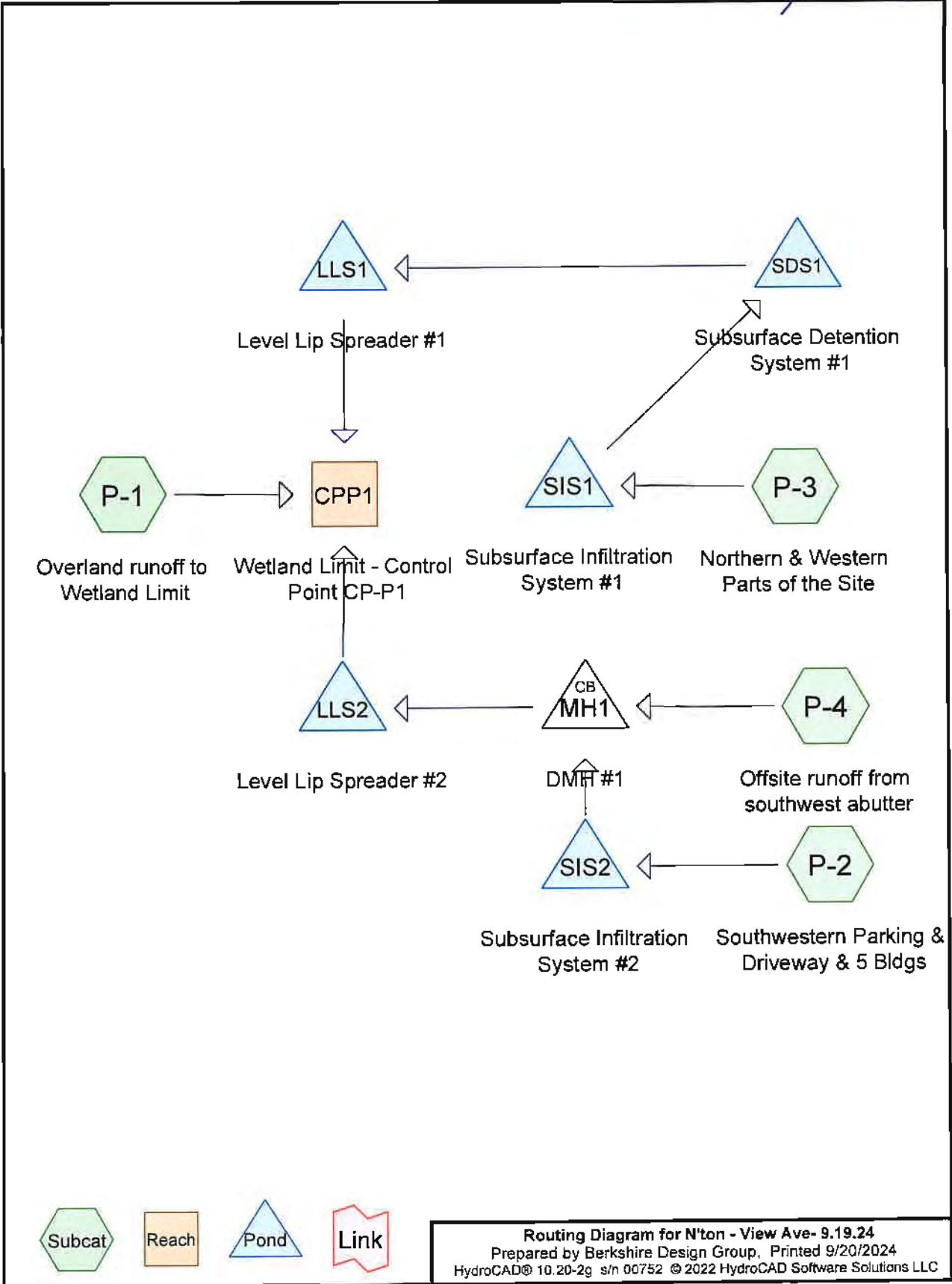


9/20/24 version
2-year storm



Reach



Routing Diagram for N'ton - View Ave- 9.19.24
Prepared by Berkshire Design Group, Printed 9/20/2024
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N'ton - View Ave- 9.19.24

NRCC 24-hr C 2-Year Rainfall=3.84"

Prepared by Berkshire Design Group

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Page 2

Time span=0.00-32.00 hrs, dt=0.01 hrs, 3201 points
 Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
 Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

SubcatchmentP-1: Overland runoff to Runoff Area=75,703 sf 0.00% Impervious Runoff Depth=1.22"
 Flow Length=223' Tc=29.2 min CN=70 Runoff=1.32 cfs 0.177 af

SubcatchmentP-2: Southwestern Parking Runoff Area=12,163 sf 73.38% Impervious Runoff Depth=2.58"
 Tc=5.0 min CN=88 Runoff=0.93 cfs 0.060 af

SubcatchmentP-3: Northern & Western Runoff Area=42,223 sf 43.23% Impervious Runoff Depth=1.62"
 Flow Length=287' Tc=20.7 min CN=76 Runoff=1.22 cfs 0.131 af

SubcatchmentP-4: Offsite runoff from Runoff Area=25,247 sf 16.66% Impervious Runoff Depth=1.05"
 Flow Length=195' Tc=9.6 min CN=67 Runoff=0.62 cfs 0.051 af

Reach CPP1: Wetland Limit - Control Point CP-P1 Inflow=2.05 cfs 0.375 af
 Outflow=2.05 cfs 0.375 af

Pond LLS1: Level Lip Spreader#1 Peak Elev=136.04' Storage=109 cf Inflow=0.50 cfs 0.101 af
 Outflow=0.50 cfs 0.098 af

Pond LLS2: Level Lip Spreader#2 Peak Elev=133.89' Storage=112 cf Inflow=1.45 cfs 0.102 af
 Outflow=1.45 cfs 0.099 af

Pond MH1: DMH #1 Peak Elev=135.94' Inflow=1.45 cfs 0.102 af
 18.0" Round Culvert n=0.012 L=43.0' S=0.0314 /' Outflow=1.45 cfs 0.102 af

Pond SDS1: Subsurface Detention System #1 Peak Elev=137.36' Storage=970 cf Inflow=1.17 cfs 0.101 af
 Outflow=0.50 cfs 0.101 af

Pond SIS1: Subsurface Infiltration System #1 Peak Elev=138.03' Storage=1,084 cf Inflow=1.22 cfs 0.131 af
 Discarded=0.01 cfs 0.014 af Primary=1.17 cfs 0.101 af Outflow=1.17 cfs 0.115 af

Pond SIS2: Subsurface Infiltration System #2 Peak Elev=137.72' Storage=551 cf Inflow=0.93 cfs 0.060 af
 10.0" Round Culvert n=0.012 L=27.0' S=0.0204 /' Outflow=0.87 cfs 0.051 af

Total Runoff Area = 3.566 ac Runoff Volume = 0.419 af Average Runoff Depth = 1.41"
79.80% Pervious = 2.846 ac 20.20% Impervious = 0.720 ac

Summary for Subcatchment P-1: Overland runoff to Wetland Limit

Runoff = 1.32 cfs @ 12.43 hrs, Volume= 0.177 af, Depth= 1.22"
 Routed to Reach CPP1 : Wetland Limit - Control Point CP-P1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-32.00 hrs, dt= 0.01 hrs
 NRCC 24-hr C 2-Year Rainfall=3.84"

Area (sf)	CN	Description
37,021	77	Woods, Good, HSG D
12,125	55	Woods, Good, HSG B
17,581	61	>75% Grass cover, Good, HSG B
7,936	80	>75% Grass cover, Good, HSG D
* 321	85	Riprap, HSG B
* 308	91	Riprap, HSG D
271	85	Gravel roads, HSG B
140	91	Gravel roads, HSG D
75,703	70	Weighted Average
75,703		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.1	28	0.3333	0.42		Sheet Flow, Grass Grass: Short n= 0.150 P2= 3.43"
22.3	72	0.0347	0.05		Sheet Flow, Woods Woods: Dense underbrush n= 0.800 P2= 3.43"
5.8	123	0.0203	0.36		Shallow Concentrated Flow, Woods Forest w/Heavy Litter Kv= 2.5 fps
29.2	223	Total			

Summary for Subcatchment P-2: Southwestern Parking & Driveway & 5 Bldgs

Runoff = 0.93 cfs @ 12.12 hrs, Volume= 0.060 af, Depth= 2.58"
 Routed to Pond SIS2 : Subsurface Infiltration System #2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-32.00 hrs, dt= 0.01 hrs
 NRCC 24-hr C 2-Year Rainfall=3.84"

Area (sf)	CN	Description
5,915	98	Paved parking, HSG D
3,010	98	Roofs, HSG B
3,238	61	>75% Grass cover, Good, HSG B
12,163	88	Weighted Average
3,238		26.62% Pervious Area
8,925		73.38% Impervious Area

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NRCC 24-hr C 2-Year Rainfall=3.84"

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Page 4

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

Summary for Subcatchment P-3: Northern & Western Parts of the Site

Runoff = 1.22 cfs @ 12.31 hrs, Volume= 0.131 af, Depth= 1.62"
 Routed to Pond SIS1 : Subsurface Infiltration System #1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-32.00 hrs, dt= 0.01 hrs
 NRCC 24-hr C 2-Year Rainfall=3.84"

Area (sf)	CN	Description
13,496	98	Unconnected pavement, HSG B
4,756	98	Roofs, HSG B
16,612	61	>75% Grass cover, Good, HSG B
7,310	55	Woods, Good, HSG B
49	85	Gravel roads, HSG B
42,223	76	Weighted Average
23,971		56.77% Pervious Area
18,252		43.23% Impervious Area
13,496		73.94% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.6	52	0.0200	0.15		Sheet Flow, Grass Grass: Short n= 0.150 P2= 3.43"
13.1	40	0.0100	0.05		Sheet Flow, Woods Woods: Light underbrush n= 0.400 P2= 3.43"
1.5	64	0.0100	0.70		Shallow Concentrated Flow, Grass Short Grass Pasture Kv= 7.0 fps
0.2	41	0.0200	2.87		Shallow Concentrated Flow, Paved Paved Kv= 20.3 fps
0.3	90	0.0100	5.90	88.54	Trap/Vee/Rect Channel Flow, Gutter Flow Bot.W=20.00' D=0.50' Z= 0.1 & 40.0 ' Top.W=40.05' n= 0.013 Asphalt, smooth
20.7	287	Total			

Summary for Subcatchment P-4: Offsite runoff from southwest abutter

Runoff = 0.62 cfs @ 12.18 hrs, Volume= 0.051 af, Depth= 1.05"
 Routed to Pond MH1 : DMH #1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-32.00 hrs, dt= 0.01 hrs
 NRCC 24-hr C 2-Year Rainfall=3.84"

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NRCC 24-hr C 2-Year Rainfall=3.84"

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Page 5

Area (sf)	CN	Description
4,206	98	Roofs, HSG B
856	55	Woods, Good, HSG B
20,185	61	>75% Grass cover, Good, HSG B
25,247	67	Weighted Average
21,041		83.34% Pervious Area
4,206		16.66% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.0	100	0.0300	0.21		Sheet Flow, Grass Grass: Short n= 0.150 P2= 3.43"
0.3	30	0.0667	1.81		Shallow Concentrated Flow, Grass Short Grass Pasture Kv= 7.0 fps
1.3	65	0.0150	0.86		Shallow Concentrated Flow, Grass Short Grass Pasture Kv= 7.0 fps
9.6	195	Total			

Summary for Reach CPP1: Wetland Limit - Control Point CP-P1

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

Inflow Area = 3.566 ac, 20.20% Impervious, Inflow Depth = 1.26" for 2-Year event
 Inflow = 2.05 cfs @ 12.47 hrs, Volume= 0.375 af
 Outflow = 2.05 cfs @ 12.47 hrs, Volume= 0.375 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-32.00 hrs, dt= 0.01 hrs

Summary for Pond LLS1: Level Lip Spreader #1

Inflow Area = 0.969 ac, 43.23% Impervious, Inflow Depth = 1.24" for 2-Year event
 Inflow = 0.50 cfs @ 12.73 hrs, Volume= 0.101 af
 Outflow = 0.50 cfs @ 12.73 hrs, Volume= 0.098 af, Atten= 0%, Lag= 0.1 min
 Primary = 0.50 cfs @ 12.73 hrs, Volume= 0.098 af
 Routed to Reach CPP1 : Wetland Limit - Control Point CP-P1

Routing by Stor-Ind method, Time Span= 0.00-32.00 hrs, dt= 0.01 hrs
 Peak Elev= 136.04' @ 12.73 hrs Surf.Area= 157 sf Storage= 109 cf

Plug-Flow detention time= 17.5 min calculated for 0.098 af (98% of inflow)
 Center-of-Mass det. time= 4.8 min (935.6 - 930.8)

Volume #1	Invert	Avail.Storage	Storage Description			
	135.00'	196 cf	Custom Stage Data (Irregular) Listed below (Recalc)			
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)	
135.00	60	49.0	0	0	60	
136.00	152	57.0	102	102	146	
136.50	224	64.0	93	196	220	

Device	Routing	Invert	Outlet Devices
#1	Primary	136.00'	24.0' long x 1.0' 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 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32

Primary OutFlow Max=0.49 cfs @ 12.73 hrs HW=136.04' (Free Discharge)

↑1=**Broad-Crested Rectangular Weir**(Weir Controls 0.49 cfs @ 0.53 fps)

Summary for Pond LLS2: Level Lip Spreader #2

Inflow Area = 0.859 ac, 35.10% Impervious, Inflow Depth = 1.42" for 2-Year event
 Inflow = 1.45 cfs @ 12.15 hrs, Volume= 0.102 af
 Outflow = 1.45 cfs @ 12.16 hrs, Volume= 0.099 af, Atten= 0%, Lag= 0.1 min
 Primary = 1.45 cfs @ 12.16 hrs, Volume= 0.099 af
 Routed to Reach CPP1 : Wetland Limit - Control Point CP-P1

Routing by Stor-Ind method, Time Span= 0.00-32.00 hrs, dt= 0.01 hrs
 Peak Elev= 133.89' @ 12.16 hrs Surf.Area= 153 sf Storage= 112 cf

Plug-Flow detention time= 16.9 min calculated for 0.099 af (98% of inflow)
 Center-of-Mass det. time= 4.2 min (878.6 - 874.3)

Volume	Invert	Avail.Storage	Storage Description		
#1	132.80'	180 cf	Custom Stage Data (Irregular) Listed below (Recalc)		
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
132.80	56	48.0	0	0	56
133.80	148	56.0	98	98	140
134.30	178	60.0	81	180	187

Device	Routing	Invert	Outlet Devices
#1	Primary	133.80'	20.0' long x 1.0' 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 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32

Primary OutFlow Max=1.45 cfs @ 12.16 hrs HW=133.89' (Free Discharge)

↑1=**Broad-Crested Rectangular Weir**(Weir Controls 1.45 cfs @ 0.81 fps)

Summary for Pond MH1: DMH #1

[57] Hint: Peaked at 135.94' (Flood elevation advised)

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NRCC 24-hr C 2-Year Rainfall=3.84"

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Page 7

Inflow Area = 0.859 ac, 35.10% Impervious, Inflow Depth = 1.42" for 2-Year event
 Inflow = 1.45 cfs @ 12.15 hrs, Volume= 0.102 af
 Outflow = 1.45 cfs @ 12.15 hrs, Volume= 0.102 af, Atten= 0%, Lag= 0.0 min
 Primary = 1.45 cfs @ 12.15 hrs, Volume= 0.102 af
 Routed to Pond LLS2 : Level Lip Spreader #2

Routing by Stor-Ind method, Time Span= 0.00-32.00 hrs, dt= 0.01 hrs
 Peak Elev= 135.94' @ 12.15 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	135.40'	18.0" Round Culvert L= 43.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 135.40' / 134.05' S= 0.0314 '/ Cc= 0.900 n= 0.012, Flow Area= 1.77 sf

Primary OutFlow Max=1.45 cfs @ 12.15 hrs HW=135.94' (Free Discharge)
 ↑1=Culvert (Inlet Controls 1.45 cfs @ 2.51 fps)

Summary for Pond SDS1: Subsurface Detention System #1

[44] Hint: Outlet device #2 is below defined storage

Inflow Area = 0.969 ac, 43.23% Impervious, Inflow Depth = 1.24" for 2-Year event
 Inflow = 1.17 cfs @ 12.36 hrs, Volume= 0.101 af
 Outflow = 0.50 cfs @ 12.73 hrs, Volume= 0.101 af, Atten= 57%, Lag= 22.4 min
 Primary = 0.50 cfs @ 12.73 hrs, Volume= 0.101 af
 Routed to Pond LLS1 : Level Lip Spreader #1

Routing by Stor-Ind method, Time Span= 0.00-32.00 hrs, dt= 0.01 hrs
 Peak Elev= 137.36' @ 12.73 hrs Surf.Area= 2,150 sf Storage= 970 cf

Plug-Flow detention time= 40.0 min calculated for 0.101 af (100% of inflow)
 Center-of-Mass det. time= 39.9 min (930.8 - 890.9)

Volume	Invert	Avail.Storage	Storage Description
#1A	136.83'	731 cf	31.67'W x 67.25'L x 2.51'H Field A 5,342 cf Overall - 3,515 cf Embedded = 1,828 cf x 40.0% Voids
#2A	136.83'	3,339 cf	ACO StormBrixx HD 1 x 224 Inside #1 Inside= 23.7"W x 24.1"H => 3.77 sf x 3.95'L = 14.9 cf Outside= 23.7"W x 24.1"H => 3.97 sf x 3.95'L = 15.7 cf 224 Chambers in 14 Rows
#3	136.83'	25 cf	18.0" Round 18" HDPE Outlet Pipe Storage L= 14.0'
		4,095 cf	Total Available Storage

Storage Group A created with Chamber Wizard

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Page 8

Device	Routing	Invert	Outlet Devices
#1	Primary	136.75'	15.0" Round Culvert L= 55.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 136.75' / 136.20' S= 0.0100 '/ Cc= 0.900 n= 0.012, Flow Area= 1.23 sf
#2	Device 1	136.75'	4.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Device 1	137.10'	8.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#4	Device 1	138.50'	4.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)

Primary OutFlow Max=0.50 cfs @ 12.73 hrs HW=137.36' (Free Discharge)

- 1=Culvert (Passes 0.50 cfs of 1.58 cfs potential flow)
- 2=Orifice/Grate (Orifice Controls 0.28 cfs @ 3.21 fps)
- 3=Orifice/Grate (Orifice Controls 0.22 cfs @ 1.74 fps)
- 4=Sharp-Crested Rectangular Weir (Controls 0.00 cfs)

Summary for Pond SIS1: Subsurface Infiltration System #1

Inflow Area = 0.969 ac, 43.23% Impervious, Inflow Depth = 1.62" for 2-Year event
 Inflow = 1.22 cfs @ 12.31 hrs, Volume= 0.131 af
 Outflow = 1.17 cfs @ 12.36 hrs, Volume= 0.115 af, Atten= 4%, Lag= 3.0 min
 Discarded = 0.01 cfs @ 12.36 hrs, Volume= 0.014 af
 Primary = 1.17 cfs @ 12.36 hrs, Volume= 0.101 af
 Routed to Pond SDS1 : Subsurface Detention System #1

Routing by Stor-Ind method, Time Span= 0.00-32.00 hrs, dt= 0.01 hrs
 Peak Elev= 138.03' @ 12.36 hrs Surf.Area= 1,097 sf Storage= 1,084 cf

Plug-Flow detention time= 126.9 min calculated for 0.115 af (88% of inflow)
 Center-of-Mass det. time= 67.7 min (938.1 - 870.5)

Volume	Invert	Avail.Storage	Storage Description
#1A	136.83'	423 cf	27.72'W x 39.58'L x 2.51'H Field A 2,752 cf Overall - 1,695 cf Embedded = 1,057 cf x 40.0% Voids
#2A	136.83'	1,610 cf	ACO StormBrixx HD 1 x 108 Inside #1 Inside= 23.7"W x 24.1"H => 3.77 sf x 3.95'L = 14.9 cf Outside= 23.7"W x 24.1"H => 3.97 sf x 3.95'L = 15.7 cf 108 Chambers in 12 Rows
#3	138.83'	316 cf	Custom Stage Data (Irregular) listed below (Recalc)
		2,348 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
138.83	4	16.0	0	0	4
140.49	4	16.0	7	7	31
140.50	505	83.0	2	8	558
141.00	731	98.0	307	316	779

Device	Routing	Invert	Outlet Devices
#1	Discarded	136.83'	0.270 in/hr Exfiltration over Surface area Conductivity to Groundwater Elevation = 131.00'
#2	Primary	137.83'	4.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)

Discarded OutFlow Max=0.01 cfs @ 12.36 hrs HW=138.03' (Free Discharge)
 ↳1=Exfiltration (Controls 0.01 cfs)

Primary OutFlow Max=1.16 cfs @ 12.36 hrs HW=138.03' (Free Discharge)
 ↳2=Sharp-Crested Rectangular Weir(Weir Controls 1.16 cfs @ 1.46 fps)

Summary for Pond SIS2: Subsurface Infiltration System #2

Inflow Area = 0.279 ac, 73.38% Impervious, Inflow Depth = 2.58" for 2-Year event
 Inflow = 0.93 cfs @ 12.12 hrs, Volume= 0.060 af
 Outflow = 0.87 cfs @ 12.14 hrs, Volume= 0.051 af, Atten= 7%, Lag= 1.3 min
 Primary = 0.87 cfs @ 12.14 hrs, Volume= 0.051 af
 Routed to Pond MH1 : DMH #1

Routing by Stor-Ind method, Time Span= 0.00-32.00 hrs, dt= 0.01 hrs
 Peak Elev= 137.72' @ 12.14 hrs Surf.Area= 424 sf Storage= 551 cf

Plug-Flow detention time= 113.8 min calculated for 0.051 af (85% of inflow)
 Center-of-Mass det. time= 44.6 min (859.0 - 814.4)

Volume	Invert	Avail.Storage	Storage Description
#1A	135.70'	352 cf	35.63'W x 11.91'L x 3.26'H Field A 1,382 cf Overall - 502 cf Embedded = 880 cf x 40.0% Voids
#2A	136.20'	477 cf	ACO StormBrixx HD 1 x 32 Inside #1 Inside= 23.7"W x 24.1"H => 3.77 sf x 3.95'L = 14.9 cf Outside= 23.7"W x 24.1"H => 3.97 sf x 3.95'L = 15.7 cf 32 Chambers in 16 Rows
		829 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	137.20'	10.0" Round Culvert L= 27.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 137.20' / 136.65' S= 0.0204 ' Cc= 0.900 n= 0.012, Flow Area= 0.55 sf

Primary OutFlow Max=0.87 cfs @ 12.14 hrs HW=137.72' (Free Discharge)
 ↳1=Culvert (Inlet Controls 0.87 cfs @ 2.44 fps)