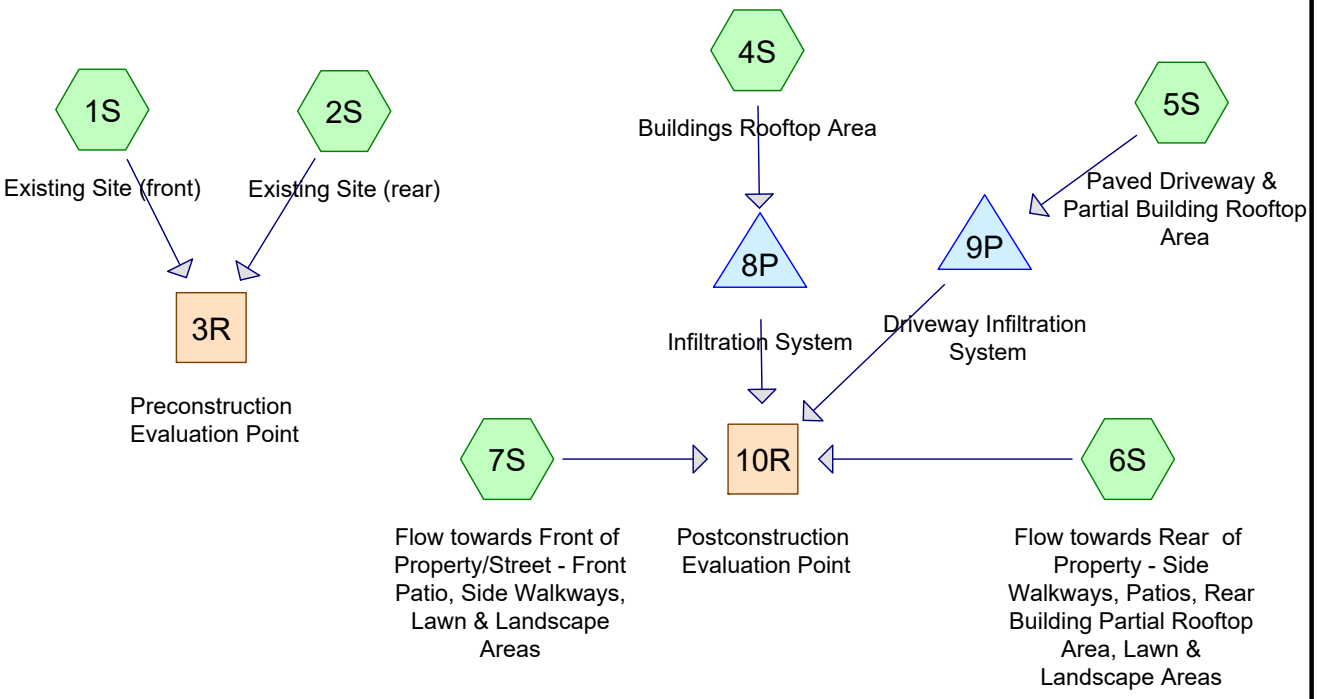


Subcat Reach Pond Link

Routing Diagram for 23 Johnson Place Hydrocad (11-11-20)
Prepared by Hayes & Associates, Printed 11/13/2020

Project Notes

Rainfall events imported from "NRCS-Rain.txt" for 4273 MA Somerville Middlesex County South
Rainfall events imported from "NRCS-Rain.txt" for 4206 MA Newton Middlesex County South
Rainfall events imported from "NRCS-Rain.txt" for 4206 MA Newton Middlesex County South

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.078	98	(E) Driveway (1S)
0.001	98	(E) Front Porch (1S)
0.003	98	(E) Front Walkway (1S)
0.001	98	(E) Front site wall @ driveway (1S)
0.001	98	(E) Front site wall @ house (1S)
0.021	98	(E) Paved Pool Deck (2S)
0.002	98	(E) Paver Patio (1S)
0.008	98	(E) Rear Covered Patio (1S)
0.002	98	(E) Rear Walkway to Pool (1S)
0.029	98	(E) Roof Area (1S)
0.001	98	(E) Side Porch (1S)
0.001	98	(E)Side Walkway (1S)
0.019	98	(P) Building Roof (right side) (5S)
0.007	98	(P) Center Patios (6S)
0.080	98	(P) Driveway (5S)
0.066	98	(P) Front Building Rooftop Area (4S)
0.010	98	(P) Rear Building Rooftop Area (6S)
0.007	98	(P) Rear Patio (6S)
0.024	98	(P) Side Walkways & Stairs (6S)
0.121	49	50-75% Grass cover, Fair, HSG A (1S)
0.155	39	>75% Grass cover, Good, HSG A (6S, 7S)
0.007	98	Front unit patio (7S)
0.068	98	Left side walkway (7S)
0.116	57	Woods/grass comb., Poor, HSG A (2S)
0.828	**74**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.392	HSG A	1S, 2S, 6S, 7S
0.000	HSG B	
0.000	HSG C	
0.000	HSG D	
0.435	Other	1S, 2S, 4S, 5S, 6S, 7S
0.828		**TOTAL AREA**

Ground Covers (all nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.000	0.000	0.000	0.000	0.078	0.078	(E) Driveway	1S
0.000	0.000	0.000	0.000	0.001	0.001	(E) Front Porch	1S
0.000	0.000	0.000	0.000	0.003	0.003	(E) Front Walkway	1S
0.000	0.000	0.000	0.000	0.001	0.001	(E) Front site wall @ driveway	1S
0.000	0.000	0.000	0.000	0.001	0.001	(E) Front site wall @ house	1S
0.000	0.000	0.000	0.000	0.021	0.021	(E) Paved Pool Deck	2S
0.000	0.000	0.000	0.000	0.002	0.002	(E) Paver Patio	1S
0.000	0.000	0.000	0.000	0.008	0.008	(E) Rear Covered Patio	1S
0.000	0.000	0.000	0.000	0.002	0.002	(E) Rear Walkway to Pool	1S
0.000	0.000	0.000	0.000	0.029	0.029	(E) Roof Area	1S
0.000	0.000	0.000	0.000	0.001	0.001	(E) Side Porch	1S
0.000	0.000	0.000	0.000	0.001	0.001	(E)Side Walkway	1S
0.000	0.000	0.000	0.000	0.019	0.019	(P) Building Roof (right side)	5S
0.000	0.000	0.000	0.000	0.007	0.007	(P) Center Patios	6S
0.000	0.000	0.000	0.000	0.080	0.080	(P) Driveway	5S
0.000	0.000	0.000	0.000	0.066	0.066	(P) Front Building Rooftop Area	4S
0.000	0.000	0.000	0.000	0.010	0.010	(P) Rear Building Rooftop Area	6S
0.000	0.000	0.000	0.000	0.007	0.007	(P) Rear Patio	6S
0.000	0.000	0.000	0.000	0.024	0.024	(P) Side Walkways & Stairs	6S
0.121	0.000	0.000	0.000	0.000	0.121	50-75% Grass cover, Fair	1S
0.155	0.000	0.000	0.000	0.000	0.155	>75% Grass cover, Good	6S, 7S
0.000	0.000	0.000	0.000	0.007	0.007	Front unit patio	7S
0.000	0.000	0.000	0.000	0.068	0.068	Left side walkway	7S
0.116	0.000	0.000	0.000	0.000	0.116	Woods/grass comb., Poor	2S
0.392	**0.000**	**0.000**	**0.000**	**0.435**	**0.828**	**TOTAL AREA**	

Pipe Listing (all nodes)

Line#	Node Number	In-Invert (feet)	Out-Invert (feet)	Length (feet)	Slope (ft/ft)	n	Diam/Width (inches)	Height (inches)	Inside-Fill (inches)
1	3R	1.00	0.00	1.0	1.0000	0.009	24.0	0.0	0.0
2	10R	1.00	0.00	1.0	1.0000	0.009	24.0	0.0	0.0

Time span=0.00-27.00 hrs, dt=0.01 hrs, 2701 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: Existing Site (front) Runoff Area=10,773 sf 51.04% Impervious Runoff Depth=1.01"
Tc=6.0 min CN=74 Runoff=0.27 cfs 0.021 af

Subcatchment 2S: Existing Site (rear) Runoff Area=5,994 sf 15.40% Impervious Runoff Depth=0.50"
Tc=6.0 min CN=63 Runoff=0.06 cfs 0.006 af

Subcatchment 4S: Buildings Rooftop Area Runoff Area=2,882 sf 100.00% Impervious Runoff Depth=2.93"
Tc=6.0 min CN=98 Runoff=0.19 cfs 0.016 af

Subcatchment 5S: Paved Driveway & Runoff Area=4,327 sf 100.00% Impervious Runoff Depth=2.93"
Tc=6.0 min CN=98 Runoff=0.28 cfs 0.024 af

Subcatchment 6S: Flow towards Rear of Runoff Area=6,609 sf 31.50% Impervious Runoff Depth=0.33"
Tc=6.0 min CN=58 Runoff=0.03 cfs 0.004 af

Subcatchment 7S: Flow towards Front of Runoff Area=5,473 sf 59.38% Impervious Runoff Depth=1.01"
Tc=6.0 min CN=74 Runoff=0.14 cfs 0.011 af

Reach 3R: Preconstruction Evaluation Avg. Flow Depth=0.05' Max Vel=16.91 fps Inflow=0.33 cfs 0.027 af
24.0" Round Pipe n=0.009 L=1.0' S=1.0000 '/' Capacity=326.77 cfs Outflow=0.33 cfs 0.027 af

Reach 10R: Postconstruction Avg. Flow Depth=0.03' Max Vel=13.84 fps Inflow=0.16 cfs 0.015 af
24.0" Round Pipe n=0.009 L=1.0' S=1.0000 '/' Capacity=326.77 cfs Outflow=0.16 cfs 0.015 af

Pond 8P: Infiltration System Peak Elev=57.77' Storage=95 cf Inflow=0.19 cfs 0.016 af
Discarded=0.06 cfs 0.016 af Primary=0.00 cfs 0.000 af Outflow=0.06 cfs 0.016 af

Pond 9P: Driveway Infiltration System Peak Elev=48.00' Storage=62 cf Inflow=0.28 cfs 0.024 af
Discarded=0.14 cfs 0.024 af Primary=0.00 cfs 0.000 af Outflow=0.14 cfs 0.024 af

Total Runoff Area = 0.828 ac Runoff Volume = 0.082 af Average Runoff Depth = 1.18"
47.41% Pervious = 0.392 ac 52.59% Impervious = 0.435 ac

Summary for Subcatchment 1S: Existing Site (front)

Runoff = 0.27 cfs @ 12.14 hrs, Volume= 0.021 af, Depth= 1.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-27.00 hrs, dt= 0.01 hrs
NRCC 24-hr D 2-Year Rainfall=3.16"

	Area (sf)	CN	Description
*	1,265	98	(E) Roof Area
*	41	98	(E) Front Porch
*	131	98	(E) Front Walkway
*	46	98	(E) Front site wall @ house
*	34	98	(E) Front site wall @ driveway
*	23	98	(E) Side Porch
*	22	98	(E)Side Walkway
*	3,416	98	(E) Driveway
*	365	98	(E) Rear Covered Patio
*	85	98	(E) Rear Walkway to Pool
*	71	98	(E) Paver Patio
	5,274	49	50-75% Grass cover, Fair, HSG A
	10,773	74	Weighted Average
	5,274		48.96% Pervious Area
	5,499		51.04% Impervious Area

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

Summary for Subcatchment 2S: Existing Site (rear)

Runoff = 0.06 cfs @ 12.14 hrs, Volume= 0.006 af, Depth= 0.50"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-27.00 hrs, dt= 0.01 hrs
NRCC 24-hr D 2-Year Rainfall=3.16"

	Area (sf)	CN	Description
*	923	98	(E) Paved Pool Deck
	5,071	57	Woods/grass comb., Poor, HSG A
	5,994	63	Weighted Average
	5,071		84.60% Pervious Area
	923		15.40% Impervious Area

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

Summary for Subcatchment 4S: Buildings Rooftop Area

Runoff = 0.19 cfs @ 12.13 hrs, Volume= 0.016 af, Depth= 2.93"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-27.00 hrs, dt= 0.01 hrs
NRCC 24-hr D 2-Year Rainfall=3.16"

	Area (sf)	CN	Description
*	2,882	98	(P) Front Building Rooftop Area
	2,882		100.00% Impervious Area

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

Summary for Subcatchment 5S: Paved Driveway & Partial Building Rooftop Area

Runoff = 0.28 cfs @ 12.13 hrs, Volume= 0.024 af, Depth= 2.93"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-27.00 hrs, dt= 0.01 hrs
NRCC 24-hr D 2-Year Rainfall=3.16"

	Area (sf)	CN	Description
*	3,488	98	(P) Driveway
*	839	98	(P) Building Roof (right side)
	4,327	98	Weighted Average
	4,327		100.00% Impervious Area

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

hment 6S: Flow towards Rear of Property - Side Walkways, Patios, Rear Building Partial Rooftop Area,

Runoff = 0.03 cfs @ 12.16 hrs, Volume= 0.004 af, Depth= 0.33"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-27.00 hrs, dt= 0.01 hrs
NRCC 24-hr D 2-Year Rainfall=3.16"

	Area (sf)	CN	Description
*	1,051	98	(P) Side Walkways & Stairs
*	301	98	(P) Center Patios
*	301	98	(P) Rear Patio
*	429	98	(P) Rear Building Rooftop Area
	4,527	39	>75% Grass cover, Good, HSG A
	6,609	58	Weighted Average
	4,527		68.50% Pervious Area
	2,082		31.50% Impervious Area

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

for Subcatchment 7S: Flow towards Front of Property/Street - Front Patio, Side Walkways, Lawn & Lan

Runoff = 0.14 cfs @ 12.14 hrs, Volume= 0.011 af, Depth= 1.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-27.00 hrs, dt= 0.01 hrs
NRCC 24-hr D 2-Year Rainfall=3.16"

	Area (sf)	CN	Description
*	2,949	98	Left side walkway
*	301	98	Front unit patio
	2,223	39	>75% Grass cover, Good, HSG A
	5,473	74	Weighted Average
	2,223		40.62% Pervious Area
	3,250		59.38% Impervious Area

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

Summary for Reach 3R: Preconstruction Evaluation Point

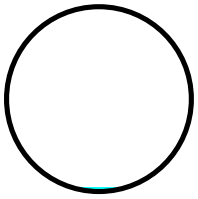
[52] Hint: Inlet/Outlet conditions not evaluated

Inflow Area = 0.385 ac, 38.30% Impervious, Inflow Depth = 0.83" for 2-Year event
Inflow = 0.33 cfs @ 12.14 hrs, Volume= 0.027 af
Outflow = 0.33 cfs @ 12.14 hrs, Volume= 0.027 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-27.00 hrs, dt= 0.01 hrs
Max. Velocity= 16.91 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 9.45 fps, Avg. Travel Time= 0.0 min

Peak Storage= 0 cf @ 12.14 hrs
Average Depth at Peak Storage= 0.05'
Bank-Full Depth= 2.00' Flow Area= 3.1 sf, Capacity= 326.77 cfs

24.0" Round Pipe
n= 0.009 PVC, smooth interior
Length= 1.0' Slope= 1.0000 '/'
Inlet Invert= 1.00', Outlet Invert= 0.00'



Summary for Reach 10R: Postconstruction Evaluation Point

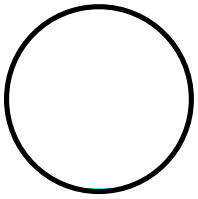
[52] Hint: Inlet/Outlet conditions not evaluated

Inflow Area = 0.443 ac, 65.01% Impervious, Inflow Depth = 0.40" for 2-Year event
Inflow = 0.16 cfs @ 12.14 hrs, Volume= 0.015 af
Outflow = 0.16 cfs @ 12.14 hrs, Volume= 0.015 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-27.00 hrs, dt= 0.01 hrs / 2
Max. Velocity= 13.84 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 9.32 fps, Avg. Travel Time= 0.0 min

Peak Storage= 0 cf @ 12.14 hrs
Average Depth at Peak Storage= 0.03'
Bank-Full Depth= 2.00' Flow Area= 3.1 sf, Capacity= 326.77 cfs

24.0" Round Pipe
n= 0.009 PVC, smooth interior
Length= 1.0' Slope= 1.0000 '/'
Inlet Invert= 1.00', Outlet Invert= 0.00'



Summary for Pond 8P: Infiltration System

Inflow Area = 0.066 ac,100.00% Impervious, Inflow Depth = 2.93" for 2-Year event
Inflow = 0.19 cfs @ 12.13 hrs, Volume= 0.016 af
Outflow = 0.06 cfs @ 12.12 hrs, Volume= 0.016 af, Atten= 67%, Lag= 0.0 min
Discarded = 0.06 cfs @ 12.12 hrs, Volume= 0.016 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-27.00 hrs, dt= 0.01 hrs / 6
Peak Elev= 57.77' @ 12.29 hrs Surf.Area= 132 sf Storage= 95 cf
Flood Elev= 62.00' Surf.Area= 132 sf Storage= 108 cf

Plug-Flow detention time= 9.9 min calculated for 0.016 af (100% of inflow)
Center-of-Mass det. time= 9.9 min (770.7 - 760.7)

Volume	Invert	Avail.Storage	Storage Description
#1	56.00'	103 cf	**6.00'W x 22.00'L x 2.00'H Prismatoid** 264 cf Overall - 5 cf Embedded = 259 cf x 40.0% Voids
#2	56.50'	4 cf	**6.0" Round 6" Perforated Pipe** Inside #1 L= 20.0' S= 0.0001 '/' 5 cf Overall - 0.5" Wall Thickness = 4 cf
#3	56.50'	14 cf	**4.0" Round Drainage Pipe from downspouts** L= 160.0' S= 1.0000 '/'
#4	62.00'	1 cf	**0.33'D x 6.00'H Downspout Overflow Piping**-Impervious
		122 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Discarded	56.00'	**20.000 in/hr Exfiltration over Surface area**
#2	Primary	62.00'	**4.0" Horiz. Orifice/Grate X 4.00** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.06 cfs @ 12.12 hrs HW=57.09' (Free Discharge)
↑—**1=Exfiltration** (Exfiltration Controls 0.06 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=56.00' (Free Discharge)
↑—**2=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond 9P: Driveway Infiltration System

Inflow Area = 0.099 ac,100.00% Impervious, Inflow Depth = 2.93" for 2-Year event
Inflow = 0.28 cfs @ 12.13 hrs, Volume= 0.024 af
Outflow = 0.14 cfs @ 12.01 hrs, Volume= 0.024 af, Atten= 49%, Lag= 0.0 min
Discarded = 0.14 cfs @ 12.01 hrs, Volume= 0.024 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-27.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 48.00' @ 12.22 hrs Surf.Area= 312 sf Storage= 62 cf
Flood Elev= 50.75' Surf.Area= 325 sf Storage= 524 cf

Plug-Flow detention time= 1.4 min calculated for 0.024 af (100% of inflow)
Center-of-Mass det. time= 1.4 min (762.1 - 760.7)

Volume	Invert	Avail.Storage	Storage Description
#1	47.50'	366 cf	**6.00'W x 52.00'L x 3.00'H Prismatoid** 936 cf Overall - 22 cf Embedded = 914 cf x 40.0% Voids
#2	48.00'	17 cf	**8.0" Round 8" Perforated Pipe** Inside #1 L= 50.0' S= 0.0001 '/' 22 cf Overall - 0.5" Wall Thickness = 17 cf
#3	48.25'	110 cf	**12.0" Round Pipe Storage** L= 140.0' S= 0.0100 '/'
#4	48.25'	41 cf	**4.00'D x 3.30'H Vertical Cone/Cylinder**
		534 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Discarded	47.50'	**20.000 in/hr Exfiltration over Surface area**
#2	Primary	50.75'	**24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.14 cfs @ 12.01 hrs HW=47.54' (Free Discharge)
↑—**1=Exfiltration** (Exfiltration Controls 0.14 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=47.50' (Free Discharge)
↑—**2=Orifice/Grate** (Controls 0.00 cfs)

Time span=0.00-27.00 hrs, dt=0.01 hrs, 2701 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: Existing Site (front) Runoff Area=10,773 sf 51.04% Impervious Runoff Depth=2.18"
Tc=6.0 min CN=74 Runoff=0.60 cfs 0.045 af

Subcatchment 2S: Existing Site (rear) Runoff Area=5,994 sf 15.40% Impervious Runoff Depth=1.37"
Tc=6.0 min CN=63 Runoff=0.20 cfs 0.016 af

Subcatchment 4S: Buildings Rooftop Area Runoff Area=2,882 sf 100.00% Impervious Runoff Depth=4.53"
Tc=6.0 min CN=98 Runoff=0.29 cfs 0.025 af

Subcatchment 5S: Paved Driveway & Runoff Area=4,327 sf 100.00% Impervious Runoff Depth=4.53"
Tc=6.0 min CN=98 Runoff=0.43 cfs 0.038 af

Subcatchment 6S: Flow towards Rear of Runoff Area=6,609 sf 31.50% Impervious Runoff Depth=1.04"
Tc=6.0 min CN=58 Runoff=0.16 cfs 0.013 af

Subcatchment 7S: Flow towards Front of Runoff Area=5,473 sf 59.38% Impervious Runoff Depth=2.18"
Tc=6.0 min CN=74 Runoff=0.31 cfs 0.023 af

Reach 3R: Preconstruction Evaluation Avg. Flow Depth=0.07' Max Vel=21.94 fps Inflow=0.80 cfs 0.061 af
24.0" Round Pipe n=0.009 L=1.0' S=1.0000 '/' Capacity=326.77 cfs Outflow=0.80 cfs 0.061 af

Reach 10R: Postconstruction Avg. Flow Depth=0.07' Max Vel=20.69 fps Inflow=0.66 cfs 0.038 af
24.0" Round Pipe n=0.009 L=1.0' S=1.0000 '/' Capacity=326.77 cfs Outflow=0.66 cfs 0.038 af

Pond 8P: Infiltration System Peak Elev=62.08' Storage=108 cf Inflow=0.29 cfs 0.025 af
Discarded=0.06 cfs 0.023 af Primary=0.20 cfs 0.002 af Outflow=0.26 cfs 0.025 af

Pond 9P: Driveway Infiltration System Peak Elev=48.64' Storage=161 cf Inflow=0.43 cfs 0.038 af
Discarded=0.16 cfs 0.038 af Primary=0.00 cfs 0.000 af Outflow=0.16 cfs 0.038 af

Total Runoff Area = 0.828 ac Runoff Volume = 0.159 af Average Runoff Depth = 2.31"
47.41% Pervious = 0.392 ac 52.59% Impervious = 0.435 ac

Summary for Subcatchment 1S: Existing Site (front)

Runoff = 0.60 cfs @ 12.13 hrs, Volume= 0.045 af, Depth= 2.18"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-27.00 hrs, dt= 0.01 hrs
NRCC 24-hr D 10-Year Rainfall=4.77"

	Area (sf)	CN	Description
*	1,265	98	(E) Roof Area
*	41	98	(E) Front Porch
*	131	98	(E) Front Walkway
*	46	98	(E) Front site wall @ house
*	34	98	(E) Front site wall @ driveway
*	23	98	(E) Side Porch
*	22	98	(E)Side Walkway
*	3,416	98	(E) Driveway
*	365	98	(E) Rear Covered Patio
*	85	98	(E) Rear Walkway to Pool
*	71	98	(E) Paver Patio
	5,274	49	50-75% Grass cover, Fair, HSG A
	10,773	74	Weighted Average
	5,274		48.96% Pervious Area
	5,499		51.04% Impervious Area

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

Summary for Subcatchment 2S: Existing Site (rear)

Runoff = 0.20 cfs @ 12.14 hrs, Volume= 0.016 af, Depth= 1.37"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-27.00 hrs, dt= 0.01 hrs
NRCC 24-hr D 10-Year Rainfall=4.77"

	Area (sf)	CN	Description
*	923	98	(E) Paved Pool Deck
	5,071	57	Woods/grass comb., Poor, HSG A
	5,994	63	Weighted Average
	5,071		84.60% Pervious Area
	923		15.40% Impervious Area

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

Summary for Subcatchment 4S: Buildings Rooftop Area

Runoff = 0.29 cfs @ 12.13 hrs, Volume= 0.025 af, Depth= 4.53"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-27.00 hrs, dt= 0.01 hrs
NRCC 24-hr D 10-Year Rainfall=4.77"

	Area (sf)	CN	Description
*	2,882	98	(P) Front Building Rooftop Area
	2,882		100.00% Impervious Area

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

Summary for Subcatchment 5S: Paved Driveway & Partial Building Rooftop Area

Runoff = 0.43 cfs @ 12.13 hrs, Volume= 0.038 af, Depth= 4.53"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-27.00 hrs, dt= 0.01 hrs
NRCC 24-hr D 10-Year Rainfall=4.77"

	Area (sf)	CN	Description
*	3,488	98	(P) Driveway
*	839	98	(P) Building Roof (right side)
	4,327	98	Weighted Average
	4,327		100.00% Impervious Area

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

hment 6S: Flow towards Rear of Property - Side Walkways, Patios, Rear Building Partial Rooftop Area,

Runoff = 0.16 cfs @ 12.14 hrs, Volume= 0.013 af, Depth= 1.04"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-27.00 hrs, dt= 0.01 hrs
NRCC 24-hr D 10-Year Rainfall=4.77"

	Area (sf)	CN	Description
*	1,051	98	(P) Side Walkways & Stairs
*	301	98	(P) Center Patios
*	301	98	(P) Rear Patio
*	429	98	(P) Rear Building Rooftop Area
	4,527	39	>75% Grass cover, Good, HSG A
	6,609	58	Weighted Average
	4,527		68.50% Pervious Area
	2,082		31.50% Impervious Area

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

for Subcatchment 7S: Flow towards Front of Property/Street - Front Patio, Side Walkways, Lawn & Lan

Runoff = 0.31 cfs @ 12.13 hrs, Volume= 0.023 af, Depth= 2.18"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-27.00 hrs, dt= 0.01 hrs
NRCC 24-hr D 10-Year Rainfall=4.77"

	Area (sf)	CN	Description
*	2,949	98	Left side walkway
*	301	98	Front unit patio
	2,223	39	>75% Grass cover, Good, HSG A
	5,473	74	Weighted Average
	2,223		40.62% Pervious Area
	3,250		59.38% Impervious Area

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

Summary for Reach 3R: Preconstruction Evaluation Point

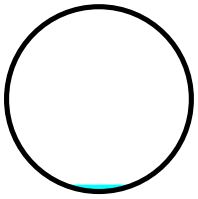
[52] Hint: Inlet/Outlet conditions not evaluated

Inflow Area = 0.385 ac, 38.30% Impervious, Inflow Depth = 1.89" for 10-Year event
Inflow = 0.80 cfs @ 12.13 hrs, Volume= 0.061 af
Outflow = 0.80 cfs @ 12.13 hrs, Volume= 0.061 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-27.00 hrs, dt= 0.01 hrs
Max. Velocity= 21.94 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 9.84 fps, Avg. Travel Time= 0.0 min

Peak Storage= 0 cf @ 12.13 hrs
Average Depth at Peak Storage= 0.07'
Bank-Full Depth= 2.00' Flow Area= 3.1 sf, Capacity= 326.77 cfs

24.0" Round Pipe
n= 0.009 PVC, smooth interior
Length= 1.0' Slope= 1.0000 '/'
Inlet Invert= 1.00', Outlet Invert= 0.00'



Summary for Reach 10R: Postconstruction Evaluation Point

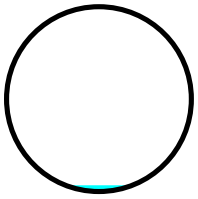
[52] Hint: Inlet/Outlet conditions not evaluated

Inflow Area = 0.443 ac, 65.01% Impervious, Inflow Depth = 1.02" for 10-Year event
Inflow = 0.66 cfs @ 12.14 hrs, Volume= 0.038 af
Outflow = 0.66 cfs @ 12.14 hrs, Volume= 0.038 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-27.00 hrs, dt= 0.01 hrs / 2
Max. Velocity= 20.69 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 9.56 fps, Avg. Travel Time= 0.0 min

Peak Storage= 0 cf @ 12.14 hrs
Average Depth at Peak Storage= 0.07'
Bank-Full Depth= 2.00' Flow Area= 3.1 sf, Capacity= 326.77 cfs

24.0" Round Pipe
n= 0.009 PVC, smooth interior
Length= 1.0' Slope= 1.0000 '/'
Inlet Invert= 1.00', Outlet Invert= 0.00'



Summary for Pond 8P: Infiltration System

[58] Hint: Peaked 0.08' above defined flood level

Inflow Area = 0.066 ac,100.00% Impervious, Inflow Depth = 4.53" for 10-Year event
Inflow = 0.29 cfs @ 12.13 hrs, Volume= 0.025 af
Outflow = 0.26 cfs @ 12.14 hrs, Volume= 0.025 af, Atten= 10%, Lag= 0.6 min
Discarded = 0.06 cfs @ 12.04 hrs, Volume= 0.023 af
Primary = 0.20 cfs @ 12.14 hrs, Volume= 0.002 af

Routing by Stor-Ind method, Time Span= 0.00-27.00 hrs, dt= 0.01 hrs / 6
Peak Elev= 62.08' @ 12.14 hrs Surf.Area= 132 sf Storage= 108 cf
Flood Elev= 62.00' Surf.Area= 132 sf Storage= 108 cf

Plug-Flow detention time= 13.9 min calculated for 0.025 af (99% of inflow)
Center-of-Mass det. time= 10.4 min (761.8 - 751.4)

Volume	Invert	Avail.Storage	Storage Description
#1	56.00'	103 cf	**6.00'W x 22.00'L x 2.00'H Prismatoid** 264 cf Overall - 5 cf Embedded = 259 cf x 40.0% Voids
#2	56.50'	4 cf	**6.0" Round 6" Perforated Pipe** Inside #1 L= 20.0' S= 0.0001 '/' 5 cf Overall - 0.5" Wall Thickness = 4 cf
#3	56.50'	14 cf	**4.0" Round Drainage Pipe from downspouts** L= 160.0' S= 1.0000 '/'
#4	62.00'	1 cf	**0.33'D x 6.00'H Downspout Overflow Piping**-Impervious
		122 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Discarded	56.00'	**20.000 in/hr Exfiltration over Surface area**
#2	Primary	62.00'	**4.0" Horiz. Orifice/Grate X 4.00** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.06 cfs @ 12.04 hrs HW=57.12' (Free Discharge)
↑—**1=Exfiltration** (Exfiltration Controls 0.06 cfs)

Primary OutFlow Max=0.29 cfs @ 12.14 hrs HW=62.08' (Free Discharge)
↑—**2=Orifice/Grate** (Weir Controls 0.29 cfs @ 0.91 fps)

Summary for Pond 9P: Driveway Infiltration System

Inflow Area = 0.099 ac,100.00% Impervious, Inflow Depth = 4.53" for 10-Year event
Inflow = 0.43 cfs @ 12.13 hrs, Volume= 0.038 af
Outflow = 0.16 cfs @ 12.26 hrs, Volume= 0.038 af, Atten= 62%, Lag= 8.1 min
Discarded = 0.16 cfs @ 12.26 hrs, Volume= 0.038 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-27.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 48.64' @ 12.26 hrs Surf.Area= 353 sf Storage= 161 cf
Flood Elev= 50.75' Surf.Area= 325 sf Storage= 524 cf

Plug-Flow detention time= 3.4 min calculated for 0.038 af (100% of inflow)
Center-of-Mass det. time= 3.4 min (754.8 - 751.4)

Volume	Invert	Avail.Storage	Storage Description
#1	47.50'	366 cf	**6.00'W x 52.00'L x 3.00'H Prismatoid** 936 cf Overall - 22 cf Embedded = 914 cf x 40.0% Voids
#2	48.00'	17 cf	**8.0" Round 8" Perforated Pipe** Inside #1 L= 50.0' S= 0.0001 '/' 22 cf Overall - 0.5" Wall Thickness = 17 cf
#3	48.25'	110 cf	**12.0" Round Pipe Storage** L= 140.0' S= 0.0100 '/'
#4	48.25'	41 cf	**4.00'D x 3.30'H Vertical Cone/Cylinder**
		534 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Discarded	47.50'	**20.000 in/hr Exfiltration over Surface area**
#2	Primary	50.75'	**24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.16 cfs @ 12.26 hrs HW=48.64' (Free Discharge)
↑—**1=Exfiltration** (Exfiltration Controls 0.16 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=47.50' (Free Discharge)
↑—**2=Orifice/Grate** (Controls 0.00 cfs)

Time span=0.00-27.00 hrs, dt=0.01 hrs, 2701 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: Existing Site (front) Runoff Area=10,773 sf 51.04% Impervious Runoff Depth=3.21"
Tc=6.0 min CN=74 Runoff=0.89 cfs 0.066 af

Subcatchment 2S: Existing Site (rear) Runoff Area=5,994 sf 15.40% Impervious Runoff Depth=2.20"
Tc=6.0 min CN=63 Runoff=0.33 cfs 0.025 af

Subcatchment 4S: Buildings Rooftop Area Runoff Area=2,882 sf 100.00% Impervious Runoff Depth=5.79"
Tc=6.0 min CN=98 Runoff=0.36 cfs 0.032 af

Subcatchment 5S: Paved Driveway & Runoff Area=4,327 sf 100.00% Impervious Runoff Depth=5.79"
Tc=6.0 min CN=98 Runoff=0.54 cfs 0.048 af

Subcatchment 6S: Flow towards Rear of Runoff Area=6,609 sf 31.50% Impervious Runoff Depth=1.78"
Tc=6.0 min CN=58 Runoff=0.29 cfs 0.022 af

Subcatchment 7S: Flow towards Front of Runoff Area=5,473 sf 59.38% Impervious Runoff Depth=3.21"
Tc=6.0 min CN=74 Runoff=0.45 cfs 0.034 af

Reach 3R: Preconstruction Evaluation Avg. Flow Depth=0.09' Max Vel=24.88 fps Inflow=1.22 cfs 0.091 af
24.0" Round Pipe n=0.009 L=1.0' S=1.0000 '/' Capacity=326.77 cfs Outflow=1.22 cfs 0.091 af

Reach 10R: Postconstruction Avg. Flow Depth=0.08' Max Vel=23.36 fps Inflow=1.01 cfs 0.059 af
24.0" Round Pipe n=0.009 L=1.0' S=1.0000 '/' Capacity=326.77 cfs Outflow=1.01 cfs 0.059 af

Pond 8P: Infiltration System Peak Elev=62.11' Storage=108 cf Inflow=0.36 cfs 0.032 af
Discarded=0.06 cfs 0.028 af Primary=0.27 cfs 0.003 af Outflow=0.33 cfs 0.031 af

Pond 9P: Driveway Infiltration System Peak Elev=49.10' Storage=248 cf Inflow=0.54 cfs 0.048 af
Discarded=0.18 cfs 0.048 af Primary=0.00 cfs 0.000 af Outflow=0.18 cfs 0.048 af

Total Runoff Area = 0.828 ac Runoff Volume = 0.227 af Average Runoff Depth = 3.29"
47.41% Pervious = 0.392 ac 52.59% Impervious = 0.435 ac

Summary for Subcatchment 1S: Existing Site (front)

Runoff = 0.89 cfs @ 12.13 hrs, Volume= 0.066 af, Depth= 3.21"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-27.00 hrs, dt= 0.01 hrs
NRCC 24-hr D 25-Year Rainfall=6.03"

	Area (sf)	CN	Description
*	1,265	98	(E) Roof Area
*	41	98	(E) Front Porch
*	131	98	(E) Front Walkway
*	46	98	(E) Front site wall @ house
*	34	98	(E) Front site wall @ driveway
*	23	98	(E) Side Porch
*	22	98	(E)Side Walkway
*	3,416	98	(E) Driveway
*	365	98	(E) Rear Covered Patio
*	85	98	(E) Rear Walkway to Pool
*	71	98	(E) Paver Patio
	5,274	49	50-75% Grass cover, Fair, HSG A
	10,773	74	Weighted Average
	5,274		48.96% Pervious Area
	5,499		51.04% Impervious Area

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

Summary for Subcatchment 2S: Existing Site (rear)

Runoff = 0.33 cfs @ 12.13 hrs, Volume= 0.025 af, Depth= 2.20"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-27.00 hrs, dt= 0.01 hrs
NRCC 24-hr D 25-Year Rainfall=6.03"

	Area (sf)	CN	Description
*	923	98	(E) Paved Pool Deck
	5,071	57	Woods/grass comb., Poor, HSG A
	5,994	63	Weighted Average
	5,071		84.60% Pervious Area
	923		15.40% Impervious Area

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

Summary for Subcatchment 4S: Buildings Rooftop Area

Runoff = 0.36 cfs @ 12.13 hrs, Volume= 0.032 af, Depth= 5.79"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-27.00 hrs, dt= 0.01 hrs
NRCC 24-hr D 25-Year Rainfall=6.03"

	Area (sf)	CN	Description
*	2,882	98	(P) Front Building Rooftop Area
	2,882		100.00% Impervious Area

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

Summary for Subcatchment 5S: Paved Driveway & Partial Building Rooftop Area

Runoff = 0.54 cfs @ 12.13 hrs, Volume= 0.048 af, Depth= 5.79"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-27.00 hrs, dt= 0.01 hrs
NRCC 24-hr D 25-Year Rainfall=6.03"

	Area (sf)	CN	Description
*	3,488	98	(P) Driveway
*	839	98	(P) Building Roof (right side)
	4,327	98	Weighted Average
	4,327		100.00% Impervious Area

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

hment 6S: Flow towards Rear of Property - Side Walkways, Patios, Rear Building Partial Rooftop Area,

Runoff = 0.29 cfs @ 12.14 hrs, Volume= 0.022 af, Depth= 1.78"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-27.00 hrs, dt= 0.01 hrs
NRCC 24-hr D 25-Year Rainfall=6.03"

	Area (sf)	CN	Description
*	1,051	98	(P) Side Walkways & Stairs
*	301	98	(P) Center Patios
*	301	98	(P) Rear Patio
*	429	98	(P) Rear Building Rooftop Area
	4,527	39	>75% Grass cover, Good, HSG A
	6,609	58	Weighted Average
	4,527		68.50% Pervious Area
	2,082		31.50% Impervious Area

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

for Subcatchment 7S: Flow towards Front of Property/Street - Front Patio, Side Walkways, Lawn & Lan

Runoff = 0.45 cfs @ 12.13 hrs, Volume= 0.034 af, Depth= 3.21"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-27.00 hrs, dt= 0.01 hrs
NRCC 24-hr D 25-Year Rainfall=6.03"

	Area (sf)	CN	Description
*	2,949	98	Left side walkway
*	301	98	Front unit patio
	2,223	39	>75% Grass cover, Good, HSG A
	5,473	74	Weighted Average
	2,223		40.62% Pervious Area
	3,250		59.38% Impervious Area

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

Summary for Reach 3R: Preconstruction Evaluation Point

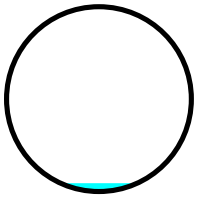
[52] Hint: Inlet/Outlet conditions not evaluated

Inflow Area = 0.385 ac, 38.30% Impervious, Inflow Depth = 2.85" for 25-Year event
Inflow = 1.22 cfs @ 12.13 hrs, Volume= 0.091 af
Outflow = 1.22 cfs @ 12.13 hrs, Volume= 0.091 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-27.00 hrs, dt= 0.01 hrs
Max. Velocity= 24.88 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 10.20 fps, Avg. Travel Time= 0.0 min

Peak Storage= 0 cf @ 12.13 hrs
Average Depth at Peak Storage= 0.09'
Bank-Full Depth= 2.00' Flow Area= 3.1 sf, Capacity= 326.77 cfs

24.0" Round Pipe
n= 0.009 PVC, smooth interior
Length= 1.0' Slope= 1.0000 '/'
Inlet Invert= 1.00', Outlet Invert= 0.00'



Summary for Reach 10R: Postconstruction Evaluation Point

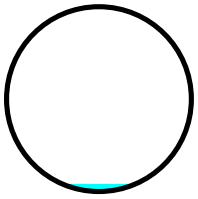
[52] Hint: Inlet/Outlet conditions not evaluated

Inflow Area = 0.443 ac, 65.01% Impervious, Inflow Depth = 1.61" for 25-Year event
Inflow = 1.01 cfs @ 12.14 hrs, Volume= 0.059 af
Outflow = 1.01 cfs @ 12.14 hrs, Volume= 0.059 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-27.00 hrs, dt= 0.01 hrs / 2
Max. Velocity= 23.36 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 9.77 fps, Avg. Travel Time= 0.0 min

Peak Storage= 0 cf @ 12.14 hrs
Average Depth at Peak Storage= 0.08'
Bank-Full Depth= 2.00' Flow Area= 3.1 sf, Capacity= 326.77 cfs

24.0" Round Pipe
n= 0.009 PVC, smooth interior
Length= 1.0' Slope= 1.0000 '/'
Inlet Invert= 1.00', Outlet Invert= 0.00'



Summary for Pond 8P: Infiltration System

[58] Hint: Peaked 0.11' above defined flood level

Inflow Area = 0.066 ac,100.00% Impervious, Inflow Depth = 5.79" for 25-Year event
Inflow = 0.36 cfs @ 12.13 hrs, Volume= 0.032 af
Outflow = 0.33 cfs @ 12.14 hrs, Volume= 0.031 af, Atten= 8%, Lag= 0.6 min
Discarded = 0.06 cfs @ 11.98 hrs, Volume= 0.028 af
Primary = 0.27 cfs @ 12.14 hrs, Volume= 0.003 af

Routing by Stor-Ind method, Time Span= 0.00-27.00 hrs, dt= 0.01 hrs / 6
Peak Elev= 62.11' @ 12.14 hrs Surf.Area= 132 sf Storage= 108 cf
Flood Elev= 62.00' Surf.Area= 132 sf Storage= 108 cf

Plug-Flow detention time= 22.2 min calculated for 0.031 af (98% of inflow)
Center-of-Mass det. time= 10.4 min (757.5 - 747.1)

Volume	Invert	Avail.Storage	Storage Description
#1	56.00'	103 cf	**6.00'W x 22.00'L x 2.00'H Prismatoid** 264 cf Overall - 5 cf Embedded = 259 cf x 40.0% Voids
#2	56.50'	4 cf	**6.0" Round 6" Perforated Pipe** Inside #1 L= 20.0' S= 0.0001 '/' 5 cf Overall - 0.5" Wall Thickness = 4 cf
#3	56.50'	14 cf	**4.0" Round Drainage Pipe from downspouts** L= 160.0' S= 1.0000 '/'
#4	62.00'	1 cf	**0.33'D x 6.00'H Downspout Overflow Piping**-Impervious
		122 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Discarded	56.00'	**20.000 in/hr Exfiltration over Surface area**
#2	Primary	62.00'	**4.0" Horiz. Orifice/Grate X 4.00** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.06 cfs @ 11.98 hrs HW=57.09' (Free Discharge)
↑—**1=Exfiltration** (Exfiltration Controls 0.06 cfs)

Primary OutFlow Max=0.47 cfs @ 12.14 hrs HW=62.11' (Free Discharge)
↑—**2=Orifice/Grate** (Weir Controls 0.47 cfs @ 1.06 fps)

Summary for Pond 9P: Driveway Infiltration System

Inflow Area = 0.099 ac,100.00% Impervious, Inflow Depth = 5.79" for 25-Year event
Inflow = 0.54 cfs @ 12.13 hrs, Volume= 0.048 af
Outflow = 0.18 cfs @ 12.28 hrs, Volume= 0.048 af, Atten= 66%, Lag= 9.3 min
Discarded = 0.18 cfs @ 12.28 hrs, Volume= 0.048 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-27.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 49.10' @ 12.28 hrs Surf.Area= 396 sf Storage= 248 cf
Flood Elev= 50.75' Surf.Area= 325 sf Storage= 524 cf

Plug-Flow detention time= 5.1 min calculated for 0.048 af (100% of inflow)
Center-of-Mass det. time= 5.1 min (752.2 - 747.1)

Volume	Invert	Avail.Storage	Storage Description
#1	47.50'	366 cf	**6.00'W x 52.00'L x 3.00'H Prismatoid** 936 cf Overall - 22 cf Embedded = 914 cf x 40.0% Voids
#2	48.00'	17 cf	**8.0" Round 8" Perforated Pipe** Inside #1 L= 50.0' S= 0.0001 '/' 22 cf Overall - 0.5" Wall Thickness = 17 cf
#3	48.25'	110 cf	**12.0" Round Pipe Storage** L= 140.0' S= 0.0100 '/'
#4	48.25'	41 cf	**4.00'D x 3.30'H Vertical Cone/Cylinder**
		534 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Discarded	47.50'	**20.000 in/hr Exfiltration over Surface area**
#2	Primary	50.75'	**24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.18 cfs @ 12.28 hrs HW=49.10' (Free Discharge)
↑**1=Exfiltration** (Exfiltration Controls 0.18 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=47.50' (Free Discharge)
↑**2=Orifice/Grate** (Controls 0.00 cfs)

Time span=0.00-27.00 hrs, dt=0.01 hrs, 2701 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: Existing Site (front) Runoff Area=10,773 sf 51.04% Impervious Runoff Depth=5.63"
Tc=6.0 min CN=74 Runoff=1.53 cfs 0.116 af

Subcatchment 2S: Existing Site (rear) Runoff Area=5,994 sf 15.40% Impervious Runoff Depth=4.29"
Tc=6.0 min CN=63 Runoff=0.66 cfs 0.049 af

Subcatchment 4S: Buildings Rooftop Area Runoff Area=2,882 sf 100.00% Impervious Runoff Depth=8.54"
Tc=6.0 min CN=98 Runoff=0.53 cfs 0.047 af

Subcatchment 5S: Paved Driveway & Runoff Area=4,327 sf 100.00% Impervious Runoff Depth=8.54"
Tc=6.0 min CN=98 Runoff=0.79 cfs 0.071 af

Subcatchment 6S: Flow towards Rear of Runoff Area=6,609 sf 31.50% Impervious Runoff Depth=3.69"
Tc=6.0 min CN=58 Runoff=0.62 cfs 0.047 af

Subcatchment 7S: Flow towards Front of Runoff Area=5,473 sf 59.38% Impervious Runoff Depth=5.63"
Tc=6.0 min CN=74 Runoff=0.78 cfs 0.059 af

Reach 3R: Preconstruction Evaluation Avg. Flow Depth=0.12' Max Vel=29.63 fps Inflow=2.19 cfs 0.165 af
24.0" Round Pipe n=0.009 L=1.0' S=1.0000 '/' Capacity=326.77 cfs Outflow=2.19 cfs 0.165 af

Reach 10R: Postconstruction Avg. Flow Depth=0.11' Max Vel=28.27 fps Inflow=1.86 cfs 0.114 af
24.0" Round Pipe n=0.009 L=1.0' S=1.0000 '/' Capacity=326.77 cfs Outflow=1.87 cfs 0.114 af

Pond 8P: Infiltration System Peak Elev=62.18' Storage=108 cf Inflow=0.53 cfs 0.047 af
Discarded=0.06 cfs 0.038 af Primary=0.47 cfs 0.009 af Outflow=0.53 cfs 0.047 af

Pond 9P: Driveway Infiltration System Peak Elev=50.33' Storage=495 cf Inflow=0.79 cfs 0.071 af
Discarded=0.19 cfs 0.071 af Primary=0.00 cfs 0.000 af Outflow=0.19 cfs 0.071 af

Total Runoff Area = 0.828 ac Runoff Volume = 0.389 af Average Runoff Depth = 5.63"
47.41% Pervious = 0.392 ac 52.59% Impervious = 0.435 ac

Summary for Subcatchment 1S: Existing Site (front)

Runoff = 1.53 cfs @ 12.13 hrs, Volume= 0.116 af, Depth= 5.63"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-27.00 hrs, dt= 0.01 hrs
NRCC 24-hr D 100-Year Rainfall=8.78"

	Area (sf)	CN	Description
*	1,265	98	(E) Roof Area
*	41	98	(E) Front Porch
*	131	98	(E) Front Walkway
*	46	98	(E) Front site wall @ house
*	34	98	(E) Front site wall @ driveway
*	23	98	(E) Side Porch
*	22	98	(E)Side Walkway
*	3,416	98	(E) Driveway
*	365	98	(E) Rear Covered Patio
*	85	98	(E) Rear Walkway to Pool
*	71	98	(E) Paver Patio
	5,274	49	50-75% Grass cover, Fair, HSG A
	10,773	74	Weighted Average
	5,274		48.96% Pervious Area
	5,499		51.04% Impervious Area

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

Summary for Subcatchment 2S: Existing Site (rear)

Runoff = 0.66 cfs @ 12.13 hrs, Volume= 0.049 af, Depth= 4.29"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-27.00 hrs, dt= 0.01 hrs
NRCC 24-hr D 100-Year Rainfall=8.78"

	Area (sf)	CN	Description
*	923	98	(E) Paved Pool Deck
	5,071	57	Woods/grass comb., Poor, HSG A
	5,994	63	Weighted Average
	5,071		84.60% Pervious Area
	923		15.40% Impervious Area

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

Summary for Subcatchment 4S: Buildings Rooftop Area

Runoff = 0.53 cfs @ 12.13 hrs, Volume= 0.047 af, Depth= 8.54"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-27.00 hrs, dt= 0.01 hrs
NRCC 24-hr D 100-Year Rainfall=8.78"

	Area (sf)	CN	Description
*	2,882	98	(P) Front Building Rooftop Area
	2,882		100.00% Impervious Area

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

Summary for Subcatchment 5S: Paved Driveway & Partial Building Rooftop Area

Runoff = 0.79 cfs @ 12.13 hrs, Volume= 0.071 af, Depth= 8.54"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-27.00 hrs, dt= 0.01 hrs
NRCC 24-hr D 100-Year Rainfall=8.78"

	Area (sf)	CN	Description
*	3,488	98	(P) Driveway
*	839	98	(P) Building Roof (right side)
	4,327	98	Weighted Average
	4,327		100.00% Impervious Area

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

hment 6S: Flow towards Rear of Property - Side Walkways, Patios, Rear Building Partial Rooftop Area,

Runoff = 0.62 cfs @ 12.13 hrs, Volume= 0.047 af, Depth= 3.69"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-27.00 hrs, dt= 0.01 hrs
NRCC 24-hr D 100-Year Rainfall=8.78"

	Area (sf)	CN	Description
*	1,051	98	(P) Side Walkways & Stairs
*	301	98	(P) Center Patios
*	301	98	(P) Rear Patio
*	429	98	(P) Rear Building Rooftop Area
	4,527	39	>75% Grass cover, Good, HSG A
	6,609	58	Weighted Average
	4,527		68.50% Pervious Area
	2,082		31.50% Impervious Area

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

for Subcatchment 7S: Flow towards Front of Property/Street - Front Patio, Side Walkways, Lawn & Lan

Runoff = 0.78 cfs @ 12.13 hrs, Volume= 0.059 af, Depth= 5.63"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-27.00 hrs, dt= 0.01 hrs
NRCC 24-hr D 100-Year Rainfall=8.78"

	Area (sf)	CN	Description
*	2,949	98	Left side walkway
*	301	98	Front unit patio
	2,223	39	>75% Grass cover, Good, HSG A
	5,473	74	Weighted Average
	2,223		40.62% Pervious Area
	3,250		59.38% Impervious Area

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

Summary for Reach 3R: Preconstruction Evaluation Point

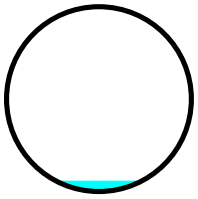
[52] Hint: Inlet/Outlet conditions not evaluated

Inflow Area = 0.385 ac, 38.30% Impervious, Inflow Depth = 5.15" for 100-Year event
Inflow = 2.19 cfs @ 12.13 hrs, Volume= 0.165 af
Outflow = 2.19 cfs @ 12.13 hrs, Volume= 0.165 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-27.00 hrs, dt= 0.01 hrs
Max. Velocity= 29.63 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 11.08 fps, Avg. Travel Time= 0.0 min

Peak Storage= 0 cf @ 12.13 hrs
Average Depth at Peak Storage= 0.12'
Bank-Full Depth= 2.00' Flow Area= 3.1 sf, Capacity= 326.77 cfs

24.0" Round Pipe
n= 0.009 PVC, smooth interior
Length= 1.0' Slope= 1.0000 '/'
Inlet Invert= 1.00', Outlet Invert= 0.00'



Summary for Reach 10R: Postconstruction Evaluation Point

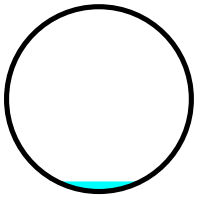
[52] Hint: Inlet/Outlet conditions not evaluated

Inflow Area = 0.443 ac, 65.01% Impervious, Inflow Depth = 3.10" for 100-Year event
Inflow = 1.86 cfs @ 12.13 hrs, Volume= 0.114 af
Outflow = 1.87 cfs @ 12.13 hrs, Volume= 0.114 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-27.00 hrs, dt= 0.01 hrs / 2
Max. Velocity= 28.27 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 10.33 fps, Avg. Travel Time= 0.0 min

Peak Storage= 0 cf @ 12.13 hrs
Average Depth at Peak Storage= 0.11'
Bank-Full Depth= 2.00' Flow Area= 3.1 sf, Capacity= 326.77 cfs

24.0" Round Pipe
n= 0.009 PVC, smooth interior
Length= 1.0' Slope= 1.0000 '/'
Inlet Invert= 1.00', Outlet Invert= 0.00'



Summary for Pond 8P: Infiltration System

[58] Hint: Peaked 0.18' above defined flood level

Inflow Area = 0.066 ac,100.00% Impervious, Inflow Depth = 8.54" for 100-Year event
Inflow = 0.53 cfs @ 12.13 hrs, Volume= 0.047 af
Outflow = 0.53 cfs @ 12.13 hrs, Volume= 0.047 af, Atten= 0%, Lag= 0.0 min
Discarded = 0.06 cfs @ 11.82 hrs, Volume= 0.038 af
Primary = 0.47 cfs @ 12.13 hrs, Volume= 0.009 af

Routing by Stor-Ind method, Time Span= 0.00-27.00 hrs, dt= 0.01 hrs / 6
Peak Elev= 62.18' @ 12.13 hrs Surf.Area= 132 sf Storage= 108 cf
Flood Elev= 62.00' Surf.Area= 132 sf Storage= 108 cf

Plug-Flow detention time= 15.8 min calculated for 0.047 af (99% of inflow)
Center-of-Mass det. time= 9.8 min (751.2 - 741.4)

Volume	Invert	Avail.Storage	Storage Description
#1	56.00'	103 cf	**6.00'W x 22.00'L x 2.00'H Prismatoid** 264 cf Overall - 5 cf Embedded = 259 cf x 40.0% Voids
#2	56.50'	4 cf	**6.0" Round 6" Perforated Pipe** Inside #1 L= 20.0' S= 0.0001 '/' 5 cf Overall - 0.5" Wall Thickness = 4 cf
#3	56.50'	14 cf	**4.0" Round Drainage Pipe from downspouts** L= 160.0' S= 1.0000 '/'
#4	62.00'	1 cf	**0.33'D x 6.00'H Downspout Overflow Piping**-Impervious
		122 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Discarded	56.00'	**20.000 in/hr Exfiltration over Surface area**
#2	Primary	62.00'	**4.0" Horiz. Orifice/Grate X 4.00** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.06 cfs @ 11.82 hrs HW=57.05' (Free Discharge)
↑—**1=Exfiltration** (Exfiltration Controls 0.06 cfs)

Primary OutFlow Max=0.72 cfs @ 12.13 hrs HW=62.18' (Free Discharge)
↑—**2=Orifice/Grate** (Orifice Controls 0.72 cfs @ 2.06 fps)

Summary for Pond 9P: Driveway Infiltration System

Inflow Area = 0.099 ac,100.00% Impervious, Inflow Depth = 8.54" for 100-Year event
Inflow = 0.79 cfs @ 12.13 hrs, Volume= 0.071 af
Outflow = 0.19 cfs @ 12.13 hrs, Volume= 0.071 af, Atten= 76%, Lag= 0.1 min
Discarded = 0.19 cfs @ 12.13 hrs, Volume= 0.071 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-27.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 50.33' @ 12.41 hrs Surf.Area= 346 sf Storage= 495 cf
Flood Elev= 50.75' Surf.Area= 325 sf Storage= 524 cf

Plug-Flow detention time= 11.7 min calculated for 0.071 af (100% of inflow)
Center-of-Mass det. time= 11.6 min (753.0 - 741.4)

Volume	Invert	Avail.Storage	Storage Description
#1	47.50'	366 cf	**6.00'W x 52.00'L x 3.00'H Prismatoid** 936 cf Overall - 22 cf Embedded = 914 cf x 40.0% Voids
#2	48.00'	17 cf	**8.0" Round 8" Perforated Pipe** Inside #1 L= 50.0' S= 0.0001 '/' 22 cf Overall - 0.5" Wall Thickness = 17 cf
#3	48.25'	110 cf	**12.0" Round Pipe Storage** L= 140.0' S= 0.0100 '/'
#4	48.25'	41 cf	**4.00'D x 3.30'H Vertical Cone/Cylinder**
		534 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Discarded	47.50'	**20.000 in/hr Exfiltration over Surface area**
#2	Primary	50.75'	**24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.19 cfs @ 12.13 hrs HW=49.34' (Free Discharge)
↑**1=Exfiltration** (Exfiltration Controls 0.19 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=47.50' (Free Discharge)
↑**2=Orifice/Grate** (Controls 0.00 cfs)