 cfs of 6.57 cfs potential flow)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=94.50' (Free Discharge)

↑4=**Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 7P: PP (w/ underdrain) w/ UG storage 4 - Chamber Wizard Field A

Chamber Model = ADS_StormTech SC-740 +Cap (ADS StormTech® SC-740 with cap length)

Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf

Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap

51.0" Wide + 6.0" Spacing = 57.0" C-C Row Spacing

22 Chambers/Row x 7.12' Long +0.81' Cap Length x 2 = 158.26' Row Length +12.0" End Stone x 2 = 160.26' Base Length

34 Rows x 51.0" Wide + 6.0" Spacing x 33 + 12.0" Side Stone x 2 = 163.00' Base Width

6.0" Stone Base + 30.0" Chamber Height + 6.0" Stone Cover = 3.50' Field Height

748 Chambers x 45.9 cf = 34,363.1 cf Chamber Storage

91,426.4 cf Field - 34,363.1 cf Chambers = 57,063.3 cf Stone x 40.0% Voids = 22,825.3 cf Stone Storage

Chamber Storage + Stone Storage = 57,188.5 cf = 1.313 af

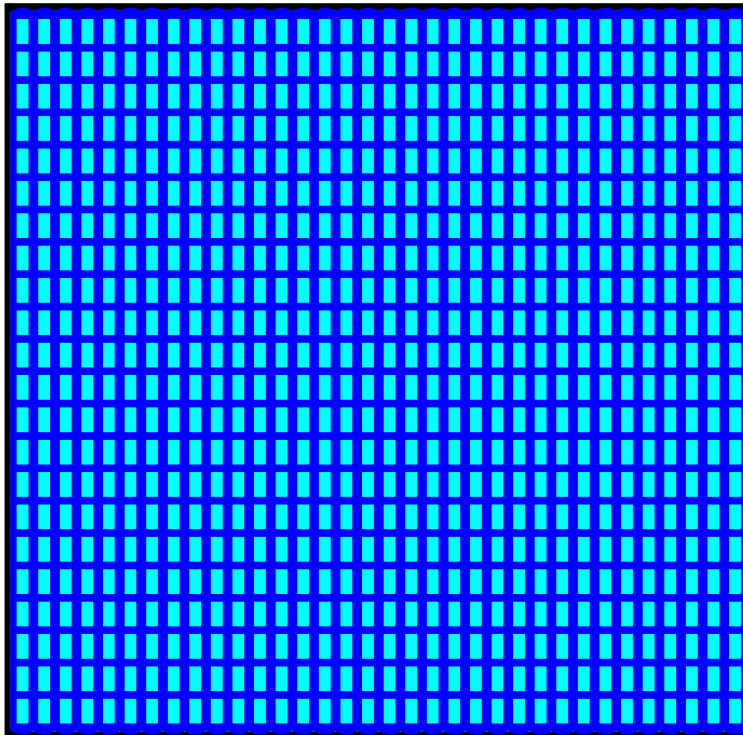
Overall Storage Efficiency = 62.6%

Overall System Size = 160.26' x 163.00' x 3.50'

748 Chambers

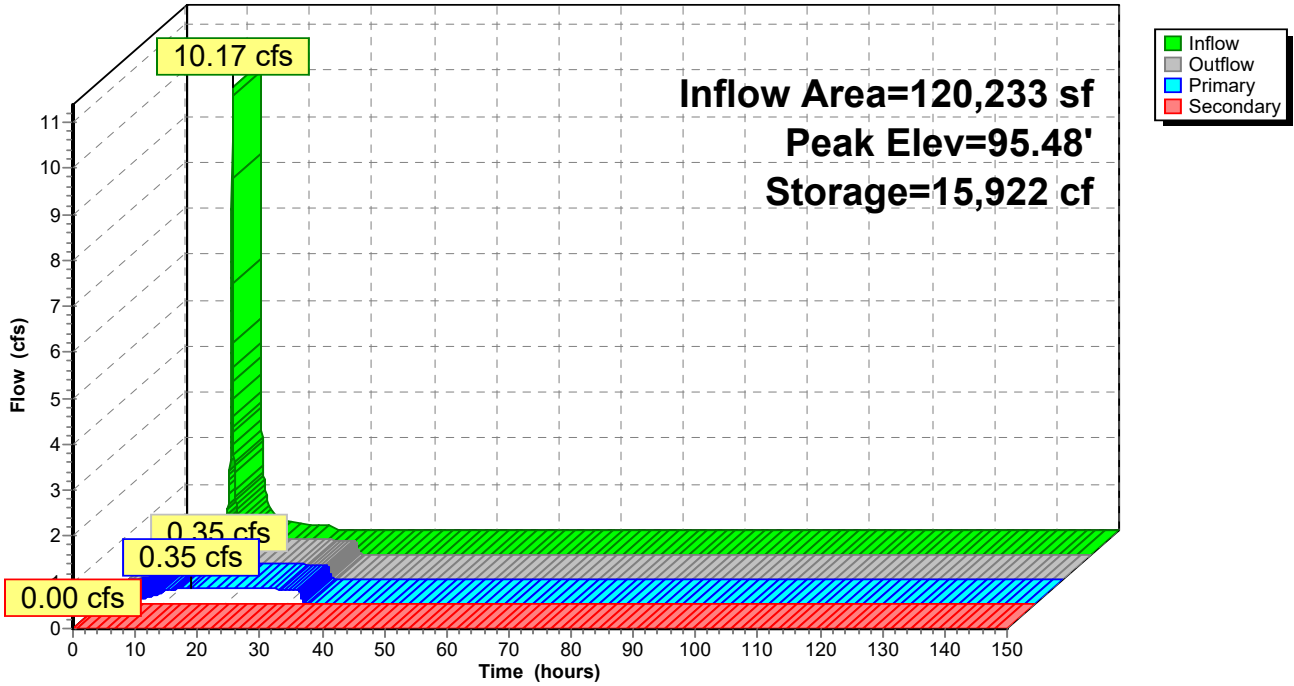
3,386.2 cy Field

2,113.5 cy Stone



Pond 7P: PP (w/ underdrain) w/ UG storage 4

Hydrograph



Summary for Pond 8P: Existing Basin 1

Inflow Area = 444,913 sf, 80.94% Impervious, Inflow Depth = 2.75" for 2-Year _Current event
 Inflow = 9.45 cfs @ 12.09 hrs, Volume= 102,126 cf
 Outflow = 5.85 cfs @ 12.14 hrs, Volume= 102,126 cf, Atten= 38%, Lag= 2.8 min
 Primary = 5.85 cfs @ 12.14 hrs, Volume= 102,126 cf
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
 Routed to nonexistent node 67L
 Tertiary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
 Routed to nonexistent node 67L

Routing by Stor-Ind method, Time Span= 0.00-150.00 hrs, dt= 0.02 hrs / 2
 Peak Elev= 59.05' @ 12.14 hrs Surf.Area= 7,406 sf Storage= 4,615 cf

Plug-Flow detention time= 17.4 min calculated for 102,113 cf (100% of inflow)
 Center-of-Mass det. time= 17.4 min (1,051.1 - 1,033.6)

Volume	Invert	Avail.Storage	Storage Description
#1	58.00'	33,881 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
58.00	1,339	0	0
59.00	7,134	4,237	4,237
60.00	12,352	9,743	13,980
61.00	18,300	15,326	29,306
61.25	18,300	4,575	33,881

Device	Routing	Invert	Outlet Devices
#1	Primary	58.00'	24.0" Vert. Low Flow Orifice C= 0.600 Limited to weir flow at low heads
#2	Secondary	60.00'	24.0" W x 18.0" H Vert. 2-YR Orifice C= 0.600 Limited to weir flow at low heads
#3	Tertiary	60.75'	48.0" x 48.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#4	Tertiary	61.00'	100.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)

Primary OutFlow Max=5.84 cfs @ 12.14 hrs HW=59.05' (Free Discharge)

↑1=**Low Flow Orifice** (Orifice Controls 5.84 cfs @ 3.49 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=58.00' (Free Discharge)

↑2=**2-YR Orifice** (Controls 0.00 cfs)

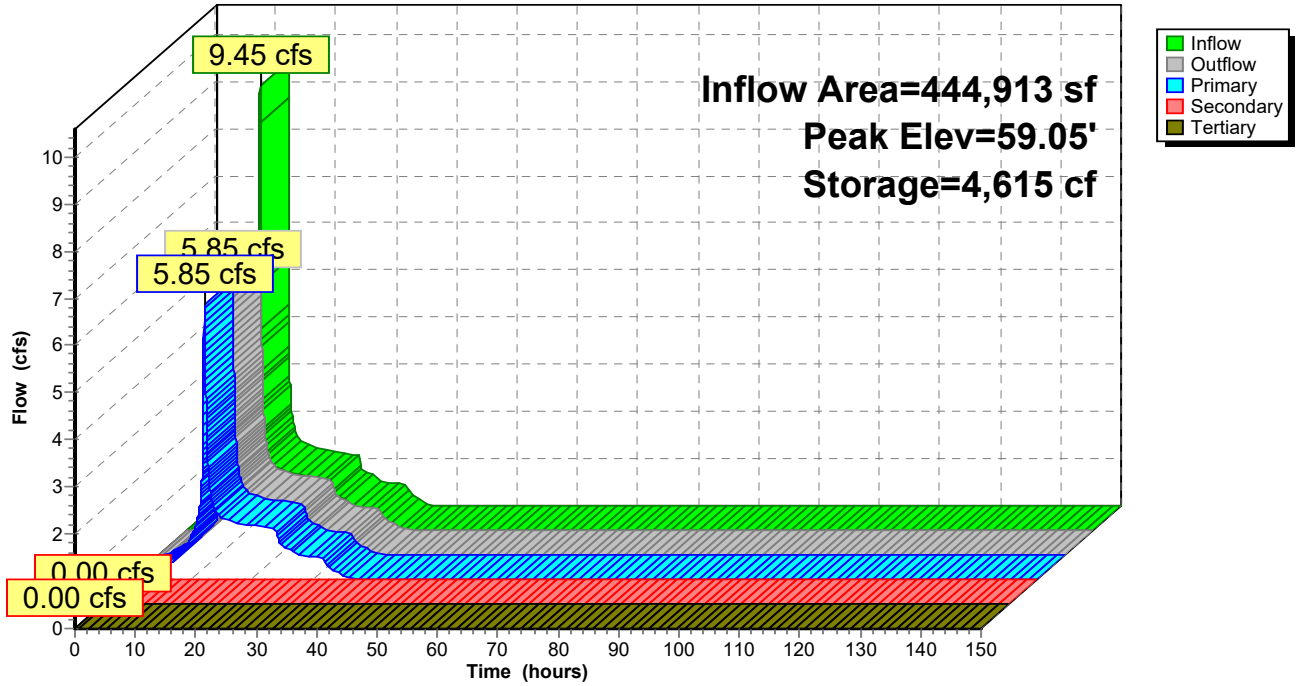
Tertiary OutFlow Max=0.00 cfs @ 0.00 hrs HW=58.00' (Free Discharge)

↑3=**Orifice/Grate** (Controls 0.00 cfs)

↑4=**Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 8P: Existing Basin 1

Hydrograph



Summary for Pond 9P: Existing Basin 2

<https://hydro.rutgers.edu/view-project/100596/>

Inflow Area = 59,019 sf, 68.70% Impervious, Inflow Depth = 2.57" for 2-Year _Current event
 Inflow = 4.45 cfs @ 12.10 hrs, Volume= 12,617 cf
 Outflow = 0.68 cfs @ 12.54 hrs, Volume= 12,617 cf, Atten= 85%, Lag= 26.6 min
 Primary = 0.33 cfs @ 12.54 hrs, Volume= 11,249 cf
 Secondary = 0.35 cfs @ 12.54 hrs, Volume= 1,368 cf
 Tertiary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.00-150.00 hrs, dt= 0.02 hrs / 2
 Peak Elev= 66.70' @ 12.54 hrs Surf.Area= 3,793 sf Storage= 4,801 cf

Plug-Flow detention time= 105.1 min calculated for 12,616 cf (100% of inflow)
 Center-of-Mass det. time= 105.1 min (874.5 - 769.4)

Volume	Invert	Avail.Storage	Storage Description
#1	64.60'	13,401 cf	Custom Stage Data (Prismatic) Listed below
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
64.60	0	0	0
65.00	647	129	129
66.00	2,768	1,708	1,837
68.00	5,693	8,461	10,298
68.50	6,718	3,103	13,401

Device	Routing	Invert	Outlet Devices
#1	Primary	64.60'	3.0" Vert. 3" Orifice C= 0.600 Limited to weir flow at low heads
#2	Secondary	66.40'	0.7' long 8" Sharp-Crested Rectangular Weir 2 End Contraction(s)
#3	Tertiary	67.75'	48.0" x 48.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads

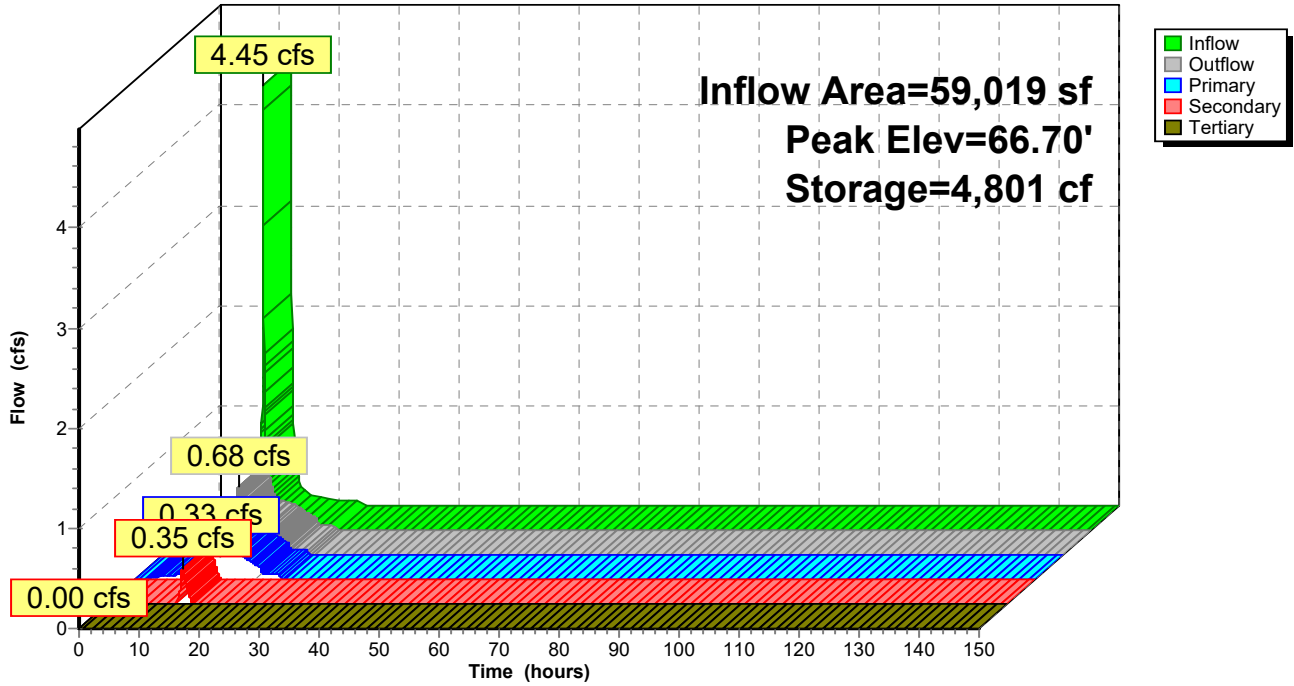
Primary OutFlow Max=0.33 cfs @ 12.54 hrs HW=66.70' (Free Discharge)
 ↳1=3" Orifice (Orifice Controls 0.33 cfs @ 6.77 fps)

Secondary OutFlow Max=0.35 cfs @ 12.54 hrs HW=66.70' (Free Discharge)
 ↳2=8" Sharp-Crested Rectangular Weir (Weir Controls 0.35 cfs @ 1.79 fps)

Tertiary OutFlow Max=0.00 cfs @ 0.00 hrs HW=64.60' (Free Discharge)
 ↳3=Orifice/Grate (Controls 0.00 cfs)

Pond 9P: Existing Basin 2

Hydrograph



Summary for Pond 10P: PP (w/ underdrain) w/ UG storage 5

[44] Hint: Outlet device #3 is below defined storage

Inflow Area = 48,527 sf, 85.53% Impervious, Inflow Depth = 2.82" for 2-Year_Current event
 Inflow = 3.62 cfs @ 12.13 hrs, Volume= 11,408 cf
 Outflow = 0.36 cfs @ 12.93 hrs, Volume= 11,408 cf, Atten= 90%, Lag= 48.2 min
 Primary = 0.36 cfs @ 12.93 hrs, Volume= 11,408 cf
 Routed to Pond 13P : Bioretention Basin 4
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
 Routed to Pond 13P : Bioretention Basin 4

Routing by Stor-Ind method, Time Span= 0.00-150.00 hrs, dt= 0.02 hrs
 Peak Elev= 95.59' @ 12.93 hrs Surf.Area= 5,816 sf Storage= 4,010 cf

Plug-Flow detention time= 79.8 min calculated for 11,408 cf (100% of inflow)
 Center-of-Mass det. time= 79.8 min (842.4 - 762.6)

Volume	Invert	Avail.Storage	Storage Description
#1	97.00'	3,687 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
#2A	94.50'	5,184 cf	34.75'W x 167.38'L x 3.50'H Field A 20,357 cf Overall - 7,396 cf Embedded = 12,961 cf x 40.0% Voids
#3A	95.00'	7,396 cf	ADS_StormTech SC-740 +Cap x 161 Inside #2 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 161 Chambers in 7 Rows
		16,268 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
97.00	5,816	0.0	0	0
97.67	5,816	35.0	1,364	1,364
97.83	5,816	15.0	140	1,503
98.00	5,816	15.0	148	1,652
98.35	5,816	100.0	2,036	3,687

Device	Routing	Invert	Outlet Devices
#1	Primary	92.07'	3.0" Vert. Restriction Orifice C= 0.600 Limited to weir flow at low heads
#2	Device 1	92.17'	6.0" Round 6" HDPE Underdrain L= 359.0' Ke= 0.500 Inlet / Outlet Invert= 92.17' / 90.37' S= 0.0050 '/' Cc= 0.900 n= 0.020 Corrugated PE, corrugated interior, Flow Area= 0.20 sf
#3	Device 2	92.17'	0.9" x 0.1" Horiz. Perforations X 400.00 columns X 3 rows C= 0.600 Limited to weir flow at low heads
#4	Secondary	98.00'	168.0' long x 2.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Primary OutFlow Max=0.36 cfs @ 12.93 hrs HW=95.59' (Free Discharge)

↑1=**Restriction Orifice** (Passes 0.36 cfs of 0.44 cfs potential flow)

↑2=**6" HDPE Underdrain** (Outlet Controls 0.36 cfs @ 1.82 fps)

↑3=**Perforations** (Passes 0.36 cfs of 6.68 cfs potential flow)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=94.50' (Free Discharge)

↑4=**Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 10P: PP (w/ underdrain) w/ UG storage 5 - Chamber Wizard Field A

Chamber Model = ADS_StormTech SC-740 +Cap (ADS StormTech® SC-740 with cap length)

Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf

Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap

51.0" Wide + 6.0" Spacing = 57.0" C-C Row Spacing

23 Chambers/Row x 7.12' Long +0.81' Cap Length x 2 = 165.38' Row Length +12.0" End Stone x 2 = 167.38' Base Length

7 Rows x 51.0" Wide + 6.0" Spacing x 6 + 12.0" Side Stone x 2 = 34.75' Base Width

6.0" Stone Base + 30.0" Chamber Height + 6.0" Stone Cover = 3.50' Field Height

161 Chambers x 45.9 cf = 7,396.3 cf Chamber Storage

20,357.2 cf Field - 7,396.3 cf Chambers = 12,960.8 cf Stone x 40.0% Voids = 5,184.3 cf Stone Storage

Chamber Storage + Stone Storage = 12,580.7 cf = 0.289 af

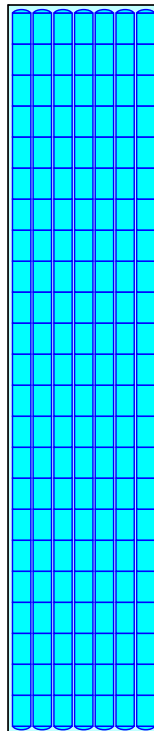
Overall Storage Efficiency = 61.8%

Overall System Size = 167.38' x 34.75' x 3.50'

161 Chambers

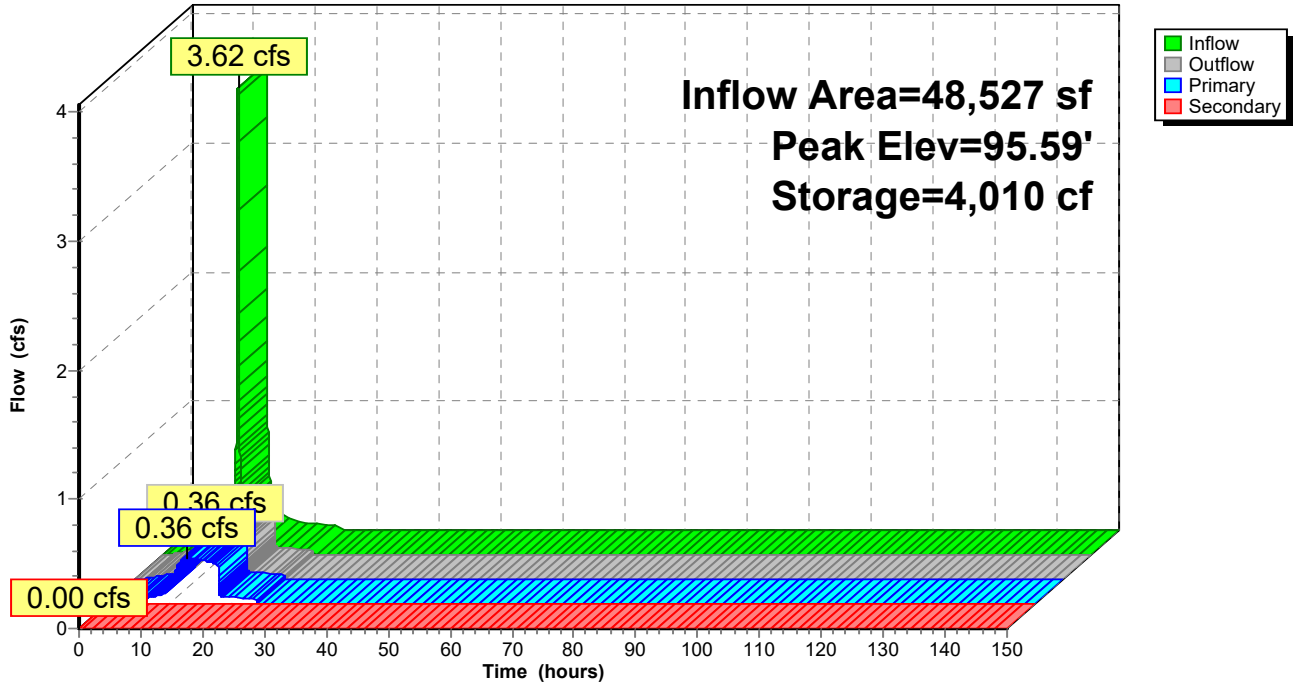
754.0 cy Field

480.0 cy Stone



Pond 10P: PP (w/ underdrain) w/ UG storage 5

Hydrograph



Summary for Pond 11P: PP (w/ underdrain) w/ UG storage 6

[44] Hint: Outlet device #3 is below defined storage

Inflow Area = 57,652 sf, 78.51% Impervious, Inflow Depth = 2.71" for 2-Year_Current event
 Inflow = 4.58 cfs @ 12.09 hrs, Volume= 13,010 cf
 Outflow = 0.35 cfs @ 13.03 hrs, Volume= 13,010 cf, Atten= 92%, Lag= 56.2 min
 Primary = 0.35 cfs @ 13.03 hrs, Volume= 13,010 cf
 Routed to Pond 13P : Bioretention Basin 4
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
 Routed to Pond 13P : Bioretention Basin 4

Routing by Stor-Ind method, Time Span= 0.00-150.00 hrs, dt= 0.02 hrs
 Peak Elev= 95.45' @ 13.03 hrs Surf.Area= 8,594 sf Storage= 4,956 cf

Plug-Flow detention time= 106.2 min calculated for 13,010 cf (100% of inflow)
 Center-of-Mass det. time= 106.2 min (869.5 - 763.3)

Volume	Invert	Avail.Storage	Storage Description
#1	97.00'	2,144 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
#2A	94.50'	7,621 cf	96.50'W x 89.06'L x 3.50'H Field A 30,079 cf Overall - 11,026 cf Embedded = 19,053 cf x 40.0% Voids
#3A	95.00'	11,026 cf	ADS_StormTech SC-740 +Cap x 240 Inside #2 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 240 Chambers in 20 Rows
		20,791 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
97.00	3,382	0.0	0	0
97.67	3,382	35.0	793	793
97.83	3,382	15.0	81	874
98.00	3,382	15.0	86	960
98.35	3,382	100.0	1,184	2,144

Device	Routing	Invert	Outlet Devices
#1	Primary	92.07'	3.0" Vert. Restriction Orifice C= 0.600 Limited to weir flow at low heads
#2	Device 1	92.17'	6.0" Round 6" HDPE Underdrain L= 359.0' Ke= 0.500 Inlet / Outlet Invert= 92.17' / 90.37' S= 0.0050 ' S= 0.0050 ' Cc= 0.900 n= 0.020 Corrugated PE, corrugated interior, Flow Area= 0.20 sf
#3	Device 2	92.17'	0.9" x 0.1" Horiz. Perforations X 400.00 columns X 3 rows C= 0.600 Limited to weir flow at low heads
#4	Secondary	98.00'	168.0' long x 2.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Primary OutFlow Max=0.35 cfs @ 13.03 hrs HW=95.45' (Free Discharge)

↑**1=Restriction Orifice** (Passes 0.35 cfs of 0.43 cfs potential flow)

↑**2=6" HDPE Underdrain** (Outlet Controls 0.35 cfs @ 1.78 fps)

↑**3=Perforations** (Passes 0.35 cfs of 6.54 cfs potential flow)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=94.50' (Free Discharge)

↑**4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 11P: PP (w/ underdrain) w/ UG storage 6 - Chamber Wizard Field A

Chamber Model = ADS_StormTech SC-740 +Cap (ADS StormTech® SC-740 with cap length)

Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf

Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap

51.0" Wide + 6.0" Spacing = 57.0" C-C Row Spacing

12 Chambers/Row x 7.12' Long +0.81' Cap Length x 2 = 87.06' Row Length +12.0" End Stone x 2 = 89.06' Base Length

20 Rows x 51.0" Wide + 6.0" Spacing x 19 + 12.0" Side Stone x 2 = 96.50' Base Width

6.0" Stone Base + 30.0" Chamber Height + 6.0" Stone Cover = 3.50' Field Height

240 Chambers x 45.9 cf = 11,025.6 cf Chamber Storage

30,078.9 cf Field - 11,025.6 cf Chambers = 19,053.3 cf Stone x 40.0% Voids = 7,621.3 cf Stone Storage

Chamber Storage + Stone Storage = 18,646.9 cf = 0.428 af

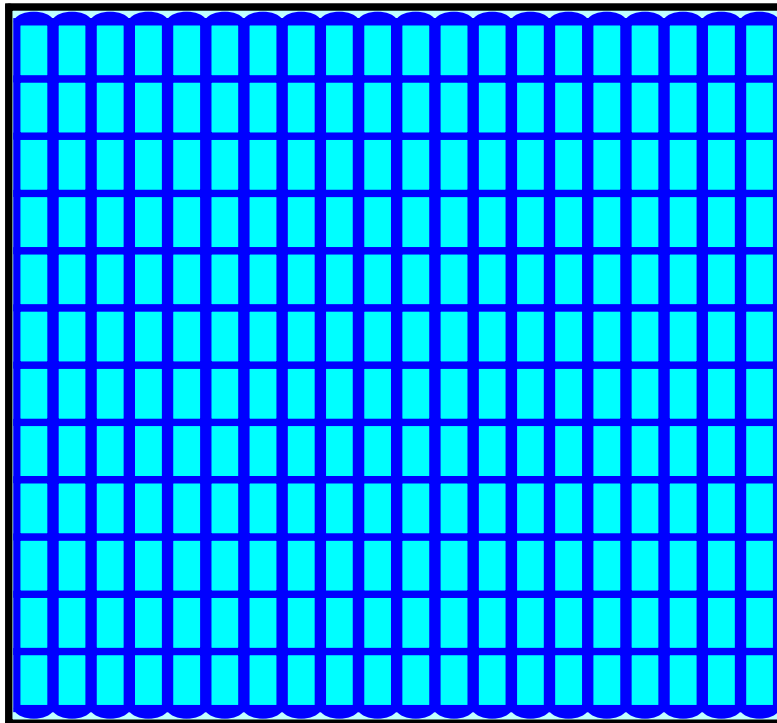
Overall Storage Efficiency = 62.0%

Overall System Size = 89.06' x 96.50' x 3.50'

240 Chambers

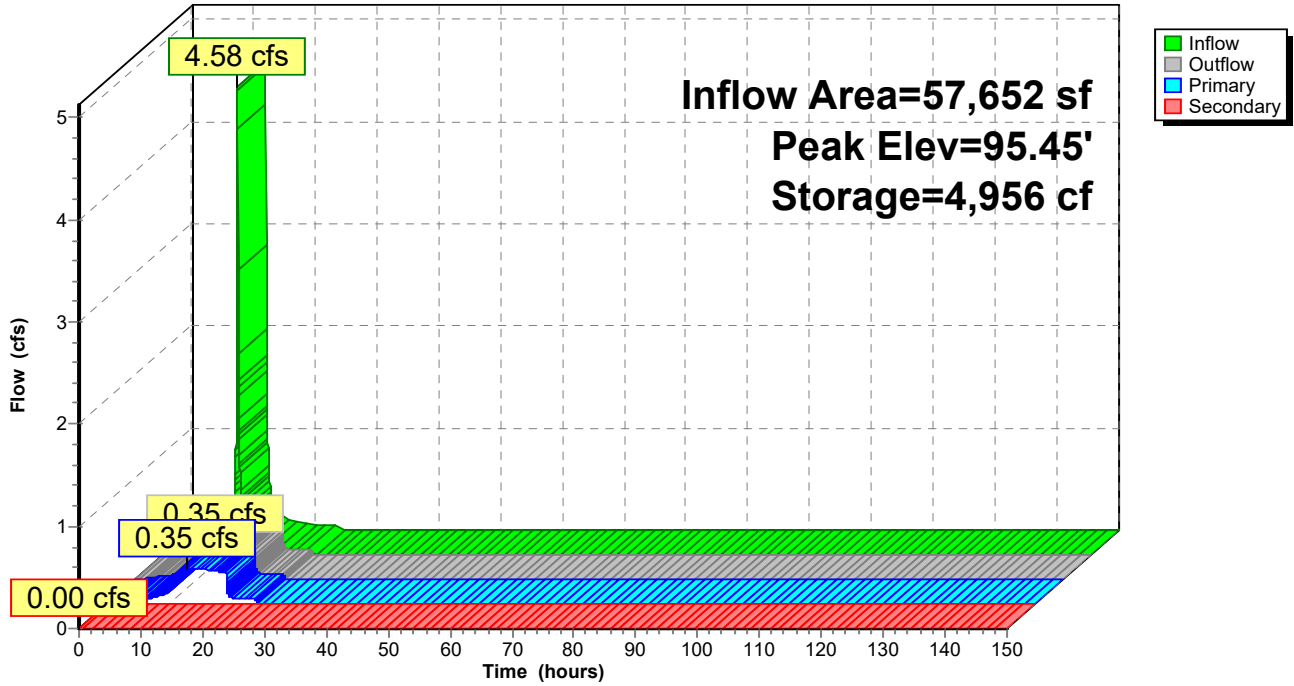
1,114.0 cy Field

705.7 cy Stone



Pond 11P: PP (w/ underdrain) w/ UG storage 6

Hydrograph



Summary for Pond 12P: PP (w/ underdrain) w/ UG storage 7

[44] Hint: Outlet device #3 is below defined storage

Inflow Area = 67,756 sf, 72.56% Impervious, Inflow Depth = 2.61" for 2-Year _Current event
 Inflow = 5.17 cfs @ 12.10 hrs, Volume= 14,764 cf
 Outflow = 0.35 cfs @ 13.19 hrs, Volume= 14,764 cf, Atten= 93%, Lag= 65.7 min
 Primary = 0.35 cfs @ 13.19 hrs, Volume= 14,764 cf
 Routed to Pond 13P : Bioretention Basin 4
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
 Routed to Pond 13P : Bioretention Basin 4

Routing by Stor-Ind method, Time Span= 0.00-150.00 hrs, dt= 0.02 hrs
 Peak Elev= 95.39' @ 13.19 hrs Surf.Area= 11,316 sf Storage= 6,005 cf

Plug-Flow detention time= 136.5 min calculated for 14,762 cf (100% of inflow)
 Center-of-Mass det. time= 136.4 min (903.5 - 767.1)

Volume	Invert	Avail.Storage	Storage Description
#1	97.00'	935 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
#2A	94.50'	9,962 cf	77.50'W x 146.02'L x 3.50'H Field A 39,607 cf Overall - 14,701 cf Embedded = 24,906 cf x 40.0% Voids
#3A	95.00'	14,701 cf	ADS_StormTech SC-740 +Cap x 320 Inside #2 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 320 Chambers in 16 Rows
		25,598 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
97.00	1,474	0.0	0	0
97.67	1,474	35.0	346	346
97.83	1,474	15.0	35	381
98.00	1,474	15.0	38	419
98.35	1,474	100.0	516	935

Device	Routing	Invert	Outlet Devices
#1	Primary	92.07'	3.0" Vert. Restriction Orifice C= 0.600 Limited to weir flow at low heads
#2	Device 1	92.17'	6.0" Round 6" HDPE Underdrain L= 359.0' Ke= 0.500 Inlet / Outlet Invert= 92.17' / 90.37' S= 0.0050 ' S= 0.0050 ' Cc= 0.900 n= 0.020 Corrugated PE, corrugated interior, Flow Area= 0.20 sf
#3	Device 2	92.17'	0.9" x 0.1" Horiz. Perforations X 400.00 columns X 3 rows C= 0.600 Limited to weir flow at low heads
#4	Secondary	98.00'	168.0' long x 2.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Primary OutFlow Max=0.35 cfs @ 13.19 hrs HW=95.39' (Free Discharge)

↑1=**Restriction Orifice** (Passes 0.35 cfs of 0.42 cfs potential flow)

↑2=**6" HDPE Underdrain** (Outlet Controls 0.35 cfs @ 1.76 fps)

↑3=**Perforations** (Passes 0.35 cfs of 6.48 cfs potential flow)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=94.50' (Free Discharge)

↑4=**Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 12P: PP (w/ underdrain) w/ UG storage 7 - Chamber Wizard Field A

Chamber Model = ADS_StormTech SC-740 +Cap (ADS StormTech® SC-740 with cap length)

Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf

Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap

51.0" Wide + 6.0" Spacing = 57.0" C-C Row Spacing

20 Chambers/Row x 7.12' Long +0.81' Cap Length x 2 = 144.02' Row Length +12.0" End Stone x 2 = 146.02' Base Length

16 Rows x 51.0" Wide + 6.0" Spacing x 15 + 12.0" Side Stone x 2 = 77.50' Base Width

6.0" Stone Base + 30.0" Chamber Height + 6.0" Stone Cover = 3.50' Field Height

320 Chambers x 45.9 cf = 14,700.8 cf Chamber Storage

39,607.0 cf Field - 14,700.8 cf Chambers = 24,906.2 cf Stone x 40.0% Voids = 9,962.5 cf Stone Storage

Chamber Storage + Stone Storage = 24,663.3 cf = 0.566 af

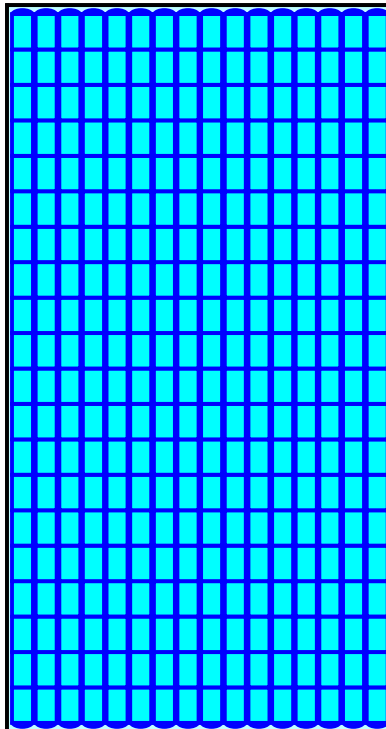
Overall Storage Efficiency = 62.3%

Overall System Size = 146.02' x 77.50' x 3.50'

320 Chambers

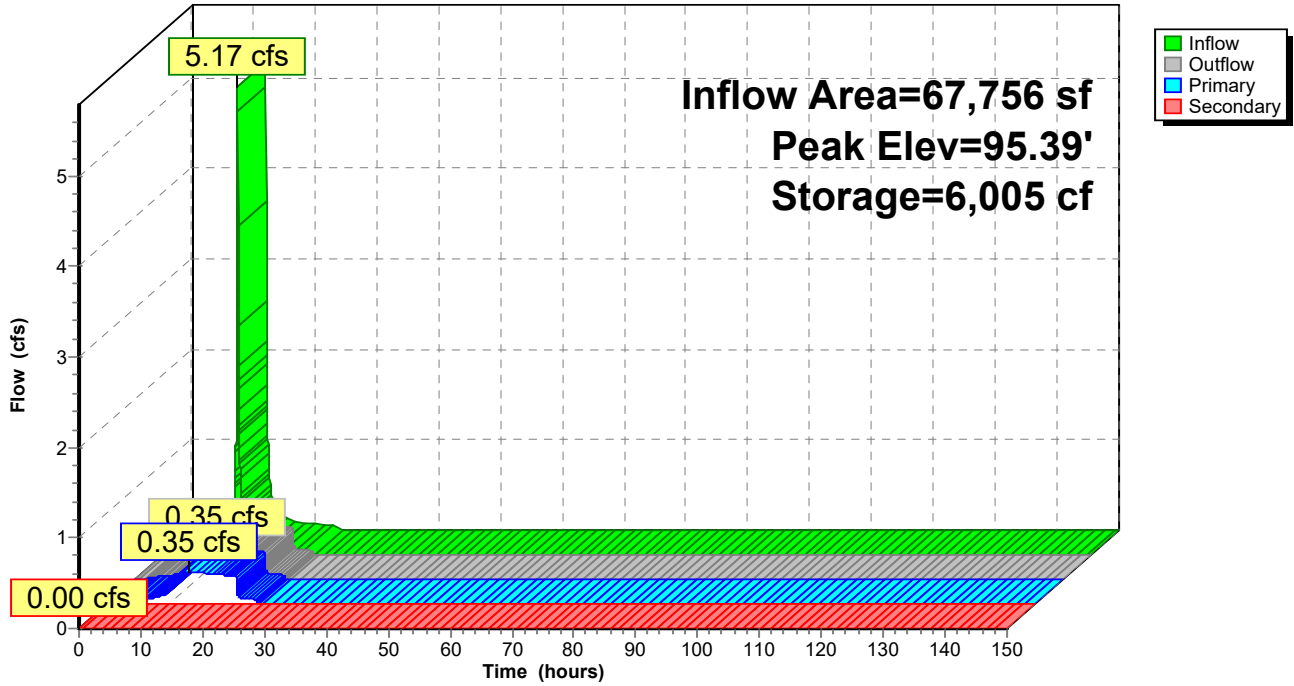
1,466.9 cy Field

922.5 cy Stone



Pond 12P: PP (w/ underdrain) w/ UG storage 7

Hydrograph



Summary for Pond 13P: Bioretention Basin 4

Inflow Area = 329,976 sf, 48.67% Impervious, Inflow Depth = 2.11" for 2-Year _Current event
 Inflow = 4.72 cfs @ 12.37 hrs, Volume= 57,946 cf
 Outflow = 2.17 cfs @ 12.99 hrs, Volume= 56,684 cf, Atten= 54%, Lag= 37.2 min
 Primary = 0.34 cfs @ 12.99 hrs, Volume= 28,380 cf
 Routed to nonexistent node 5R
 Secondary = 1.83 cfs @ 12.99 hrs, Volume= 28,304 cf
 Routed to nonexistent node 5R
 Tertiary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
 Routed to nonexistent node 5R

Routing by Stor-Ind method, Time Span= 0.00-150.00 hrs, dt= 0.02 hrs / 2
 Peak Elev= 51.43' @ 12.99 hrs Surf.Area= 9,405 sf Storage= 17,279 cf

Plug-Flow detention time= 321.8 min calculated for 56,684 cf (98% of inflow)
 Center-of-Mass det. time= 309.6 min (1,174.2 - 864.6)

Volume	Invert	Avail.Storage	Storage Description
#1	49.00'	33,395 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
49.00	4,800	0	0
52.00	10,478	22,917	22,917
53.00	10,478	10,478	33,395

Device	Routing	Invert	Outlet Devices
#1	Primary	49.25'	3.0" Vert. Low Flow Orifice C= 0.600 Limited to weir flow at low heads
#2	Secondary	51.00'	24.0" W x 18.0" H Vert. SECONDARY OUTLET C= 0.600 Limited to weir flow at low heads
#3	Tertiary	52.00'	60.0" x 60.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.34 cfs @ 12.99 hrs HW=51.43' (Free Discharge)

↑**1=Low Flow Orifice** (Orifice Controls 0.34 cfs @ 6.91 fps)

Secondary OutFlow Max=1.83 cfs @ 12.99 hrs HW=51.43' (Free Discharge)

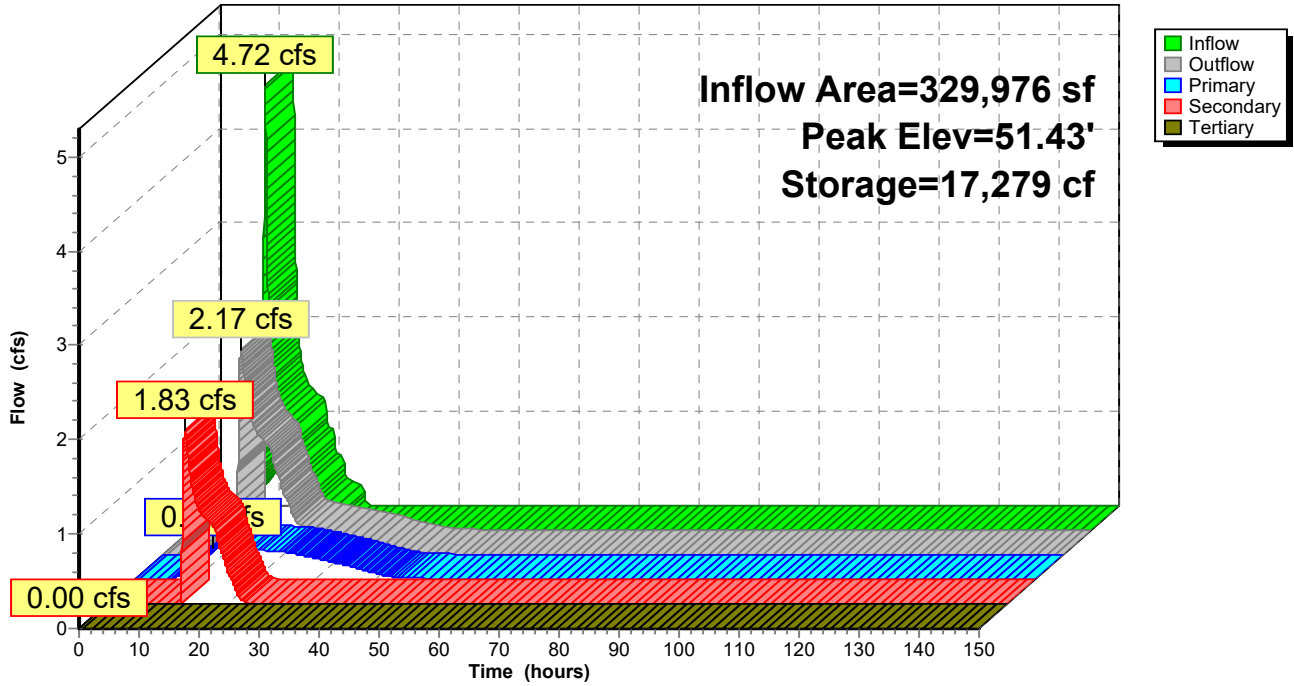
↑**2=SECONDARY OUTLET** (Orifice Controls 1.83 cfs @ 2.11 fps)

Tertiary OutFlow Max=0.00 cfs @ 0.00 hrs HW=49.00' (Free Discharge)

↑**3=Orifice/Grate** (Controls 0.00 cfs)

Pond 13P: Bioretention Basin 4

Hydrograph



Time span=0.00-150.00 hrs, dt=0.02 hrs, 7501 points
 Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious
 Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: DA 1: CN w/ IC areas	Runoff Area=141,085 sf 17.73% Impervious Runoff Depth=3.91" Tc=18.6 min CN=75/98 Runoff=10.66 cfs 45,932 cf
Subcatchment 2S: DA 2: CN w/ IC areas	Runoff Area=21,583 sf 64.54% Impervious Runoff Depth=5.19" Tc=1.4 min CN=78/98 Runoff=3.29 cfs 9,333 cf
Subcatchment 3S: DA 3: CN w/ IC areas	Runoff Area=40,101 sf 65.65% Impervious Runoff Depth=5.18" Tc=3.5 min CN=77/98 Runoff=5.93 cfs 17,306 cf
Subcatchment 4S: DA 4: CN w/ IC areas	Runoff Area=84,260 sf 73.22% Impervious Runoff Depth=5.35" Tc=3.2 min CN=77/98 Runoff=12.84 cfs 37,590 cf
Subcatchment 5S: DA 5: CN w/ IC areas	Runoff Area=52,282 sf 79.56% Impervious Runoff Depth=5.52" Tc=2.5 min CN=78/98 Runoff=8.32 cfs 24,052 cf
Subcatchment 6S: DA 6: CN w/ IC areas	Runoff Area=76,785 sf 82.96% Impervious Runoff Depth=5.61" Tc=3.2 min CN=79/98 Runoff=12.11 cfs 35,917 cf
Subcatchment 7S: DA 7: CN w/ IC areas	Runoff Area=120,233 sf 94.05% Impervious Runoff Depth=5.84" Tc=3.5 min CN=78/98 Runoff=19.31 cfs 58,516 cf
Subcatchment 8S: DA 8: CN w/ IC areas	Runoff Area=111,353 sf 71.87% Impervious Runoff Depth=5.21" Tc=2.0 min CN=73/98 Runoff=17.14 cfs 48,345 cf
Subcatchment 9S: DA 9: CN w/ IC areas	Runoff Area=59,019 sf 68.70% Impervious Runoff Depth=5.28" Tc=2.8 min CN=78/98 Runoff=9.04 cfs 25,973 cf
Subcatchment 10S: DA 10: CN w/ IC areas	Runoff Area=48,527 sf 85.53% Impervious Runoff Depth=5.59" Tc=5.8 min CN=74/98 Runoff=7.06 cfs 22,622 cf
Subcatchment 11S: DA 11: CN w/ IC areas	Runoff Area=57,652 sf 78.51% Impervious Runoff Depth=5.45" Tc=2.5 min CN=76/98 Runoff=9.07 cfs 26,202 cf
Subcatchment 12S: DA 12: CN w/ IC areas	Runoff Area=67,756 sf 72.56% Impervious Runoff Depth=5.34" Tc=2.9 min CN=77/98 Runoff=10.40 cfs 30,142 cf
Subcatchment 13S: DA 13: CN w/ IC areas	Runoff Area=156,041 sf 15.80% Impervious Runoff Depth=3.77" Tc=24.6 min CN=74/98 Runoff=10.00 cfs 49,081 cf
Pond 1P: Bioretention Basin 1	Peak Elev=64.83' Storage=15,610 cf Inflow=10.66 cfs 45,932 cf Primary=0.41 cfs 25,853 cf Secondary=4.90 cfs 20,079 cf Tertiary=0.00 cfs 0 cf Outflow=5.30 cfs 45,932 cf
Pond 2P: Bioretention Basin 2	Peak Elev=70.18' Storage=4,380 cf Inflow=3.29 cfs 9,333 cf Primary=0.32 cfs 8,992 cf Secondary=0.00 cfs 0 cf Tertiary=0.00 cfs 0 cf Outflow=0.32 cfs 8,992 cf
Pond 3P: Bioretention Basin 3	Peak Elev=66.80' Storage=7,533 cf Inflow=5.93 cfs 17,306 cf Primary=0.37 cfs 14,298 cf Secondary=1.03 cfs 2,547 cf Tertiary=0.00 cfs 0 cf Outflow=1.40 cfs 16,845 cf

Pond 4P: PP (w/ underdrain) w/ UG Peak Elev=96.48' Storage=20,478 cf Inflow=12.84 cfs 37,590 cf
Primary=0.40 cfs 37,590 cf Secondary=0.00 cfs 0 cf Outflow=0.40 cfs 37,590 cf

Pond 5P: PP (w/ underdrain) w/ UG storage Peak Elev=96.43' Storage=13,760 cf Inflow=8.32 cfs 24,052 cf
Primary=0.22 cfs 24,052 cf Secondary=0.00 cfs 0 cf Outflow=0.22 cfs 24,052 cf

Pond 6P: PP (w/ underdrain) w/ UG Peak Elev=96.47' Storage=23,262 cf Inflow=12.11 cfs 35,917 cf
Primary=0.22 cfs 35,917 cf Secondary=0.00 cfs 0 cf Outflow=0.22 cfs 35,917 cf

Pond 7P: PP (w/ underdrain) w/ UG Peak Elev=96.48' Storage=36,366 cf Inflow=19.31 cfs 58,516 cf
Primary=0.40 cfs 58,516 cf Secondary=0.00 cfs 0 cf Outflow=0.40 cfs 58,516 cf

Pond 8P: Existing Basin 1 Peak Elev=59.51' Storage=8,527 cf Inflow=18.25 cfs 204,421 cf
Primary=10.62 cfs 204,421 cf Secondary=0.00 cfs 0 cf Tertiary=0.00 cfs 0 cf Outflow=10.62 cfs 204,421 cf

Pond 9P: Existing Basin 2 Peak Elev=67.70' Storage=9,017 cf Inflow=9.04 cfs 25,973 cf
Primary=0.41 cfs 16,408 cf Secondary=2.13 cfs 9,565 cf Tertiary=0.00 cfs 0 cf Outflow=2.54 cfs 25,973 cf

Pond 10P: PP (w/ underdrain) w/ UG Peak Elev=97.01' Storage=10,021 cf Inflow=7.06 cfs 22,622 cf
Primary=0.42 cfs 22,622 cf Secondary=0.00 cfs 0 cf Outflow=0.42 cfs 22,622 cf

Pond 11P: PP (w/ underdrain) w/ UG Peak Elev=96.59' Storage=12,473 cf Inflow=9.07 cfs 26,202 cf
Primary=0.40 cfs 26,202 cf Secondary=0.00 cfs 0 cf Outflow=0.40 cfs 26,202 cf

Pond 12P: PP (w/ underdrain) w/ UG Peak Elev=96.43' Storage=15,238 cf Inflow=10.40 cfs 30,142 cf
Primary=0.40 cfs 30,142 cf Secondary=0.00 cfs 0 cf Outflow=0.40 cfs 30,142 cf

Pond 13P: Bioretention Basin 4 Peak Elev=52.08' Storage=23,758 cf Inflow=11.17 cfs 128,047 cf
Primary=0.39 cfs 39,416 cf Secondary=7.21 cfs 86,239 cf Tertiary=1.49 cfs 1,129 cf Outflow=9.09 cfs 126,784 cf

Total Runoff Area = 1,036,677 sf Runoff Volume = 431,011 cf Average Runoff Depth = 4.99"
39.57% Pervious = 410,178 sf 60.43% Impervious = 626,499 sf

Summary for Subcatchment 1S: DA 1: CN w/ IC areas

Runoff = 10.66 cfs @ 12.27 hrs, Volume= 45,932 cf, Depth= 3.91"
 Routed to Pond 1P : Bioretention Basin 1

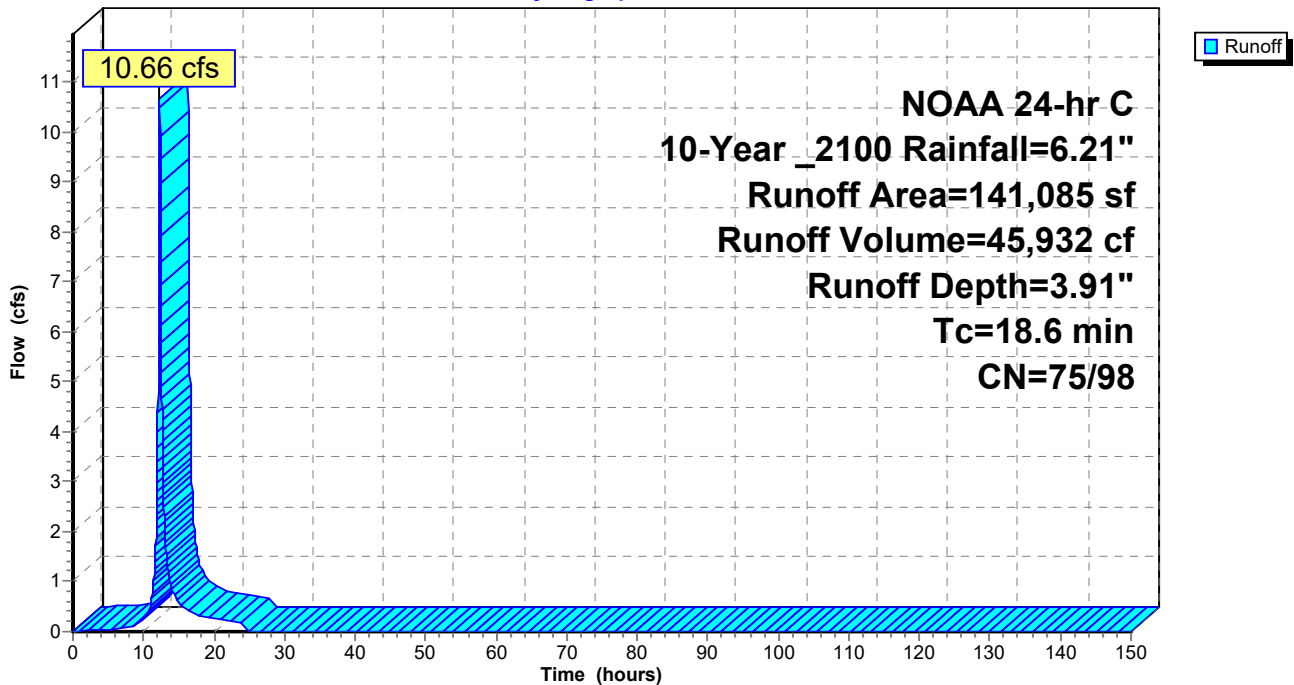
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-150.00 hrs, dt= 0.0
 NOAA 24-hr C 10-Year _2100 Rainfall=6.21"

	Area (sf)	CN	Description
*	25,014	98	Impervious HSG C
	26,886	70	Brush (fair) HSG C
	45,464	79	Open Space (fair) HSG C
*	10,665	74	Open Space (good) HSG C
*	33,056	73	Woods (fair) HSG C
	141,085	79	Weighted Average
	116,071	75	82.27% Pervious Area
	25,014	98	17.73% Impervious Area

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

Subcatchment 1S: DA 1: CN w/ IC areas

Hydrograph



Summary for Subcatchment 2S: DA 2: CN w/ IC areas

[49] Hint: Tc<2dt may require smaller dt

Runoff = 3.29 cfs @ 12.09 hrs, Volume= 9,333 cf, Depth= 5.19"
 Routed to Pond 2P : Bioretention Basin 2

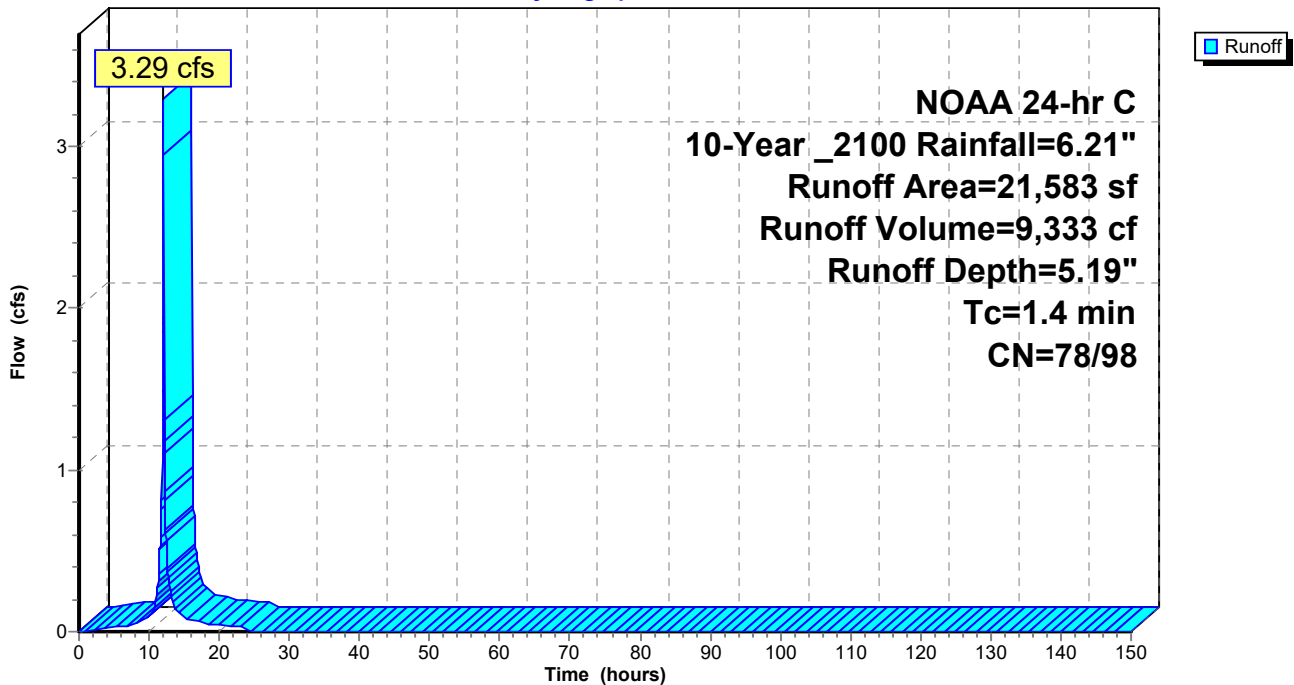
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-150.00 hrs, dt= 0.0
 NOAA 24-hr C 10-Year _2100 Rainfall=6.21"

	Area (sf)	CN	Description
*	13,929	98	Impervious HSG C
	6,668	79	Open Space (fair) HSG C
*	986	74	Open Space (good) HSG C
	21,583	91	Weighted Average
	7,654	78	35.46% Pervious Area
	13,929	98	64.54% Impervious Area

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

Subcatchment 2S: DA 2: CN w/ IC areas

Hydrograph



Summary for Subcatchment 3S: DA 3: CN w/ IC areas

Runoff = 5.93 cfs @ 12.10 hrs, Volume= 17,306 cf, Depth= 5.18"
 Routed to Pond 3P : Bioretention Basin 3

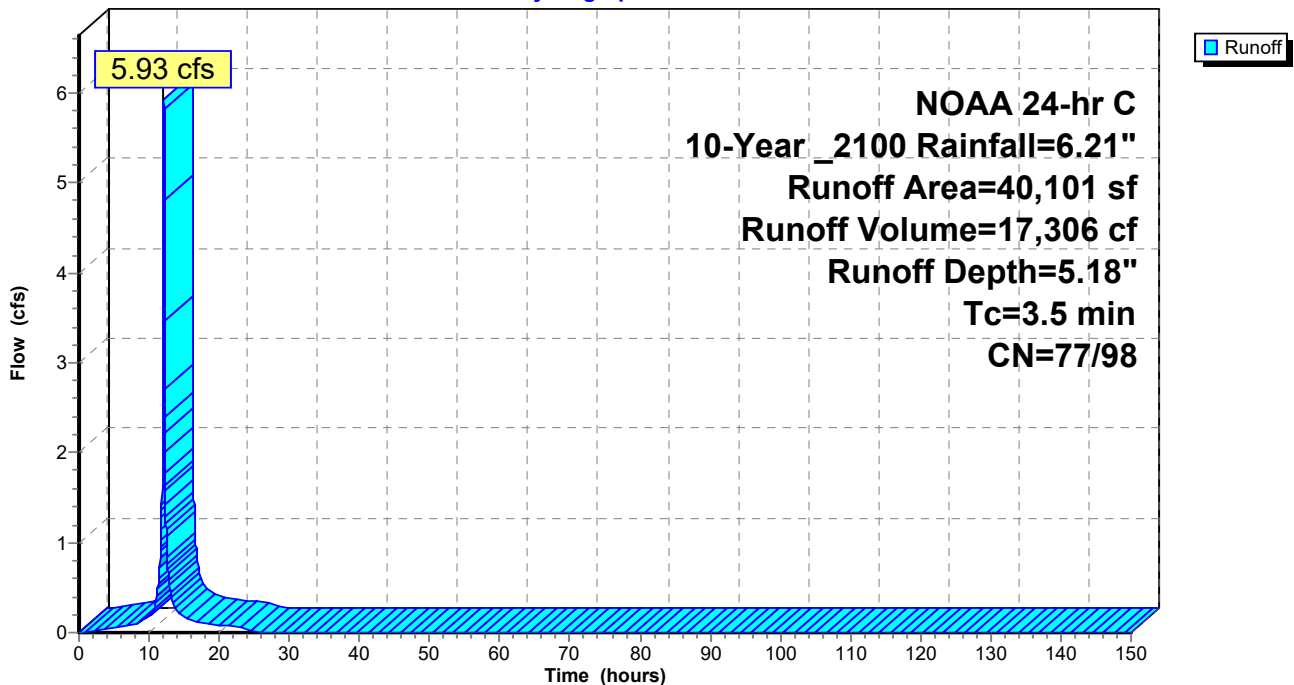
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-150.00 hrs, dt= 0.0
 NOAA 24-hr C 10-Year _2100 Rainfall=6.21"

	Area (sf)	CN	Description
*	26,326	98	Impervious HSG C
	9,202	79	Open Space (fair) HSG C
*	4,573	74	Open Space (good) HSG C
	40,101	91	Weighted Average
	13,775	77	34.35% Pervious Area
	26,326	98	65.65% Impervious Area

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

Subcatchment 3S: DA 3: CN w/ IC areas

Hydrograph



Summary for Subcatchment 4S: DA 4: CN w/ IC areas

Runoff = 12.84 cfs @ 12.10 hrs, Volume= 37,590 cf, Depth= 5.35"

Routed to Pond 4P : PP (w/ underdrain) w/ UG storage 1

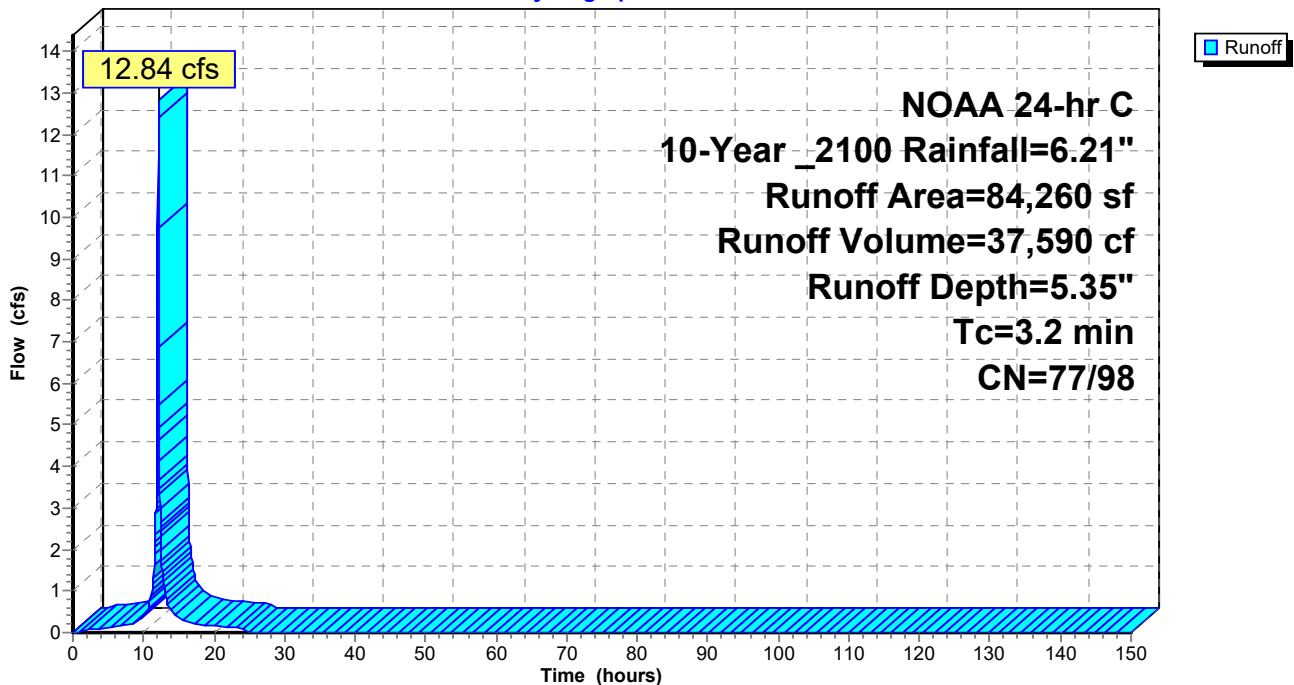
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-150.00 hrs, dt= 0.0
 NOAA 24-hr C 10-Year _2100 Rainfall=6.21"

	Area (sf)	CN	Description
*	61,698	98	Impervious HSG C
	13,143	79	Open Space (fair) HSG C
*	9,419	74	Open Space (good) HSG C
	84,260	92	Weighted Average
	22,562	77	26.78% Pervious Area
	61,698	98	73.22% Impervious Area

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

Subcatchment 4S: DA 4: CN w/ IC areas

Hydrograph



Summary for Subcatchment 5S: DA 5: CN w/ IC areas

Runoff = 8.32 cfs @ 12.09 hrs, Volume= 24,052 cf, Depth= 5.52"

Routed to Pond 5P : PP (w/ underdrain) w/ UG storage 2

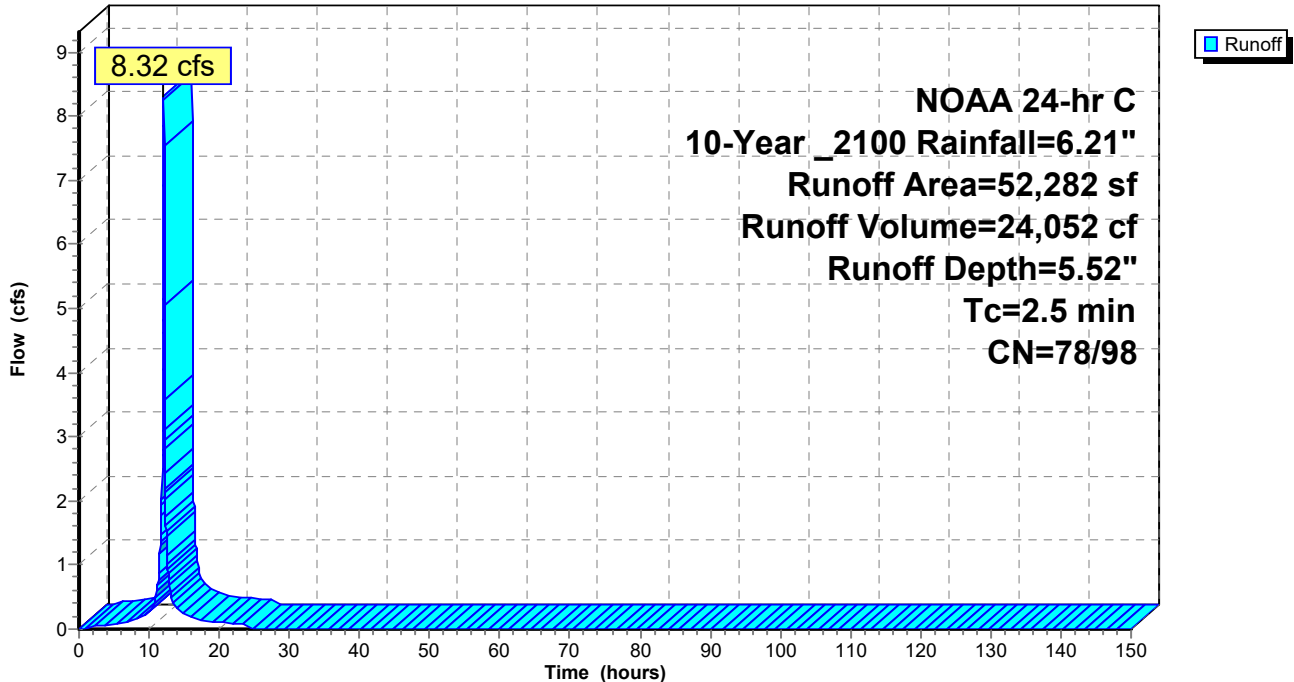
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-150.00 hrs, dt= 0.0
 NOAA 24-hr C 10-Year _2100 Rainfall=6.21"

	Area (sf)	CN	Description
*	41,595	98	Impervious HSG C
	444	70	Brush (fair) HSG C
	9,377	79	Open Space (fair) HSG C
*	866	74	Open Space (good) HSG C
	52,282	94	Weighted Average
	10,687	78	20.44% Pervious Area
	41,595	98	79.56% Impervious Area

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

Subcatchment 5S: DA 5: CN w/ IC areas

Hydrograph



Summary for Subcatchment 6S: DA 6: CN w/ IC areas

Runoff = 12.11 cfs @ 12.10 hrs, Volume= 35,917 cf, Depth= 5.61"

Routed to Pond 6P : PP (w/ underdrain) w/ UG storage 3

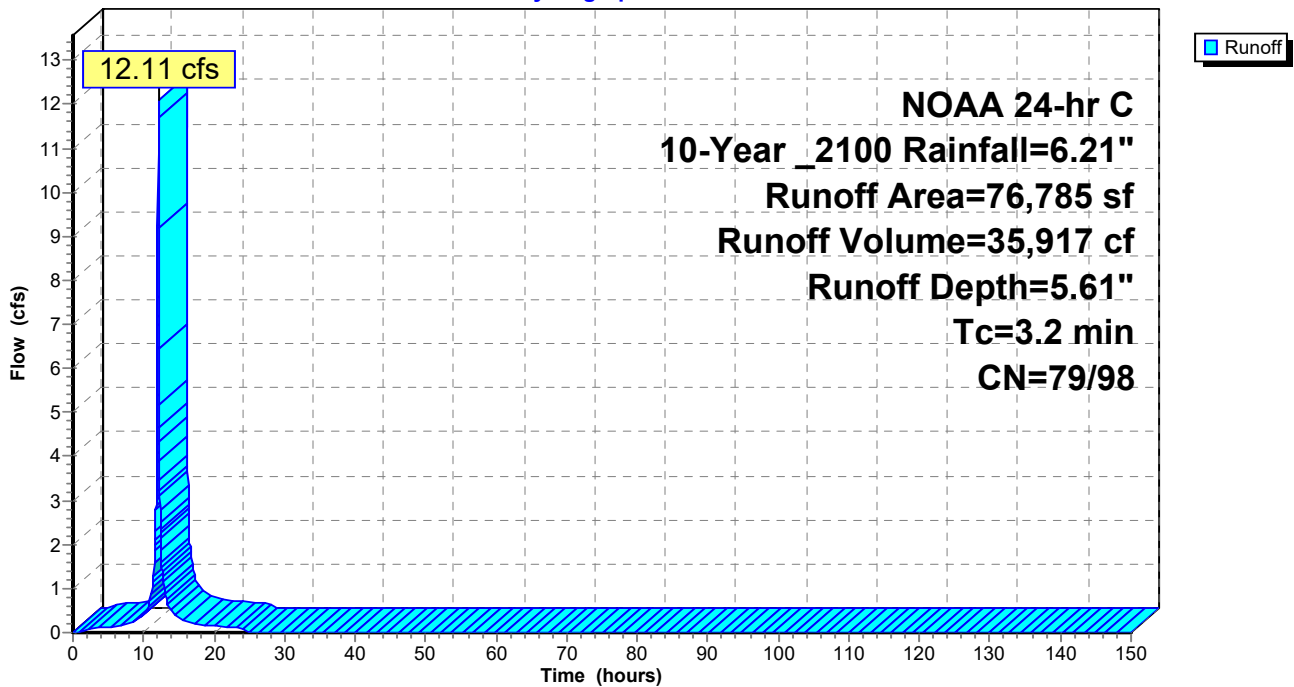
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-150.00 hrs, dt= 0.0
 NOAA 24-hr C 10-Year _2100 Rainfall=6.21"

	Area (sf)	CN	Description
*	63,699	98	Impervious HSG C
	12,708	79	Open Space (fair) HSG C
*	378	74	Open Space (good) HSG C
	76,785	95	Weighted Average
	13,086	79	17.04% Pervious Area
	63,699	98	82.96% Impervious Area

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

Subcatchment 6S: DA 6: CN w/ IC areas

Hydrograph



Summary for Subcatchment 7S: DA 7: CN w/ IC areas

Runoff = 19.31 cfs @ 12.10 hrs, Volume= 58,516 cf, Depth= 5.84"

Routed to Pond 7P : PP (w/ underdrain) w/ UG storage 4

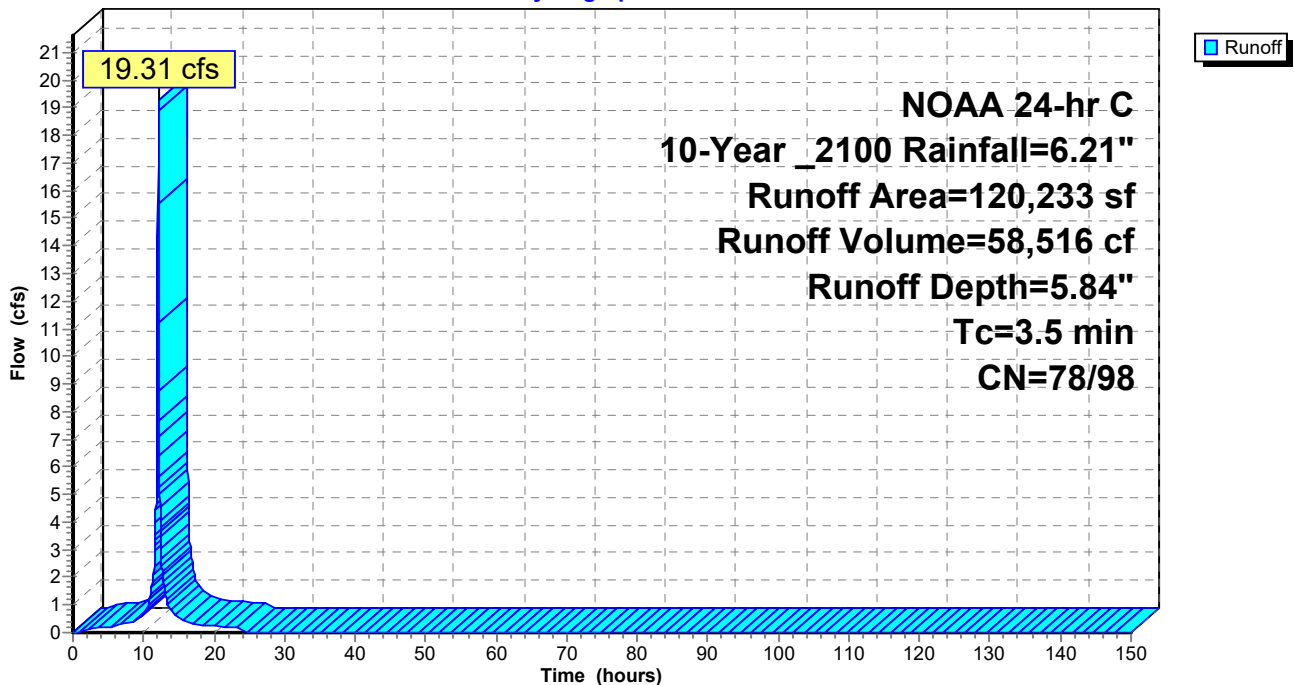
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-150.00 hrs, dt= 0.0
 NOAA 24-hr C 10-Year _2100 Rainfall=6.21"

	Area (sf)	CN	Description
*	113,075	98	Impervious HSG C
	5,111	79	Open Space (fair) HSG C
*	2,047	74	Open Space (good) HSG C
	120,233	97	Weighted Average
	7,158	78	5.95% Pervious Area
	113,075	98	94.05% Impervious Area

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

Subcatchment 7S: DA 7: CN w/ IC areas

Hydrograph



Summary for Subcatchment 8S: DA 8: CN w/ IC areas

[49] Hint: Tc<2dt may require smaller dt

Runoff = 17.14 cfs @ 12.09 hrs, Volume= 48,345 cf, Depth= 5.21"
 Routed to Pond 8P : Existing Basin 1

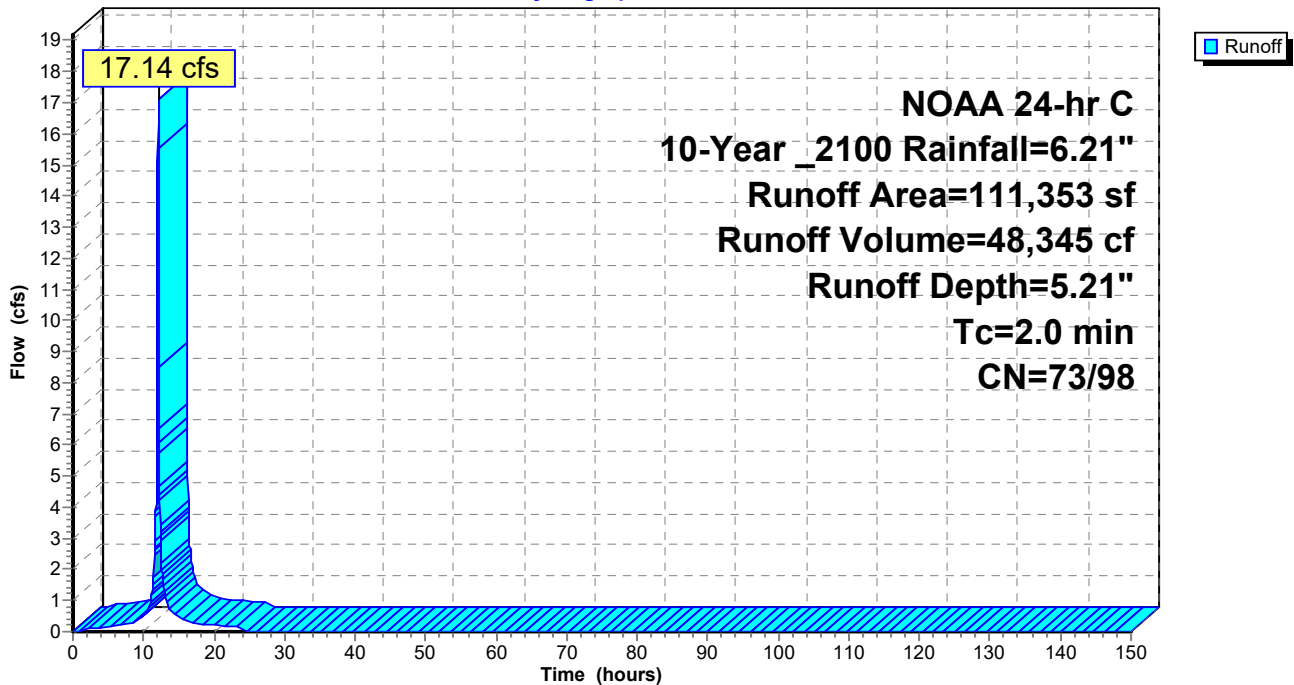
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-150.00 hrs, dt= 0.0
 NOAA 24-hr C 10-Year _2100 Rainfall=6.21"

	Area (sf)	CN	Description
*	80,033	98	Impervious HSG C
	3,876	70	Brush (fair) HSG C
	419	79	Open Space (fair) HSG C
*	12,431	74	Open Space (good) HSG C
*	14,594	73	Woods (fair) HSG C
	111,353	91	Weighted Average
	31,320	73	28.13% Pervious Area
	80,033	98	71.87% Impervious Area

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

Subcatchment 8S: DA 8: CN w/ IC areas

Hydrograph



Summary for Subcatchment 9S: DA 9: CN w/ IC areas

Runoff = 9.04 cfs @ 12.10 hrs, Volume= 25,973 cf, Depth= 5.28"
 Routed to Pond 9P : Existing Basin 2

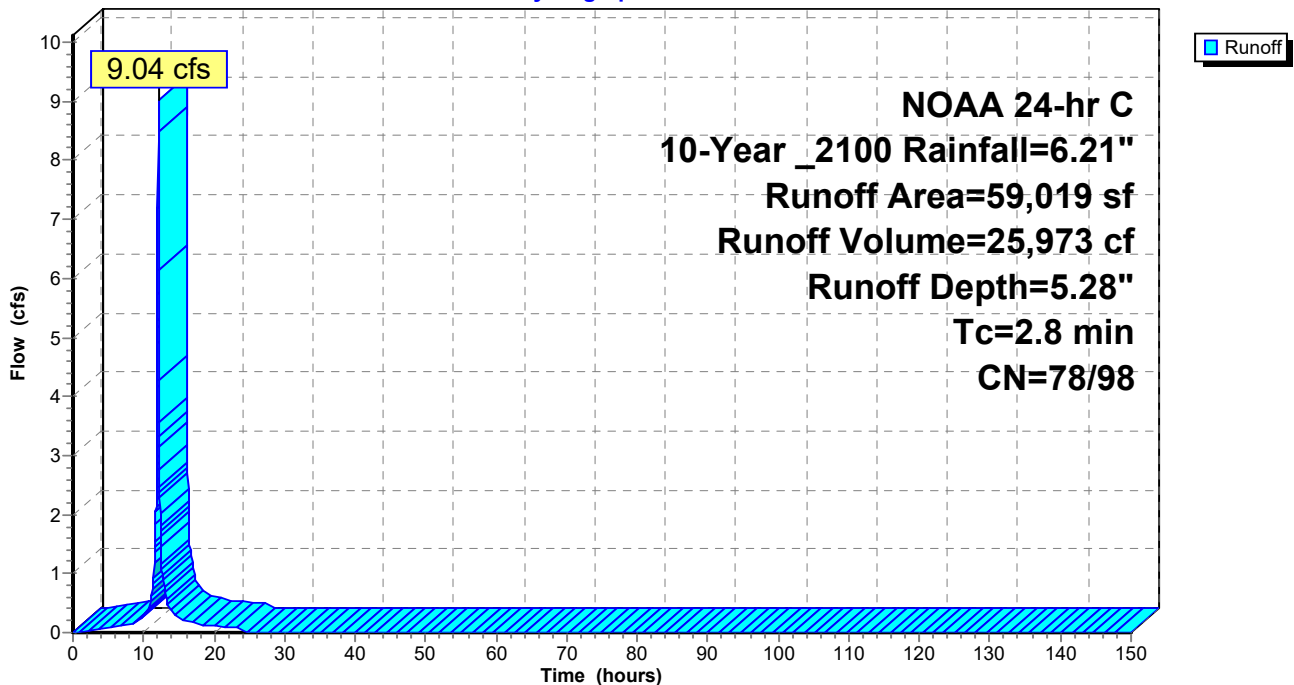
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-150.00 hrs, dt= 0.0
 NOAA 24-hr C 10-Year _2100 Rainfall=6.21"

	Area (sf)	CN	Description
*	40,544	98	Impervious HSG C
	15,969	79	Open Space (fair) HSG C
*	2,506	74	Open Space (good) HSG C
	59,019	92	Weighted Average
	18,475	78	31.30% Pervious Area
	40,544	98	68.70% Impervious Area

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

Subcatchment 9S: DA 9: CN w/ IC areas

Hydrograph



Summary for Subcatchment 10S: DA 10: CN w/ IC areas

Runoff = 7.06 cfs @ 12.13 hrs, Volume= 22,622 cf, Depth= 5.59"

Routed to Pond 10P : PP (w/ underdrain) w/ UG storage 5

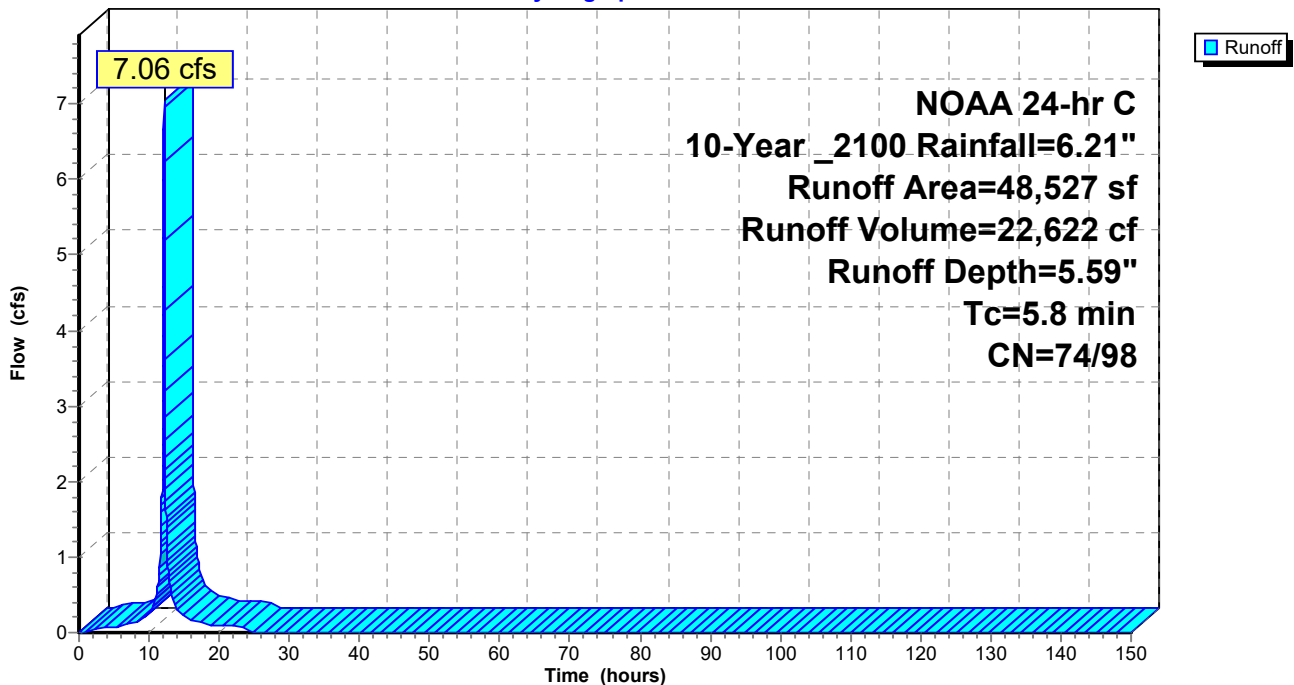
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-150.00 hrs, dt= 0.00
 NOAA 24-hr C 10-Year _2100 Rainfall=6.21"

	Area (sf)	CN	Description
*	41,506	98	Impervious HSG C
	60	79	Open Space (fair) HSG C
*	6,961	74	Open Space (good) HSG C
	48,527	95	Weighted Average
	7,021	74	14.47% Pervious Area
	41,506	98	85.53% Impervious Area

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

Subcatchment 10S: DA 10: CN w/ IC areas

Hydrograph



Summary for Subcatchment 11S: DA 11: CN w/ IC areas

Runoff = 9.07 cfs @ 12.09 hrs, Volume= 26,202 cf, Depth= 5.45"

Routed to Pond 11P : PP (w/ underdrain) w/ UG storage 6

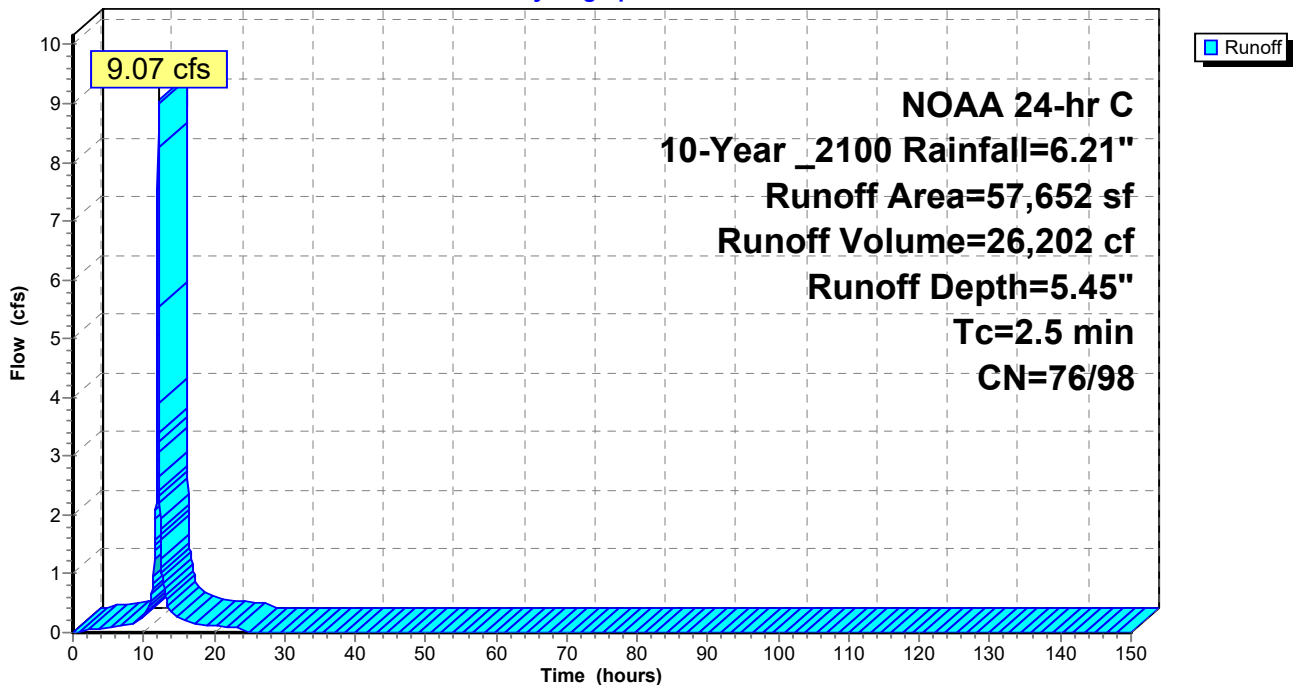
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-150.00 hrs, dt= 0.01
 NOAA 24-hr C 10-Year _2100 Rainfall=6.21"

	Area (sf)	CN	Description
*	45,264	98	Impervious HSG C
	5,795	79	Open Space (fair) HSG C
*	6,593	74	Open Space (good) HSG C
	57,652	93	Weighted Average
	12,388	76	21.49% Pervious Area
	45,264	98	78.51% Impervious Area

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

Subcatchment 11S: DA 11: CN w/ IC areas

Hydrograph



Summary for Subcatchment 12S: DA 12: CN w/ IC areas

Runoff = 10.40 cfs @ 12.10 hrs, Volume= 30,142 cf, Depth= 5.34"

Routed to Pond 12P : PP (w/ underdrain) w/ UG storage 7

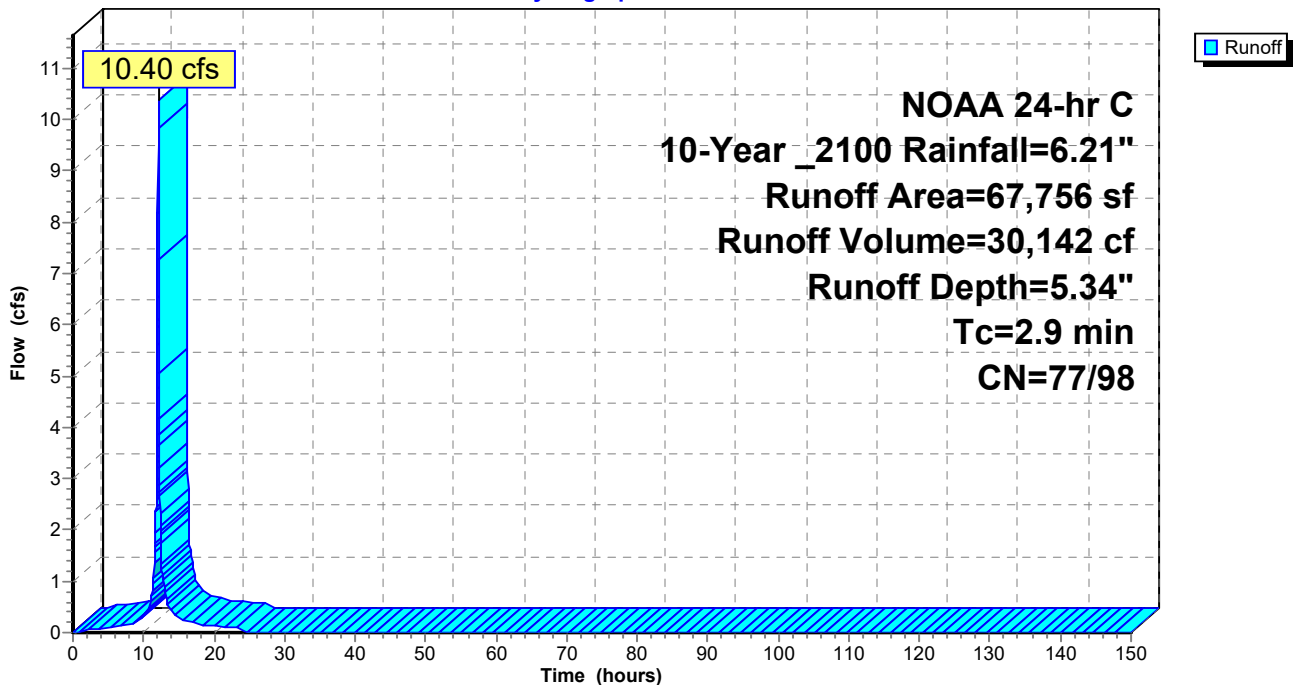
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-150.00 hrs, dt= 0.0
 NOAA 24-hr C 10-Year _2100 Rainfall=6.21"

	Area (sf)	CN	Description
*	49,166	98	Impervious HSG C
	11,017	79	Open Space (fair) HSG C
*	7,573	74	Open Space (good) HSG C
	67,756	92	Weighted Average
	18,590	77	27.44% Pervious Area
	49,166	98	72.56% Impervious Area

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

Subcatchment 12S: DA 12: CN w/ IC areas

Hydrograph



Summary for Subcatchment 13S: DA 13: CN w/ IC areas

Runoff = 10.00 cfs @ 12.35 hrs, Volume= 49,081 cf, Depth= 3.77"
 Routed to Pond 13P : Bioretention Basin 4

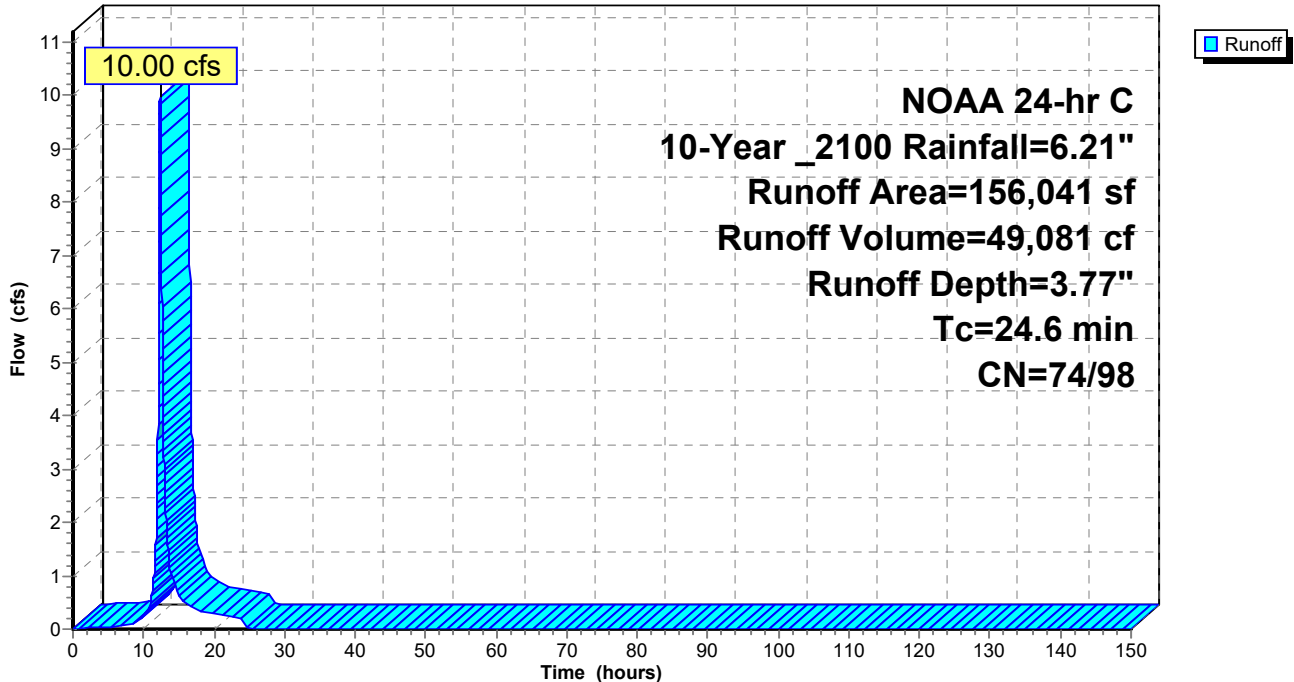
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-150.00 hrs, dt= 0.0
 NOAA 24-hr C 10-Year _2100 Rainfall=6.21"

	Area (sf)	CN	Description
*	24,650	98	Impervious HSG C
	42,240	79	Open Space (fair) HSG C
*	20,548	74	Open Space (good) HSG C
	68,603	70	Woods, Good, HSG C
	156,041	77	Weighted Average
	131,391	74	84.20% Pervious Area
	24,650	98	15.80% Impervious Area

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

Subcatchment 13S: DA 13: CN w/ IC areas

Hydrograph



Summary for Pond 1P: Bioretention Basin 1

[44] Hint: Outlet device #1 is below defined storage

Inflow Area = 141,085 sf, 17.73% Impervious, Inflow Depth = 3.91" for 10-Year _2100 event
 Inflow = 10.66 cfs @ 12.27 hrs, Volume= 45,932 cf
 Outflow = 5.30 cfs @ 12.55 hrs, Volume= 45,932 cf, Atten= 50%, Lag= 16.7 min
 Primary = 0.41 cfs @ 12.55 hrs, Volume= 25,853 cf
 Routed to nonexistent node 5R
 Secondary = 4.90 cfs @ 12.55 hrs, Volume= 20,079 cf
 Routed to nonexistent node 5R
 Tertiary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
 Routed to nonexistent node 5R

Routing by Stor-Ind method, Time Span= 0.00-150.00 hrs, dt= 0.02 hrs / 2
 Peak Elev= 64.83' @ 12.55 hrs Surf.Area= 8,572 sf Storage= 15,610 cf

Plug-Flow detention time= 186.7 min calculated for 45,932 cf (100% of inflow)
 Center-of-Mass det. time= 186.7 min (1,004.1 - 817.4)

Volume	Invert	Avail.Storage	Storage Description
#1	62.50'	37,960 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
62.50	4,800	0	0
67.00	12,071	37,960	37,960

Device	Routing	Invert	Outlet Devices
#1	Primary	61.75'	3.0" Vert. Low Flow Orifice C= 0.600 Limited to weir flow at low heads
#2	Secondary	64.00'	24.0" W x 18.0" H Vert. SECONDARY OUTLET C= 0.600 Limited to weir flow at low heads
#3	Tertiary	66.25'	60.0" x 60.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads

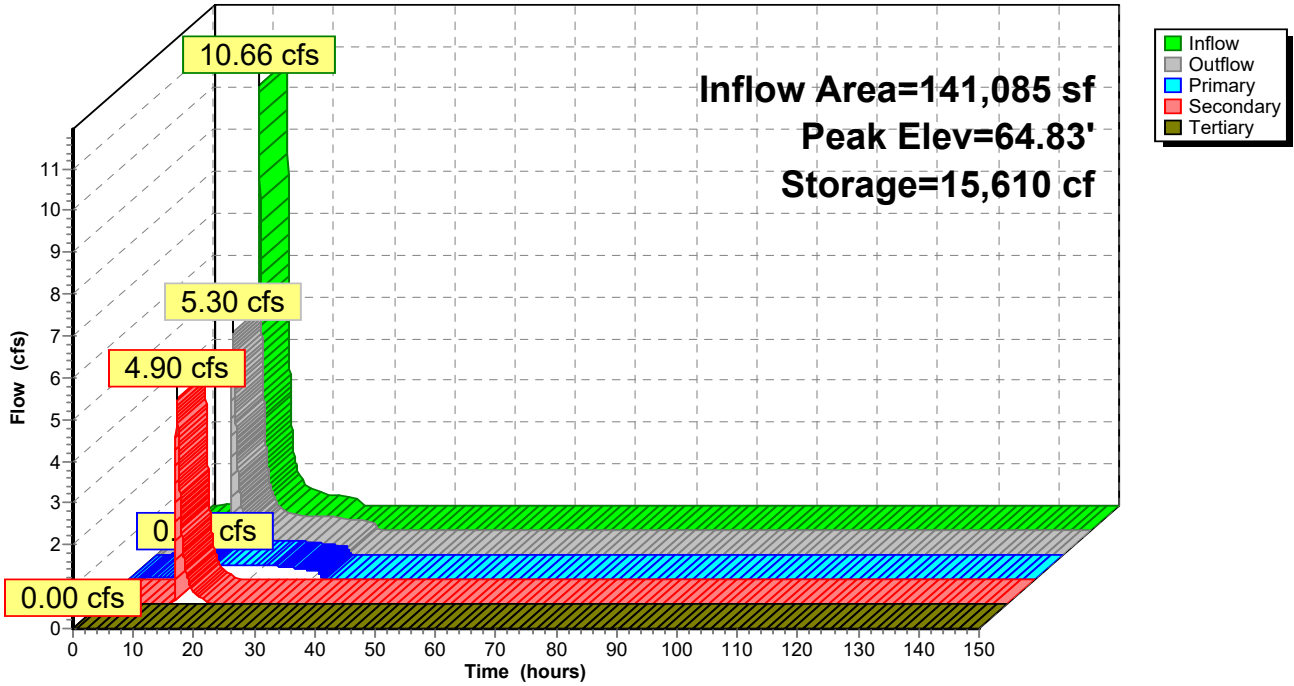
Primary OutFlow Max=0.41 cfs @ 12.55 hrs HW=64.83' (Free Discharge)
 ↖**1=Low Flow Orifice** (Orifice Controls 0.41 cfs @ 8.28 fps)

Secondary OutFlow Max=4.89 cfs @ 12.55 hrs HW=64.83' (Free Discharge)
 ↖**2=SECONDARY OUTLET** (Orifice Controls 4.89 cfs @ 2.93 fps)

Tertiary OutFlow Max=0.00 cfs @ 0.00 hrs HW=62.50' (Free Discharge)
 ↖**3=Orifice/Grate** (Controls 0.00 cfs)

Pond 1P: Bioretention Basin 1

Hydrograph



Summary for Pond 2P: Bioretention Basin 2

Inflow Area = 21,583 sf, 64.54% Impervious, Inflow Depth = 5.19" for 10-Year_2100 event
 Inflow = 3.29 cfs @ 12.09 hrs, Volume= 9,333 cf
 Outflow = 0.32 cfs @ 12.81 hrs, Volume= 8,992 cf, Atten= 90%, Lag= 43.3 min
 Primary = 0.32 cfs @ 12.81 hrs, Volume= 8,992 cf
 Routed to nonexistent node 5R
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
 Routed to nonexistent node 5R
 Tertiary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
 Routed to nonexistent node 5R

Routing by Stor-Ind method, Time Span= 0.00-150.00 hrs, dt= 0.02 hrs / 2
 Peak Elev= 70.18' @ 12.81 hrs Surf.Area= 2,744 sf Storage= 4,380 cf

Plug-Flow detention time= 188.7 min calculated for 8,992 cf (96% of inflow)
 Center-of-Mass det. time= 165.7 min (926.2 - 760.5)

Volume	Invert	Avail.Storage	Storage Description
#1	68.00'	14,805 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
68.00	1,281	0	0
73.00	4,641	14,805	14,805

Device	Routing	Invert	Outlet Devices
#1	Primary	68.25'	3.0" Vert. Low Flow Orifice C= 0.600 Limited to weir flow at low heads
#2	Secondary	70.50'	24.0" W x 18.0" H Vert. SECONDARY OUTLET C= 0.600 Limited to weir flow at low heads
#3	Tertiary	72.75'	60.0" x 60.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads

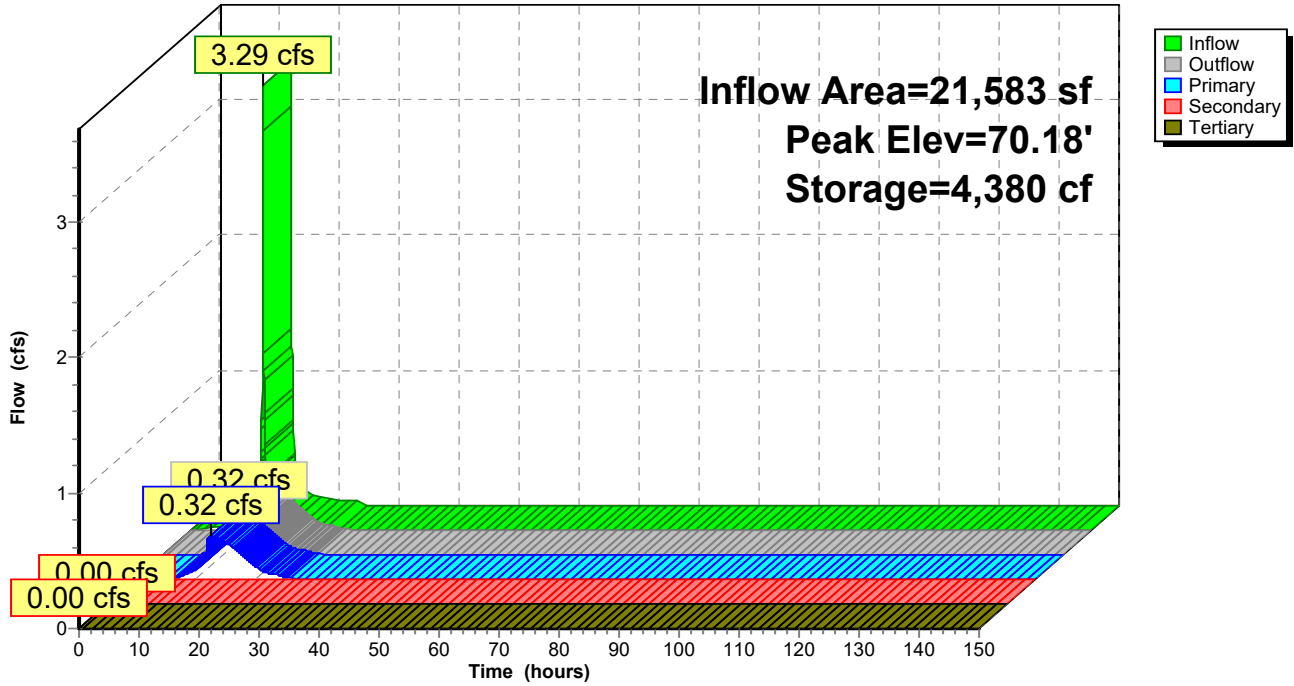
Primary OutFlow Max=0.32 cfs @ 12.81 hrs HW=70.18' (Free Discharge)
 ↖1=Low Flow Orifice (Orifice Controls 0.32 cfs @ 6.46 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=68.00' (Free Discharge)
 ↖2=SECONDARY OUTLET (Controls 0.00 cfs)

Tertiary OutFlow Max=0.00 cfs @ 0.00 hrs HW=68.00' (Free Discharge)
 ↖3=Orifice/Grate (Controls 0.00 cfs)

Pond 2P: Bioretention Basin 2

Hydrograph



Summary for Pond 3P: Bioretention Basin 3

Inflow Area = 40,101 sf, 65.65% Impervious, Inflow Depth = 5.18" for 10-Year_2100 event
 Inflow = 5.93 cfs @ 12.10 hrs, Volume= 17,306 cf
 Outflow = 1.40 cfs @ 12.34 hrs, Volume= 16,845 cf, Atten= 76%, Lag= 14.4 min
 Primary = 0.37 cfs @ 12.34 hrs, Volume= 14,298 cf
 Routed to nonexistent node 5R
 Secondary = 1.03 cfs @ 12.34 hrs, Volume= 2,547 cf
 Routed to nonexistent node 5R
 Tertiary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
 Routed to nonexistent node 5R

Routing by Stor-Ind method, Time Span= 0.00-150.00 hrs, dt= 0.02 hrs / 2
 Peak Elev= 66.80' @ 12.34 hrs Surf.Area= 3,630 sf Storage= 7,533 cf

Plug-Flow detention time= 212.8 min calculated for 16,845 cf (97% of inflow)
 Center-of-Mass det. time= 195.6 min (957.5 - 762.0)

Volume	Invert	Avail.Storage	Storage Description
#1	64.00'	17,160 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
64.00	1,760	0	0
69.00	5,104	17,160	17,160

Device	Routing	Invert	Outlet Devices
#1	Primary	64.25'	3.0" Vert. Low Flow Orifice C= 0.600 Limited to weir flow at low heads
#2	Secondary	66.50'	24.0" W x 18.0" H Vert. SECONDARY OUTLET C= 0.600 Limited to weir flow at low heads
#3	Tertiary	68.75'	60.0" x 60.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads

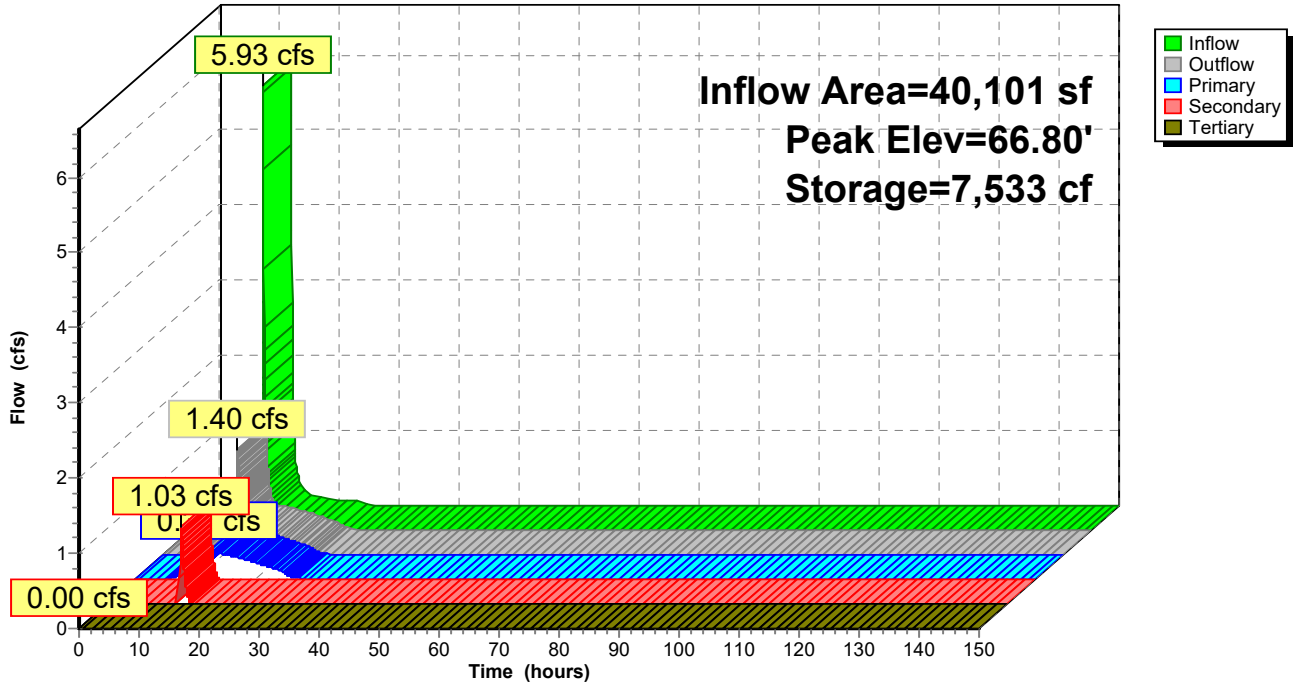
Primary OutFlow Max=0.37 cfs @ 12.34 hrs HW=66.80' (Free Discharge)
 ↖1=Low Flow Orifice (Orifice Controls 0.37 cfs @ 7.49 fps)

Secondary OutFlow Max=1.03 cfs @ 12.34 hrs HW=66.80' (Free Discharge)
 ↖2=SECONDARY OUTLET (Orifice Controls 1.03 cfs @ 1.74 fps)

Tertiary OutFlow Max=0.00 cfs @ 0.00 hrs HW=64.00' (Free Discharge)
 ↖3=Orifice/Grate (Controls 0.00 cfs)

Pond 3P: Bioretention Basin 3

Hydrograph



Summary for Pond 4P: PP (w/ underdrain) w/ UG storage 1

[44] Hint: Outlet device #3 is below defined storage

Inflow Area = 84,260 sf, 73.22% Impervious, Inflow Depth = 5.35" for 10-Year_2100 event
 Inflow = 12.84 cfs @ 12.10 hrs, Volume= 37,590 cf
 Outflow = 0.40 cfs @ 14.66 hrs, Volume= 37,590 cf, Atten= 97%, Lag= 153.8 min
 Primary = 0.40 cfs @ 14.66 hrs, Volume= 37,590 cf
 Routed to Pond 8P : Existing Basin 1
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
 Routed to Pond 8P : Existing Basin 1

Routing by Stor-Ind method, Time Span= 0.00-150.00 hrs, dt= 0.02 hrs
 Peak Elev= 96.48' @ 14.66 hrs Surf.Area= 14,771 sf Storage= 20,478 cf

Plug-Flow detention time= 477.3 min calculated for 37,585 cf (100% of inflow)
 Center-of-Mass det. time= 477.3 min (1,234.4 - 757.0)

Volume	Invert	Avail.Storage	Storage Description
#1	97.00'	3,624 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
#2A	94.50'	12,961 cf	68.00'W x 217.22'L x 3.50'H Field A 51,698 cf Overall - 19,295 cf Embedded = 32,403 cf x 40.0% Voids
#3A	95.00'	19,295 cf	ADS_StormTech SC-740 +Cap x 420 Inside #2 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 420 Chambers in 14 Rows
		35,880 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
97.00	6,787	0.0	0	0
97.67	6,787	35.0	1,592	1,592
97.83	6,787	15.0	163	1,754
98.00	6,787	15.0	173	1,928
98.25	6,787	100.0	1,697	3,624

Device	Routing	Invert	Outlet Devices
#1	Primary	92.07'	3.0" Vert. Restriction Orifice C= 0.600 Limited to weir flow at low heads
#2	Device 1	92.17'	6.0" Round 6" HDPE Underdrain L= 359.0' Ke= 0.500 Inlet / Outlet Invert= 92.17' / 90.37' S= 0.0050 ' S= 0.0050 ' Cc= 0.900 n= 0.020 Corrugated PE, corrugated interior, Flow Area= 0.20 sf
#3	Device 2	92.17'	0.9" x 0.1" Horiz. Perforations X 400.00 columns X 3 rows C= 0.600 Limited to weir flow at low heads
#4	Secondary	98.00'	67.0' long x 2.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Primary OutFlow Max=0.40 cfs @ 14.66 hrs HW=96.48' (Free Discharge)

↑**1=Restriction Orifice** (Passes 0.40 cfs of 0.49 cfs potential flow)

↑**2=6" HDPE Underdrain** (Outlet Controls 0.40 cfs @ 2.03 fps)

↑**3=Perforations** (Passes 0.40 cfs of 7.50 cfs potential flow)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=94.50' (Free Discharge)

↑**4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 4P: PP (w/ underdrain) w/ UG storage 1 - Chamber Wizard Field A

Chamber Model = ADS_StormTech SC-740 +Cap (ADS StormTech® SC-740 with cap length)

Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf

Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap

51.0" Wide + 6.0" Spacing = 57.0" C-C Row Spacing

30 Chambers/Row x 7.12' Long +0.81' Cap Length x 2 = 215.22' Row Length +12.0" End Stone x 2 =

217.22' Base Length

14 Rows x 51.0" Wide + 6.0" Spacing x 13 + 12.0" Side Stone x 2 = 68.00' Base Width

6.0" Stone Base + 30.0" Chamber Height + 6.0" Stone Cover = 3.50' Field Height

420 Chambers x 45.9 cf = 19,294.8 cf Chamber Storage

51,697.6 cf Field - 19,294.8 cf Chambers = 32,402.8 cf Stone x 40.0% Voids = 12,961.1 cf Stone Storage

Chamber Storage + Stone Storage = 32,255.9 cf = 0.740 af

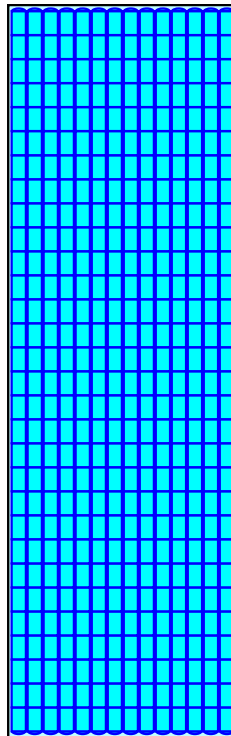
Overall Storage Efficiency = 62.4%

Overall System Size = 217.22' x 68.00' x 3.50'

420 Chambers

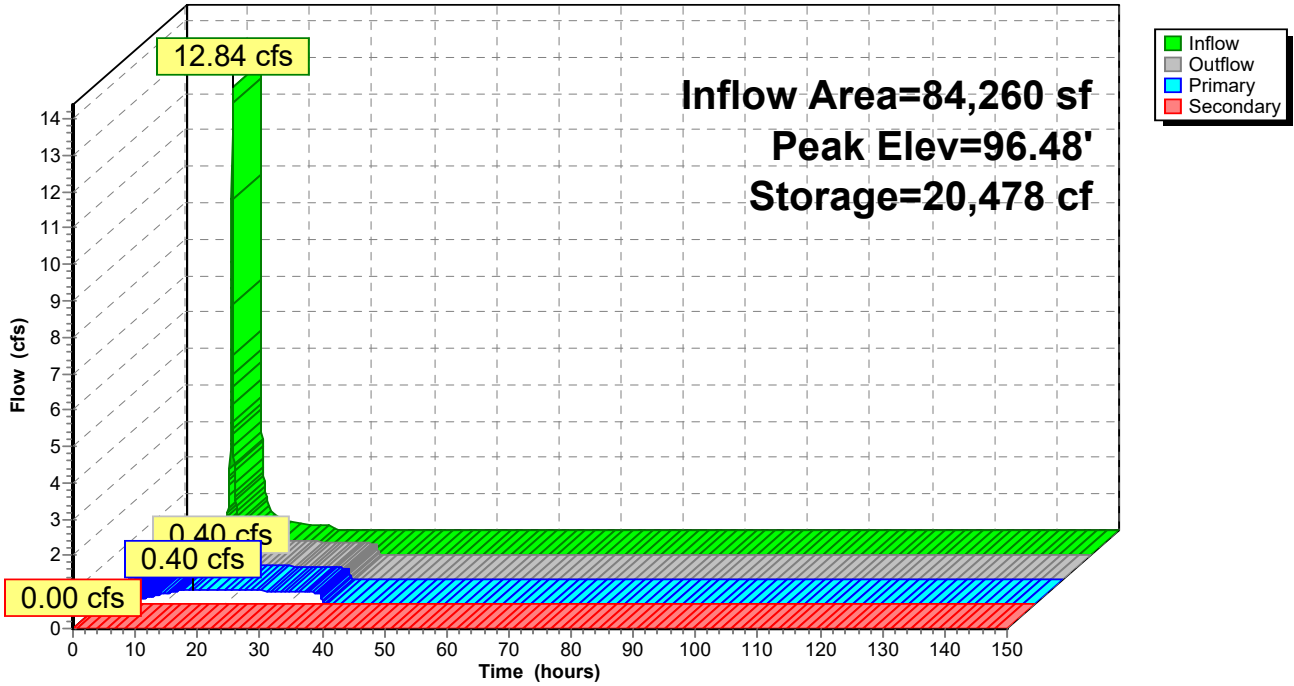
1,914.7 cy Field

1,200.1 cy Stone



Pond 4P: PP (w/ underdrain) w/ UG storage 1

Hydrograph



Summary for Pond 5P: PP (w/ underdrain) w/ UG storage 2

[44] Hint: Outlet device #3 is below defined storage

Inflow Area = 52,282 sf, 79.56% Impervious, Inflow Depth = 5.52" for 10-Year_2100 event
 Inflow = 8.32 cfs @ 12.09 hrs, Volume= 24,052 cf
 Outflow = 0.22 cfs @ 14.96 hrs, Volume= 24,052 cf, Atten= 97%, Lag= 171.9 min
 Primary = 0.22 cfs @ 14.96 hrs, Volume= 24,052 cf
 Routed to Pond 8P : Existing Basin 1
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
 Routed to Pond 8P : Existing Basin 1

Routing by Stor-Ind method, Time Span= 0.00-150.00 hrs, dt= 0.02 hrs
 Peak Elev= 96.43' @ 14.96 hrs Surf.Area= 10,213 sf Storage= 13,760 cf

Plug-Flow detention time= 591.0 min calculated for 24,052 cf (100% of inflow)
 Center-of-Mass det. time= 591.0 min (1,343.6 - 752.6)

Volume	Invert	Avail.Storage	Storage Description
#1	97.00'	2,510 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
#2A	94.50'	9,005 cf	77.50'W x 131.78'L x 3.50'H Field A 35,744 cf Overall - 13,231 cf Embedded = 22,514 cf x 40.0% Voids
#3A	95.00'	13,231 cf	ADS_StormTech SC-740 +Cap x 288 Inside #2 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 288 Chambers in 16 Rows
		24,746 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
97.00	4,700	0.0	0	0
97.67	4,700	35.0	1,102	1,102
97.83	4,700	15.0	113	1,215
98.00	4,700	15.0	120	1,335
98.25	4,700	100.0	1,175	2,510

Device	Routing	Invert	Outlet Devices
#1	Primary	92.07'	2.0" Vert. Restriction Orifice C= 0.600 Limited to weir flow at low heads
#2	Device 1	92.17'	6.0" Round 6" HDPE Underdrain L= 359.0' Ke= 0.500 Inlet / Outlet Invert= 92.17' / 90.37' S= 0.0050 ' S= 0.0050 ' Cc= 0.900 n= 0.020 Corrugated PE, corrugated interior, Flow Area= 0.20 sf
#3	Device 2	92.17'	0.9" x 0.1" Horiz. Perforations X 400.00 columns X 3 rows C= 0.600 Limited to weir flow at low heads
#4	Secondary	98.00'	132.0' long x 2.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Primary OutFlow Max=0.22 cfs @ 14.96 hrs HW=96.43' (Free Discharge)

↑1=**Restriction Orifice** (Orifice Controls 0.22 cfs @ 9.96 fps)

↑2=**6" HDPE Underdrain** (Passes 0.22 cfs of 0.40 cfs potential flow)

↑3=**Perforations** (Passes 0.22 cfs of 7.46 cfs potential flow)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=94.50' (Free Discharge)

↑4=**Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 5P: PP (w/ underdrain) w/ UG storage 2 - Chamber Wizard Field A

Chamber Model = ADS_StormTech SC-740 +Cap (ADS StormTech® SC-740 with cap length)

Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf

Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap

51.0" Wide + 6.0" Spacing = 57.0" C-C Row Spacing

18 Chambers/Row x 7.12' Long +0.81' Cap Length x 2 = 129.78' Row Length +12.0" End Stone x 2 =

131.78' Base Length

16 Rows x 51.0" Wide + 6.0" Spacing x 15 + 12.0" Side Stone x 2 = 77.50' Base Width

6.0" Stone Base + 30.0" Chamber Height + 6.0" Stone Cover = 3.50' Field Height

288 Chambers x 45.9 cf = 13,230.7 cf Chamber Storage

35,744.4 cf Field - 13,230.7 cf Chambers = 22,513.7 cf Stone x 40.0% Voids = 9,005.5 cf Stone Storage

Chamber Storage + Stone Storage = 22,236.2 cf = 0.510 af

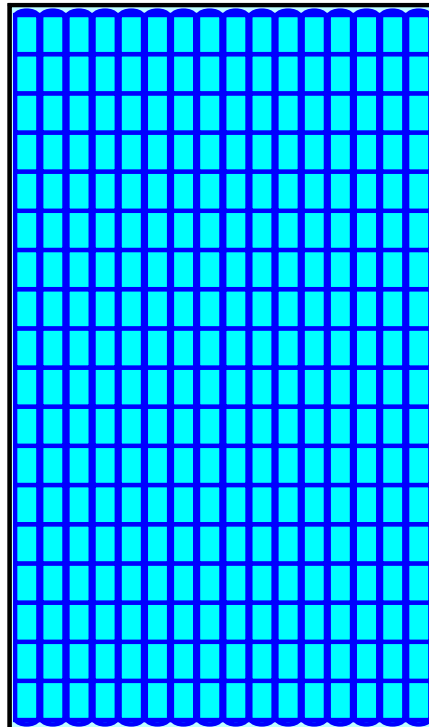
Overall Storage Efficiency = 62.2%

Overall System Size = 131.78' x 77.50' x 3.50'

288 Chambers

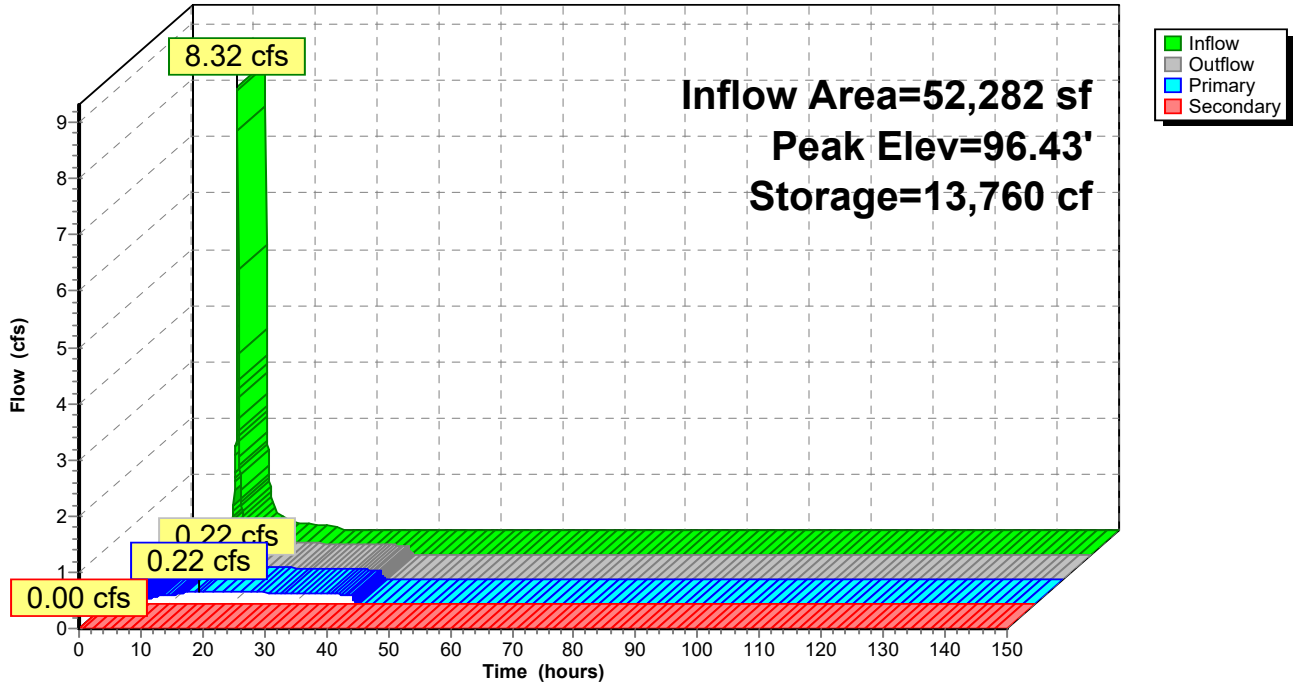
1,323.9 cy Field

833.8 cy Stone



Pond 5P: PP (w/ underdrain) w/ UG storage 2

Hydrograph



Summary for Pond 6P: PP (w/ underdrain) w/ UG storage 3

[44] Hint: Outlet device #3 is below defined storage

Inflow Area = 76,785 sf, 82.96% Impervious, Inflow Depth = 5.61" for 10-Year_2100 event
 Inflow = 12.11 cfs @ 12.10 hrs, Volume= 35,917 cf
 Outflow = 0.22 cfs @ 17.07 hrs, Volume= 35,917 cf, Atten= 98%, Lag= 298.1 min
 Primary = 0.22 cfs @ 17.07 hrs, Volume= 35,917 cf
 Routed to Pond 8P : Existing Basin 1
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
 Routed to Pond 8P : Existing Basin 1

Routing by Stor-Ind method, Time Span= 0.00-150.00 hrs, dt= 0.02 hrs
 Peak Elev= 96.47' @ 17.07 hrs Surf.Area= 16,925 sf Storage= 23,262 cf

Plug-Flow detention time= 1,005.2 min calculated for 35,912 cf (100% of inflow)
 Center-of-Mass det. time= 1,005.3 min (1,756.6 - 751.3)

Volume	Invert	Avail.Storage	Storage Description
#1	97.00'	2,054 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
#2A	94.50'	14,875 cf	144.00'W x 117.54'L x 3.50'H Field A 59,238 cf Overall - 22,051 cf Embedded = 37,187 cf x 40.0% Voids
#3A	95.00'	22,051 cf	ADS_StormTech SC-740 +Cap x 480 Inside #2 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 480 Chambers in 30 Rows
		38,980 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
97.00	3,240	0.0	0	0
97.67	3,240	35.0	760	760
97.83	3,240	15.0	78	838
98.00	3,240	15.0	83	920
98.35	3,240	100.0	1,134	2,054

Device	Routing	Invert	Outlet Devices
#1	Primary	92.07'	2.0" Vert. Restriction Orifice C= 0.600 Limited to weir flow at low heads
#2	Device 1	92.17'	6.0" Round 6" HDPE Underdrain L= 359.0' Ke= 0.500 Inlet / Outlet Invert= 92.17' / 90.37' S= 0.0050 ' S= 0.0050 ' Cc= 0.900 n= 0.020 Corrugated PE, corrugated interior, Flow Area= 0.20 sf
#3	Device 2	92.17'	0.9" x 0.1" Horiz. Perforations X 400.00 columns X 3 rows C= 0.600 Limited to weir flow at low heads
#4	Secondary	98.00'	19.0' long x 2.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Primary OutFlow Max=0.22 cfs @ 17.07 hrs HW=96.47' (Free Discharge)

↑1=**Restriction Orifice** (Orifice Controls 0.22 cfs @ 10.00 fps)

↑2=**6" HDPE Underdrain** (Passes 0.22 cfs of 0.40 cfs potential flow)

↑3=**Perforations** (Passes 0.22 cfs of 7.48 cfs potential flow)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=94.50' (Free Discharge)

↑4=**Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 6P: PP (w/ underdrain) w/ UG storage 3 - Chamber Wizard Field A

Chamber Model = ADS_StormTech SC-740 +Cap (ADS StormTech® SC-740 with cap length)

Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf

Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap

51.0" Wide + 6.0" Spacing = 57.0" C-C Row Spacing

16 Chambers/Row x 7.12' Long +0.81' Cap Length x 2 = 115.54' Row Length +12.0" End Stone x 2 = 117.54' Base Length

30 Rows x 51.0" Wide + 6.0" Spacing x 29 + 12.0" Side Stone x 2 = 144.00' Base Width

6.0" Stone Base + 30.0" Chamber Height + 6.0" Stone Cover = 3.50' Field Height

480 Chambers x 45.9 cf = 22,051.2 cf Chamber Storage

59,238.5 cf Field - 22,051.2 cf Chambers = 37,187.3 cf Stone x 40.0% Voids = 14,874.9 cf Stone Storage

Chamber Storage + Stone Storage = 36,926.1 cf = 0.848 af

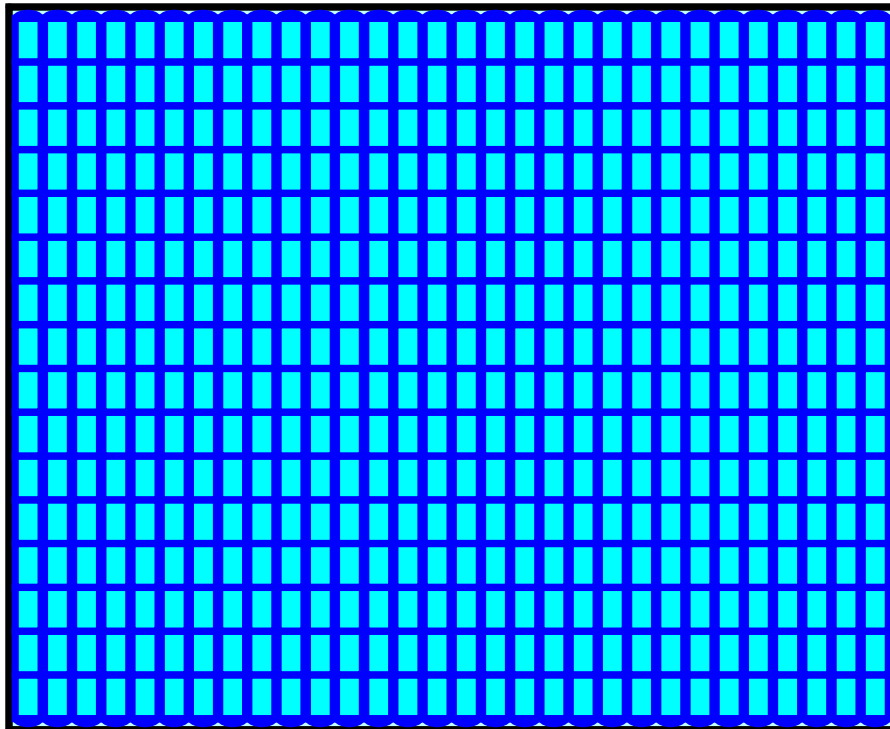
Overall Storage Efficiency = 62.3%

Overall System Size = 117.54' x 144.00' x 3.50'

480 Chambers

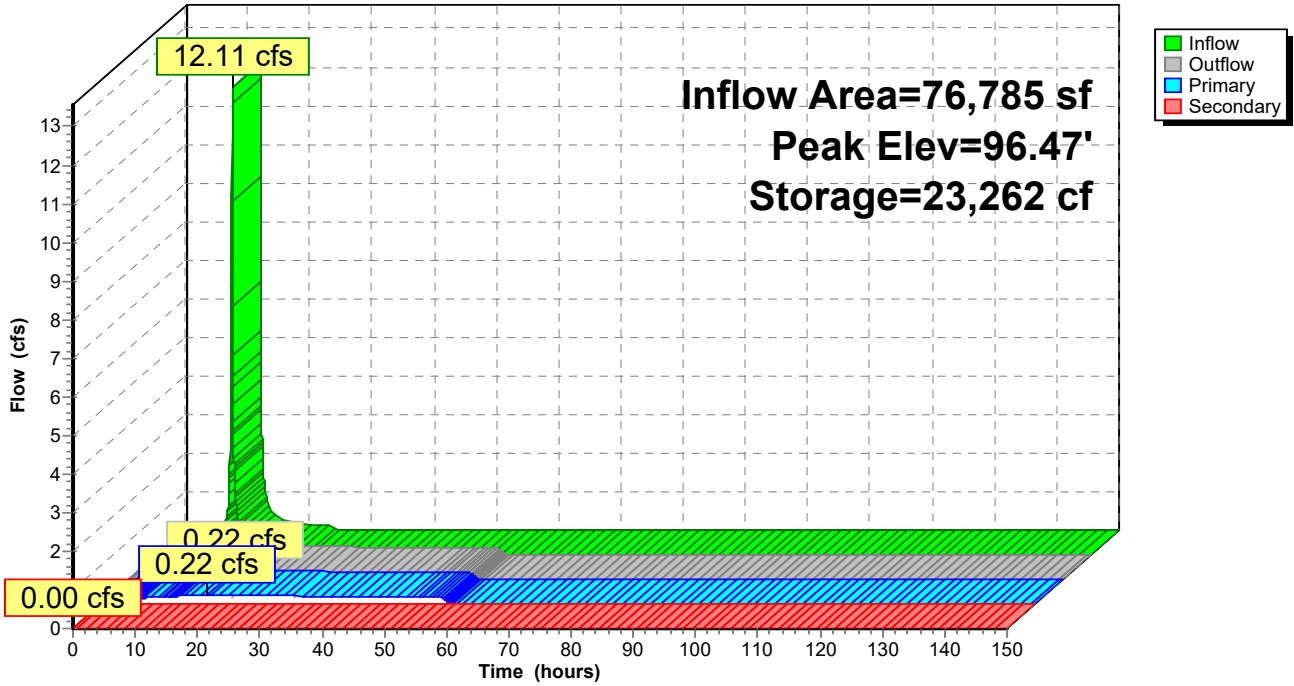
2,194.0 cy Field

1,377.3 cy Stone



Pond 6P: PP (w/ underdrain) w/ UG storage 3

Hydrograph



Summary for Pond 7P: PP (w/ underdrain) w/ UG storage 4

[44] Hint: Outlet device #3 is below defined storage

Inflow Area = 120,233 sf, 94.05% Impervious, Inflow Depth = 5.84" for 10-Year _2100 event
 Inflow = 19.31 cfs @ 12.10 hrs, Volume= 58,516 cf
 Outflow = 0.40 cfs @ 16.27 hrs, Volume= 58,516 cf, Atten= 98%, Lag= 250.2 min
 Primary = 0.40 cfs @ 16.27 hrs, Volume= 58,516 cf
 Routed to Pond 8P : Existing Basin 1
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
 Routed to Pond 8P : Existing Basin 1

Routing by Stor-Ind method, Time Span= 0.00-150.00 hrs, dt= 0.02 hrs
 Peak Elev= 96.48' @ 16.27 hrs Surf.Area= 26,122 sf Storage= 36,366 cf

Plug-Flow detention time= 850.5 min calculated for 58,508 cf (100% of inflow)
 Center-of-Mass det. time= 850.6 min (1,596.5 - 745.9)

Volume	Invert	Avail.Storage	Storage Description
#1	97.00'	2,980 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
#2A	94.50'	22,825 cf	163.00'W x 160.26'L x 3.50'H Field A 91,426 cf Overall - 34,363 cf Embedded = 57,063 cf x 40.0% Voids
#3A	95.00'	34,363 cf	ADS_StormTech SC-740 +Cap x 748 Inside #2 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 748 Chambers in 34 Rows
		60,168 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
97.00	4,700	0.0	0	0
97.67	4,700	35.0	1,102	1,102
97.83	4,700	15.0	113	1,215
98.00	4,700	15.0	120	1,335
98.35	4,700	100.0	1,645	2,980

Device	Routing	Invert	Outlet Devices
#1	Primary	92.07'	3.0" Vert. Restriction Orifice C= 0.600 Limited to weir flow at low heads
#2	Device 1	92.17'	6.0" Round 6" HDPE Underdrain L= 359.0' Ke= 0.500 Inlet / Outlet Invert= 92.17' / 90.37' S= 0.0050 ' S= 0.0050 ' Cc= 0.900 n= 0.020 Corrugated PE, corrugated interior, Flow Area= 0.20 sf
#3	Device 2	92.17'	0.9" x 0.1" Horiz. Perforations X 400.00 columns X 3 rows C= 0.600 Limited to weir flow at low heads
#4	Secondary	98.00'	19.0' long x 2.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Primary OutFlow Max=0.40 cfs @ 16.27 hrs HW=96.48' (Free Discharge)

↑1=**Restriction Orifice** (Passes 0.40 cfs of 0.49 cfs potential flow)

↑2=**6" HDPE Underdrain** (Outlet Controls 0.40 cfs @ 2.03 fps)

↑3=**Perforations** (Passes 0.40 cfs of 7.50 cfs potential flow)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=94.50' (Free Discharge)

↑4=**Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 7P: PP (w/ underdrain) w/ UG storage 4 - Chamber Wizard Field A

Chamber Model = ADS_StormTech SC-740 +Cap (ADS StormTech® SC-740 with cap length)

Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf

Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap

51.0" Wide + 6.0" Spacing = 57.0" C-C Row Spacing

22 Chambers/Row x 7.12' Long +0.81' Cap Length x 2 = 158.26' Row Length +12.0" End Stone x 2 = 160.26' Base Length

34 Rows x 51.0" Wide + 6.0" Spacing x 33 + 12.0" Side Stone x 2 = 163.00' Base Width

6.0" Stone Base + 30.0" Chamber Height + 6.0" Stone Cover = 3.50' Field Height

748 Chambers x 45.9 cf = 34,363.1 cf Chamber Storage

91,426.4 cf Field - 34,363.1 cf Chambers = 57,063.3 cf Stone x 40.0% Voids = 22,825.3 cf Stone Storage

Chamber Storage + Stone Storage = 57,188.5 cf = 1.313 af

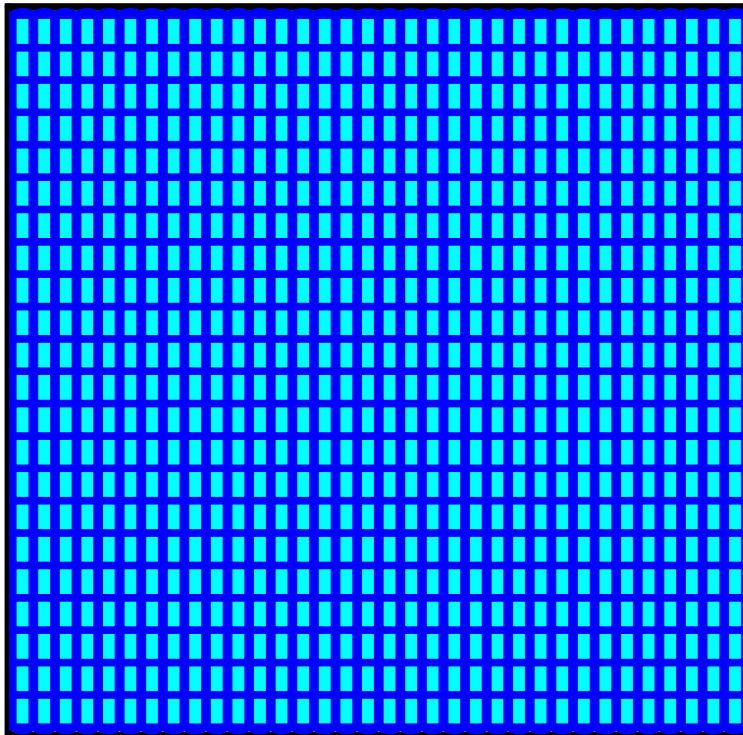
Overall Storage Efficiency = 62.6%

Overall System Size = 160.26' x 163.00' x 3.50'

748 Chambers

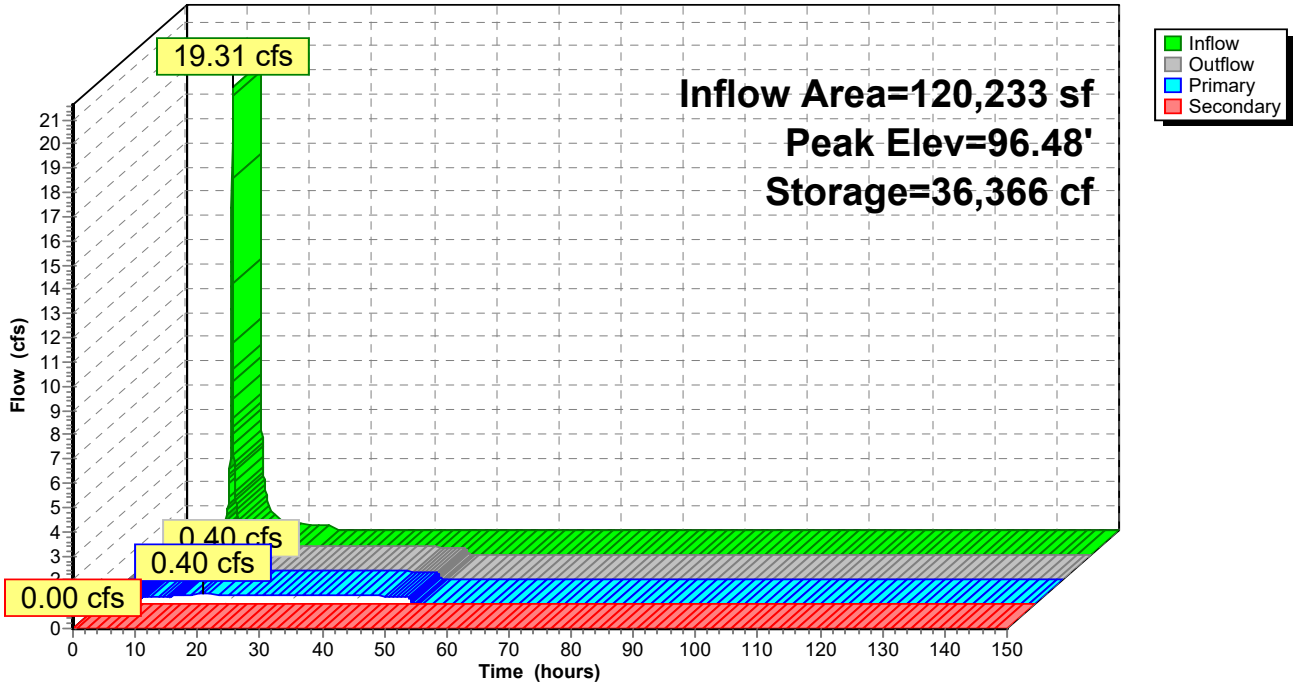
3,386.2 cy Field

2,113.5 cy Stone



Pond 7P: PP (w/ underdrain) w/ UG storage 4

Hydrograph



Summary for Pond 8P: Existing Basin 1

Inflow Area = 444,913 sf, 80.94% Impervious, Inflow Depth = 5.51" for 10-Year _2100 event
 Inflow = 18.25 cfs @ 12.09 hrs, Volume= 204,421 cf
 Outflow = 10.62 cfs @ 12.14 hrs, Volume= 204,421 cf, Atten= 42%, Lag= 2.9 min
 Primary = 10.62 cfs @ 12.14 hrs, Volume= 204,421 cf
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
 Routed to nonexistent node 67L
 Tertiary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
 Routed to nonexistent node 67L

Routing by Stor-Ind method, Time Span= 0.00-150.00 hrs, dt= 0.02 hrs / 2
 Peak Elev= 59.51' @ 12.14 hrs Surf.Area= 9,781 sf Storage= 8,527 cf

Plug-Flow detention time= 16.8 min calculated for 204,421 cf (100% of inflow)
 Center-of-Mass det. time= 16.7 min (1,346.4 - 1,329.8)

Volume	Invert	Avail.Storage	Storage Description
#1	58.00'	33,881 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
58.00	1,339	0	0
59.00	7,134	4,237	4,237
60.00	12,352	9,743	13,980
61.00	18,300	15,326	29,306
61.25	18,300	4,575	33,881

Device	Routing	Invert	Outlet Devices
#1	Primary	58.00'	24.0" Vert. Low Flow Orifice C= 0.600 Limited to weir flow at low heads
#2	Secondary	60.00'	24.0" W x 18.0" H Vert. 2-YR Orifice C= 0.600 Limited to weir flow at low heads
#3	Tertiary	60.75'	48.0" x 48.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#4	Tertiary	61.00'	100.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)

Primary OutFlow Max=10.62 cfs @ 12.14 hrs HW=59.51' (Free Discharge)

↳ **1=Low Flow Orifice** (Orifice Controls 10.62 cfs @ 4.18 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=58.00' (Free Discharge)

↳ **2=2-YR Orifice** (Controls 0.00 cfs)

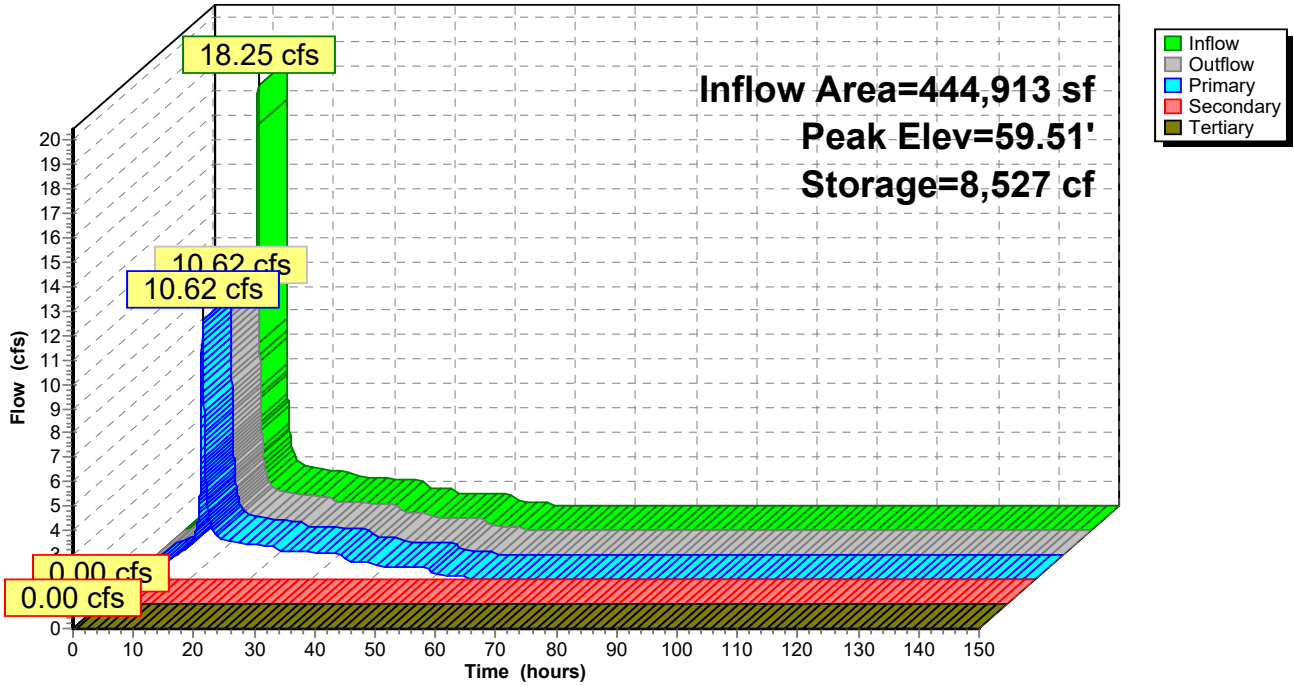
Tertiary OutFlow Max=0.00 cfs @ 0.00 hrs HW=58.00' (Free Discharge)

↳ **3=Orifice/Grate** (Controls 0.00 cfs)

↳ **4=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 8P: Existing Basin 1

Hydrograph



Summary for Pond 9P: Existing Basin 2

<https://hydro.rutgers.edu/view-project/100596/>

Inflow Area = 59,019 sf, 68.70% Impervious, Inflow Depth = 5.28" for 10-Year_2100 event
 Inflow = 9.04 cfs @ 12.10 hrs, Volume= 25,973 cf
 Outflow = 2.54 cfs @ 12.26 hrs, Volume= 25,973 cf, Atten= 72%, Lag= 9.8 min
 Primary = 0.41 cfs @ 12.26 hrs, Volume= 16,408 cf
 Secondary = 2.13 cfs @ 12.26 hrs, Volume= 9,565 cf
 Tertiary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.00-150.00 hrs, dt= 0.02 hrs / 2
 Peak Elev= 67.70' @ 12.26 hrs Surf.Area= 5,250 sf Storage= 9,017 cf

Plug-Flow detention time= 91.4 min calculated for 25,969 cf (100% of inflow)
 Center-of-Mass det. time= 91.4 min (850.7 - 759.2)

Volume	Invert	Avail.Storage	Storage Description
#1	64.60'	13,401 cf	Custom Stage Data (Prismatic) Listed below
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
64.60	0	0	0
65.00	647	129	129
66.00	2,768	1,708	1,837
68.00	5,693	8,461	10,298
68.50	6,718	3,103	13,401

Device	Routing	Invert	Outlet Devices
#1	Primary	64.60'	3.0" Vert. 3" Orifice C= 0.600 Limited to weir flow at low heads
#2	Secondary	66.40'	0.7' long 8" Sharp-Crested Rectangular Weir 2 End Contraction(s)
#3	Tertiary	67.75'	48.0" x 48.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads

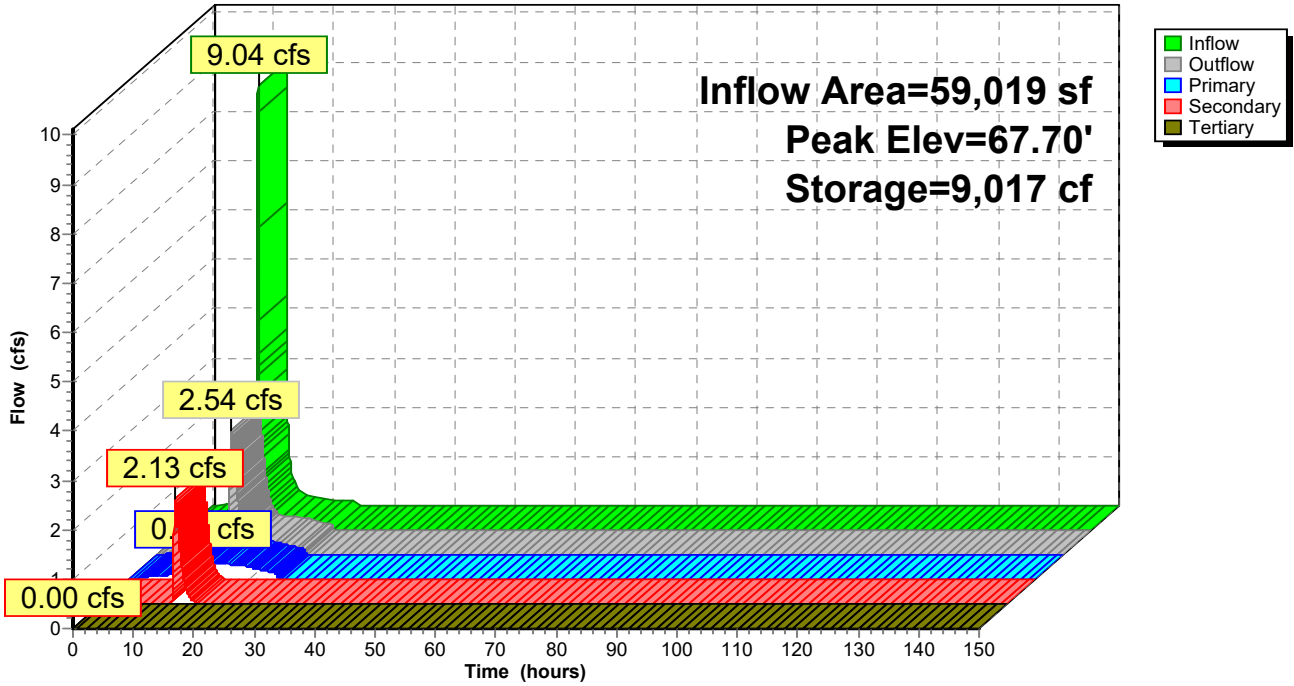
Primary OutFlow Max=0.41 cfs @ 12.26 hrs HW=67.70' (Free Discharge)
 ↳1=3" Orifice (Orifice Controls 0.41 cfs @ 8.30 fps)

Secondary OutFlow Max=2.13 cfs @ 12.26 hrs HW=67.70' (Free Discharge)
 ↳2=8" Sharp-Crested Rectangular Weir (Weir Controls 2.13 cfs @ 3.72 fps)

Tertiary OutFlow Max=0.00 cfs @ 0.00 hrs HW=64.60' (Free Discharge)
 ↳3=Orifice/Grate (Controls 0.00 cfs)

Pond 9P: Existing Basin 2

Hydrograph



Summary for Pond 10P: PP (w/ underdrain) w/ UG storage 5

[44] Hint: Outlet device #3 is below defined storage

Inflow Area = 48,527 sf, 85.53% Impervious, Inflow Depth = 5.59" for 10-Year_2100 event
 Inflow = 7.06 cfs @ 12.13 hrs, Volume= 22,622 cf
 Outflow = 0.42 cfs @ 13.43 hrs, Volume= 22,622 cf, Atten= 94%, Lag= 78.4 min
 Primary = 0.42 cfs @ 13.43 hrs, Volume= 22,622 cf
 Routed to Pond 13P : Bioretention Basin 4
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
 Routed to Pond 13P : Bioretention Basin 4

Routing by Stor-Ind method, Time Span= 0.00-150.00 hrs, dt= 0.02 hrs
 Peak Elev= 97.01' @ 13.43 hrs Surf.Area= 11,632 sf Storage= 10,021 cf

Plug-Flow detention time= 202.1 min calculated for 22,619 cf (100% of inflow)
 Center-of-Mass det. time= 202.1 min (954.7 - 752.6)

Volume	Invert	Avail.Storage	Storage Description
#1	97.00'	3,687 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
#2A	94.50'	5,184 cf	34.75'W x 167.38'L x 3.50'H Field A 20,357 cf Overall - 7,396 cf Embedded = 12,961 cf x 40.0% Voids
#3A	95.00'	7,396 cf	ADS_StormTech SC-740 +Cap x 161 Inside #2 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 161 Chambers in 7 Rows
		16,268 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
97.00	5,816	0.0	0	0
97.67	5,816	35.0	1,364	1,364
97.83	5,816	15.0	140	1,503
98.00	5,816	15.0	148	1,652
98.35	5,816	100.0	2,036	3,687

Device	Routing	Invert	Outlet Devices
#1	Primary	92.07'	3.0" Vert. Restriction Orifice C= 0.600 Limited to weir flow at low heads
#2	Device 1	92.17'	6.0" Round 6" HDPE Underdrain L= 359.0' Ke= 0.500 Inlet / Outlet Invert= 92.17' / 90.37' S= 0.0050 ' S= 0.0050 ' Cc= 0.900 n= 0.020 Corrugated PE, corrugated interior, Flow Area= 0.20 sf
#3	Device 2	92.17'	0.9" x 0.1" Horiz. Perforations X 400.00 columns X 3 rows C= 0.600 Limited to weir flow at low heads
#4	Secondary	98.00'	168.0' long x 2.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Primary OutFlow Max=0.42 cfs @ 13.43 hrs HW=97.01' (Free Discharge)

↑**1=Restriction Orifice** (Passes 0.42 cfs of 0.52 cfs potential flow)

↑**2=6" HDPE Underdrain** (Outlet Controls 0.42 cfs @ 2.15 fps)

↑**3=Perforations** (Passes 0.42 cfs of 7.94 cfs potential flow)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=94.50' (Free Discharge)

↑**4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 10P: PP (w/ underdrain) w/ UG storage 5 - Chamber Wizard Field A

Chamber Model = ADS_StormTech SC-740 +Cap (ADS StormTech® SC-740 with cap length)

Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf

Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap

51.0" Wide + 6.0" Spacing = 57.0" C-C Row Spacing

23 Chambers/Row x 7.12' Long +0.81' Cap Length x 2 = 165.38' Row Length +12.0" End Stone x 2 = 167.38' Base Length

7 Rows x 51.0" Wide + 6.0" Spacing x 6 + 12.0" Side Stone x 2 = 34.75' Base Width

6.0" Stone Base + 30.0" Chamber Height + 6.0" Stone Cover = 3.50' Field Height

161 Chambers x 45.9 cf = 7,396.3 cf Chamber Storage

20,357.2 cf Field - 7,396.3 cf Chambers = 12,960.8 cf Stone x 40.0% Voids = 5,184.3 cf Stone Storage

Chamber Storage + Stone Storage = 12,580.7 cf = 0.289 af

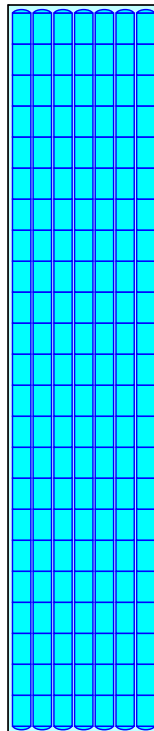
Overall Storage Efficiency = 61.8%

Overall System Size = 167.38' x 34.75' x 3.50'

161 Chambers

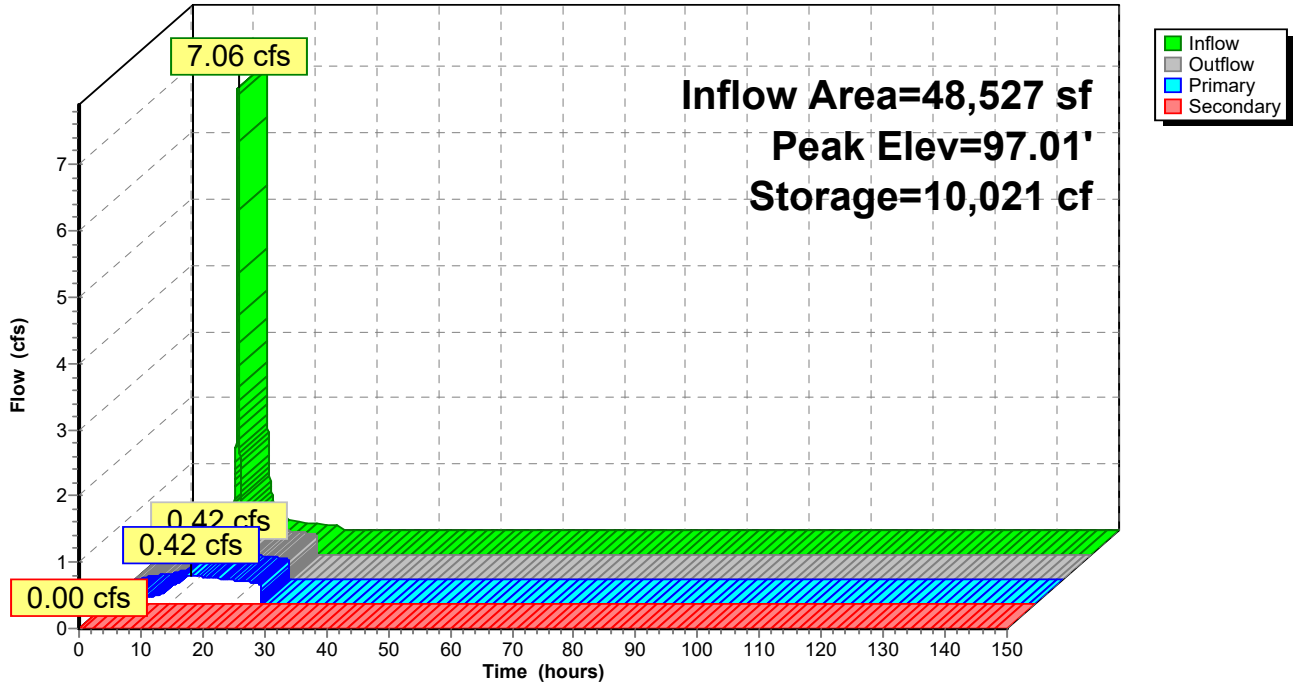
754.0 cy Field

480.0 cy Stone



Pond 10P: PP (w/ underdrain) w/ UG storage 5

Hydrograph



Summary for Pond 11P: PP (w/ underdrain) w/ UG storage 6

[44] Hint: Outlet device #3 is below defined storage

Inflow Area = 57,652 sf, 78.51% Impervious, Inflow Depth = 5.45" for 10-Year_2100 event
 Inflow = 9.07 cfs @ 12.09 hrs, Volume= 26,202 cf
 Outflow = 0.40 cfs @ 13.59 hrs, Volume= 26,202 cf, Atten= 96%, Lag= 89.8 min
 Primary = 0.40 cfs @ 13.59 hrs, Volume= 26,202 cf
 Routed to Pond 13P : Bioretention Basin 4
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
 Routed to Pond 13P : Bioretention Basin 4

Routing by Stor-Ind method, Time Span= 0.00-150.00 hrs, dt= 0.02 hrs
 Peak Elev= 96.59' @ 13.59 hrs Surf.Area= 8,594 sf Storage= 12,473 cf

Plug-Flow detention time= 273.7 min calculated for 26,202 cf (100% of inflow)
 Center-of-Mass det. time= 273.7 min (1,027.1 - 753.4)

Volume	Invert	Avail.Storage	Storage Description
#1	97.00'	2,144 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
#2A	94.50'	7,621 cf	96.50'W x 89.06'L x 3.50'H Field A 30,079 cf Overall - 11,026 cf Embedded = 19,053 cf x 40.0% Voids
#3A	95.00'	11,026 cf	ADS_StormTech SC-740 +Cap x 240 Inside #2 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 240 Chambers in 20 Rows
		20,791 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
97.00	3,382	0.0	0	0
97.67	3,382	35.0	793	793
97.83	3,382	15.0	81	874
98.00	3,382	15.0	86	960
98.35	3,382	100.0	1,184	2,144

Device	Routing	Invert	Outlet Devices
#1	Primary	92.07'	3.0" Vert. Restriction Orifice C= 0.600 Limited to weir flow at low heads
#2	Device 1	92.17'	6.0" Round 6" HDPE Underdrain L= 359.0' Ke= 0.500 Inlet / Outlet Invert= 92.17' / 90.37' S= 0.0050 ' S= 0.0050 ' Cc= 0.900 n= 0.020 Corrugated PE, corrugated interior, Flow Area= 0.20 sf
#3	Device 2	92.17'	0.9" x 0.1" Horiz. Perforations X 400.00 columns X 3 rows C= 0.600 Limited to weir flow at low heads
#4	Secondary	98.00'	168.0' long x 2.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Primary OutFlow Max=0.40 cfs @ 13.59 hrs HW=96.59' (Free Discharge)

↑1=**Restriction Orifice** (Passes 0.40 cfs of 0.50 cfs potential flow)

↑2=**6" HDPE Underdrain** (Outlet Controls 0.40 cfs @ 2.06 fps)

↑3=**Perforations** (Passes 0.40 cfs of 7.59 cfs potential flow)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=94.50' (Free Discharge)

↑4=**Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 11P: PP (w/ underdrain) w/ UG storage 6 - Chamber Wizard Field A

Chamber Model = ADS_StormTech SC-740 +Cap (ADS StormTech® SC-740 with cap length)

Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf

Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap

51.0" Wide + 6.0" Spacing = 57.0" C-C Row Spacing

12 Chambers/Row x 7.12' Long +0.81' Cap Length x 2 = 87.06' Row Length +12.0" End Stone x 2 = 89.06' Base Length

20 Rows x 51.0" Wide + 6.0" Spacing x 19 + 12.0" Side Stone x 2 = 96.50' Base Width

6.0" Stone Base + 30.0" Chamber Height + 6.0" Stone Cover = 3.50' Field Height

240 Chambers x 45.9 cf = 11,025.6 cf Chamber Storage

30,078.9 cf Field - 11,025.6 cf Chambers = 19,053.3 cf Stone x 40.0% Voids = 7,621.3 cf Stone Storage

Chamber Storage + Stone Storage = 18,646.9 cf = 0.428 af

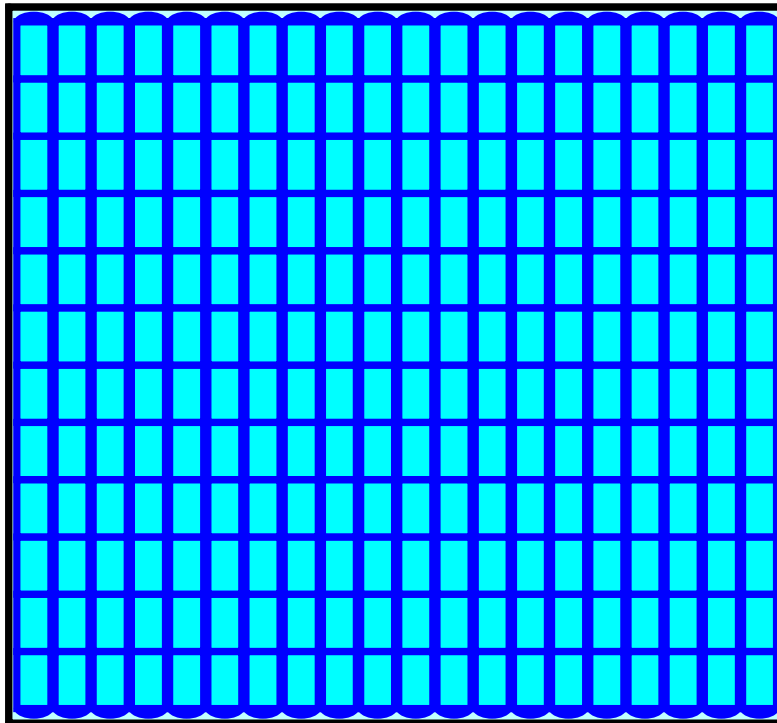
Overall Storage Efficiency = 62.0%

Overall System Size = 89.06' x 96.50' x 3.50'

240 Chambers

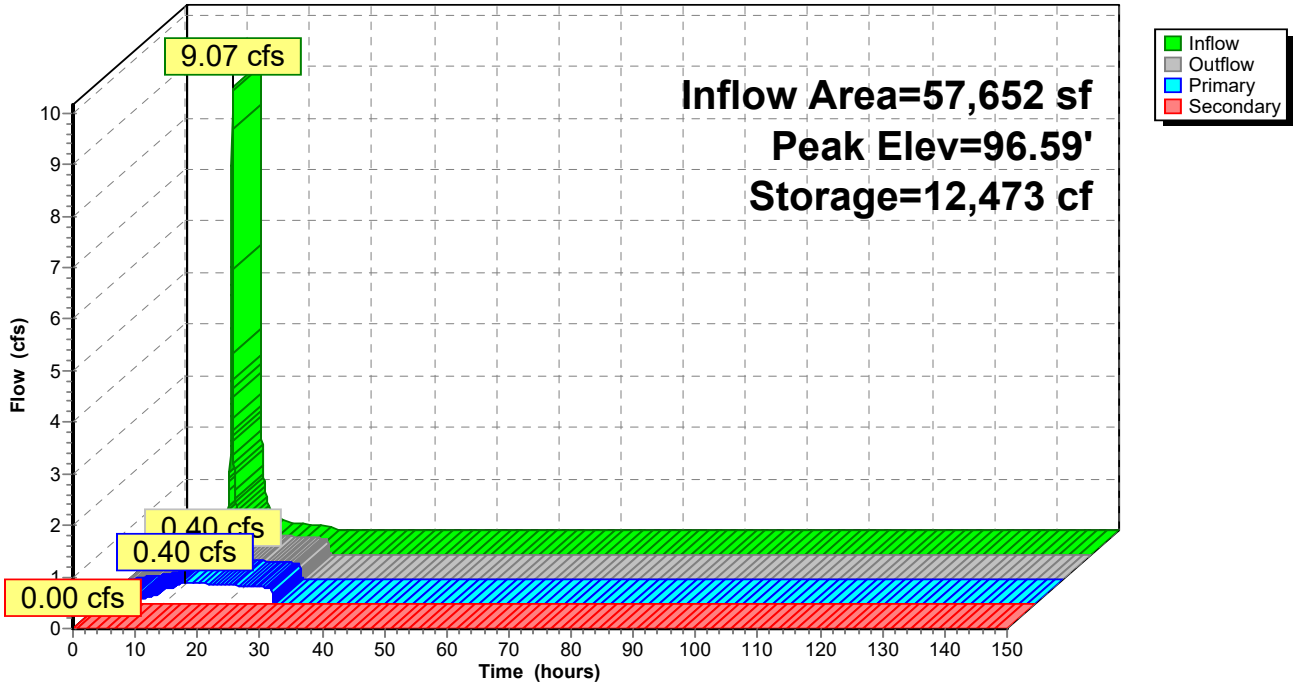
1,114.0 cy Field

705.7 cy Stone



Pond 11P: PP (w/ underdrain) w/ UG storage 6

Hydrograph



Summary for Pond 12P: PP (w/ underdrain) w/ UG storage 7

[44] Hint: Outlet device #3 is below defined storage

Inflow Area = 67,756 sf, 72.56% Impervious, Inflow Depth = 5.34" for 10-Year_2100 event
 Inflow = 10.40 cfs @ 12.10 hrs, Volume= 30,142 cf
 Outflow = 0.40 cfs @ 14.13 hrs, Volume= 30,142 cf, Atten= 96%, Lag= 121.9 min
 Primary = 0.40 cfs @ 14.13 hrs, Volume= 30,142 cf
 Routed to Pond 13P : Bioretention Basin 4
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
 Routed to Pond 13P : Bioretention Basin 4

Routing by Stor-Ind method, Time Span= 0.00-150.00 hrs, dt= 0.02 hrs
 Peak Elev= 96.43' @ 14.13 hrs Surf.Area= 11,316 sf Storage= 15,238 cf

Plug-Flow detention time= 350.1 min calculated for 30,138 cf (100% of inflow)
 Center-of-Mass det. time= 350.1 min (1,107.2 - 757.1)

Volume	Invert	Avail.Storage	Storage Description
#1	97.00'	935 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
#2A	94.50'	9,962 cf	77.50'W x 146.02'L x 3.50'H Field A 39,607 cf Overall - 14,701 cf Embedded = 24,906 cf x 40.0% Voids
#3A	95.00'	14,701 cf	ADS_StormTech SC-740 +Cap x 320 Inside #2 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 320 Chambers in 16 Rows
		25,598 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
97.00	1,474	0.0	0	0
97.67	1,474	35.0	346	346
97.83	1,474	15.0	35	381
98.00	1,474	15.0	38	419
98.35	1,474	100.0	516	935

Device	Routing	Invert	Outlet Devices
#1	Primary	92.07'	3.0" Vert. Restriction Orifice C= 0.600 Limited to weir flow at low heads
#2	Device 1	92.17'	6.0" Round 6" HDPE Underdrain L= 359.0' Ke= 0.500 Inlet / Outlet Invert= 92.17' / 90.37' S= 0.0050 ' S= 0.0050 ' Cc= 0.900 n= 0.020 Corrugated PE, corrugated interior, Flow Area= 0.20 sf
#3	Device 2	92.17'	0.9" x 0.1" Horiz. Perforations X 400.00 columns X 3 rows C= 0.600 Limited to weir flow at low heads
#4	Secondary	98.00'	168.0' long x 2.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Primary OutFlow Max=0.40 cfs @ 14.13 hrs HW=96.43' (Free Discharge)

↑1=**Restriction Orifice** (Passes 0.40 cfs of 0.49 cfs potential flow)

↑2=**6" HDPE Underdrain** (Outlet Controls 0.40 cfs @ 2.02 fps)

↑3=**Perforations** (Passes 0.40 cfs of 7.45 cfs potential flow)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=94.50' (Free Discharge)

↑4=**Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 12P: PP (w/ underdrain) w/ UG storage 7 - Chamber Wizard Field A

Chamber Model = ADS_StormTech SC-740 +Cap (ADS StormTech® SC-740 with cap length)

Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf

Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap

51.0" Wide + 6.0" Spacing = 57.0" C-C Row Spacing

20 Chambers/Row x 7.12' Long +0.81' Cap Length x 2 = 144.02' Row Length +12.0" End Stone x 2 = 146.02' Base Length

16 Rows x 51.0" Wide + 6.0" Spacing x 15 + 12.0" Side Stone x 2 = 77.50' Base Width

6.0" Stone Base + 30.0" Chamber Height + 6.0" Stone Cover = 3.50' Field Height

320 Chambers x 45.9 cf = 14,700.8 cf Chamber Storage

39,607.0 cf Field - 14,700.8 cf Chambers = 24,906.2 cf Stone x 40.0% Voids = 9,962.5 cf Stone Storage

Chamber Storage + Stone Storage = 24,663.3 cf = 0.566 af

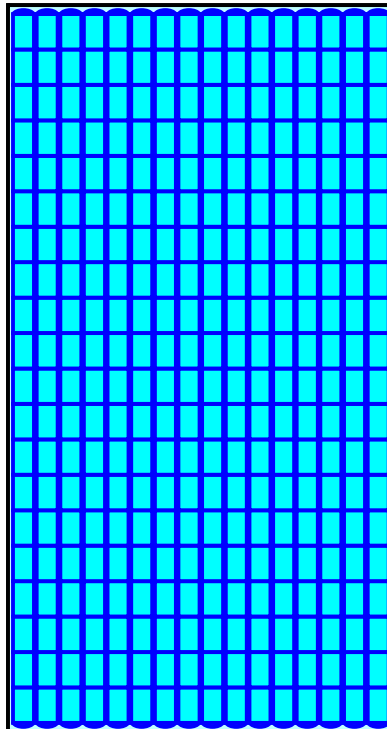
Overall Storage Efficiency = 62.3%

Overall System Size = 146.02' x 77.50' x 3.50'

320 Chambers

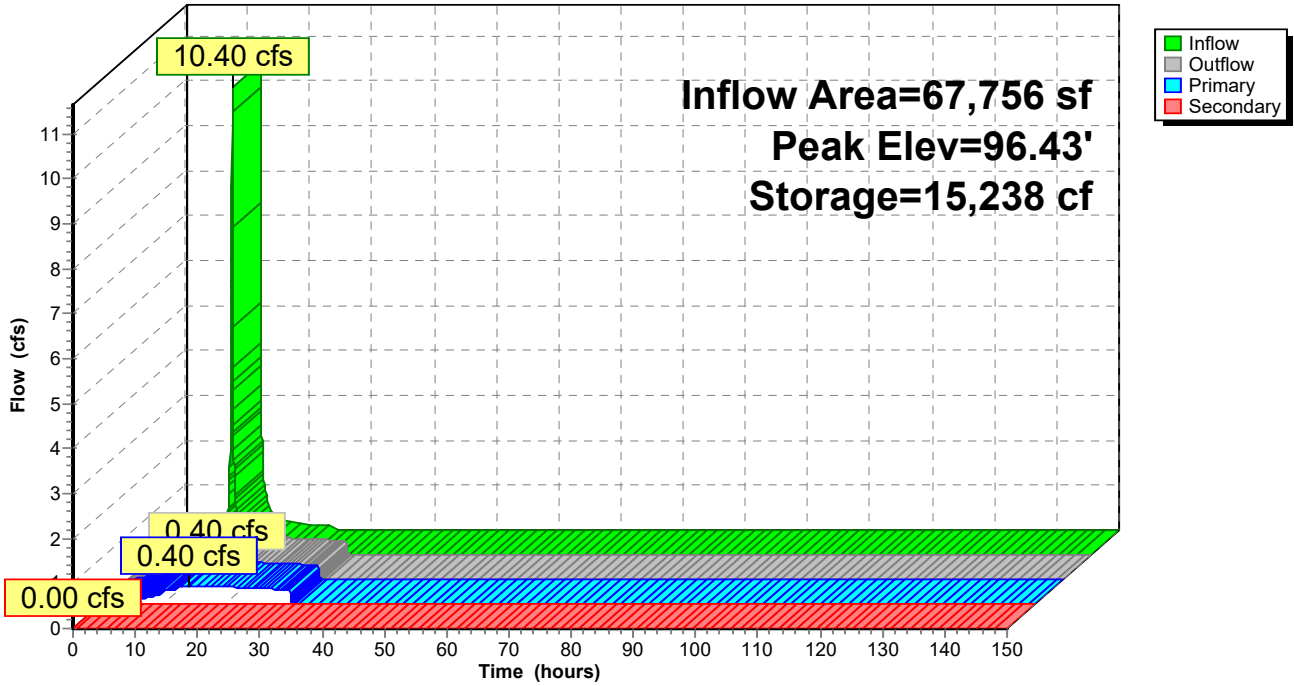
1,466.9 cy Field

922.5 cy Stone



Pond 12P: PP (w/ underdrain) w/ UG storage 7

Hydrograph



Summary for Pond 13P: Bioretention Basin 4

Inflow Area = 329,976 sf, 48.67% Impervious, Inflow Depth = 4.66" for 10-Year _2100 event
 Inflow = 11.17 cfs @ 12.35 hrs, Volume= 128,047 cf
 Outflow = 9.09 cfs @ 12.51 hrs, Volume= 126,784 cf, Atten= 19%, Lag= 9.7 min
 Primary = 0.39 cfs @ 12.51 hrs, Volume= 39,416 cf
 Routed to nonexistent node 5R
 Secondary = 7.21 cfs @ 12.51 hrs, Volume= 86,239 cf
 Routed to nonexistent node 5R
 Tertiary = 1.49 cfs @ 12.51 hrs, Volume= 1,129 cf
 Routed to nonexistent node 5R

Routing by Stor-Ind method, Time Span= 0.00-150.00 hrs, dt= 0.02 hrs / 2
 Peak Elev= 52.08' @ 12.51 hrs Surf.Area= 10,478 sf Storage= 23,758 cf

Plug-Flow detention time= 214.7 min calculated for 126,784 cf (99% of inflow)
 Center-of-Mass det. time= 206.3 min (1,162.6 - 956.3)

Volume	Invert	Avail.Storage	Storage Description
#1	49.00'	33,395 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
49.00	4,800	0	0
52.00	10,478	22,917	22,917
53.00	10,478	10,478	33,395

Device	Routing	Invert	Outlet Devices
#1	Primary	49.25'	3.0" Vert. Low Flow Orifice C= 0.600 Limited to weir flow at low heads
#2	Secondary	51.00'	24.0" W x 18.0" H Vert. SECONDARY OUTLET C= 0.600 Limited to weir flow at low heads
#3	Tertiary	52.00'	60.0" x 60.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.39 cfs @ 12.51 hrs HW=52.08' (Free Discharge)

↑**1=Low Flow Orifice** (Orifice Controls 0.39 cfs @ 7.92 fps)

Secondary OutFlow Max=7.21 cfs @ 12.51 hrs HW=52.08' (Free Discharge)

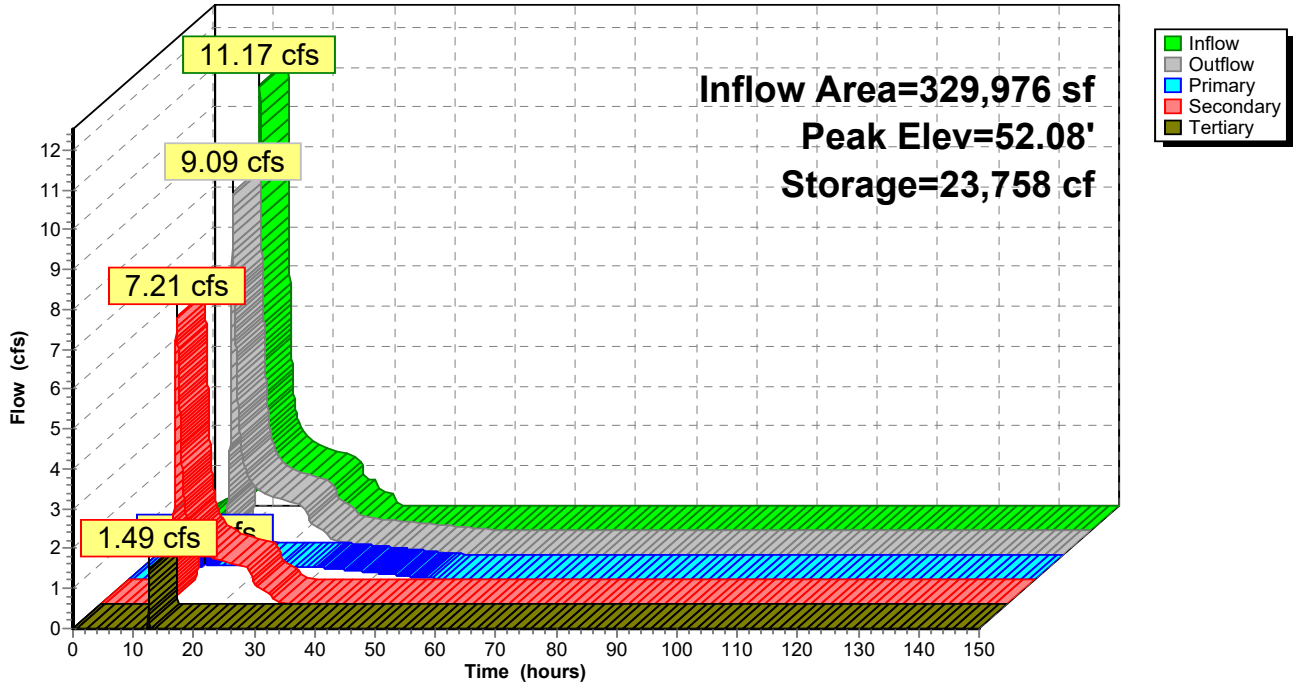
↑**2=SECONDARY OUTLET** (Orifice Controls 7.21 cfs @ 3.34 fps)

Tertiary OutFlow Max=1.48 cfs @ 12.51 hrs HW=52.08' (Free Discharge)

↑**3=Orifice/Grate** (Weir Controls 1.48 cfs @ 0.93 fps)

Pond 13P: Bioretention Basin 4

Hydrograph



Time span=0.00-150.00 hrs, dt=0.02 hrs, 7501 points
 Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious
 Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: DA 1: CN w/ IC areas	Runoff Area=141,085 sf 17.73% Impervious Runoff Depth=3.00" Tc=18.6 min CN=75/98 Runoff=8.15 cfs 35,214 cf
Subcatchment 2S: DA 2: CN w/ IC areas	Runoff Area=21,583 sf 64.54% Impervious Runoff Depth=4.19" Tc=1.4 min CN=78/98 Runoff=2.67 cfs 7,531 cf
Subcatchment 3S: DA 3: CN w/ IC areas	Runoff Area=40,101 sf 65.65% Impervious Runoff Depth=4.18" Tc=3.5 min CN=77/98 Runoff=4.80 cfs 13,965 cf
Subcatchment 4S: DA 4: CN w/ IC areas	Runoff Area=84,260 sf 73.22% Impervious Runoff Depth=4.34" Tc=3.2 min CN=77/98 Runoff=10.47 cfs 30,496 cf
Subcatchment 5S: DA 5: CN w/ IC areas	Runoff Area=52,282 sf 79.56% Impervious Runoff Depth=4.50" Tc=2.5 min CN=78/98 Runoff=6.81 cfs 19,601 cf
Subcatchment 6S: DA 6: CN w/ IC areas	Runoff Area=76,785 sf 82.96% Impervious Runoff Depth=4.58" Tc=3.2 min CN=79/98 Runoff=9.95 cfs 29,338 cf
Subcatchment 7S: DA 7: CN w/ IC areas	Runoff Area=120,233 sf 94.05% Impervious Runoff Depth=4.80" Tc=3.5 min CN=78/98 Runoff=15.96 cfs 48,087 cf
Subcatchment 8S: DA 8: CN w/ IC areas	Runoff Area=111,353 sf 71.87% Impervious Runoff Depth=4.22" Tc=2.0 min CN=73/98 Runoff=13.91 cfs 39,114 cf
Subcatchment 9S: DA 9: CN w/ IC areas	Runoff Area=59,019 sf 68.70% Impervious Runoff Depth=4.27" Tc=2.8 min CN=78/98 Runoff=7.35 cfs 21,018 cf
Subcatchment 10S: DA 10: CN w/ IC areas	Runoff Area=48,527 sf 85.53% Impervious Runoff Depth=4.57" Tc=5.8 min CN=74/98 Runoff=5.80 cfs 18,486 cf
Subcatchment 11S: DA 11: CN w/ IC areas	Runoff Area=57,652 sf 78.51% Impervious Runoff Depth=4.44" Tc=2.5 min CN=76/98 Runoff=7.42 cfs 21,323 cf
Subcatchment 12S: DA 12: CN w/ IC areas	Runoff Area=67,756 sf 72.56% Impervious Runoff Depth=4.33" Tc=2.9 min CN=77/98 Runoff=8.47 cfs 24,442 cf
Subcatchment 13S: DA 13: CN w/ IC areas	Runoff Area=156,041 sf 15.80% Impervious Runoff Depth=2.88" Tc=24.6 min CN=74/98 Runoff=7.59 cfs 37,404 cf
Pond 1P: Bioretention Basin 1	Peak Elev=64.55' Storage=13,250 cf Inflow=8.15 cfs 35,214 cf Primary=0.39 cfs 23,652 cf Secondary=2.63 cfs 11,561 cf Tertiary=0.00 cfs 0 cf Outflow=3.02 cfs 35,213 cf
Pond 2P: Bioretention Basin 2	Peak Elev=69.84' Storage=3,495 cf Inflow=2.67 cfs 7,531 cf Primary=0.29 cfs 7,190 cf Secondary=0.00 cfs 0 cf Tertiary=0.00 cfs 0 cf Outflow=0.29 cfs 7,190 cf
Pond 3P: Bioretention Basin 3	Peak Elev=66.61' Storage=6,857 cf Inflow=4.80 cfs 13,965 cf Primary=0.35 cfs 12,938 cf Secondary=0.22 cfs 566 cf Tertiary=0.00 cfs 0 cf Outflow=0.58 cfs 13,504 cf

Pond 4P: PP (w/ underdrain) w/ UG Peak Elev=96.05' Storage=15,705 cf Inflow=10.47 cfs 30,496 cf
Primary=0.38 cfs 30,496 cf Secondary=0.00 cfs 0 cf Outflow=0.38 cfs 30,496 cf

Pond 5P: PP (w/ underdrain) w/ UG storage Peak Elev=96.03' Storage=10,665 cf Inflow=6.81 cfs 19,601 cf
Primary=0.21 cfs 19,601 cf Secondary=0.00 cfs 0 cf Outflow=0.21 cfs 19,601 cf

Pond 6P: PP (w/ underdrain) w/ UG storage Peak Elev=96.06' Storage=18,114 cf Inflow=9.95 cfs 29,338 cf
Primary=0.21 cfs 29,338 cf Secondary=0.00 cfs 0 cf Outflow=0.21 cfs 29,338 cf

Pond 7P: PP (w/ underdrain) w/ UG Peak Elev=96.08' Storage=28,512 cf Inflow=15.96 cfs 48,087 cf
Primary=0.38 cfs 48,087 cf Secondary=0.00 cfs 0 cf Outflow=0.38 cfs 48,087 cf

Pond 8P: Existing Basin 1 Peak Elev=59.35' Storage=7,049 cf Inflow=14.99 cfs 166,636 cf
Primary=8.92 cfs 166,636 cf Secondary=0.00 cfs 0 cf Tertiary=0.00 cfs 0 cf Outflow=8.92 cfs 166,636 cf

Pond 9P: Existing Basin 2 Peak Elev=67.32' Storage=7,418 cf Inflow=7.35 cfs 21,018 cf
Primary=0.38 cfs 14,690 cf Secondary=1.49 cfs 6,327 cf Tertiary=0.00 cfs 0 cf Outflow=1.87 cfs 21,018 cf

Pond 10P: PP (w/ underdrain) w/ UG storage Peak Elev=96.42' Storage=7,718 cf Inflow=5.80 cfs 18,486 cf
Primary=0.40 cfs 18,486 cf Secondary=0.00 cfs 0 cf Outflow=0.40 cfs 18,486 cf

Pond 11P: PP (w/ underdrain) w/ UG storage Peak Elev=96.13' Storage=9,585 cf Inflow=7.42 cfs 21,323 cf
Primary=0.38 cfs 21,323 cf Secondary=0.00 cfs 0 cf Outflow=0.38 cfs 21,323 cf

Pond 12P: PP (w/ underdrain) w/ UG Peak Elev=96.01' Storage=11,654 cf Inflow=8.47 cfs 24,442 cf
Primary=0.38 cfs 24,442 cf Secondary=0.00 cfs 0 cf Outflow=0.38 cfs 24,442 cf

Pond 13P: Bioretention Basin 4 Peak Elev=51.91' Storage=21,981 cf Inflow=8.71 cfs 101,655 cf
Primary=0.38 cfs 34,773 cf Secondary=5.57 cfs 65,619 cf Tertiary=0.00 cfs 0 cf Outflow=5.95 cfs 100,393 cf

Total Runoff Area = 1,036,677 sf Runoff Volume = 346,018 cf Average Runoff Depth = 4.01"
39.57% Pervious = 410,178 sf 60.43% Impervious = 626,499 sf

Summary for Subcatchment 1S: DA 1: CN w/ IC areas

Runoff = 8.15 cfs @ 12.28 hrs, Volume= 35,214 cf, Depth= 3.00"
 Routed to Pond 1P : Bioretention Basin 1

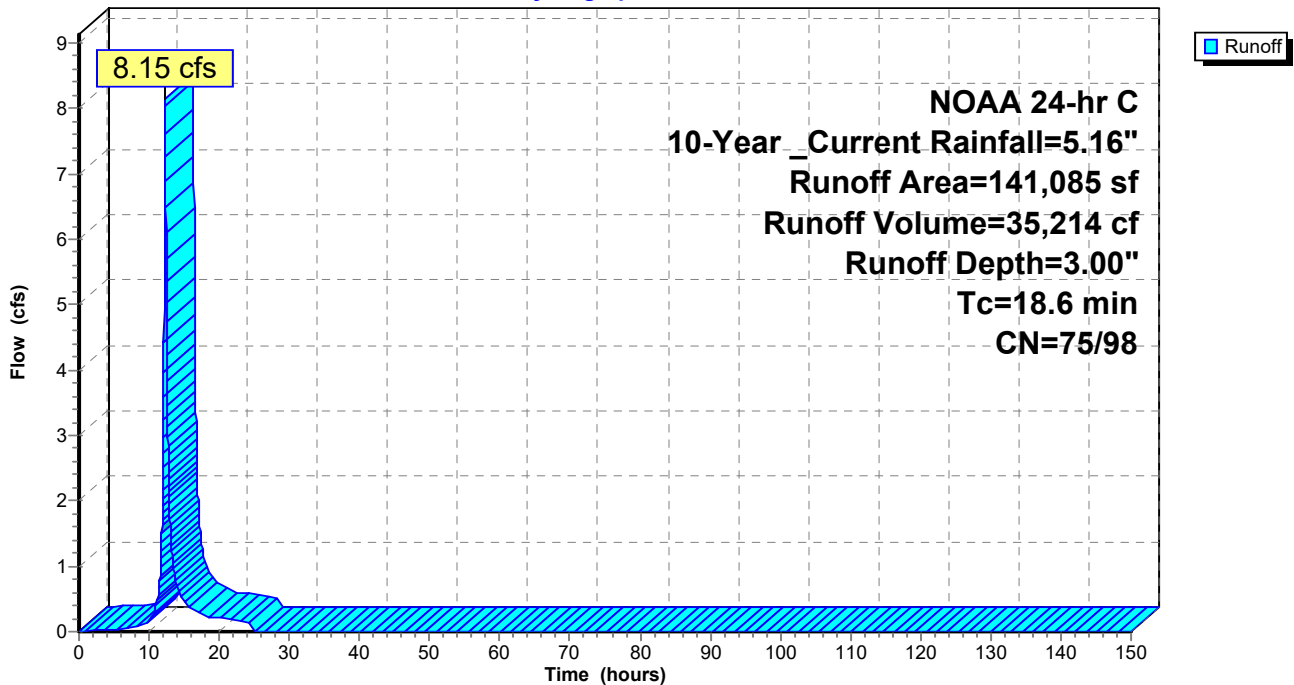
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-150.00 hrs, dt= 0.00
 NOAA 24-hr C 10-Year _Current Rainfall=5.16"

	Area (sf)	CN	Description
*	25,014	98	Impervious HSG C
	26,886	70	Brush (fair) HSG C
	45,464	79	Open Space (fair) HSG C
*	10,665	74	Open Space (good) HSG C
*	33,056	73	Woods (fair) HSG C
	141,085	79	Weighted Average
	116,071	75	82.27% Pervious Area
	25,014	98	17.73% Impervious Area

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

Subcatchment 1S: DA 1: CN w/ IC areas

Hydrograph



Summary for Subcatchment 2S: DA 2: CN w/ IC areas

[49] Hint: Tc<2dt may require smaller dt

Runoff = 2.67 cfs @ 12.09 hrs, Volume= 7,531 cf, Depth= 4.19"
 Routed to Pond 2P : Bioretention Basin 2

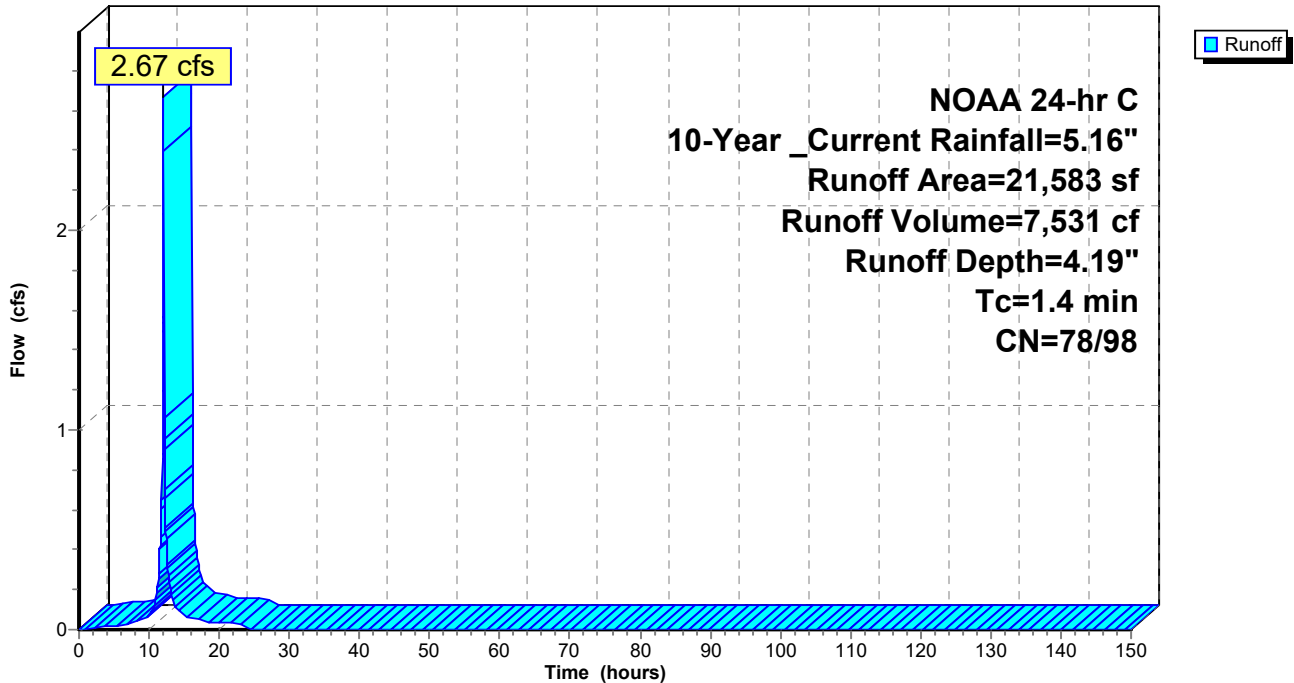
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-150.00 hrs, dt= 0.0
 NOAA 24-hr C 10-Year _Current Rainfall=5.16"

	Area (sf)	CN	Description
*	13,929	98	Impervious HSG C
	6,668	79	Open Space (fair) HSG C
*	986	74	Open Space (good) HSG C
	21,583	91	Weighted Average
	7,654	78	35.46% Pervious Area
	13,929	98	64.54% Impervious Area

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

Subcatchment 2S: DA 2: CN w/ IC areas

Hydrograph



Summary for Subcatchment 3S: DA 3: CN w/ IC areas

Runoff = 4.80 cfs @ 12.10 hrs, Volume= 13,965 cf, Depth= 4.18"
 Routed to Pond 3P : Bioretention Basin 3

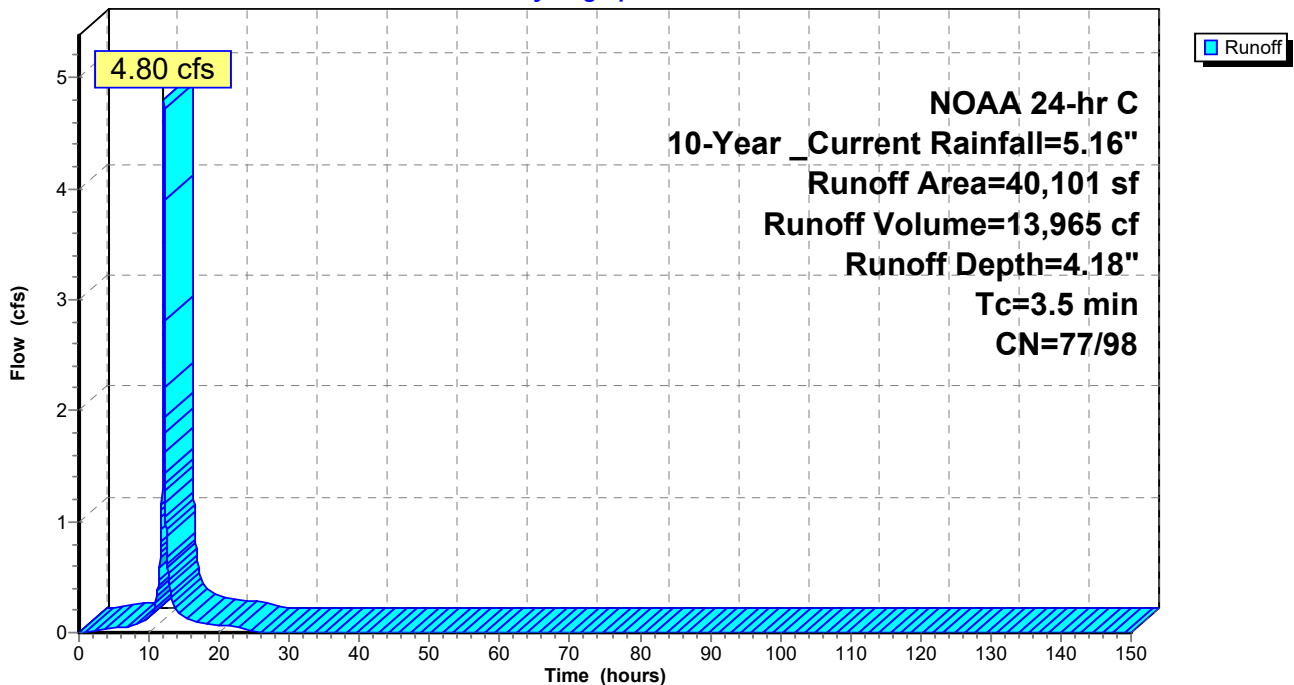
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-150.00 hrs, dt= 0.00
 NOAA 24-hr C 10-Year _Current Rainfall=5.16"

	Area (sf)	CN	Description
*	26,326	98	Impervious HSG C
	9,202	79	Open Space (fair) HSG C
*	4,573	74	Open Space (good) HSG C
	40,101	91	Weighted Average
	13,775	77	34.35% Pervious Area
	26,326	98	65.65% Impervious Area

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

Subcatchment 3S: DA 3: CN w/ IC areas

Hydrograph



Summary for Subcatchment 4S: DA 4: CN w/ IC areas

Runoff = 10.47 cfs @ 12.10 hrs, Volume= 30,496 cf, Depth= 4.34"

Routed to Pond 4P : PP (w/ underdrain) w/ UG storage 1

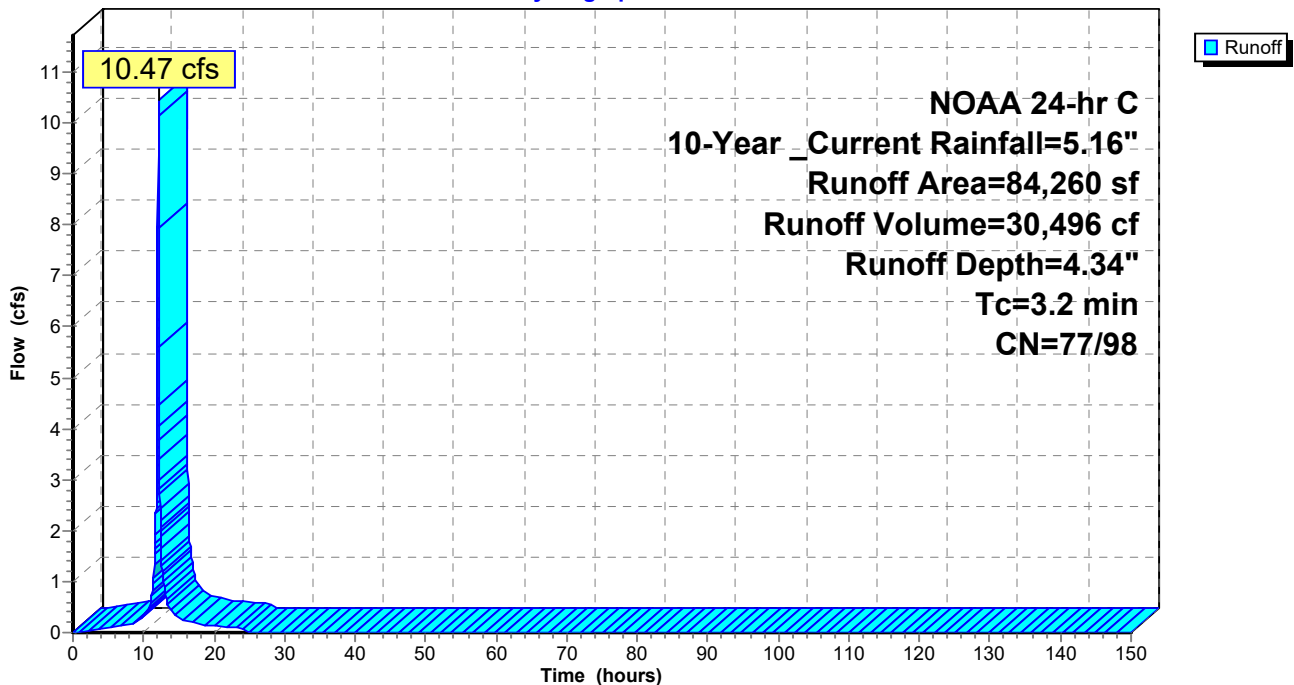
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-150.00 hrs, dt= 0.0
 NOAA 24-hr C 10-Year _Current Rainfall=5.16"

	Area (sf)	CN	Description
*	61,698	98	Impervious HSG C
	13,143	79	Open Space (fair) HSG C
*	9,419	74	Open Space (good) HSG C
	84,260	92	Weighted Average
	22,562	77	26.78% Pervious Area
	61,698	98	73.22% Impervious Area

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

Subcatchment 4S: DA 4: CN w/ IC areas

Hydrograph



Summary for Subcatchment 5S: DA 5: CN w/ IC areas

Runoff = 6.81 cfs @ 12.09 hrs, Volume= 19,601 cf, Depth= 4.50"

Routed to Pond 5P : PP (w/ underdrain) w/ UG storage 2

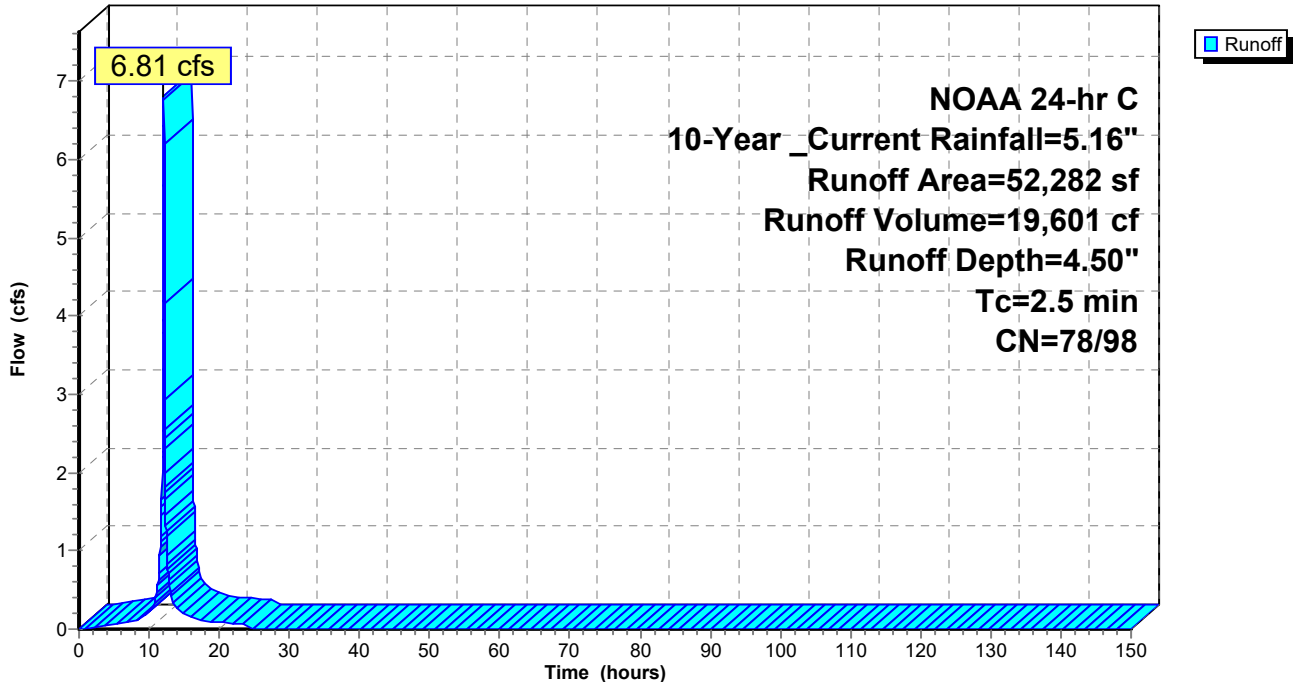
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-150.00 hrs, dt= 0.0
 NOAA 24-hr C 10-Year _Current Rainfall=5.16"

	Area (sf)	CN	Description
*	41,595	98	Impervious HSG C
	444	70	Brush (fair) HSG C
	9,377	79	Open Space (fair) HSG C
*	866	74	Open Space (good) HSG C
	52,282	94	Weighted Average
	10,687	78	20.44% Pervious Area
	41,595	98	79.56% Impervious Area

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

Subcatchment 5S: DA 5: CN w/ IC areas

Hydrograph



Summary for Subcatchment 6S: DA 6: CN w/ IC areas

Runoff = 9.95 cfs @ 12.10 hrs, Volume= 29,338 cf, Depth= 4.58"

Routed to Pond 6P : PP (w/ underdrain) w/ UG storage 3

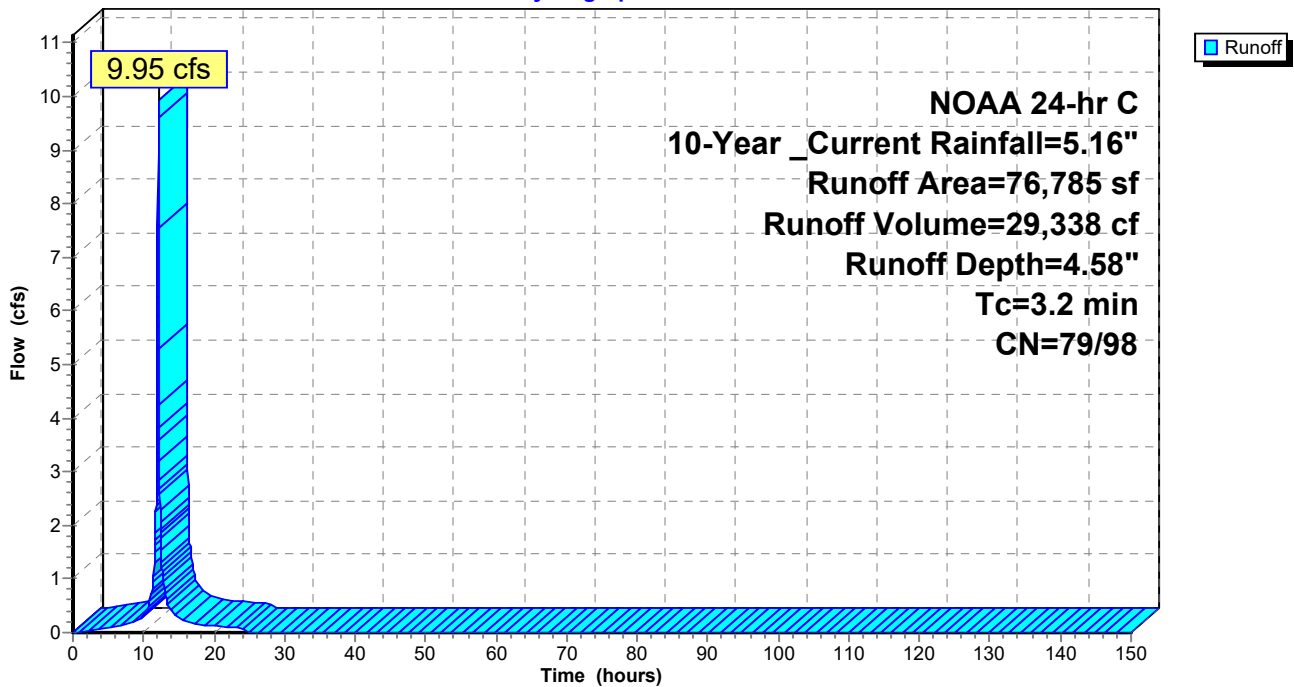
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-150.00 hrs, dt= 0.00
 NOAA 24-hr C 10-Year _Current Rainfall=5.16"

	Area (sf)	CN	Description
*	63,699	98	Impervious HSG C
	12,708	79	Open Space (fair) HSG C
*	378	74	Open Space (good) HSG C
	76,785	95	Weighted Average
	13,086	79	17.04% Pervious Area
	63,699	98	82.96% Impervious Area

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

Subcatchment 6S: DA 6: CN w/ IC areas

Hydrograph



Summary for Subcatchment 7S: DA 7: CN w/ IC areas

Runoff = 15.96 cfs @ 12.10 hrs, Volume= 48,087 cf, Depth= 4.80"

Routed to Pond 7P : PP (w/ underdrain) w/ UG storage 4

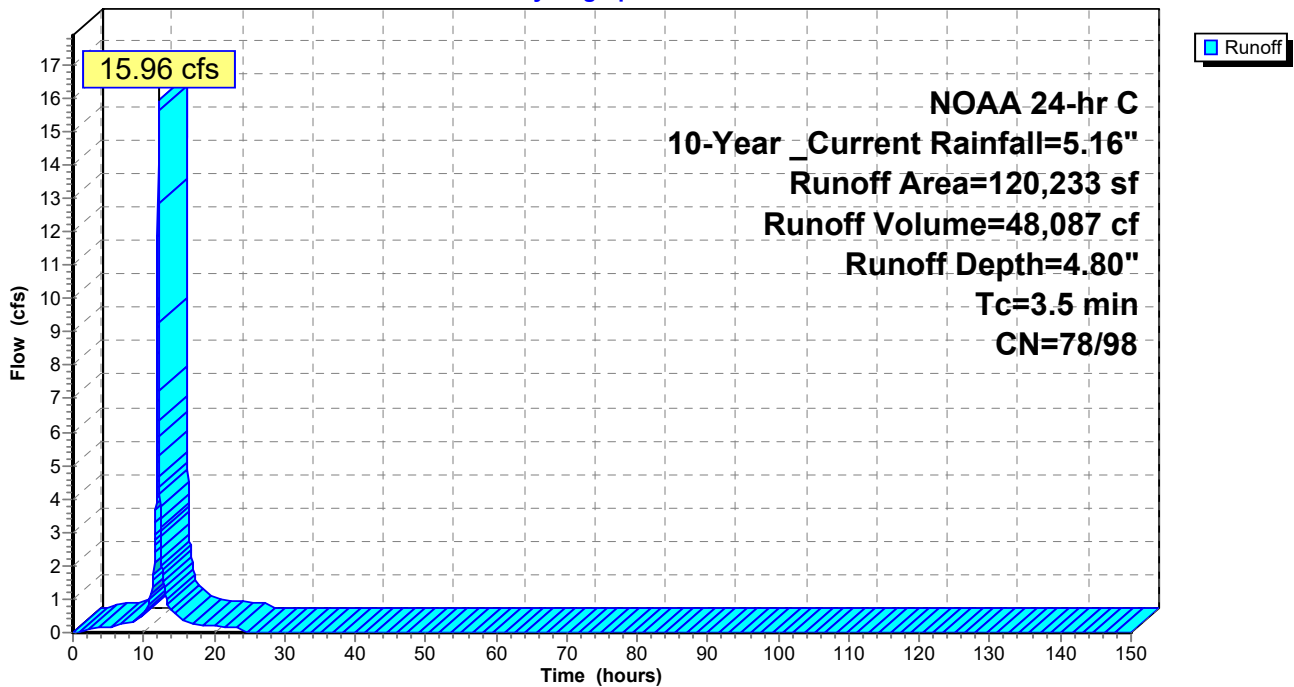
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-150.00 hrs, dt= 0.0
 NOAA 24-hr C 10-Year _Current Rainfall=5.16"

	Area (sf)	CN	Description
*	113,075	98	Impervious HSG C
	5,111	79	Open Space (fair) HSG C
*	2,047	74	Open Space (good) HSG C
	120,233	97	Weighted Average
	7,158	78	5.95% Pervious Area
	113,075	98	94.05% Impervious Area

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

Subcatchment 7S: DA 7: CN w/ IC areas

Hydrograph



Summary for Subcatchment 8S: DA 8: CN w/ IC areas

[49] Hint: Tc<2dt may require smaller dt

Runoff = 13.91 cfs @ 12.09 hrs, Volume= 39,114 cf, Depth= 4.22"
 Routed to Pond 8P : Existing Basin 1

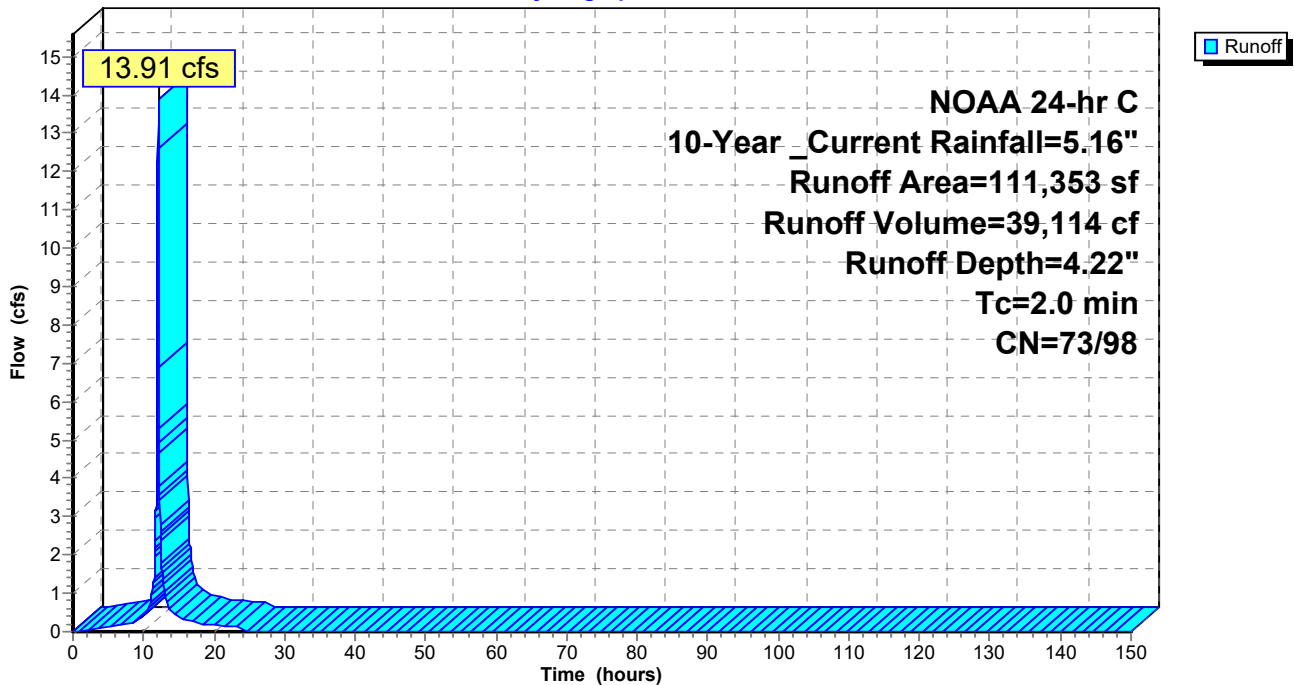
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-150.00 hrs, dt= 0.0
 NOAA 24-hr C 10-Year _Current Rainfall=5.16"

	Area (sf)	CN	Description
*	80,033	98	Impervious HSG C
	3,876	70	Brush (fair) HSG C
	419	79	Open Space (fair) HSG C
*	12,431	74	Open Space (good) HSG C
*	14,594	73	Woods (fair) HSG C
	111,353	91	Weighted Average
	31,320	73	28.13% Pervious Area
	80,033	98	71.87% Impervious Area

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

Subcatchment 8S: DA 8: CN w/ IC areas

Hydrograph



Summary for Subcatchment 9S: DA 9: CN w/ IC areas

Runoff = 7.35 cfs @ 12.10 hrs, Volume= 21,018 cf, Depth= 4.27"
 Routed to Pond 9P : Existing Basin 2

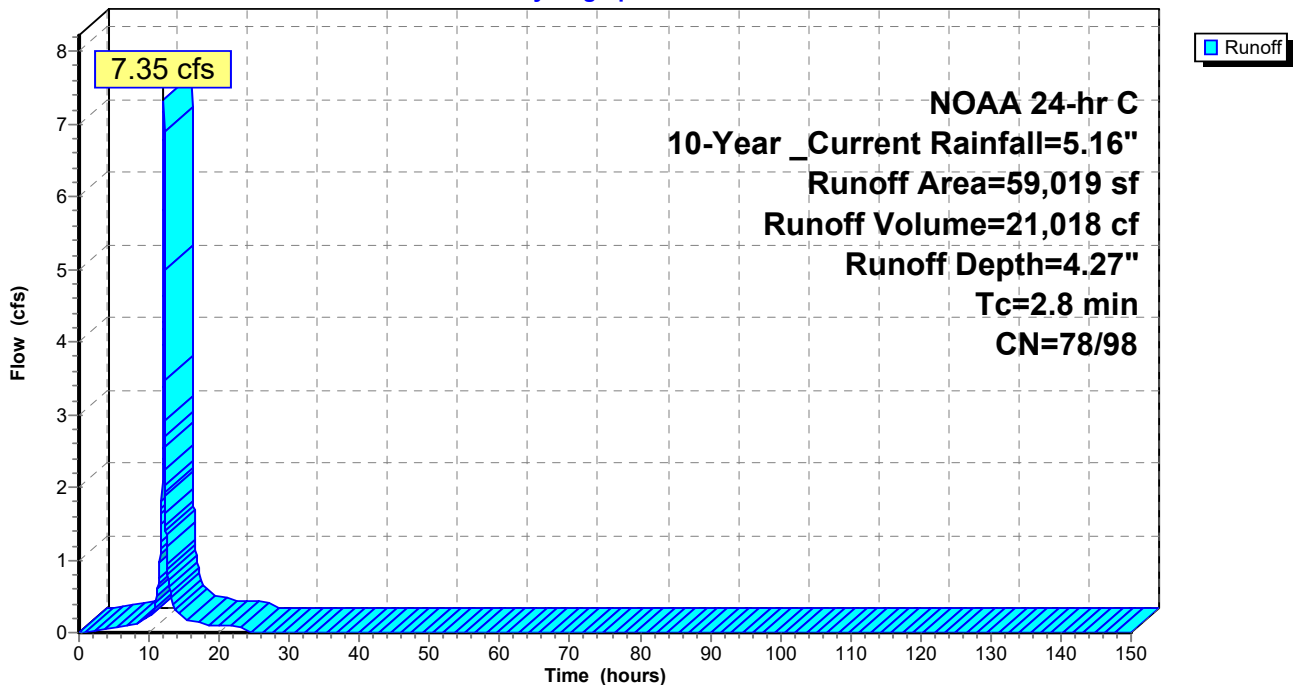
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-150.00 hrs, dt= 0.00
 NOAA 24-hr C 10-Year _Current Rainfall=5.16"

	Area (sf)	CN	Description
*	40,544	98	Impervious HSG C
	15,969	79	Open Space (fair) HSG C
*	2,506	74	Open Space (good) HSG C
	59,019	92	Weighted Average
	18,475	78	31.30% Pervious Area
	40,544	98	68.70% Impervious Area

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

Subcatchment 9S: DA 9: CN w/ IC areas

Hydrograph



Summary for Subcatchment 10S: DA 10: CN w/ IC areas

Runoff = 5.80 cfs @ 12.13 hrs, Volume= 18,486 cf, Depth= 4.57"

Routed to Pond 10P : PP (w/ underdrain) w/ UG storage 5

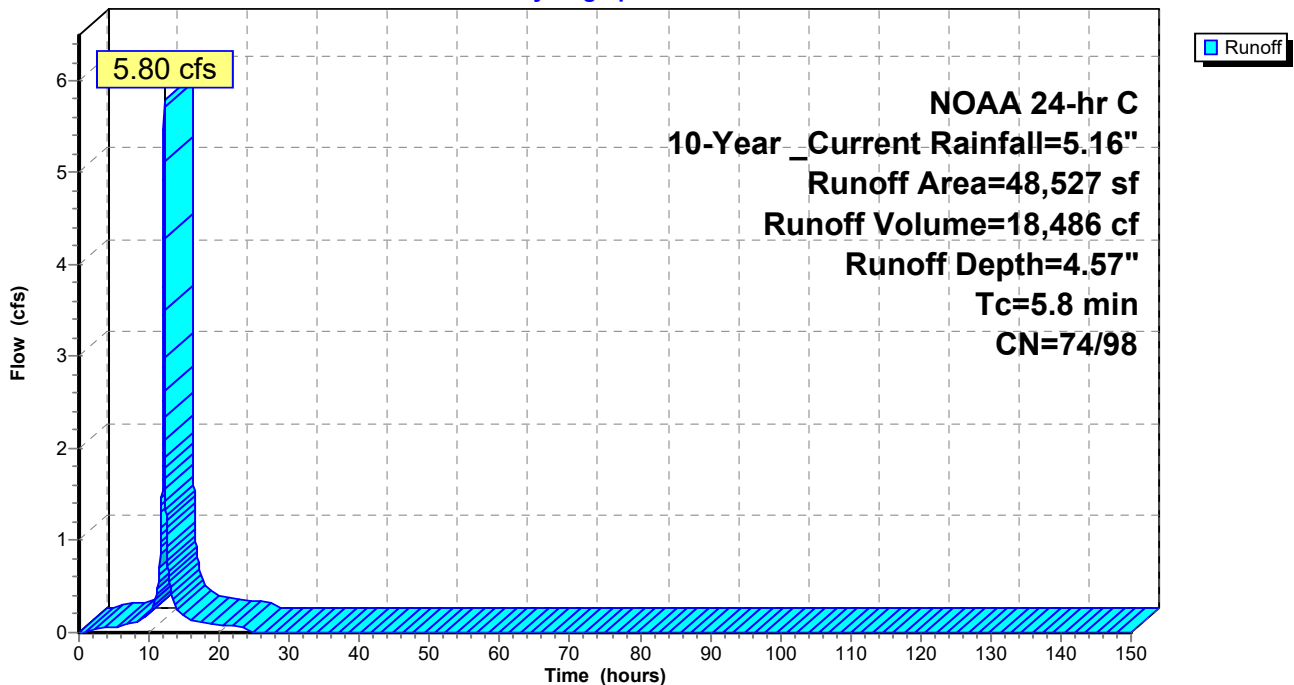
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-150.00 hrs, dt= 0.0
 NOAA 24-hr C 10-Year _Current Rainfall=5.16"

	Area (sf)	CN	Description
*	41,506	98	Impervious HSG C
	60	79	Open Space (fair) HSG C
*	6,961	74	Open Space (good) HSG C
	48,527	95	Weighted Average
	7,021	74	14.47% Pervious Area
	41,506	98	85.53% Impervious Area

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

Subcatchment 10S: DA 10: CN w/ IC areas

Hydrograph



Summary for Subcatchment 11S: DA 11: CN w/ IC areas

Runoff = 7.42 cfs @ 12.09 hrs, Volume= 21,323 cf, Depth= 4.44"

Routed to Pond 11P : PP (w/ underdrain) w/ UG storage 6

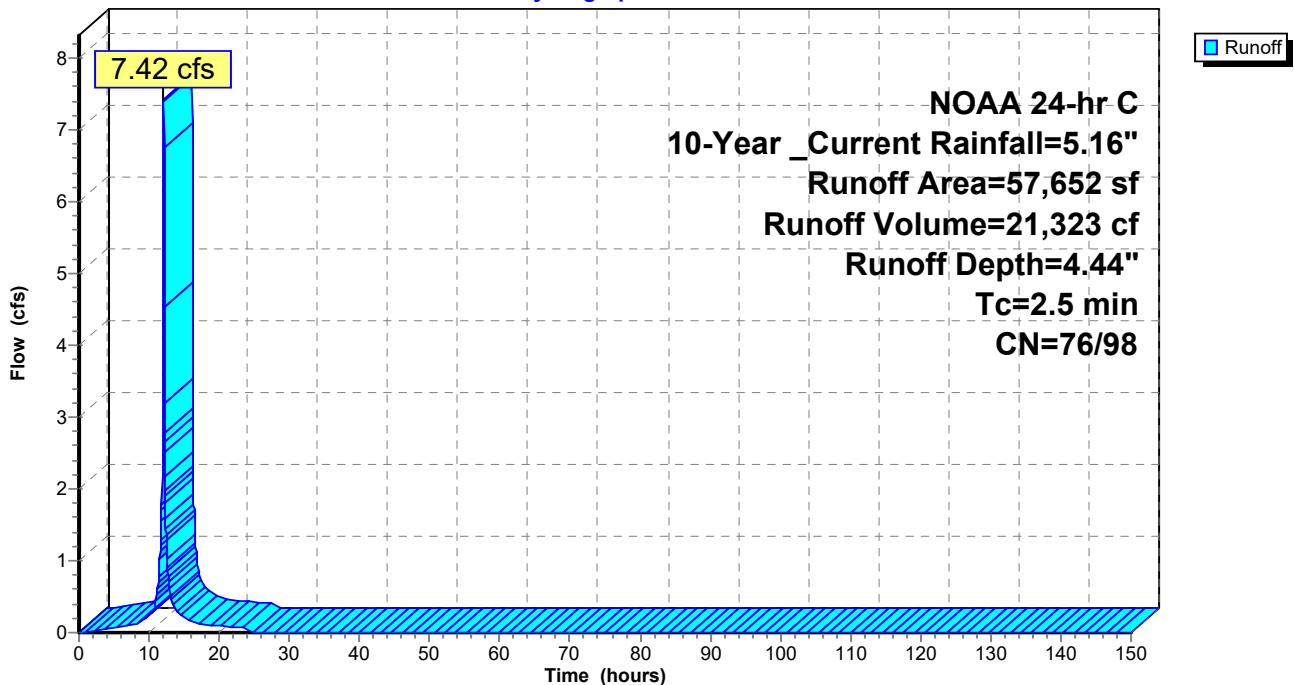
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-150.00 hrs, dt= 0.0
 NOAA 24-hr C 10-Year _Current Rainfall=5.16"

	Area (sf)	CN	Description
*	45,264	98	Impervious HSG C
	5,795	79	Open Space (fair) HSG C
*	6,593	74	Open Space (good) HSG C
	57,652	93	Weighted Average
	12,388	76	21.49% Pervious Area
	45,264	98	78.51% Impervious Area

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

Subcatchment 11S: DA 11: CN w/ IC areas

Hydrograph



Summary for Subcatchment 12S: DA 12: CN w/ IC areas

Runoff = 8.47 cfs @ 12.10 hrs, Volume= 24,442 cf, Depth= 4.33"

Routed to Pond 12P : PP (w/ underdrain) w/ UG storage 7

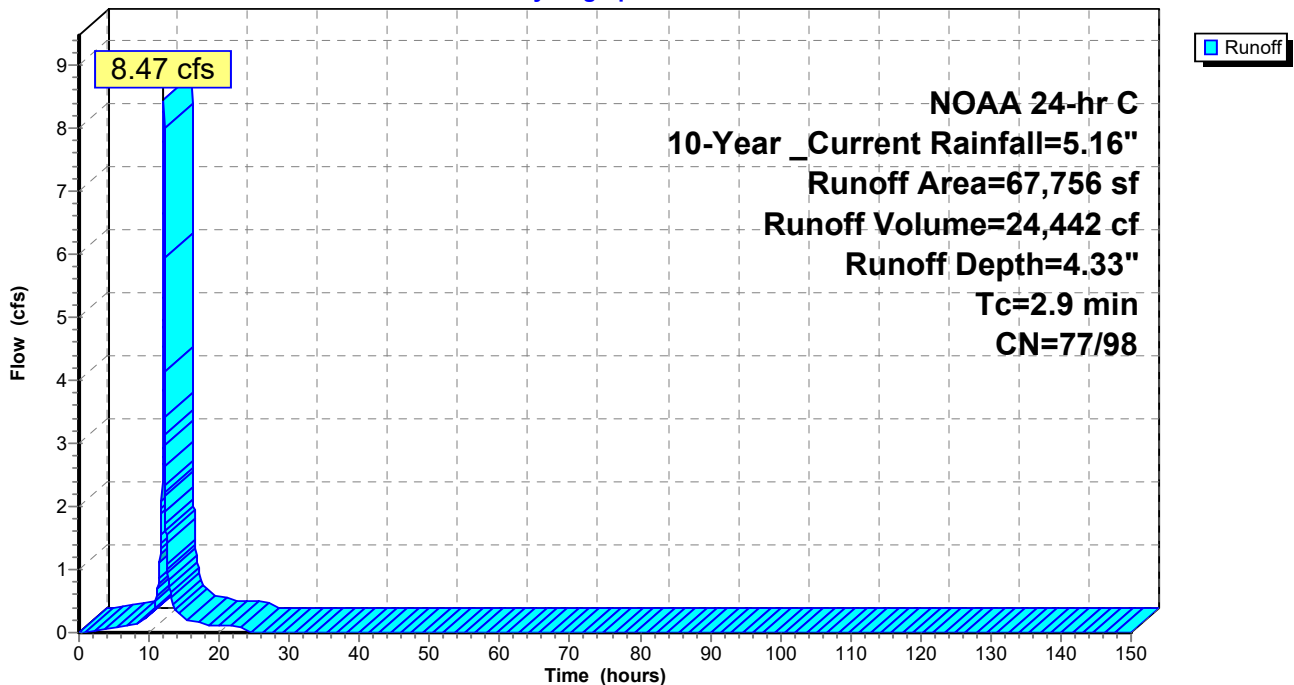
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-150.00 hrs, dt= 0.0
 NOAA 24-hr C 10-Year _Current Rainfall=5.16"

	Area (sf)	CN	Description
*	49,166	98	Impervious HSG C
	11,017	79	Open Space (fair) HSG C
*	7,573	74	Open Space (good) HSG C
	67,756	92	Weighted Average
	18,590	77	27.44% Pervious Area
	49,166	98	72.56% Impervious Area

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

Subcatchment 12S: DA 12: CN w/ IC areas

Hydrograph



Summary for Subcatchment 13S: DA 13: CN w/ IC areas

Runoff = 7.59 cfs @ 12.36 hrs, Volume= 37,404 cf, Depth= 2.88"
 Routed to Pond 13P : Bioretention Basin 4

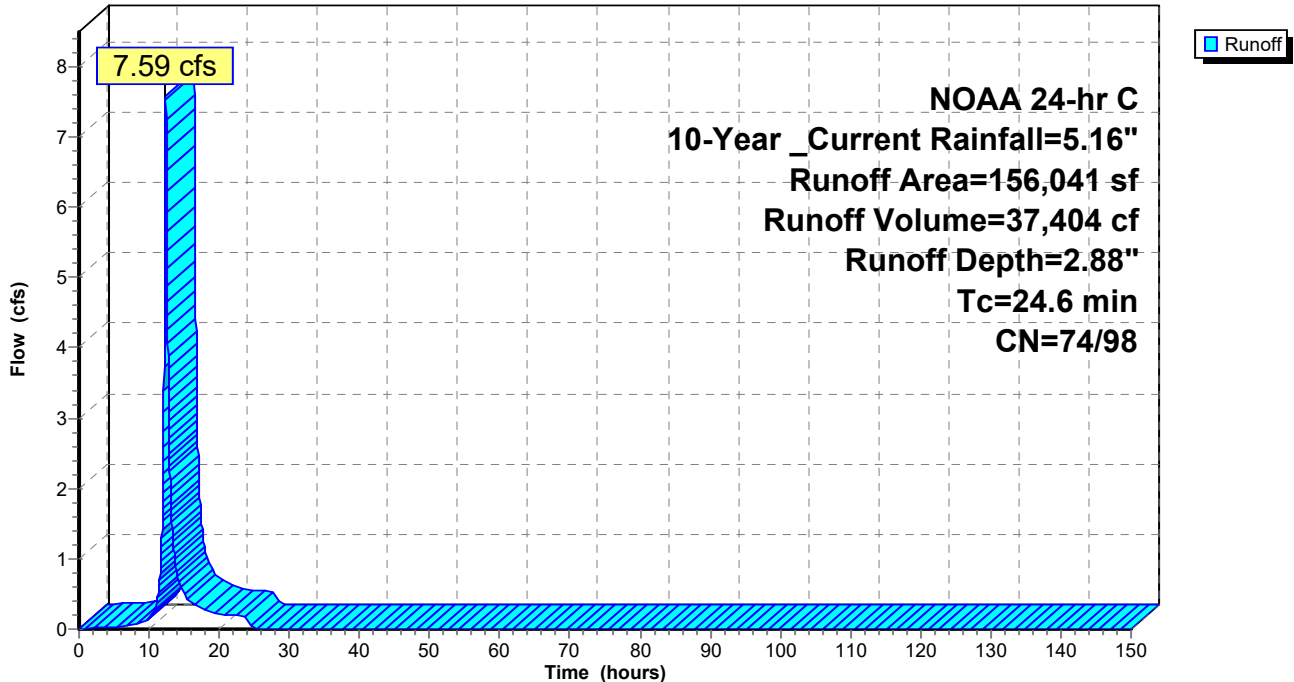
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-150.00 hrs, dt= 0.0
 NOAA 24-hr C 10-Year _Current Rainfall=5.16"

	Area (sf)	CN	Description
*	24,650	98	Impervious HSG C
	42,240	79	Open Space (fair) HSG C
*	20,548	74	Open Space (good) HSG C
	68,603	70	Woods, Good, HSG C
	156,041	77	Weighted Average
	131,391	74	84.20% Pervious Area
	24,650	98	15.80% Impervious Area

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

Subcatchment 13S: DA 13: CN w/ IC areas

Hydrograph



Summary for Pond 1P: Bioretention Basin 1

[44] Hint: Outlet device #1 is below defined storage

Inflow Area = 141,085 sf, 17.73% Impervious, Inflow Depth = 3.00" for 10-Year _Current event
 Inflow = 8.15 cfs @ 12.28 hrs, Volume= 35,214 cf
 Outflow = 3.02 cfs @ 12.68 hrs, Volume= 35,213 cf, Atten= 63%, Lag= 24.0 min
 Primary = 0.39 cfs @ 12.68 hrs, Volume= 23,652 cf
 Routed to nonexistent node 5R
 Secondary = 2.63 cfs @ 12.68 hrs, Volume= 11,561 cf
 Routed to nonexistent node 5R
 Tertiary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
 Routed to nonexistent node 5R

Routing by Stor-Ind method, Time Span= 0.00-150.00 hrs, dt= 0.02 hrs / 2
 Peak Elev= 64.55' @ 12.68 hrs Surf.Area= 8,115 sf Storage= 13,250 cf

Plug-Flow detention time= 214.6 min calculated for 35,209 cf (100% of inflow)
 Center-of-Mass det. time= 214.7 min (1,037.3 - 822.6)

Volume	Invert	Avail.Storage	Storage Description
#1	62.50'	37,960 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
62.50	4,800	0	0
67.00	12,071	37,960	37,960

Device	Routing	Invert	Outlet Devices
#1	Primary	61.75'	3.0" Vert. Low Flow Orifice C= 0.600 Limited to weir flow at low heads
#2	Secondary	64.00'	24.0" W x 18.0" H Vert. SECONDARY OUTLET C= 0.600 Limited to weir flow at low heads
#3	Tertiary	66.25'	60.0" x 60.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads

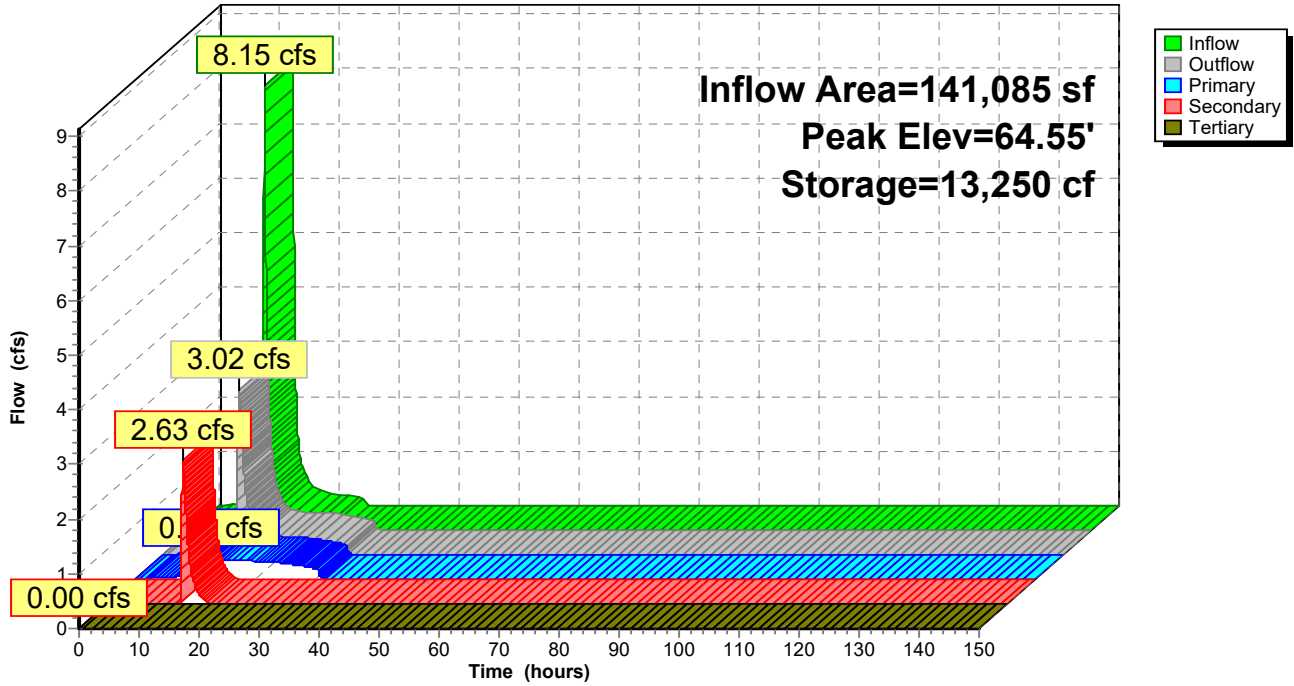
Primary OutFlow Max=0.39 cfs @ 12.68 hrs HW=64.55' (Free Discharge)
 ↑1=**Low Flow Orifice** (Orifice Controls 0.39 cfs @ 7.88 fps)

Secondary OutFlow Max=2.63 cfs @ 12.68 hrs HW=64.55' (Free Discharge)
 ↑2=**SECONDARY OUTLET** (Orifice Controls 2.63 cfs @ 2.38 fps)

Tertiary OutFlow Max=0.00 cfs @ 0.00 hrs HW=62.50' (Free Discharge)
 ↑3=**Orifice/Grate** (Controls 0.00 cfs)

Pond 1P: Bioretention Basin 1

Hydrograph



Summary for Pond 2P: Bioretention Basin 2

Inflow Area = 21,583 sf, 64.54% Impervious, Inflow Depth = 4.19" for 10-Year _Current event
 Inflow = 2.67 cfs @ 12.09 hrs, Volume= 7,531 cf
 Outflow = 0.29 cfs @ 12.70 hrs, Volume= 7,190 cf, Atten= 89%, Lag= 36.8 min
 Primary = 0.29 cfs @ 12.70 hrs, Volume= 7,190 cf
 Routed to nonexistent node 5R
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
 Routed to nonexistent node 5R
 Tertiary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
 Routed to nonexistent node 5R

Routing by Stor-Ind method, Time Span= 0.00-150.00 hrs, dt= 0.02 hrs / 2
 Peak Elev= 69.84' @ 12.70 hrs Surf.Area= 2,518 sf Storage= 3,495 cf

Plug-Flow detention time= 182.3 min calculated for 7,190 cf (95% of inflow)
 Center-of-Mass det. time= 154.7 min (918.2 - 763.5)

Volume	Invert	Avail.Storage	Storage Description
#1	68.00'	14,805 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
68.00	1,281	0	0
73.00	4,641	14,805	14,805

Device	Routing	Invert	Outlet Devices
#1	Primary	68.25'	3.0" Vert. Low Flow Orifice C= 0.600 Limited to weir flow at low heads
#2	Secondary	70.50'	24.0" W x 18.0" H Vert. SECONDARY OUTLET C= 0.600 Limited to weir flow at low heads
#3	Tertiary	72.75'	60.0" x 60.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads

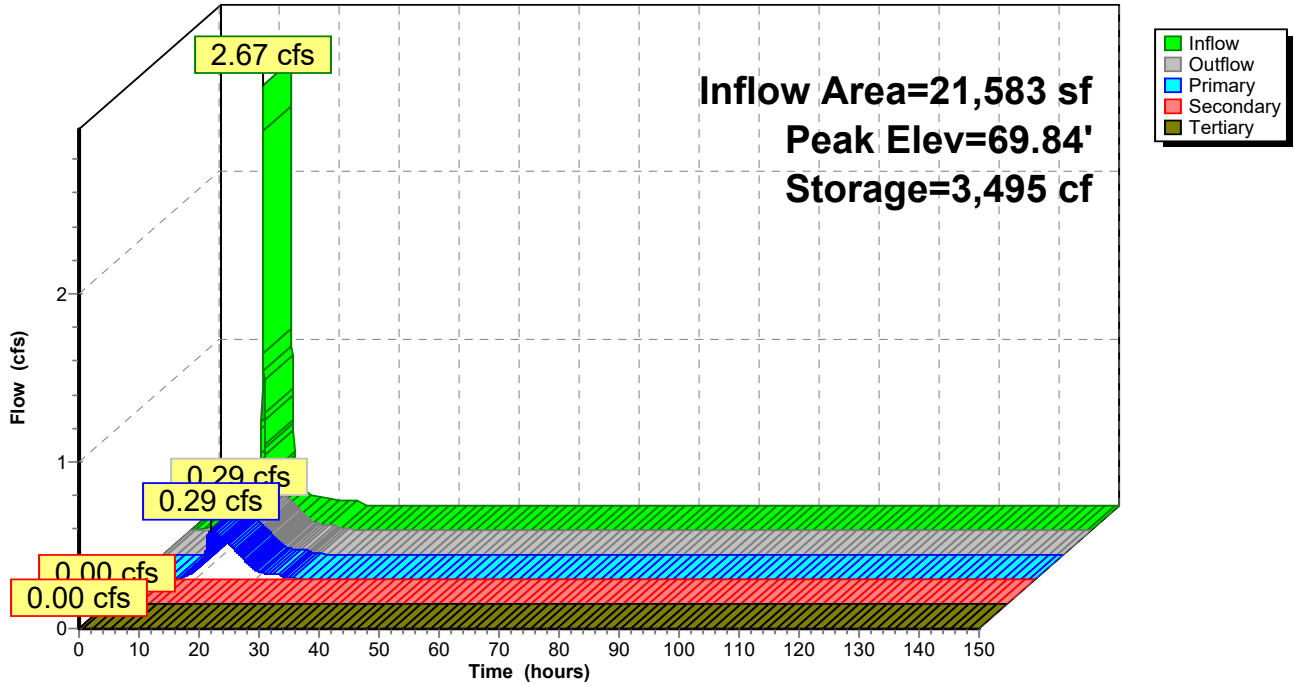
Primary OutFlow Max=0.29 cfs @ 12.70 hrs HW=69.84' (Free Discharge)
 ↑1=**Low Flow Orifice** (Orifice Controls 0.29 cfs @ 5.83 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=68.00' (Free Discharge)
 ↑2=**SECONDARY OUTLET** (Controls 0.00 cfs)

Tertiary OutFlow Max=0.00 cfs @ 0.00 hrs HW=68.00' (Free Discharge)
 ↑3=**Orifice/Grate** (Controls 0.00 cfs)

Pond 2P: Bioretention Basin 2

Hydrograph



Summary for Pond 3P: Bioretention Basin 3

Inflow Area = 40,101 sf, 65.65% Impervious, Inflow Depth = 4.18" for 10-Year _Current event
 Inflow = 4.80 cfs @ 12.10 hrs, Volume= 13,965 cf
 Outflow = 0.58 cfs @ 12.62 hrs, Volume= 13,504 cf, Atten= 88%, Lag= 31.1 min
 Primary = 0.35 cfs @ 12.62 hrs, Volume= 12,938 cf
 Routed to nonexistent node 5R
 Secondary = 0.22 cfs @ 12.62 hrs, Volume= 566 cf
 Routed to nonexistent node 5R
 Tertiary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
 Routed to nonexistent node 5R

Routing by Stor-Ind method, Time Span= 0.00-150.00 hrs, dt= 0.02 hrs / 2
 Peak Elev= 66.61' @ 12.62 hrs Surf.Area= 3,503 sf Storage= 6,857 cf

Plug-Flow detention time= 238.7 min calculated for 13,504 cf (97% of inflow)
 Center-of-Mass det. time= 217.7 min (982.6 - 764.9)

Volume	Invert	Avail.Storage	Storage Description
#1	64.00'	17,160 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
64.00	1,760	0	0
69.00	5,104	17,160	17,160

Device	Routing	Invert	Outlet Devices
#1	Primary	64.25'	3.0" Vert. Low Flow Orifice C= 0.600 Limited to weir flow at low heads
#2	Secondary	66.50'	24.0" W x 18.0" H Vert. SECONDARY OUTLET C= 0.600 Limited to weir flow at low heads
#3	Tertiary	68.75'	60.0" x 60.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads

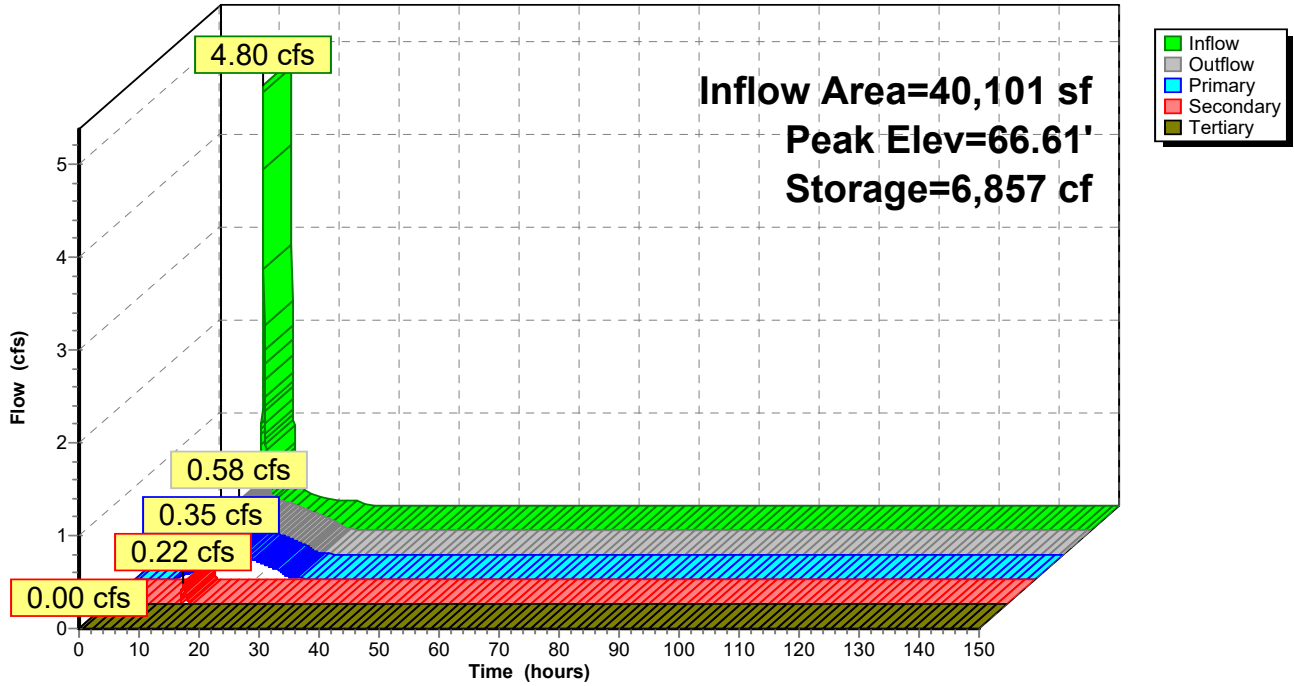
Primary OutFlow Max=0.35 cfs @ 12.62 hrs HW=66.61' (Free Discharge)
 ↖**1=Low Flow Orifice** (Orifice Controls 0.35 cfs @ 7.19 fps)

Secondary OutFlow Max=0.22 cfs @ 12.62 hrs HW=66.61' (Free Discharge)
 ↖**2=SECONDARY OUTLET** (Orifice Controls 0.22 cfs @ 1.04 fps)

Tertiary OutFlow Max=0.00 cfs @ 0.00 hrs HW=64.00' (Free Discharge)
 ↖**3=Orifice/Grate** (Controls 0.00 cfs)

Pond 3P: Bioretention Basin 3

Hydrograph



Summary for Pond 4P: PP (w/ underdrain) w/ UG storage 1

[44] Hint: Outlet device #3 is below defined storage

Inflow Area = 84,260 sf, 73.22% Impervious, Inflow Depth = 4.34" for 10-Year _Current event
 Inflow = 10.47 cfs @ 12.10 hrs, Volume= 30,496 cf
 Outflow = 0.38 cfs @ 14.32 hrs, Volume= 30,496 cf, Atten= 96%, Lag= 133.0 min
 Primary = 0.38 cfs @ 14.32 hrs, Volume= 30,496 cf
 Routed to Pond 8P : Existing Basin 1
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
 Routed to Pond 8P : Existing Basin 1

Routing by Stor-Ind method, Time Span= 0.00-150.00 hrs, dt= 0.02 hrs
 Peak Elev= 96.05' @ 14.32 hrs Surf.Area= 14,771 sf Storage= 15,705 cf

Plug-Flow detention time= 377.6 min calculated for 30,492 cf (100% of inflow)
 Center-of-Mass det. time= 377.7 min (1,137.5 - 759.9)

Volume	Invert	Avail.Storage	Storage Description
#1	97.00'	3,624 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
#2A	94.50'	12,961 cf	68.00'W x 217.22'L x 3.50'H Field A 51,698 cf Overall - 19,295 cf Embedded = 32,403 cf x 40.0% Voids
#3A	95.00'	19,295 cf	ADS_StormTech SC-740 +Cap x 420 Inside #2 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 420 Chambers in 14 Rows
		35,880 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
97.00	6,787	0.0	0	0
97.67	6,787	35.0	1,592	1,592
97.83	6,787	15.0	163	1,754
98.00	6,787	15.0	173	1,928
98.25	6,787	100.0	1,697	3,624

Device	Routing	Invert	Outlet Devices
#1	Primary	92.07'	3.0" Vert. Restriction Orifice C= 0.600 Limited to weir flow at low heads
#2	Device 1	92.17'	6.0" Round 6" HDPE Underdrain L= 359.0' Ke= 0.500 Inlet / Outlet Invert= 92.17' / 90.37' S= 0.0050 ' S= 0.0050 ' Cc= 0.900 n= 0.020 Corrugated PE, corrugated interior, Flow Area= 0.20 sf
#3	Device 2	92.17'	0.9" x 0.1" Horiz. Perforations X 400.00 columns X 3 rows C= 0.600 Limited to weir flow at low heads
#4	Secondary	98.00'	67.0' long x 2.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Primary OutFlow Max=0.38 cfs @ 14.32 hrs HW=96.05' (Free Discharge)

↑**1=Restriction Orifice** (Passes 0.38 cfs of 0.46 cfs potential flow)

↑**2=6" HDPE Underdrain** (Outlet Controls 0.38 cfs @ 1.93 fps)

↑**3=Perforations** (Passes 0.38 cfs of 7.11 cfs potential flow)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=94.50' (Free Discharge)

↑**4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 4P: PP (w/ underdrain) w/ UG storage 1 - Chamber Wizard Field A

Chamber Model = ADS_StormTech SC-740 +Cap (ADS StormTech® SC-740 with cap length)

Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf

Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap

51.0" Wide + 6.0" Spacing = 57.0" C-C Row Spacing

30 Chambers/Row x 7.12' Long +0.81' Cap Length x 2 = 215.22' Row Length +12.0" End Stone x 2 = 217.22' Base Length

14 Rows x 51.0" Wide + 6.0" Spacing x 13 + 12.0" Side Stone x 2 = 68.00' Base Width

6.0" Stone Base + 30.0" Chamber Height + 6.0" Stone Cover = 3.50' Field Height

420 Chambers x 45.9 cf = 19,294.8 cf Chamber Storage

51,697.6 cf Field - 19,294.8 cf Chambers = 32,402.8 cf Stone x 40.0% Voids = 12,961.1 cf Stone Storage

Chamber Storage + Stone Storage = 32,255.9 cf = 0.740 af

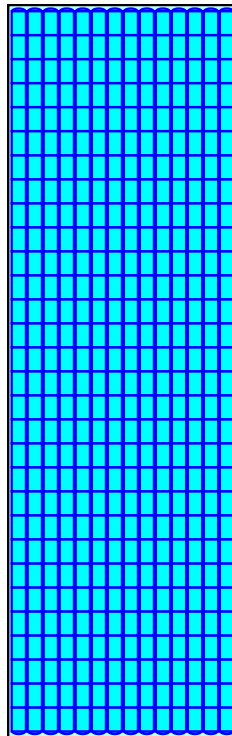
Overall Storage Efficiency = 62.4%

Overall System Size = 217.22' x 68.00' x 3.50'

420 Chambers

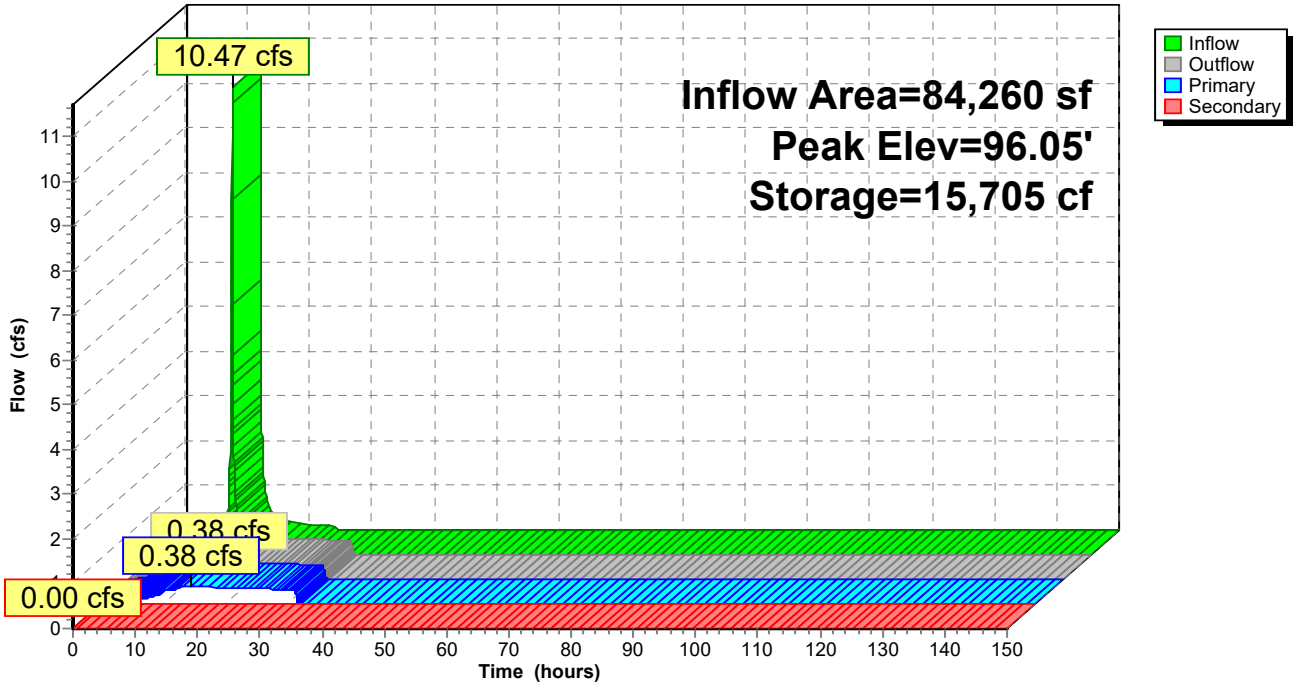
1,914.7 cy Field

1,200.1 cy Stone



Pond 4P: PP (w/ underdrain) w/ UG storage 1

Hydrograph



Summary for Pond 5P: PP (w/ underdrain) w/ UG storage 2

[44] Hint: Outlet device #3 is below defined storage

Inflow Area = 52,282 sf, 79.56% Impervious, Inflow Depth = 4.50" for 10-Year _Current event
 Inflow = 6.81 cfs @ 12.09 hrs, Volume= 19,601 cf
 Outflow = 0.21 cfs @ 14.65 hrs, Volume= 19,601 cf, Atten= 97%, Lag= 153.3 min
 Primary = 0.21 cfs @ 14.65 hrs, Volume= 19,601 cf
 Routed to Pond 8P : Existing Basin 1
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
 Routed to Pond 8P : Existing Basin 1

Routing by Stor-Ind method, Time Span= 0.00-150.00 hrs, dt= 0.02 hrs
 Peak Elev= 96.03' @ 14.65 hrs Surf.Area= 10,213 sf Storage= 10,665 cf

Plug-Flow detention time= 474.1 min calculated for 19,601 cf (100% of inflow)
 Center-of-Mass det. time= 474.0 min (1,229.5 - 755.5)

Volume	Invert	Avail.Storage	Storage Description
#1	97.00'	2,510 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
#2A	94.50'	9,005 cf	77.50'W x 131.78'L x 3.50'H Field A 35,744 cf Overall - 13,231 cf Embedded = 22,514 cf x 40.0% Voids
#3A	95.00'	13,231 cf	ADS_StormTech SC-740 +Cap x 288 Inside #2 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 288 Chambers in 16 Rows
		24,746 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
97.00	4,700	0.0	0	0
97.67	4,700	35.0	1,102	1,102
97.83	4,700	15.0	113	1,215
98.00	4,700	15.0	120	1,335
98.25	4,700	100.0	1,175	2,510

Device	Routing	Invert	Outlet Devices
#1	Primary	92.07'	2.0" Vert. Restriction Orifice C= 0.600 Limited to weir flow at low heads
#2	Device 1	92.17'	6.0" Round 6" HDPE Underdrain L= 359.0' Ke= 0.500 Inlet / Outlet Invert= 92.17' / 90.37' S= 0.0050 ' S= 0.0050 ' Cc= 0.900 n= 0.020 Corrugated PE, corrugated interior, Flow Area= 0.20 sf
#3	Device 2	92.17'	0.9" x 0.1" Horiz. Perforations X 400.00 columns X 3 rows C= 0.600 Limited to weir flow at low heads
#4	Secondary	98.00'	132.0' long x 2.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Primary OutFlow Max=0.21 cfs @ 14.65 hrs HW=96.03' (Free Discharge)

↑1=**Restriction Orifice** (Orifice Controls 0.21 cfs @ 9.48 fps)

↑2=**6" HDPE Underdrain** (Passes 0.21 cfs of 0.38 cfs potential flow)

↑3=**Perforations** (Passes 0.21 cfs of 7.09 cfs potential flow)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=94.50' (Free Discharge)

↑4=**Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 5P: PP (w/ underdrain) w/ UG storage 2 - Chamber Wizard Field A

Chamber Model = ADS_StormTech SC-740 +Cap (ADS StormTech® SC-740 with cap length)

Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf

Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap

51.0" Wide + 6.0" Spacing = 57.0" C-C Row Spacing

18 Chambers/Row x 7.12' Long +0.81' Cap Length x 2 = 129.78' Row Length +12.0" End Stone x 2 =

131.78' Base Length

16 Rows x 51.0" Wide + 6.0" Spacing x 15 + 12.0" Side Stone x 2 = 77.50' Base Width

6.0" Stone Base + 30.0" Chamber Height + 6.0" Stone Cover = 3.50' Field Height

288 Chambers x 45.9 cf = 13,230.7 cf Chamber Storage

35,744.4 cf Field - 13,230.7 cf Chambers = 22,513.7 cf Stone x 40.0% Voids = 9,005.5 cf Stone Storage

Chamber Storage + Stone Storage = 22,236.2 cf = 0.510 af

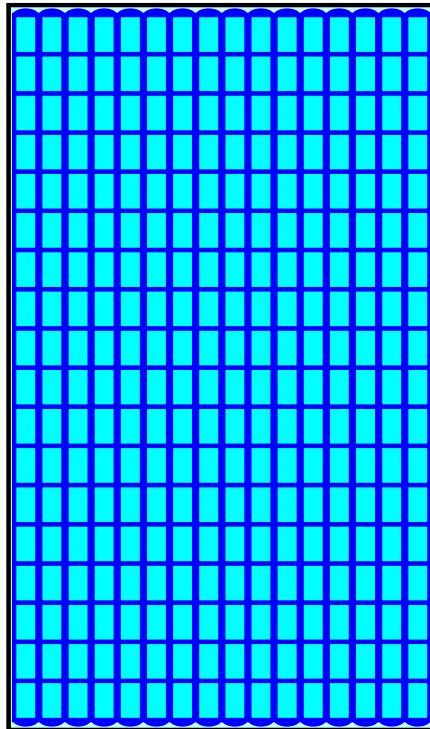
Overall Storage Efficiency = 62.2%

Overall System Size = 131.78' x 77.50' x 3.50'

288 Chambers

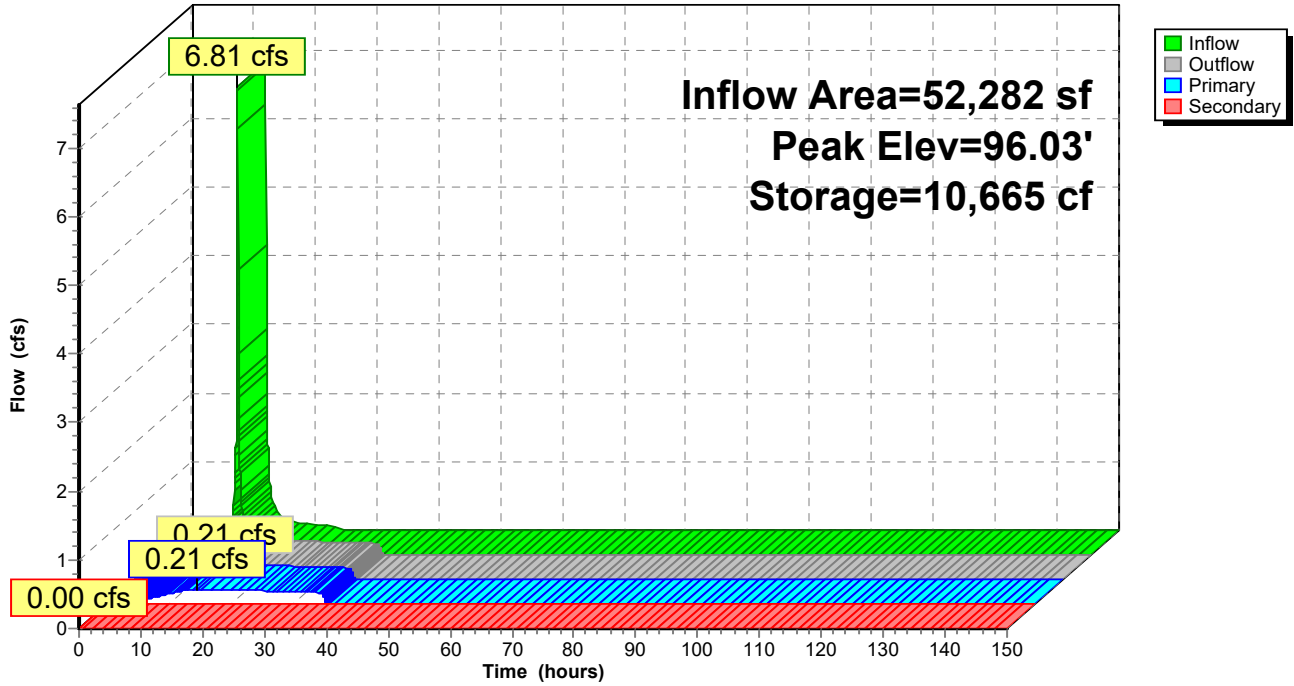
1,323.9 cy Field

833.8 cy Stone



Pond 5P: PP (w/ underdrain) w/ UG storage 2

Hydrograph



Summary for Pond 6P: PP (w/ underdrain) w/ UG storage 3

[44] Hint: Outlet device #3 is below defined storage

Inflow Area = 76,785 sf, 82.96% Impervious, Inflow Depth = 4.58" for 10-Year _Current event
 Inflow = 9.95 cfs @ 12.10 hrs, Volume= 29,338 cf
 Outflow = 0.21 cfs @ 16.27 hrs, Volume= 29,338 cf, Atten= 98%, Lag= 250.2 min
 Primary = 0.21 cfs @ 16.27 hrs, Volume= 29,338 cf
 Routed to Pond 8P : Existing Basin 1
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
 Routed to Pond 8P : Existing Basin 1

Routing by Stor-Ind method, Time Span= 0.00-150.00 hrs, dt= 0.02 hrs
 Peak Elev= 96.06' @ 16.27 hrs Surf.Area= 16,925 sf Storage= 18,114 cf

Plug-Flow detention time= 815.1 min calculated for 29,338 cf (100% of inflow)
 Center-of-Mass det. time= 815.1 min (1,569.3 - 754.2)

Volume	Invert	Avail.Storage	Storage Description
#1	97.00'	2,054 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
#2A	94.50'	14,875 cf	144.00'W x 117.54'L x 3.50'H Field A 59,238 cf Overall - 22,051 cf Embedded = 37,187 cf x 40.0% Voids
#3A	95.00'	22,051 cf	ADS_StormTech SC-740 +Cap x 480 Inside #2 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 480 Chambers in 30 Rows
		38,980 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
97.00	3,240	0.0	0	0
97.67	3,240	35.0	760	760
97.83	3,240	15.0	78	838
98.00	3,240	15.0	83	920
98.35	3,240	100.0	1,134	2,054

Device	Routing	Invert	Outlet Devices
#1	Primary	92.07'	2.0" Vert. Restriction Orifice C= 0.600 Limited to weir flow at low heads
#2	Device 1	92.17'	6.0" Round 6" HDPE Underdrain L= 359.0' Ke= 0.500 Inlet / Outlet Invert= 92.17' / 90.37' S= 0.0050 ' S= 0.0050 ' Cc= 0.900 n= 0.020 Corrugated PE, corrugated interior, Flow Area= 0.20 sf
#3	Device 2	92.17'	0.9" x 0.1" Horiz. Perforations X 400.00 columns X 3 rows C= 0.600 Limited to weir flow at low heads
#4	Secondary	98.00'	19.0' long x 2.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Primary OutFlow Max=0.21 cfs @ 16.27 hrs HW=96.06' (Free Discharge)

↑1=**Restriction Orifice** (Orifice Controls 0.21 cfs @ 9.52 fps)

↑2=**6" HDPE Underdrain** (Passes 0.21 cfs of 0.38 cfs potential flow)

↑3=**Perforations** (Passes 0.21 cfs of 7.12 cfs potential flow)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=94.50' (Free Discharge)

↑4=**Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 6P: PP (w/ underdrain) w/ UG storage 3 - Chamber Wizard Field A

Chamber Model = ADS_StormTech SC-740 +Cap (ADS StormTech® SC-740 with cap length)

Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf

Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap

51.0" Wide + 6.0" Spacing = 57.0" C-C Row Spacing

16 Chambers/Row x 7.12' Long +0.81' Cap Length x 2 = 115.54' Row Length +12.0" End Stone x 2 = 117.54' Base Length

30 Rows x 51.0" Wide + 6.0" Spacing x 29 + 12.0" Side Stone x 2 = 144.00' Base Width

6.0" Stone Base + 30.0" Chamber Height + 6.0" Stone Cover = 3.50' Field Height

480 Chambers x 45.9 cf = 22,051.2 cf Chamber Storage

59,238.5 cf Field - 22,051.2 cf Chambers = 37,187.3 cf Stone x 40.0% Voids = 14,874.9 cf Stone Storage

Chamber Storage + Stone Storage = 36,926.1 cf = 0.848 af

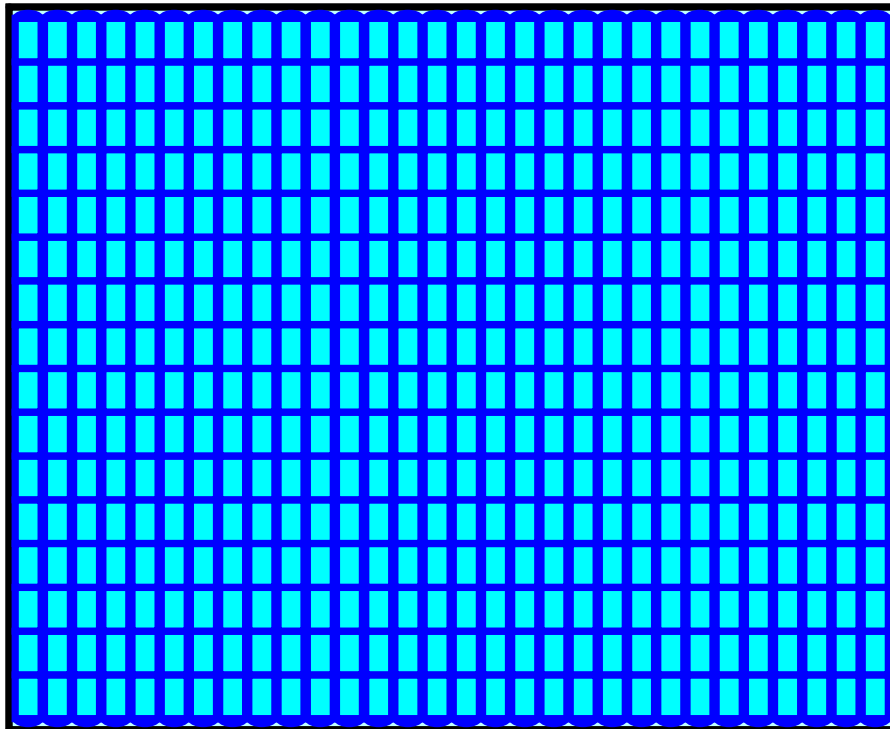
Overall Storage Efficiency = 62.3%

Overall System Size = 117.54' x 144.00' x 3.50'

480 Chambers

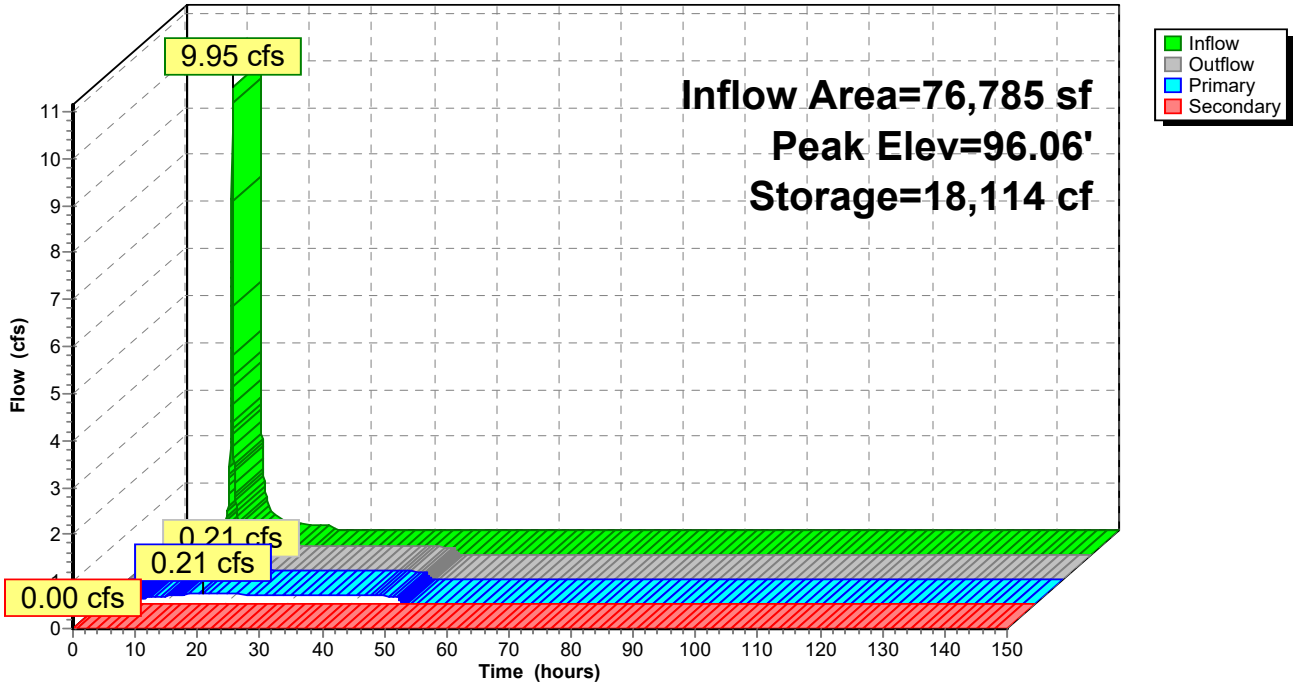
2,194.0 cy Field

1,377.3 cy Stone



Pond 6P: PP (w/ underdrain) w/ UG storage 3

Hydrograph



Summary for Pond 7P: PP (w/ underdrain) w/ UG storage 4

[44] Hint: Outlet device #3 is below defined storage

Inflow Area = 120,233 sf, 94.05% Impervious, Inflow Depth = 4.80" for 10-Year _Current event
 Inflow = 15.96 cfs @ 12.10 hrs, Volume= 48,087 cf
 Outflow = 0.38 cfs @ 15.42 hrs, Volume= 48,087 cf, Atten= 98%, Lag= 199.2 min
 Primary = 0.38 cfs @ 15.42 hrs, Volume= 48,087 cf
 Routed to Pond 8P : Existing Basin 1
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
 Routed to Pond 8P : Existing Basin 1

Routing by Stor-Ind method, Time Span= 0.00-150.00 hrs, dt= 0.02 hrs
 Peak Elev= 96.08' @ 15.42 hrs Surf.Area= 26,122 sf Storage= 28,512 cf

Plug-Flow detention time= 690.9 min calculated for 48,081 cf (100% of inflow)
 Center-of-Mass det. time= 691.0 min (1,439.8 - 748.8)

Volume	Invert	Avail.Storage	Storage Description
#1	97.00'	2,980 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
#2A	94.50'	22,825 cf	163.00'W x 160.26'L x 3.50'H Field A 91,426 cf Overall - 34,363 cf Embedded = 57,063 cf x 40.0% Voids
#3A	95.00'	34,363 cf	ADS_StormTech SC-740 +Cap x 748 Inside #2 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 748 Chambers in 34 Rows
		60,168 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
97.00	4,700	0.0	0	0
97.67	4,700	35.0	1,102	1,102
97.83	4,700	15.0	113	1,215
98.00	4,700	15.0	120	1,335
98.35	4,700	100.0	1,645	2,980

Device	Routing	Invert	Outlet Devices
#1	Primary	92.07'	3.0" Vert. Restriction Orifice C= 0.600 Limited to weir flow at low heads
#2	Device 1	92.17'	6.0" Round 6" HDPE Underdrain L= 359.0' Ke= 0.500 Inlet / Outlet Invert= 92.17' / 90.37' S= 0.0050 ' S= 0.0050 ' Cc= 0.900 n= 0.020 Corrugated PE, corrugated interior, Flow Area= 0.20 sf
#3	Device 2	92.17'	0.9" x 0.1" Horiz. Perforations X 400.00 columns X 3 rows C= 0.600 Limited to weir flow at low heads
#4	Secondary	98.00'	19.0' long x 2.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Primary OutFlow Max=0.38 cfs @ 15.42 hrs HW=96.08' (Free Discharge)

↑**1=Restriction Orifice** (Passes 0.38 cfs of 0.47 cfs potential flow)

↑**2=6" HDPE Underdrain** (Outlet Controls 0.38 cfs @ 1.94 fps)

↑**3=Perforations** (Passes 0.38 cfs of 7.14 cfs potential flow)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=94.50' (Free Discharge)

↑**4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 7P: PP (w/ underdrain) w/ UG storage 4 - Chamber Wizard Field A

Chamber Model = ADS_StormTech SC-740 +Cap (ADS StormTech® SC-740 with cap length)

Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf

Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap

51.0" Wide + 6.0" Spacing = 57.0" C-C Row Spacing

22 Chambers/Row x 7.12' Long +0.81' Cap Length x 2 = 158.26' Row Length +12.0" End Stone x 2 = 160.26' Base Length

34 Rows x 51.0" Wide + 6.0" Spacing x 33 + 12.0" Side Stone x 2 = 163.00' Base Width

6.0" Stone Base + 30.0" Chamber Height + 6.0" Stone Cover = 3.50' Field Height

748 Chambers x 45.9 cf = 34,363.1 cf Chamber Storage

91,426.4 cf Field - 34,363.1 cf Chambers = 57,063.3 cf Stone x 40.0% Voids = 22,825.3 cf Stone Storage

Chamber Storage + Stone Storage = 57,188.5 cf = 1.313 af

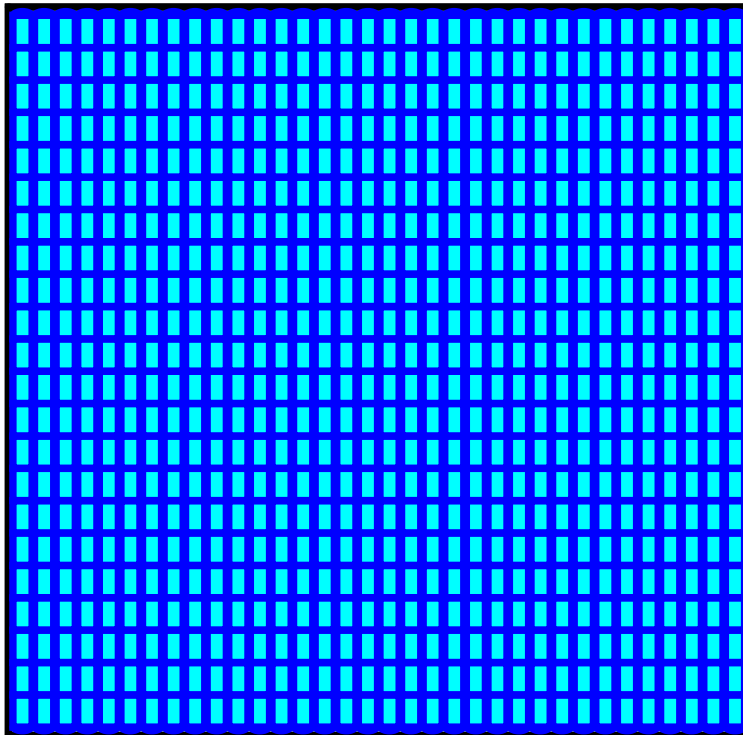
Overall Storage Efficiency = 62.6%

Overall System Size = 160.26' x 163.00' x 3.50'

748 Chambers

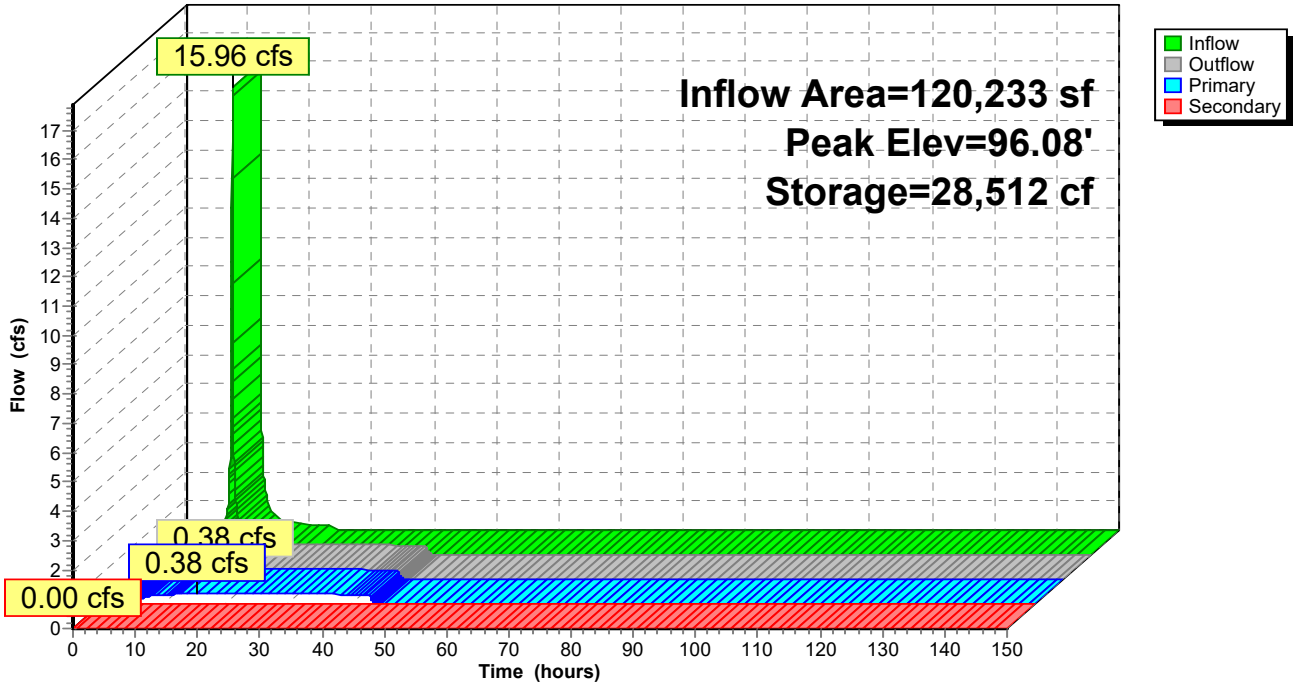
3,386.2 cy Field

2,113.5 cy Stone



Pond 7P: PP (w/ underdrain) w/ UG storage 4

Hydrograph



Summary for Pond 8P: Existing Basin 1

Inflow Area = 444,913 sf, 80.94% Impervious, Inflow Depth = 4.49" for 10-Year _Current event
 Inflow = 14.99 cfs @ 12.09 hrs, Volume= 166,636 cf
 Outflow = 8.92 cfs @ 12.14 hrs, Volume= 166,636 cf, Atten= 40%, Lag= 2.9 min
 Primary = 8.92 cfs @ 12.14 hrs, Volume= 166,636 cf
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
 Routed to nonexistent node 67L
 Tertiary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
 Routed to nonexistent node 67L

Routing by Stor-Ind method, Time Span= 0.00-150.00 hrs, dt= 0.02 hrs / 2
 Peak Elev= 59.35' @ 12.14 hrs Surf.Area= 8,958 sf Storage= 7,049 cf

Plug-Flow detention time= 16.8 min calculated for 166,613 cf (100% of inflow)
 Center-of-Mass det. time= 16.9 min (1,239.8 - 1,222.9)

Volume	Invert	Avail.Storage	Storage Description
#1	58.00'	33,881 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
58.00	1,339	0	0
59.00	7,134	4,237	4,237
60.00	12,352	9,743	13,980
61.00	18,300	15,326	29,306
61.25	18,300	4,575	33,881

Device	Routing	Invert	Outlet Devices
#1	Primary	58.00'	24.0" Vert. Low Flow Orifice C= 0.600 Limited to weir flow at low heads
#2	Secondary	60.00'	24.0" W x 18.0" H Vert. 2-YR Orifice C= 0.600 Limited to weir flow at low heads
#3	Tertiary	60.75'	48.0" x 48.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#4	Tertiary	61.00'	100.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)

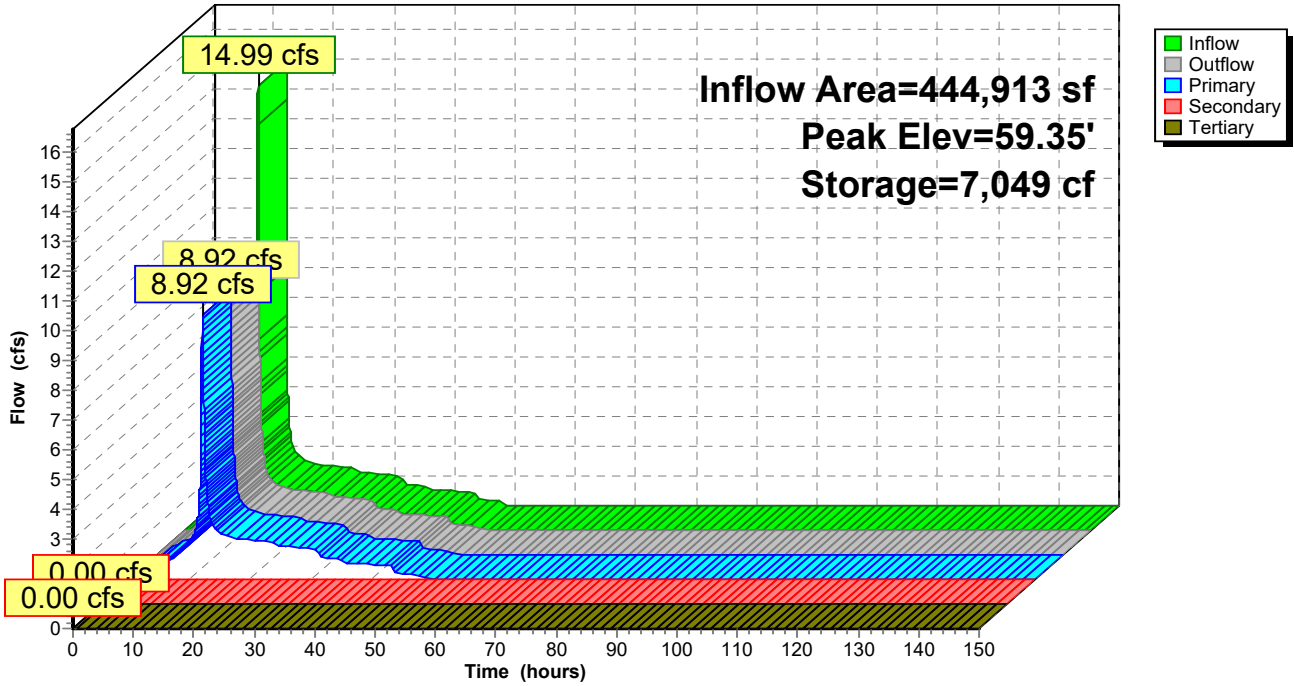
Primary OutFlow Max=8.92 cfs @ 12.14 hrs HW=59.35' (Free Discharge)
 ↳1=Low Flow Orifice (Orifice Controls 8.92 cfs @ 3.95 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=58.00' (Free Discharge)
 ↳2=2-YR Orifice (Controls 0.00 cfs)

Tertiary OutFlow Max=0.00 cfs @ 0.00 hrs HW=58.00' (Free Discharge)
 ↳3=Orifice/Grate (Controls 0.00 cfs)
 ↳4=Sharp-Crested Rectangular Weir (Controls 0.00 cfs)

Pond 8P: Existing Basin 1

Hydrograph



Summary for Pond 9P: Existing Basin 2

<https://hydro.rutgers.edu/view-project/100596/>

Inflow Area = 59,019 sf, 68.70% Impervious, Inflow Depth = 4.27" for 10-Year _Current event
 Inflow = 7.35 cfs @ 12.10 hrs, Volume= 21,018 cf
 Outflow = 1.87 cfs @ 12.31 hrs, Volume= 21,018 cf, Atten= 75%, Lag= 12.9 min
 Primary = 0.38 cfs @ 12.31 hrs, Volume= 14,690 cf
 Secondary = 1.49 cfs @ 12.31 hrs, Volume= 6,327 cf
 Tertiary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.00-150.00 hrs, dt= 0.02 hrs / 2
 Peak Elev= 67.32' @ 12.31 hrs Surf.Area= 4,697 sf Storage= 7,418 cf

Plug-Flow detention time= 94.6 min calculated for 21,018 cf (100% of inflow)
 Center-of-Mass det. time= 94.5 min (856.7 - 762.2)

Volume	Invert	Avail.Storage	Storage Description
#1	64.60'	13,401 cf	Custom Stage Data (Prismatic) Listed below
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
64.60	0	0	0
65.00	647	129	129
66.00	2,768	1,708	1,837
68.00	5,693	8,461	10,298
68.50	6,718	3,103	13,401

Device	Routing	Invert	Outlet Devices
#1	Primary	64.60'	3.0" Vert. 3" Orifice C= 0.600 Limited to weir flow at low heads
#2	Secondary	66.40'	0.7' long 8" Sharp-Crested Rectangular Weir 2 End Contraction(s)
#3	Tertiary	67.75'	48.0" x 48.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads

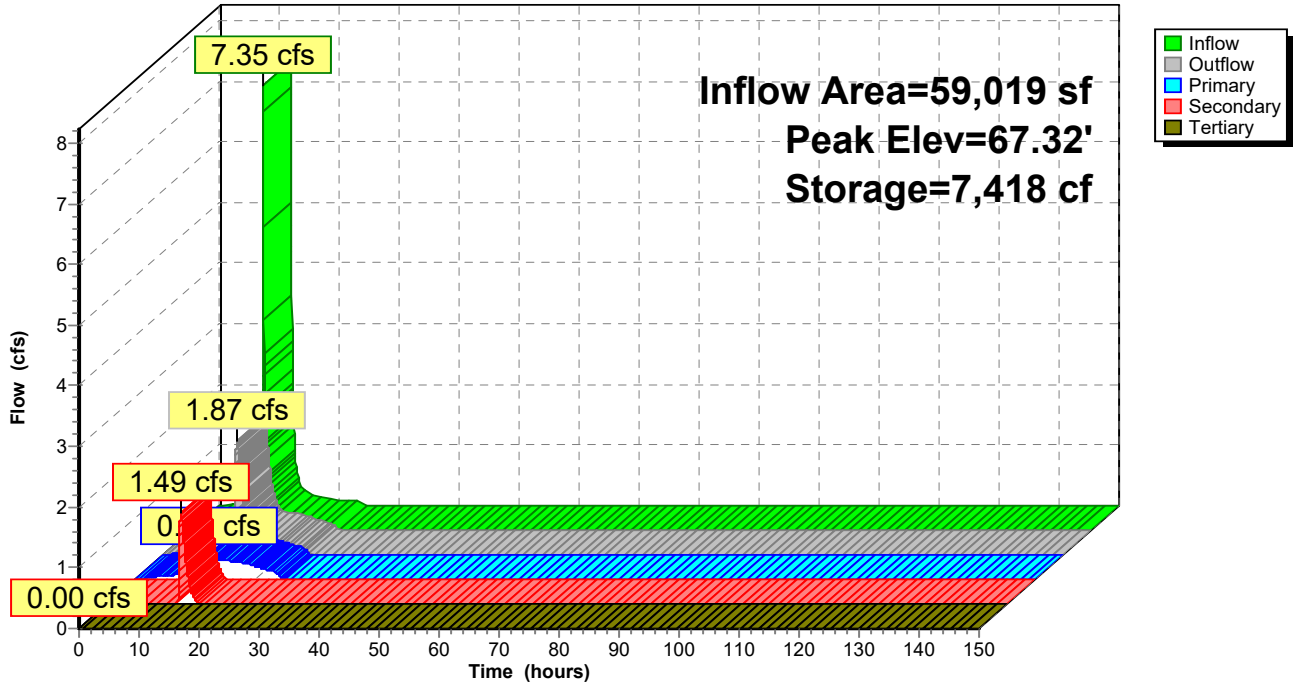
Primary OutFlow Max=0.38 cfs @ 12.31 hrs HW=67.32' (Free Discharge)
 ↑1=3" Orifice (Orifice Controls 0.38 cfs @ 7.75 fps)

Secondary OutFlow Max=1.49 cfs @ 12.31 hrs HW=67.32' (Free Discharge)
 ↑2=8" Sharp-Crested Rectangular Weir (Weir Controls 1.49 cfs @ 3.13 fps)

Tertiary OutFlow Max=0.00 cfs @ 0.00 hrs HW=64.60' (Free Discharge)
 ↑3=Orifice/Grate (Controls 0.00 cfs)

Pond 9P: Existing Basin 2

Hydrograph



Summary for Pond 10P: PP (w/ underdrain) w/ UG storage 5

[44] Hint: Outlet device #3 is below defined storage

Inflow Area = 48,527 sf, 85.53% Impervious, Inflow Depth = 4.57" for 10-Year _Current event
 Inflow = 5.80 cfs @ 12.13 hrs, Volume= 18,486 cf
 Outflow = 0.40 cfs @ 13.28 hrs, Volume= 18,486 cf, Atten= 93%, Lag= 69.0 min
 Primary = 0.40 cfs @ 13.28 hrs, Volume= 18,486 cf
 Routed to Pond 13P : Bioretention Basin 4
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
 Routed to Pond 13P : Bioretention Basin 4

Routing by Stor-Ind method, Time Span= 0.00-150.00 hrs, dt= 0.02 hrs
 Peak Elev= 96.42' @ 13.28 hrs Surf.Area= 5,816 sf Storage= 7,718 cf

Plug-Flow detention time= 156.6 min calculated for 18,483 cf (100% of inflow)
 Center-of-Mass det. time= 156.6 min (911.9 - 755.3)

Volume	Invert	Avail.Storage	Storage Description
#1	97.00'	3,687 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
#2A	94.50'	5,184 cf	34.75'W x 167.38'L x 3.50'H Field A 20,357 cf Overall - 7,396 cf Embedded = 12,961 cf x 40.0% Voids
#3A	95.00'	7,396 cf	ADS_StormTech SC-740 +Cap x 161 Inside #2 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 161 Chambers in 7 Rows
		16,268 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
97.00	5,816	0.0	0	0
97.67	5,816	35.0	1,364	1,364
97.83	5,816	15.0	140	1,503
98.00	5,816	15.0	148	1,652
98.35	5,816	100.0	2,036	3,687

Device	Routing	Invert	Outlet Devices
#1	Primary	92.07'	3.0" Vert. Restriction Orifice C= 0.600 Limited to weir flow at low heads
#2	Device 1	92.17'	6.0" Round 6" HDPE Underdrain L= 359.0' Ke= 0.500 Inlet / Outlet Invert= 92.17' / 90.37' S= 0.0050 ' S= 0.0050 ' Cc= 0.900 n= 0.020 Corrugated PE, corrugated interior, Flow Area= 0.20 sf
#3	Device 2	92.17'	0.9" x 0.1" Horiz. Perforations X 400.00 columns X 3 rows C= 0.600 Limited to weir flow at low heads
#4	Secondary	98.00'	168.0' long x 2.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Primary OutFlow Max=0.40 cfs @ 13.28 hrs HW=96.42' (Free Discharge)

↑**1=Restriction Orifice** (Passes 0.40 cfs of 0.49 cfs potential flow)

↑**2=6" HDPE Underdrain** (Outlet Controls 0.40 cfs @ 2.02 fps)

↑**3=Perforations** (Passes 0.40 cfs of 7.44 cfs potential flow)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=94.50' (Free Discharge)

↑**4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 10P: PP (w/ underdrain) w/ UG storage 5 - Chamber Wizard Field A

Chamber Model = ADS_StormTech SC-740 +Cap (ADS StormTech® SC-740 with cap length)

Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf

Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap

51.0" Wide + 6.0" Spacing = 57.0" C-C Row Spacing

23 Chambers/Row x 7.12' Long +0.81' Cap Length x 2 = 165.38' Row Length +12.0" End Stone x 2 = 167.38' Base Length

7 Rows x 51.0" Wide + 6.0" Spacing x 6 + 12.0" Side Stone x 2 = 34.75' Base Width

6.0" Stone Base + 30.0" Chamber Height + 6.0" Stone Cover = 3.50' Field Height

161 Chambers x 45.9 cf = 7,396.3 cf Chamber Storage

20,357.2 cf Field - 7,396.3 cf Chambers = 12,960.8 cf Stone x 40.0% Voids = 5,184.3 cf Stone Storage

Chamber Storage + Stone Storage = 12,580.7 cf = 0.289 af

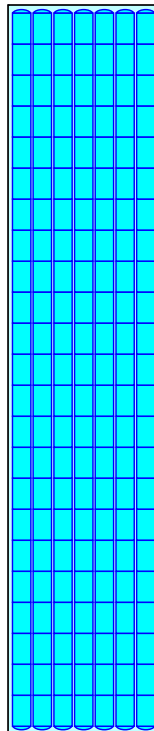
Overall Storage Efficiency = 61.8%

Overall System Size = 167.38' x 34.75' x 3.50'

161 Chambers

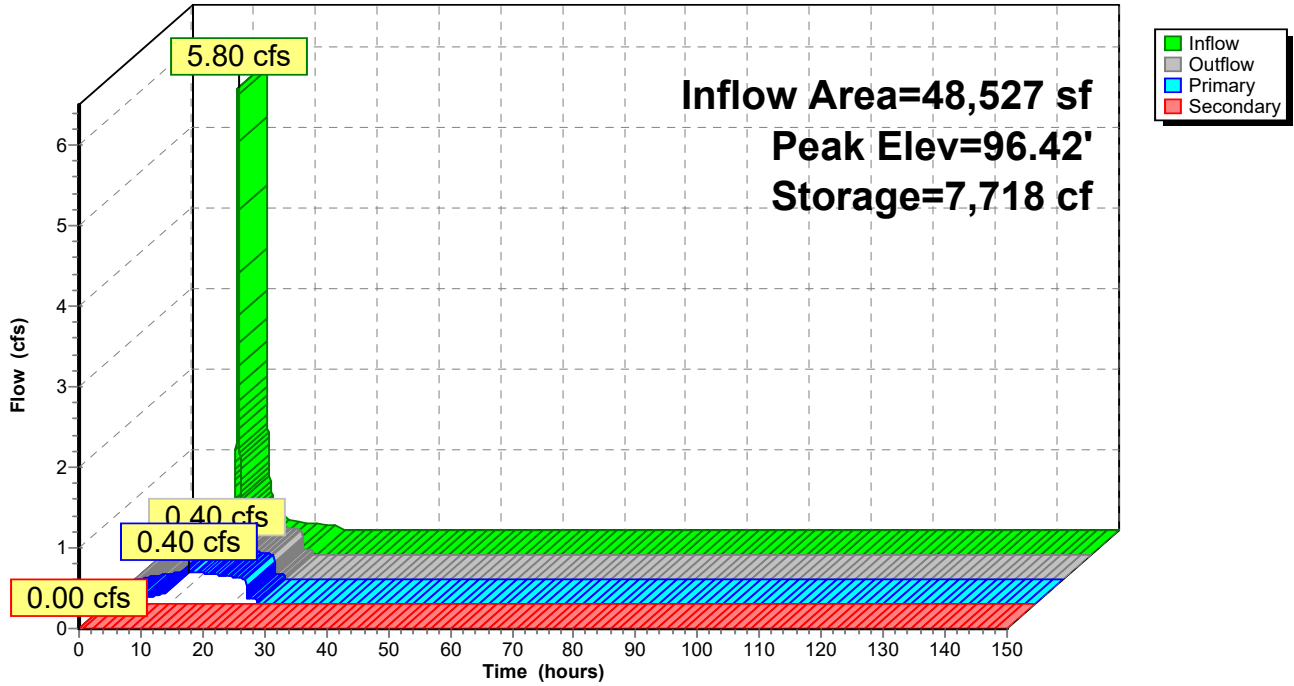
754.0 cy Field

480.0 cy Stone



Pond 10P: PP (w/ underdrain) w/ UG storage 5

Hydrograph



Summary for Pond 11P: PP (w/ underdrain) w/ UG storage 6

[44] Hint: Outlet device #3 is below defined storage

Inflow Area = 57,652 sf, 78.51% Impervious, Inflow Depth = 4.44" for 10-Year_Current event
 Inflow = 7.42 cfs @ 12.09 hrs, Volume= 21,323 cf
 Outflow = 0.38 cfs @ 13.44 hrs, Volume= 21,323 cf, Atten= 95%, Lag= 81.0 min
 Primary = 0.38 cfs @ 13.44 hrs, Volume= 21,323 cf
 Routed to Pond 13P : Bioretention Basin 4
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
 Routed to Pond 13P : Bioretention Basin 4

Routing by Stor-Ind method, Time Span= 0.00-150.00 hrs, dt= 0.02 hrs
 Peak Elev= 96.13' @ 13.44 hrs Surf.Area= 8,594 sf Storage= 9,585 cf

Plug-Flow detention time= 212.4 min calculated for 21,321 cf (100% of inflow)
 Center-of-Mass det. time= 212.4 min (968.6 - 756.2)

Volume	Invert	Avail.Storage	Storage Description
#1	97.00'	2,144 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
#2A	94.50'	7,621 cf	96.50'W x 89.06'L x 3.50'H Field A 30,079 cf Overall - 11,026 cf Embedded = 19,053 cf x 40.0% Voids
#3A	95.00'	11,026 cf	ADS_StormTech SC-740 +Cap x 240 Inside #2 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 240 Chambers in 20 Rows
		20,791 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
97.00	3,382	0.0	0	0
97.67	3,382	35.0	793	793
97.83	3,382	15.0	81	874
98.00	3,382	15.0	86	960
98.35	3,382	100.0	1,184	2,144

Device	Routing	Invert	Outlet Devices
#1	Primary	92.07'	3.0" Vert. Restriction Orifice C= 0.600 Limited to weir flow at low heads
#2	Device 1	92.17'	6.0" Round 6" HDPE Underdrain L= 359.0' Ke= 0.500 Inlet / Outlet Invert= 92.17' / 90.37' S= 0.0050 ' S= 0.0050 ' Cc= 0.900 n= 0.020 Corrugated PE, corrugated interior, Flow Area= 0.20 sf
#3	Device 2	92.17'	0.9" x 0.1" Horiz. Perforations X 400.00 columns X 3 rows C= 0.600 Limited to weir flow at low heads
#4	Secondary	98.00'	168.0' long x 2.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Primary OutFlow Max=0.38 cfs @ 13.44 hrs HW=96.13' (Free Discharge)

↑1=**Restriction Orifice** (Passes 0.38 cfs of 0.47 cfs potential flow)

↑2=**6" HDPE Underdrain** (Outlet Controls 0.38 cfs @ 1.95 fps)

↑3=**Perforations** (Passes 0.38 cfs of 7.18 cfs potential flow)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=94.50' (Free Discharge)

↑4=**Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 11P: PP (w/ underdrain) w/ UG storage 6 - Chamber Wizard Field A

Chamber Model = ADS_StormTech SC-740 +Cap (ADS StormTech® SC-740 with cap length)

Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf

Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap

51.0" Wide + 6.0" Spacing = 57.0" C-C Row Spacing

12 Chambers/Row x 7.12' Long +0.81' Cap Length x 2 = 87.06' Row Length +12.0" End Stone x 2 = 89.06' Base Length

20 Rows x 51.0" Wide + 6.0" Spacing x 19 + 12.0" Side Stone x 2 = 96.50' Base Width

6.0" Stone Base + 30.0" Chamber Height + 6.0" Stone Cover = 3.50' Field Height

240 Chambers x 45.9 cf = 11,025.6 cf Chamber Storage

30,078.9 cf Field - 11,025.6 cf Chambers = 19,053.3 cf Stone x 40.0% Voids = 7,621.3 cf Stone Storage

Chamber Storage + Stone Storage = 18,646.9 cf = 0.428 af

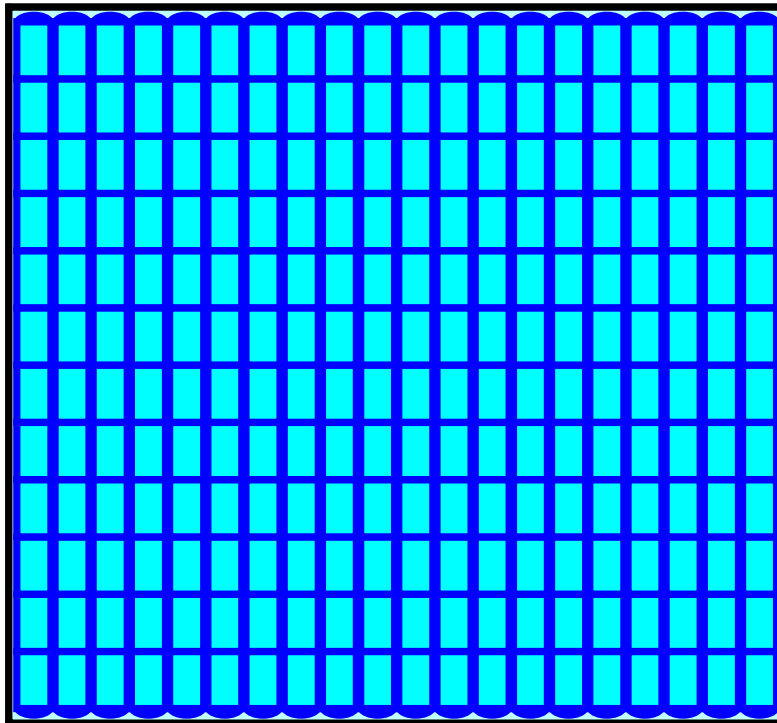
Overall Storage Efficiency = 62.0%

Overall System Size = 89.06' x 96.50' x 3.50'

240 Chambers

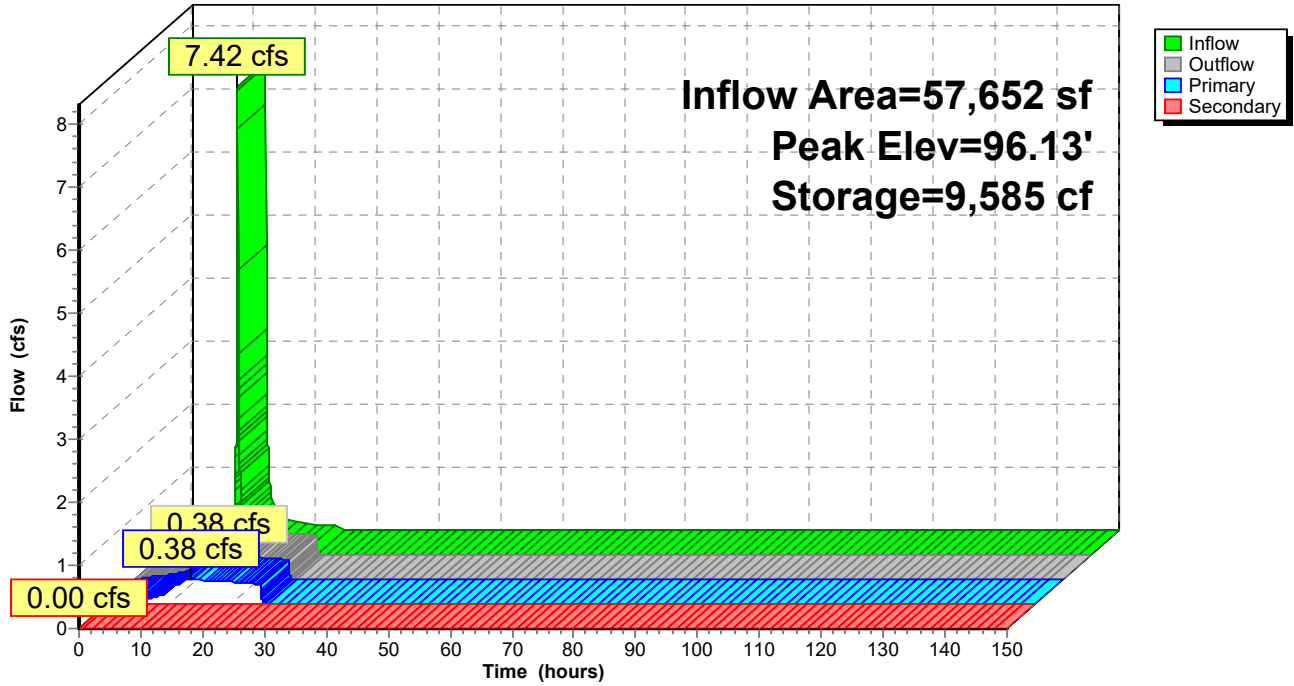
1,114.0 cy Field

705.7 cy Stone



Pond 11P: PP (w/ underdrain) w/ UG storage 6

Hydrograph



Summary for Pond 12P: PP (w/ underdrain) w/ UG storage 7

[44] Hint: Outlet device #3 is below defined storage

Inflow Area = 67,756 sf, 72.56% Impervious, Inflow Depth = 4.33" for 10-Year _Current event
 Inflow = 8.47 cfs @ 12.10 hrs, Volume= 24,442 cf
 Outflow = 0.38 cfs @ 13.65 hrs, Volume= 24,442 cf, Atten= 96%, Lag= 93.3 min
 Primary = 0.38 cfs @ 13.65 hrs, Volume= 24,442 cf
 Routed to Pond 13P : Bioretention Basin 4
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
 Routed to Pond 13P : Bioretention Basin 4

Routing by Stor-Ind method, Time Span= 0.00-150.00 hrs, dt= 0.02 hrs
 Peak Elev= 96.01' @ 13.65 hrs Surf.Area= 11,316 sf Storage= 11,654 cf

Plug-Flow detention time= 273.0 min calculated for 24,438 cf (100% of inflow)
 Center-of-Mass det. time= 273.0 min (1,033.0 - 760.0)

Volume	Invert	Avail.Storage	Storage Description
#1	97.00'	935 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
#2A	94.50'	9,962 cf	77.50'W x 146.02'L x 3.50'H Field A 39,607 cf Overall - 14,701 cf Embedded = 24,906 cf x 40.0% Voids
#3A	95.00'	14,701 cf	ADS_StormTech SC-740 +Cap x 320 Inside #2 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 320 Chambers in 16 Rows
		25,598 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
97.00	1,474	0.0	0	0
97.67	1,474	35.0	346	346
97.83	1,474	15.0	35	381
98.00	1,474	15.0	38	419
98.35	1,474	100.0	516	935

Device	Routing	Invert	Outlet Devices
#1	Primary	92.07'	3.0" Vert. Restriction Orifice C= 0.600 Limited to weir flow at low heads
#2	Device 1	92.17'	6.0" Round 6" HDPE Underdrain L= 359.0' Ke= 0.500 Inlet / Outlet Invert= 92.17' / 90.37' S= 0.0050 ' S= 0.0050 ' Cc= 0.900 n= 0.020 Corrugated PE, corrugated interior, Flow Area= 0.20 sf
#3	Device 2	92.17'	0.9" x 0.1" Horiz. Perforations X 400.00 columns X 3 rows C= 0.600 Limited to weir flow at low heads
#4	Secondary	98.00'	168.0' long x 2.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Primary OutFlow Max=0.38 cfs @ 13.65 hrs HW=96.01' (Free Discharge)

↑**1=Restriction Orifice** (Passes 0.38 cfs of 0.46 cfs potential flow)

↑**2=6" HDPE Underdrain** (Outlet Controls 0.38 cfs @ 1.92 fps)

↑**3=Perforations** (Passes 0.38 cfs of 7.08 cfs potential flow)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=94.50' (Free Discharge)

↑**4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 12P: PP (w/ underdrain) w/ UG storage 7 - Chamber Wizard Field A

Chamber Model = ADS_StormTech SC-740 +Cap (ADS StormTech® SC-740 with cap length)

Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf

Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap

51.0" Wide + 6.0" Spacing = 57.0" C-C Row Spacing

20 Chambers/Row x 7.12' Long +0.81' Cap Length x 2 = 144.02' Row Length +12.0" End Stone x 2 = 146.02' Base Length

16 Rows x 51.0" Wide + 6.0" Spacing x 15 + 12.0" Side Stone x 2 = 77.50' Base Width

6.0" Stone Base + 30.0" Chamber Height + 6.0" Stone Cover = 3.50' Field Height

320 Chambers x 45.9 cf = 14,700.8 cf Chamber Storage

39,607.0 cf Field - 14,700.8 cf Chambers = 24,906.2 cf Stone x 40.0% Voids = 9,962.5 cf Stone Storage

Chamber Storage + Stone Storage = 24,663.3 cf = 0.566 af

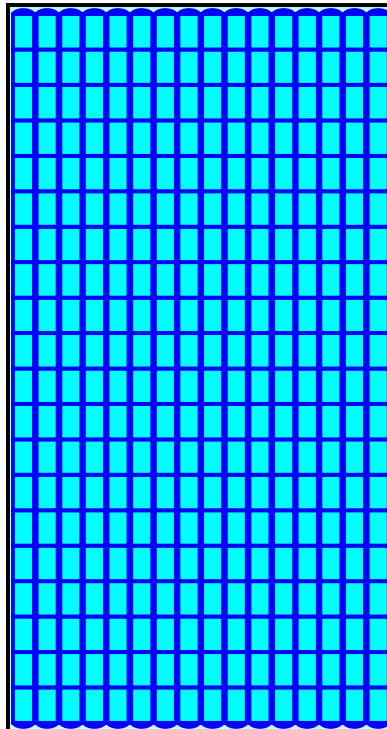
Overall Storage Efficiency = 62.3%

Overall System Size = 146.02' x 77.50' x 3.50'

320 Chambers

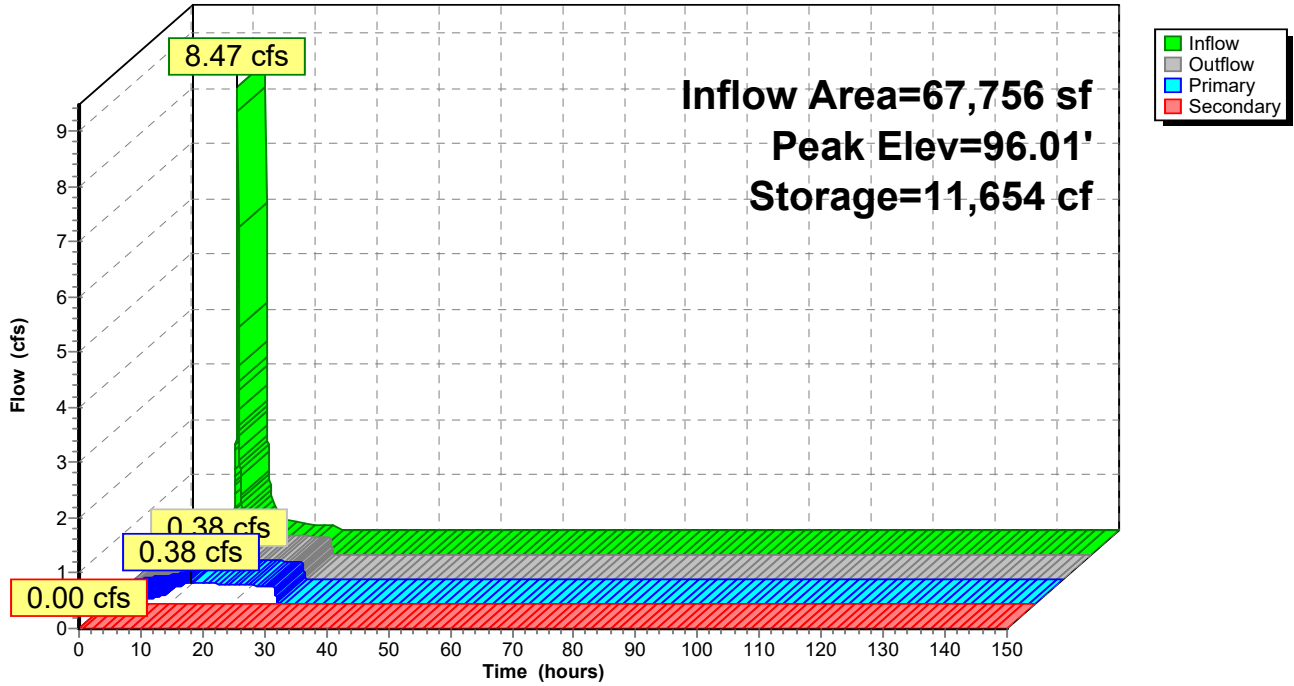
1,466.9 cy Field

922.5 cy Stone



Pond 12P: PP (w/ underdrain) w/ UG storage 7

Hydrograph



Summary for Pond 13P: Bioretention Basin 4

Inflow Area = 329,976 sf, 48.67% Impervious, Inflow Depth = 3.70" for 10-Year _Current event
 Inflow = 8.71 cfs @ 12.36 hrs, Volume= 101,655 cf
 Outflow = 5.95 cfs @ 12.61 hrs, Volume= 100,393 cf, Atten= 32%, Lag= 15.1 min
 Primary = 0.38 cfs @ 12.61 hrs, Volume= 34,773 cf
 Routed to nonexistent node 5R
 Secondary = 5.57 cfs @ 12.61 hrs, Volume= 65,619 cf
 Routed to nonexistent node 5R
 Tertiary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
 Routed to nonexistent node 5R

Routing by Stor-Ind method, Time Span= 0.00-150.00 hrs, dt= 0.02 hrs / 2
 Peak Elev= 51.91' @ 12.61 hrs Surf.Area= 10,308 sf Storage= 21,981 cf

Plug-Flow detention time= 232.7 min calculated for 100,379 cf (99% of inflow)
 Center-of-Mass det. time= 224.9 min (1,148.3 - 923.5)

Volume	Invert	Avail.Storage	Storage Description
#1	49.00'	33,395 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
49.00	4,800	0	0
52.00	10,478	22,917	22,917
53.00	10,478	10,478	33,395

Device	Routing	Invert	Outlet Devices
#1	Primary	49.25'	3.0" Vert. Low Flow Orifice C= 0.600 Limited to weir flow at low heads
#2	Secondary	51.00'	24.0" W x 18.0" H Vert. SECONDARY OUTLET C= 0.600 Limited to weir flow at low heads
#3	Tertiary	52.00'	60.0" x 60.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads

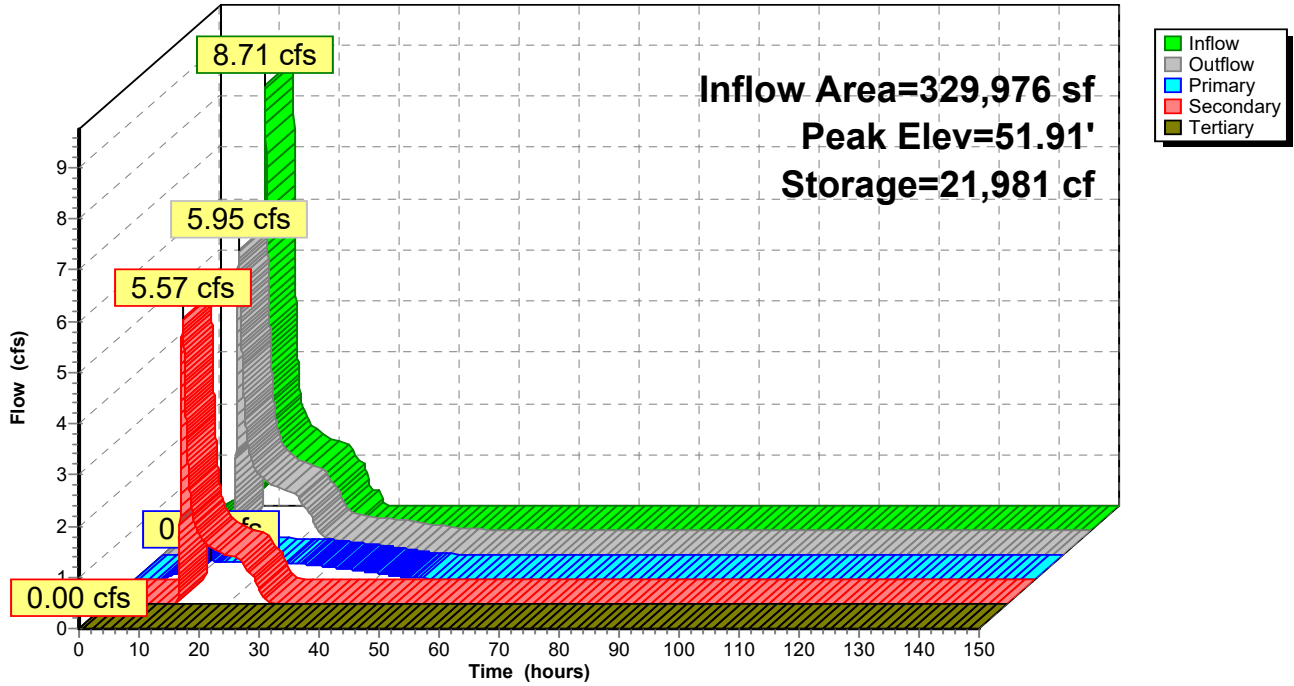
Primary OutFlow Max=0.38 cfs @ 12.61 hrs HW=51.91' (Free Discharge)
 ↑1=Low Flow Orifice (Orifice Controls 0.38 cfs @ 7.67 fps)

Secondary OutFlow Max=5.57 cfs @ 12.61 hrs HW=51.91' (Free Discharge)
 ↑2=SECONDARY OUTLET (Orifice Controls 5.57 cfs @ 3.06 fps)

Tertiary OutFlow Max=0.00 cfs @ 0.00 hrs HW=49.00' (Free Discharge)
 ↑3=Orifice/Grate (Controls 0.00 cfs)

Pond 13P: Bioretention Basin 4

Hydrograph



Time span=0.00-150.00 hrs, dt=0.02 hrs, 7501 points
 Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious
 Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: DA 1: CN w/ IC areas Runoff Area=141,085 sf 17.73% Impervious Runoff Depth=9.43"
 Tc=18.6 min CN=75/98 Runoff=25.39 cfs 110,908 cf

Subcatchment 2S: DA 2: CN w/ IC areas Runoff Area=21,583 sf 64.54% Impervious Runoff Depth=10.99"
 Tc=1.4 min CN=78/98 Runoff=6.83 cfs 19,766 cf

Subcatchment 3S: DA 3: CN w/ IC areas Runoff Area=40,101 sf 65.65% Impervious Runoff Depth=10.97"
 Tc=3.5 min CN=77/98 Runoff=12.33 cfs 36,662 cf

Subcatchment 4S: DA 4: CN w/ IC areas Runoff Area=84,260 sf 73.22% Impervious Runoff Depth=11.18"
 Tc=3.2 min CN=77/98 Runoff=26.35 cfs 78,486 cf

Subcatchment 5S: DA 5: CN w/ IC areas Runoff Area=52,282 sf 79.56% Impervious Runoff Depth=11.38"
 Tc=2.5 min CN=78/98 Runoff=16.84 cfs 49,576 cf

Subcatchment 6S: DA 6: CN w/ IC areas Runoff Area=76,785 sf 82.96% Impervious Runoff Depth=11.49"
 Tc=3.2 min CN=79/98 Runoff=24.36 cfs 73,524 cf

Subcatchment 7S: DA 7: CN w/ IC areas Runoff Area=120,233 sf 94.05% Impervious Runoff Depth=11.75"
 Tc=3.5 min CN=78/98 Runoff=38.22 cfs 117,771 cf

Subcatchment 8S: DA 8: CN w/ IC areas Runoff Area=111,353 sf 71.87% Impervious Runoff Depth=10.98"
 Tc=2.0 min CN=73/98 Runoff=34.94 cfs 101,913 cf

Subcatchment 9S: DA 9: CN w/ IC areas Runoff Area=59,019 sf 68.70% Impervious Runoff Depth=11.10"
 Tc=2.8 min CN=78/98 Runoff=18.62 cfs 54,580 cf

Subcatchment 10S: DA 10: CN w/ IC areas Runoff Area=48,527 sf 85.53% Impervious Runoff Depth=11.45"
 Tc=5.8 min CN=74/98 Runoff=14.25 cfs 46,314 cf

Subcatchment 11S: DA 11: CN w/ IC areas Runoff Area=57,652 sf 78.51% Impervious Runoff Depth=11.29"
 Tc=2.5 min CN=76/98 Runoff=18.47 cfs 54,251 cf

Subcatchment 12S: DA 12: CN w/ IC areas Runoff Area=67,756 sf 72.56% Impervious Runoff Depth=11.16"
 Tc=2.9 min CN=77/98 Runoff=21.35 cfs 63,011 cf

Subcatchment 13S: DA 13: CN w/ IC areas Runoff Area=156,041 sf 15.80% Impervious Runoff Depth=9.26"
 Tc=24.6 min CN=74/98 Runoff=24.26 cfs 120,366 cf

Pond 1P: Bioretention Basin 1 Peak Elev=66.08' Storage=27,491 cf Inflow=25.39 cfs 110,908 cf
 Primary=0.48 cfs 32,497 cf Secondary=16.39 cfs 78,412 cf Tertiary=0.00 cfs 0 cf Outflow=16.88 cfs 110,908 cf

Pond 2P: Bioretention Basin 2 Peak Elev=71.10' Storage=7,200 cf Inflow=6.83 cfs 19,766 cf
 Primary=0.39 cfs 14,520 cf Secondary=2.98 cfs 4,905 cf Tertiary=0.00 cfs 0 cf Outflow=3.37 cfs 19,425 cf

Pond 3P: Bioretention Basin 3 Peak Elev=67.68' Storage=11,017 cf Inflow=12.33 cfs 36,662 cf
 Primary=0.43 cfs 20,526 cf Secondary=8.26 cfs 15,675 cf Tertiary=0.00 cfs 0 cf Outflow=8.69 cfs 36,200 cf

Pond 4P: PP (w/ underdrain) w/ UG Peak Elev=98.13' Storage=35,087 cf Inflow=26.35 cfs 78,486 cf
Primary=0.47 cfs 61,398 cf Secondary=8.29 cfs 17,088 cf Outflow=8.76 cfs 78,486 cf

Pond 5P: PP (w/ underdrain) w/ UG Peak Elev=98.05' Storage=23,825 cf Inflow=16.84 cfs 49,576 cf
Primary=0.26 cfs 39,427 cf Secondary=4.36 cfs 10,149 cf Outflow=4.61 cfs 49,576 cf

Pond 6P: PP (w/ underdrain) w/ UG Peak Elev=98.24' Storage=38,636 cf Inflow=24.36 cfs 73,524 cf
Primary=0.26 cfs 55,446 cf Secondary=5.86 cfs 18,078 cf Outflow=6.12 cfs 73,524 cf

Pond 7P: PP (w/ underdrain) w/ UG Peak Elev=98.34' Storage=60,099 cf Inflow=38.22 cfs 117,771 cf
Primary=0.48 cfs 90,166 cf Secondary=9.55 cfs 27,605 cf Outflow=10.03 cfs 117,771 cf

Pond 8P: Existing Basin 1 Peak Elev=60.78' Storage=25,375 cf Inflow=36.28 cfs 421,270 cf
Primary=20.17 cfs 413,133 cf Secondary=4.40 cfs 8,044 cf Tertiary=0.27 cfs 94 cf Outflow=24.83 cfs 421,271 cf

Pond 9P: Existing Basin 2 Peak Elev=68.17' Storage=11,343 cf Inflow=18.62 cfs 54,580 cf
Primary=0.44 cfs 23,554 cf Secondary=2.69 cfs 19,921 cf Tertiary=14.17 cfs 11,108 cf Outflow=17.30 cfs 54,582 cf

Pond 10P: PP (w/ underdrain) w/ UG Peak Elev=98.10' Storage=14,807 cf Inflow=14.25 cfs 46,314 cf
Primary=0.47 cfs 35,237 cf Secondary=13.37 cfs 11,077 cf Outflow=13.84 cfs 46,314 cf

Pond 11P: PP (w/ underdrain) w/ UG Peak Elev=98.11' Storage=19,976 cf Inflow=18.47 cfs 54,251 cf
Primary=0.47 cfs 42,376 cf Secondary=15.50 cfs 11,875 cf Outflow=15.97 cfs 54,251 cf

Pond 12P: PP (w/ underdrain) w/ UG Peak Elev=98.12' Storage=25,262 cf Inflow=21.35 cfs 63,011 cf
Primary=0.47 cfs 49,575 cf Secondary=17.96 cfs 13,436 cf Outflow=18.42 cfs 63,011 cf

Pond 13P: Bioretention Basin 4 Peak Elev=52.56' Storage=28,791 cf Inflow=55.02 cfs 283,942 cf
Primary=0.42 cfs 53,654 cf Secondary=12.42 cfs 178,726 cf Tertiary=27.45 cfs 50,300 cf Outflow=40.30 cfs 282,681 cf

Total Runoff Area = 1,036,677 sf Runoff Volume = 927,128 cf Average Runoff Depth = 10.73"
39.57% Pervious = 410,178 sf 60.43% Impervious = 626,499 sf

Summary for Subcatchment 1S: DA 1: CN w/ IC areas

Runoff = 25.39 cfs @ 12.27 hrs, Volume= 110,908 cf, Depth= 9.43"
 Routed to Pond 1P : Bioretention Basin 1

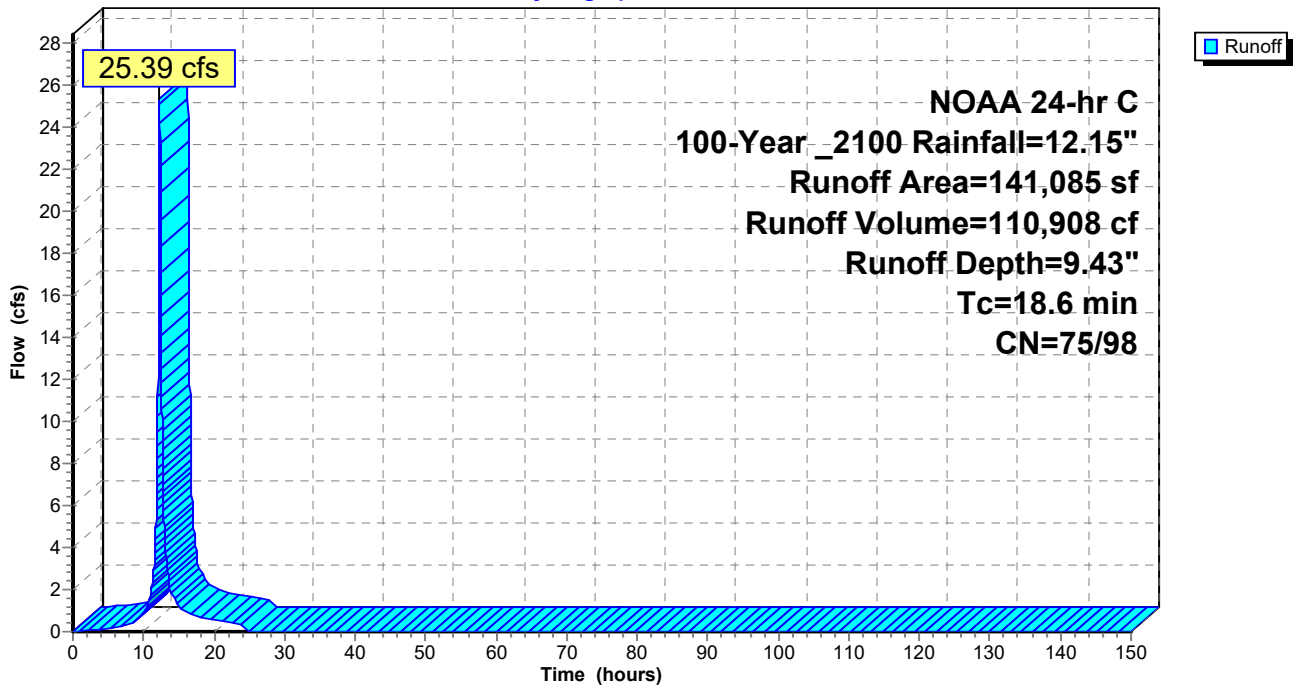
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-150.00 hrs, dt= 0.0
 NOAA 24-hr C 100-Year _2100 Rainfall=12.15"

	Area (sf)	CN	Description
*	25,014	98	Impervious HSG C
	26,886	70	Brush (fair) HSG C
	45,464	79	Open Space (fair) HSG C
*	10,665	74	Open Space (good) HSG C
*	33,056	73	Woods (fair) HSG C
	141,085	79	Weighted Average
	116,071	75	82.27% Pervious Area
	25,014	98	17.73% Impervious Area

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

Subcatchment 1S: DA 1: CN w/ IC areas

Hydrograph



Summary for Subcatchment 2S: DA 2: CN w/ IC areas

[49] Hint: Tc<2dt may require smaller dt

Runoff = 6.83 cfs @ 12.08 hrs, Volume= 19,766 cf, Depth=10.99"
 Routed to Pond 2P : Bioretention Basin 2

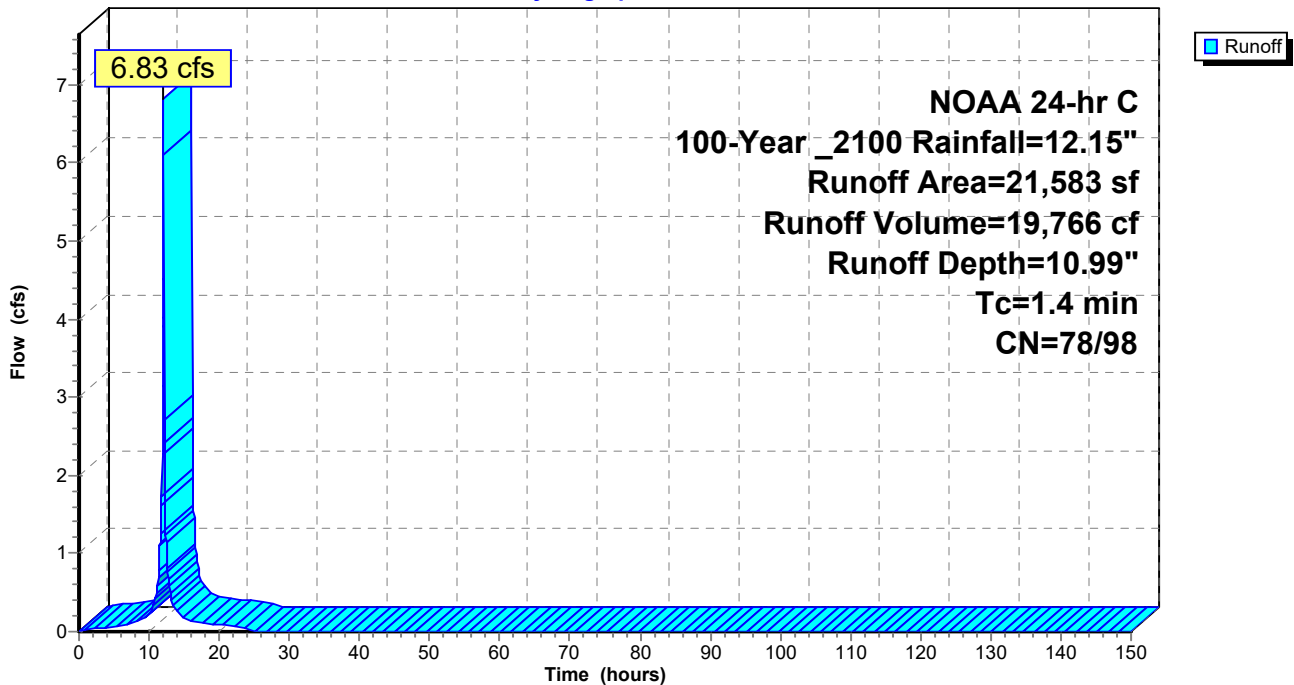
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-150.00 hrs, dt= 0.0
 NOAA 24-hr C 100-Year_2100 Rainfall=12.15"

	Area (sf)	CN	Description
*	13,929	98	Impervious HSG C
	6,668	79	Open Space (fair) HSG C
*	986	74	Open Space (good) HSG C
	21,583	91	Weighted Average
	7,654	78	35.46% Pervious Area
	13,929	98	64.54% Impervious Area

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

Subcatchment 2S: DA 2: CN w/ IC areas

Hydrograph



Summary for Subcatchment 3S: DA 3: CN w/ IC areas

Runoff = 12.33 cfs @ 12.10 hrs, Volume= 36,662 cf, Depth=10.97"
 Routed to Pond 3P : Bioretention Basin 3

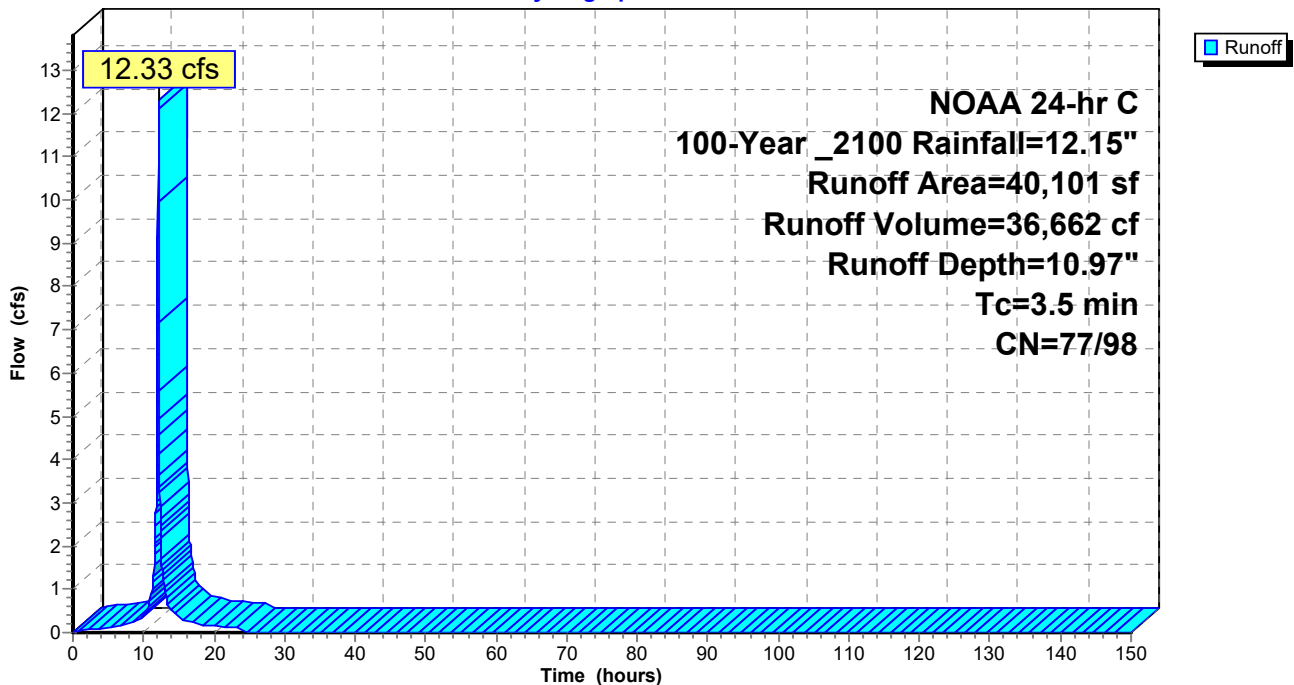
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-150.00 hrs, dt= 0.0
 NOAA 24-hr C 100-Year _2100 Rainfall=12.15"

	Area (sf)	CN	Description
*	26,326	98	Impervious HSG C
	9,202	79	Open Space (fair) HSG C
*	4,573	74	Open Space (good) HSG C
	40,101	91	Weighted Average
	13,775	77	34.35% Pervious Area
	26,326	98	65.65% Impervious Area

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

Subcatchment 3S: DA 3: CN w/ IC areas

Hydrograph



Summary for Subcatchment 4S: DA 4: CN w/ IC areas

Runoff = 26.35 cfs @ 12.10 hrs, Volume= 78,486 cf, Depth=11.18"

Routed to Pond 4P : PP (w/ underdrain) w/ UG storage 1

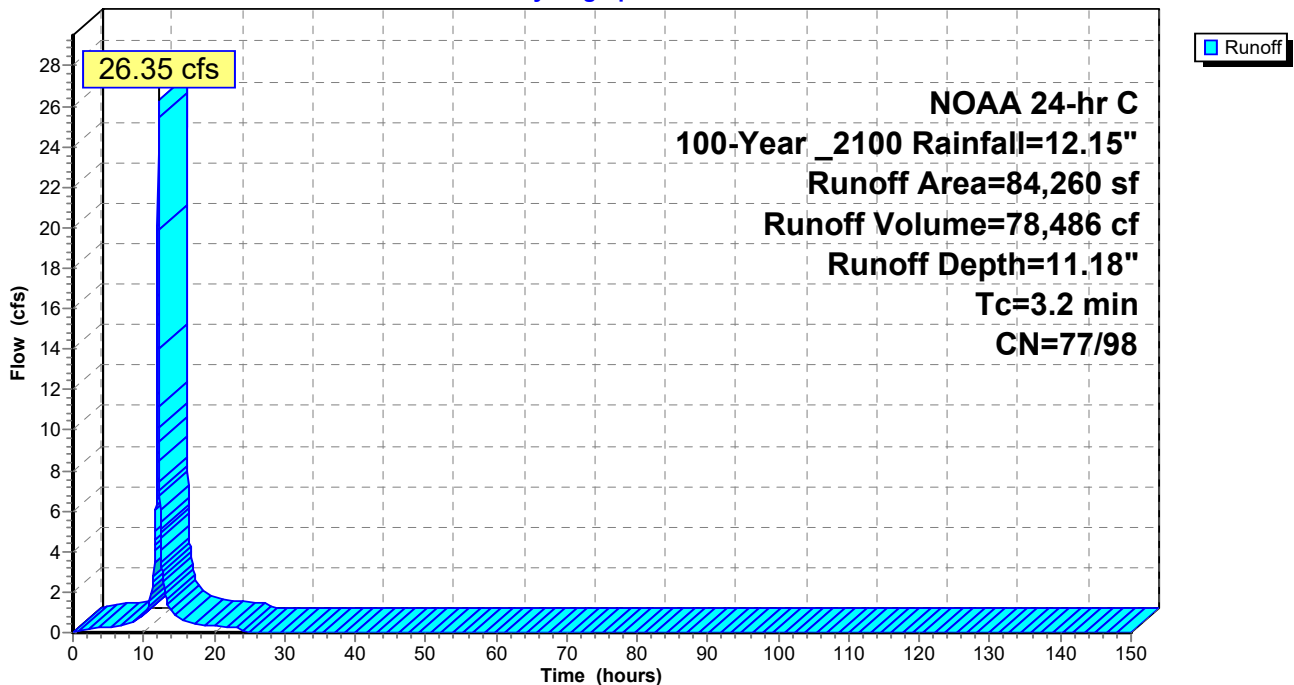
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-150.00 hrs, dt= 0.0
 NOAA 24-hr C 100-Year_2100 Rainfall=12.15"

	Area (sf)	CN	Description
*	61,698	98	Impervious HSG C
	13,143	79	Open Space (fair) HSG C
*	9,419	74	Open Space (good) HSG C
	84,260	92	Weighted Average
	22,562	77	26.78% Pervious Area
	61,698	98	73.22% Impervious Area

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

Subcatchment 4S: DA 4: CN w/ IC areas

Hydrograph



Summary for Subcatchment 5S: DA 5: CN w/ IC areas

Runoff = 16.84 cfs @ 12.09 hrs, Volume= 49,576 cf, Depth=11.38"

Routed to Pond 5P : PP (w/ underdrain) w/ UG storage 2

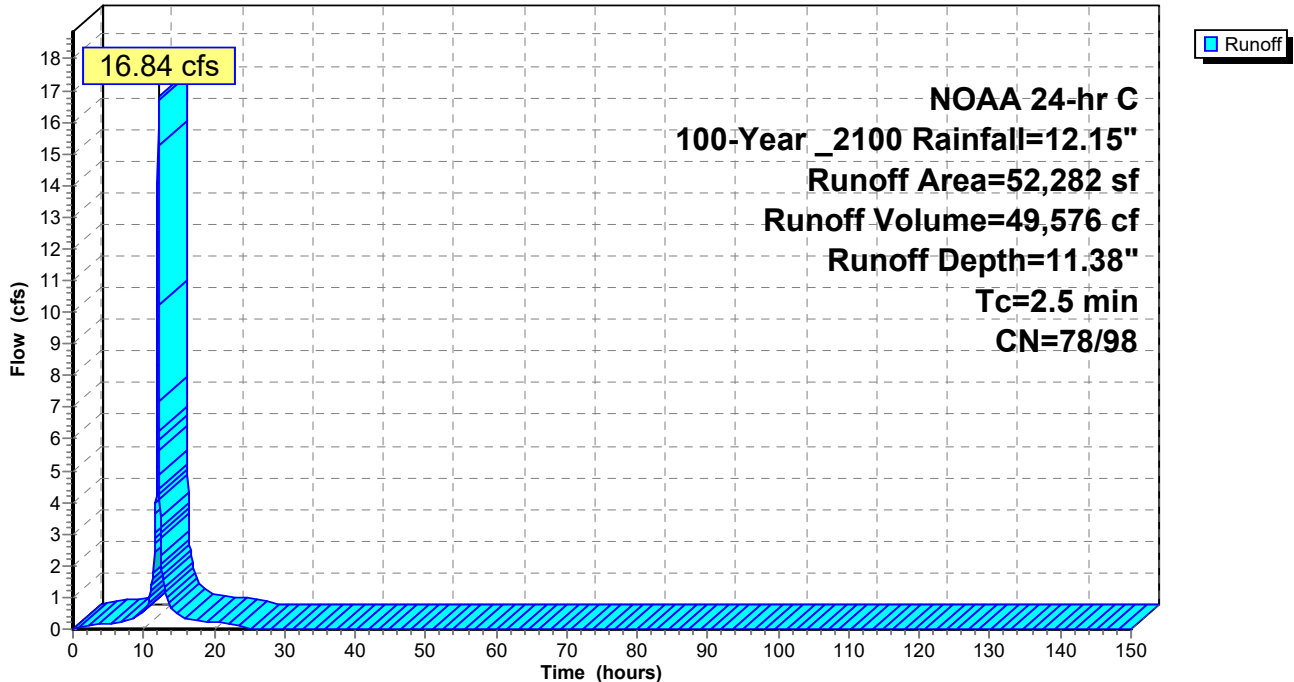
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-150.00 hrs, dt= 0.0
 NOAA 24-hr C 100-Year _2100 Rainfall=12.15"

	Area (sf)	CN	Description
*	41,595	98	Impervious HSG C
	444	70	Brush (fair) HSG C
	9,377	79	Open Space (fair) HSG C
*	866	74	Open Space (good) HSG C
	52,282	94	Weighted Average
	10,687	78	20.44% Pervious Area
	41,595	98	79.56% Impervious Area

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

Subcatchment 5S: DA 5: CN w/ IC areas

Hydrograph



Summary for Subcatchment 6S: DA 6: CN w/ IC areas

Runoff = 24.36 cfs @ 12.10 hrs, Volume= 73,524 cf, Depth=11.49"

Routed to Pond 6P : PP (w/ underdrain) w/ UG storage 3

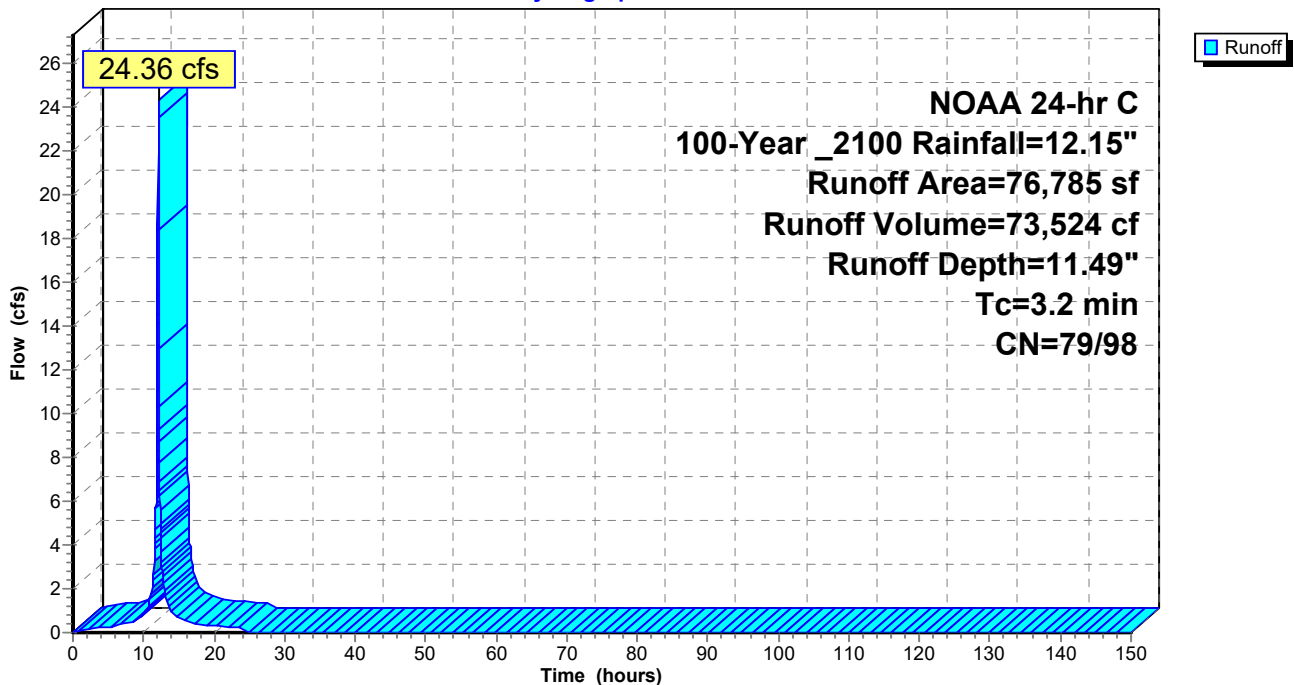
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-150.00 hrs, dt= 0.00
 NOAA 24-hr C 100-Year _2100 Rainfall=12.15"

	Area (sf)	CN	Description
*	63,699	98	Impervious HSG C
	12,708	79	Open Space (fair) HSG C
*	378	74	Open Space (good) HSG C
	76,785	95	Weighted Average
	13,086	79	17.04% Pervious Area
	63,699	98	82.96% Impervious Area

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

Subcatchment 6S: DA 6: CN w/ IC areas

Hydrograph



Summary for Subcatchment 7S: DA 7: CN w/ IC areas

Runoff = 38.22 cfs @ 12.10 hrs, Volume= 117,771 cf, Depth=11.75"

Routed to Pond 7P : PP (w/ underdrain) w/ UG storage 4

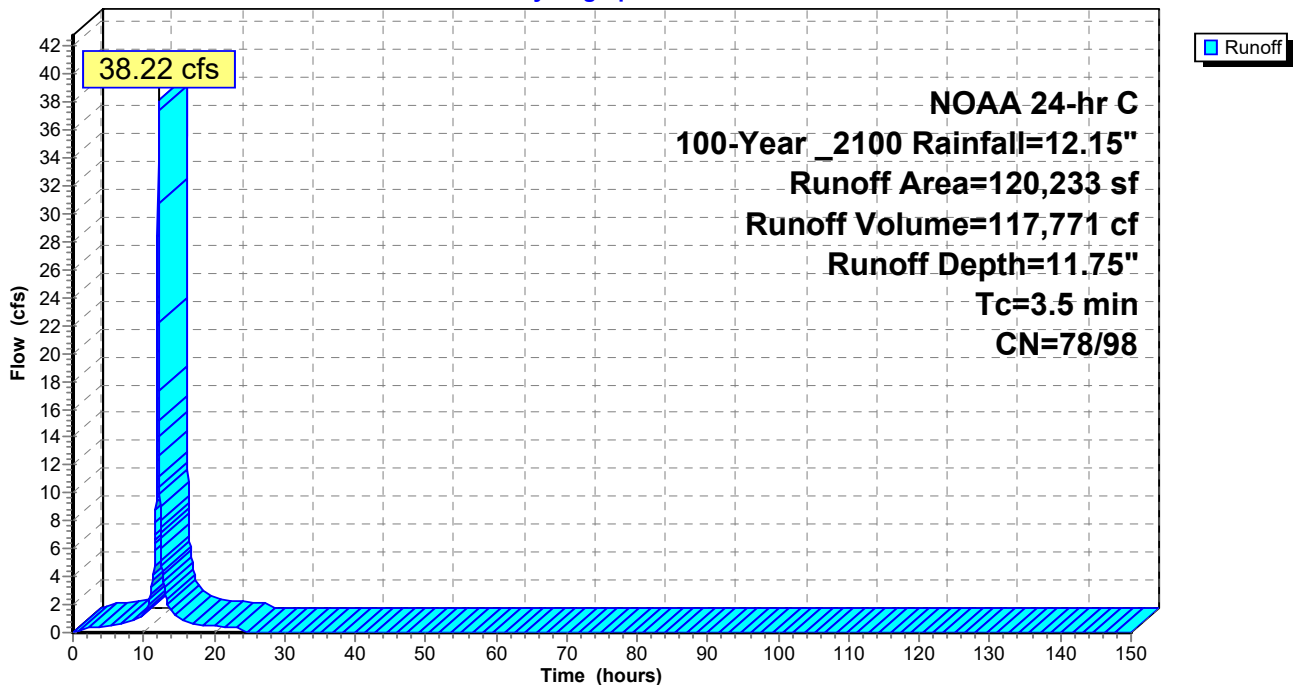
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-150.00 hrs, dt= 0.00
 NOAA 24-hr C 100-Year _2100 Rainfall=12.15"

	Area (sf)	CN	Description
*	113,075	98	Impervious HSG C
	5,111	79	Open Space (fair) HSG C
*	2,047	74	Open Space (good) HSG C
	120,233	97	Weighted Average
	7,158	78	5.95% Pervious Area
	113,075	98	94.05% Impervious Area

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

Subcatchment 7S: DA 7: CN w/ IC areas

Hydrograph



Summary for Subcatchment 8S: DA 8: CN w/ IC areas

[49] Hint: Tc<2dt may require smaller dt

Runoff = 34.94 cfs @ 12.10 hrs, Volume= 101,913 cf, Depth=10.98"
 Routed to Pond 8P : Existing Basin 1

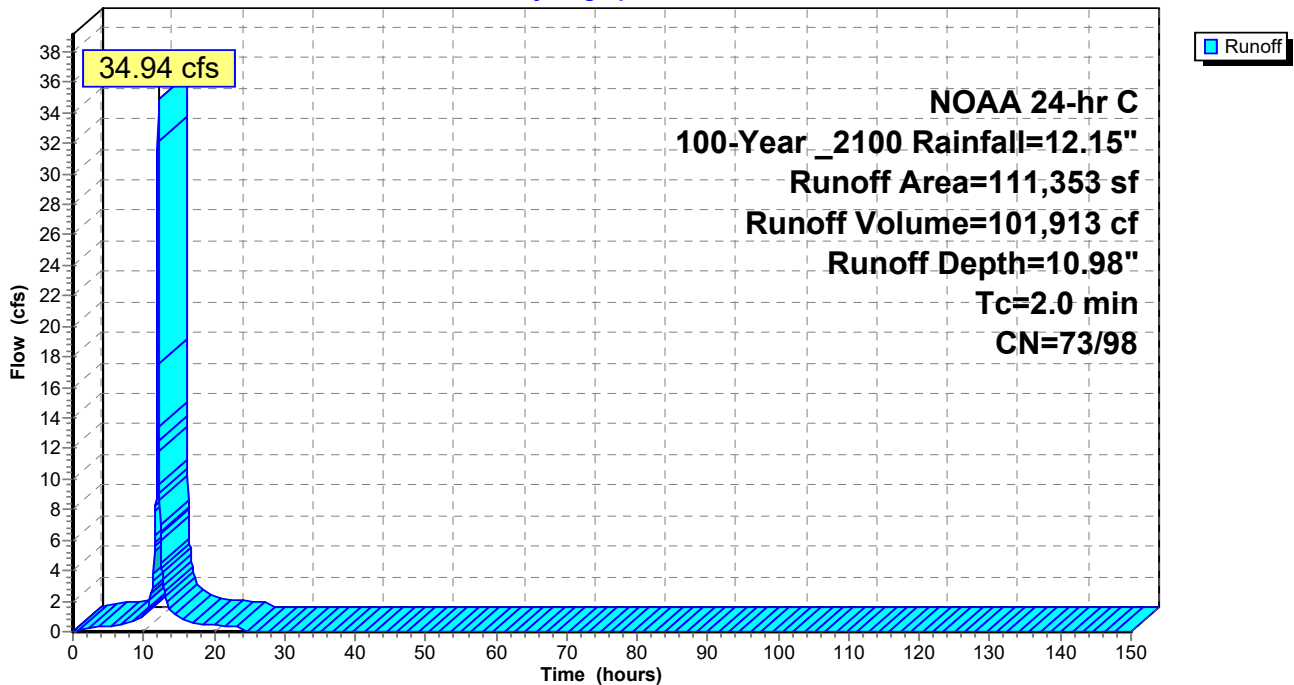
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-150.00 hrs, dt= 0.0
 NOAA 24-hr C 100-Year _2100 Rainfall=12.15"

	Area (sf)	CN	Description
*	80,033	98	Impervious HSG C
	3,876	70	Brush (fair) HSG C
	419	79	Open Space (fair) HSG C
*	12,431	74	Open Space (good) HSG C
*	14,594	73	Woods (fair) HSG C
	111,353	91	Weighted Average
	31,320	73	28.13% Pervious Area
	80,033	98	71.87% Impervious Area

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

Subcatchment 8S: DA 8: CN w/ IC areas

Hydrograph



Summary for Subcatchment 9S: DA 9: CN w/ IC areas

Runoff = 18.62 cfs @ 12.09 hrs, Volume= 54,580 cf, Depth=11.10"
 Routed to Pond 9P : Existing Basin 2

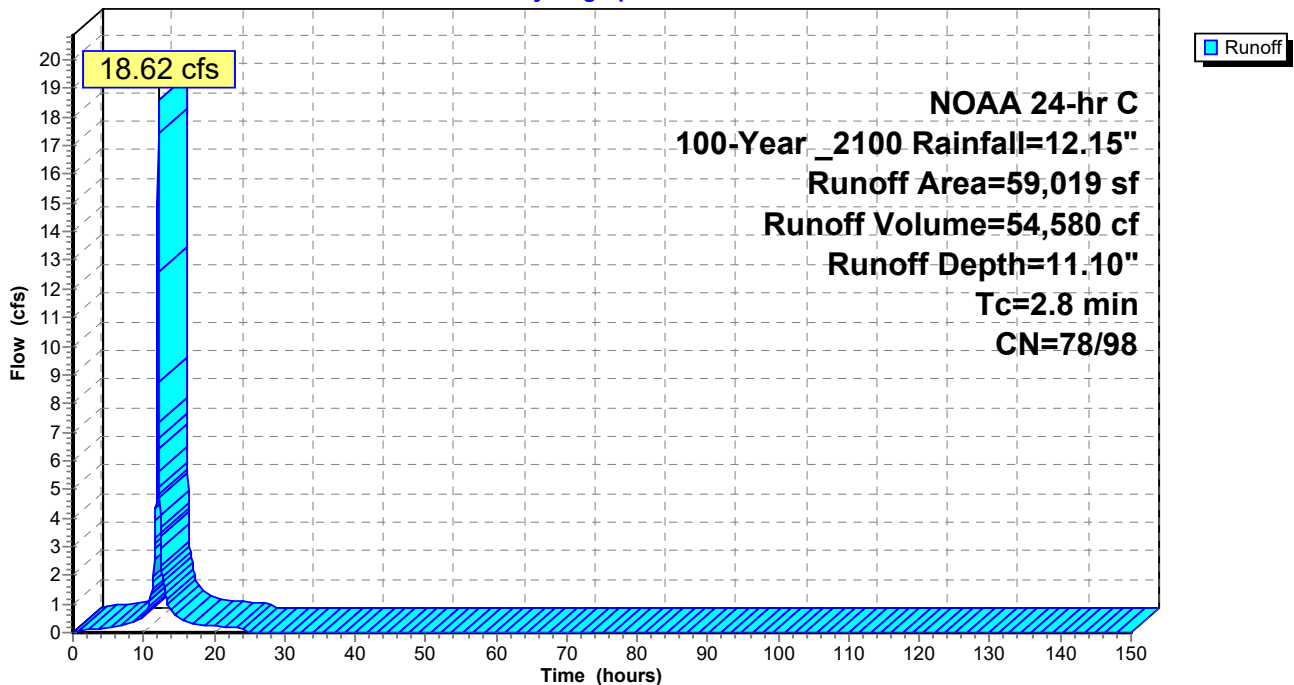
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-150.00 hrs, dt= 0.01
 NOAA 24-hr C 100-Year_2100 Rainfall=12.15"

	Area (sf)	CN	Description
*	40,544	98	Impervious HSG C
	15,969	79	Open Space (fair) HSG C
*	2,506	74	Open Space (good) HSG C
	59,019	92	Weighted Average
	18,475	78	31.30% Pervious Area
	40,544	98	68.70% Impervious Area

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

Subcatchment 9S: DA 9: CN w/ IC areas

Hydrograph



Summary for Subcatchment 10S: DA 10: CN w/ IC areas

Runoff = 14.25 cfs @ 12.13 hrs, Volume= 46,314 cf, Depth=11.45"

Routed to Pond 10P : PP (w/ underdrain) w/ UG storage 5

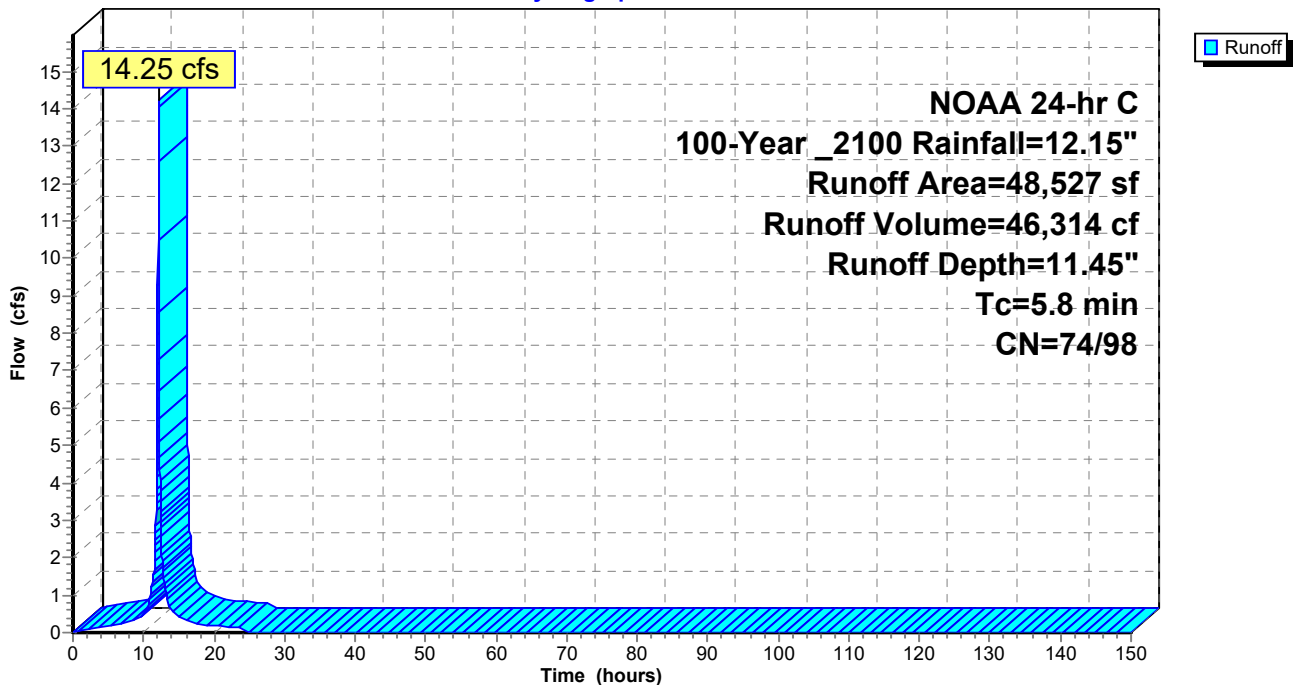
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-150.00 hrs, dt= 0.00
 NOAA 24-hr C 100-Year _2100 Rainfall=12.15"

	Area (sf)	CN	Description
*	41,506	98	Impervious HSG C
	60	79	Open Space (fair) HSG C
*	6,961	74	Open Space (good) HSG C
	48,527	95	Weighted Average
	7,021	74	14.47% Pervious Area
	41,506	98	85.53% Impervious Area

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

Subcatchment 10S: DA 10: CN w/ IC areas

Hydrograph



Summary for Subcatchment 11S: DA 11: CN w/ IC areas

Runoff = 18.47 cfs @ 12.09 hrs, Volume= 54,251 cf, Depth=11.29"

Routed to Pond 11P : PP (w/ underdrain) w/ UG storage 6

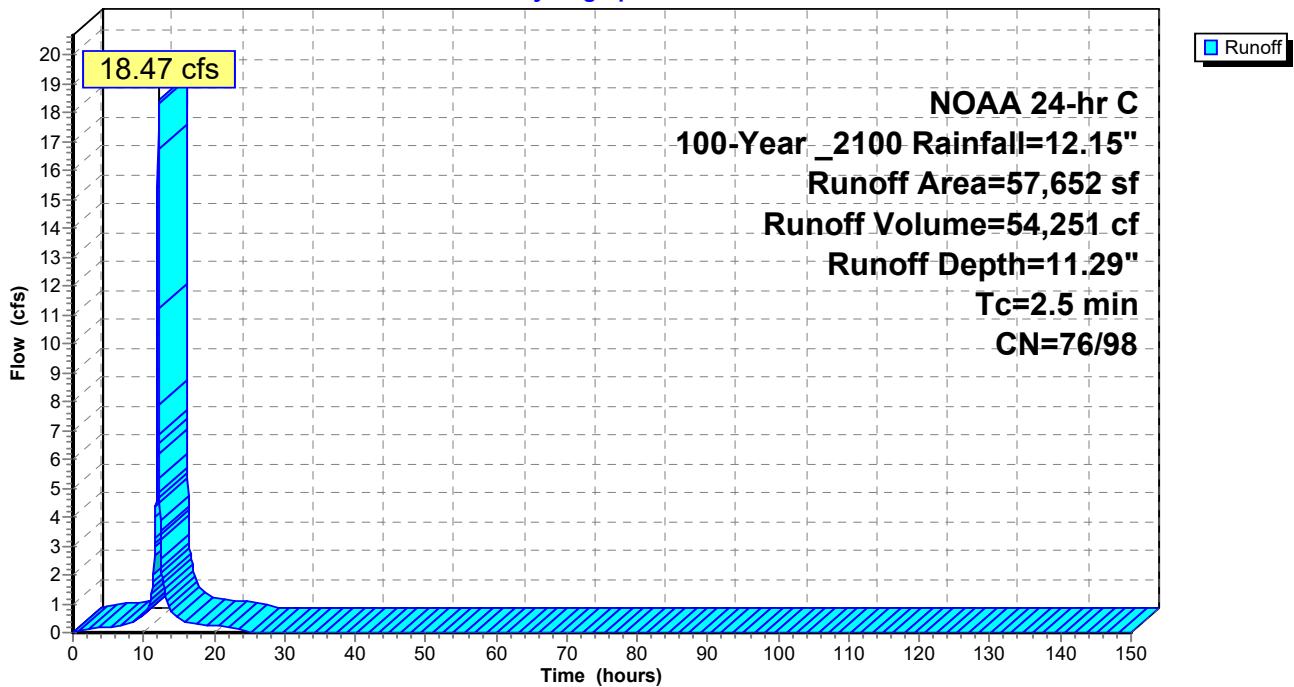
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-150.00 hrs, dt= 0.00
 NOAA 24-hr C 100-Year _2100 Rainfall=12.15"

	Area (sf)	CN	Description
*	45,264	98	Impervious HSG C
	5,795	79	Open Space (fair) HSG C
*	6,593	74	Open Space (good) HSG C
	57,652	93	Weighted Average
	12,388	76	21.49% Pervious Area
	45,264	98	78.51% Impervious Area

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

Subcatchment 11S: DA 11: CN w/ IC areas

Hydrograph



Summary for Subcatchment 12S: DA 12: CN w/ IC areas

Runoff = 21.35 cfs @ 12.10 hrs, Volume= 63,011 cf, Depth=11.16"

Routed to Pond 12P : PP (w/ underdrain) w/ UG storage 7

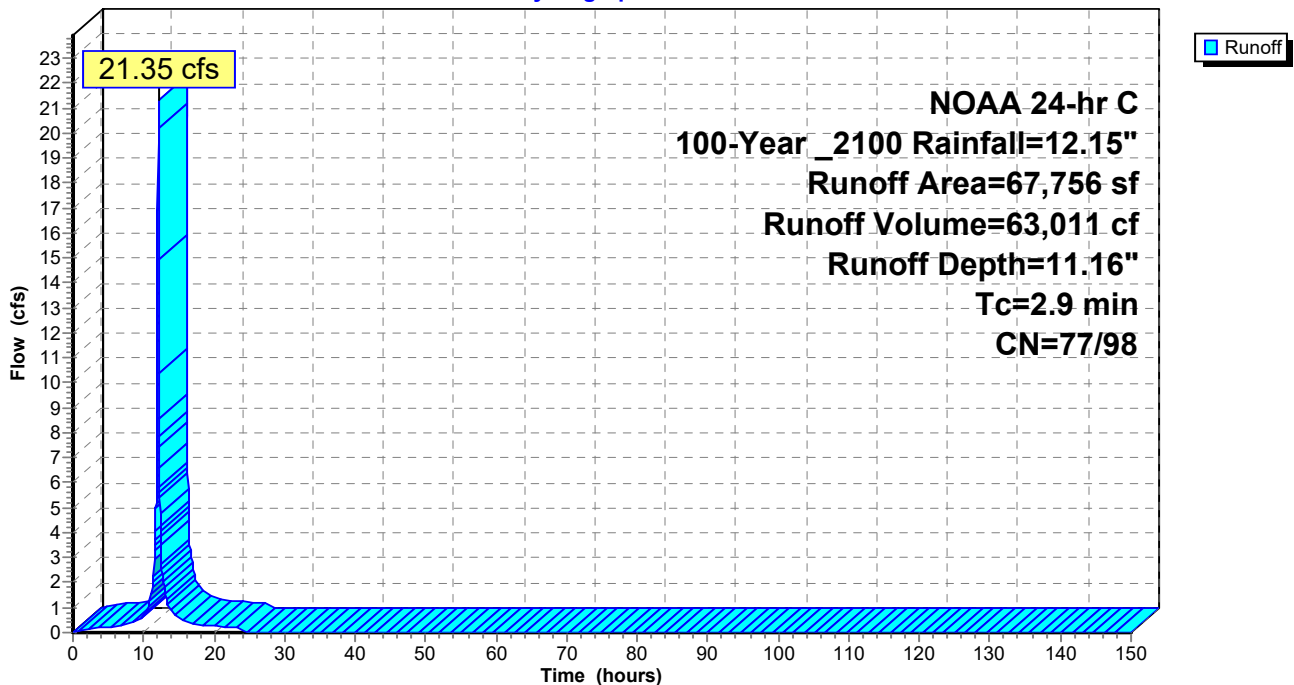
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-150.00 hrs, dt= 0.0
 NOAA 24-hr C 100-Year _2100 Rainfall=12.15"

	Area (sf)	CN	Description
*	49,166	98	Impervious HSG C
	11,017	79	Open Space (fair) HSG C
*	7,573	74	Open Space (good) HSG C
	67,756	92	Weighted Average
	18,590	77	27.44% Pervious Area
	49,166	98	72.56% Impervious Area

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

Subcatchment 12S: DA 12: CN w/ IC areas

Hydrograph



Summary for Subcatchment 13S: DA 13: CN w/ IC areas

Runoff = 24.26 cfs @ 12.34 hrs, Volume= 120,366 cf, Depth= 9.26"
 Routed to Pond 13P : Bioretention Basin 4

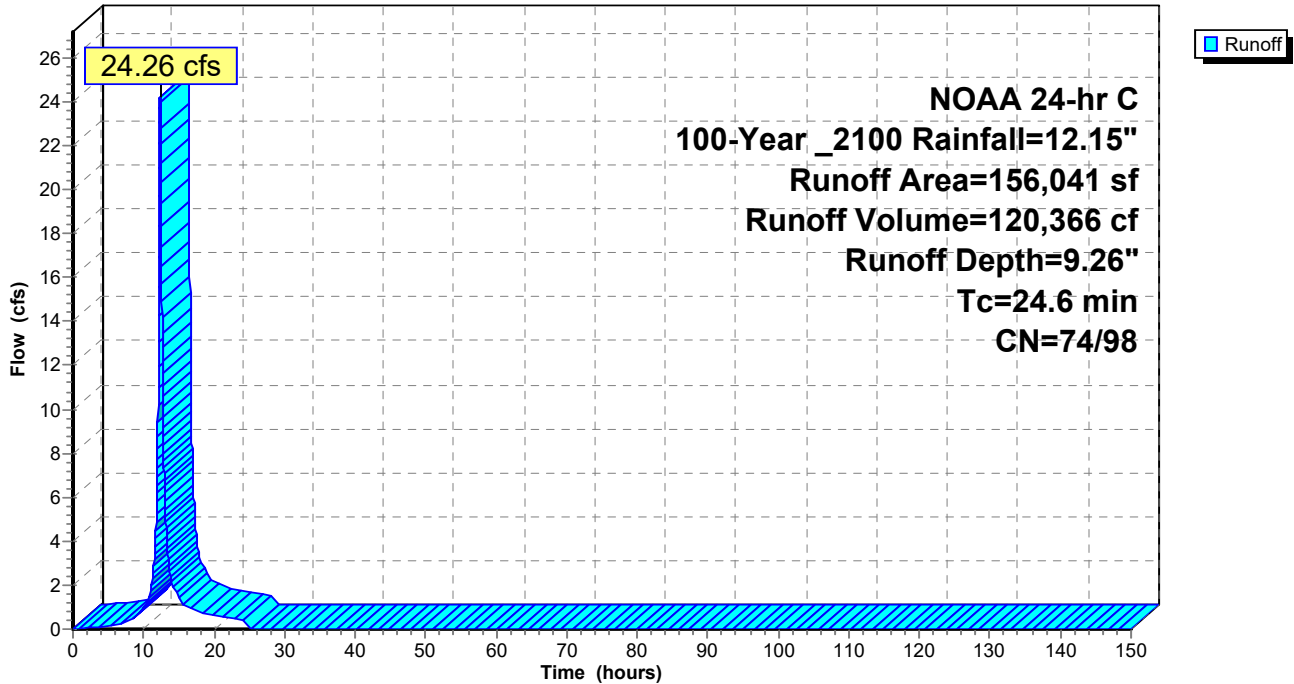
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-150.00 hrs, dt= 0.0
 NOAA 24-hr C 100-Year _2100 Rainfall=12.15"

	Area (sf)	CN	Description
*	24,650	98	Impervious HSG C
	42,240	79	Open Space (fair) HSG C
*	20,548	74	Open Space (good) HSG C
	68,603	70	Woods, Good, HSG C
	156,041	77	Weighted Average
	131,391	74	84.20% Pervious Area
	24,650	98	15.80% Impervious Area

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

Subcatchment 13S: DA 13: CN w/ IC areas

Hydrograph



Summary for Pond 1P: Bioretention Basin 1

[44] Hint: Outlet device #1 is below defined storage

Inflow Area = 141,085 sf, 17.73% Impervious, Inflow Depth = 9.43" for 100-Year_2100 event
 Inflow = 25.39 cfs @ 12.27 hrs, Volume= 110,908 cf
 Outflow = 16.88 cfs @ 12.45 hrs, Volume= 110,908 cf, Atten= 34%, Lag= 10.6 min
 Primary = 0.48 cfs @ 12.45 hrs, Volume= 32,497 cf
 Routed to nonexistent node 5R
 Secondary = 16.39 cfs @ 12.45 hrs, Volume= 78,412 cf
 Routed to nonexistent node 5R
 Tertiary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
 Routed to nonexistent node 5R

Routing by Stor-Ind method, Time Span= 0.00-150.00 hrs, dt= 0.02 hrs / 2
 Peak Elev= 66.08' @ 12.45 hrs Surf.Area= 10,577 sf Storage= 27,491 cf

Plug-Flow detention time= 109.3 min calculated for 110,893 cf (100% of inflow)
 Center-of-Mass det. time= 109.4 min (907.6 - 798.2)

Volume	Invert	Avail.Storage	Storage Description
#1	62.50'	37,960 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
62.50	4,800	0	0
67.00	12,071	37,960	37,960

Device	Routing	Invert	Outlet Devices
#1	Primary	61.75'	3.0" Vert. Low Flow Orifice C= 0.600 Limited to weir flow at low heads
#2	Secondary	64.00'	24.0" W x 18.0" H Vert. SECONDARY OUTLET C= 0.600 Limited to weir flow at low heads
#3	Tertiary	66.25'	60.0" x 60.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads

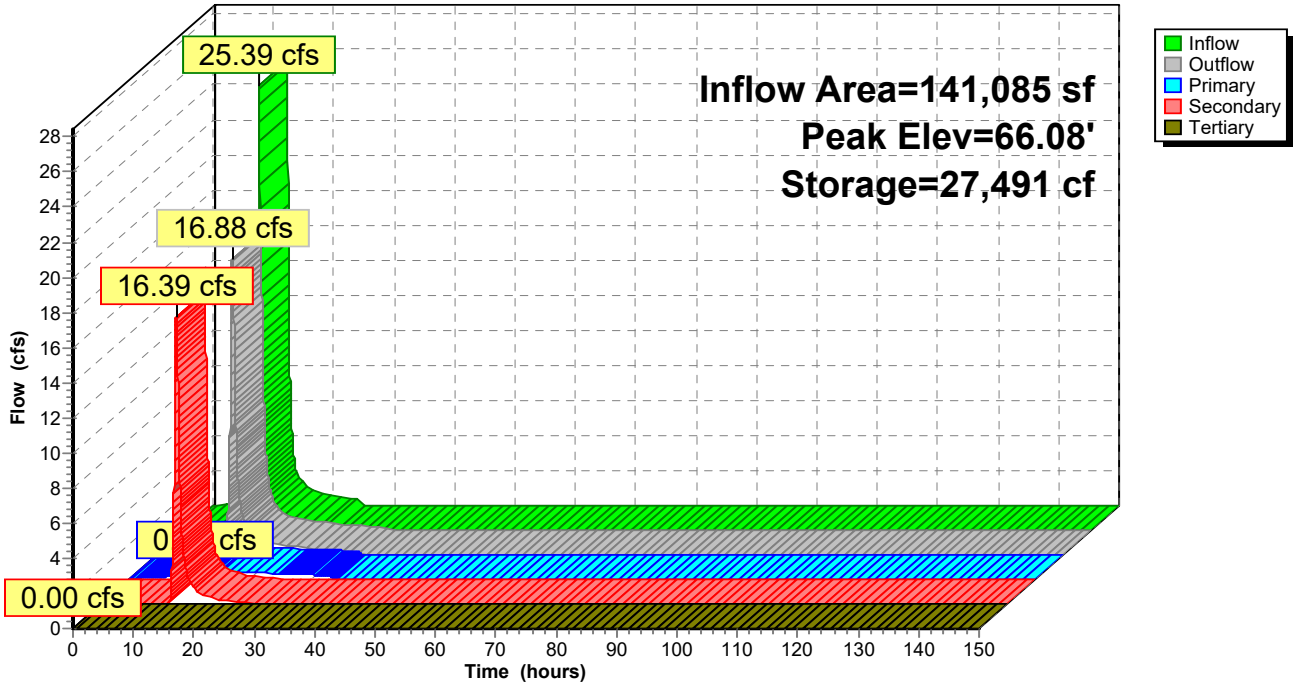
Primary OutFlow Max=0.48 cfs @ 12.45 hrs HW=66.07' (Free Discharge)
 ↑1=**Low Flow Orifice** (Orifice Controls 0.48 cfs @ 9.87 fps)

Secondary OutFlow Max=16.39 cfs @ 12.45 hrs HW=66.07' (Free Discharge)
 ↑2=**SECONDARY OUTLET** (Orifice Controls 16.39 cfs @ 5.46 fps)

Tertiary OutFlow Max=0.00 cfs @ 0.00 hrs HW=62.50' (Free Discharge)
 ↑3=**Orifice/Grate** (Controls 0.00 cfs)

Pond 1P: Bioretention Basin 1

Hydrograph



Summary for Pond 2P: Bioretention Basin 2

Inflow Area = 21,583 sf, 64.54% Impervious, Inflow Depth = 10.99" for 100-Year_2100 event
 Inflow = 6.83 cfs @ 12.08 hrs, Volume= 19,766 cf
 Outflow = 3.37 cfs @ 12.14 hrs, Volume= 19,425 cf, Atten= 51%, Lag= 3.3 min
 Primary = 0.39 cfs @ 12.14 hrs, Volume= 14,520 cf
 Routed to nonexistent node 5R
 Secondary = 2.98 cfs @ 12.14 hrs, Volume= 4,905 cf
 Routed to nonexistent node 5R
 Tertiary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
 Routed to nonexistent node 5R

Routing by Stor-Ind method, Time Span= 0.00-150.00 hrs, dt= 0.02 hrs / 2
 Peak Elev= 71.10' @ 12.14 hrs Surf.Area= 3,364 sf Storage= 7,200 cf

Plug-Flow detention time= 149.2 min calculated for 19,422 cf (98% of inflow)
 Center-of-Mass det. time= 138.0 min (888.2 - 750.2)

Volume	Invert	Avail.Storage	Storage Description
#1	68.00'	14,805 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
68.00	1,281	0	0
73.00	4,641	14,805	14,805

Device	Routing	Invert	Outlet Devices
#1	Primary	68.25'	3.0" Vert. Low Flow Orifice C= 0.600 Limited to weir flow at low heads
#2	Secondary	70.50'	24.0" W x 18.0" H Vert. SECONDARY OUTLET C= 0.600 Limited to weir flow at low heads
#3	Tertiary	72.75'	60.0" x 60.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads

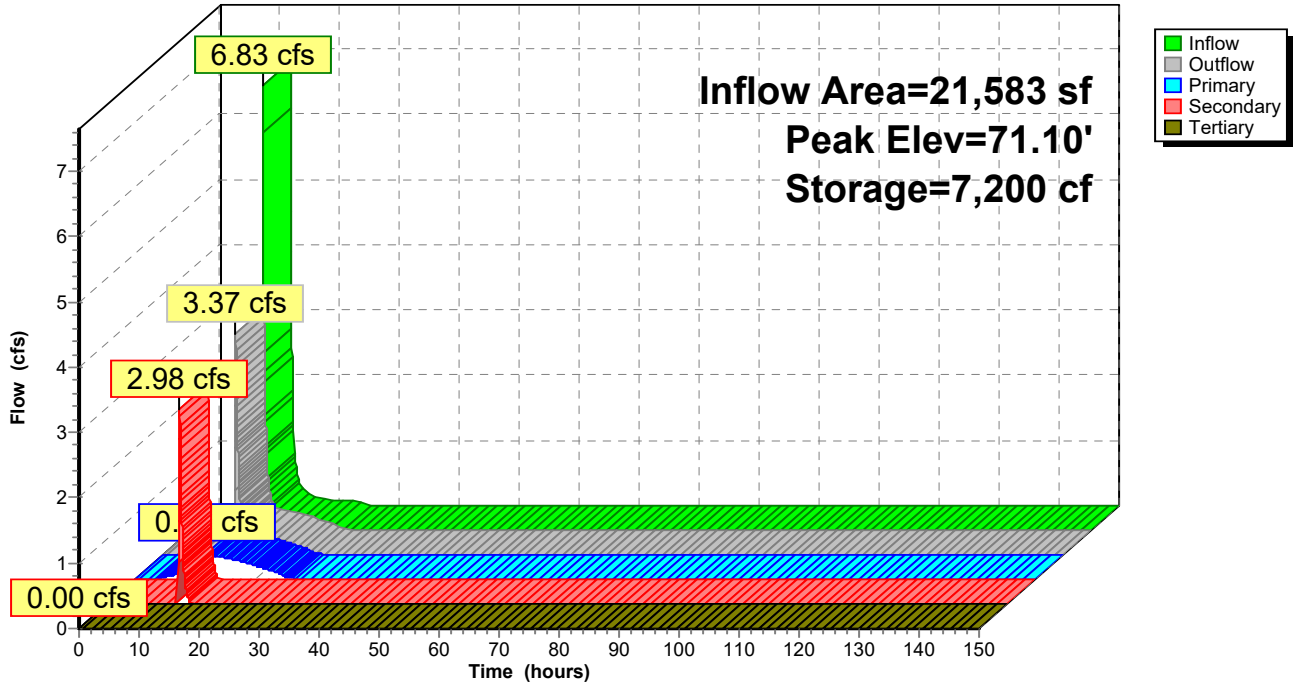
Primary OutFlow Max=0.39 cfs @ 12.14 hrs HW=71.10' (Free Discharge)
 ↖1=Low Flow Orifice (Orifice Controls 0.39 cfs @ 7.95 fps)

Secondary OutFlow Max=2.97 cfs @ 12.14 hrs HW=71.10' (Free Discharge)
 ↖2=SECONDARY OUTLET (Orifice Controls 2.97 cfs @ 2.48 fps)

Tertiary OutFlow Max=0.00 cfs @ 0.00 hrs HW=68.00' (Free Discharge)
 ↖3=Orifice/Grate (Controls 0.00 cfs)

Pond 2P: Bioretention Basin 2

Hydrograph



Summary for Pond 3P: Bioretention Basin 3

Inflow Area = 40,101 sf, 65.65% Impervious, Inflow Depth = 10.97" for 100-Year_2100 event
 Inflow = 12.33 cfs @ 12.10 hrs, Volume= 36,662 cf
 Outflow = 8.69 cfs @ 12.15 hrs, Volume= 36,200 cf, Atten= 30%, Lag= 2.8 min
 Primary = 0.43 cfs @ 12.15 hrs, Volume= 20,526 cf
 Routed to nonexistent node 5R
 Secondary = 8.26 cfs @ 12.15 hrs, Volume= 15,675 cf
 Routed to nonexistent node 5R
 Tertiary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
 Routed to nonexistent node 5R

Routing by Stor-Ind method, Time Span= 0.00-150.00 hrs, dt= 0.02 hrs / 2
 Peak Elev= 67.68' @ 12.15 hrs Surf.Area= 4,223 sf Storage= 11,017 cf

Plug-Flow detention time= 147.6 min calculated for 36,200 cf (99% of inflow)
 Center-of-Mass det. time= 138.8 min (890.8 - 752.0)

Volume	Invert	Avail.Storage	Storage Description
#1	64.00'	17,160 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
64.00	1,760	0	0
69.00	5,104	17,160	17,160

Device	Routing	Invert	Outlet Devices
#1	Primary	64.25'	3.0" Vert. Low Flow Orifice C= 0.600 Limited to weir flow at low heads
#2	Secondary	66.50'	24.0" W x 18.0" H Vert. SECONDARY OUTLET C= 0.600 Limited to weir flow at low heads
#3	Tertiary	68.75'	60.0" x 60.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads

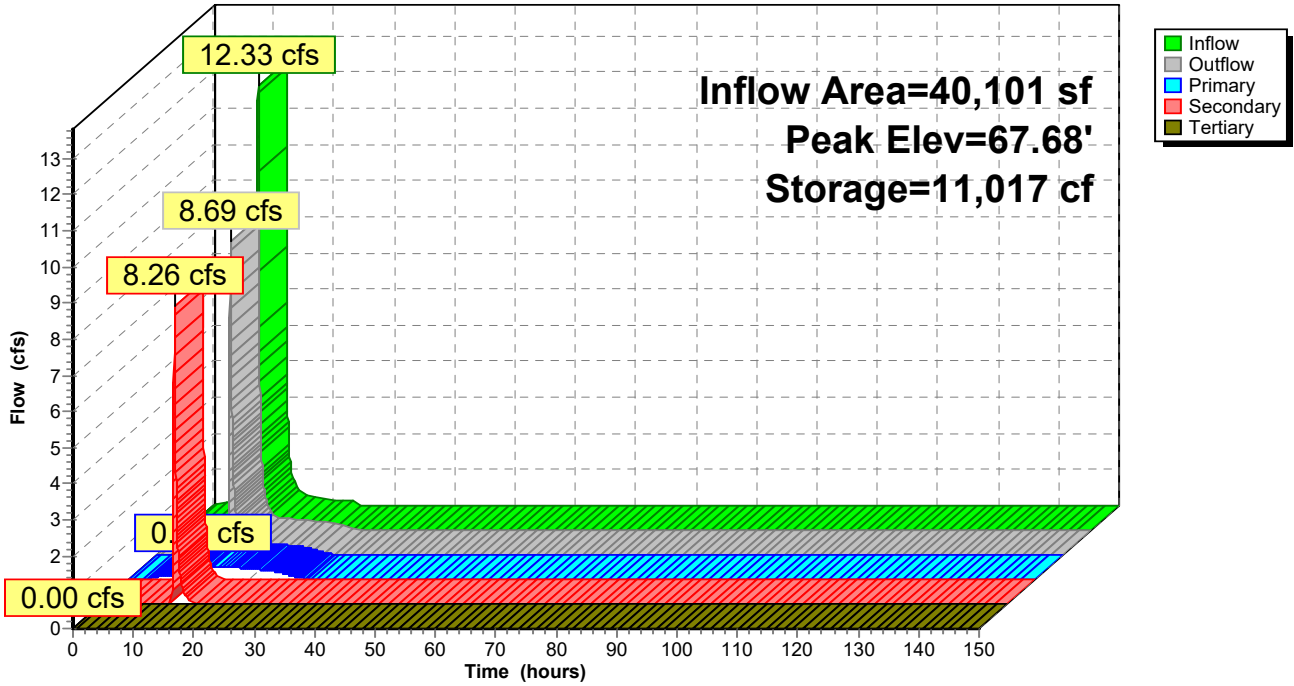
Primary OutFlow Max=0.43 cfs @ 12.15 hrs HW=67.68' (Free Discharge)
 ↖1=Low Flow Orifice (Orifice Controls 0.43 cfs @ 8.75 fps)

Secondary OutFlow Max=8.20 cfs @ 12.15 hrs HW=67.68' (Free Discharge)
 ↖2=SECONDARY OUTLET (Orifice Controls 8.20 cfs @ 3.48 fps)

Tertiary OutFlow Max=0.00 cfs @ 0.00 hrs HW=64.00' (Free Discharge)
 ↖3=Orifice/Grate (Controls 0.00 cfs)

Pond 3P: Bioretention Basin 3

Hydrograph



Summary for Pond 4P: PP (w/ underdrain) w/ UG storage 1

[44] Hint: Outlet device #3 is below defined storage

Inflow Area = 84,260 sf, 73.22% Impervious, Inflow Depth = 11.18" for 100-Year_2100 event
 Inflow = 26.35 cfs @ 12.10 hrs, Volume= 78,486 cf
 Outflow = 8.76 cfs @ 12.24 hrs, Volume= 78,486 cf, Atten= 67%, Lag= 8.3 min
 Primary = 0.47 cfs @ 12.24 hrs, Volume= 61,398 cf
 Routed to Pond 8P : Existing Basin 1
 Secondary = 8.29 cfs @ 12.24 hrs, Volume= 17,088 cf
 Routed to Pond 8P : Existing Basin 1

Routing by Stor-Ind method, Time Span= 0.00-150.00 hrs, dt= 0.02 hrs
 Peak Elev= 98.13' @ 12.24 hrs Surf.Area= 21,558 sf Storage= 35,087 cf

Plug-Flow detention time= 578.3 min calculated for 78,486 cf (100% of inflow)
 Center-of-Mass det. time= 578.3 min (1,326.0 - 747.7)

Volume	Invert	Avail.Storage	Storage Description
#1	97.00'	3,624 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
#2A	94.50'	12,961 cf	68.00'W x 217.22'L x 3.50'H Field A 51,698 cf Overall - 19,295 cf Embedded = 32,403 cf x 40.0% Voids
#3A	95.00'	19,295 cf	ADS_StormTech SC-740 +Cap x 420 Inside #2 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 420 Chambers in 14 Rows
		35,880 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
97.00	6,787	0.0	0	0
97.67	6,787	35.0	1,592	1,592
97.83	6,787	15.0	163	1,754
98.00	6,787	15.0	173	1,928
98.25	6,787	100.0	1,697	3,624

Device	Routing	Invert	Outlet Devices
#1	Primary	92.07'	3.0" Vert. Restriction Orifice C= 0.600 Limited to weir flow at low heads
#2	Device 1	92.17'	6.0" Round 6" HDPE Underdrain L= 359.0' Ke= 0.500 Inlet / Outlet Invert= 92.17' / 90.37' S= 0.0050 ' S= 0.0050 ' Cc= 0.900 n= 0.020 Corrugated PE, corrugated interior, Flow Area= 0.20 sf
#3	Device 2	92.17'	0.9" x 0.1" Horiz. Perforations X 400.00 columns X 3 rows C= 0.600 Limited to weir flow at low heads
#4	Secondary	98.00'	67.0' long x 2.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Primary OutFlow Max=0.47 cfs @ 12.24 hrs HW=98.13' (Free Discharge)

↑**1=Restriction Orifice** (Passes 0.47 cfs of 0.58 cfs potential flow)

↑**2=6" HDPE Underdrain** (Outlet Controls 0.47 cfs @ 2.38 fps)

↑**3=Perforations** (Passes 0.47 cfs of 8.82 cfs potential flow)

Secondary OutFlow Max=8.22 cfs @ 12.24 hrs HW=98.13' (Free Discharge)

↑**4=Broad-Crested Rectangular Weir** (Weir Controls 8.22 cfs @ 0.93 fps)

Pond 4P: PP (w/ underdrain) w/ UG storage 1 - Chamber Wizard Field A

Chamber Model = ADS_StormTech SC-740 +Cap (ADS StormTech® SC-740 with cap length)

Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf

Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap

51.0" Wide + 6.0" Spacing = 57.0" C-C Row Spacing

30 Chambers/Row x 7.12' Long +0.81' Cap Length x 2 = 215.22' Row Length +12.0" End Stone x 2 = 217.22' Base Length

14 Rows x 51.0" Wide + 6.0" Spacing x 13 + 12.0" Side Stone x 2 = 68.00' Base Width

6.0" Stone Base + 30.0" Chamber Height + 6.0" Stone Cover = 3.50' Field Height

420 Chambers x 45.9 cf = 19,294.8 cf Chamber Storage

51,697.6 cf Field - 19,294.8 cf Chambers = 32,402.8 cf Stone x 40.0% Voids = 12,961.1 cf Stone Storage

Chamber Storage + Stone Storage = 32,255.9 cf = 0.740 af

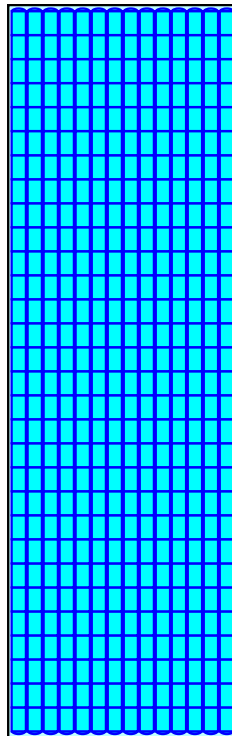
Overall Storage Efficiency = 62.4%

Overall System Size = 217.22' x 68.00' x 3.50'

420 Chambers

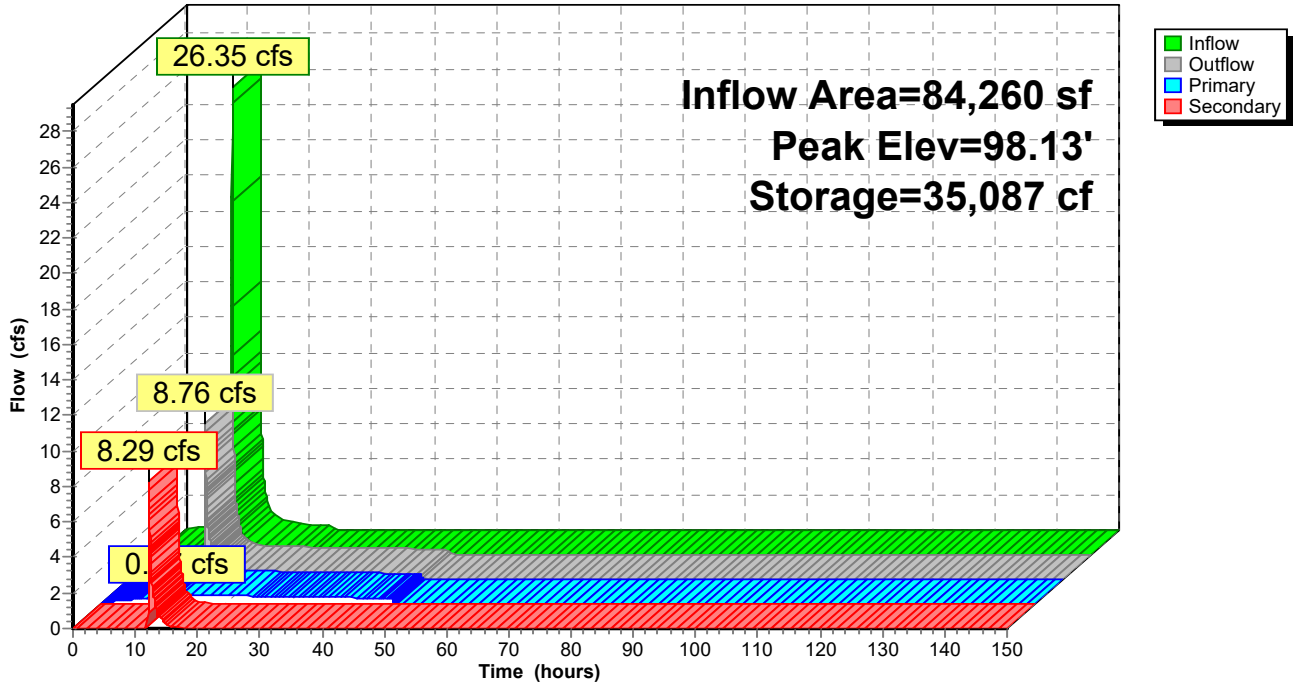
1,914.7 cy Field

1,200.1 cy Stone



Pond 4P: PP (w/ underdrain) w/ UG storage 1

Hydrograph



Summary for Pond 5P: PP (w/ underdrain) w/ UG storage 2

[44] Hint: Outlet device #3 is below defined storage

Inflow Area = 52,282 sf, 79.56% Impervious, Inflow Depth = 11.38" for 100-Year_2100 event
 Inflow = 16.84 cfs @ 12.09 hrs, Volume= 49,576 cf
 Outflow = 4.61 cfs @ 12.26 hrs, Volume= 49,576 cf, Atten= 73%, Lag= 10.1 min
 Primary = 0.26 cfs @ 12.26 hrs, Volume= 39,427 cf
 Routed to Pond 8P : Existing Basin 1
 Secondary = 4.36 cfs @ 12.26 hrs, Volume= 10,149 cf
 Routed to Pond 8P : Existing Basin 1

Routing by Stor-Ind method, Time Span= 0.00-150.00 hrs, dt= 0.02 hrs
 Peak Elev= 98.05' @ 12.26 hrs Surf.Area= 14,913 sf Storage= 23,825 cf

Plug-Flow detention time= 737.9 min calculated for 49,569 cf (100% of inflow)
 Center-of-Mass det. time= 738.0 min (1,481.6 - 743.5)

Volume	Invert	Avail.Storage	Storage Description
#1	97.00'	2,510 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
#2A	94.50'	9,005 cf	77.50'W x 131.78'L x 3.50'H Field A 35,744 cf Overall - 13,231 cf Embedded = 22,514 cf x 40.0% Voids
#3A	95.00'	13,231 cf	ADS_StormTech SC-740 +Cap x 288 Inside #2 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 288 Chambers in 16 Rows
		24,746 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
97.00	4,700	0.0	0	0
97.67	4,700	35.0	1,102	1,102
97.83	4,700	15.0	113	1,215
98.00	4,700	15.0	120	1,335
98.25	4,700	100.0	1,175	2,510

Device	Routing	Invert	Outlet Devices
#1	Primary	92.07'	2.0" Vert. Restriction Orifice C= 0.600 Limited to weir flow at low heads
#2	Device 1	92.17'	6.0" Round 6" HDPE Underdrain L= 359.0' Ke= 0.500 Inlet / Outlet Invert= 92.17' / 90.37' S= 0.0050 ' S= 0.0050 ' Cc= 0.900 n= 0.020 Corrugated PE, corrugated interior, Flow Area= 0.20 sf
#3	Device 2	92.17'	0.9" x 0.1" Horiz. Perforations X 400.00 columns X 3 rows C= 0.600 Limited to weir flow at low heads
#4	Secondary	98.00'	132.0' long x 2.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Primary OutFlow Max=0.26 cfs @ 12.26 hrs HW=98.05' (Free Discharge)

↑1=**Restriction Orifice** (Orifice Controls 0.26 cfs @ 11.70 fps)

↑2=**6" HDPE Underdrain** (Passes 0.26 cfs of 0.47 cfs potential flow)

↑3=**Perforations** (Passes 0.26 cfs of 8.76 cfs potential flow)

Secondary OutFlow Max=4.20 cfs @ 12.26 hrs HW=98.05' (Free Discharge)

↑4=**Broad-Crested Rectangular Weir** (Weir Controls 4.20 cfs @ 0.59 fps)

Pond 5P: PP (w/ underdrain) w/ UG storage 2 - Chamber Wizard Field A

Chamber Model = ADS_StormTech SC-740 +Cap (ADS StormTech® SC-740 with cap length)

Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf

Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap

51.0" Wide + 6.0" Spacing = 57.0" C-C Row Spacing

18 Chambers/Row x 7.12' Long +0.81' Cap Length x 2 = 129.78' Row Length +12.0" End Stone x 2 = 131.78' Base Length

16 Rows x 51.0" Wide + 6.0" Spacing x 15 + 12.0" Side Stone x 2 = 77.50' Base Width

6.0" Stone Base + 30.0" Chamber Height + 6.0" Stone Cover = 3.50' Field Height

288 Chambers x 45.9 cf = 13,230.7 cf Chamber Storage

35,744.4 cf Field - 13,230.7 cf Chambers = 22,513.7 cf Stone x 40.0% Voids = 9,005.5 cf Stone Storage

Chamber Storage + Stone Storage = 22,236.2 cf = 0.510 af

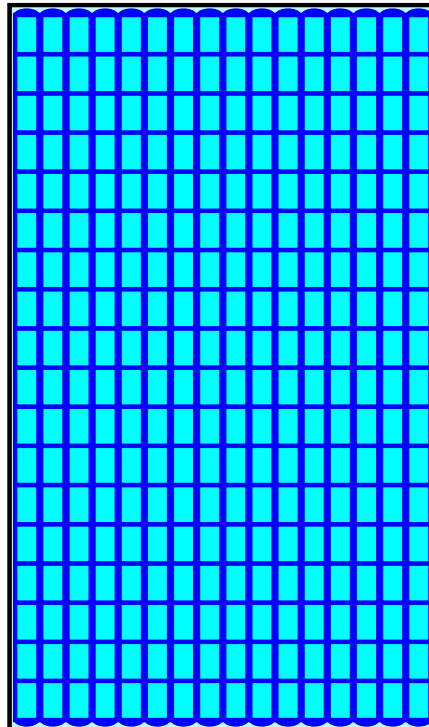
Overall Storage Efficiency = 62.2%

Overall System Size = 131.78' x 77.50' x 3.50'

288 Chambers

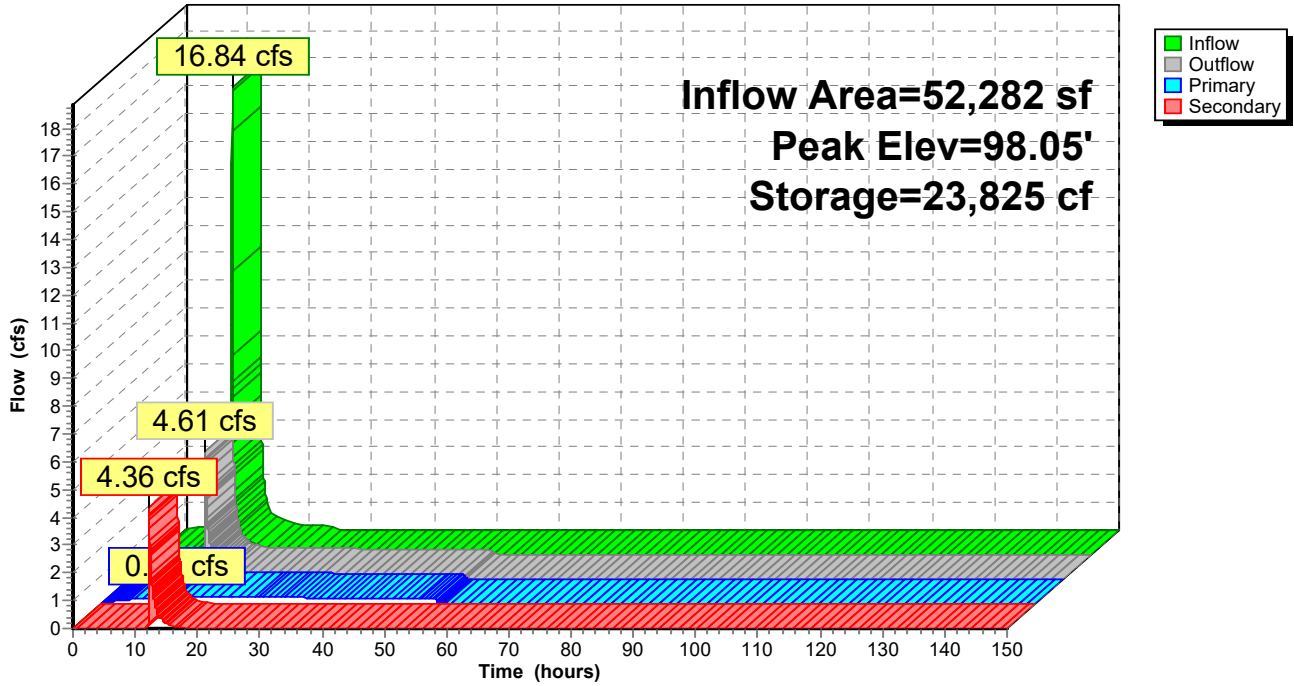
1,323.9 cy Field

833.8 cy Stone



Pond 5P: PP (w/ underdrain) w/ UG storage 2

Hydrograph



Summary for Pond 6P: PP (w/ underdrain) w/ UG storage 3

[44] Hint: Outlet device #3 is below defined storage

Inflow Area = 76,785 sf, 82.96% Impervious, Inflow Depth = 11.49" for 100-Year_2100 event
 Inflow = 24.36 cfs @ 12.10 hrs, Volume= 73,524 cf
 Outflow = 6.12 cfs @ 12.32 hrs, Volume= 73,524 cf, Atten= 75%, Lag= 13.3 min
 Primary = 0.26 cfs @ 12.32 hrs, Volume= 55,446 cf
 Routed to Pond 8P : Existing Basin 1
 Secondary = 5.86 cfs @ 12.32 hrs, Volume= 18,078 cf
 Routed to Pond 8P : Existing Basin 1

Routing by Stor-Ind method, Time Span= 0.00-150.00 hrs, dt= 0.02 hrs
 Peak Elev= 98.24' @ 12.32 hrs Surf.Area= 20,165 sf Storage= 38,636 cf

Plug-Flow detention time= 1,131.1 min calculated for 73,514 cf (100% of inflow)
 Center-of-Mass det. time= 1,131.4 min (1,873.7 - 742.3)

Volume	Invert	Avail.Storage	Storage Description
#1	97.00'	2,054 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
#2A	94.50'	14,875 cf	144.00'W x 117.54'L x 3.50'H Field A 59,238 cf Overall - 22,051 cf Embedded = 37,187 cf x 40.0% Voids
#3A	95.00'	22,051 cf	ADS_StormTech SC-740 +Cap x 480 Inside #2 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 480 Chambers in 30 Rows
		38,980 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
97.00	3,240	0.0	0	0
97.67	3,240	35.0	760	760
97.83	3,240	15.0	78	838
98.00	3,240	15.0	83	920
98.35	3,240	100.0	1,134	2,054

Device	Routing	Invert	Outlet Devices
#1	Primary	92.07'	2.0" Vert. Restriction Orifice C= 0.600 Limited to weir flow at low heads
#2	Device 1	92.17'	6.0" Round 6" HDPE Underdrain L= 359.0' Ke= 0.500 Inlet / Outlet Invert= 92.17' / 90.37' S= 0.0050 ' S= 0.0050 ' Cc= 0.900 n= 0.020 Corrugated PE, corrugated interior, Flow Area= 0.20 sf
#3	Device 2	92.17'	0.9" x 0.1" Horiz. Perforations X 400.00 columns X 3 rows C= 0.600 Limited to weir flow at low heads
#4	Secondary	98.00'	19.0' long x 2.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Primary OutFlow Max=0.26 cfs @ 12.32 hrs HW=98.24' (Free Discharge)

↑1=**Restriction Orifice** (Orifice Controls 0.26 cfs @ 11.88 fps)

↑2=**6" HDPE Underdrain** (Passes 0.26 cfs of 0.47 cfs potential flow)

↑3=**Perforations** (Passes 0.26 cfs of 8.90 cfs potential flow)

Secondary OutFlow Max=5.84 cfs @ 12.32 hrs HW=98.24' (Free Discharge)

↑4=**Broad-Crested Rectangular Weir** (Weir Controls 5.84 cfs @ 1.26 fps)

Pond 6P: PP (w/ underdrain) w/ UG storage 3 - Chamber Wizard Field A

Chamber Model = ADS_StormTech SC-740 +Cap (ADS StormTech® SC-740 with cap length)

Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf

Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap

51.0" Wide + 6.0" Spacing = 57.0" C-C Row Spacing

16 Chambers/Row x 7.12' Long +0.81' Cap Length x 2 = 115.54' Row Length +12.0" End Stone x 2 = 117.54' Base Length

30 Rows x 51.0" Wide + 6.0" Spacing x 29 + 12.0" Side Stone x 2 = 144.00' Base Width

6.0" Stone Base + 30.0" Chamber Height + 6.0" Stone Cover = 3.50' Field Height

480 Chambers x 45.9 cf = 22,051.2 cf Chamber Storage

59,238.5 cf Field - 22,051.2 cf Chambers = 37,187.3 cf Stone x 40.0% Voids = 14,874.9 cf Stone Storage

Chamber Storage + Stone Storage = 36,926.1 cf = 0.848 af

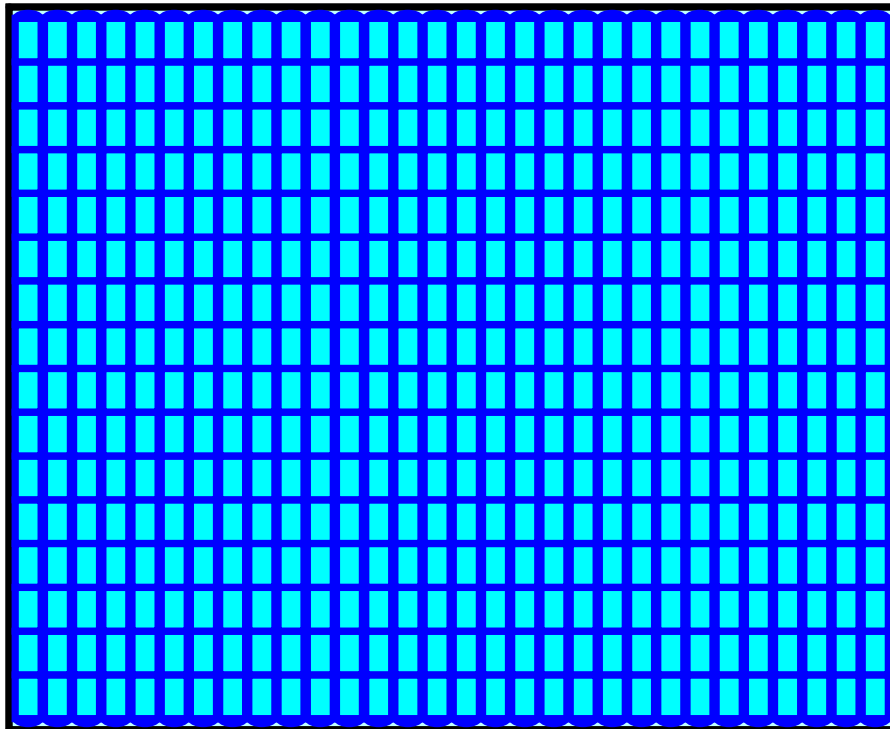
Overall Storage Efficiency = 62.3%

Overall System Size = 117.54' x 144.00' x 3.50'

480 Chambers

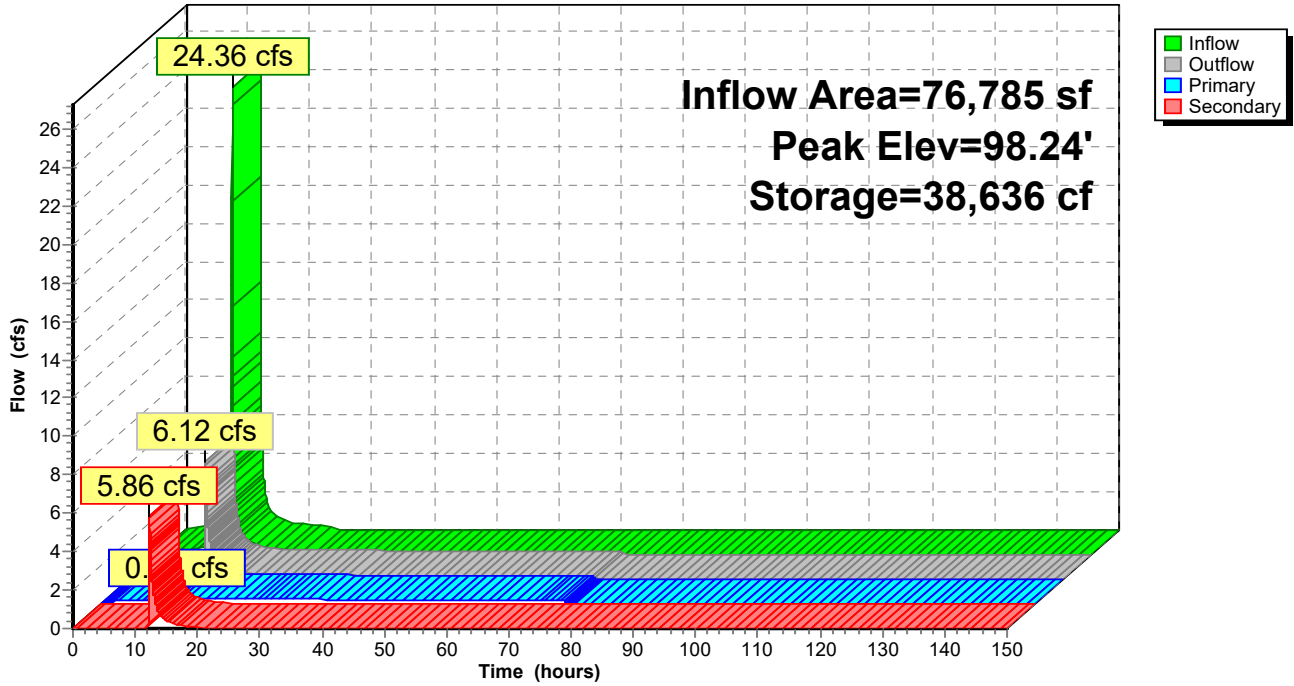
2,194.0 cy Field

1,377.3 cy Stone



Pond 6P: PP (w/ underdrain) w/ UG storage 3

Hydrograph



Summary for Pond 7P: PP (w/ underdrain) w/ UG storage 4

[44] Hint: Outlet device #3 is below defined storage

Inflow Area = 120,233 sf, 94.05% Impervious, Inflow Depth = 11.75" for 100-Year_2100 event
 Inflow = 38.22 cfs @ 12.10 hrs, Volume= 117,771 cf
 Outflow = 10.03 cfs @ 12.31 hrs, Volume= 117,771 cf, Atten= 74%, Lag= 12.2 min
 Primary = 0.48 cfs @ 12.31 hrs, Volume= 90,166 cf
 Routed to Pond 8P : Existing Basin 1
 Secondary = 9.55 cfs @ 12.31 hrs, Volume= 27,605 cf
 Routed to Pond 8P : Existing Basin 1

Routing by Stor-Ind method, Time Span= 0.00-150.00 hrs, dt= 0.02 hrs
 Peak Elev= 98.34' @ 12.31 hrs Surf.Area= 30,822 sf Storage= 60,099 cf

Plug-Flow detention time= 973.7 min calculated for 117,755 cf (100% of inflow)
 Center-of-Mass det. time= 973.9 min (1,711.4 - 737.5)

Volume	Invert	Avail.Storage	Storage Description
#1	97.00'	2,980 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
#2A	94.50'	22,825 cf	163.00'W x 160.26'L x 3.50'H Field A 91,426 cf Overall - 34,363 cf Embedded = 57,063 cf x 40.0% Voids
#3A	95.00'	34,363 cf	ADS_StormTech SC-740 +Cap x 748 Inside #2 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 748 Chambers in 34 Rows
		60,168 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
97.00	4,700	0.0	0	0
97.67	4,700	35.0	1,102	1,102
97.83	4,700	15.0	113	1,215
98.00	4,700	15.0	120	1,335
98.35	4,700	100.0	1,645	2,980

Device	Routing	Invert	Outlet Devices
#1	Primary	92.07'	3.0" Vert. Restriction Orifice C= 0.600 Limited to weir flow at low heads
#2	Device 1	92.17'	6.0" Round 6" HDPE Underdrain L= 359.0' Ke= 0.500 Inlet / Outlet Invert= 92.17' / 90.37' S= 0.0050 ' S= 0.0050 ' Cc= 0.900 n= 0.020 Corrugated PE, corrugated interior, Flow Area= 0.20 sf
#3	Device 2	92.17'	0.9" x 0.1" Horiz. Perforations X 400.00 columns X 3 rows C= 0.600 Limited to weir flow at low heads
#4	Secondary	98.00'	19.0' long x 2.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Primary OutFlow Max=0.48 cfs @ 12.31 hrs HW=98.33' (Free Discharge)

↑**1=Restriction Orifice** (Passes 0.48 cfs of 0.59 cfs potential flow)

↑**2=6" HDPE Underdrain** (Outlet Controls 0.48 cfs @ 2.42 fps)

↑**3=Perforations** (Passes 0.48 cfs of 8.97 cfs potential flow)

Secondary OutFlow Max=9.51 cfs @ 12.31 hrs HW=98.33' (Free Discharge)

↑**4=Broad-Crested Rectangular Weir** (Weir Controls 9.51 cfs @ 1.50 fps)

Pond 7P: PP (w/ underdrain) w/ UG storage 4 - Chamber Wizard Field A

Chamber Model = ADS_StormTech SC-740 +Cap (ADS StormTech® SC-740 with cap length)

Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf

Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap

51.0" Wide + 6.0" Spacing = 57.0" C-C Row Spacing

22 Chambers/Row x 7.12' Long +0.81' Cap Length x 2 = 158.26' Row Length +12.0" End Stone x 2 = 160.26' Base Length

34 Rows x 51.0" Wide + 6.0" Spacing x 33 + 12.0" Side Stone x 2 = 163.00' Base Width

6.0" Stone Base + 30.0" Chamber Height + 6.0" Stone Cover = 3.50' Field Height

748 Chambers x 45.9 cf = 34,363.1 cf Chamber Storage

91,426.4 cf Field - 34,363.1 cf Chambers = 57,063.3 cf Stone x 40.0% Voids = 22,825.3 cf Stone Storage

Chamber Storage + Stone Storage = 57,188.5 cf = 1.313 af

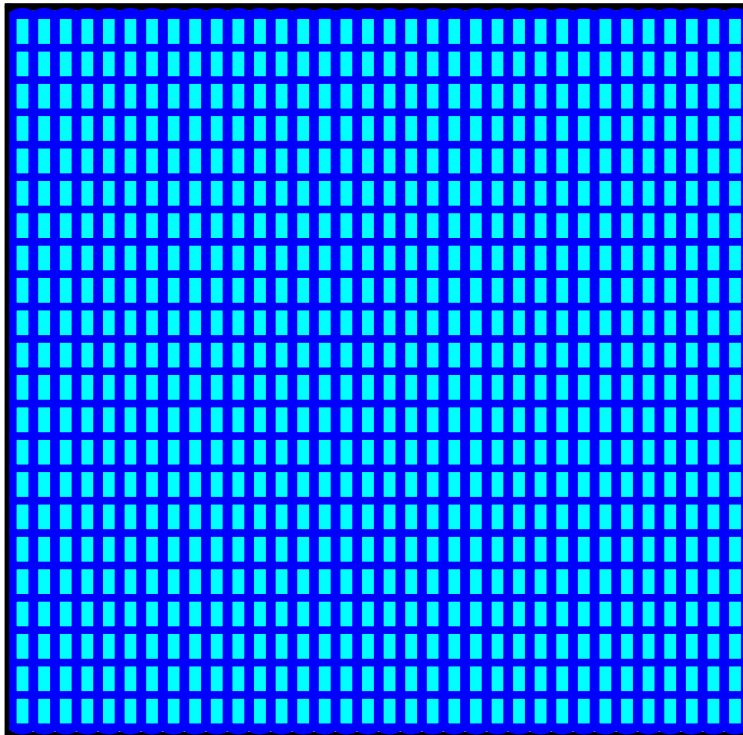
Overall Storage Efficiency = 62.6%

Overall System Size = 160.26' x 163.00' x 3.50'

748 Chambers

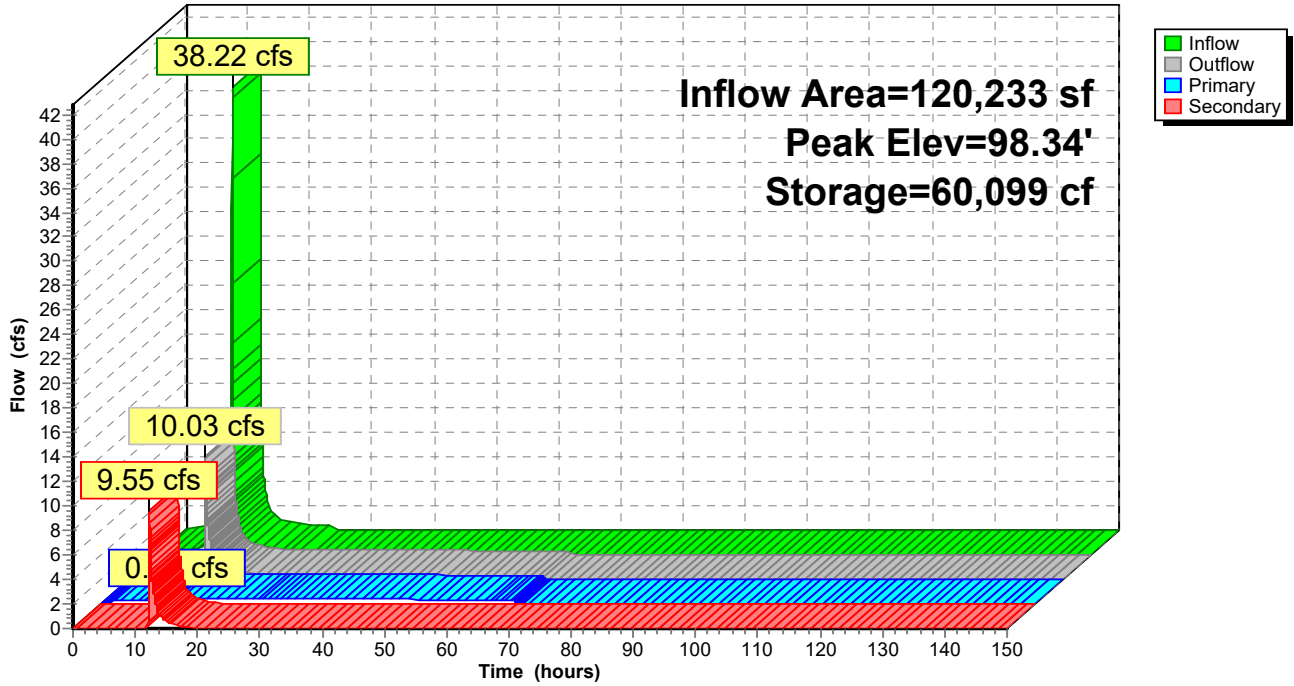
3,386.2 cy Field

2,113.5 cy Stone



Pond 7P: PP (w/ underdrain) w/ UG storage 4

Hydrograph



Summary for Pond 8P: Existing Basin 1

Inflow Area = 444,913 sf, 80.94% Impervious, Inflow Depth = 11.36" for 100-Year_2100 event
 Inflow = 36.28 cfs @ 12.10 hrs, Volume= 421,270 cf
 Outflow = 24.83 cfs @ 12.51 hrs, Volume= 421,271 cf, Atten= 32%, Lag= 24.5 min
 Primary = 20.17 cfs @ 12.51 hrs, Volume= 413,133 cf
 Secondary = 4.40 cfs @ 12.51 hrs, Volume= 8,044 cf
 Routed to nonexistent node 67L
 Tertiary = 0.27 cfs @ 12.51 hrs, Volume= 94 cf
 Routed to nonexistent node 67L

Routing by Stor-Ind method, Time Span= 0.00-150.00 hrs, dt= 0.02 hrs / 2
 Peak Elev= 60.78' @ 12.51 hrs Surf.Area= 16,975 sf Storage= 25,375 cf

Plug-Flow detention time= 16.0 min calculated for 421,215 cf (100% of inflow)
 Center-of-Mass det. time= 16.0 min (1,423.9 - 1,407.9)

Volume	Invert	Avail.Storage	Storage Description
#1	58.00'	33,881 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
58.00	1,339	0	0
59.00	7,134	4,237	4,237
60.00	12,352	9,743	13,980
61.00	18,300	15,326	29,306
61.25	18,300	4,575	33,881

Device	Routing	Invert	Outlet Devices
#1	Primary	58.00'	24.0" Vert. Low Flow Orifice C= 0.600 Limited to weir flow at low heads
#2	Secondary	60.00'	24.0" W x 18.0" H Vert. 2-YR Orifice C= 0.600 Limited to weir flow at low heads
#3	Tertiary	60.75'	48.0" x 48.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#4	Tertiary	61.00'	100.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)

Primary OutFlow Max=20.16 cfs @ 12.51 hrs HW=60.78' (Free Discharge)

↑1=**Low Flow Orifice** (Orifice Controls 20.16 cfs @ 6.42 fps)

Secondary OutFlow Max=4.40 cfs @ 12.51 hrs HW=60.78' (Free Discharge)

↑2=**2-YR Orifice** (Orifice Controls 4.40 cfs @ 2.83 fps)

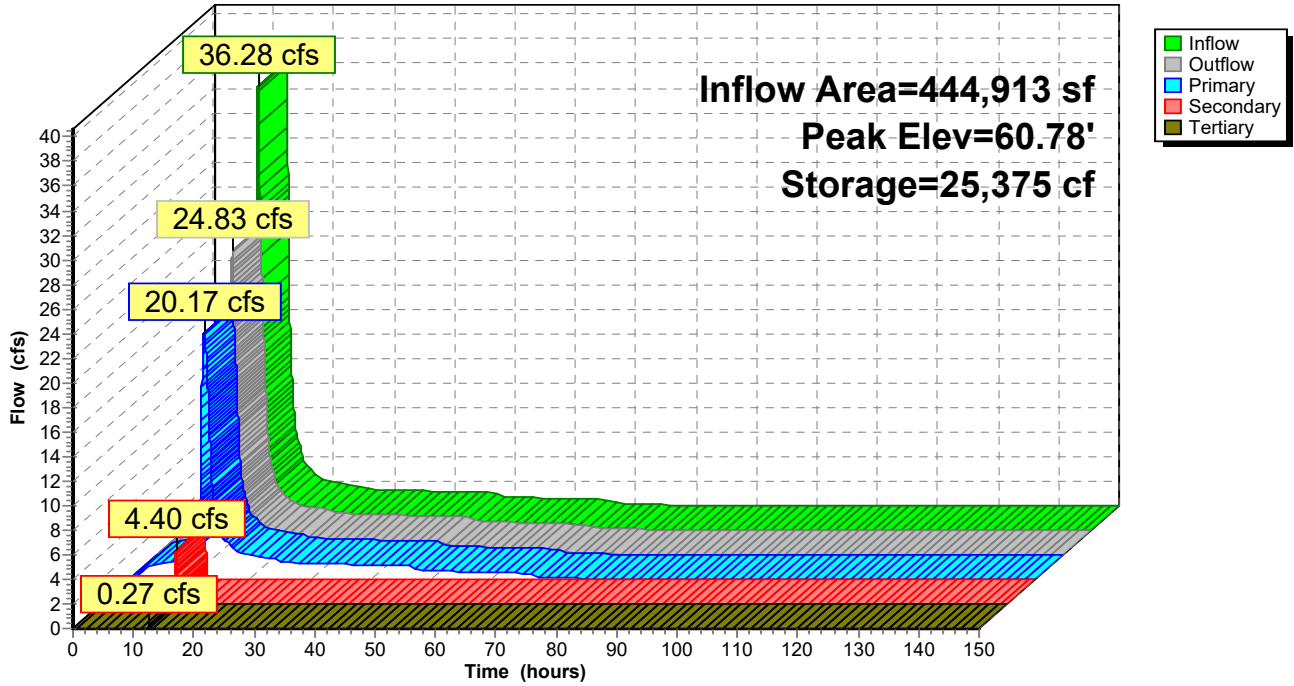
Tertiary OutFlow Max=0.23 cfs @ 12.51 hrs HW=60.78' (Free Discharge)

↑3=**Orifice/Grate** (Weir Controls 0.23 cfs @ 0.54 fps)

↑4=**Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 8P: Existing Basin 1

Hydrograph



Summary for Pond 9P: Existing Basin 2

<https://hydro.rutgers.edu/view-project/100596/>

Inflow Area = 59,019 sf, 68.70% Impervious, Inflow Depth = 11.10" for 100-Year_2100 event
 Inflow = 18.62 cfs @ 12.09 hrs, Volume= 54,580 cf
 Outflow = 17.30 cfs @ 12.12 hrs, Volume= 54,582 cf, Atten= 7%, Lag= 1.3 min
 Primary = 0.44 cfs @ 12.12 hrs, Volume= 23,554 cf
 Secondary = 2.69 cfs @ 12.12 hrs, Volume= 19,921 cf
 Tertiary = 14.17 cfs @ 12.12 hrs, Volume= 11,108 cf

Routing by Stor-Ind method, Time Span= 0.00-150.00 hrs, dt= 0.02 hrs / 2
 Peak Elev= 68.17' @ 12.12 hrs Surf.Area= 6,038 sf Storage= 11,343 cf

Plug-Flow detention time= 76.6 min calculated for 54,575 cf (100% of inflow)
 Center-of-Mass det. time= 76.6 min (825.9 - 749.3)

Volume	Invert	Avail.Storage	Storage Description
#1	64.60'	13,401 cf	Custom Stage Data (Prismatic) Listed below

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
64.60	0	0	0
65.00	647	129	129
66.00	2,768	1,708	1,837
68.00	5,693	8,461	10,298
68.50	6,718	3,103	13,401

Device	Routing	Invert	Outlet Devices
#1	Primary	64.60'	3.0" Vert. 3" Orifice C= 0.600 Limited to weir flow at low heads
#2	Secondary	66.40'	0.7' long 8" Sharp-Crested Rectangular Weir 2 End Contraction(s)
#3	Tertiary	67.75'	48.0" x 48.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads

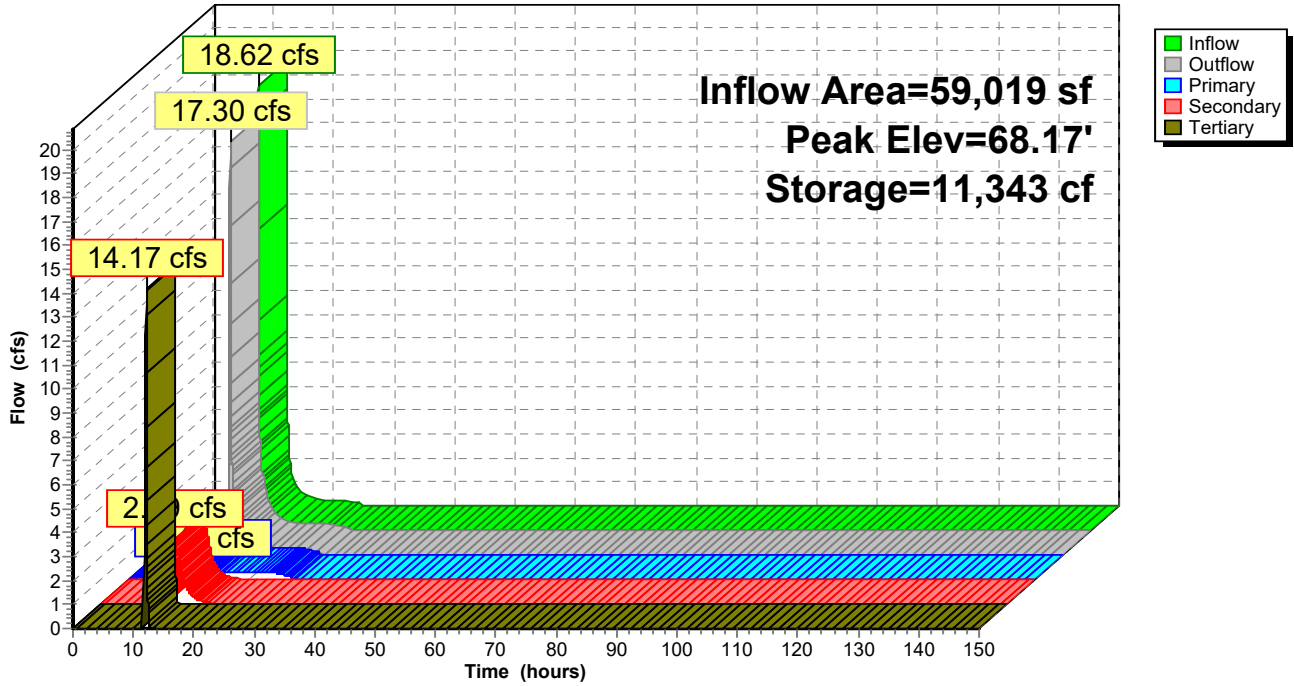
Primary OutFlow Max=0.44 cfs @ 12.12 hrs HW=68.17' (Free Discharge)
 ↖1=3" Orifice (Orifice Controls 0.44 cfs @ 8.93 fps)

Secondary OutFlow Max=2.69 cfs @ 12.12 hrs HW=68.17' (Free Discharge)
 ↖2=8" Sharp-Crested Rectangular Weir (Weir Controls 2.69 cfs @ 4.35 fps)

Tertiary OutFlow Max=14.05 cfs @ 12.12 hrs HW=68.17' (Free Discharge)
 ↖3=Orifice/Grate (Weir Controls 14.05 cfs @ 2.11 fps)

Pond 9P: Existing Basin 2

Hydrograph



Summary for Pond 10P: PP (w/ underdrain) w/ UG storage 5

[44] Hint: Outlet device #3 is below defined storage

Inflow Area = 48,527 sf, 85.53% Impervious, Inflow Depth = 11.45" for 100-Year_2100 event
 Inflow = 14.25 cfs @ 12.13 hrs, Volume= 46,314 cf
 Outflow = 13.84 cfs @ 12.16 hrs, Volume= 46,314 cf, Atten= 3%, Lag= 2.3 min
 Primary = 0.47 cfs @ 12.17 hrs, Volume= 35,237 cf
 Routed to Pond 13P : Bioretention Basin 4
 Secondary = 13.37 cfs @ 12.16 hrs, Volume= 11,077 cf
 Routed to Pond 13P : Bioretention Basin 4

Routing by Stor-Ind method, Time Span= 0.00-150.00 hrs, dt= 0.02 hrs
 Peak Elev= 98.10' @ 12.17 hrs Surf.Area= 11,632 sf Storage= 14,807 cf

Plug-Flow detention time= 221.2 min calculated for 46,314 cf (100% of inflow)
 Center-of-Mass det. time= 221.2 min (965.4 - 744.2)

Volume	Invert	Avail.Storage	Storage Description
#1	97.00'	3,687 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
#2A	94.50'	5,184 cf	34.75'W x 167.38'L x 3.50'H Field A 20,357 cf Overall - 7,396 cf Embedded = 12,961 cf x 40.0% Voids
#3A	95.00'	7,396 cf	ADS_StormTech SC-740 +Cap x 161 Inside #2 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 161 Chambers in 7 Rows
		16,268 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
97.00	5,816	0.0	0	0
97.67	5,816	35.0	1,364	1,364
97.83	5,816	15.0	140	1,503
98.00	5,816	15.0	148	1,652
98.35	5,816	100.0	2,036	3,687

Device	Routing	Invert	Outlet Devices
#1	Primary	92.07'	3.0" Vert. Restriction Orifice C= 0.600 Limited to weir flow at low heads
#2	Device 1	92.17'	6.0" Round 6" HDPE Underdrain L= 359.0' Ke= 0.500 Inlet / Outlet Invert= 92.17' / 90.37' S= 0.0050 ' S= 0.0050 ' Cc= 0.900 n= 0.020 Corrugated PE, corrugated interior, Flow Area= 0.20 sf
#3	Device 2	92.17'	0.9" x 0.1" Horiz. Perforations X 400.00 columns X 3 rows C= 0.600 Limited to weir flow at low heads
#4	Secondary	98.00'	168.0' long x 2.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Primary OutFlow Max=0.47 cfs @ 12.17 hrs HW=98.09' (Free Discharge)

↑**1=Restriction Orifice** (Passes 0.47 cfs of 0.57 cfs potential flow)

↑**2=6" HDPE Underdrain** (Outlet Controls 0.47 cfs @ 2.38 fps)

↑**3=Perforations** (Passes 0.47 cfs of 8.79 cfs potential flow)

Secondary OutFlow Max=12.42 cfs @ 12.16 hrs HW=98.09' (Free Discharge)

↑**4=Broad-Crested Rectangular Weir** (Weir Controls 12.42 cfs @ 0.78 fps)

Pond 10P: PP (w/ underdrain) w/ UG storage 5 - Chamber Wizard Field A

Chamber Model = ADS_StormTech SC-740 +Cap (ADS StormTech® SC-740 with cap length)

Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf

Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap

51.0" Wide + 6.0" Spacing = 57.0" C-C Row Spacing

23 Chambers/Row x 7.12' Long +0.81' Cap Length x 2 = 165.38' Row Length +12.0" End Stone x 2 = 167.38' Base Length

7 Rows x 51.0" Wide + 6.0" Spacing x 6 + 12.0" Side Stone x 2 = 34.75' Base Width

6.0" Stone Base + 30.0" Chamber Height + 6.0" Stone Cover = 3.50' Field Height

161 Chambers x 45.9 cf = 7,396.3 cf Chamber Storage

20,357.2 cf Field - 7,396.3 cf Chambers = 12,960.8 cf Stone x 40.0% Voids = 5,184.3 cf Stone Storage

Chamber Storage + Stone Storage = 12,580.7 cf = 0.289 af

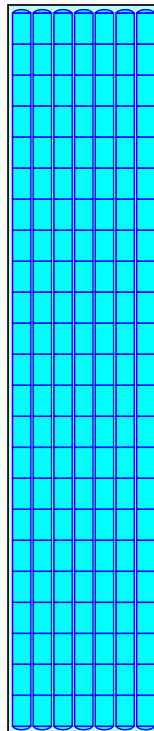
Overall Storage Efficiency = 61.8%

Overall System Size = 167.38' x 34.75' x 3.50'

161 Chambers

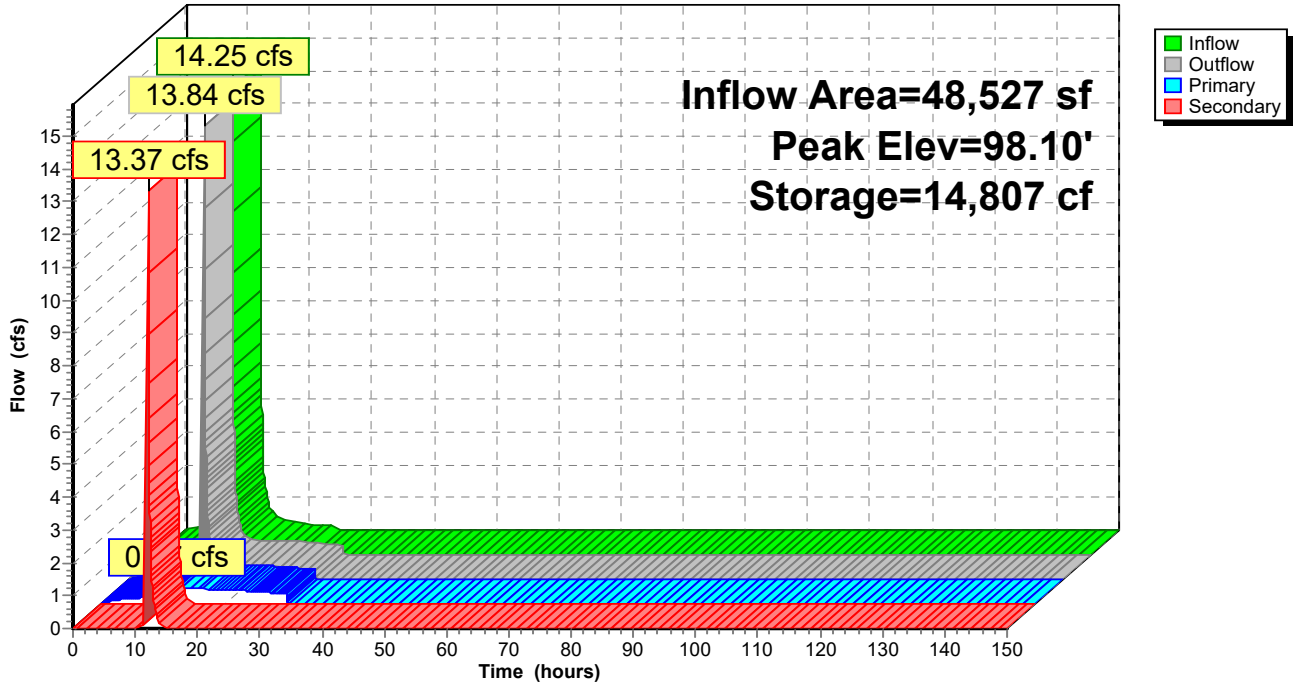
754.0 cy Field

480.0 cy Stone



Pond 10P: PP (w/ underdrain) w/ UG storage 5

Hydrograph



Summary for Pond 11P: PP (w/ underdrain) w/ UG storage 6

[44] Hint: Outlet device #3 is below defined storage

Inflow Area = 57,652 sf, 78.51% Impervious, Inflow Depth = 11.29" for 100-Year_2100 event
 Inflow = 18.47 cfs @ 12.09 hrs, Volume= 54,251 cf
 Outflow = 15.97 cfs @ 12.14 hrs, Volume= 54,251 cf, Atten= 14%, Lag= 2.8 min
 Primary = 0.47 cfs @ 12.14 hrs, Volume= 42,376 cf
 Routed to Pond 13P : Bioretention Basin 4
 Secondary = 15.50 cfs @ 12.14 hrs, Volume= 11,875 cf
 Routed to Pond 13P : Bioretention Basin 4

Routing by Stor-Ind method, Time Span= 0.00-150.00 hrs, dt= 0.02 hrs
 Peak Elev= 98.11' @ 12.14 hrs Surf.Area= 11,976 sf Storage= 19,976 cf

Plug-Flow detention time= 324.1 min calculated for 54,251 cf (100% of inflow)
 Center-of-Mass det. time= 324.1 min (1,068.6 - 744.5)

Volume	Invert	Avail.Storage	Storage Description
#1	97.00'	2,144 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
#2A	94.50'	7,621 cf	96.50'W x 89.06'L x 3.50'H Field A 30,079 cf Overall - 11,026 cf Embedded = 19,053 cf x 40.0% Voids
#3A	95.00'	11,026 cf	ADS_StormTech SC-740 +Cap x 240 Inside #2 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 240 Chambers in 20 Rows
		20,791 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
97.00	3,382	0.0	0	0
97.67	3,382	35.0	793	793
97.83	3,382	15.0	81	874
98.00	3,382	15.0	86	960
98.35	3,382	100.0	1,184	2,144

Device	Routing	Invert	Outlet Devices
#1	Primary	92.07'	3.0" Vert. Restriction Orifice C= 0.600 Limited to weir flow at low heads
#2	Device 1	92.17'	6.0" Round 6" HDPE Underdrain L= 359.0' Ke= 0.500 Inlet / Outlet Invert= 92.17' / 90.37' S= 0.0050 ' S= 0.0050 ' Cc= 0.900 n= 0.020 Corrugated PE, corrugated interior, Flow Area= 0.20 sf
#3	Device 2	92.17'	0.9" x 0.1" Horiz. Perforations X 400.00 columns X 3 rows C= 0.600 Limited to weir flow at low heads
#4	Secondary	98.00'	168.0' long x 2.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Primary OutFlow Max=0.47 cfs @ 12.14 hrs HW=98.11' (Free Discharge)

↑**1=Restriction Orifice** (Passes 0.47 cfs of 0.57 cfs potential flow)

↑**2=6" HDPE Underdrain** (Outlet Controls 0.47 cfs @ 2.38 fps)

↑**3=Perforations** (Passes 0.47 cfs of 8.80 cfs potential flow)

Secondary OutFlow Max=15.20 cfs @ 12.14 hrs HW=98.11' (Free Discharge)

↑**4=Broad-Crested Rectangular Weir** (Weir Controls 15.20 cfs @ 0.84 fps)

Pond 11P: PP (w/ underdrain) w/ UG storage 6 - Chamber Wizard Field A

Chamber Model = ADS_StormTech SC-740 +Cap (ADS StormTech® SC-740 with cap length)

Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf

Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap

51.0" Wide + 6.0" Spacing = 57.0" C-C Row Spacing

12 Chambers/Row x 7.12' Long +0.81' Cap Length x 2 = 87.06' Row Length +12.0" End Stone x 2 = 89.06' Base Length

20 Rows x 51.0" Wide + 6.0" Spacing x 19 + 12.0" Side Stone x 2 = 96.50' Base Width

6.0" Stone Base + 30.0" Chamber Height + 6.0" Stone Cover = 3.50' Field Height

240 Chambers x 45.9 cf = 11,025.6 cf Chamber Storage

30,078.9 cf Field - 11,025.6 cf Chambers = 19,053.3 cf Stone x 40.0% Voids = 7,621.3 cf Stone Storage

Chamber Storage + Stone Storage = 18,646.9 cf = 0.428 af

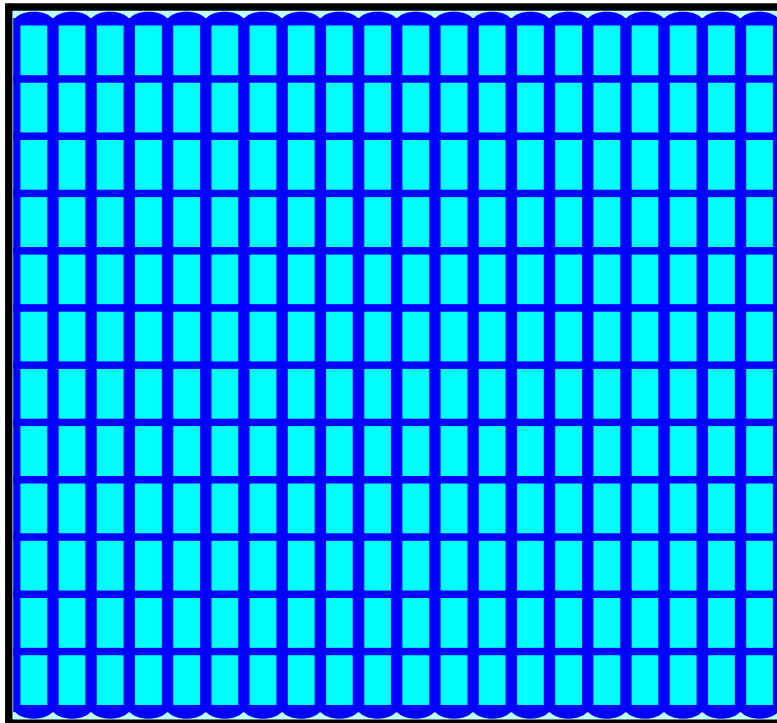
Overall Storage Efficiency = 62.0%

Overall System Size = 89.06' x 96.50' x 3.50'

240 Chambers

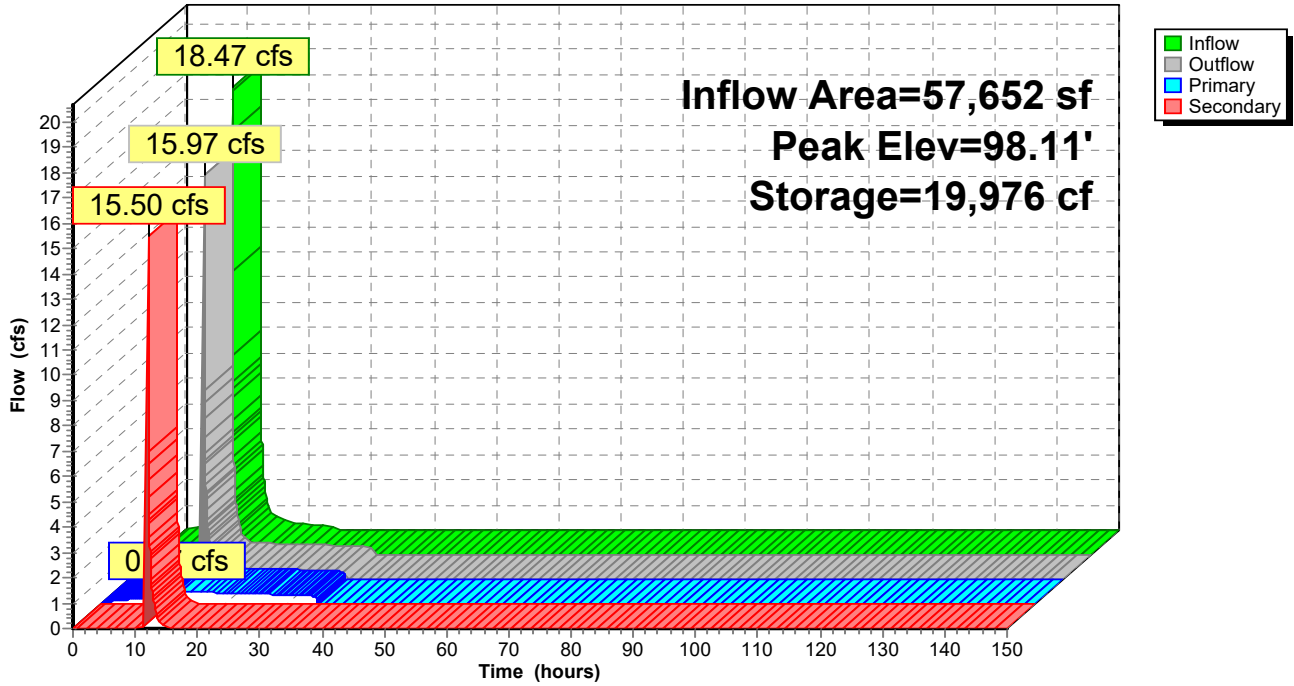
1,114.0 cy Field

705.7 cy Stone



Pond 11P: PP (w/ underdrain) w/ UG storage 6

Hydrograph



Summary for Pond 12P: PP (w/ underdrain) w/ UG storage 7

[44] Hint: Outlet device #3 is below defined storage

[85] Warning: Oscillations may require smaller dt or Finer Routing (severity=2)

Inflow Area = 67,756 sf, 72.56% Impervious, Inflow Depth = 11.16" for 100-Year _2100 event
 Inflow = 21.35 cfs @ 12.10 hrs, Volume= 63,011 cf
 Outflow = 18.42 cfs @ 12.16 hrs, Volume= 63,011 cf, Atten= 14%, Lag= 3.9 min
 Primary = 0.47 cfs @ 12.16 hrs, Volume= 49,575 cf
 Routed to Pond 13P : Bioretention Basin 4
 Secondary = 17.96 cfs @ 12.16 hrs, Volume= 13,436 cf
 Routed to Pond 13P : Bioretention Basin 4

Routing by Stor-Ind method, Time Span= 0.00-150.00 hrs, dt= 0.02 hrs
 Peak Elev= 98.12' @ 12.16 hrs Surf.Area= 12,790 sf Storage= 25,262 cf

Plug-Flow detention time= 425.9 min calculated for 63,011 cf (100% of inflow)
 Center-of-Mass det. time= 425.8 min (1,173.6 - 747.7)

Volume	Invert	Avail.Storage	Storage Description
#1	97.00'	935 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
#2A	94.50'	9,962 cf	77.50'W x 146.02'L x 3.50'H Field A 39,607 cf Overall - 14,701 cf Embedded = 24,906 cf x 40.0% Voids
#3A	95.00'	14,701 cf	ADS_StormTech SC-740 +Cap x 320 Inside #2 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 320 Chambers in 16 Rows
		25,598 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
97.00	1,474	0.0	0	0
97.67	1,474	35.0	346	346
97.83	1,474	15.0	35	381
98.00	1,474	15.0	38	419
98.35	1,474	100.0	516	935

Device	Routing	Invert	Outlet Devices
#1	Primary	92.07'	3.0" Vert. Restriction Orifice C= 0.600 Limited to weir flow at low heads
#2	Device 1	92.17'	6.0" Round 6" HDPE Underdrain L= 359.0' Ke= 0.500 Inlet / Outlet Invert= 92.17' / 90.37' S= 0.0050 ' S= 0.0050 ' Cc= 0.900 n= 0.020 Corrugated PE, corrugated interior, Flow Area= 0.20 sf
#3	Device 2	92.17'	0.9" x 0.1" Horiz. Perforations X 400.00 columns X 3 rows C= 0.600 Limited to weir flow at low heads
#4	Secondary	98.00'	168.0' long x 2.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Primary OutFlow Max=0.47 cfs @ 12.16 hrs HW=98.11' (Free Discharge)

↑**1=Restriction Orifice** (Passes 0.47 cfs of 0.57 cfs potential flow)

↑**2=6" HDPE Underdrain** (Outlet Controls 0.47 cfs @ 2.38 fps)

↑**3=Perforations** (Passes 0.47 cfs of 8.80 cfs potential flow)

Secondary OutFlow Max=16.94 cfs @ 12.16 hrs HW=98.12' (Free Discharge)

↑**4=Broad-Crested Rectangular Weir** (Weir Controls 16.94 cfs @ 0.87 fps)

Pond 12P: PP (w/ underdrain) w/ UG storage 7 - Chamber Wizard Field A

Chamber Model = ADS_StormTech SC-740 +Cap (ADS StormTech® SC-740 with cap length)

Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf

Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap

51.0" Wide + 6.0" Spacing = 57.0" C-C Row Spacing

20 Chambers/Row x 7.12' Long +0.81' Cap Length x 2 = 144.02' Row Length +12.0" End Stone x 2 = 146.02' Base Length

16 Rows x 51.0" Wide + 6.0" Spacing x 15 + 12.0" Side Stone x 2 = 77.50' Base Width

6.0" Stone Base + 30.0" Chamber Height + 6.0" Stone Cover = 3.50' Field Height

320 Chambers x 45.9 cf = 14,700.8 cf Chamber Storage

39,607.0 cf Field - 14,700.8 cf Chambers = 24,906.2 cf Stone x 40.0% Voids = 9,962.5 cf Stone Storage

Chamber Storage + Stone Storage = 24,663.3 cf = 0.566 af

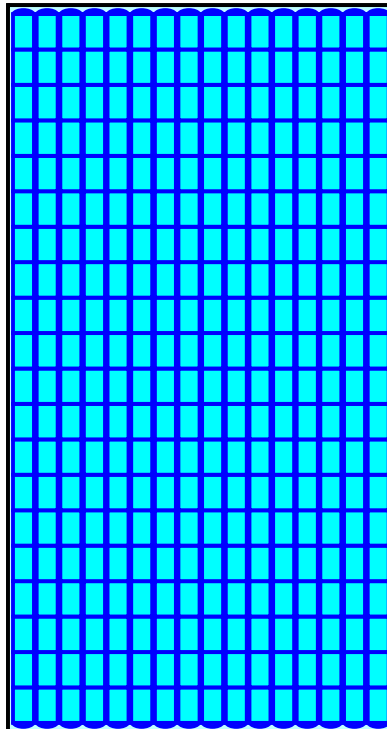
Overall Storage Efficiency = 62.3%

Overall System Size = 146.02' x 77.50' x 3.50'

320 Chambers

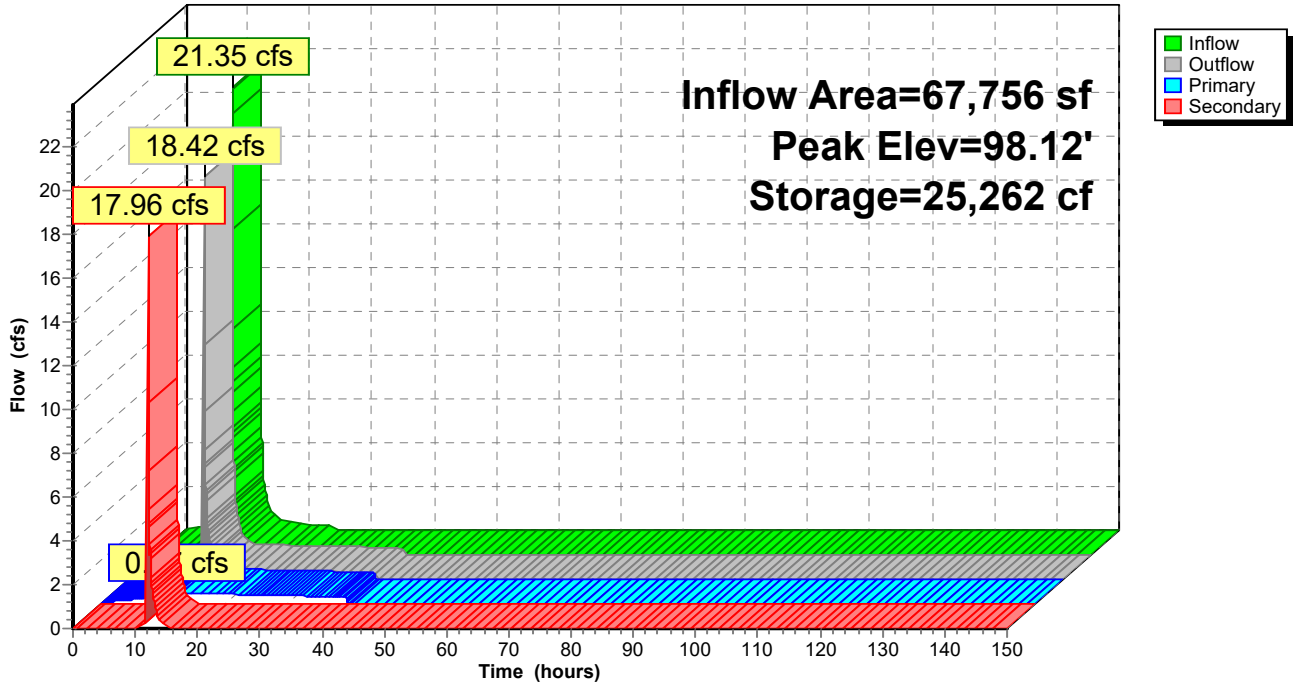
1,466.9 cy Field

922.5 cy Stone



Pond 12P: PP (w/ underdrain) w/ UG storage 7

Hydrograph



Summary for Pond 13P: Bioretention Basin 4

Inflow Area = 329,976 sf, 48.67% Impervious, Inflow Depth = 10.33" for 100-Year_2100 event
 Inflow = 55.02 cfs @ 12.16 hrs, Volume= 283,942 cf
 Outflow = 40.30 cfs @ 12.24 hrs, Volume= 282,681 cf, Atten= 27%, Lag= 4.7 min
 Primary = 0.42 cfs @ 12.24 hrs, Volume= 53,654 cf
 Routed to nonexistent node 5R
 Secondary = 12.42 cfs @ 12.24 hrs, Volume= 178,726 cf
 Routed to nonexistent node 5R
 Tertiary = 27.45 cfs @ 12.24 hrs, Volume= 50,300 cf
 Routed to nonexistent node 5R

Routing by Stor-Ind method, Time Span= 0.00-150.00 hrs, dt= 0.02 hrs / 2
 Peak Elev= 52.56' @ 12.24 hrs Surf.Area= 10,478 sf Storage= 28,791 cf

Plug-Flow detention time= 139.7 min calculated for 282,681 cf (100% of inflow)
 Center-of-Mass det. time= 133.5 min (1,097.5 - 964.0)

Volume	Invert	Avail.Storage	Storage Description
#1	49.00'	33,395 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
49.00	4,800	0	0
52.00	10,478	22,917	22,917
53.00	10,478	10,478	33,395

Device	Routing	Invert	Outlet Devices
#1	Primary	49.25'	3.0" Vert. Low Flow Orifice C= 0.600 Limited to weir flow at low heads
#2	Secondary	51.00'	24.0" W x 18.0" H Vert. SECONDARY OUTLET C= 0.600 Limited to weir flow at low heads
#3	Tertiary	52.00'	60.0" x 60.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.42 cfs @ 12.24 hrs HW=52.56' (Free Discharge)

↑**1=Low Flow Orifice** (Orifice Controls 0.42 cfs @ 8.59 fps)

Secondary OutFlow Max=12.42 cfs @ 12.24 hrs HW=52.56' (Free Discharge)

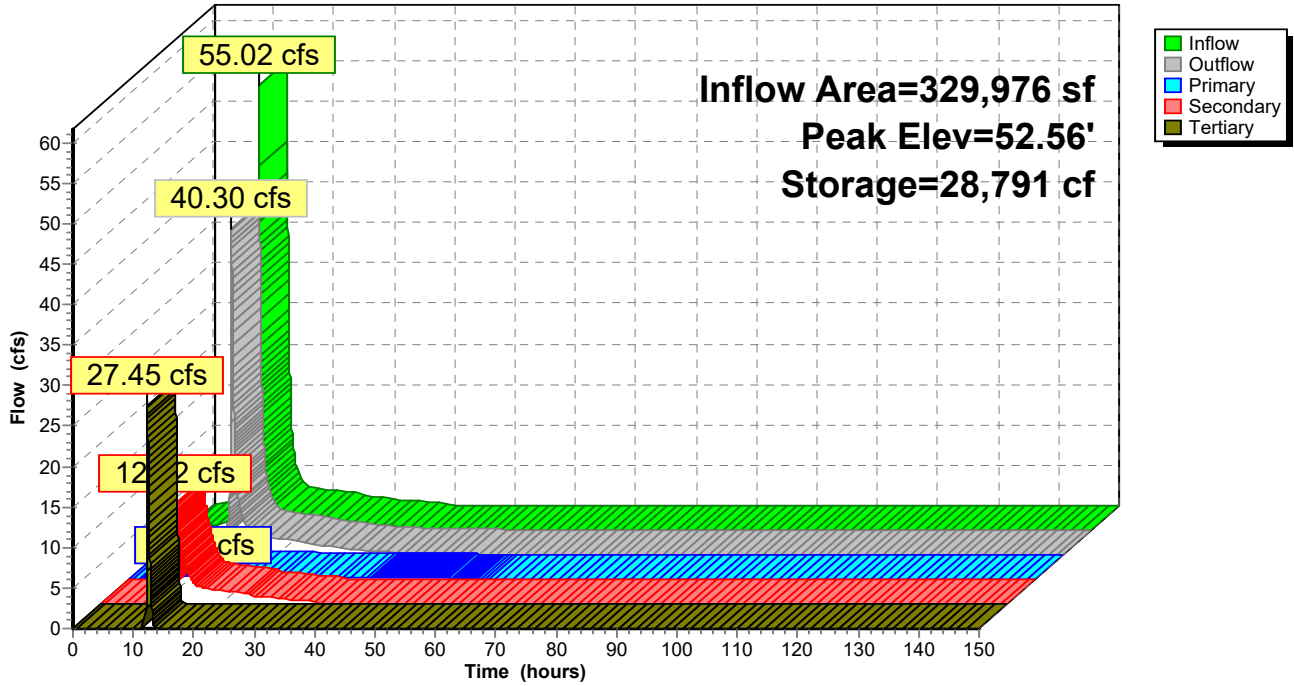
↑**2=SECONDARY OUTLET** (Orifice Controls 12.42 cfs @ 4.14 fps)

Tertiary OutFlow Max=27.44 cfs @ 12.24 hrs HW=52.56' (Free Discharge)

↑**3=Orifice/Grate** (Weir Controls 27.44 cfs @ 2.45 fps)

Pond 13P: Bioretention Basin 4

Hydrograph



Time span=0.00-150.00 hrs, dt=0.02 hrs, 7501 points
 Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious
 Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: DA 1: CN w/ IC areas	Runoff Area=141,085 sf 17.73% Impervious Runoff Depth=6.40" Tc=18.6 min CN=75/98 Runoff=17.42 cfs 75,286 cf
Subcatchment 2S: DA 2: CN w/ IC areas	Runoff Area=21,583 sf 64.54% Impervious Runoff Depth=7.85" Tc=1.4 min CN=78/98 Runoff=4.92 cfs 14,112 cf
Subcatchment 3S: DA 3: CN w/ IC areas	Runoff Area=40,101 sf 65.65% Impervious Runoff Depth=7.83" Tc=3.5 min CN=77/98 Runoff=8.88 cfs 26,170 cf
Subcatchment 4S: DA 4: CN w/ IC areas	Runoff Area=84,260 sf 73.22% Impervious Runoff Depth=8.02" Tc=3.2 min CN=77/98 Runoff=19.07 cfs 56,348 cf
Subcatchment 5S: DA 5: CN w/ IC areas	Runoff Area=52,282 sf 79.56% Impervious Runoff Depth=8.21" Tc=2.5 min CN=78/98 Runoff=12.25 cfs 35,779 cf
Subcatchment 6S: DA 6: CN w/ IC areas	Runoff Area=76,785 sf 82.96% Impervious Runoff Depth=8.32" Tc=3.2 min CN=79/98 Runoff=17.77 cfs 53,210 cf
Subcatchment 7S: DA 7: CN w/ IC areas	Runoff Area=120,233 sf 94.05% Impervious Runoff Depth=8.56" Tc=3.5 min CN=78/98 Runoff=28.04 cfs 85,814 cf
Subcatchment 8S: DA 8: CN w/ IC areas	Runoff Area=111,353 sf 71.87% Impervious Runoff Depth=7.85" Tc=2.0 min CN=73/98 Runoff=25.63 cfs 72,862 cf
Subcatchment 9S: DA 9: CN w/ IC areas	Runoff Area=59,019 sf 68.70% Impervious Runoff Depth=7.95" Tc=2.8 min CN=78/98 Runoff=13.46 cfs 39,088 cf
Subcatchment 10S: DA 10: CN w/ IC areas	Runoff Area=48,527 sf 85.53% Impervious Runoff Depth=8.29" Tc=5.8 min CN=74/98 Runoff=10.38 cfs 33,509 cf
Subcatchment 11S: DA 11: CN w/ IC areas	Runoff Area=57,652 sf 78.51% Impervious Runoff Depth=8.13" Tc=2.5 min CN=76/98 Runoff=13.41 cfs 39,077 cf
Subcatchment 12S: DA 12: CN w/ IC areas	Runoff Area=67,756 sf 72.56% Impervious Runoff Depth=8.01" Tc=2.9 min CN=77/98 Runoff=15.45 cfs 45,216 cf
Subcatchment 13S: DA 13: CN w/ IC areas	Runoff Area=156,041 sf 15.80% Impervious Runoff Depth=6.25" Tc=24.6 min CN=74/98 Runoff=16.52 cfs 81,215 cf
Pond 1P: Bioretention Basin 1	Peak Elev=65.46' Storage=21,262 cf Inflow=17.42 cfs 75,286 cf Primary=0.45 cfs 29,948 cf Secondary=11.30 cfs 45,339 cf Tertiary=0.00 cfs 0 cf Outflow=11.74 cfs 75,287 cf
Pond 2P: Bioretention Basin 2	Peak Elev=70.72' Storage=5,980 cf Inflow=4.92 cfs 14,112 cf Primary=0.36 cfs 12,259 cf Secondary=0.68 cfs 1,512 cf Tertiary=0.00 cfs 0 cf Outflow=1.04 cfs 13,771 cf
Pond 3P: Bioretention Basin 3	Peak Elev=67.30' Storage=9,437 cf Inflow=8.88 cfs 26,170 cf Primary=0.40 cfs 17,407 cf Secondary=4.57 cfs 8,302 cf Tertiary=0.00 cfs 0 cf Outflow=4.97 cfs 25,709 cf

Pond 4P: PP (w/ underdrain) w/ UG Peak Elev=97.93' Storage=33,697 cf Inflow=19.07 cfs 56,348 cf
Primary=0.46 cfs 56,348 cf Secondary=0.00 cfs 0 cf Outflow=0.46 cfs 56,348 cf

Pond 5P: PP (w/ underdrain) w/ UG Peak Elev=97.76' Storage=22,412 cf Inflow=12.25 cfs 35,779 cf
Primary=0.25 cfs 35,779 cf Secondary=0.00 cfs 0 cf Outflow=0.25 cfs 35,779 cf

Pond 6P: PP (w/ underdrain) w/ UG Peak Elev=97.93' Storage=37,362 cf Inflow=17.77 cfs 53,210 cf
Primary=0.25 cfs 53,210 cf Secondary=0.00 cfs 0 cf Outflow=0.25 cfs 53,210 cf

Pond 7P: PP (w/ underdrain) w/ UG Peak Elev=97.95' Storage=57,964 cf Inflow=28.04 cfs 85,814 cf
Primary=0.46 cfs 85,814 cf Secondary=0.00 cfs 0 cf Outflow=0.46 cfs 85,814 cf

Pond 8P: Existing Basin 1 Peak Elev=59.89' Storage=12,668 cf Inflow=26.84 cfs 304,013 cf
Primary=14.40 cfs 304,013 cf Secondary=0.00 cfs 0 cf Tertiary=0.00 cfs 0 cf Outflow=14.40 cfs 304,013 cf

Pond 9P: Existing Basin 2 Peak Elev=68.05' Storage=10,616 cf Inflow=13.46 cfs 39,088 cf
Primary=0.43 cfs 20,114 cf Secondary=2.57 cfs 14,376 cf Tertiary=8.66 cfs 4,595 cf Outflow=11.66 cfs 39,085 cf

Pond 10P: PP (w/ underdrain) w/ UG Peak Elev=98.02' Storage=14,344 cf Inflow=10.38 cfs 33,509 cf
Primary=0.46 cfs 31,168 cf Secondary=1.56 cfs 2,341 cf Outflow=2.02 cfs 33,509 cf

Pond 11P: PP (w/ underdrain) w/ UG Peak Elev=98.01' Storage=19,638 cf Inflow=13.41 cfs 39,077 cf
Primary=0.46 cfs 38,066 cf Secondary=0.62 cfs 1,012 cf Outflow=1.08 cfs 39,077 cf

Pond 12P: PP (w/ underdrain) w/ UG Peak Elev=98.00' Storage=25,088 cf Inflow=15.45 cfs 45,216 cf
Primary=0.46 cfs 45,056 cf Secondary=0.14 cfs 160 cf Outflow=0.60 cfs 45,216 cf

Pond 13P: Bioretention Basin 4 Peak Elev=52.24' Storage=25,461 cf Inflow=17.84 cfs 199,018 cf
Primary=0.40 cfs 50,099 cf Secondary=8.90 cfs 135,873 cf Tertiary=7.83 cfs 11,778 cf Outflow=17.13 cfs 197,749 cf

Total Runoff Area = 1,036,677 sf Runoff Volume = 657,688 cf Average Runoff Depth = 7.61"
39.57% Pervious = 410,178 sf 60.43% Impervious = 626,499 sf

Summary for Subcatchment 1S: DA 1: CN w/ IC areas

Runoff = 17.42 cfs @ 12.27 hrs, Volume= 75,286 cf, Depth= 6.40"
 Routed to Pond 1P : Bioretention Basin 1

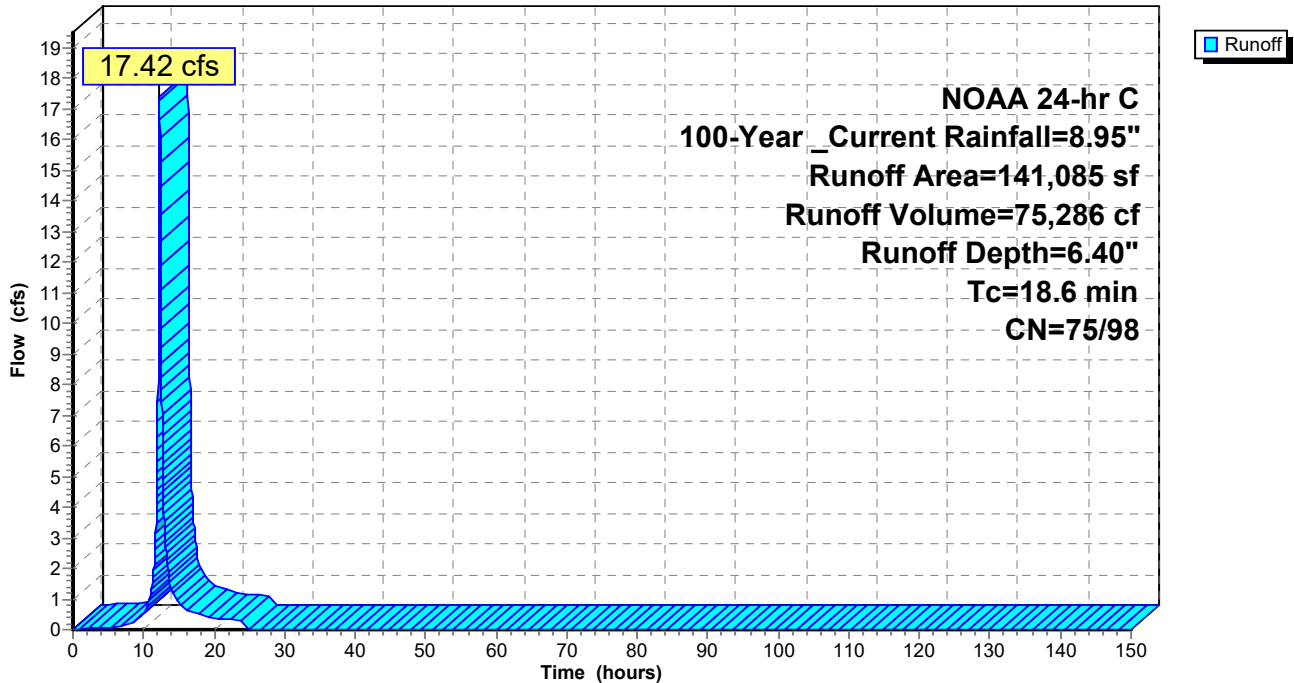
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-150.00 hrs, dt= 0.00
 NOAA 24-hr C 100-Year _Current Rainfall=8.95"

	Area (sf)	CN	Description
*	25,014	98	Impervious HSG C
	26,886	70	Brush (fair) HSG C
	45,464	79	Open Space (fair) HSG C
*	10,665	74	Open Space (good) HSG C
*	33,056	73	Woods (fair) HSG C
	141,085	79	Weighted Average
	116,071	75	82.27% Pervious Area
	25,014	98	17.73% Impervious Area

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

Subcatchment 1S: DA 1: CN w/ IC areas

Hydrograph



Summary for Subcatchment 2S: DA 2: CN w/ IC areas

[49] Hint: Tc<2dt may require smaller dt

Runoff = 4.92 cfs @ 12.08 hrs, Volume= 14,112 cf, Depth= 7.85"
 Routed to Pond 2P : Bioretention Basin 2

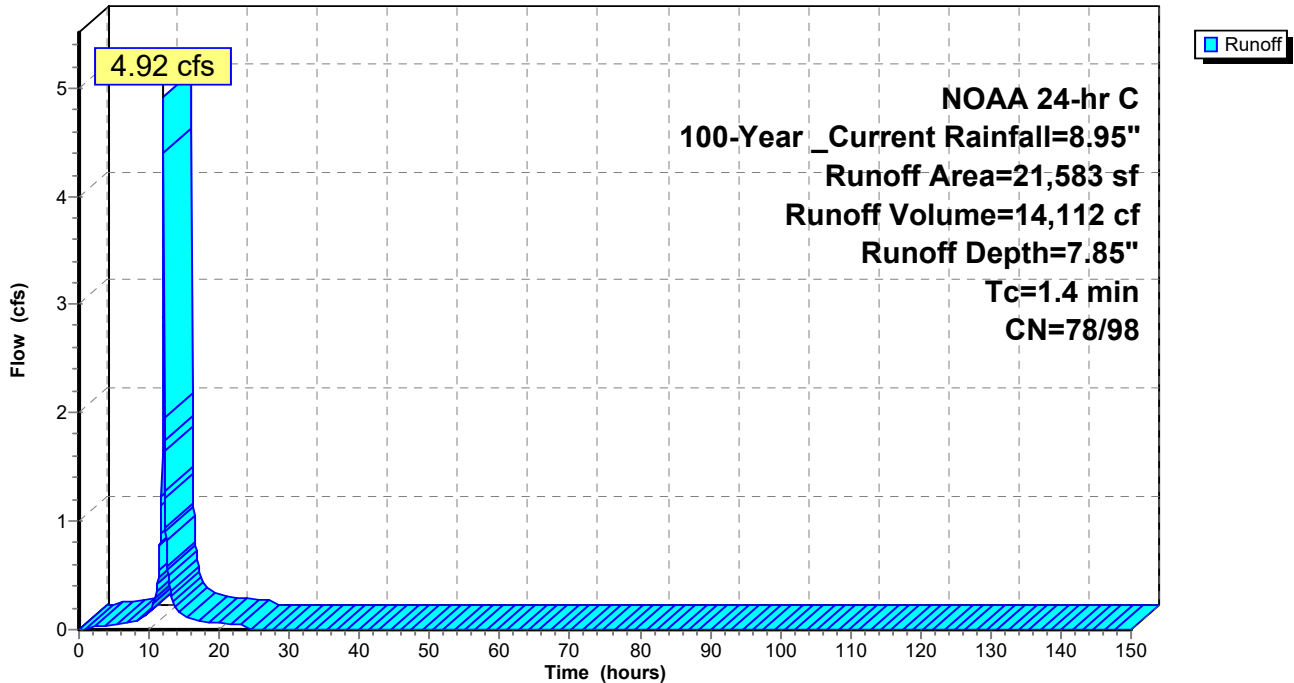
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-150.00 hrs, dt= 0.0
 NOAA 24-hr C 100-Year _Current Rainfall=8.95"

	Area (sf)	CN	Description
*	13,929	98	Impervious HSG C
	6,668	79	Open Space (fair) HSG C
*	986	74	Open Space (good) HSG C
	21,583	91	Weighted Average
	7,654	78	35.46% Pervious Area
	13,929	98	64.54% Impervious Area

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

Subcatchment 2S: DA 2: CN w/ IC areas

Hydrograph



Summary for Subcatchment 3S: DA 3: CN w/ IC areas

Runoff = 8.88 cfs @ 12.10 hrs, Volume= 26,170 cf, Depth= 7.83"
 Routed to Pond 3P : Bioretention Basin 3

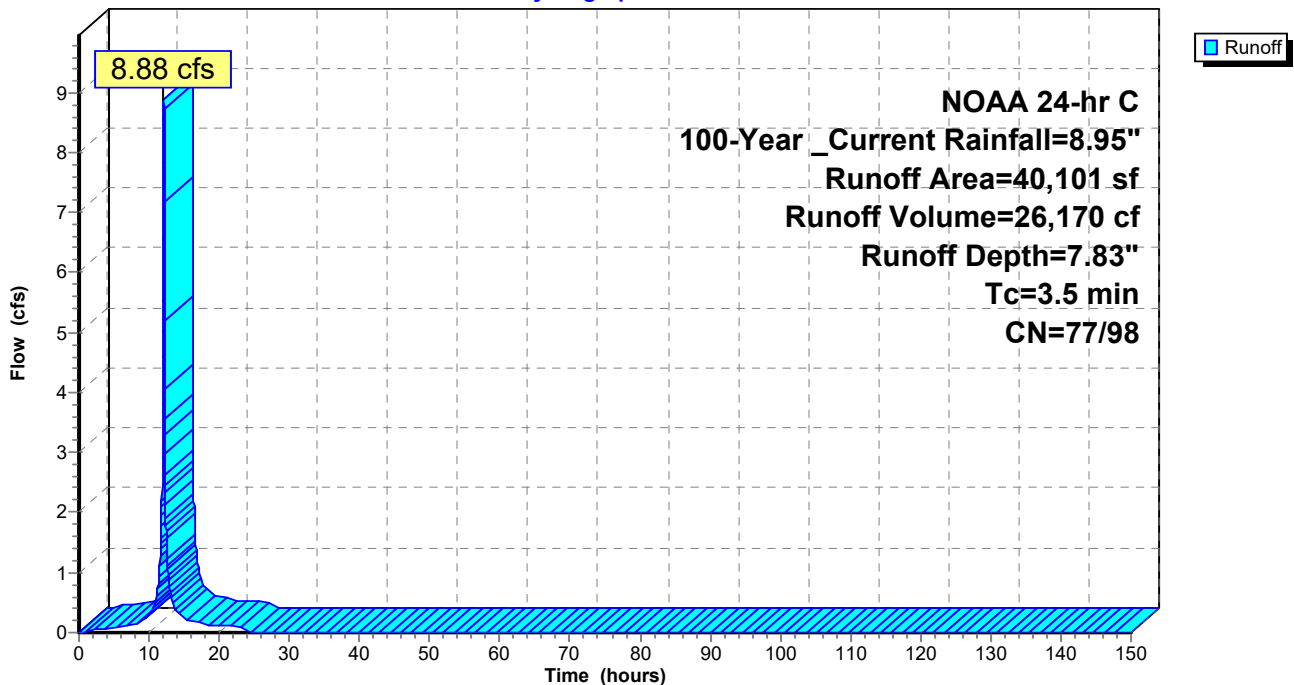
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-150.00 hrs, dt= 0.00
 NOAA 24-hr C 100-Year _Current Rainfall=8.95"

	Area (sf)	CN	Description
*	26,326	98	Impervious HSG C
	9,202	79	Open Space (fair) HSG C
*	4,573	74	Open Space (good) HSG C
	40,101	91	Weighted Average
	13,775	77	34.35% Pervious Area
	26,326	98	65.65% Impervious Area

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

Subcatchment 3S: DA 3: CN w/ IC areas

Hydrograph



Summary for Subcatchment 4S: DA 4: CN w/ IC areas

Runoff = 19.07 cfs @ 12.10 hrs, Volume= 56,348 cf, Depth= 8.02"

Routed to Pond 4P : PP (w/ underdrain) w/ UG storage 1

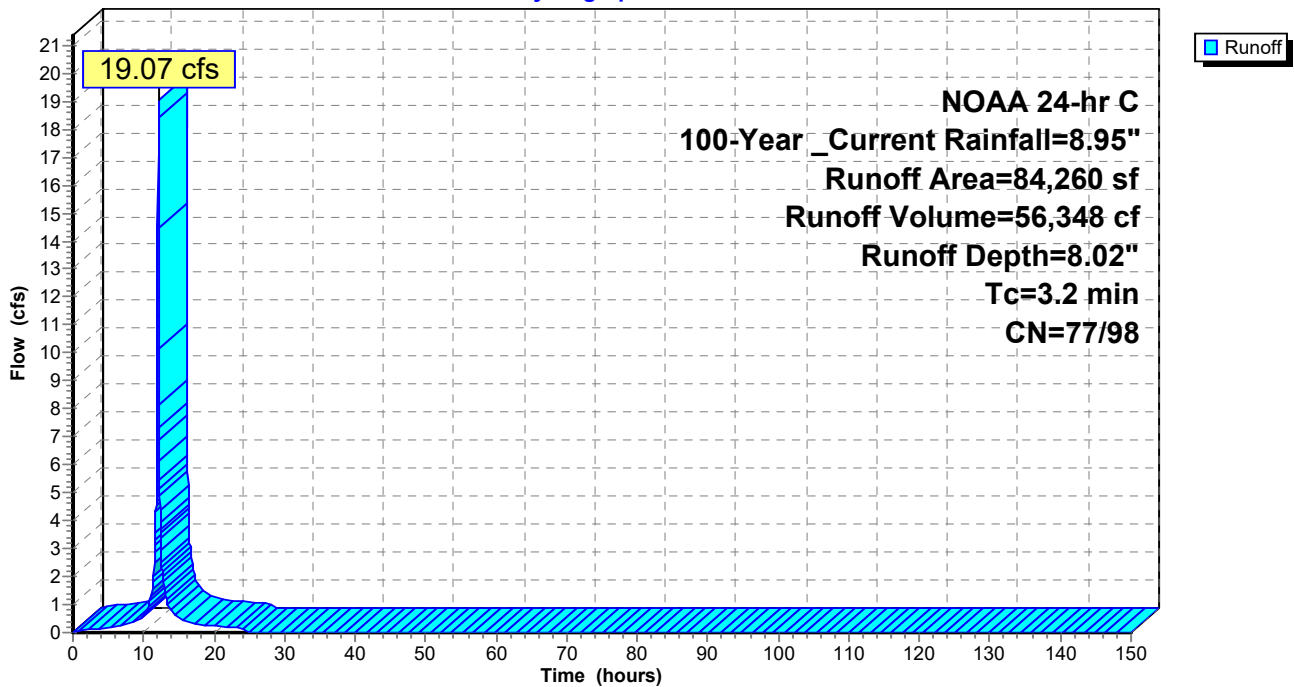
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-150.00 hrs, dt= 0.0
 NOAA 24-hr C 100-Year _Current Rainfall=8.95"

	Area (sf)	CN	Description
*	61,698	98	Impervious HSG C
	13,143	79	Open Space (fair) HSG C
*	9,419	74	Open Space (good) HSG C
	84,260	92	Weighted Average
	22,562	77	26.78% Pervious Area
	61,698	98	73.22% Impervious Area

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

Subcatchment 4S: DA 4: CN w/ IC areas

Hydrograph



Summary for Subcatchment 5S: DA 5: CN w/ IC areas

Runoff = 12.25 cfs @ 12.09 hrs, Volume= 35,779 cf, Depth= 8.21"

Routed to Pond 5P : PP (w/ underdrain) w/ UG storage 2

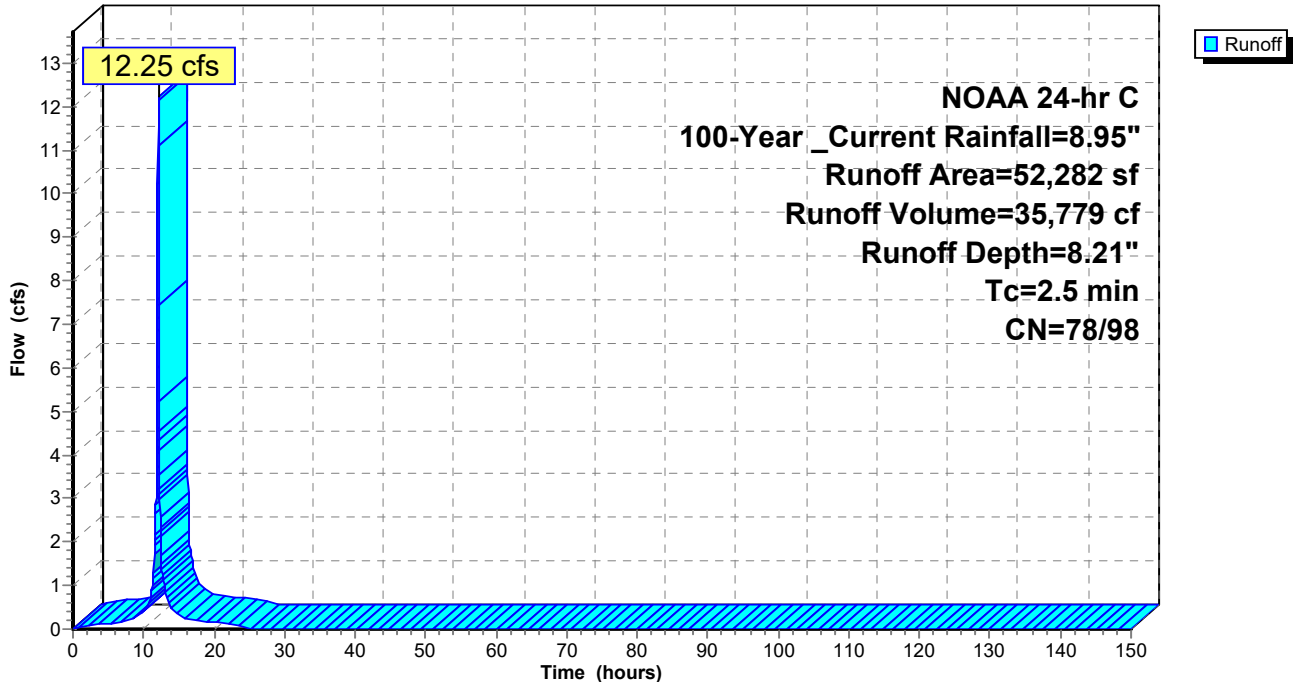
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-150.00 hrs, dt= 0.00
 NOAA 24-hr C 100-Year _Current Rainfall=8.95"

	Area (sf)	CN	Description
*	41,595	98	Impervious HSG C
	444	70	Brush (fair) HSG C
	9,377	79	Open Space (fair) HSG C
*	866	74	Open Space (good) HSG C
	52,282	94	Weighted Average
	10,687	78	20.44% Pervious Area
	41,595	98	79.56% Impervious Area

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

Subcatchment 5S: DA 5: CN w/ IC areas

Hydrograph



Summary for Subcatchment 6S: DA 6: CN w/ IC areas

Runoff = 17.77 cfs @ 12.10 hrs, Volume= 53,210 cf, Depth= 8.32"

Routed to Pond 6P : PP (w/ underdrain) w/ UG storage 3

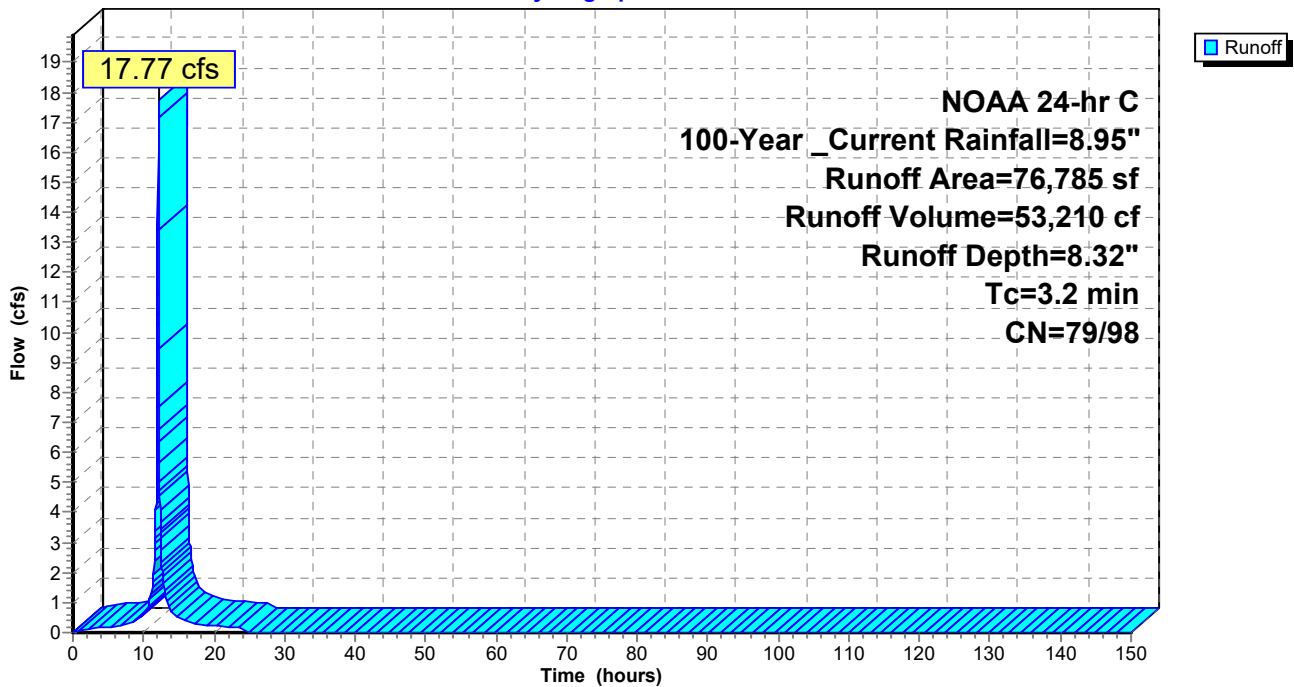
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-150.00 hrs, dt= 0.00
 NOAA 24-hr C 100-Year _Current Rainfall=8.95"

	Area (sf)	CN	Description
*	63,699	98	Impervious HSG C
	12,708	79	Open Space (fair) HSG C
*	378	74	Open Space (good) HSG C
	76,785	95	Weighted Average
	13,086	79	17.04% Pervious Area
	63,699	98	82.96% Impervious Area

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

Subcatchment 6S: DA 6: CN w/ IC areas

Hydrograph



Summary for Subcatchment 7S: DA 7: CN w/ IC areas

Runoff = 28.04 cfs @ 12.10 hrs, Volume= 85,814 cf, Depth= 8.56"

Routed to Pond 7P : PP (w/ underdrain) w/ UG storage 4

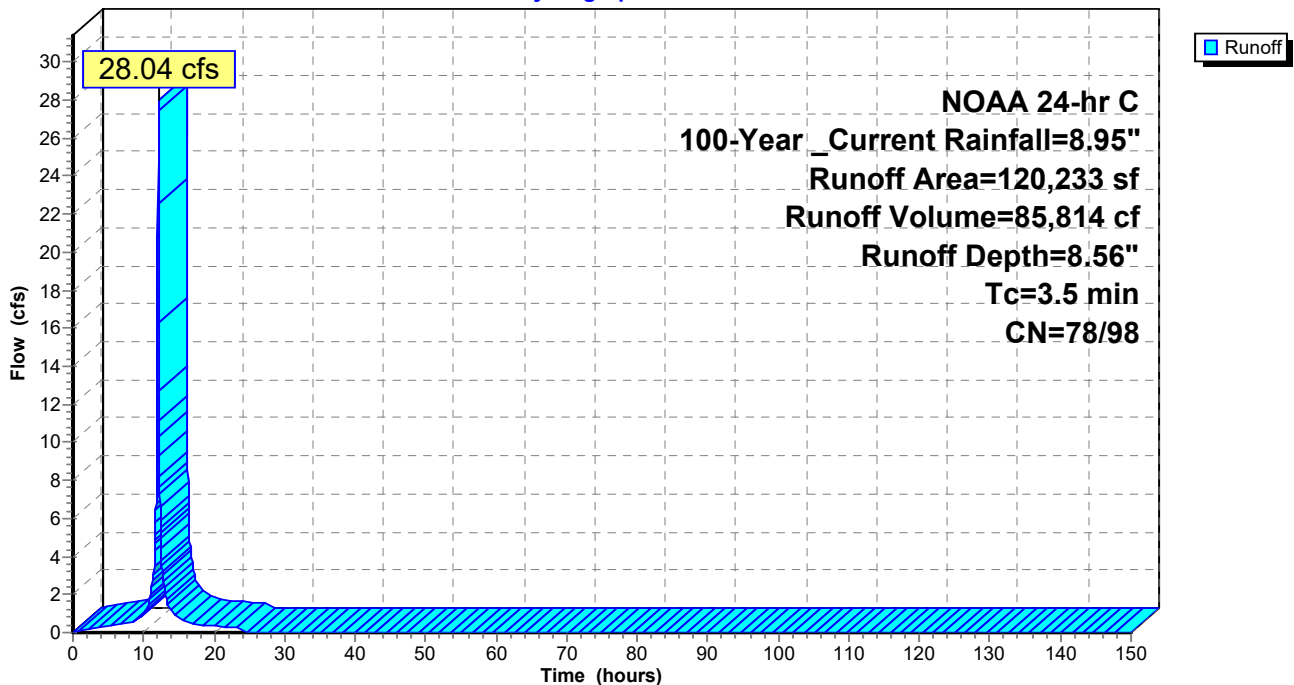
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-150.00 hrs, dt= 0.00
 NOAA 24-hr C 100-Year _Current Rainfall=8.95"

	Area (sf)	CN	Description
*	113,075	98	Impervious HSG C
	5,111	79	Open Space (fair) HSG C
*	2,047	74	Open Space (good) HSG C
	120,233	97	Weighted Average
	7,158	78	5.95% Pervious Area
	113,075	98	94.05% Impervious Area

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

Subcatchment 7S: DA 7: CN w/ IC areas

Hydrograph



Summary for Subcatchment 8S: DA 8: CN w/ IC areas

[49] Hint: Tc<2dt may require smaller dt

Runoff = 25.63 cfs @ 12.09 hrs, Volume= 72,862 cf, Depth= 7.85"
 Routed to Pond 8P : Existing Basin 1

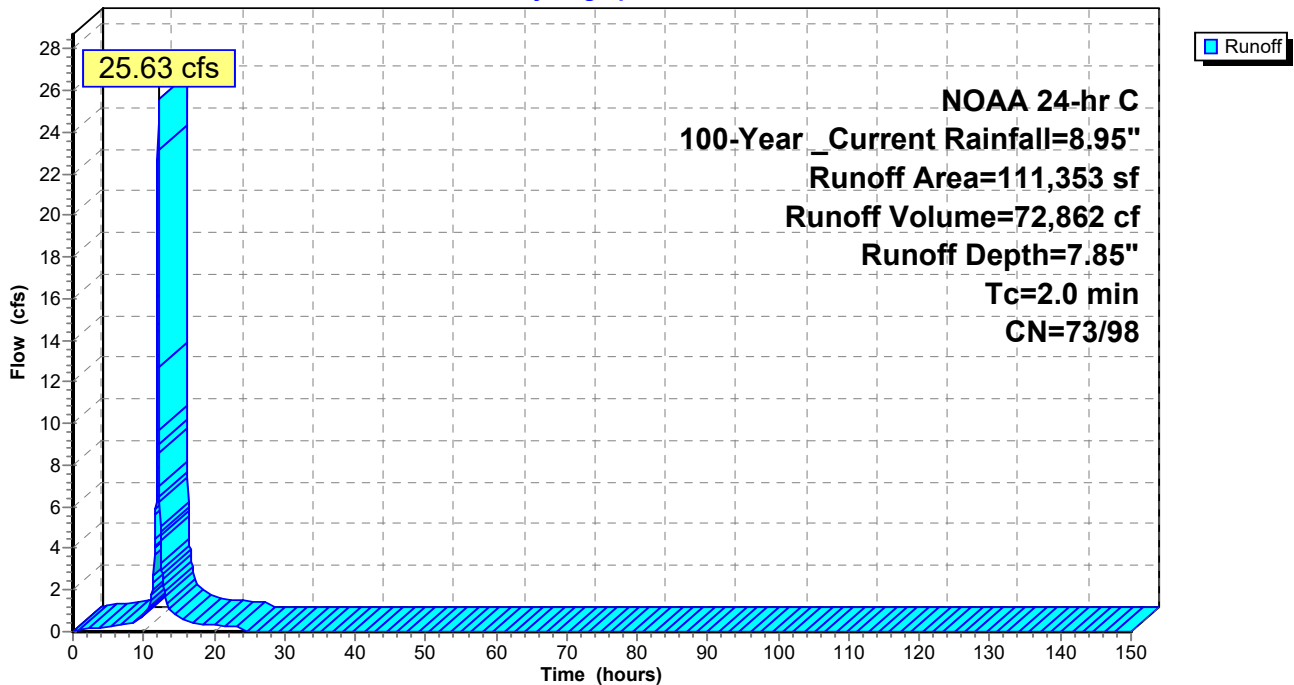
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-150.00 hrs, dt= 0.0
 NOAA 24-hr C 100-Year _Current Rainfall=8.95"

	Area (sf)	CN	Description
*	80,033	98	Impervious HSG C
	3,876	70	Brush (fair) HSG C
	419	79	Open Space (fair) HSG C
*	12,431	74	Open Space (good) HSG C
*	14,594	73	Woods (fair) HSG C
	111,353	91	Weighted Average
	31,320	73	28.13% Pervious Area
	80,033	98	71.87% Impervious Area

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

Subcatchment 8S: DA 8: CN w/ IC areas

Hydrograph



Summary for Subcatchment 9S: DA 9: CN w/ IC areas

Runoff = 13.46 cfs @ 12.09 hrs, Volume= 39,088 cf, Depth= 7.95"
 Routed to Pond 9P : Existing Basin 2

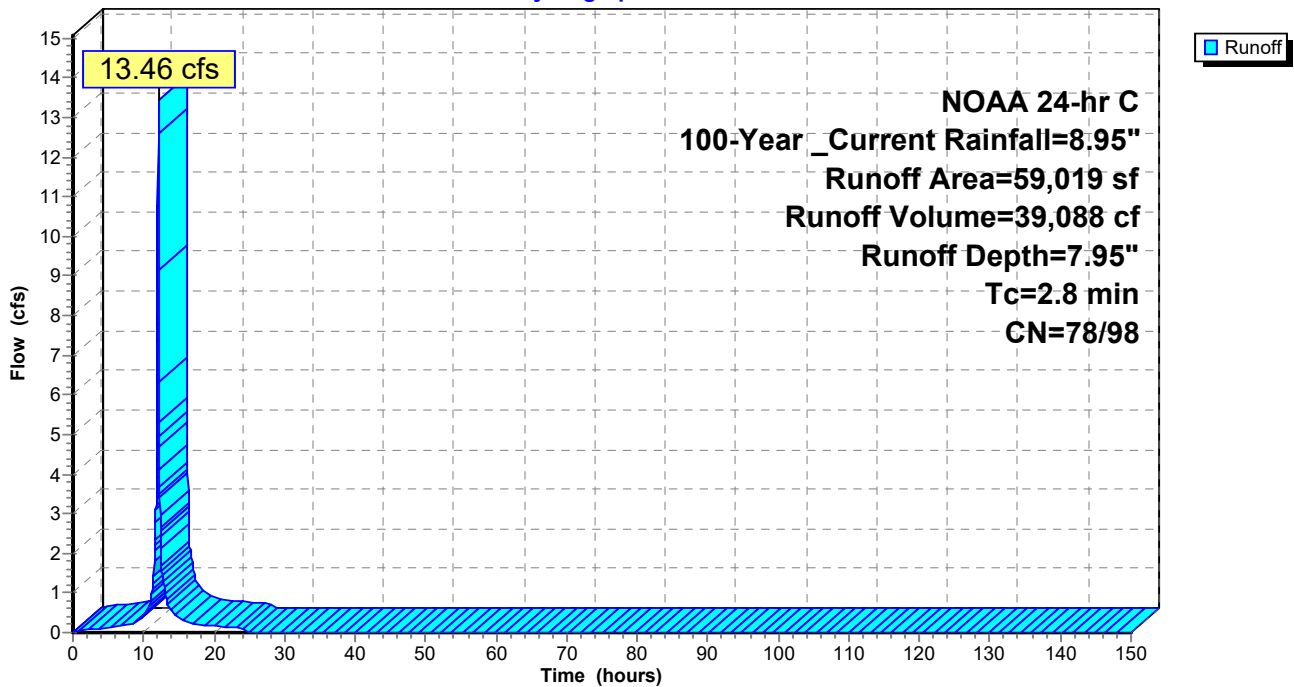
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-150.00 hrs, dt= 0.0
 NOAA 24-hr C 100-Year _Current Rainfall=8.95"

	Area (sf)	CN	Description
*	40,544	98	Impervious HSG C
	15,969	79	Open Space (fair) HSG C
*	2,506	74	Open Space (good) HSG C
	59,019	92	Weighted Average
	18,475	78	31.30% Pervious Area
	40,544	98	68.70% Impervious Area

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

Subcatchment 9S: DA 9: CN w/ IC areas

Hydrograph



Summary for Subcatchment 10S: DA 10: CN w/ IC areas

Runoff = 10.38 cfs @ 12.13 hrs, Volume= 33,509 cf, Depth= 8.29"

Routed to Pond 10P : PP (w/ underdrain) w/ UG storage 5

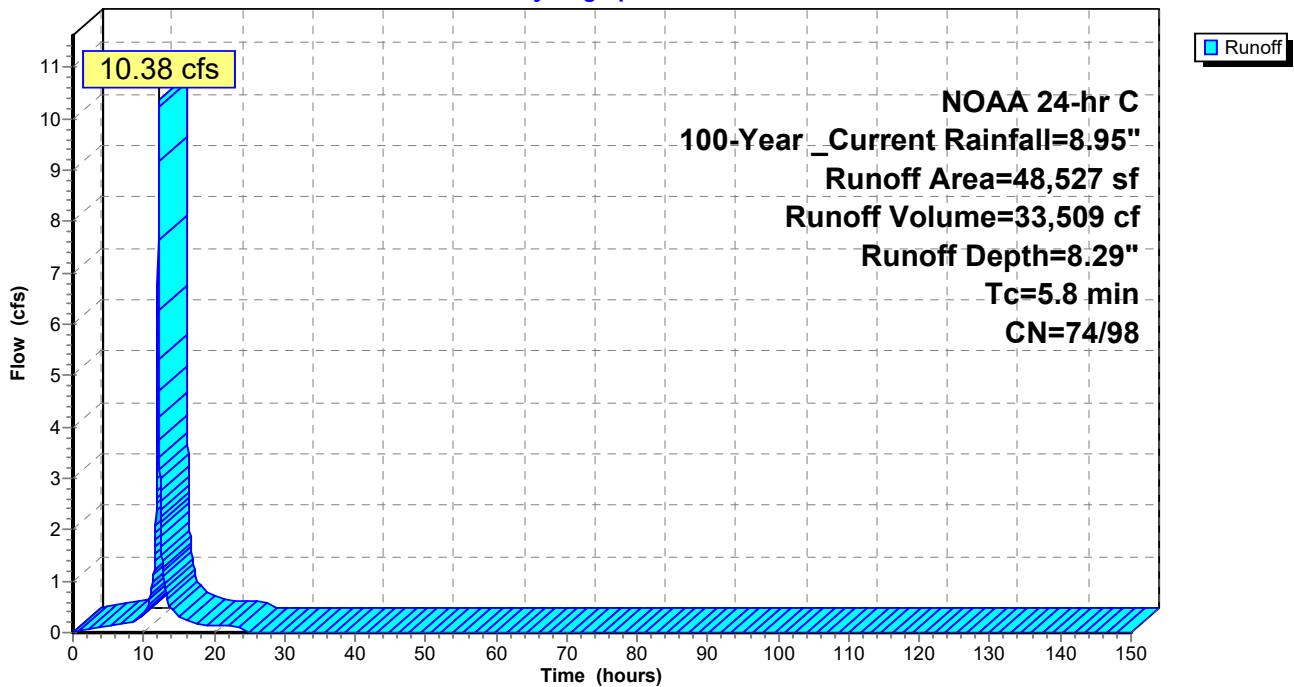
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-150.00 hrs, dt= 0.00
 NOAA 24-hr C 100-Year _Current Rainfall=8.95"

	Area (sf)	CN	Description
*	41,506	98	Impervious HSG C
	60	79	Open Space (fair) HSG C
*	6,961	74	Open Space (good) HSG C
	48,527	95	Weighted Average
	7,021	74	14.47% Pervious Area
	41,506	98	85.53% Impervious Area

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

Subcatchment 10S: DA 10: CN w/ IC areas

Hydrograph



Summary for Subcatchment 11S: DA 11: CN w/ IC areas

Runoff = 13.41 cfs @ 12.09 hrs, Volume= 39,077 cf, Depth= 8.13"

Routed to Pond 11P : PP (w/ underdrain) w/ UG storage 6

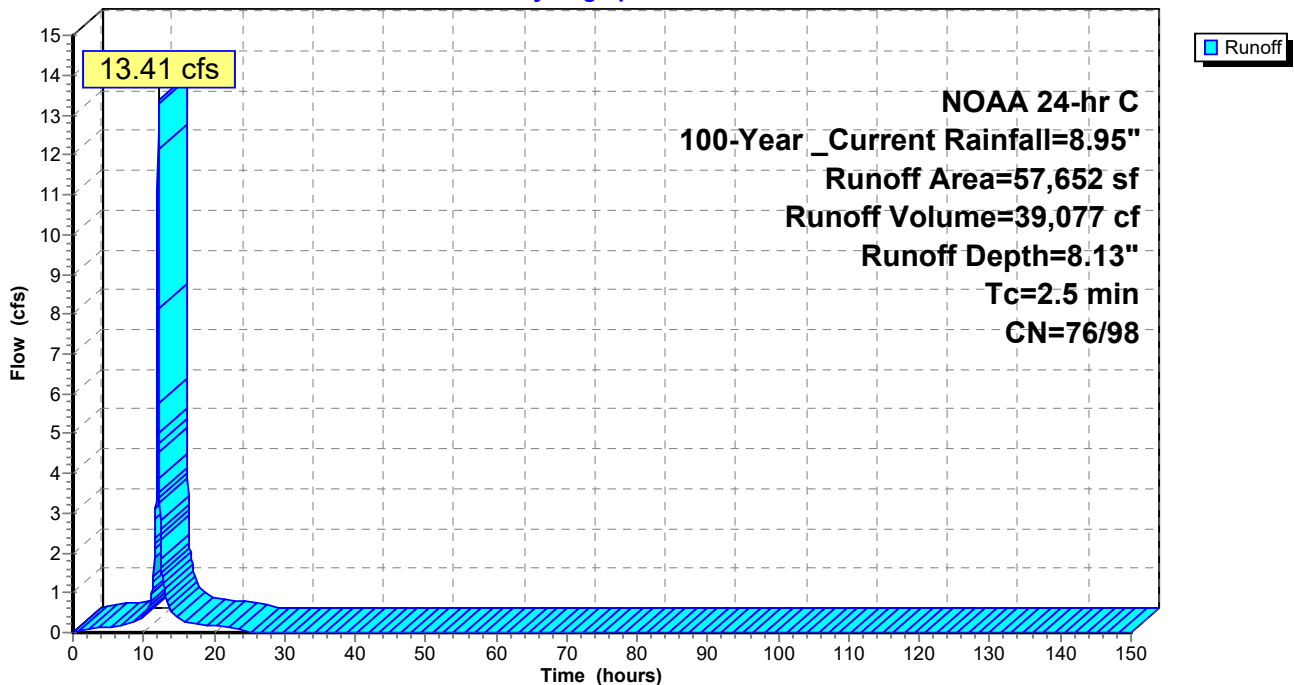
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-150.00 hrs, dt= 0.00
 NOAA 24-hr C 100-Year _Current Rainfall=8.95"

	Area (sf)	CN	Description
*	45,264	98	Impervious HSG C
	5,795	79	Open Space (fair) HSG C
*	6,593	74	Open Space (good) HSG C
	57,652	93	Weighted Average
	12,388	76	21.49% Pervious Area
	45,264	98	78.51% Impervious Area

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

Subcatchment 11S: DA 11: CN w/ IC areas

Hydrograph



Summary for Subcatchment 12S: DA 12: CN w/ IC areas

Runoff = 15.45 cfs @ 12.10 hrs, Volume= 45,216 cf, Depth= 8.01"

Routed to Pond 12P : PP (w/ underdrain) w/ UG storage 7

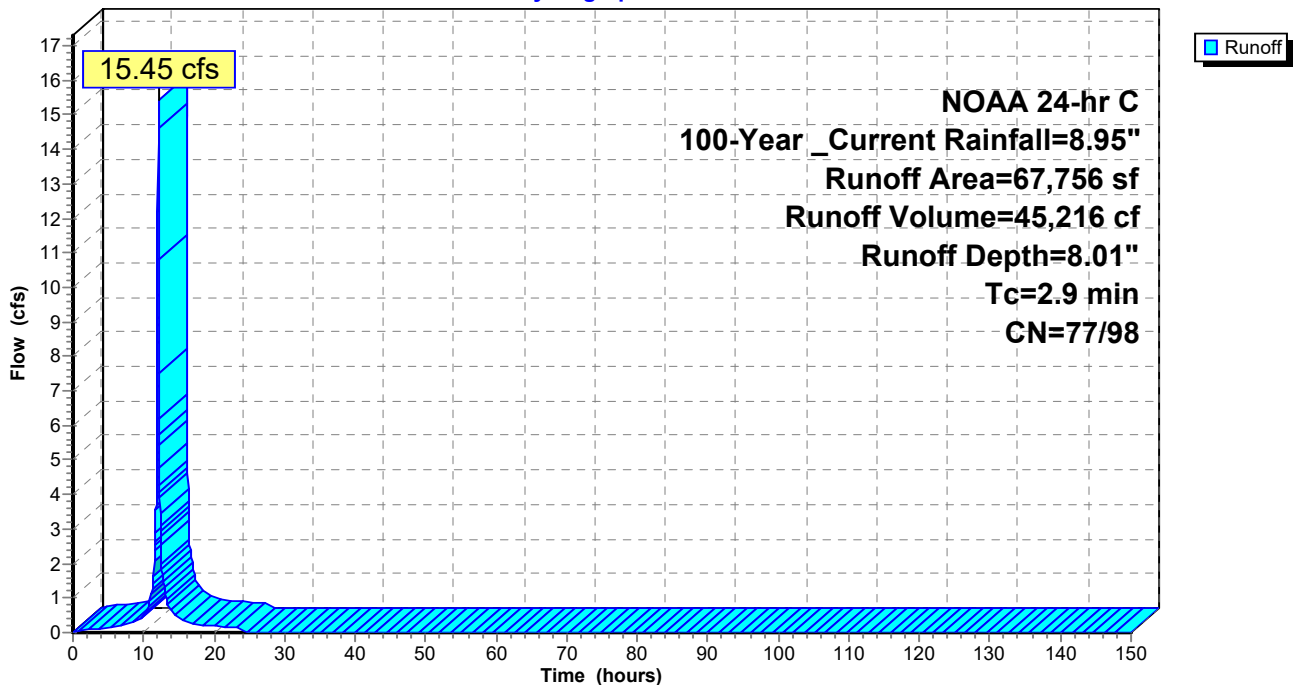
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-150.00 hrs, dt= 0.00
 NOAA 24-hr C 100-Year _Current Rainfall=8.95"

	Area (sf)	CN	Description
*	49,166	98	Impervious HSG C
	11,017	79	Open Space (fair) HSG C
*	7,573	74	Open Space (good) HSG C
	67,756	92	Weighted Average
	18,590	77	27.44% Pervious Area
	49,166	98	72.56% Impervious Area

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

Subcatchment 12S: DA 12: CN w/ IC areas

Hydrograph



Summary for Subcatchment 13S: DA 13: CN w/ IC areas

Runoff = 16.52 cfs @ 12.35 hrs, Volume= 81,215 cf, Depth= 6.25"
 Routed to Pond 13P : Bioretention Basin 4

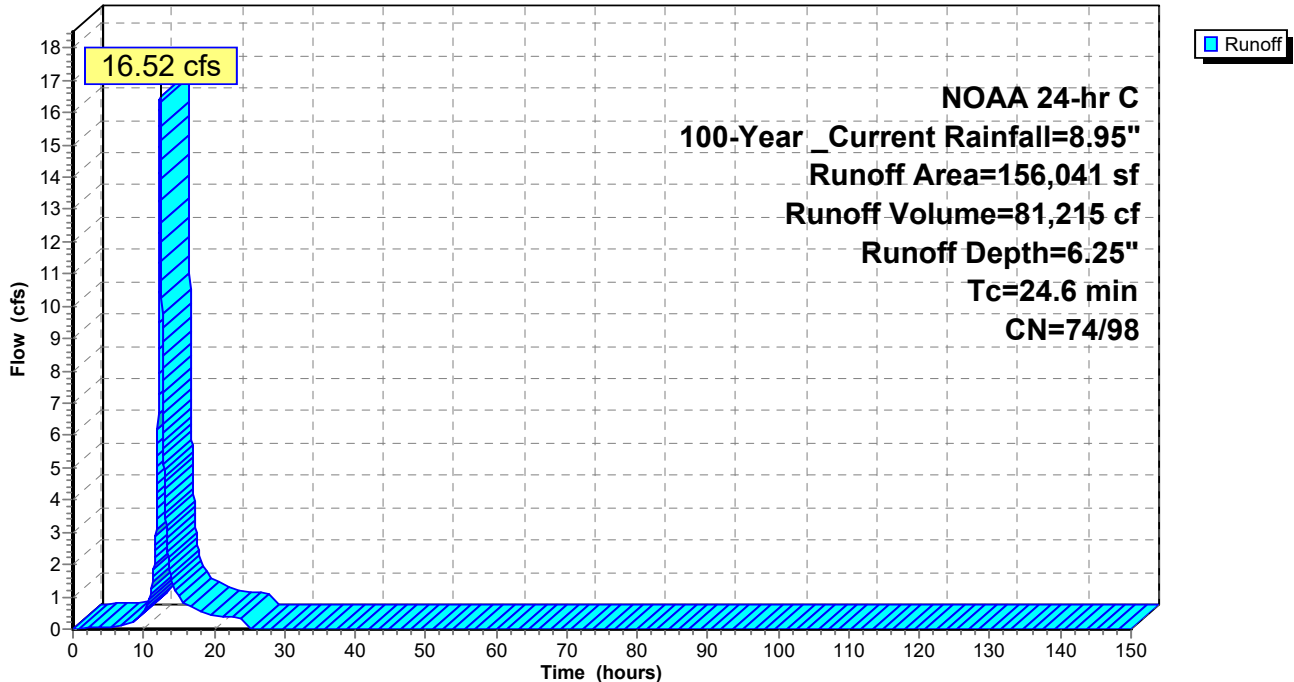
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-150.00 hrs, dt= 0.0
 NOAA 24-hr C 100-Year _Current Rainfall=8.95"

	Area (sf)	CN	Description
*	24,650	98	Impervious HSG C
	42,240	79	Open Space (fair) HSG C
*	20,548	74	Open Space (good) HSG C
	68,603	70	Woods, Good, HSG C
	156,041	77	Weighted Average
	131,391	74	84.20% Pervious Area
	24,650	98	15.80% Impervious Area

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

Subcatchment 13S: DA 13: CN w/ IC areas

Hydrograph



Summary for Pond 1P: Bioretention Basin 1

[44] Hint: Outlet device #1 is below defined storage

Inflow Area = 141,085 sf, 17.73% Impervious, Inflow Depth = 6.40" for 100-Year_Current event
 Inflow = 17.42 cfs @ 12.27 hrs, Volume= 75,286 cf
 Outflow = 11.74 cfs @ 12.44 hrs, Volume= 75,287 cf, Atten= 33%, Lag= 10.5 min
 Primary = 0.45 cfs @ 12.44 hrs, Volume= 29,948 cf
 Routed to nonexistent node 5R
 Secondary = 11.30 cfs @ 12.44 hrs, Volume= 45,339 cf
 Routed to nonexistent node 5R
 Tertiary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
 Routed to nonexistent node 5R

Routing by Stor-Ind method, Time Span= 0.00-150.00 hrs, dt= 0.02 hrs / 2
 Peak Elev= 65.46' @ 12.44 hrs Surf.Area= 9,579 sf Storage= 21,262 cf

Plug-Flow detention time= 140.6 min calculated for 75,277 cf (100% of inflow)
 Center-of-Mass det. time= 140.6 min (947.5 - 806.9)

Volume	Invert	Avail.Storage	Storage Description
#1	62.50'	37,960 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
62.50	4,800	0	0
67.00	12,071	37,960	37,960

Device	Routing	Invert	Outlet Devices
#1	Primary	61.75'	3.0" Vert. Low Flow Orifice C= 0.600 Limited to weir flow at low heads
#2	Secondary	64.00'	24.0" W x 18.0" H Vert. SECONDARY OUTLET C= 0.600 Limited to weir flow at low heads
#3	Tertiary	66.25'	60.0" x 60.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads

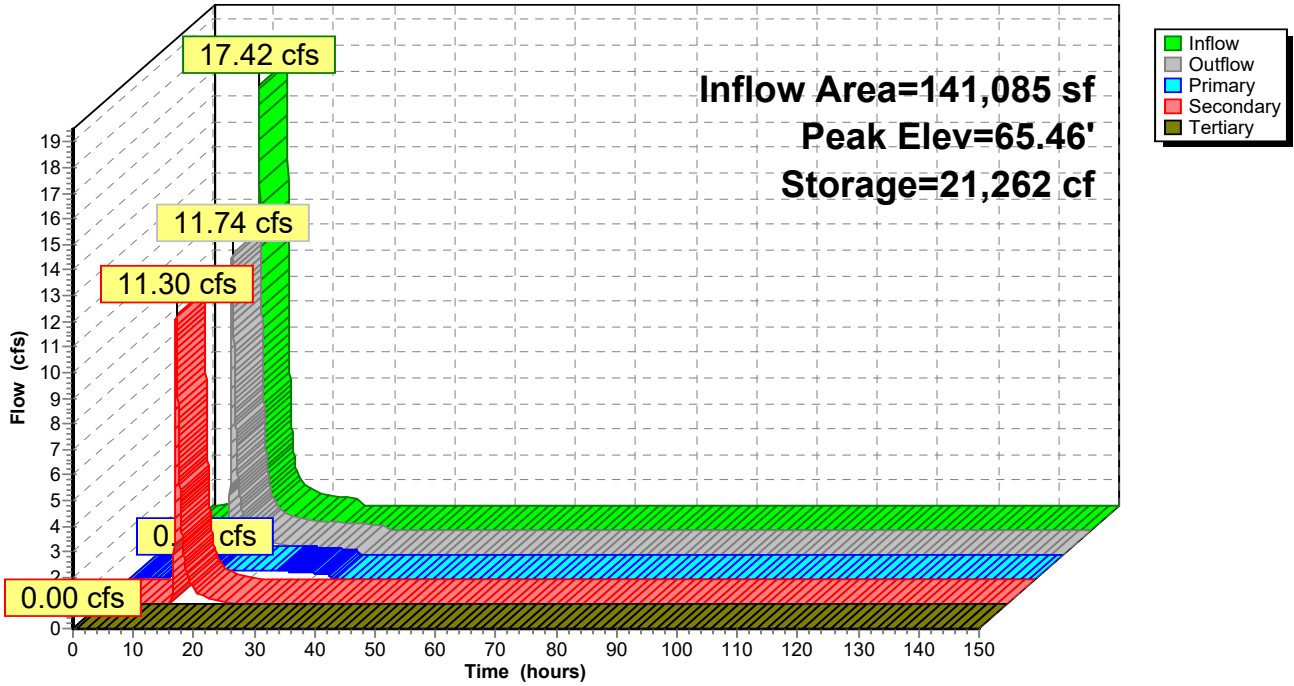
Primary OutFlow Max=0.45 cfs @ 12.44 hrs HW=65.46' (Free Discharge)
 ↑1=**Low Flow Orifice** (Orifice Controls 0.45 cfs @ 9.11 fps)

Secondary OutFlow Max=11.29 cfs @ 12.44 hrs HW=65.46' (Free Discharge)
 ↑2=**SECONDARY OUTLET** (Orifice Controls 11.29 cfs @ 3.87 fps)

Tertiary OutFlow Max=0.00 cfs @ 0.00 hrs HW=62.50' (Free Discharge)
 ↑3=**Orifice/Grate** (Controls 0.00 cfs)

Pond 1P: Bioretention Basin 1

Hydrograph



Summary for Pond 2P: Bioretention Basin 2

Inflow Area = 21,583 sf, 64.54% Impervious, Inflow Depth = 7.85" for 100-Year _Current event
 Inflow = 4.92 cfs @ 12.08 hrs, Volume= 14,112 cf
 Outflow = 1.04 cfs @ 12.33 hrs, Volume= 13,771 cf, Atten= 79%, Lag= 14.5 min
 Primary = 0.36 cfs @ 12.33 hrs, Volume= 12,259 cf
 Routed to nonexistent node 5R
 Secondary = 0.68 cfs @ 12.33 hrs, Volume= 1,512 cf
 Routed to nonexistent node 5R
 Tertiary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
 Routed to nonexistent node 5R

Routing by Stor-Ind method, Time Span= 0.00-150.00 hrs, dt= 0.02 hrs / 2
 Peak Elev= 70.72' @ 12.33 hrs Surf.Area= 3,111 sf Storage= 5,980 cf

Plug-Flow detention time= 177.1 min calculated for 13,769 cf (98% of inflow)
 Center-of-Mass det. time= 161.7 min (916.5 - 754.8)

Volume	Invert	Avail.Storage	Storage Description
#1	68.00'	14,805 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
68.00	1,281	0	0
73.00	4,641	14,805	14,805

Device	Routing	Invert	Outlet Devices
#1	Primary	68.25'	3.0" Vert. Low Flow Orifice C= 0.600 Limited to weir flow at low heads
#2	Secondary	70.50'	24.0" W x 18.0" H Vert. SECONDARY OUTLET C= 0.600 Limited to weir flow at low heads
#3	Tertiary	72.75'	60.0" x 60.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads

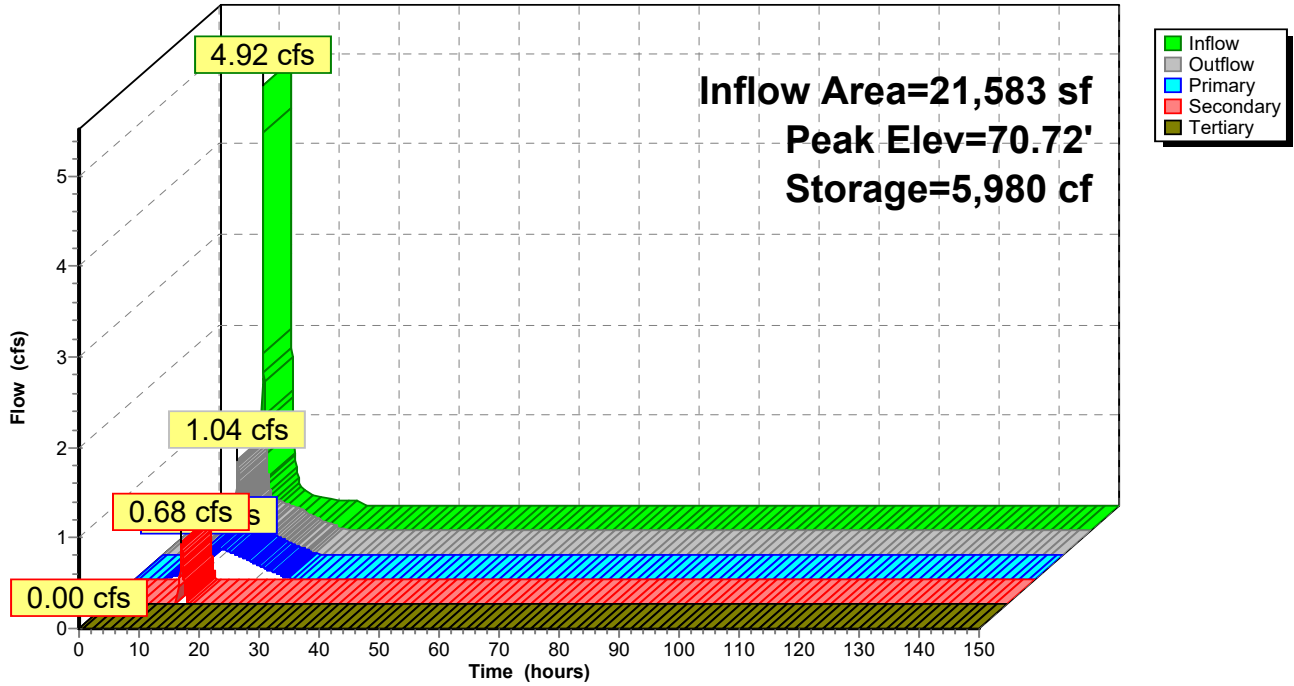
Primary OutFlow Max=0.36 cfs @ 12.33 hrs HW=70.72' (Free Discharge)
 ↖**1=Low Flow Orifice** (Orifice Controls 0.36 cfs @ 7.38 fps)

Secondary OutFlow Max=0.67 cfs @ 12.33 hrs HW=70.72' (Free Discharge)
 ↖**2=SECONDARY OUTLET** (Orifice Controls 0.67 cfs @ 1.51 fps)

Tertiary OutFlow Max=0.00 cfs @ 0.00 hrs HW=68.00' (Free Discharge)
 ↖**3=Orifice/Grate** (Controls 0.00 cfs)

Pond 2P: Bioretention Basin 2

Hydrograph



Summary for Pond 3P: Bioretention Basin 3

Inflow Area = 40,101 sf, 65.65% Impervious, Inflow Depth = 7.83" for 100-Year_Current event
 Inflow = 8.88 cfs @ 12.10 hrs, Volume= 26,170 cf
 Outflow = 4.97 cfs @ 12.17 hrs, Volume= 25,709 cf, Atten= 44%, Lag= 3.7 min
 Primary = 0.40 cfs @ 12.17 hrs, Volume= 17,407 cf
 Routed to nonexistent node 5R
 Secondary = 4.57 cfs @ 12.17 hrs, Volume= 8,302 cf
 Routed to nonexistent node 5R
 Tertiary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
 Routed to nonexistent node 5R

Routing by Stor-Ind method, Time Span= 0.00-150.00 hrs, dt= 0.02 hrs / 2
 Peak Elev= 67.30' @ 12.17 hrs Surf.Area= 3,965 sf Storage= 9,437 cf

Plug-Flow detention time= 172.2 min calculated for 25,709 cf (98% of inflow)
 Center-of-Mass det. time= 160.3 min (916.7 - 756.4)

Volume	Invert	Avail.Storage	Storage Description
#1	64.00'	17,160 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
64.00	1,760	0	0
69.00	5,104	17,160	17,160

Device	Routing	Invert	Outlet Devices
#1	Primary	64.25'	3.0" Vert. Low Flow Orifice C= 0.600 Limited to weir flow at low heads
#2	Secondary	66.50'	24.0" W x 18.0" H Vert. SECONDARY OUTLET C= 0.600 Limited to weir flow at low heads
#3	Tertiary	68.75'	60.0" x 60.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads

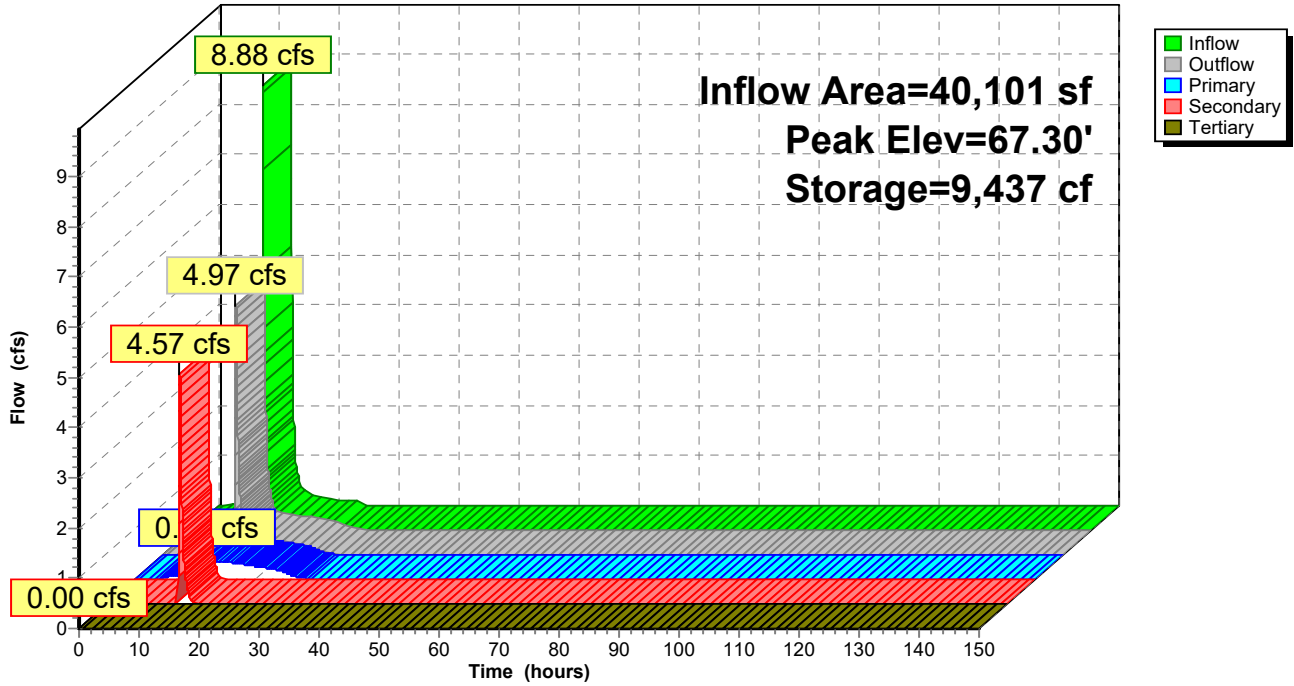
Primary OutFlow Max=0.40 cfs @ 12.17 hrs HW=67.29' (Free Discharge)
 ↖**1=Low Flow Orifice** (Orifice Controls 0.40 cfs @ 8.23 fps)

Secondary OutFlow Max=4.54 cfs @ 12.17 hrs HW=67.29' (Free Discharge)
 ↖**2=SECONDARY OUTLET** (Orifice Controls 4.54 cfs @ 2.86 fps)

Tertiary OutFlow Max=0.00 cfs @ 0.00 hrs HW=64.00' (Free Discharge)
 ↖**3=Orifice/Grate** (Controls 0.00 cfs)

Pond 3P: Bioretention Basin 3

Hydrograph



Summary for Pond 4P: PP (w/ underdrain) w/ UG storage 1

[44] Hint: Outlet device #3 is below defined storage

Inflow Area = 84,260 sf, 73.22% Impervious, Inflow Depth = 8.02" for 100-Year_Current event
 Inflow = 19.07 cfs @ 12.10 hrs, Volume= 56,348 cf
 Outflow = 0.46 cfs @ 15.36 hrs, Volume= 56,348 cf, Atten= 98%, Lag= 195.5 min
 Primary = 0.46 cfs @ 15.36 hrs, Volume= 56,348 cf
 Routed to Pond 8P : Existing Basin 1
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
 Routed to Pond 8P : Existing Basin 1

Routing by Stor-Ind method, Time Span= 0.00-150.00 hrs, dt= 0.02 hrs
 Peak Elev= 97.93' @ 15.36 hrs Surf.Area= 21,558 sf Storage= 33,697 cf

Plug-Flow detention time= 713.3 min calculated for 56,341 cf (100% of inflow)
 Center-of-Mass det. time= 713.3 min (1,465.1 - 751.7)

Volume	Invert	Avail.Storage	Storage Description
#1	97.00'	3,624 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
#2A	94.50'	12,961 cf	68.00'W x 217.22'L x 3.50'H Field A 51,698 cf Overall - 19,295 cf Embedded = 32,403 cf x 40.0% Voids
#3A	95.00'	19,295 cf	ADS_StormTech SC-740 +Cap x 420 Inside #2 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 420 Chambers in 14 Rows
		35,880 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
97.00	6,787	0.0	0	0
97.67	6,787	35.0	1,592	1,592
97.83	6,787	15.0	163	1,754
98.00	6,787	15.0	173	1,928
98.25	6,787	100.0	1,697	3,624

Device	Routing	Invert	Outlet Devices
#1	Primary	92.07'	3.0" Vert. Restriction Orifice C= 0.600 Limited to weir flow at low heads
#2	Device 1	92.17'	6.0" Round 6" HDPE Underdrain L= 359.0' Ke= 0.500 Inlet / Outlet Invert= 92.17' / 90.37' S= 0.0050 ' S= 0.0050 ' Cc= 0.900 n= 0.020 Corrugated PE, corrugated interior, Flow Area= 0.20 sf
#3	Device 2	92.17'	0.9" x 0.1" Horiz. Perforations X 400.00 columns X 3 rows C= 0.600 Limited to weir flow at low heads
#4	Secondary	98.00'	67.0' long x 2.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Primary OutFlow Max=0.46 cfs @ 15.36 hrs HW=97.93' (Free Discharge)

↑1=**Restriction Orifice** (Passes 0.46 cfs of 0.57 cfs potential flow)

↑2=**6" HDPE Underdrain** (Outlet Controls 0.46 cfs @ 2.34 fps)

↑3=**Perforations** (Passes 0.46 cfs of 8.67 cfs potential flow)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=94.50' (Free Discharge)

↑4=**Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 4P: PP (w/ underdrain) w/ UG storage 1 - Chamber Wizard Field A

Chamber Model = ADS_StormTech SC-740 +Cap (ADS StormTech® SC-740 with cap length)

Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf

Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap

51.0" Wide + 6.0" Spacing = 57.0" C-C Row Spacing

30 Chambers/Row x 7.12' Long +0.81' Cap Length x 2 = 215.22' Row Length +12.0" End Stone x 2 = 217.22' Base Length

14 Rows x 51.0" Wide + 6.0" Spacing x 13 + 12.0" Side Stone x 2 = 68.00' Base Width

6.0" Stone Base + 30.0" Chamber Height + 6.0" Stone Cover = 3.50' Field Height

420 Chambers x 45.9 cf = 19,294.8 cf Chamber Storage

51,697.6 cf Field - 19,294.8 cf Chambers = 32,402.8 cf Stone x 40.0% Voids = 12,961.1 cf Stone Storage

Chamber Storage + Stone Storage = 32,255.9 cf = 0.740 af

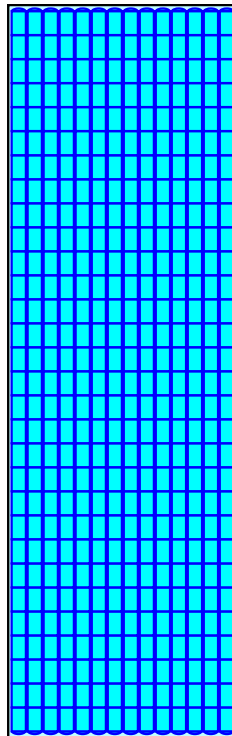
Overall Storage Efficiency = 62.4%

Overall System Size = 217.22' x 68.00' x 3.50'

420 Chambers

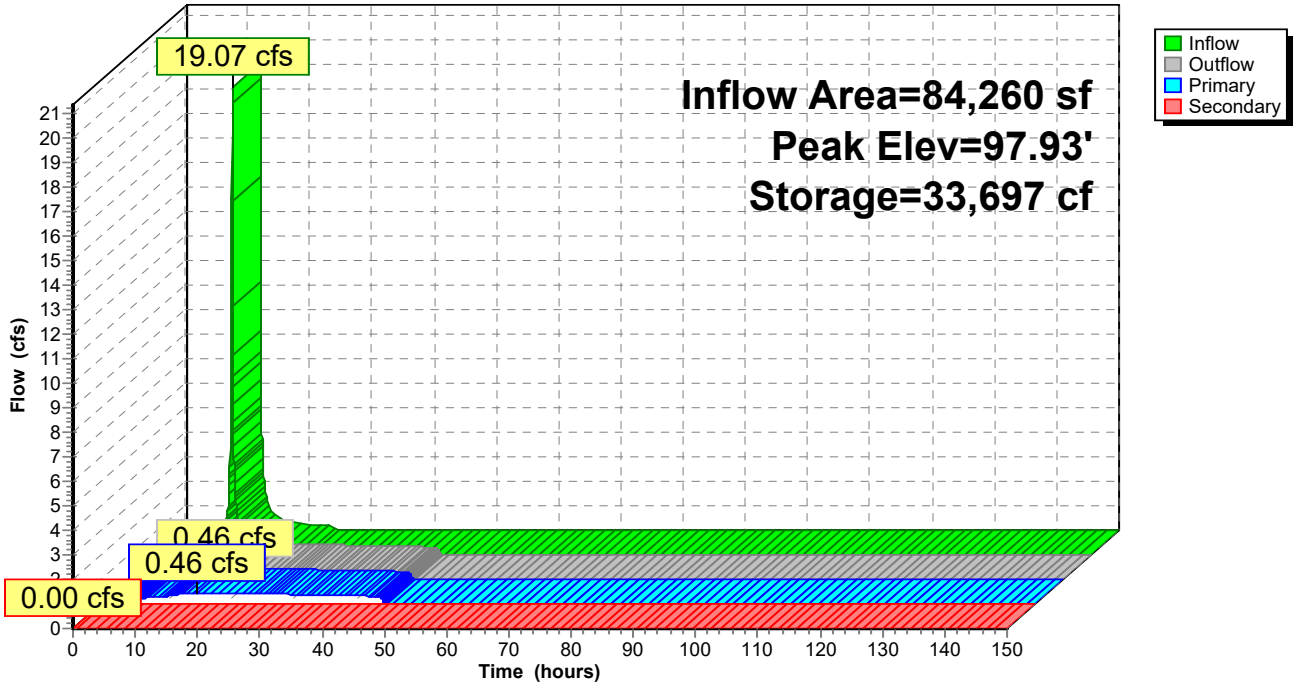
1,914.7 cy Field

1,200.1 cy Stone



Pond 4P: PP (w/ underdrain) w/ UG storage 1

Hydrograph



Summary for Pond 5P: PP (w/ underdrain) w/ UG storage 2

[44] Hint: Outlet device #3 is below defined storage

Inflow Area = 52,282 sf, 79.56% Impervious, Inflow Depth = 8.21" for 100-Year_Current event
 Inflow = 12.25 cfs @ 12.09 hrs, Volume= 35,779 cf
 Outflow = 0.25 cfs @ 16.25 hrs, Volume= 35,779 cf, Atten= 98%, Lag= 249.4 min
 Primary = 0.25 cfs @ 16.25 hrs, Volume= 35,779 cf
 Routed to Pond 8P : Existing Basin 1
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
 Routed to Pond 8P : Existing Basin 1

Routing by Stor-Ind method, Time Span= 0.00-150.00 hrs, dt= 0.02 hrs
 Peak Elev= 97.76' @ 16.25 hrs Surf.Area= 14,913 sf Storage= 22,412 cf

Plug-Flow detention time= 875.2 min calculated for 35,774 cf (100% of inflow)
 Center-of-Mass det. time= 875.3 min (1,622.7 - 747.4)

Volume	Invert	Avail.Storage	Storage Description
#1	97.00'	2,510 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
#2A	94.50'	9,005 cf	77.50'W x 131.78'L x 3.50'H Field A 35,744 cf Overall - 13,231 cf Embedded = 22,514 cf x 40.0% Voids
#3A	95.00'	13,231 cf	ADS_StormTech SC-740 +Cap x 288 Inside #2 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 288 Chambers in 16 Rows
		24,746 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
97.00	4,700	0.0	0	0
97.67	4,700	35.0	1,102	1,102
97.83	4,700	15.0	113	1,215
98.00	4,700	15.0	120	1,335
98.25	4,700	100.0	1,175	2,510

Device	Routing	Invert	Outlet Devices
#1	Primary	92.07'	2.0" Vert. Restriction Orifice C= 0.600 Limited to weir flow at low heads
#2	Device 1	92.17'	6.0" Round 6" HDPE Underdrain L= 359.0' Ke= 0.500 Inlet / Outlet Invert= 92.17' / 90.37' S= 0.0050 ' S= 0.0050 ' Cc= 0.900 n= 0.020 Corrugated PE, corrugated interior, Flow Area= 0.20 sf
#3	Device 2	92.17'	0.9" x 0.1" Horiz. Perforations X 400.00 columns X 3 rows C= 0.600 Limited to weir flow at low heads
#4	Secondary	98.00'	132.0' long x 2.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Primary OutFlow Max=0.25 cfs @ 16.25 hrs HW=97.76' (Free Discharge)

↑1=**Restriction Orifice** (Orifice Controls 0.25 cfs @ 11.40 fps)

↑2=**6" HDPE Underdrain** (Passes 0.25 cfs of 0.45 cfs potential flow)

↑3=**Perforations** (Passes 0.25 cfs of 8.54 cfs potential flow)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=94.50' (Free Discharge)

↑4=**Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 5P: PP (w/ underdrain) w/ UG storage 2 - Chamber Wizard Field A

Chamber Model = ADS_StormTech SC-740 +Cap (ADS StormTech® SC-740 with cap length)

Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf

Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap

51.0" Wide + 6.0" Spacing = 57.0" C-C Row Spacing

18 Chambers/Row x 7.12' Long +0.81' Cap Length x 2 = 129.78' Row Length +12.0" End Stone x 2 =

131.78' Base Length

16 Rows x 51.0" Wide + 6.0" Spacing x 15 + 12.0" Side Stone x 2 = 77.50' Base Width

6.0" Stone Base + 30.0" Chamber Height + 6.0" Stone Cover = 3.50' Field Height

288 Chambers x 45.9 cf = 13,230.7 cf Chamber Storage

35,744.4 cf Field - 13,230.7 cf Chambers = 22,513.7 cf Stone x 40.0% Voids = 9,005.5 cf Stone Storage

Chamber Storage + Stone Storage = 22,236.2 cf = 0.510 af

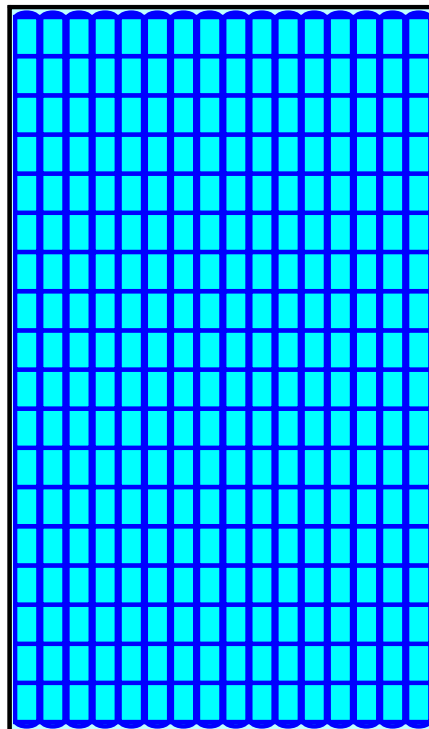
Overall Storage Efficiency = 62.2%

Overall System Size = 131.78' x 77.50' x 3.50'

288 Chambers

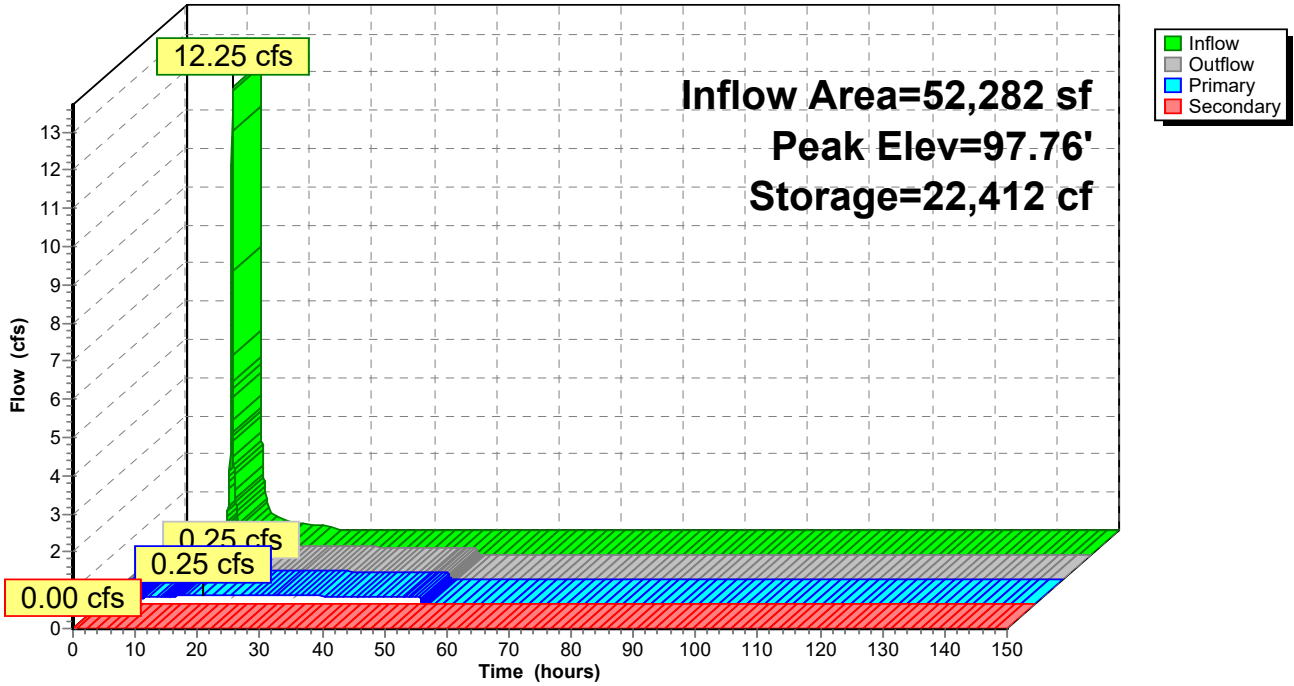
1,323.9 cy Field

833.8 cy Stone



Pond 5P: PP (w/ underdrain) w/ UG storage 2

Hydrograph



Summary for Pond 6P: PP (w/ underdrain) w/ UG storage 3

[44] Hint: Outlet device #3 is below defined storage

Inflow Area = 76,785 sf, 82.96% Impervious, Inflow Depth = 8.32" for 100-Year_Current event
 Inflow = 17.77 cfs @ 12.10 hrs, Volume= 53,210 cf
 Outflow = 0.25 cfs @ 18.14 hrs, Volume= 53,210 cf, Atten= 99%, Lag= 362.5 min
 Primary = 0.25 cfs @ 18.14 hrs, Volume= 53,210 cf
 Routed to Pond 8P : Existing Basin 1
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
 Routed to Pond 8P : Existing Basin 1

Routing by Stor-Ind method, Time Span= 0.00-150.00 hrs, dt= 0.02 hrs
 Peak Elev= 97.93' @ 18.14 hrs Surf.Area= 20,165 sf Storage= 37,362 cf

Plug-Flow detention time= 1,456.4 min calculated for 53,210 cf (100% of inflow)
 Center-of-Mass det. time= 1,456.4 min (2,202.5 - 746.1)

Volume	Invert	Avail.Storage	Storage Description
#1	97.00'	2,054 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
#2A	94.50'	14,875 cf	144.00'W x 117.54'L x 3.50'H Field A 59,238 cf Overall - 22,051 cf Embedded = 37,187 cf x 40.0% Voids
#3A	95.00'	22,051 cf	ADS_StormTech SC-740 +Cap x 480 Inside #2 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 480 Chambers in 30 Rows
		38,980 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
97.00	3,240	0.0	0	0
97.67	3,240	35.0	760	760
97.83	3,240	15.0	78	838
98.00	3,240	15.0	83	920
98.35	3,240	100.0	1,134	2,054

Device	Routing	Invert	Outlet Devices
#1	Primary	92.07'	2.0" Vert. Restriction Orifice C= 0.600 Limited to weir flow at low heads
#2	Device 1	92.17'	6.0" Round 6" HDPE Underdrain L= 359.0' Ke= 0.500 Inlet / Outlet Invert= 92.17' / 90.37' S= 0.0050 ' S= 0.0050 ' Cc= 0.900 n= 0.020 Corrugated PE, corrugated interior, Flow Area= 0.20 sf
#3	Device 2	92.17'	0.9" x 0.1" Horiz. Perforations X 400.00 columns X 3 rows C= 0.600 Limited to weir flow at low heads
#4	Secondary	98.00'	19.0' long x 2.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Primary OutFlow Max=0.25 cfs @ 18.14 hrs HW=97.93' (Free Discharge)

↑1=**Restriction Orifice** (Orifice Controls 0.25 cfs @ 11.58 fps)

↑2=**6" HDPE Underdrain** (Passes 0.25 cfs of 0.46 cfs potential flow)

↑3=**Perforations** (Passes 0.25 cfs of 8.67 cfs potential flow)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=94.50' (Free Discharge)

↑4=**Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 6P: PP (w/ underdrain) w/ UG storage 3 - Chamber Wizard Field A

Chamber Model = ADS_StormTech SC-740 +Cap (ADS StormTech® SC-740 with cap length)

Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf

Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap

51.0" Wide + 6.0" Spacing = 57.0" C-C Row Spacing

16 Chambers/Row x 7.12' Long +0.81' Cap Length x 2 = 115.54' Row Length +12.0" End Stone x 2 = 117.54' Base Length

30 Rows x 51.0" Wide + 6.0" Spacing x 29 + 12.0" Side Stone x 2 = 144.00' Base Width

6.0" Stone Base + 30.0" Chamber Height + 6.0" Stone Cover = 3.50' Field Height

480 Chambers x 45.9 cf = 22,051.2 cf Chamber Storage

59,238.5 cf Field - 22,051.2 cf Chambers = 37,187.3 cf Stone x 40.0% Voids = 14,874.9 cf Stone Storage

Chamber Storage + Stone Storage = 36,926.1 cf = 0.848 af

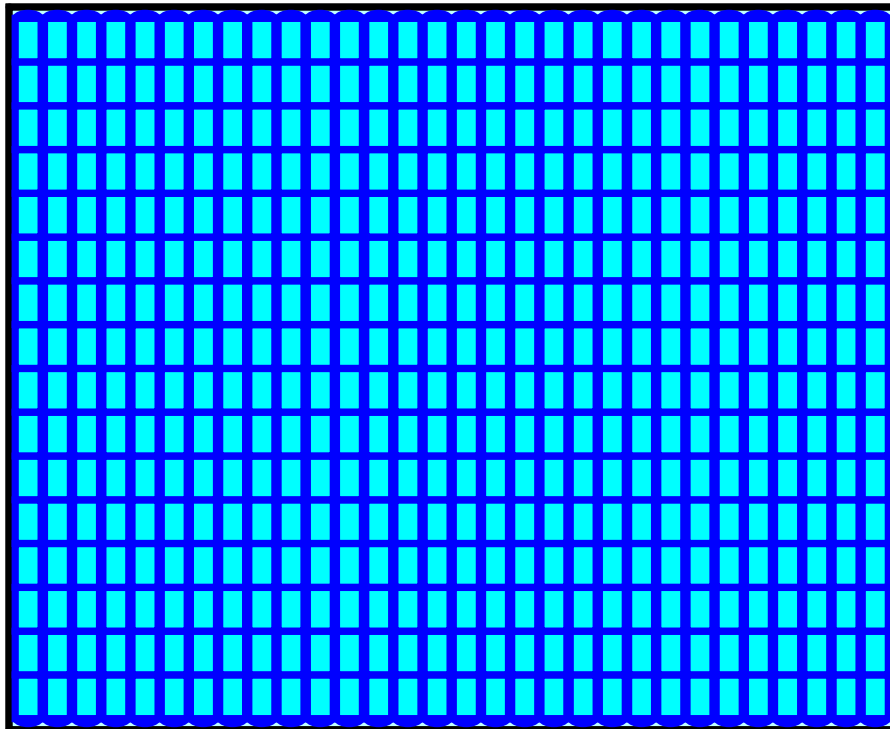
Overall Storage Efficiency = 62.3%

Overall System Size = 117.54' x 144.00' x 3.50'

480 Chambers

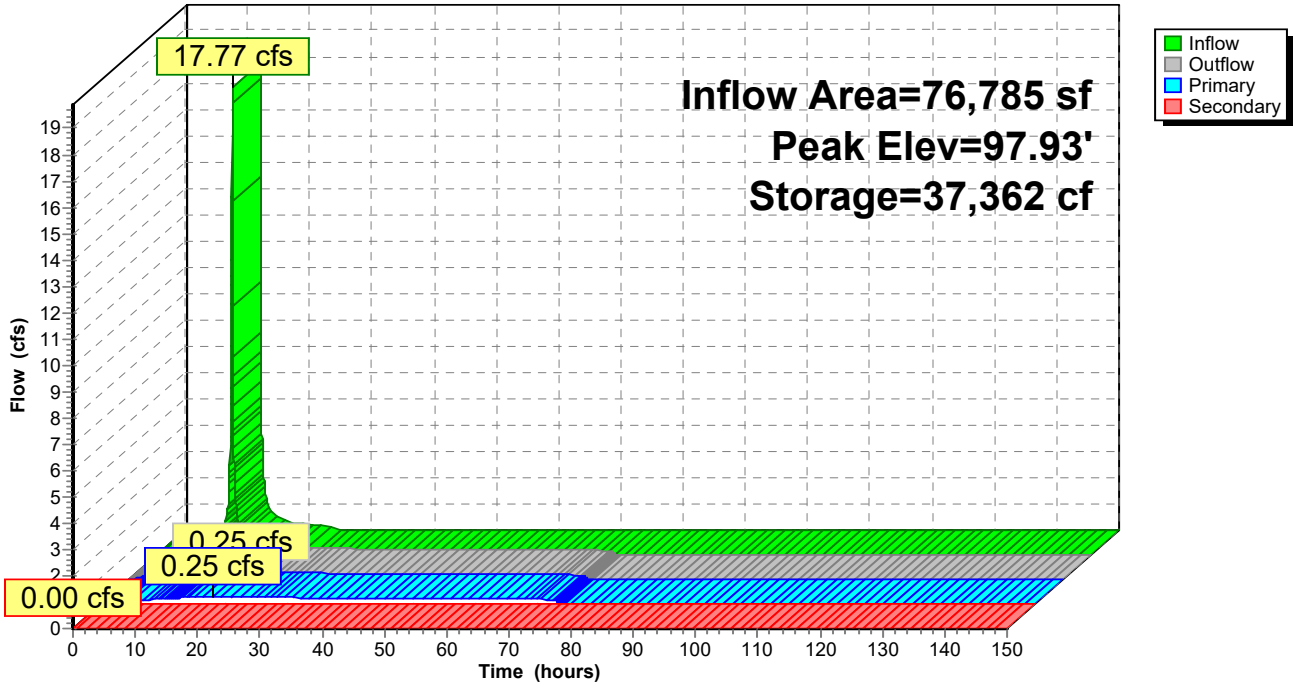
2,194.0 cy Field

1,377.3 cy Stone



Pond 6P: PP (w/ underdrain) w/ UG storage 3

Hydrograph



Summary for Pond 7P: PP (w/ underdrain) w/ UG storage 4

[44] Hint: Outlet device #3 is below defined storage

Inflow Area = 120,233 sf, 94.05% Impervious, Inflow Depth = 8.56" for 100-Year _Current event
 Inflow = 28.04 cfs @ 12.10 hrs, Volume= 85,814 cf
 Outflow = 0.46 cfs @ 17.47 hrs, Volume= 85,814 cf, Atten= 98%, Lag= 322.0 min
 Primary = 0.46 cfs @ 17.47 hrs, Volume= 85,814 cf
 Routed to Pond 8P : Existing Basin 1
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
 Routed to Pond 8P : Existing Basin 1

Routing by Stor-Ind method, Time Span= 0.00-150.00 hrs, dt= 0.02 hrs
 Peak Elev= 97.95' @ 17.47 hrs Surf.Area= 30,822 sf Storage= 57,964 cf

Plug-Flow detention time= 1,229.5 min calculated for 85,814 cf (100% of inflow)
 Center-of-Mass det. time= 1,229.5 min (1,970.5 - 741.0)

Volume	Invert	Avail.Storage	Storage Description
#1	97.00'	2,980 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
#2A	94.50'	22,825 cf	163.00'W x 160.26'L x 3.50'H Field A 91,426 cf Overall - 34,363 cf Embedded = 57,063 cf x 40.0% Voids
#3A	95.00'	34,363 cf	ADS_StormTech SC-740 +Cap x 748 Inside #2 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 748 Chambers in 34 Rows
		60,168 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
97.00	4,700	0.0	0	0
97.67	4,700	35.0	1,102	1,102
97.83	4,700	15.0	113	1,215
98.00	4,700	15.0	120	1,335
98.35	4,700	100.0	1,645	2,980

Device	Routing	Invert	Outlet Devices
#1	Primary	92.07'	3.0" Vert. Restriction Orifice C= 0.600 Limited to weir flow at low heads
#2	Device 1	92.17'	6.0" Round 6" HDPE Underdrain L= 359.0' Ke= 0.500 Inlet / Outlet Invert= 92.17' / 90.37' S= 0.0050 ' S= 0.0050 ' Cc= 0.900 n= 0.020 Corrugated PE, corrugated interior, Flow Area= 0.20 sf
#3	Device 2	92.17'	0.9" x 0.1" Horiz. Perforations X 400.00 columns X 3 rows C= 0.600 Limited to weir flow at low heads
#4	Secondary	98.00'	19.0' long x 2.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Primary OutFlow Max=0.46 cfs @ 17.47 hrs HW=97.95' (Free Discharge)

↑1=Restriction Orifice (Passes 0.46 cfs of 0.57 cfs potential flow)

↑2=6" HDPE Underdrain (Outlet Controls 0.46 cfs @ 2.35 fps)

↑3=Perforations (Passes 0.46 cfs of 8.68 cfs potential flow)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=94.50' (Free Discharge)

↑4=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Pond 7P: PP (w/ underdrain) w/ UG storage 4 - Chamber Wizard Field A

Chamber Model = ADS_StormTech SC-740 +Cap (ADS StormTech® SC-740 with cap length)

Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf

Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap

51.0" Wide + 6.0" Spacing = 57.0" C-C Row Spacing

22 Chambers/Row x 7.12' Long +0.81' Cap Length x 2 = 158.26' Row Length +12.0" End Stone x 2 = 160.26' Base Length

34 Rows x 51.0" Wide + 6.0" Spacing x 33 + 12.0" Side Stone x 2 = 163.00' Base Width

6.0" Stone Base + 30.0" Chamber Height + 6.0" Stone Cover = 3.50' Field Height

748 Chambers x 45.9 cf = 34,363.1 cf Chamber Storage

91,426.4 cf Field - 34,363.1 cf Chambers = 57,063.3 cf Stone x 40.0% Voids = 22,825.3 cf Stone Storage

Chamber Storage + Stone Storage = 57,188.5 cf = 1.313 af

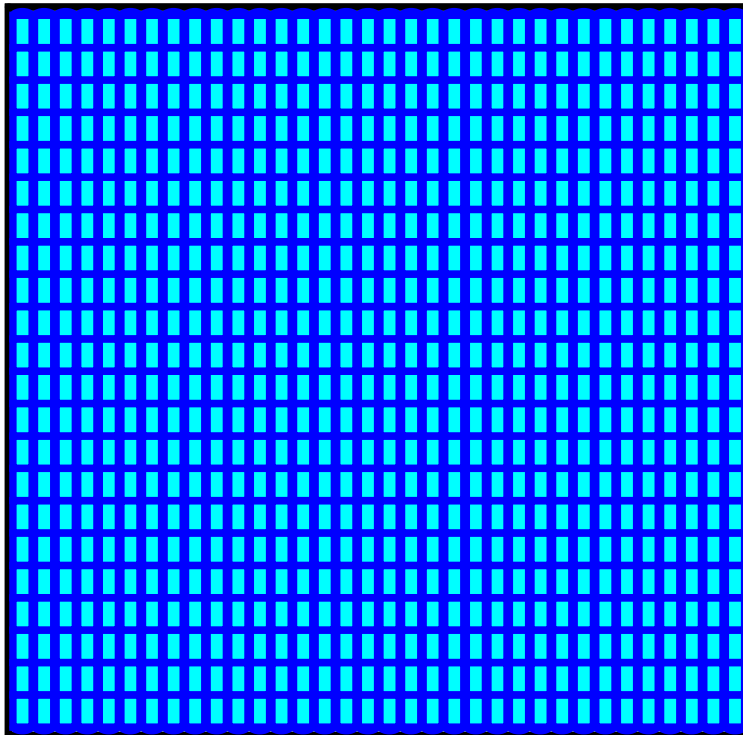
Overall Storage Efficiency = 62.6%

Overall System Size = 160.26' x 163.00' x 3.50'

748 Chambers

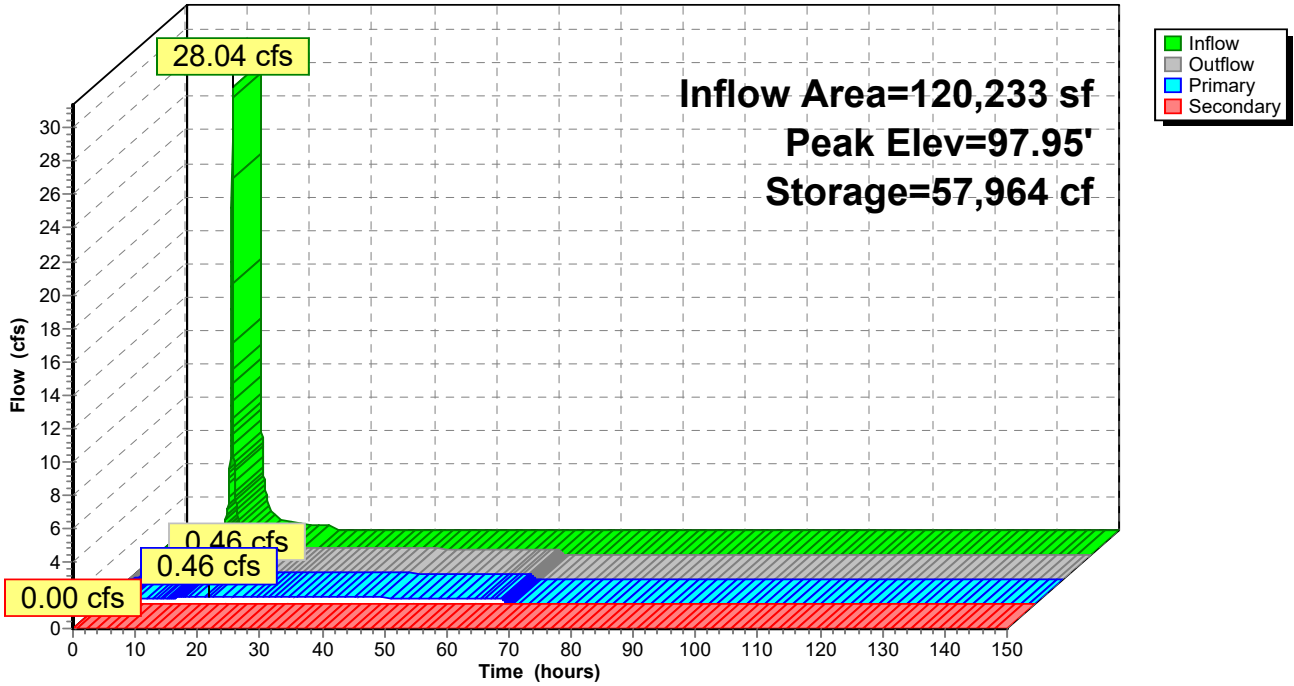
3,386.2 cy Field

2,113.5 cy Stone



Pond 7P: PP (w/ underdrain) w/ UG storage 4

Hydrograph



Summary for Pond 8P: Existing Basin 1

Inflow Area = 444,913 sf, 80.94% Impervious, Inflow Depth = 8.20" for 100-Year_Current event
 Inflow = 26.84 cfs @ 12.09 hrs, Volume= 304,013 cf
 Outflow = 14.40 cfs @ 12.14 hrs, Volume= 304,013 cf, Atten= 46%, Lag= 3.2 min
 Primary = 14.40 cfs @ 12.14 hrs, Volume= 304,013 cf
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
 Routed to nonexistent node 67L
 Tertiary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
 Routed to nonexistent node 67L

Routing by Stor-Ind method, Time Span= 0.00-150.00 hrs, dt= 0.02 hrs / 2
 Peak Elev= 59.89' @ 12.14 hrs Surf.Area= 11,785 sf Storage= 12,668 cf

Plug-Flow detention time= 16.3 min calculated for 303,973 cf (100% of inflow)
 Center-of-Mass det. time= 16.3 min (1,600.8 - 1,584.5)

Volume	Invert	Avail.Storage	Storage Description
#1	58.00'	33,881 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
58.00	1,339	0	0
59.00	7,134	4,237	4,237
60.00	12,352	9,743	13,980
61.00	18,300	15,326	29,306
61.25	18,300	4,575	33,881

Device	Routing	Invert	Outlet Devices
#1	Primary	58.00'	24.0" Vert. Low Flow Orifice C= 0.600 Limited to weir flow at low heads
#2	Secondary	60.00'	24.0" W x 18.0" H Vert. 2-YR Orifice C= 0.600 Limited to weir flow at low heads
#3	Tertiary	60.75'	48.0" x 48.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#4	Tertiary	61.00'	100.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)

Primary OutFlow Max=14.38 cfs @ 12.14 hrs HW=59.89' (Free Discharge)

↑1=Low Flow Orifice (Orifice Controls 14.38 cfs @ 4.68 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=58.00' (Free Discharge)

↑2=2-YR Orifice (Controls 0.00 cfs)

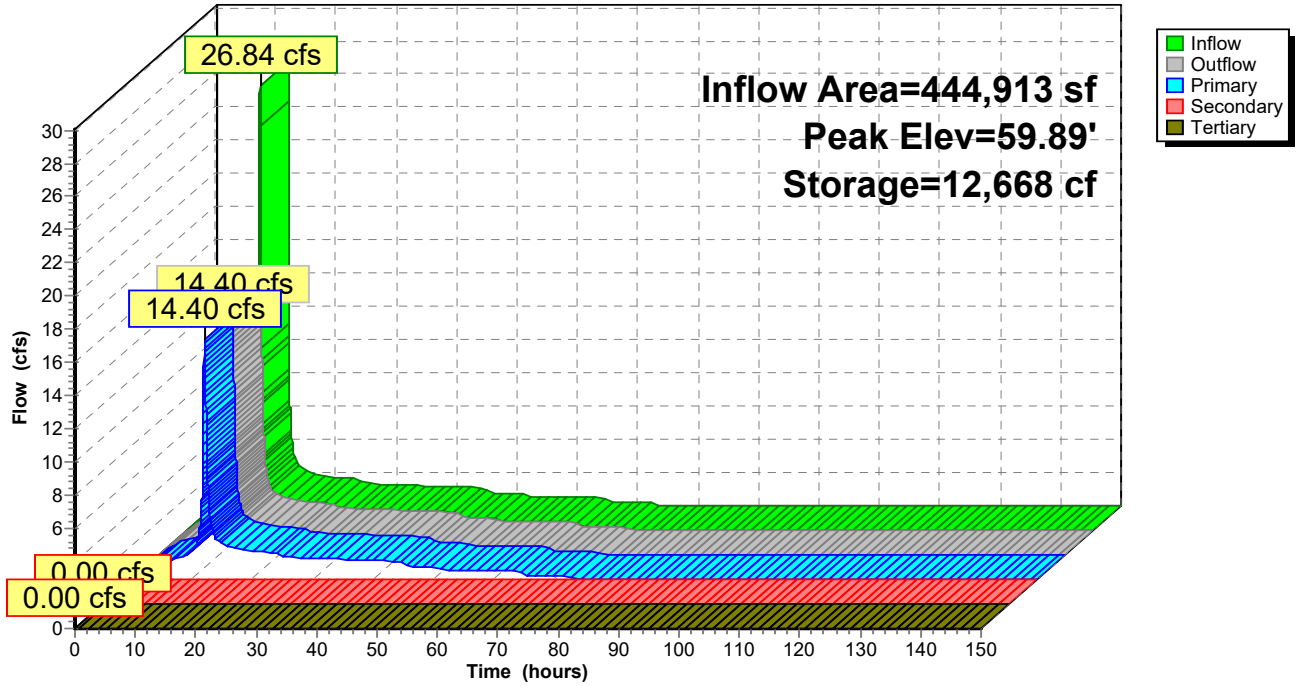
Tertiary OutFlow Max=0.00 cfs @ 0.00 hrs HW=58.00' (Free Discharge)

↑3=Orifice/Grate (Controls 0.00 cfs)

↑4=Sharp-Crested Rectangular Weir (Controls 0.00 cfs)

Pond 8P: Existing Basin 1

Hydrograph



Summary for Pond 9P: Existing Basin 2

<https://hydro.rutgers.edu/view-project/100596/>

Inflow Area = 59,019 sf, 68.70% Impervious, Inflow Depth = 7.95" for 100-Year_Current event
 Inflow = 13.46 cfs @ 12.09 hrs, Volume= 39,088 cf
 Outflow = 11.66 cfs @ 12.12 hrs, Volume= 39,085 cf, Atten= 13%, Lag= 1.8 min
 Primary = 0.43 cfs @ 12.12 hrs, Volume= 20,114 cf
 Secondary = 2.57 cfs @ 12.12 hrs, Volume= 14,376 cf
 Tertiary = 8.66 cfs @ 12.12 hrs, Volume= 4,595 cf

Routing by Stor-Ind method, Time Span= 0.00-150.00 hrs, dt= 0.02 hrs / 2
 Peak Elev= 68.05' @ 12.12 hrs Surf.Area= 5,798 sf Storage= 10,616 cf

Plug-Flow detention time= 82.7 min calculated for 39,085 cf (100% of inflow)
 Center-of-Mass det. time= 82.6 min (836.2 - 753.7)

Volume	Invert	Avail.Storage	Storage Description
#1	64.60'	13,401 cf	Custom Stage Data (Prismatic) Listed below

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
64.60	0	0	0
65.00	647	129	129
66.00	2,768	1,708	1,837
68.00	5,693	8,461	10,298
68.50	6,718	3,103	13,401

Device	Routing	Invert	Outlet Devices
#1	Primary	64.60'	3.0" Vert. 3" Orifice C= 0.600 Limited to weir flow at low heads
#2	Secondary	66.40'	0.7' long 8" Sharp-Crested Rectangular Weir 2 End Contraction(s)
#3	Tertiary	67.75'	48.0" x 48.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads

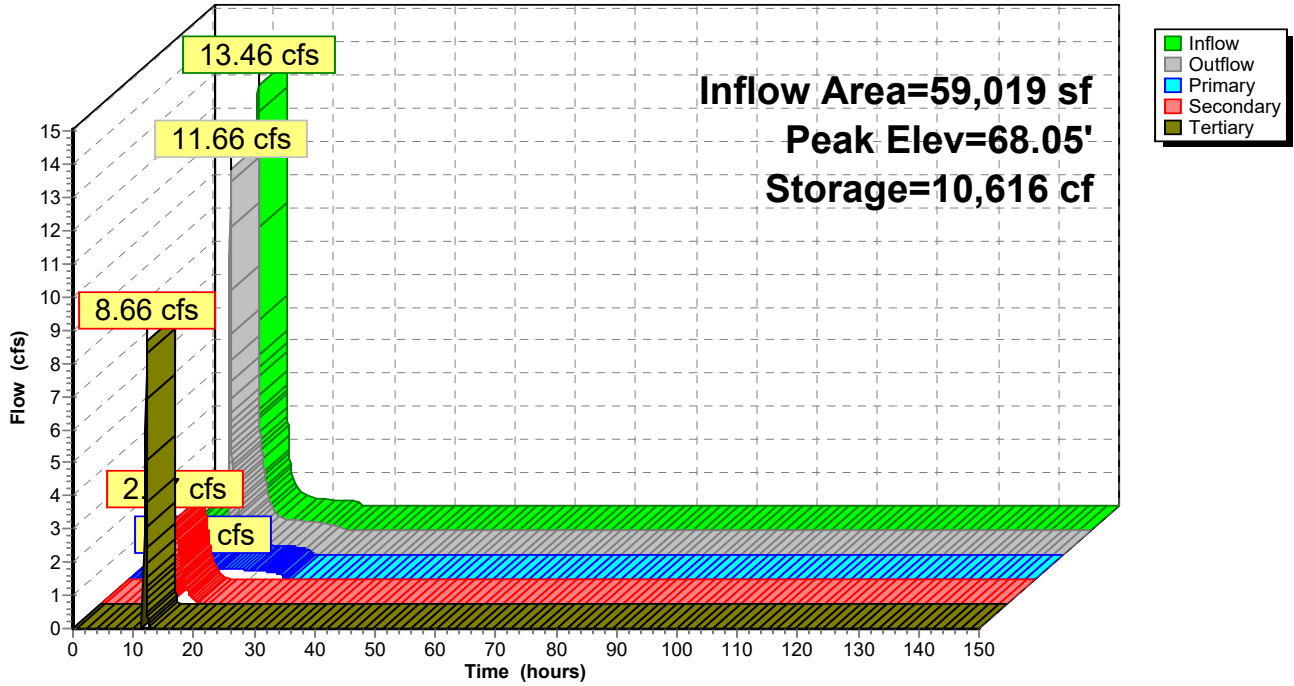
Primary OutFlow Max=0.43 cfs @ 12.12 hrs HW=68.05' (Free Discharge)
 ↳1=3" Orifice (Orifice Controls 0.43 cfs @ 8.78 fps)

Secondary OutFlow Max=2.56 cfs @ 12.12 hrs HW=68.05' (Free Discharge)
 ↳2=8" Sharp-Crested Rectangular Weir (Weir Controls 2.56 cfs @ 4.20 fps)

Tertiary OutFlow Max=8.54 cfs @ 12.12 hrs HW=68.05' (Free Discharge)
 ↳3=Orifice/Grate (Weir Controls 8.54 cfs @ 1.79 fps)

Pond 9P: Existing Basin 2

Hydrograph



Summary for Pond 10P: PP (w/ underdrain) w/ UG storage 5

[44] Hint: Outlet device #3 is below defined storage

Inflow Area = 48,527 sf, 85.53% Impervious, Inflow Depth = 8.29" for 100-Year_Current event
 Inflow = 10.38 cfs @ 12.13 hrs, Volume= 33,509 cf
 Outflow = 2.02 cfs @ 12.52 hrs, Volume= 33,509 cf, Atten= 81%, Lag= 23.4 min
 Primary = 0.46 cfs @ 12.52 hrs, Volume= 31,168 cf
 Routed to Pond 13P : Bioretention Basin 4
 Secondary = 1.56 cfs @ 12.52 hrs, Volume= 2,341 cf
 Routed to Pond 13P : Bioretention Basin 4

Routing by Stor-Ind method, Time Span= 0.00-150.00 hrs, dt= 0.02 hrs
 Peak Elev= 98.02' @ 12.52 hrs Surf.Area= 11,632 sf Storage= 14,344 cf

Plug-Flow detention time= 262.4 min calculated for 33,505 cf (100% of inflow)
 Center-of-Mass det. time= 262.4 min (1,010.2 - 747.7)

Volume	Invert	Avail.Storage	Storage Description
#1	97.00'	3,687 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
#2A	94.50'	5,184 cf	34.75'W x 167.38'L x 3.50'H Field A 20,357 cf Overall - 7,396 cf Embedded = 12,961 cf x 40.0% Voids
#3A	95.00'	7,396 cf	ADS_StormTech SC-740 +Cap x 161 Inside #2 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 161 Chambers in 7 Rows
		16,268 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
97.00	5,816	0.0	0	0
97.67	5,816	35.0	1,364	1,364
97.83	5,816	15.0	140	1,503
98.00	5,816	15.0	148	1,652
98.35	5,816	100.0	2,036	3,687

Device	Routing	Invert	Outlet Devices
#1	Primary	92.07'	3.0" Vert. Restriction Orifice C= 0.600 Limited to weir flow at low heads
#2	Device 1	92.17'	6.0" Round 6" HDPE Underdrain L= 359.0' Ke= 0.500 Inlet / Outlet Invert= 92.17' / 90.37' S= 0.0050 ' S= 0.0050 ' Cc= 0.900 n= 0.020 Corrugated PE, corrugated interior, Flow Area= 0.20 sf
#3	Device 2	92.17'	0.9" x 0.1" Horiz. Perforations X 400.00 columns X 3 rows C= 0.600 Limited to weir flow at low heads
#4	Secondary	98.00'	168.0' long x 2.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Primary OutFlow Max=0.46 cfs @ 12.52 hrs HW=98.02' (Free Discharge)

↑1=**Restriction Orifice** (Passes 0.46 cfs of 0.57 cfs potential flow)

↑2=**6" HDPE Underdrain** (Outlet Controls 0.46 cfs @ 2.36 fps)

↑3=**Perforations** (Passes 0.46 cfs of 8.73 cfs potential flow)

Secondary OutFlow Max=1.14 cfs @ 12.52 hrs HW=98.02' (Free Discharge)

↑4=**Broad-Crested Rectangular Weir** (Weir Controls 1.14 cfs @ 0.35 fps)

Pond 10P: PP (w/ underdrain) w/ UG storage 5 - Chamber Wizard Field A

Chamber Model = ADS_StormTech SC-740 +Cap (ADS StormTech® SC-740 with cap length)

Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf

Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap

51.0" Wide + 6.0" Spacing = 57.0" C-C Row Spacing

23 Chambers/Row x 7.12' Long +0.81' Cap Length x 2 = 165.38' Row Length +12.0" End Stone x 2 = 167.38' Base Length

7 Rows x 51.0" Wide + 6.0" Spacing x 6 + 12.0" Side Stone x 2 = 34.75' Base Width

6.0" Stone Base + 30.0" Chamber Height + 6.0" Stone Cover = 3.50' Field Height

161 Chambers x 45.9 cf = 7,396.3 cf Chamber Storage

20,357.2 cf Field - 7,396.3 cf Chambers = 12,960.8 cf Stone x 40.0% Voids = 5,184.3 cf Stone Storage

Chamber Storage + Stone Storage = 12,580.7 cf = 0.289 af

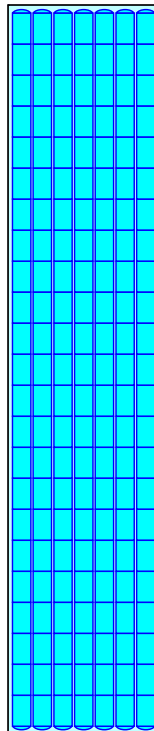
Overall Storage Efficiency = 61.8%

Overall System Size = 167.38' x 34.75' x 3.50'

161 Chambers

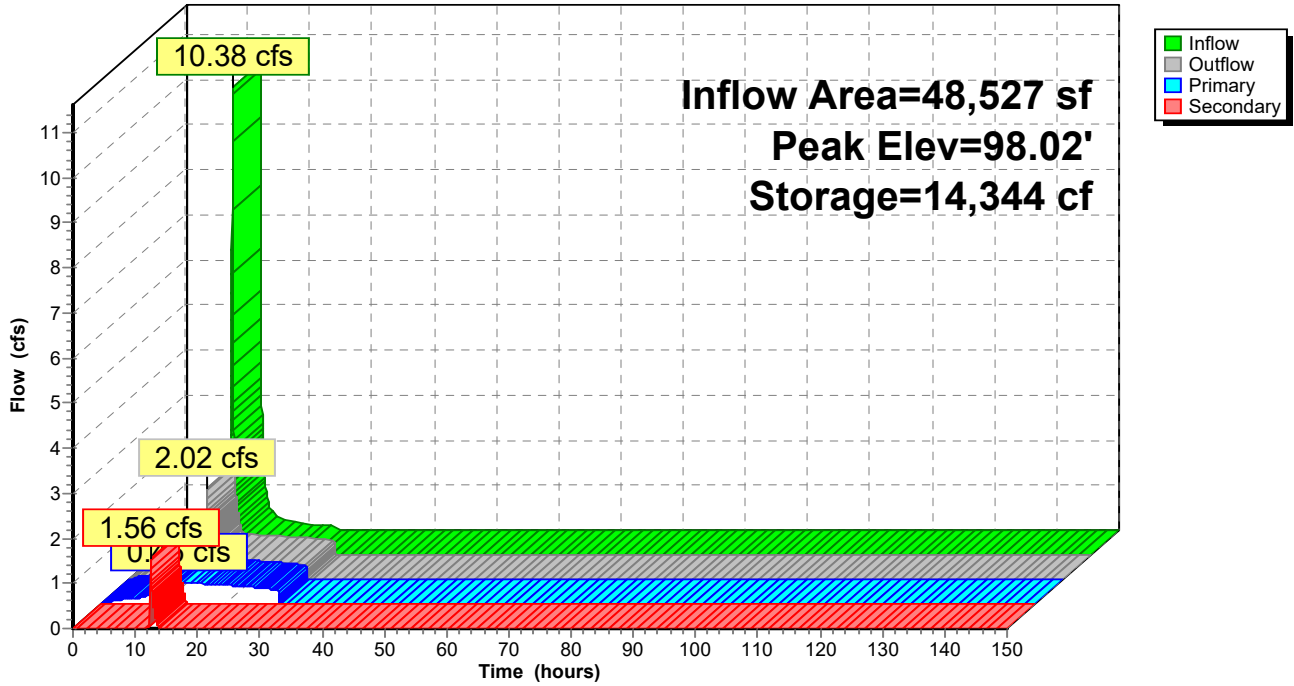
754.0 cy Field

480.0 cy Stone



Pond 10P: PP (w/ underdrain) w/ UG storage 5

Hydrograph



Summary for Pond 11P: PP (w/ underdrain) w/ UG storage 6

[44] Hint: Outlet device #3 is below defined storage

Inflow Area = 57,652 sf, 78.51% Impervious, Inflow Depth = 8.13" for 100-Year_Current event
 Inflow = 13.41 cfs @ 12.09 hrs, Volume= 39,077 cf
 Outflow = 1.08 cfs @ 12.96 hrs, Volume= 39,077 cf, Atten= 92%, Lag= 52.0 min
 Primary = 0.46 cfs @ 12.96 hrs, Volume= 38,066 cf
 Routed to Pond 13P : Bioretention Basin 4
 Secondary = 0.62 cfs @ 12.96 hrs, Volume= 1,012 cf
 Routed to Pond 13P : Bioretention Basin 4

Routing by Stor-Ind method, Time Span= 0.00-150.00 hrs, dt= 0.02 hrs
 Peak Elev= 98.01' @ 12.96 hrs Surf.Area= 11,976 sf Storage= 19,638 cf

Plug-Flow detention time= 393.1 min calculated for 39,072 cf (100% of inflow)
 Center-of-Mass det. time= 393.1 min (1,141.4 - 748.3)

Volume	Invert	Avail.Storage	Storage Description
#1	97.00'	2,144 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
#2A	94.50'	7,621 cf	96.50'W x 89.06'L x 3.50'H Field A 30,079 cf Overall - 11,026 cf Embedded = 19,053 cf x 40.0% Voids
#3A	95.00'	11,026 cf	ADS_StormTech SC-740 +Cap x 240 Inside #2 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 240 Chambers in 20 Rows
		20,791 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
97.00	3,382	0.0	0	0
97.67	3,382	35.0	793	793
97.83	3,382	15.0	81	874
98.00	3,382	15.0	86	960
98.35	3,382	100.0	1,184	2,144

Device	Routing	Invert	Outlet Devices
#1	Primary	92.07'	3.0" Vert. Restriction Orifice C= 0.600 Limited to weir flow at low heads
#2	Device 1	92.17'	6.0" Round 6" HDPE Underdrain L= 359.0' Ke= 0.500 Inlet / Outlet Invert= 92.17' / 90.37' S= 0.0050 ' S= 0.0050 ' Cc= 0.900 n= 0.020 Corrugated PE, corrugated interior, Flow Area= 0.20 sf
#3	Device 2	92.17'	0.9" x 0.1" Horiz. Perforations X 400.00 columns X 3 rows C= 0.600 Limited to weir flow at low heads
#4	Secondary	98.00'	168.0' long x 2.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Primary OutFlow Max=0.46 cfs @ 12.96 hrs HW=98.01' (Free Discharge)

↑**1=Restriction Orifice** (Passes 0.46 cfs of 0.57 cfs potential flow)

↑**2=6" HDPE Underdrain** (Outlet Controls 0.46 cfs @ 2.36 fps)

↑**3=Perforations** (Passes 0.46 cfs of 8.73 cfs potential flow)

Secondary OutFlow Max=0.37 cfs @ 12.96 hrs HW=98.01' (Free Discharge)

↑**4=Broad-Crested Rectangular Weir** (Weir Controls 0.37 cfs @ 0.24 fps)

Pond 11P: PP (w/ underdrain) w/ UG storage 6 - Chamber Wizard Field A

Chamber Model = ADS_StormTech SC-740 +Cap (ADS StormTech® SC-740 with cap length)

Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf

Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap

51.0" Wide + 6.0" Spacing = 57.0" C-C Row Spacing

12 Chambers/Row x 7.12' Long +0.81' Cap Length x 2 = 87.06' Row Length +12.0" End Stone x 2 = 89.06' Base Length

20 Rows x 51.0" Wide + 6.0" Spacing x 19 + 12.0" Side Stone x 2 = 96.50' Base Width

6.0" Stone Base + 30.0" Chamber Height + 6.0" Stone Cover = 3.50' Field Height

240 Chambers x 45.9 cf = 11,025.6 cf Chamber Storage

30,078.9 cf Field - 11,025.6 cf Chambers = 19,053.3 cf Stone x 40.0% Voids = 7,621.3 cf Stone Storage

Chamber Storage + Stone Storage = 18,646.9 cf = 0.428 af

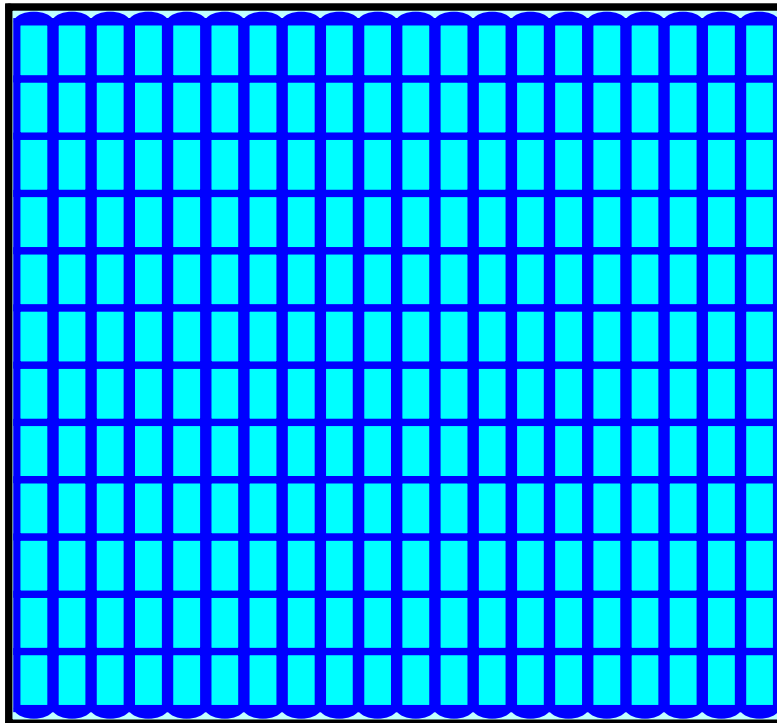
Overall Storage Efficiency = 62.0%

Overall System Size = 89.06' x 96.50' x 3.50'

240 Chambers

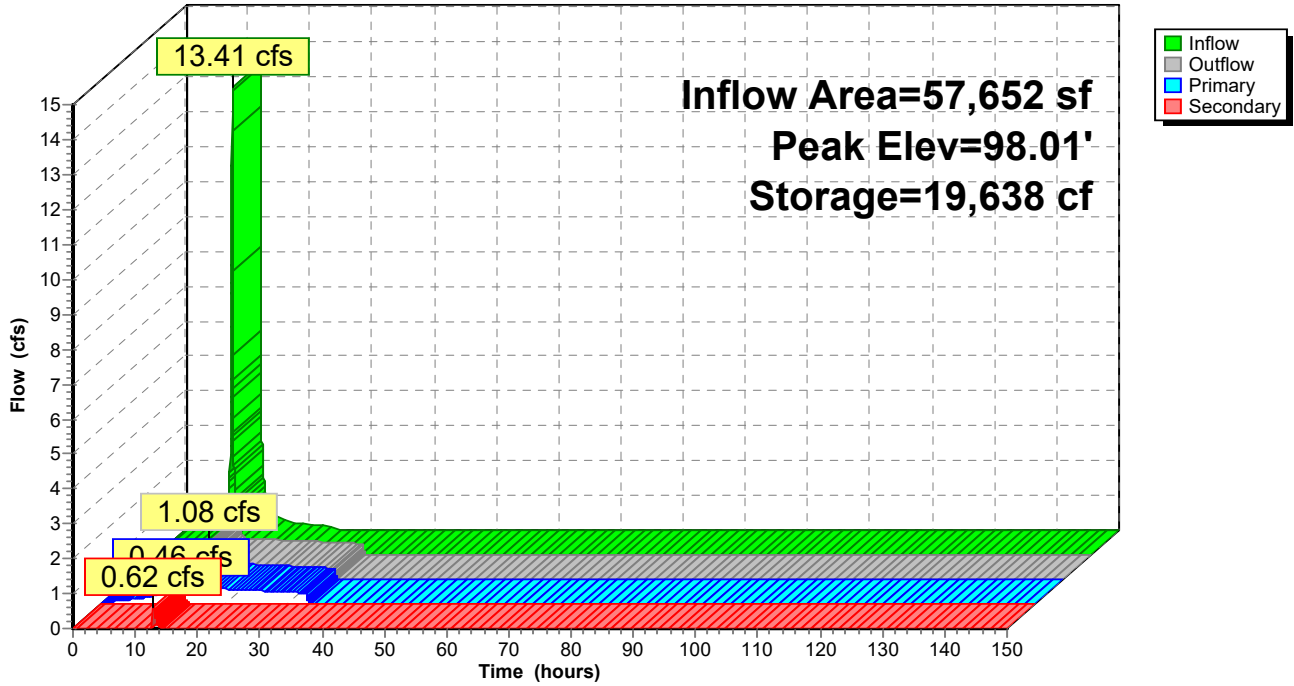
1,114.0 cy Field

705.7 cy Stone



Pond 11P: PP (w/ underdrain) w/ UG storage 6

Hydrograph



Summary for Pond 12P: PP (w/ underdrain) w/ UG storage 7

[44] Hint: Outlet device #3 is below defined storage

Inflow Area = 67,756 sf, 72.56% Impervious, Inflow Depth = 8.01" for 100-Year_Current event
 Inflow = 15.45 cfs @ 12.10 hrs, Volume= 45,216 cf
 Outflow = 0.60 cfs @ 14.09 hrs, Volume= 45,216 cf, Atten= 96%, Lag= 119.5 min
 Primary = 0.46 cfs @ 14.08 hrs, Volume= 45,056 cf
 Routed to Pond 13P : Bioretention Basin 4
 Secondary = 0.14 cfs @ 14.09 hrs, Volume= 160 cf
 Routed to Pond 13P : Bioretention Basin 4

Routing by Stor-Ind method, Time Span= 0.00-150.00 hrs, dt= 0.02 hrs
 Peak Elev= 98.00' @ 14.08 hrs Surf.Area= 12,790 sf Storage= 25,088 cf

Plug-Flow detention time= 524.3 min calculated for 45,216 cf (100% of inflow)
 Center-of-Mass det. time= 524.3 min (1,276.2 - 751.8)

Volume	Invert	Avail.Storage	Storage Description
#1	97.00'	935 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
#2A	94.50'	9,962 cf	77.50'W x 146.02'L x 3.50'H Field A 39,607 cf Overall - 14,701 cf Embedded = 24,906 cf x 40.0% Voids
#3A	95.00'	14,701 cf	ADS_StormTech SC-740 +Cap x 320 Inside #2 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 320 Chambers in 16 Rows
		25,598 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
97.00	1,474	0.0	0	0
97.67	1,474	35.0	346	346
97.83	1,474	15.0	35	381
98.00	1,474	15.0	38	419
98.35	1,474	100.0	516	935

Device	Routing	Invert	Outlet Devices
#1	Primary	92.07'	3.0" Vert. Restriction Orifice C= 0.600 Limited to weir flow at low heads
#2	Device 1	92.17'	6.0" Round 6" HDPE Underdrain L= 359.0' Ke= 0.500 Inlet / Outlet Invert= 92.17' / 90.37' S= 0.0050 ' S= 0.0050 ' Cc= 0.900 n= 0.020 Corrugated PE, corrugated interior, Flow Area= 0.20 sf
#3	Device 2	92.17'	0.9" x 0.1" Horiz. Perforations X 400.00 columns X 3 rows C= 0.600 Limited to weir flow at low heads
#4	Secondary	98.00'	168.0' long x 2.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Primary OutFlow Max=0.46 cfs @ 14.08 hrs HW=98.00' (Free Discharge)

↑**1=Restriction Orifice** (Passes 0.46 cfs of 0.57 cfs potential flow)

↑**2=6" HDPE Underdrain** (Outlet Controls 0.46 cfs @ 2.36 fps)

↑**3=Perforations** (Passes 0.46 cfs of 8.72 cfs potential flow)

Secondary OutFlow Max=0.11 cfs @ 14.09 hrs HW=98.00' (Free Discharge)

↑**4=Broad-Crested Rectangular Weir** (Weir Controls 0.11 cfs @ 0.16 fps)

Pond 12P: PP (w/ underdrain) w/ UG storage 7 - Chamber Wizard Field A

Chamber Model = ADS_StormTech SC-740 +Cap (ADS StormTech® SC-740 with cap length)

Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf

Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap

51.0" Wide + 6.0" Spacing = 57.0" C-C Row Spacing

20 Chambers/Row x 7.12' Long +0.81' Cap Length x 2 = 144.02' Row Length +12.0" End Stone x 2 = 146.02' Base Length

16 Rows x 51.0" Wide + 6.0" Spacing x 15 + 12.0" Side Stone x 2 = 77.50' Base Width

6.0" Stone Base + 30.0" Chamber Height + 6.0" Stone Cover = 3.50' Field Height

320 Chambers x 45.9 cf = 14,700.8 cf Chamber Storage

39,607.0 cf Field - 14,700.8 cf Chambers = 24,906.2 cf Stone x 40.0% Voids = 9,962.5 cf Stone Storage

Chamber Storage + Stone Storage = 24,663.3 cf = 0.566 af

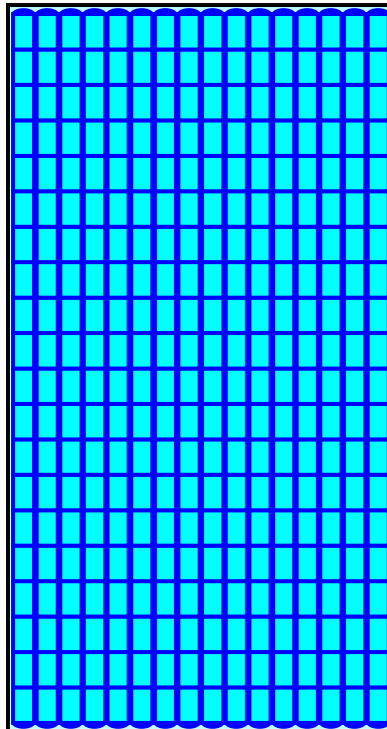
Overall Storage Efficiency = 62.3%

Overall System Size = 146.02' x 77.50' x 3.50'

320 Chambers

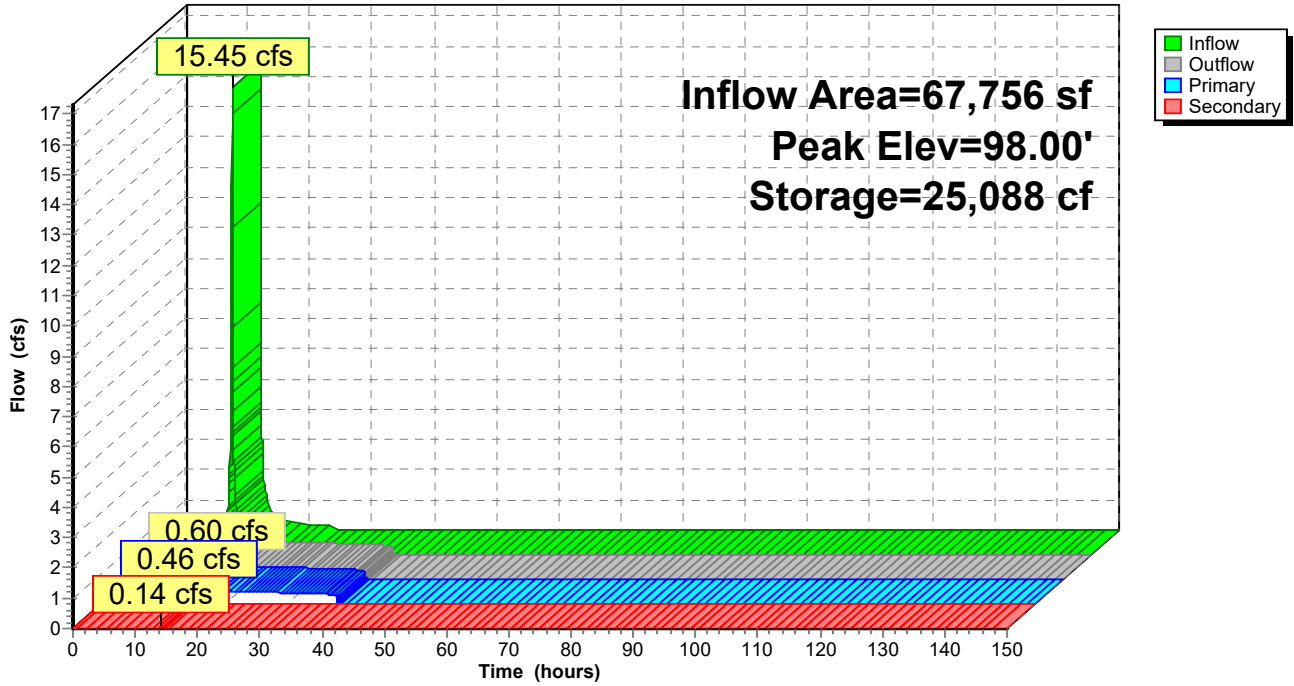
1,466.9 cy Field

922.5 cy Stone



Pond 12P: PP (w/ underdrain) w/ UG storage 7

Hydrograph



Summary for Pond 13P: Bioretention Basin 4

Inflow Area = 329,976 sf, 48.67% Impervious, Inflow Depth = 7.24" for 100-Year_Current event
 Inflow = 17.84 cfs @ 12.35 hrs, Volume= 199,018 cf
 Outflow = 17.13 cfs @ 12.41 hrs, Volume= 197,749 cf, Atten= 4%, Lag= 3.8 min
 Primary = 0.40 cfs @ 12.41 hrs, Volume= 50,099 cf
 Routed to nonexistent node 5R
 Secondary = 8.90 cfs @ 12.41 hrs, Volume= 135,873 cf
 Routed to nonexistent node 5R
 Tertiary = 7.83 cfs @ 12.41 hrs, Volume= 11,778 cf
 Routed to nonexistent node 5R

Routing by Stor-Ind method, Time Span= 0.00-150.00 hrs, dt= 0.02 hrs / 2
 Peak Elev= 52.24' @ 12.41 hrs Surf.Area= 10,478 sf Storage= 25,461 cf

Plug-Flow detention time= 181.8 min calculated for 197,723 cf (99% of inflow)
 Center-of-Mass det. time= 174.6 min (1,191.6 - 1,017.0)

Volume	Invert	Avail.Storage	Storage Description
#1	49.00'	33,395 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
49.00	4,800	0	0
52.00	10,478	22,917	22,917
53.00	10,478	10,478	33,395

Device	Routing	Invert	Outlet Devices
#1	Primary	49.25'	3.0" Vert. Low Flow Orifice C= 0.600 Limited to weir flow at low heads
#2	Secondary	51.00'	24.0" W x 18.0" H Vert. SECONDARY OUTLET C= 0.600 Limited to weir flow at low heads
#3	Tertiary	52.00'	60.0" x 60.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.40 cfs @ 12.41 hrs HW=52.24' (Free Discharge)
 ↑1=**Low Flow Orifice** (Orifice Controls 0.40 cfs @ 8.15 fps)

Secondary OutFlow Max=8.89 cfs @ 12.41 hrs HW=52.24' (Free Discharge)
 ↑2=**SECONDARY OUTLET** (Orifice Controls 8.89 cfs @ 3.58 fps)

Tertiary OutFlow Max=7.81 cfs @ 12.41 hrs HW=52.24' (Free Discharge)
 ↑3=**Orifice/Grate** (Weir Controls 7.81 cfs @ 1.61 fps)

Pond 13P: Bioretention Basin 4

Hydrograph

