

DRAINAGE CALCULATIONS

56 FOUNTAIN STREET

in

Ashland, MA

September 7, 2021



File No. 21009.00

DRAINAGE DATA

PROJECT:	PROJECT NO.:	DATE:
56 Fountain Street	21009	9/7/21

OBJECTIVE:

Calculate the overland storm water flows for the post-development conditions and design a drainage system to infiltrate roof runoff and control the stormwater runoff from the site for the 100 year storm event.

STORM FREQUENCY:

100 year storm event

SOIL TYPE/GROUP:

Haven – (251B)	(Soil Type A)
Paxton – (307B, 307D)	(Soil Type C)

CALCULATION METHOD:

SCS Method - TR 55

DRAINAGE REPORT:

Refer to calculations.

INTRODUCTION

The site is approximately 4.34 acres located at 56 Fountain Street (Map 09 – Parcel 241) in Ashland, MA. The drainage area associated with this project is 4.34 acres. The existing site is the location of a single family home with barn and pasture. The project will consist of the construction of a new single family home with associated driveway and utilities. The site consists of steep to moderate slopes from north to south toward a low area on the property.

The roof drainage system will consist of a closed drainage system with a roof drain to a new subsurface infiltration system and the driveway drainage system will consist of a closed drainage system with a catch basin to a subsurface infiltration system.

OBJECTIVE

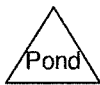
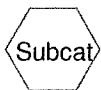
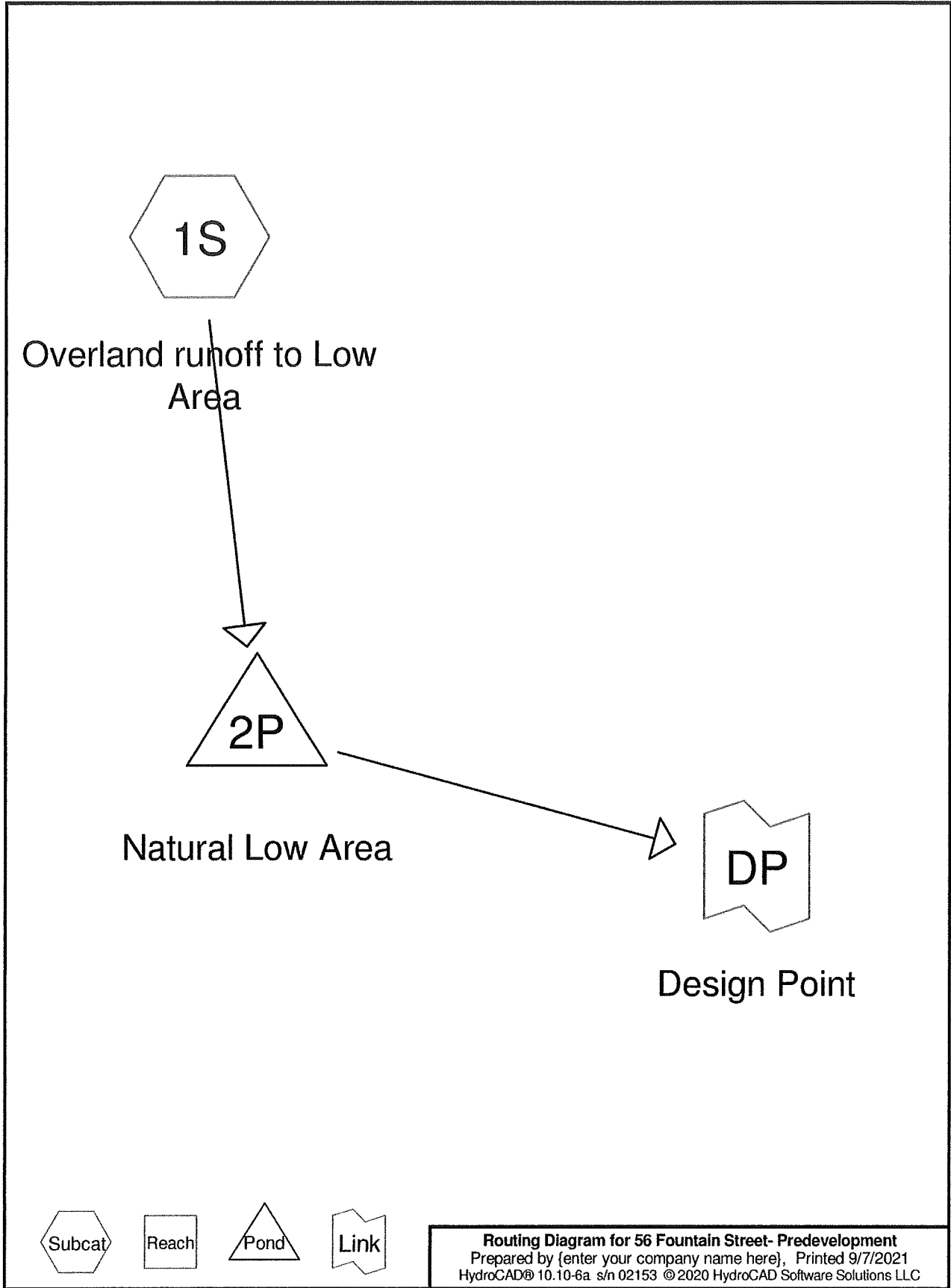
Runoff rates and volumes have been calculated for the 100-year storm. The infiltration basins have been designed to maintain pre-development rates and volumes of runoff at or below the post-development conditions, which is to contain the 100 year storm on the site as it is during the pre-development conditions.

DRAINAGE SUMMARY:

Soil testing was performed on the lot and the deep hole data logs are located on the plan. The soil consists of a Haven soil type (A type soil) and is suitable for infiltration. The proposed subsurface infiltration systems are located within the Haven soil type area. Therefore a subsurface infiltration system is provided to store the volume of roof runoff and to infiltrate as much as practicable. As shown in the calculations the 100 year storm (6.7 inches of runoff in 24 hours) is contained on the property therefore all storms smaller than a 100 year storm event are contained on the site as well.

CONCLUSION:

The 100 year storm post development runoff is contained on the site therefore the recharge volume is maintained on the site and there is no increase in runoff from the site.



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Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 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: Overland runoff to Low Area Runoff Area=4.340 ac 6.22% Impervious Runoff Depth>2.65"
Flow Length=679' Tc=10.8 min CN=65 Runoff=12.18 cfs 0.957 af

Pond 2P: Natural Low Area Peak Elev=177.99' Storage=15,116 cf Inflow=12.18 cfs 0.957 af
Primary=0.00 cfs 0.000 af Secondary=2.54 cfs 0.956 af Outflow=2.54 cfs 0.956 af

Link DP: Design Point Inflow=0.00 cfs 0.000 af
Primary=0.00 cfs 0.000 af

Total Runoff Area = 4.340 ac Runoff Volume = 0.957 af Average Runoff Depth = 2.65"
93.78% Pervious = 4.070 ac 6.22% Impervious = 0.270 ac

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Summary for Subcatchment 1S: Overland runoff to Low Area

Runoff = 12.18 cfs @ 12.16 hrs, Volume= 0.957 af, Depth> 2.65"
Routed to Pond 2P : Natural Low Area

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr Rainfall=6.70"

Area (ac)	CN	Description
* 0.270	98	Impervious Roof and Driveway
0.060	96	Gravel surface, HSG A
0.790	39	Pasture/grassland/range, Good, HSG A
0.230	74	>75% Grass cover, Good, HSG C
0.230	39	>75% Grass cover, Good, HSG A
2.760	70	Woods, Good, HSG C
4.340	65	Weighted Average
4.070		93.78% Pervious Area
0.270		6.22% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.9	50	0.2000	0.17		Sheet Flow, Path 1 Woods: Light underbrush n= 0.400 P2= 3.20"
2.6	350	0.2037	2.26		Shallow Concentrated Flow, Path 2 Woodland Kv= 5.0 fps
1.6	152	0.1053	1.62		Shallow Concentrated Flow, Path 3 Woodland Kv= 5.0 fps
1.7	127	0.0315	1.24		Shallow Concentrated Flow, Path 4 Short Grass Pasture Kv= 7.0 fps
10.8	679	Total			

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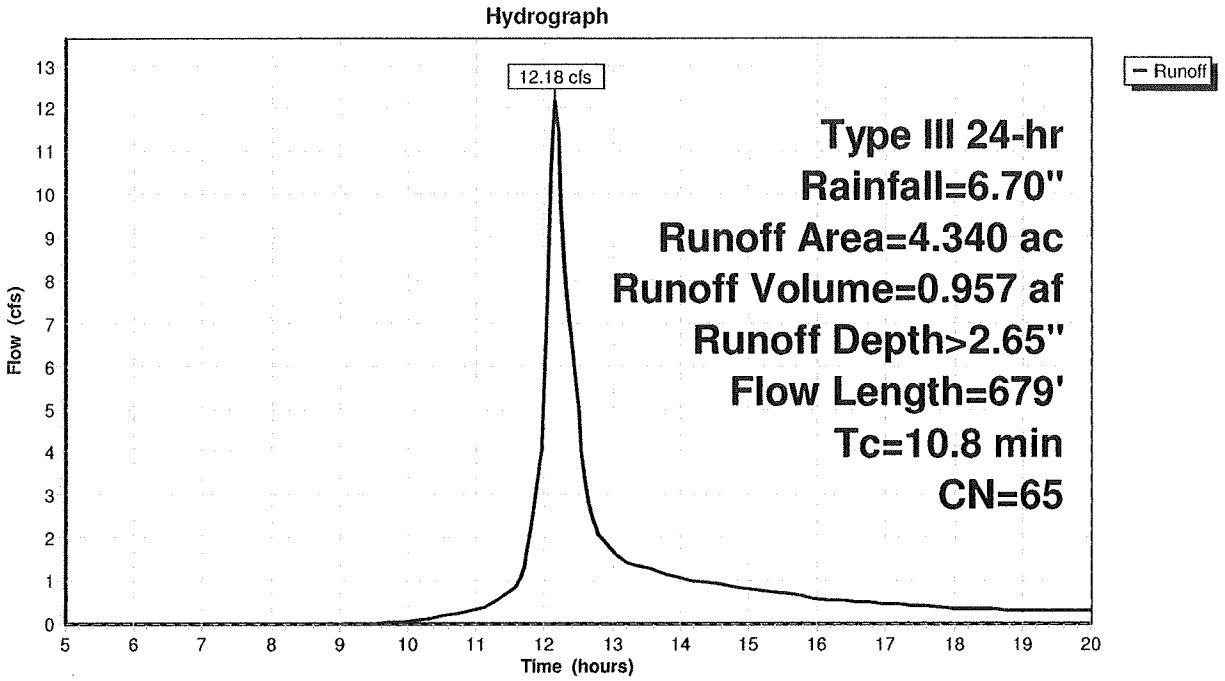
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Subcatchment 1S: Overland runoff to Low Area



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Hydrograph for Subcatchment 1S: Overland runoff to Low Area

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
5.00	0.38	0.00	0.00	18.25	6.24	2.53	0.34
5.25	0.40	0.00	0.00	18.50	6.27	2.55	0.34
5.50	0.43	0.00	0.00	18.75	6.30	2.57	0.33
5.75	0.46	0.00	0.00	19.00	6.32	2.59	0.32
6.00	0.48	0.00	0.00	19.25	6.34	2.60	0.31
6.25	0.51	0.00	0.00	19.50	6.37	2.62	0.31
6.50	0.54	0.00	0.00	19.75	6.39	2.64	0.30
6.75	0.57	0.00	0.00	20.00	6.41	2.66	0.29
7.00	0.61	0.00	0.00				
7.25	0.64	0.00	0.00				
7.50	0.68	0.00	0.00				
7.75	0.72	0.00	0.00				
8.00	0.76	0.00	0.00				
8.25	0.81	0.00	0.00				
8.50	0.86	0.00	0.00				
8.75	0.92	0.00	0.00				
9.00	0.98	0.00	0.00				
9.25	1.04	0.00	0.00				
9.50	1.11	0.00	0.00				
9.75	1.19	0.00	0.03				
10.00	1.27	0.01	0.07				
10.25	1.35	0.01	0.11				
10.50	1.45	0.02	0.18				
10.75	1.56	0.04	0.25				
11.00	1.68	0.06	0.34				
11.25	1.82	0.09	0.48				
11.50	2.00	0.13	0.74				
11.75	2.38	0.25	1.75				
12.00	3.35	0.67	5.26				
12.25	4.32	1.22	9.73				
12.50	4.70	1.46	4.89				
12.75	4.88	1.58	2.25				
13.00	5.02	1.67	1.71				
13.25	5.14	1.75	1.41				
13.50	5.25	1.82	1.29				
13.75	5.35	1.89	1.18				
14.00	5.43	1.95	1.07				
14.25	5.51	2.00	0.98				
14.50	5.59	2.06	0.93				
14.75	5.66	2.11	0.87				
15.00	5.72	2.15	0.82				
15.25	5.78	2.20	0.76				
15.50	5.84	2.24	0.71				
15.75	5.89	2.27	0.65				
16.00	5.94	2.31	0.59				
16.25	5.98	2.34	0.54				
16.50	6.02	2.37	0.52				
16.75	6.06	2.39	0.49				
17.00	6.09	2.42	0.47				
17.25	6.13	2.44	0.44				
17.50	6.16	2.47	0.42				
17.75	6.19	2.49	0.39				
18.00	6.22	2.51	0.36				

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Summary for Pond 2P: Natural Low Area

Inflow Area = 4.340 ac, 6.22% Impervious, Inflow Depth > 2.65"
 Inflow = 12.18 cfs @ 12.16 hrs, Volume= 0.957 af
 Outflow = 2.54 cfs @ 12.69 hrs, Volume= 0.956 af, Atten= 79%, Lag= 32.1 min
 Primary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
 Routed to Link DP : Design Point
 Secondary = 2.54 cfs @ 12.69 hrs, Volume= 0.956 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 177.99' @ 12.69 hrs Surf.Area= 13,264 sf Storage= 15,116 cf

Plug-Flow detention time= 63.8 min calculated for 0.956 af (100% of inflow)
 Center-of-Mass det. time= 63.3 min (871.9 - 808.5)

Volume	Invert	Avail.Storage	Storage Description
#1	176.00'	31,013 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
176.00	1,960	0	0
178.00	13,345	15,305	15,305
179.00	18,070	15,708	31,013

Device	Routing	Invert	Outlet Devices
#1	Secondary	176.00'	8.270 in/hr Exfiltration over Surface area
#2	Primary	178.50'	30.0' long x 1.00' rise Sharp-Crested Rectangular Weir 2 End Contraction(s) 2.0' Crest Height

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=176.00' (Free Discharge)
 ↕ **2=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

Secondary OutFlow Max=2.54 cfs @ 12.69 hrs HW=177.99' (Free Discharge)
 ↕ **1=Exfiltration** (Exfiltration Controls 2.54 cfs)

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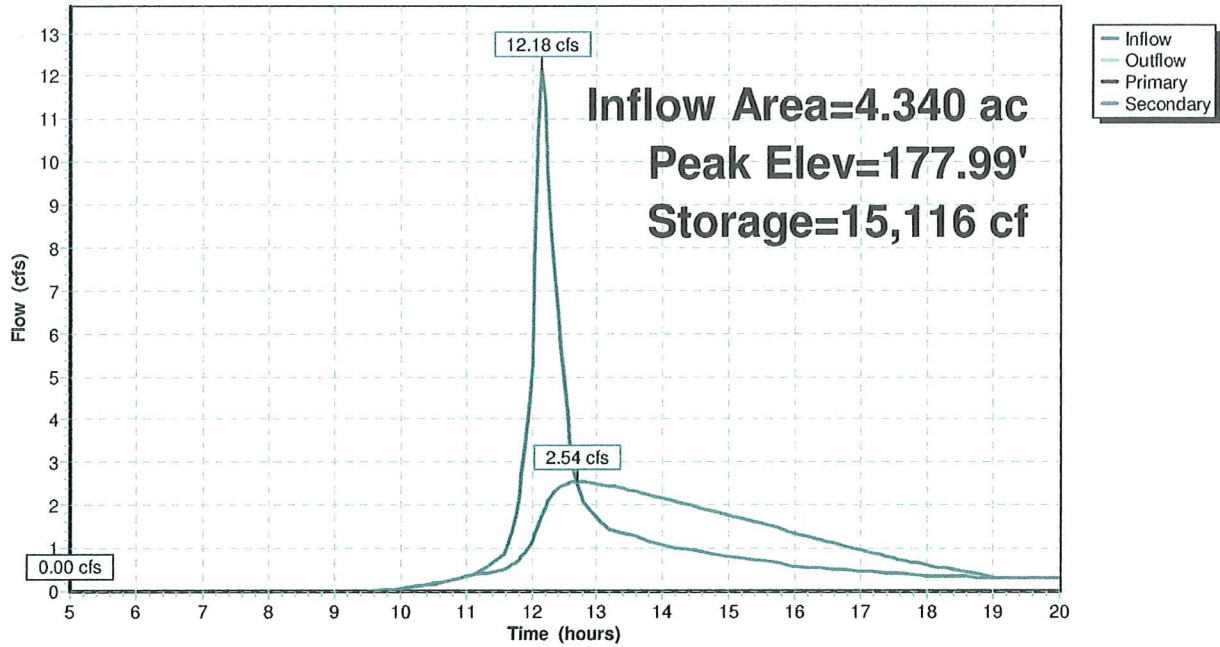
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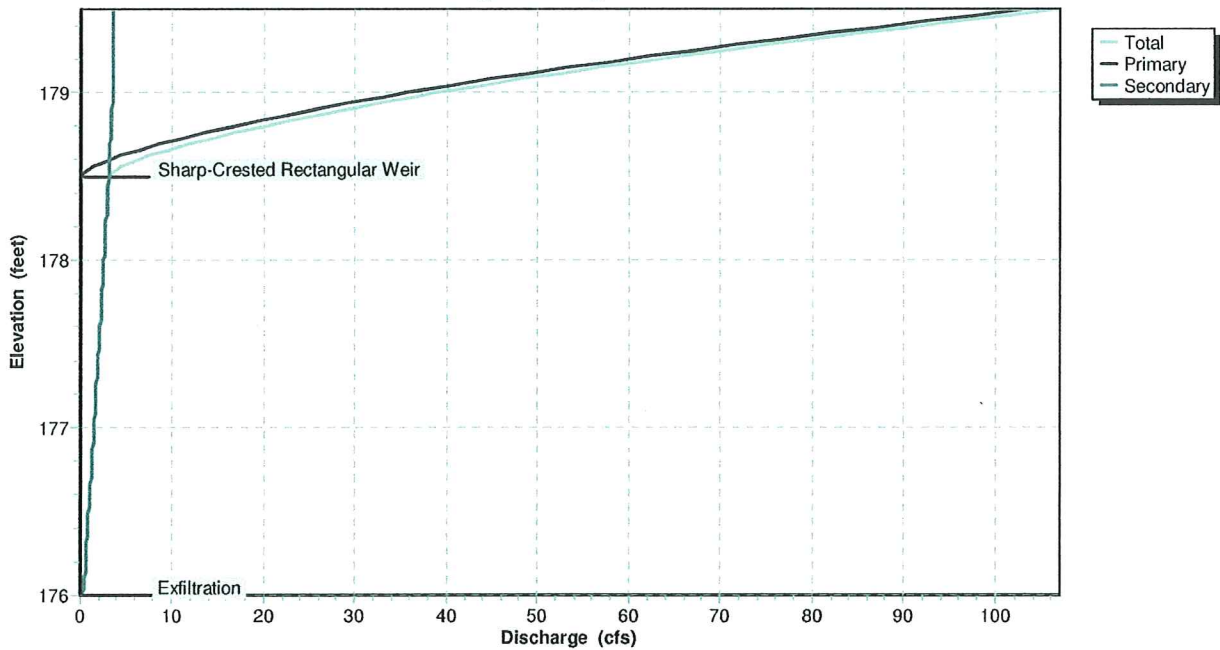
Pond 2P: Natural Low Area

Hydrograph



Pond 2P: Natural Low Area

Stage-Discharge



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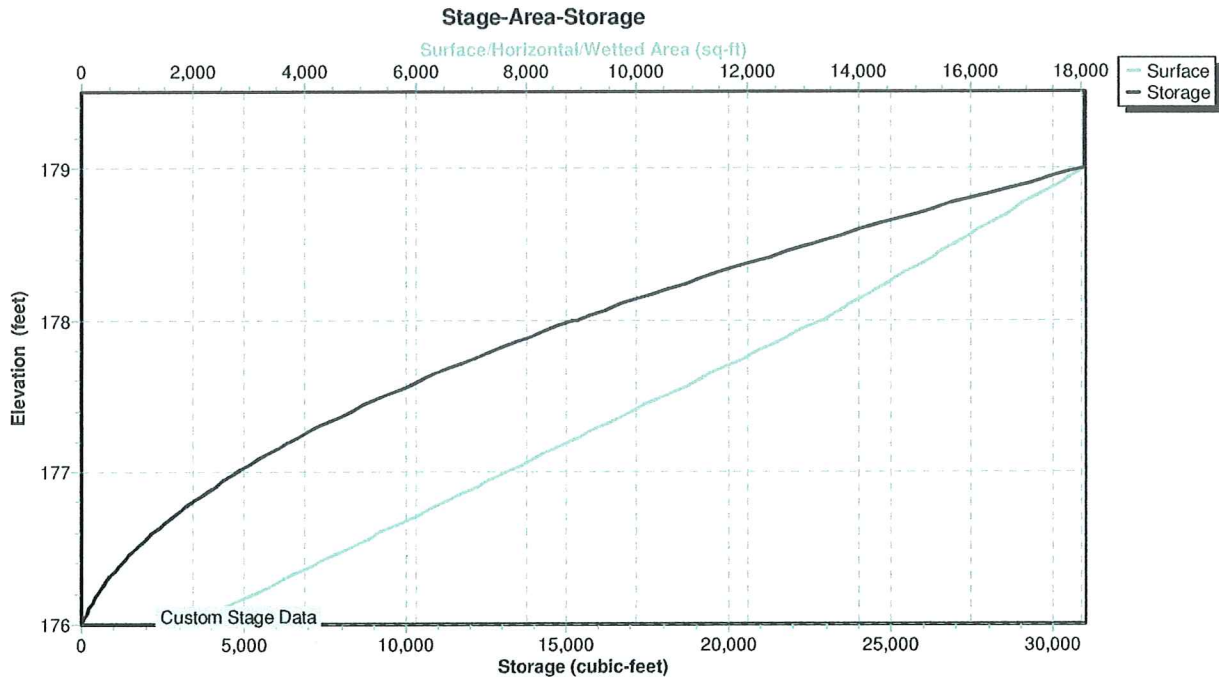
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Pond 2P: Natural Low Area



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Hydrograph for Pond 2P: Natural Low Area

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Primary (cfs)	Secondary (cfs)
5.00	0.00	0	176.00	0.00	0.00	0.00
5.50	0.00	0	176.00	0.00	0.00	0.00
6.00	0.00	0	176.00	0.00	0.00	0.00
6.50	0.00	0	176.00	0.00	0.00	0.00
7.00	0.00	0	176.00	0.00	0.00	0.00
7.50	0.00	0	176.00	0.00	0.00	0.00
8.00	0.00	0	176.00	0.00	0.00	0.00
8.50	0.00	0	176.00	0.00	0.00	0.00
9.00	0.00	0	176.00	0.00	0.00	0.00
9.50	0.00	0	176.00	0.00	0.00	0.00
10.00	0.07	10	176.01	0.06	0.00	0.06
10.50	0.18	29	176.01	0.16	0.00	0.16
11.00	0.34	56	176.03	0.32	0.00	0.32
11.50	0.74	223	176.10	0.48	0.00	0.48
12.00	5.26	2,777	176.70	1.14	0.00	1.14
12.50	4.89	14,412	177.93	2.48	0.00	2.48
13.00	1.71	14,575	177.94	2.49	0.00	2.49
13.50	1.29	12,807	177.80	2.34	0.00	2.34
14.00	1.07	10,880	177.64	2.16	0.00	2.16
14.50	0.93	8,942	177.46	1.97	0.00	1.97
15.00	0.82	7,153	177.28	1.77	0.00	1.77
15.50	0.71	5,529	177.09	1.56	0.00	1.56
16.00	0.59	4,068	176.90	1.36	0.00	1.36
16.50	0.52	2,806	176.71	1.15	0.00	1.15
17.00	0.47	1,813	176.52	0.95	0.00	0.95
17.50	0.42	1,070	176.36	0.77	0.00	0.77
18.00	0.36	541	176.21	0.61	0.00	0.61
18.50	0.34	200	176.09	0.47	0.00	0.47
19.00	0.32	57	176.03	0.32	0.00	0.32
19.50	0.31	54	176.03	0.31	0.00	0.31
20.00	0.29	51	176.02	0.29	0.00	0.29

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Stage-Discharge for Pond 2P: Natural Low Area

Elevation (feet)	Discharge (cfs)	Primary (cfs)	Secondary (cfs)	Elevation (feet)	Discharge (cfs)	Primary (cfs)	Secondary (cfs)
176.00	0.00	0.00	0.00	178.65	8.89	5.75	3.14
176.05	0.43	0.00	0.43	178.70	12.06	8.87	3.19
176.10	0.48	0.00	0.48	178.75	15.66	12.43	3.23
176.15	0.54	0.00	0.54	178.80	19.66	16.38	3.28
176.20	0.59	0.00	0.59	178.85	24.02	20.70	3.32
176.25	0.65	0.00	0.65	178.90	28.73	25.36	3.37
176.30	0.70	0.00	0.70	178.95	33.75	30.34	3.41
176.35	0.76	0.00	0.76	179.00	39.08	35.63	3.46
176.40	0.81	0.00	0.81	179.05	44.67	41.21	3.46
176.45	0.87	0.00	0.87	179.10	50.54	47.08	3.46
176.50	0.92	0.00	0.92	179.15	56.68	53.22	3.46
176.55	0.97	0.00	0.97	179.20	63.09	59.63	3.46
176.60	1.03	0.00	1.03	179.25	69.77	66.31	3.46
176.65	1.08	0.00	1.08	179.30	76.70	73.24	3.46
176.70	1.14	0.00	1.14	179.35	83.87	80.42	3.46
176.75	1.19	0.00	1.19	179.40	91.30	87.84	3.46
176.80	1.25	0.00	1.25	179.45	98.96	95.50	3.46
176.85	1.30	0.00	1.30	179.50	106.87	103.41	3.46
176.90	1.36	0.00	1.36				
176.95	1.41	0.00	1.41				
177.00	1.46	0.00	1.46				
177.05	1.52	0.00	1.52				
177.10	1.57	0.00	1.57				
177.15	1.63	0.00	1.63				
177.20	1.68	0.00	1.68				
177.25	1.74	0.00	1.74				
177.30	1.79	0.00	1.79				
177.35	1.85	0.00	1.85				
177.40	1.90	0.00	1.90				
177.45	1.96	0.00	1.96				
177.50	2.01	0.00	2.01				
177.55	2.06	0.00	2.06				
177.60	2.12	0.00	2.12				
177.65	2.17	0.00	2.17				
177.70	2.23	0.00	2.23				
177.75	2.28	0.00	2.28				
177.80	2.34	0.00	2.34				
177.85	2.39	0.00	2.39				
177.90	2.45	0.00	2.45				
177.95	2.50	0.00	2.50				
178.00	2.55	0.00	2.55				
178.05	2.60	0.00	2.60				
178.10	2.65	0.00	2.65				
178.15	2.69	0.00	2.69				
178.20	2.74	0.00	2.74				
178.25	2.78	0.00	2.78				
178.30	2.83	0.00	2.83				
178.35	2.87	0.00	2.87				
178.40	2.92	0.00	2.92				
178.45	2.96	0.00	2.96				
178.50	3.01	0.00	3.01				
178.55	4.15	1.10	3.05				
178.60	6.22	3.12	3.10				

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Stage-Area-Storage for Pond 2P: Natural Low Area

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
176.00	1,960	0	178.65	16,416	24,977
176.05	2,245	105	178.70	16,652	25,804
176.10	2,529	224	178.75	16,889	26,643
176.15	2,814	358	178.80	17,125	27,493
176.20	3,098	506	178.85	17,361	28,355
176.25	3,383	668	178.90	17,598	29,229
176.30	3,668	844	178.95	17,834	30,115
176.35	3,952	1,035	179.00	18,070	31,013
176.40	4,237	1,239	179.05	18,070	31,013
176.45	4,522	1,458	179.10	18,070	31,013
176.50	4,806	1,692	179.15	18,070	31,013
176.55	5,091	1,939	179.20	18,070	31,013
176.60	5,375	2,201	179.25	18,070	31,013
176.65	5,660	2,477	179.30	18,070	31,013
176.70	5,945	2,767	179.35	18,070	31,013
176.75	6,229	3,071	179.40	18,070	31,013
176.80	6,514	3,390	179.45	18,070	31,013
176.85	6,799	3,722	179.50	18,070	31,013
176.90	7,083	4,069			
176.95	7,368	4,431			
177.00	7,653	4,806			
177.05	7,937	5,196			
177.10	8,222	5,600			
177.15	8,506	6,018			
177.20	8,791	6,451			
177.25	9,076	6,897			
177.30	9,360	7,358			
177.35	9,645	7,833			
177.40	9,930	8,323			
177.45	10,214	8,826			
177.50	10,499	9,344			
177.55	10,783	9,876			
177.60	11,068	10,422			
177.65	11,353	10,983			
177.70	11,637	11,558			
177.75	11,922	12,147			
177.80	12,207	12,750			
177.85	12,491	13,367			
177.90	12,776	13,999			
177.95	13,060	14,645			
178.00	13,345	15,305			
178.05	13,581	15,978			
178.10	13,817	16,663			
178.15	14,054	17,360			
178.20	14,290	18,068			
178.25	14,526	18,789			
178.30	14,763	19,521			
178.35	14,999	20,265			
178.40	15,235	21,021			
178.45	15,471	21,789			
178.50	15,708	22,568			
178.55	15,944	23,359			
178.60	16,180	24,162			

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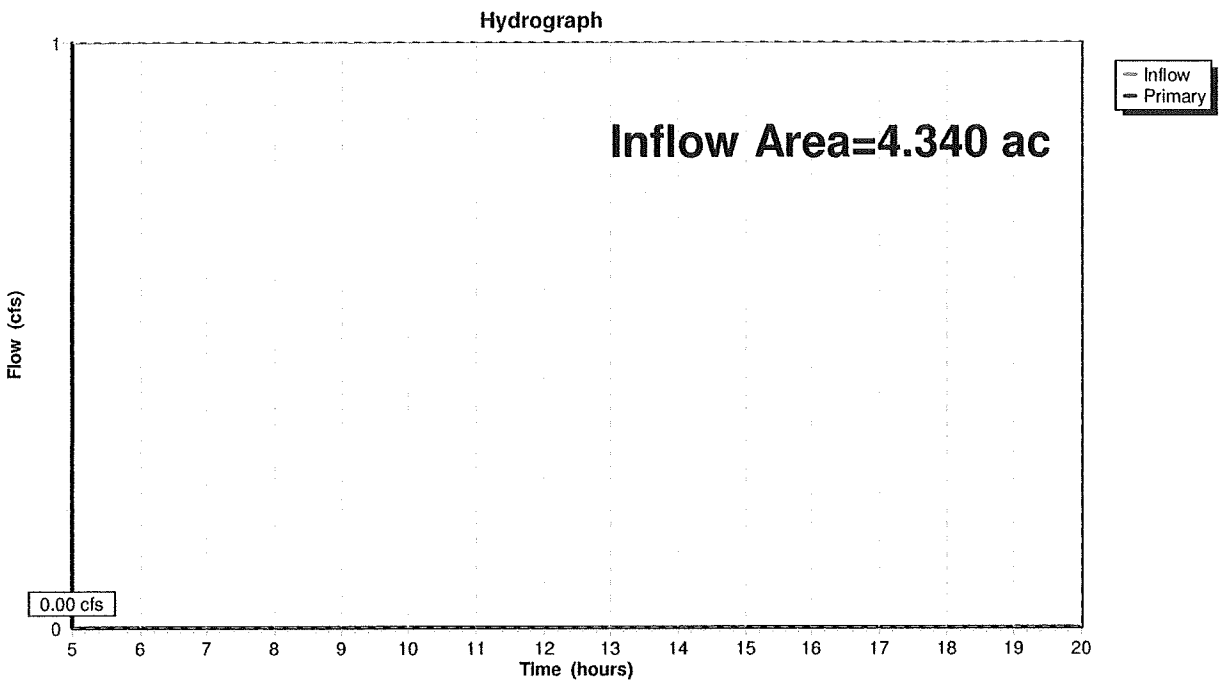
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Summary for Link DP: Design Point

Inflow Area = 4.340 ac, 6.22% Impervious, Inflow Depth = 0.00"
Inflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
Primary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Link DP: Design Point



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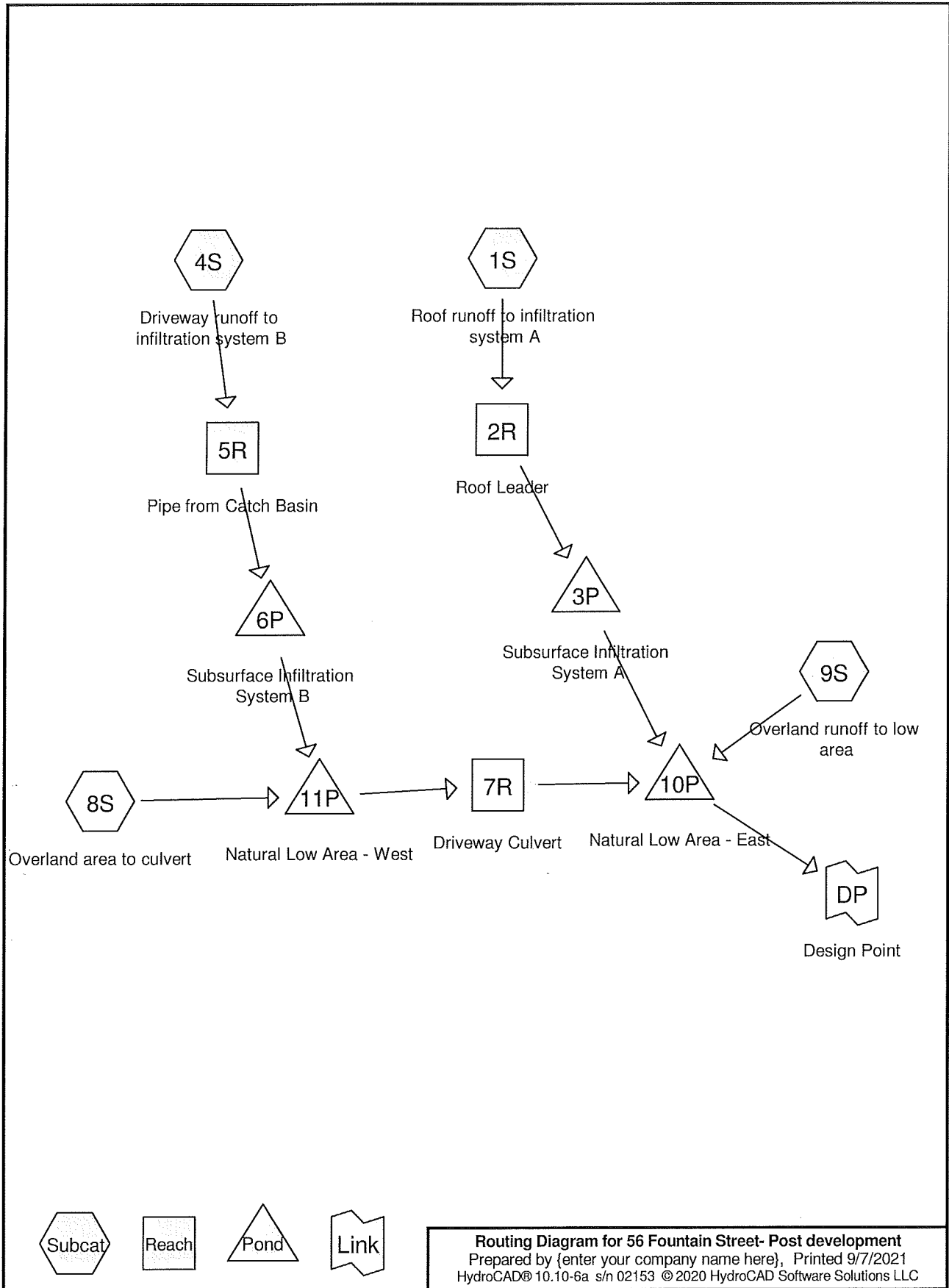
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Type III 24-hr Rainfall=6.70"

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Hydrograph for Link DP: Design Point

Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)	Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
5.00	0.00	0.00	0.00	18.25	0.00	0.00	0.00
5.25	0.00	0.00	0.00	18.50	0.00	0.00	0.00
5.50	0.00	0.00	0.00	18.75	0.00	0.00	0.00
5.75	0.00	0.00	0.00	19.00	0.00	0.00	0.00
6.00	0.00	0.00	0.00	19.25	0.00	0.00	0.00
6.25	0.00	0.00	0.00	19.50	0.00	0.00	0.00
6.50	0.00	0.00	0.00	19.75	0.00	0.00	0.00
6.75	0.00	0.00	0.00	20.00	0.00	0.00	0.00
7.00	0.00	0.00	0.00				
7.25	0.00	0.00	0.00				
7.50	0.00	0.00	0.00				
7.75	0.00	0.00	0.00				
8.00	0.00	0.00	0.00				
8.25	0.00	0.00	0.00				
8.50	0.00	0.00	0.00				
8.75	0.00	0.00	0.00				
9.00	0.00	0.00	0.00				
9.25	0.00	0.00	0.00				
9.50	0.00	0.00	0.00				
9.75	0.00	0.00	0.00				
10.00	0.00	0.00	0.00				
10.25	0.00	0.00	0.00				
10.50	0.00	0.00	0.00				
10.75	0.00	0.00	0.00				
11.00	0.00	0.00	0.00				
11.25	0.00	0.00	0.00				
11.50	0.00	0.00	0.00				
11.75	0.00	0.00	0.00				
12.00	0.00	0.00	0.00				
12.25	0.00	0.00	0.00				
12.50	0.00	0.00	0.00				
12.75	0.00	0.00	0.00				
13.00	0.00	0.00	0.00				
13.25	0.00	0.00	0.00				
13.50	0.00	0.00	0.00				
13.75	0.00	0.00	0.00				
14.00	0.00	0.00	0.00				
14.25	0.00	0.00	0.00				
14.50	0.00	0.00	0.00				
14.75	0.00	0.00	0.00				
15.00	0.00	0.00	0.00				
15.25	0.00	0.00	0.00				
15.50	0.00	0.00	0.00				
15.75	0.00	0.00	0.00				
16.00	0.00	0.00	0.00				
16.25	0.00	0.00	0.00				
16.50	0.00	0.00	0.00				
16.75	0.00	0.00	0.00				
17.00	0.00	0.00	0.00				
17.25	0.00	0.00	0.00				
17.50	0.00	0.00	0.00				
17.75	0.00	0.00	0.00				
18.00	0.00	0.00	0.00				



Routing Diagram for 56 Fountain Street- Post development
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Type III 24-hr Rainfall=6.70"

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Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 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: Roof runoff to infiltration Runoff Area=0.100 ac 100.00% Impervious Runoff Depth>5.97"
Tc=0.0 min CN=98 Runoff=0.75 cfs 0.050 af

Subcatchment 4S: Driveway runoff to Runoff Area=0.230 ac 67.39% Impervious Runoff Depth>5.12"
Flow Length=400' Tc=5.0 min CN=89 Runoff=1.40 cfs 0.098 af

Subcatchment 8S: Overland area to culvert Runoff Area=1.750 ac 12.57% Impervious Runoff Depth>3.33"
Flow Length=560' Tc=6.6 min CN=72 Runoff=7.08 cfs 0.485 af

Subcatchment 9S: Overland runoff to low area Runoff Area=2.260 ac 2.65% Impervious Runoff Depth>2.10"
Flow Length=679' Tc=10.8 min CN=59 Runoff=4.92 cfs 0.395 af

Reach 2R: Roof Leader Avg. Flow Depth=0.38' Max Vel=4.58 fps Inflow=0.75 cfs 0.050 af
6.0" Round Pipe n=0.013 L=200.0' S=0.0200 '/ Capacity=0.79 cfs Outflow=0.69 cfs 0.050 af

Reach 5R: Pipe from Catch Basin Avg. Flow Depth=0.46' Max Vel=5.43 fps Inflow=1.40 cfs 0.098 af
8.0" Round Pipe n=0.013 L=4.0' S=0.0200 '/ Capacity=1.71 cfs Outflow=1.40 cfs 0.098 af

Reach 7R: Driveway Culvert Avg. Flow Depth=0.84' Max Vel=6.21 fps Inflow=6.38 cfs 0.325 af
18.0" Round Pipe n=0.013 L=50.0' S=0.0100 '/ Capacity=10.50 cfs Outflow=6.35 cfs 0.325 af

Pond 3P: Subsurface Infiltration System A Peak Elev=185.20' Storage=1,147 cf Inflow=0.69 cfs 0.050 af
Primary=0.00 cfs 0.000 af Secondary=0.03 cfs 0.030 af Outflow=0.03 cfs 0.030 af

Pond 6P: Subsurface Infiltration System B Peak Elev=178.58' Storage=776 cf Inflow=1.40 cfs 0.098 af
Primary=1.14 cfs 0.030 af Secondary=0.11 cfs 0.067 af Outflow=1.23 cfs 0.097 af

Pond 10P: Natural Low Area - East Peak Elev=178.57' Storage=11,811 cf Inflow=11.26 cfs 0.720 af
Primary=5.59 cfs 0.095 af Secondary=1.55 cfs 0.625 af Outflow=7.14 cfs 0.719 af

Pond 11P: Natural Low Area - West Peak Elev=177.90' Storage=2,600 cf Inflow=8.18 cfs 0.516 af
Primary=6.38 cfs 0.325 af Secondary=0.36 cfs 0.189 af Outflow=6.73 cfs 0.514 af

Link DP: Design Point Inflow=5.59 cfs 0.095 af
Primary=5.59 cfs 0.095 af

Total Runoff Area = 4.340 ac Runoff Volume = 1.028 af Average Runoff Depth = 2.84"
87.67% Pervious = 3.805 ac 12.33% Impervious = 0.535 ac

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Type III 24-hr Rainfall=6.70"

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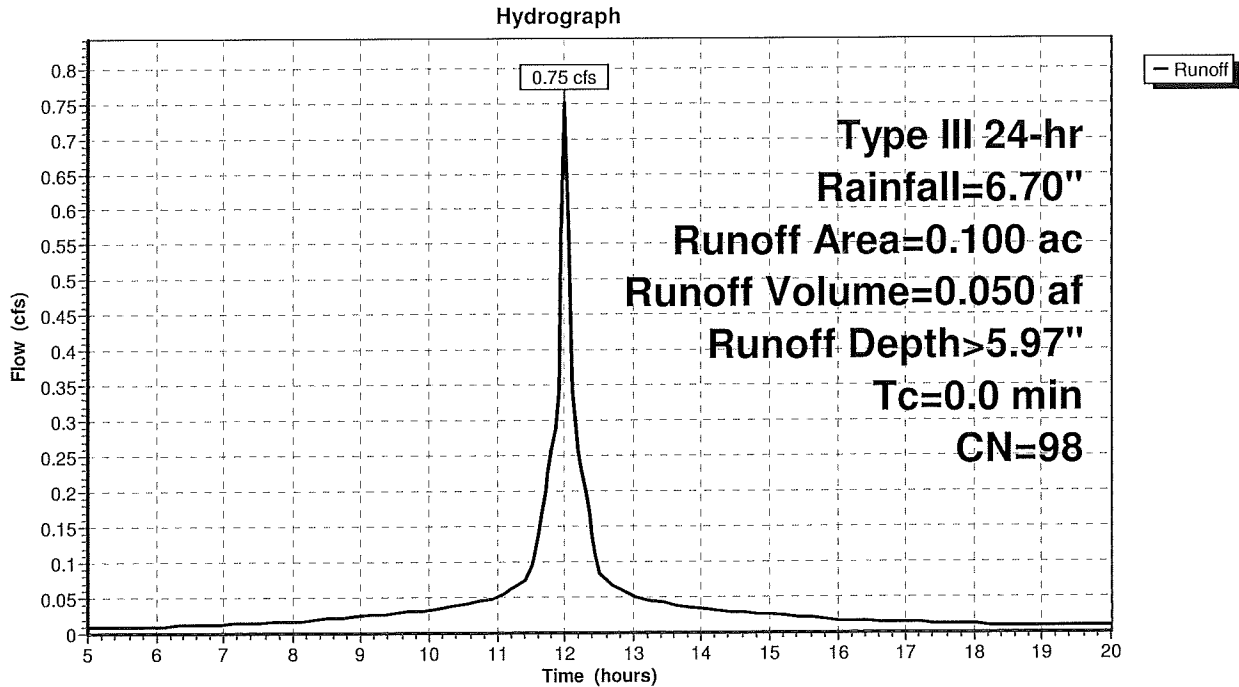
Summary for Subcatchment 1S: Roof runoff to infiltration system A

Runoff = 0.75 cfs @ 12.00 hrs, Volume= 0.050 af, Depth> 5.97"
Routed to Reach 2R : Roof Leader

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr Rainfall=6.70"

Area (ac)	CN	Description
* 0.100	98	Roof Runoff, HSG A
0.100		100.00% Impervious Area

Subcatchment 1S: Roof runoff to infiltration system A



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Hydrograph for Subcatchment 1S: Roof runoff to infiltration system A

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
5.00	0.38	0.21	0.01	18.25	6.24	6.01	0.01
5.25	0.40	0.23	0.01	18.50	6.27	6.03	0.01
5.50	0.43	0.26	0.01	18.75	6.30	6.06	0.01
5.75	0.46	0.28	0.01	19.00	6.32	6.08	0.01
6.00	0.48	0.30	0.01	19.25	6.34	6.11	0.01
6.25	0.51	0.33	0.01	19.50	6.37	6.13	0.01
6.50	0.54	0.35	0.01	19.75	6.39	6.15	0.01
6.75	0.57	0.38	0.01	20.00	6.41	6.17	0.01
7.00	0.61	0.42	0.01				
7.25	0.64	0.45	0.01				
7.50	0.68	0.49	0.01				
7.75	0.72	0.52	0.02				
8.00	0.76	0.56	0.02				
8.25	0.81	0.61	0.02				
8.50	0.86	0.66	0.02				
8.75	0.92	0.71	0.02				
9.00	0.98	0.77	0.02				
9.25	1.04	0.83	0.03				
9.50	1.11	0.90	0.03				
9.75	1.19	0.97	0.03				
10.00	1.27	1.05	0.03				
10.25	1.35	1.14	0.04				
10.50	1.45	1.23	0.04				
10.75	1.56	1.34	0.04				
11.00	1.68	1.45	0.05				
11.25	1.82	1.59	0.06				
11.50	2.00	1.77	0.08				
11.75	2.38	2.15	0.23				
12.00	3.35	3.12	0.75				
12.25	4.32	4.08	0.23				
12.50	4.70	4.47	0.08				
12.75	4.88	4.65	0.06				
13.00	5.02	4.79	0.05				
13.25	5.14	4.91	0.05				
13.50	5.25	5.01	0.04				
13.75	5.35	5.11	0.04				
14.00	5.43	5.20	0.03				
14.25	5.51	5.28	0.03				
14.50	5.59	5.35	0.03				
14.75	5.66	5.42	0.03				
15.00	5.72	5.49	0.03				
15.25	5.78	5.55	0.02				
15.50	5.84	5.60	0.02				
15.75	5.89	5.65	0.02				
16.00	5.94	5.70	0.02				
16.25	5.98	5.74	0.02				
16.50	6.02	5.78	0.02				
16.75	6.06	5.82	0.02				
17.00	6.09	5.86	0.01				
17.25	6.13	5.89	0.01				
17.50	6.16	5.92	0.01				
17.75	6.19	5.95	0.01				
18.00	6.22	5.98	0.01				

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Summary for Subcatchment 4S: Driveway runoff to infiltration system B

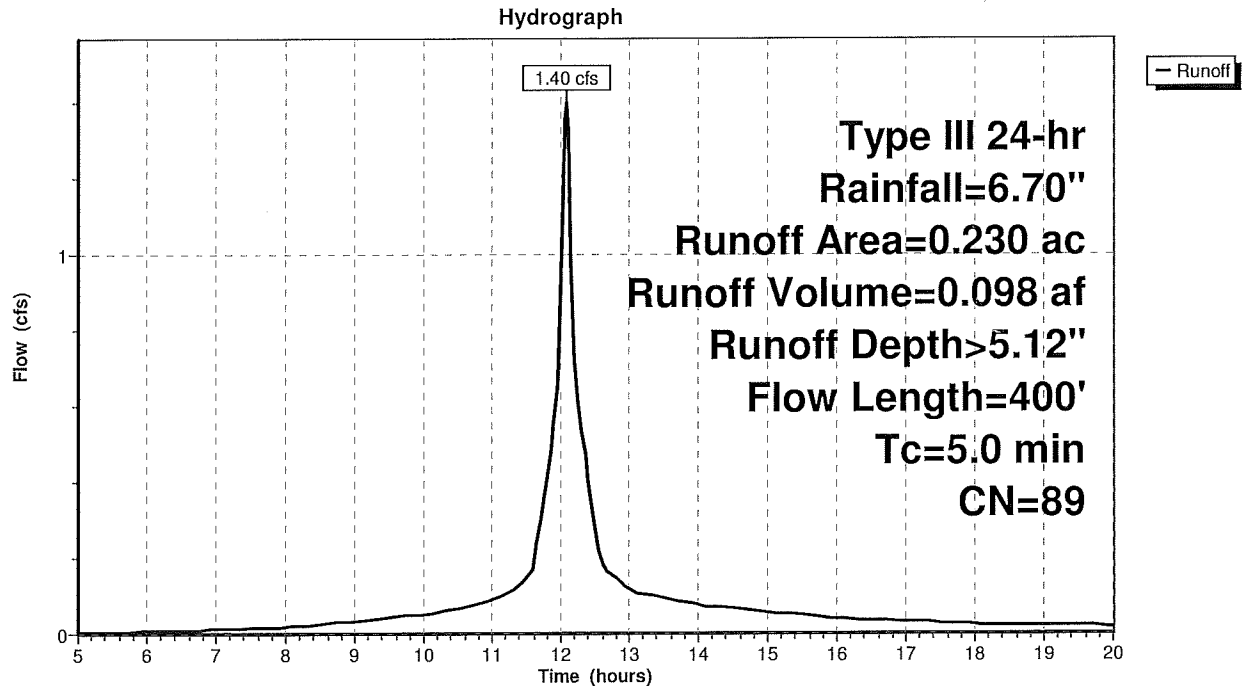
Runoff = 1.40 cfs @ 12.07 hrs, Volume= 0.098 af, Depth> 5.12"
Routed to Reach 5R : Pipe from Catch Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr Rainfall=6.70"

Area (ac)	CN	Description
* 0.155	98	Driveway, HSG A
0.030	74	>75% Grass cover, Good, HSG C
0.045	70	Woods, Good, HSG C
0.230	89	Weighted Average
0.075		32.61% Pervious Area
0.155		67.39% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0	400		1.33		Direct Entry, Path 1

Subcatchment 4S: Driveway runoff to infiltration system B



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Hydrograph for Subcatchment 4S: Driveway runoff to infiltration system B

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
5.00	0.38	0.01	0.00	18.25	6.24	4.97	0.02
5.25	0.40	0.02	0.00	18.50	6.27	5.00	0.02
5.50	0.43	0.02	0.01	18.75	6.30	5.02	0.02
5.75	0.46	0.03	0.01	19.00	6.32	5.05	0.02
6.00	0.48	0.04	0.01	19.25	6.34	5.07	0.02
6.25	0.51	0.05	0.01	19.50	6.37	5.09	0.02
6.50	0.54	0.06	0.01	19.75	6.39	5.11	0.02
6.75	0.57	0.07	0.01	20.00	6.41	5.14	0.02
7.00	0.61	0.08	0.01				
7.25	0.64	0.10	0.01				
7.50	0.68	0.11	0.02				
7.75	0.72	0.13	0.02				
8.00	0.76	0.15	0.02				
8.25	0.81	0.18	0.02				
8.50	0.86	0.20	0.03				
8.75	0.92	0.23	0.03				
9.00	0.98	0.27	0.03				
9.25	1.04	0.31	0.04				
9.50	1.11	0.36	0.04				
9.75	1.19	0.41	0.05				
10.00	1.27	0.46	0.05				
10.25	1.35	0.52	0.06				
10.50	1.45	0.59	0.07				
10.75	1.56	0.67	0.08				
11.00	1.68	0.77	0.09				
11.25	1.82	0.88	0.11				
11.50	2.00	1.03	0.14				
11.75	2.38	1.35	0.36				
12.00	3.35	2.22	0.96				
12.25	4.32	3.12	0.61				
12.50	4.70	3.49	0.28				
12.75	4.88	3.66	0.15				
13.00	5.02	3.80	0.12				
13.25	5.14	3.91	0.10				
13.50	5.25	4.01	0.09				
13.75	5.35	4.10	0.08				
14.00	5.43	4.19	0.08				
14.25	5.51	4.27	0.07				
14.50	5.59	4.34	0.07				
14.75	5.66	4.40	0.06				
15.00	5.72	4.47	0.06				
15.25	5.78	4.53	0.05				
15.50	5.84	4.58	0.05				
15.75	5.89	4.63	0.04				
16.00	5.94	4.67	0.04				
16.25	5.98	4.71	0.04				
16.50	6.02	4.75	0.04				
16.75	6.06	4.79	0.03				
17.00	6.09	4.83	0.03				
17.25	6.13	4.86	0.03				
17.50	6.16	4.89	0.03				
17.75	6.19	4.92	0.03				
18.00	6.22	4.95	0.02				

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Type III 24-hr Rainfall=6.70"

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Summary for Subcatchment 8S: Overland area to culvert

Runoff = 7.08 cfs @ 12.10 hrs, Volume= 0.485 af, Depth> 3.33"
Routed to Pond 11P : Natural Low Area - West

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr Rainfall=6.70"

Area (ac)	CN	Description
* 0.220	98	Impervious Areas
0.060	96	Gravel surface, HSG A
0.190	74	>75% Grass cover, Good, HSG C
0.180	39	>75% Grass cover, Good, HSG A
1.100	70	Woods, Good, HSG C
1.750	72	Weighted Average
1.530		87.43% Pervious Area
0.220		12.57% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.2	50	0.2000	0.37		Sheet Flow, Path 1 Grass: Short n= 0.150 P2= 3.20"
4.1	450	0.1333	1.83		Shallow Concentrated Flow, Path 2 Woodland Kv= 5.0 fps
0.3	60	0.0667	3.87		Shallow Concentrated Flow, Path 3 Grassed Waterway Kv= 15.0 fps
6.6	560	Total			

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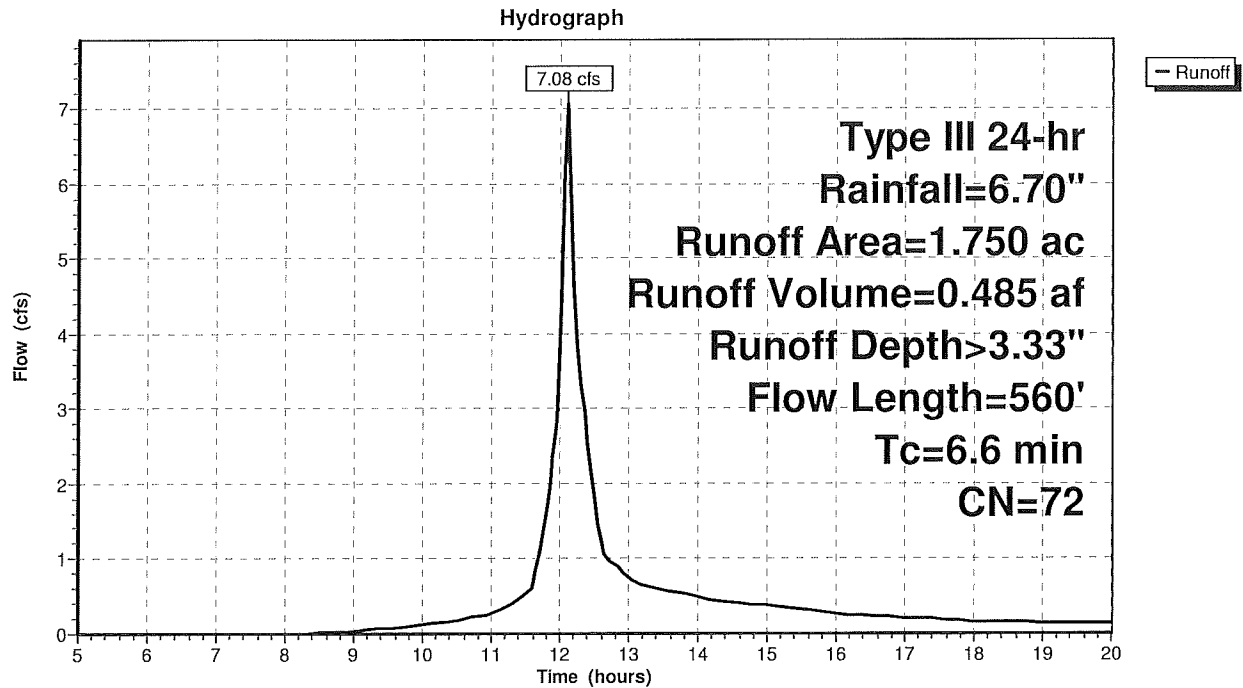
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Subcatchment 8S: Overland area to culvert



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Hydrograph for Subcatchment 8S: Overland area to culvert

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
5.00	0.38	0.00	0.00	18.25	6.24	3.19	0.15
5.25	0.40	0.00	0.00	18.50	6.27	3.22	0.15
5.50	0.43	0.00	0.00	18.75	6.30	3.24	0.15
5.75	0.46	0.00	0.00	19.00	6.32	3.26	0.14
6.00	0.48	0.00	0.00	19.25	6.34	3.28	0.14
6.25	0.51	0.00	0.00	19.50	6.37	3.30	0.14
6.50	0.54	0.00	0.00	19.75	6.39	3.31	0.13
6.75	0.57	0.00	0.00	20.00	6.41	3.33	0.13
7.00	0.61	0.00	0.00				
7.25	0.64	0.00	0.00				
7.50	0.68	0.00	0.00				
7.75	0.72	0.00	0.00				
8.00	0.76	0.00	0.00				
8.25	0.81	0.00	0.00				
8.50	0.86	0.00	0.01				
8.75	0.92	0.00	0.02				
9.00	0.98	0.01	0.04				
9.25	1.04	0.02	0.05				
9.50	1.11	0.03	0.07				
9.75	1.19	0.04	0.09				
10.00	1.27	0.05	0.11				
10.25	1.35	0.07	0.14				
10.50	1.45	0.10	0.18				
10.75	1.56	0.13	0.22				
11.00	1.68	0.17	0.27				
11.25	1.82	0.22	0.37				
11.50	2.00	0.29	0.52				
11.75	2.38	0.47	1.37				
12.00	3.35	1.02	3.99				
12.25	4.32	1.69	3.83				
12.50	4.70	1.97	1.83				
12.75	4.88	2.11	0.95				
13.00	5.02	2.22	0.75				
13.25	5.14	2.31	0.64				
13.50	5.25	2.39	0.59				
13.75	5.35	2.47	0.53				
14.00	5.43	2.54	0.48				
14.25	5.51	2.60	0.44				
14.50	5.59	2.66	0.42				
14.75	5.66	2.72	0.39				
15.00	5.72	2.77	0.37				
15.25	5.78	2.82	0.34				
15.50	5.84	2.86	0.32				
15.75	5.89	2.90	0.29				
16.00	5.94	2.94	0.26				
16.25	5.98	2.98	0.24				
16.50	6.02	3.01	0.23				
16.75	6.06	3.04	0.22				
17.00	6.09	3.07	0.21				
17.25	6.13	3.10	0.20				
17.50	6.16	3.12	0.19				
17.75	6.19	3.15	0.17				
18.00	6.22	3.17	0.16				

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Summary for Subcatchment 9S: Overland runoff to low area

Runoff = 4.92 cfs @ 12.16 hrs, Volume= 0.395 af, Depth> 2.10"
Routed to Pond 10P : Natural Low Area - East

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr Rainfall=6.70"

Area (ac)	CN	Description
* 0.060	98	Impervious Roof and Driveway
0.550	39	Pasture/grassland/range, Good, HSG A
0.320	74	>75% Grass cover, Good, HSG C
0.320	39	>75% Grass cover, Good, HSG A
1.010	70	Woods, Good, HSG C
2.260	59	Weighted Average
2.200		97.35% Pervious Area
0.060		2.65% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.9	50	0.2000	0.17		Sheet Flow, Path 1 Woods: Light underbrush n= 0.400 P2= 3.20"
2.6	350	0.2037	2.26		Shallow Concentrated Flow, Path 2 Woodland Kv= 5.0 fps
1.6	152	0.1053	1.62		Shallow Concentrated Flow, Path 3 Woodland Kv= 5.0 fps
1.7	127	0.0315	1.24		Shallow Concentrated Flow, Path 4 Short Grass Pasture Kv= 7.0 fps
10.8	679	Total			

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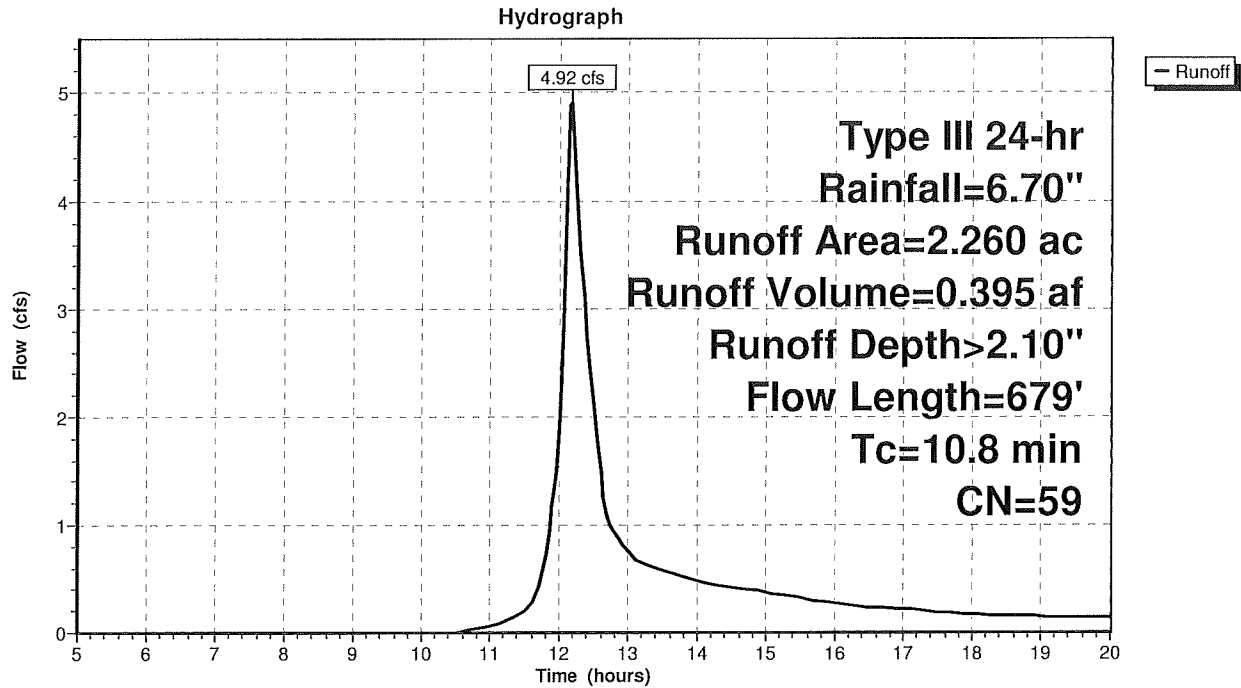
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Subcatchment 9S: Overland runoff to low area



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Type III 24-hr Rainfall=6.70"

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Hydrograph for Subcatchment 9S: Overland runoff to low area

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
5.00	0.38	0.00	0.00	18.25	6.24	2.00	0.16
5.25	0.40	0.00	0.00	18.50	6.27	2.01	0.15
5.50	0.43	0.00	0.00	18.75	6.30	2.03	0.15
5.75	0.46	0.00	0.00	19.00	6.32	2.05	0.15
6.00	0.48	0.00	0.00	19.25	6.34	2.06	0.14
6.25	0.51	0.00	0.00	19.50	6.37	2.08	0.14
6.50	0.54	0.00	0.00	19.75	6.39	2.09	0.14
6.75	0.57	0.00	0.00	20.00	6.41	2.11	0.13
7.00	0.61	0.00	0.00				
7.25	0.64	0.00	0.00				
7.50	0.68	0.00	0.00				
7.75	0.72	0.00	0.00				
8.00	0.76	0.00	0.00				
8.25	0.81	0.00	0.00				
8.50	0.86	0.00	0.00				
8.75	0.92	0.00	0.00				
9.00	0.98	0.00	0.00				
9.25	1.04	0.00	0.00				
9.50	1.11	0.00	0.00				
9.75	1.19	0.00	0.00				
10.00	1.27	0.00	0.00				
10.25	1.35	0.00	0.00				
10.50	1.45	0.00	0.00				
10.75	1.56	0.00	0.03				
11.00	1.68	0.01	0.06				
11.25	1.82	0.02	0.11				
11.50	2.00	0.05	0.20				
11.75	2.38	0.12	0.55				
12.00	3.35	0.43	1.94				
12.25	4.32	0.87	4.04				
12.50	4.70	1.07	2.12				
12.75	4.88	1.17	0.99				
13.00	5.02	1.25	0.76				
13.25	5.14	1.32	0.63				
13.50	5.25	1.38	0.58				
13.75	5.35	1.44	0.53				
14.00	5.43	1.49	0.48				
14.25	5.51	1.54	0.44				
14.50	5.59	1.58	0.42				
14.75	5.66	1.62	0.40				
15.00	5.72	1.66	0.37				
15.25	5.78	1.70	0.35				
15.50	5.84	1.74	0.32				
15.75	5.89	1.77	0.30				
16.00	5.94	1.80	0.27				
16.25	5.98	1.83	0.25				
16.50	6.02	1.85	0.24				
16.75	6.06	1.88	0.23				
17.00	6.09	1.90	0.21				
17.25	6.13	1.92	0.20				
17.50	6.16	1.94	0.19				
17.75	6.19	1.96	0.18				
18.00	6.22	1.98	0.17				

56 Fountain Street- Post development

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100 Year Storm
Type III 24-hr Rainfall=6.70"

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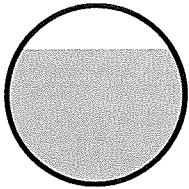
Summary for Reach 2R: Roof Leader

Inflow Area = 0.100 ac, 100.00% Impervious, Inflow Depth > 5.97"
Inflow = 0.75 cfs @ 12.00 hrs, Volume= 0.050 af
Outflow = 0.69 cfs @ 12.02 hrs, Volume= 0.050 af, Atten= 8%, Lag= 1.3 min
Routed to Pond 3P : Subsurface Infiltration System A

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 4.58 fps, Min. Travel Time= 0.7 min
Avg. Velocity = 1.85 fps, Avg. Travel Time= 1.8 min

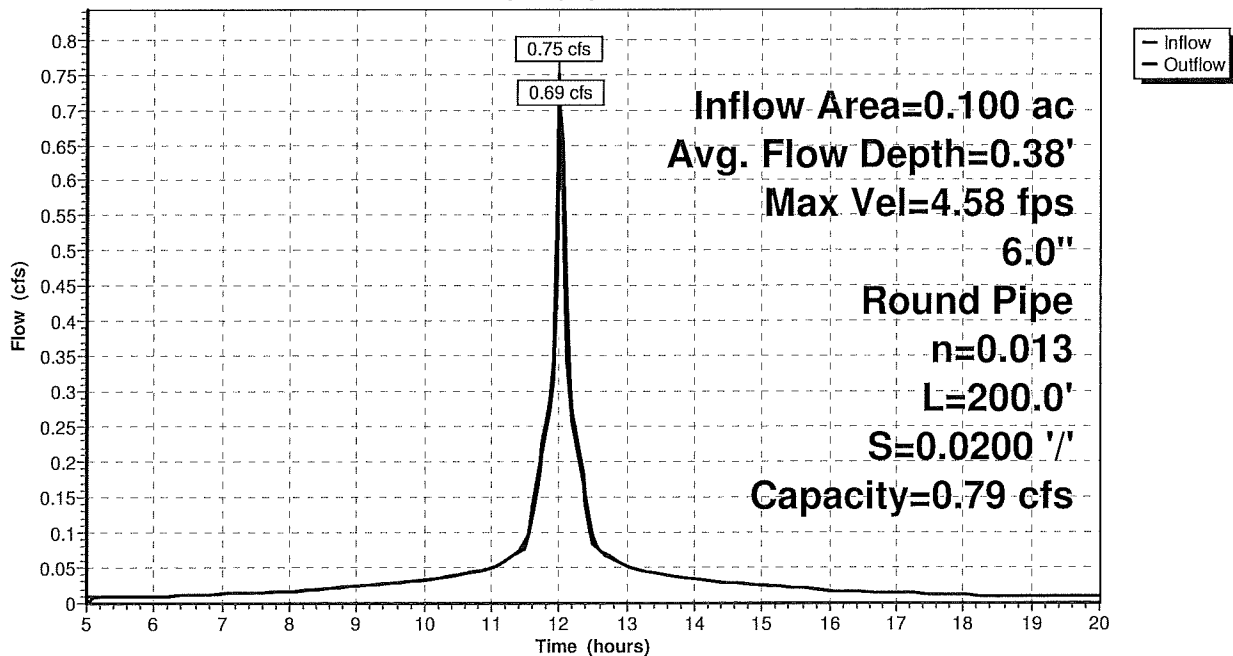
Peak Storage= 32 cf @ 12.01 hrs
Average Depth at Peak Storage= 0.38', Surface Width= 0.43'
Bank-Full Depth= 0.50' Flow Area= 0.2 sf, Capacity= 0.79 cfs

6.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 200.0' Slope= 0.0200 '/'
Inlet Invert= 189.05', Outlet Invert= 185.05'



Reach 2R: Roof Leader

Hydrograph



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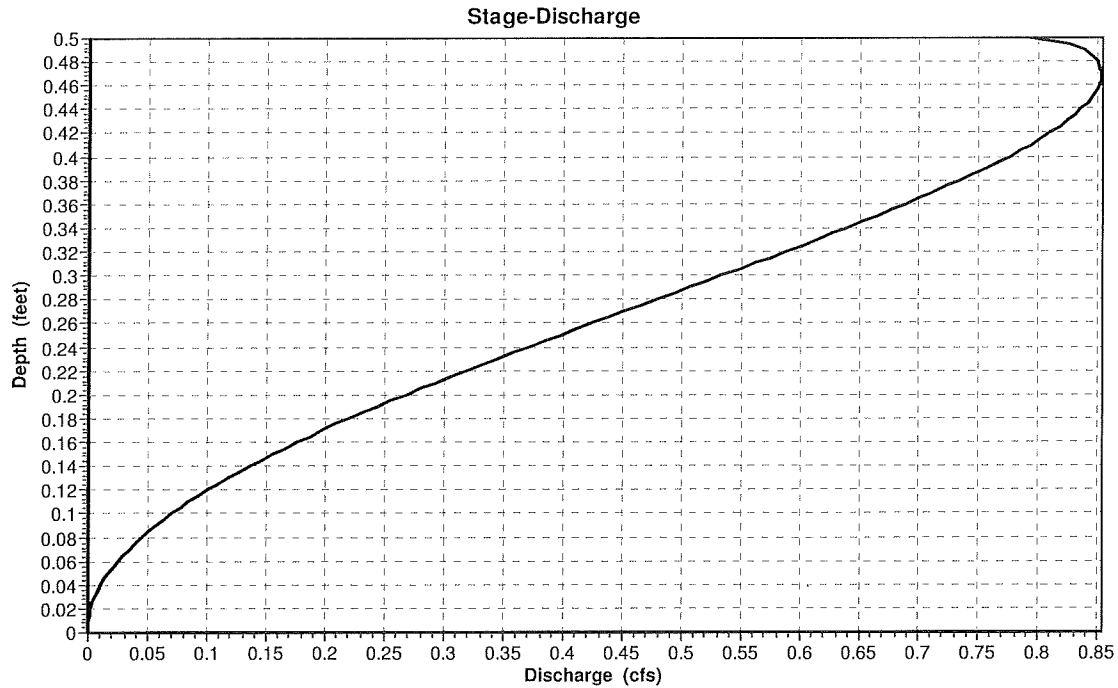
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Type III 24-hr Rainfall=6.70"

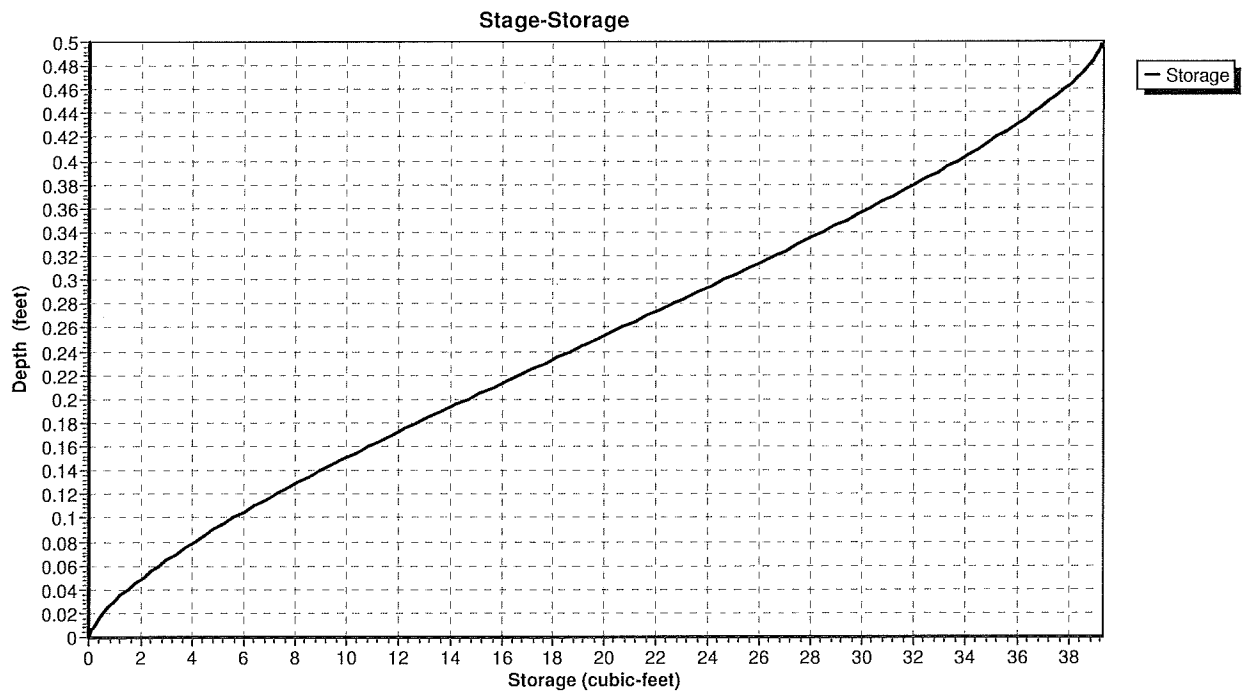
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Reach 2R: Roof Leader



Reach 2R: Roof Leader



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Hydrograph for Reach 2R: Roof Leader

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
5.00	0.01	0	189.05	0.00
5.50	0.01	1	189.09	0.01
6.00	0.01	1	189.09	0.01
6.50	0.01	2	189.09	0.01
7.00	0.01	2	189.09	0.01
7.50	0.01	2	189.10	0.01
8.00	0.02	2	189.10	0.02
8.50	0.02	2	189.11	0.02
9.00	0.02	3	189.11	0.02
9.50	0.03	3	189.11	0.03
10.00	0.03	3	189.12	0.03
10.50	0.04	4	189.13	0.04
11.00	0.05	4	189.13	0.05
11.50	0.08	6	189.16	0.08
12.00	0.75	32	189.42	0.67
12.50	0.08	7	189.16	0.10
13.00	0.05	4	189.14	0.05
13.50	0.04	4	189.13	0.04
14.00	0.03	3	189.12	0.03
14.50	0.03	3	189.12	0.03
15.00	0.03	3	189.11	0.03
15.50	0.02	2	189.11	0.02
16.00	0.02	2	189.10	0.02
16.50	0.02	2	189.10	0.02
17.00	0.01	2	189.10	0.01
17.50	0.01	2	189.09	0.01
18.00	0.01	2	189.09	0.01
18.50	0.01	1	189.09	0.01
19.00	0.01	1	189.09	0.01
19.50	0.01	1	189.09	0.01
20.00	0.01	1	189.09	0.01

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Stage-Discharge for Reach 2R: Roof Leader

Elevation (feet)	Velocity (ft/sec)	Discharge (cfs)
189.05	0.00	0.00
189.06	0.57	0.00
189.07	0.90	0.00
189.08	1.17	0.01
189.09	1.41	0.01
189.10	1.62	0.02
189.11	1.82	0.02
189.12	2.00	0.03
189.13	2.17	0.04
189.14	2.33	0.06
189.15	2.49	0.07
189.16	2.63	0.08
189.17	2.77	0.10
189.18	2.90	0.12
189.19	3.02	0.14
189.20	3.14	0.16
189.21	3.25	0.18
189.22	3.36	0.20
189.23	3.46	0.22
189.24	3.55	0.24
189.25	3.65	0.27
189.26	3.73	0.29
189.27	3.82	0.32
189.28	3.90	0.34
189.29	3.97	0.37
189.30	4.04	0.40
189.31	4.11	0.42
189.32	4.17	0.45
189.33	4.23	0.48
189.34	4.28	0.51
189.35	4.33	0.53
189.36	4.38	0.56
189.37	4.42	0.59
189.38	4.46	0.61
189.39	4.50	0.64
189.40	4.53	0.66
189.41	4.55	0.69
189.42	4.57	0.71
189.43	4.59	0.73
189.44	4.60	0.76
189.45	4.61	0.78
189.46	4.61	0.79
189.47	4.60	0.81
189.48	4.59	0.82
189.49	4.57	0.84
189.50	4.54	0.85
189.51	4.51	0.85
189.52	4.46	0.85
189.53	4.39	0.85
189.54	4.29	0.84
189.55	4.04	0.79

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Stage-Area-Storage for Reach 2R: Roof Leader

Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)
189.05	0.0	0
189.06	0.0	0
189.07	0.0	1
189.08	0.0	1
189.09	0.0	1
189.10	0.0	2
189.11	0.0	3
189.12	0.0	3
189.13	0.0	4
189.14	0.0	5
189.15	0.0	6
189.16	0.0	6
189.17	0.0	7
189.18	0.0	8
189.19	0.0	9
189.20	0.0	10
189.21	0.1	11
189.22	0.1	12
189.23	0.1	13
189.24	0.1	14
189.25	0.1	15
189.26	0.1	16
189.27	0.1	17
189.28	0.1	18
189.29	0.1	19
189.30	0.1	20
189.31	0.1	21
189.32	0.1	22
189.33	0.1	23
189.34	0.1	24
189.35	0.1	25
189.36	0.1	26
189.37	0.1	27
189.38	0.1	27
189.39	0.1	28
189.40	0.1	29
189.41	0.2	30
189.42	0.2	31
189.43	0.2	32
189.44	0.2	33
189.45	0.2	34
189.46	0.2	34
189.47	0.2	35
189.48	0.2	36
189.49	0.2	37
189.50	0.2	37
189.51	0.2	38
189.52	0.2	38
189.53	0.2	39
189.54	0.2	39
189.55	0.2	39

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100 Year Storm
Type III 24-hr Rainfall=6.70"

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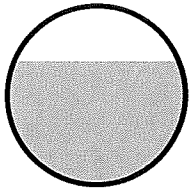
Summary for Reach 5R: Pipe from Catch Basin

Inflow Area = 0.230 ac, 67.39% Impervious, Inflow Depth > 5.12"
Inflow = 1.40 cfs @ 12.07 hrs, Volume= 0.098 af
Outflow = 1.40 cfs @ 12.07 hrs, Volume= 0.098 af, Atten= 0%, Lag= 0.0 min
Routed to Pond 6P : Subsurface Infiltration System B

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 5.43 fps, Min. Travel Time= 0.0 min
Avg. Velocity= 2.11 fps, Avg. Travel Time= 0.0 min

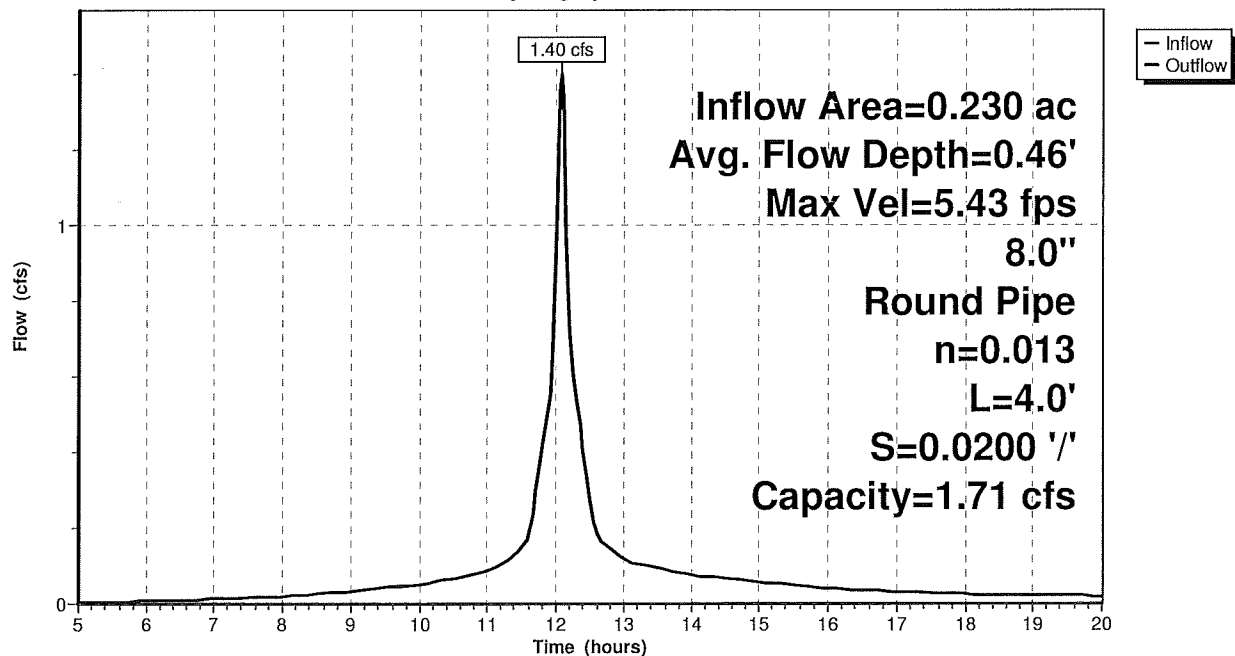
Peak Storage= 1 cf @ 12.07 hrs
Average Depth at Peak Storage= 0.46' , Surface Width= 0.62'
Bank-Full Depth= 0.67' Flow Area= 0.3 sf, Capacity= 1.71 cfs

8.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 4.0' Slope= 0.0200 '/'
Inlet Invert= 179.13', Outlet Invert= 179.05'



Reach 5R: Pipe from Catch Basin

Hydrograph



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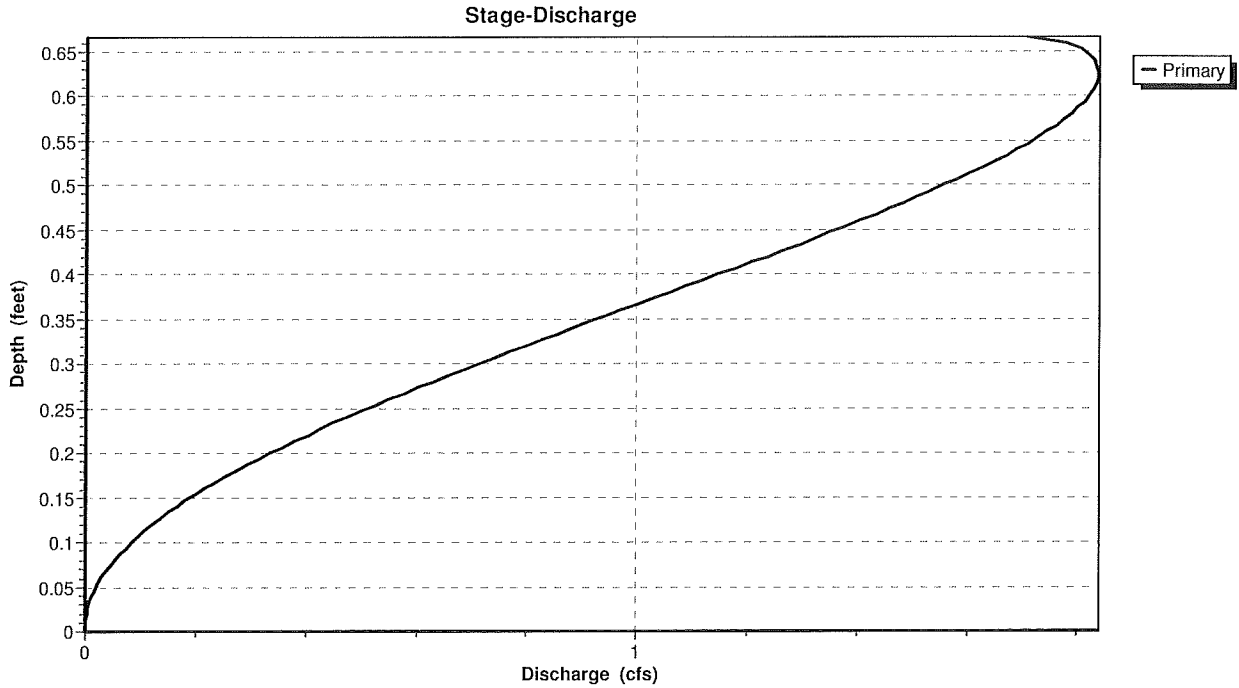
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Type III 24-hr Rainfall=6.70"

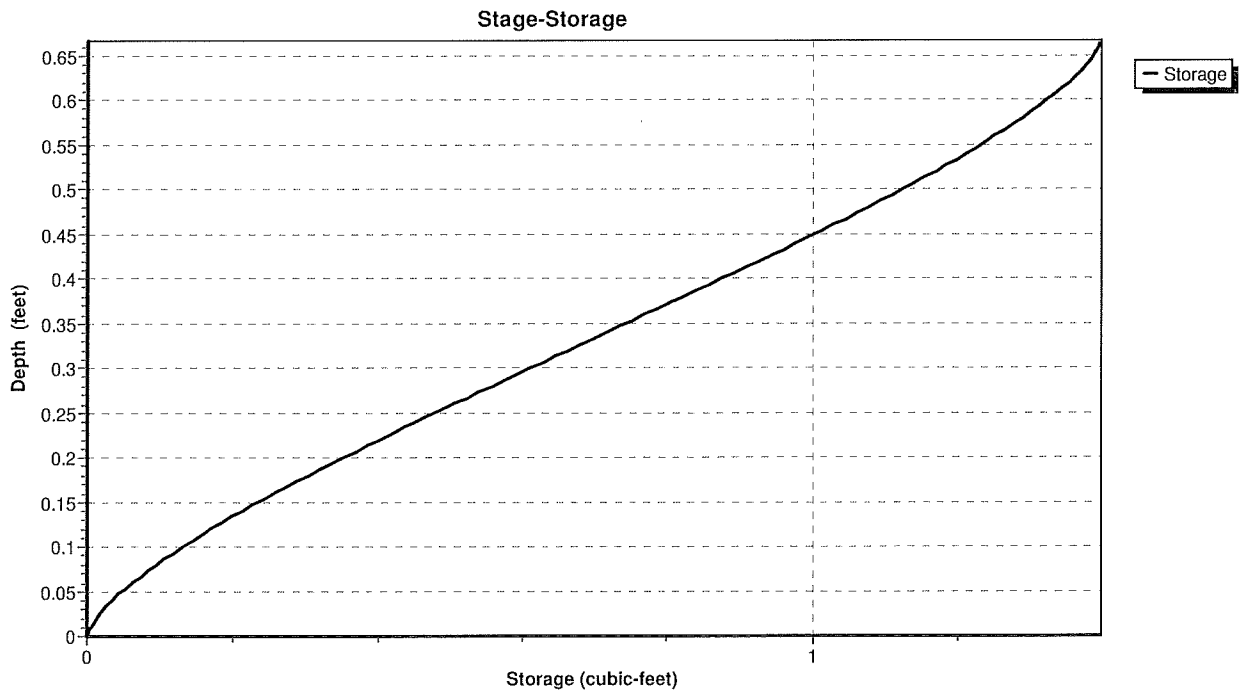
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Reach 5R: Pipe from Catch Basin



Reach 5R: Pipe from Catch Basin



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Type III 24-hr Rainfall=6.70"

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Hydrograph for Reach 5R: Pipe from Catch Basin

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
5.00	0.00	0	179.13	0.00
5.50	0.01	0	179.15	0.00
6.00	0.01	0	179.16	0.01
6.50	0.01	0	179.16	0.01
7.00	0.01	0	179.17	0.01
7.50	0.02	0	179.18	0.02
8.00	0.02	0	179.18	0.02
8.50	0.03	0	179.19	0.03
9.00	0.03	0	179.19	0.03
9.50	0.04	0	179.20	0.04
10.00	0.05	0	179.21	0.05
10.50	0.07	0	179.22	0.07
11.00	0.09	0	179.23	0.09
11.50	0.14	0	179.26	0.14
12.00	0.96	1	179.49	0.96
12.50	0.28	0	179.31	0.28
13.00	0.12	0	179.25	0.12
13.50	0.09	0	179.24	0.09
14.00	0.08	0	179.23	0.08
14.50	0.07	0	179.22	0.07
15.00	0.06	0	179.21	0.06
15.50	0.05	0	179.21	0.05
16.00	0.04	0	179.20	0.04
16.50	0.04	0	179.20	0.04
17.00	0.03	0	179.19	0.03
17.50	0.03	0	179.19	0.03
18.00	0.02	0	179.19	0.02
18.50	0.02	0	179.18	0.02
19.00	0.02	0	179.18	0.02
19.50	0.02	0	179.18	0.02
20.00	0.02	0	179.18	0.02

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Stage-Discharge for Reach 5R: Pipe from Catch Basin

Elevation (feet)	Velocity (ft/sec)	Discharge (cfs)	Elevation (feet)	Velocity (ft/sec)	Discharge (cfs)
179.13	0.00	0.00	179.66	5.58	1.66
179.14	0.56	0.00	179.67	5.58	1.69
179.15	0.90	0.00	179.68	5.58	1.72
179.16	1.17	0.01	179.69	5.57	1.74
179.17	1.42	0.01	179.70	5.56	1.77
179.18	1.63	0.02	179.71	5.55	1.79
179.19	1.84	0.03	179.72	5.53	1.81
179.20	2.02	0.04	179.73	5.50	1.82
179.21	2.20	0.05	179.74	5.47	1.83
179.22	2.37	0.07	179.75	5.43	1.84
179.23	2.53	0.08	179.76	5.38	1.84
179.24	2.68	0.10	179.77	5.32	1.83
179.25	2.83	0.12	179.78	5.23	1.81
179.26	2.97	0.14	179.79	5.11	1.78
179.27	3.10	0.17	179.80	4.79	1.67
179.28	3.23	0.19			
179.29	3.35	0.22			
179.30	3.47	0.24			
179.31	3.58	0.27			
179.32	3.69	0.30			
179.33	3.80	0.33			
179.34	3.90	0.37			
179.35	4.00	0.40			
179.36	4.10	0.44			
179.37	4.19	0.47			
179.38	4.28	0.51			
179.39	4.36	0.55			
179.40	4.44	0.59			
179.41	4.52	0.63			
179.42	4.60	0.67			
179.43	4.67	0.71			
179.44	4.74	0.75			
179.45	4.81	0.80			
179.46	4.87	0.84			
179.47	4.94	0.88			
179.48	5.00	0.93			
179.49	5.05	0.97			
179.50	5.11	1.02			
179.51	5.16	1.06			
179.52	5.20	1.10			
179.53	5.25	1.15			
179.54	5.29	1.19			
179.55	5.33	1.24			
179.56	5.37	1.28			
179.57	5.40	1.32			
179.58	5.44	1.36			
179.59	5.46	1.40			
179.60	5.49	1.44			
179.61	5.51	1.48			
179.62	5.53	1.52			
179.63	5.55	1.56			
179.64	5.56	1.59			
179.65	5.57	1.63			

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Stage-Area-Storage for Reach 5R: Pipe from Catch Basin

Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)	Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)
179.13	0.0	0	179.66	0.3	1
179.14	0.0	0	179.67	0.3	1
179.15	0.0	0	179.68	0.3	1
179.16	0.0	0	179.69	0.3	1
179.17	0.0	0	179.70	0.3	1
179.18	0.0	0	179.71	0.3	1
179.19	0.0	0	179.72	0.3	1
179.20	0.0	0	179.73	0.3	1
179.21	0.0	0	179.74	0.3	1
179.22	0.0	0	179.75	0.3	1
179.23	0.0	0	179.76	0.3	1
179.24	0.0	0	179.77	0.3	1
179.25	0.0	0	179.78	0.3	1
179.26	0.0	0	179.79	0.3	1
179.27	0.1	0	179.80	0.3	1
179.28	0.1	0			
179.29	0.1	0			
179.30	0.1	0			
179.31	0.1	0			
179.32	0.1	0			
179.33	0.1	0			
179.34	0.1	0			
179.35	0.1	0			
179.36	0.1	0			
179.37	0.1	0			
179.38	0.1	0			
179.39	0.1	1			
179.40	0.1	1			
179.41	0.1	1			
179.42	0.1	1			
179.43	0.2	1			
179.44	0.2	1			
179.45	0.2	1			
179.46	0.2	1			
179.47	0.2	1			
179.48	0.2	1			
179.49	0.2	1			
179.50	0.2	1			
179.51	0.2	1			
179.52	0.2	1			
179.53	0.2	1			
179.54	0.2	1			
179.55	0.2	1			
179.56	0.2	1			
179.57	0.2	1			
179.58	0.3	1			
179.59	0.3	1			
179.60	0.3	1			
179.61	0.3	1			
179.62	0.3	1			
179.63	0.3	1			
179.64	0.3	1			
179.65	0.3	1			

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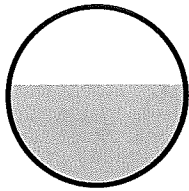
Summary for Reach 7R: Driveway Culvert

Inflow Area = 1.980 ac, 18.94% Impervious, Inflow Depth = 1.97"
Inflow = 6.38 cfs @ 12.17 hrs, Volume= 0.325 af
Outflow = 6.35 cfs @ 12.17 hrs, Volume= 0.325 af, Atten= 0%, Lag= 0.2 min
Routed to Pond 10P : Natural Low Area - East

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 6.21 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 2.47 fps, Avg. Travel Time= 0.3 min

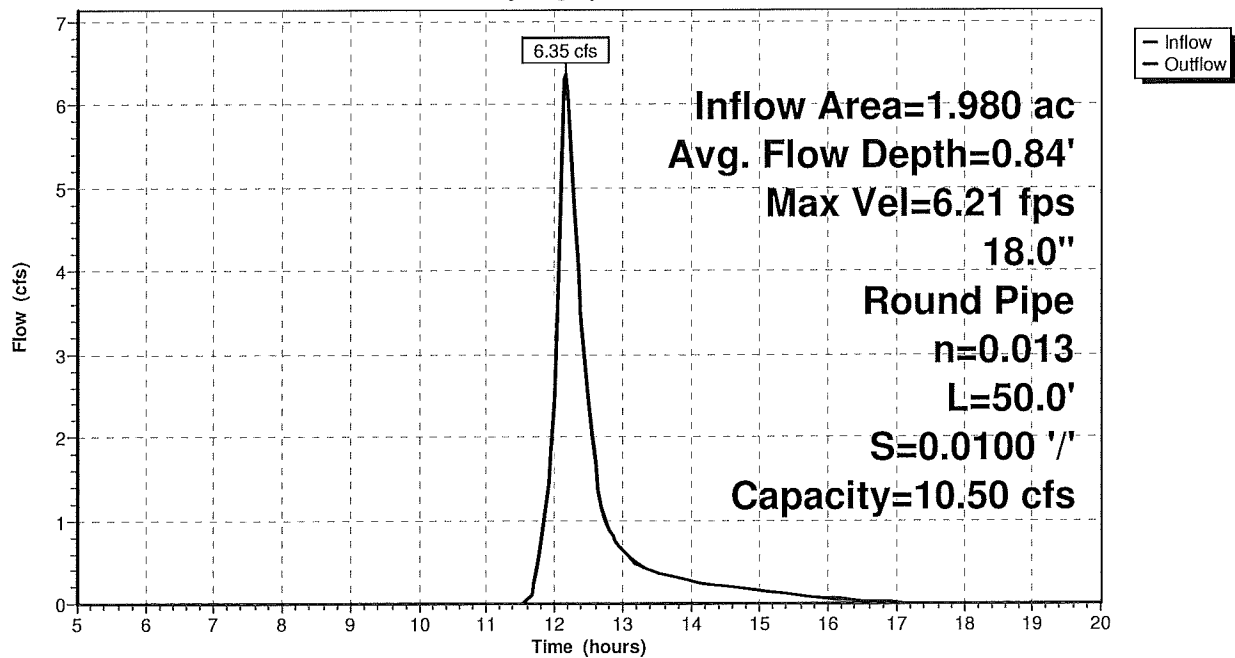
Peak Storage= 51 cf @ 12.17 hrs
Average Depth at Peak Storage= 0.84' , Surface Width= 1.49'
Bank-Full Depth= 1.50' Flow Area= 1.8 sf, Capacity= 10.50 cfs

18.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 50.0' Slope= 0.0100 '/'
Inlet Invert= 176.50', Outlet Invert= 176.00'



Reach 7R: Driveway Culvert

Hydrograph



56 Fountain Street- Post development

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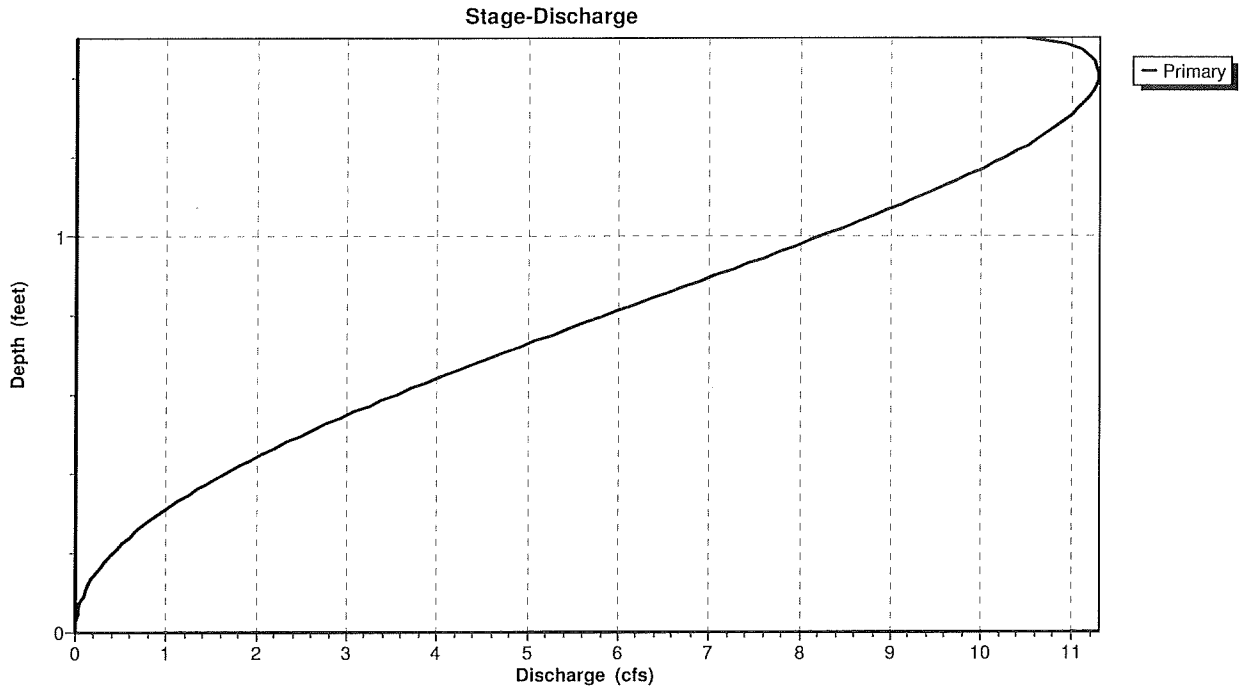
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100 Year Storm
Type III 24-hr Rainfall=6.70"

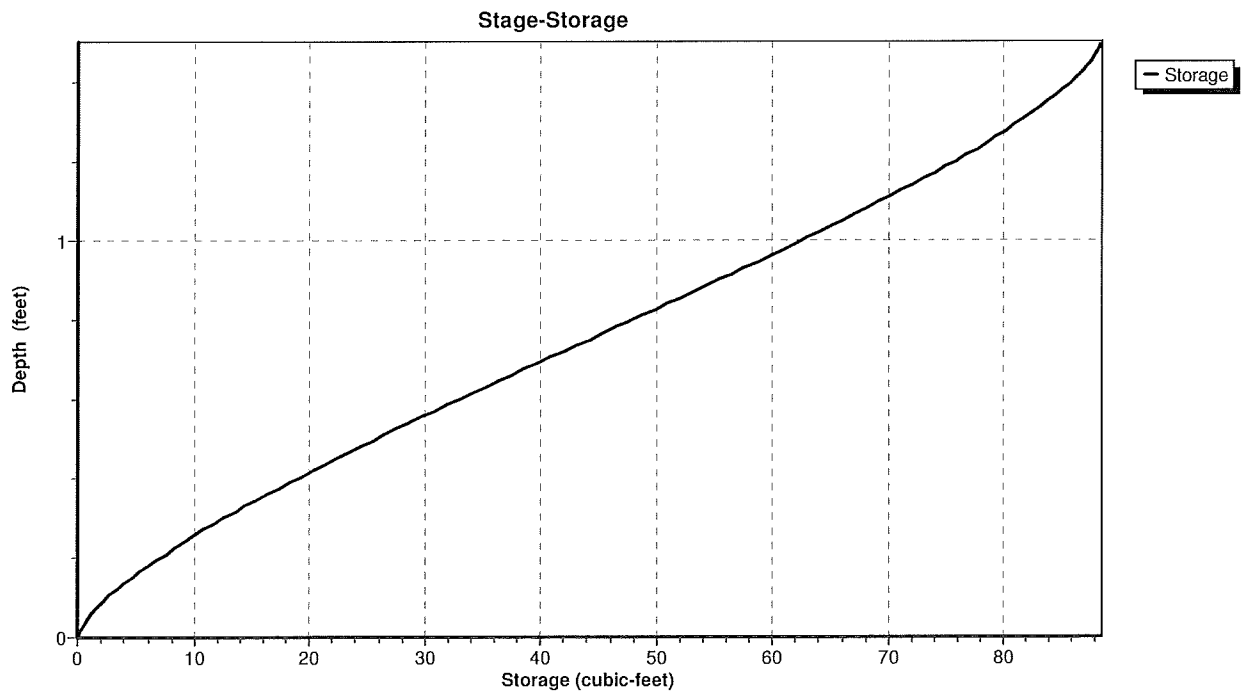
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Reach 7R: Driveway Culvert



Reach 7R: Driveway Culvert



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Hydrograph for Reach 7R: Driveway Culvert

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
5.00	0.00	0	176.50	0.00
5.50	0.00	0	176.50	0.00
6.00	0.00	0	176.50	0.00
6.50	0.00	0	176.50	0.00
7.00	0.00	0	176.50	0.00
7.50	0.00	0	176.50	0.00
8.00	0.00	0	176.50	0.00
8.50	0.00	0	176.50	0.00
9.00	0.00	0	176.50	0.00
9.50	0.00	0	176.50	0.00
10.00	0.00	0	176.50	0.00
10.50	0.00	0	176.50	0.00
11.00	0.00	0	176.50	0.00
11.50	0.00	0	176.50	0.00
12.00	2.49	25	176.99	2.43
12.50	2.48	26	177.00	2.52
13.00	0.64	10	176.75	0.64
13.50	0.38	7	176.69	0.38
14.00	0.27	5	176.67	0.27
14.50	0.20	4	176.64	0.20
15.00	0.15	4	176.63	0.15
15.50	0.11	3	176.61	0.11
16.00	0.06	2	176.58	0.06
16.50	0.03	1	176.56	0.03
17.00	0.01	1	176.54	0.01
17.50	0.00	0	176.50	0.00
18.00	0.00	0	176.50	0.00
18.50	0.00	0	176.50	0.00
19.00	0.00	0	176.50	0.00
19.50	0.00	0	176.50	0.00
20.00	0.00	0	176.50	0.00

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Stage-Discharge for Reach 7R: Driveway Culvert

Elevation (feet)	Velocity (ft/sec)	Discharge (cfs)	Elevation (feet)	Velocity (ft/sec)	Discharge (cfs)	Elevation (feet)	Velocity (ft/sec)	Discharge (cfs)
176.50	0.00	0.00	177.03	5.04	2.81	177.56	6.67	8.90
176.51	0.35	0.00	177.04	5.08	2.91	177.57	6.68	9.01
176.52	0.63	0.00	177.05	5.13	3.01	177.58	6.69	9.12
176.53	0.84	0.01	177.06	5.18	3.12	177.59	6.70	9.22
176.54	1.01	0.01	177.07	5.23	3.22	177.60	6.71	9.33
176.55	1.17	0.02	177.08	5.27	3.33	177.61	6.72	9.43
176.56	1.32	0.03	177.09	5.32	3.43	177.62	6.73	9.53
176.57	1.46	0.04	177.10	5.36	3.54	177.63	6.74	9.63
176.58	1.59	0.06	177.11	5.41	3.65	177.64	6.75	9.73
176.59	1.72	0.07	177.12	5.45	3.76	177.65	6.76	9.82
176.60	1.84	0.09	177.13	5.49	3.87	177.66	6.76	9.91
176.61	1.96	0.11	177.14	5.53	3.98	177.67	6.77	10.01
176.62	2.07	0.14	177.15	5.57	4.09	177.68	6.77	10.09
176.63	2.18	0.16	177.16	5.61	4.20	177.69	6.77	10.18
176.64	2.28	0.19	177.17	5.65	4.32	177.70	6.77	10.27
176.65	2.38	0.22	177.18	5.69	4.43	177.71	6.78	10.35
176.66	2.48	0.25	177.19	5.73	4.55	177.72	6.78	10.43
176.67	2.58	0.29	177.20	5.77	4.66	177.73	6.78	10.51
176.68	2.67	0.32	177.21	5.80	4.78	177.74	6.77	10.58
176.69	2.77	0.36	177.22	5.84	4.90	177.75	6.77	10.66
176.70	2.86	0.40	177.23	5.88	5.02	177.76	6.77	10.73
176.71	2.94	0.44	177.24	5.91	5.13	177.77	6.76	10.79
176.72	3.03	0.49	177.25	5.94	5.25	177.78	6.76	10.85
176.73	3.11	0.53	177.26	5.98	5.37	177.79	6.75	10.92
176.74	3.20	0.58	177.27	6.01	5.49	177.80	6.74	10.97
176.75	3.28	0.63	177.28	6.04	5.61	177.81	6.73	11.02
176.76	3.35	0.69	177.29	6.07	5.73	177.82	6.72	11.07
176.77	3.43	0.74	177.30	6.10	5.85	177.83	6.71	11.12
176.78	3.51	0.80	177.31	6.13	5.97	177.84	6.70	11.16
176.79	3.58	0.86	177.32	6.16	6.09	177.85	6.68	11.20
176.80	3.66	0.92	177.33	6.19	6.21	177.86	6.67	11.23
176.81	3.73	0.98	177.34	6.22	6.33	177.87	6.65	11.25
176.82	3.80	1.05	177.35	6.25	6.45	177.88	6.63	11.27
176.83	3.87	1.11	177.36	6.27	6.58	177.89	6.61	11.29
176.84	3.94	1.18	177.37	6.30	6.70	177.90	6.58	11.30
176.85	4.00	1.25	177.38	6.33	6.82	177.91	6.55	11.30
176.86	4.07	1.33	177.39	6.35	6.94	177.92	6.52	11.29
176.87	4.13	1.40	177.40	6.37	7.06	177.93	6.49	11.28
176.88	4.20	1.48	177.41	6.40	7.18	177.94	6.46	11.25
176.89	4.26	1.55	177.42	6.42	7.30	177.95	6.41	11.21
176.90	4.32	1.63	177.43	6.44	7.42	177.96	6.36	11.16
176.91	4.38	1.72	177.44	6.46	7.53	177.97	6.31	11.10
176.92	4.44	1.80	177.45	6.49	7.65	177.98	6.24	11.00
176.93	4.50	1.88	177.46	6.51	7.77	177.99	6.12	10.80
176.94	4.56	1.97	177.47	6.52	7.89	178.00	5.94	10.50
176.95	4.61	2.06	177.48	6.54	8.00			
176.96	4.67	2.15	177.49	6.56	8.12			
176.97	4.72	2.24	177.50	6.58	8.23			
176.98	4.78	2.33	177.51	6.60	8.35			
176.99	4.83	2.42	177.52	6.61	8.46			
177.00	4.88	2.52	177.53	6.63	8.57			
177.01	4.94	2.61	177.54	6.64	8.68			
177.02	4.99	2.71	177.55	6.66	8.79			

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Stage-Area-Storage for Reach 7R: Driveway Culvert

Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)	Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)
176.50	0.0	0	177.56	1.3	67
176.52	0.0	0	177.58	1.4	68
176.54	0.0	1	177.60	1.4	69
176.56	0.0	1	177.62	1.4	71
176.58	0.0	2	177.64	1.4	72
176.60	0.1	3	177.66	1.5	73
176.62	0.1	3	177.68	1.5	75
176.64	0.1	4	177.70	1.5	76
176.66	0.1	5	177.72	1.5	77
176.68	0.1	6	177.74	1.6	78
176.70	0.1	7	177.76	1.6	79
176.72	0.2	8	177.78	1.6	80
176.74	0.2	9	177.80	1.6	81
176.76	0.2	10	177.82	1.6	82
176.78	0.2	11	177.84	1.7	83
176.80	0.3	13	177.86	1.7	84
176.82	0.3	14	177.88	1.7	85
176.84	0.3	15	177.90	1.7	86
176.86	0.3	16	177.92	1.7	87
176.88	0.4	18	177.94	1.7	87
176.90	0.4	19	177.96	1.8	88
176.92	0.4	20	177.98	1.8	88
176.94	0.4	22	178.00	1.8	88
176.96	0.5	23			
176.98	0.5	24			
177.00	0.5	26			
177.02	0.5	27			
177.04	0.6	29			
177.06	0.6	30			
177.08	0.6	32			
177.10	0.7	33			
177.12	0.7	34			
177.14	0.7	36			
177.16	0.7	37			
177.18	0.8	39			
177.20	0.8	40			
177.22	0.8	42			
177.24	0.9	43			
177.26	0.9	45			
177.28	0.9	46			
177.30	1.0	48			
177.32	1.0	49			
177.34	1.0	51			
177.36	1.0	52			
177.38	1.1	54			
177.40	1.1	55			
177.42	1.1	57			
177.44	1.2	58			
177.46	1.2	60			
177.48	1.2	61			
177.50	1.3	63			
177.52	1.3	64			
177.54	1.3	65			

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Summary for Pond 3P: Subsurface Infiltration System A

Inflow Area = 0.100 ac, 100.00% Impervious, Inflow Depth > 5.96"
 Inflow = 0.69 cfs @ 12.02 hrs, Volume= 0.050 af
 Outflow = 0.03 cfs @ 9.75 hrs, Volume= 0.030 af, Atten= 96%, Lag= 0.0 min
 Primary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
 Routed to Pond 10P : Natural Low Area - East
 Secondary = 0.03 cfs @ 9.75 hrs, Volume= 0.030 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 185.20' @ 14.54 hrs Surf.Area= 522 sf Storage= 1,147 cf

Plug-Flow detention time= 179.3 min calculated for 0.030 af (60% of inflow)
 Center-of-Mass det. time= 98.5 min (829.7 - 731.2)

Volume	Invert	Avail.Storage	Storage Description
#1	182.67'	1,354 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
182.67	128	0	0
183.16	128	63	63
183.17	534	3	66
184.17	534	534	600
185.17	534	534	1,134
185.72	267	220	1,354

Device	Routing	Invert	Outlet Devices
#1	Secondary	182.67'	2.410 in/hr Exfiltration over Surface area
#2	Primary	185.22'	4.0" Round Culvert L= 20.0' Ke= 0.600 Inlet / Outlet Invert= 185.22' / 185.02' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.09 sf

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=182.67' (Free Discharge)
 ↑**2=Culvert** (Controls 0.00 cfs)

Secondary OutFlow Max=0.03 cfs @ 9.75 hrs HW=183.17' (Free Discharge)
 ↑**1=Exfiltration** (Exfiltration Controls 0.03 cfs)

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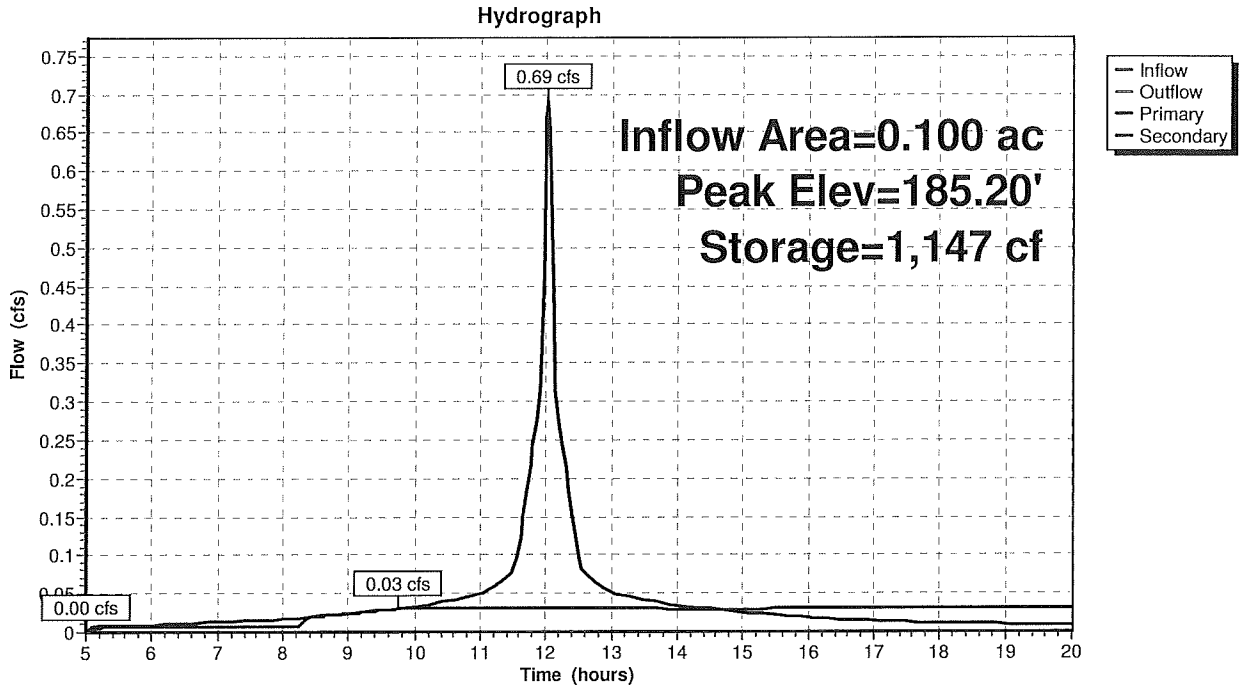
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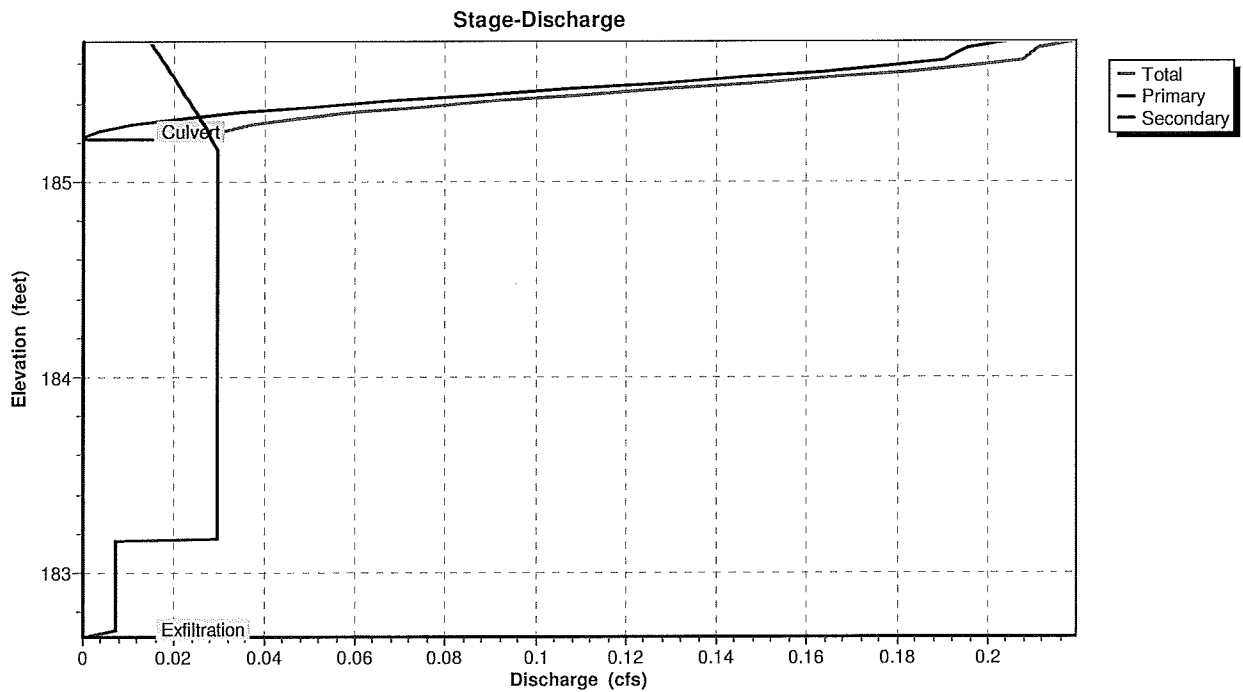
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Pond 3P: Subsurface Infiltration System A



Pond 3P: Subsurface Infiltration System A



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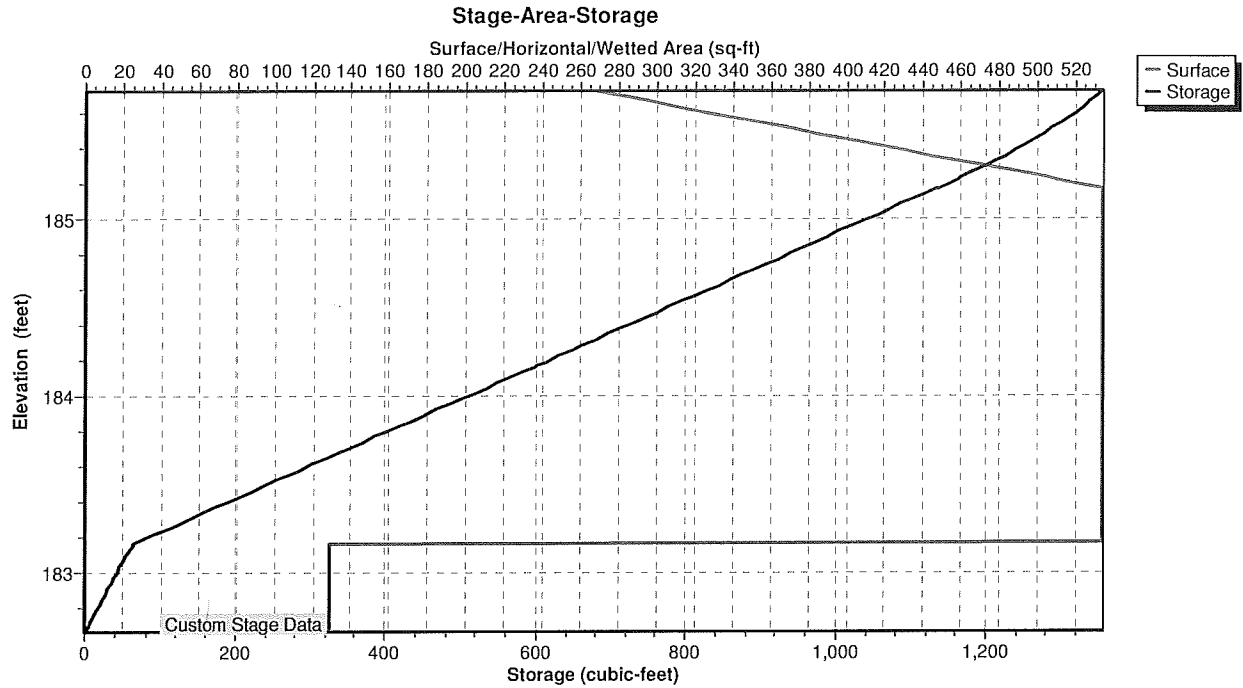
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Pond 3P: Subsurface Infiltration System A



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Hydrograph for Pond 3P: Subsurface Infiltration System A

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Primary (cfs)	Secondary (cfs)
5.00	0.00	0	182.67	0.00	0.00	0.00
5.50	0.01	5	182.71	0.01	0.00	0.01
6.00	0.01	9	182.74	0.01	0.00	0.01
6.50	0.01	15	182.79	0.01	0.00	0.01
7.00	0.01	24	182.86	0.01	0.00	0.01
7.50	0.01	36	182.95	0.01	0.00	0.01
8.00	0.02	52	183.07	0.01	0.00	0.01
8.50	0.02	65	183.17	0.02	0.00	0.02
9.00	0.02	65	183.17	0.02	0.00	0.02
9.50	0.03	66	183.17	0.03	0.00	0.03
10.00	0.03	67	183.17	0.03	0.00	0.03
10.50	0.04	78	183.19	0.03	0.00	0.03
11.00	0.05	104	183.24	0.03	0.00	0.03
11.50	0.08	163	183.35	0.03	0.00	0.03
12.00	0.67	549	184.07	0.03	0.00	0.03
12.50	0.10	1,032	184.98	0.03	0.00	0.03
13.00	0.05	1,100	185.11	0.03	0.00	0.03
13.50	0.04	1,129	185.16	0.03	0.00	0.03
14.00	0.03	1,143	185.19	0.03	0.00	0.03
14.50	0.03	1,147	185.20	0.03	0.00	0.03
15.00	0.03	1,144	185.19	0.03	0.00	0.03
15.50	0.02	1,134	185.17	0.03	0.00	0.03
16.00	0.02	1,116	185.14	0.03	0.00	0.03
16.50	0.02	1,092	185.09	0.03	0.00	0.03
17.00	0.01	1,066	185.04	0.03	0.00	0.03
17.50	0.01	1,037	184.99	0.03	0.00	0.03
18.00	0.01	1,004	184.93	0.03	0.00	0.03
18.50	0.01	970	184.86	0.03	0.00	0.03
19.00	0.01	934	184.80	0.03	0.00	0.03
19.50	0.01	898	184.73	0.03	0.00	0.03
20.00	0.01	861	184.66	0.03	0.00	0.03

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Stage-Discharge for Pond 3P: Subsurface Infiltration System A

Elevation (feet)	Discharge (cfs)	Primary (cfs)	Secondary (cfs)	Elevation (feet)	Discharge (cfs)	Primary (cfs)	Secondary (cfs)
182.67	0.00	0.00	0.00	185.32	0.05	0.02	0.03
182.72	0.01	0.00	0.01	185.37	0.07	0.04	0.02
182.77	0.01	0.00	0.01	185.42	0.09	0.07	0.02
182.82	0.01	0.00	0.01	185.47	0.12	0.10	0.02
182.87	0.01	0.00	0.01	185.52	0.16	0.14	0.02
182.92	0.01	0.00	0.01	185.57	0.18	0.17	0.02
182.97	0.01	0.00	0.01	185.62	0.21	0.19	0.02
183.02	0.01	0.00	0.01	185.67	0.21	0.19	0.02
183.07	0.01	0.00	0.01	185.72	0.22	0.20	0.01
183.12	0.01	0.00	0.01				
183.17	0.03	0.00	0.03				
183.22	0.03	0.00	0.03				
183.27	0.03	0.00	0.03				
183.32	0.03	0.00	0.03				
183.37	0.03	0.00	0.03				
183.42	0.03	0.00	0.03				
183.47	0.03	0.00	0.03				
183.52	0.03	0.00	0.03				
183.57	0.03	0.00	0.03				
183.62	0.03	0.00	0.03				
183.67	0.03	0.00	0.03				
183.72	0.03	0.00	0.03				
183.77	0.03	0.00	0.03				
183.82	0.03	0.00	0.03				
183.87	0.03	0.00	0.03				
183.92	0.03	0.00	0.03				
183.97	0.03	0.00	0.03				
184.02	0.03	0.00	0.03				
184.07	0.03	0.00	0.03				
184.12	0.03	0.00	0.03				
184.17	0.03	0.00	0.03				
184.22	0.03	0.00	0.03				
184.27	0.03	0.00	0.03				
184.32	0.03	0.00	0.03				
184.37	0.03	0.00	0.03				
184.42	0.03	0.00	0.03				
184.47	0.03	0.00	0.03				
184.52	0.03	0.00	0.03				
184.57	0.03	0.00	0.03				
184.62	0.03	0.00	0.03				
184.67	0.03	0.00	0.03				
184.72	0.03	0.00	0.03				
184.77	0.03	0.00	0.03				
184.82	0.03	0.00	0.03				
184.87	0.03	0.00	0.03				
184.92	0.03	0.00	0.03				
184.97	0.03	0.00	0.03				
185.02	0.03	0.00	0.03				
185.07	0.03	0.00	0.03				
185.12	0.03	0.00	0.03				
185.17	0.03	0.00	0.03				
185.22	0.03	0.00	0.03				
185.27	0.03	0.00	0.03				

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Stage-Area-Storage for Pond 3P: Subsurface Infiltration System A

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
182.67	128	0	185.32	461	1,209
182.72	128	6	185.37	437	1,231
182.77	128	13	185.42	413	1,252
182.82	128	19	185.47	388	1,272
182.87	128	26	185.52	364	1,291
182.92	128	32	185.57	340	1,309
182.97	128	38	185.62	316	1,325
183.02	128	45	185.67	291	1,340
183.07	128	51	185.72	267	1,354
183.12	128	58			
183.17	534	66			
183.22	534	93			
183.27	534	119			
183.32	534	146			
183.37	534	173			
183.42	534	200			
183.47	534	226			
183.52	534	253			
183.57	534	280			
183.62	534	306			
183.67	534	333			
183.72	534	360			
183.77	534	386			
183.82	534	413			
183.87	534	440			
183.92	534	467			
183.97	534	493			
184.02	534	520			
184.07	534	547			
184.12	534	573			
184.17	534	600			
184.22	534	627			
184.27	534	653			
184.32	534	680			
184.37	534	707			
184.42	534	734			
184.47	534	760			
184.52	534	787			
184.57	534	814			
184.62	534	840			
184.67	534	867			
184.72	534	894			
184.77	534	920			
184.82	534	947			
184.87	534	974			
184.92	534	1,001			
184.97	534	1,027			
185.02	534	1,054			
185.07	534	1,081			
185.12	534	1,107			
185.17	534	1,134			
185.22	510	1,160			
185.27	485	1,185			

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Summary for Pond 6P: Subsurface Infiltration System B

Inflow Area = 0.230 ac, 67.39% Impervious, Inflow Depth > 5.12"
 Inflow = 1.40 cfs @ 12.07 hrs, Volume= 0.098 af
 Outflow = 1.23 cfs @ 12.12 hrs, Volume= 0.097 af, Atten= 12%, Lag= 3.1 min
 Primary = 1.14 cfs @ 12.12 hrs, Volume= 0.030 af
 Routed to Pond 11P : Natural Low Area - West
 Secondary = 0.11 cfs @ 11.30 hrs, Volume= 0.067 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 178.58' @ 12.12 hrs Surf.Area= 433 sf Storage= 776 cf

Plug-Flow detention time= 30.8 min calculated for 0.097 af (99% of inflow)
 Center-of-Mass det. time= 27.2 min (782.5 - 755.3)

Volume	Invert	Avail.Storage	Storage Description
#1	176.83'	866 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
176.83	138	0	0
177.32	138	68	68
177.33	578	4	71
178.33	578	578	649
178.83	289	217	866

Device	Routing	Invert	Outlet Devices
#1	Secondary	176.83'	8.270 in/hr Exfiltration over Surface area
#2	Primary	178.05'	8.0" Round Culvert X 2.00 L= 8.0' Ke= 0.600 Inlet / Outlet Invert= 178.05' / 177.97' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.35 sf

Primary OutFlow Max=1.08 cfs @ 12.12 hrs HW=178.56' (Free Discharge)
 ↑**2=Culvert** (Barrel Controls 1.08 cfs @ 2.60 fps)

Secondary OutFlow Max=0.11 cfs @ 11.30 hrs HW=177.33' (Free Discharge)
 ↑**1=Exfiltration** (Exfiltration Controls 0.11 cfs)

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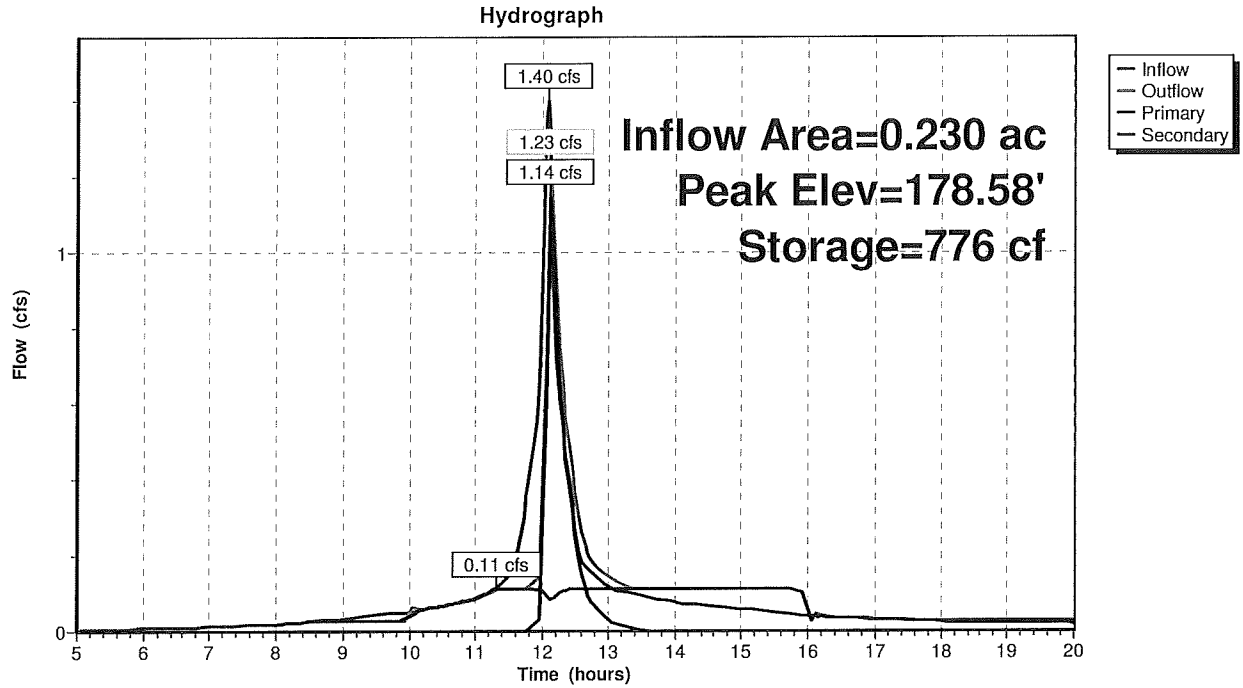
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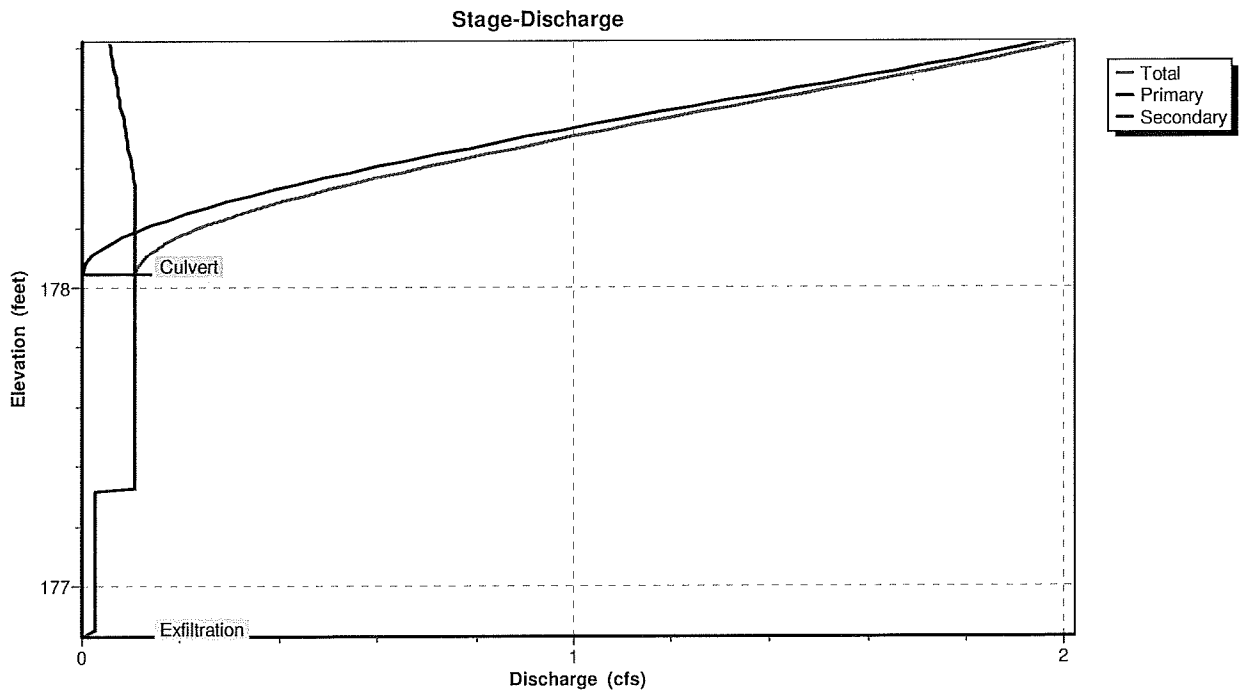
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Pond 6P: Subsurface Infiltration System B



Pond 6P: Subsurface Infiltration System B



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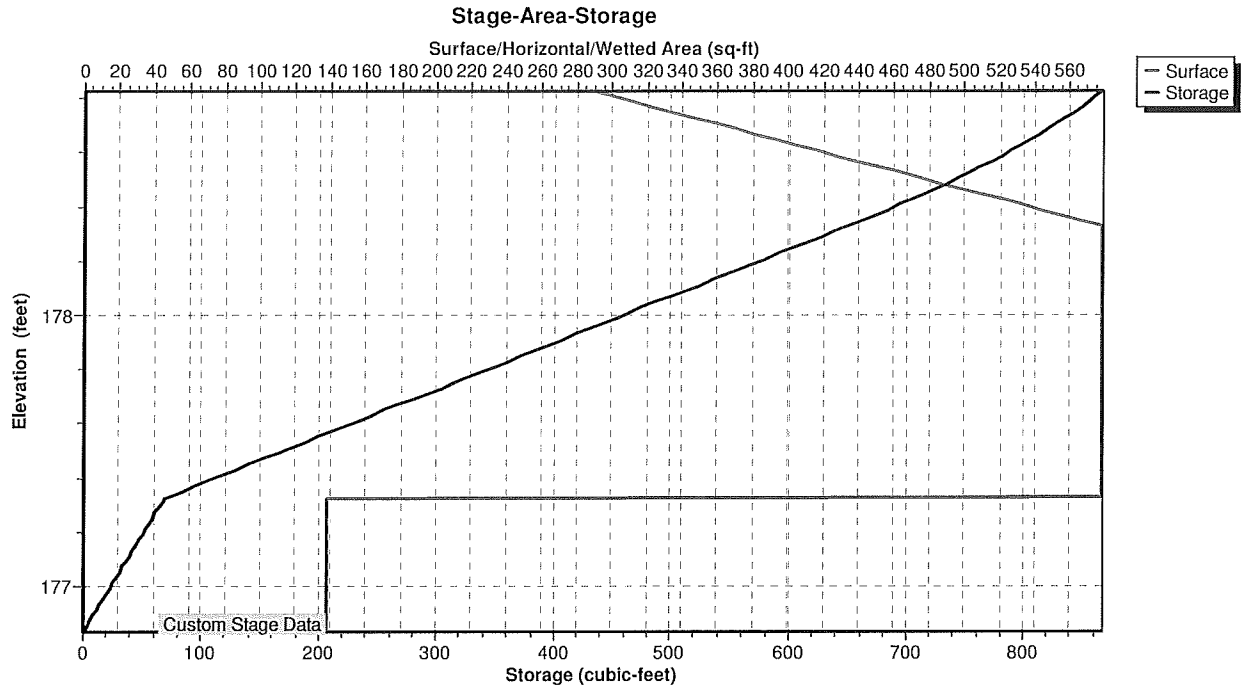
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Pond 6P: Subsurface Infiltration System B



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Hydrograph for Pond 6P: Subsurface Infiltration System B

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Primary (cfs)	Secondary (cfs)
5.00	0.00	0	176.83	0.00	0.00	0.00
5.50	0.00	1	176.83	0.01	0.00	0.01
6.00	0.01	1	176.84	0.01	0.00	0.01
6.50	0.01	1	176.84	0.01	0.00	0.01
7.00	0.01	1	176.84	0.01	0.00	0.01
7.50	0.02	2	176.84	0.02	0.00	0.02
8.00	0.02	2	176.84	0.02	0.00	0.02
8.50	0.03	3	176.85	0.03	0.00	0.03
9.00	0.03	9	176.90	0.03	0.00	0.03
9.50	0.04	30	177.05	0.03	0.00	0.03
10.00	0.05	68	177.32	0.03	0.00	0.03
10.50	0.07	69	177.32	0.07	0.00	0.07
11.00	0.09	70	177.33	0.09	0.00	0.09
11.50	0.14	85	177.35	0.11	0.00	0.11
12.00	0.96	576	178.20	0.24	0.13	0.11
12.50	0.28	616	178.27	0.37	0.26	0.11
13.00	0.12	531	178.13	0.14	0.03	0.11
13.50	0.09	496	178.06	0.11	0.00	0.11
14.00	0.08	449	177.98	0.11	0.00	0.11
14.50	0.07	377	177.86	0.11	0.00	0.11
15.00	0.06	289	177.71	0.11	0.00	0.11
15.50	0.05	186	177.53	0.11	0.00	0.11
16.00	0.04	70	177.33	0.08	0.00	0.08
16.50	0.04	68	177.32	0.04	0.00	0.04
17.00	0.03	68	177.32	0.03	0.00	0.03
17.50	0.03	68	177.32	0.03	0.00	0.03
18.00	0.02	67	177.31	0.03	0.00	0.03
18.50	0.02	62	177.28	0.03	0.00	0.03
19.00	0.02	55	177.23	0.03	0.00	0.03
19.50	0.02	47	177.17	0.03	0.00	0.03
20.00	0.02	36	177.09	0.03	0.00	0.03

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Stage-Discharge for Pond 6P: Subsurface Infiltration System B

Elevation (feet)	Discharge (cfs)	Primary (cfs)	Secondary (cfs)	Elevation (feet)	Discharge (cfs)	Primary (cfs)	Secondary (cfs)
176.83	0.00	0.00	0.00	177.89	0.11	0.00	0.11
176.85	0.03	0.00	0.03	177.91	0.11	0.00	0.11
176.87	0.03	0.00	0.03	177.93	0.11	0.00	0.11
176.89	0.03	0.00	0.03	177.95	0.11	0.00	0.11
176.91	0.03	0.00	0.03	177.97	0.11	0.00	0.11
176.93	0.03	0.00	0.03	177.99	0.11	0.00	0.11
176.95	0.03	0.00	0.03	178.01	0.11	0.00	0.11
176.97	0.03	0.00	0.03	178.03	0.11	0.00	0.11
176.99	0.03	0.00	0.03	178.05	0.11	0.00	0.11
177.01	0.03	0.00	0.03	178.07	0.11	0.00	0.11
177.03	0.03	0.00	0.03	178.09	0.12	0.01	0.11
177.05	0.03	0.00	0.03	178.11	0.13	0.02	0.11
177.07	0.03	0.00	0.03	178.13	0.15	0.04	0.11
177.09	0.03	0.00	0.03	178.15	0.17	0.06	0.11
177.11	0.03	0.00	0.03	178.17	0.19	0.08	0.11
177.13	0.03	0.00	0.03	178.19	0.22	0.11	0.11
177.15	0.03	0.00	0.03	178.21	0.25	0.14	0.11
177.17	0.03	0.00	0.03	178.23	0.28	0.17	0.11
177.19	0.03	0.00	0.03	178.25	0.32	0.21	0.11
177.21	0.03	0.00	0.03	178.27	0.36	0.25	0.11
177.23	0.03	0.00	0.03	178.29	0.41	0.29	0.11
177.25	0.03	0.00	0.03	178.31	0.45	0.34	0.11
177.27	0.03	0.00	0.03	178.33	0.50	0.39	0.11
177.29	0.03	0.00	0.03	178.35	0.55	0.44	0.11
177.31	0.03	0.00	0.03	178.37	0.60	0.49	0.11
177.33	0.11	0.00	0.11	178.39	0.65	0.55	0.10
177.35	0.11	0.00	0.11	178.41	0.70	0.60	0.10
177.37	0.11	0.00	0.11	178.43	0.76	0.66	0.10
177.39	0.11	0.00	0.11	178.45	0.82	0.72	0.10
177.41	0.11	0.00	0.11	178.47	0.88	0.78	0.10
177.43	0.11	0.00	0.11	178.49	0.94	0.85	0.09
177.45	0.11	0.00	0.11	178.51	1.00	0.91	0.09
177.47	0.11	0.00	0.11	178.53	1.06	0.97	0.09
177.49	0.11	0.00	0.11	178.55	1.13	1.04	0.09
177.51	0.11	0.00	0.11	178.57	1.19	1.11	0.08
177.53	0.11	0.00	0.11	178.59	1.26	1.18	0.08
177.55	0.11	0.00	0.11	178.61	1.32	1.24	0.08
177.57	0.11	0.00	0.11	178.63	1.39	1.31	0.08
177.59	0.11	0.00	0.11	178.65	1.46	1.38	0.08
177.61	0.11	0.00	0.11	178.67	1.52	1.45	0.07
177.63	0.11	0.00	0.11	178.69	1.59	1.52	0.07
177.65	0.11	0.00	0.11	178.71	1.66	1.59	0.07
177.67	0.11	0.00	0.11	178.73	1.72	1.65	0.07
177.69	0.11	0.00	0.11	178.75	1.78	1.72	0.06
177.71	0.11	0.00	0.11	178.77	1.85	1.78	0.06
177.73	0.11	0.00	0.11	178.79	1.91	1.85	0.06
177.75	0.11	0.00	0.11	178.81	1.96	1.91	0.06
177.77	0.11	0.00	0.11	178.83	2.02	1.96	0.06
177.79	0.11	0.00	0.11				
177.81	0.11	0.00	0.11				
177.83	0.11	0.00	0.11				
177.85	0.11	0.00	0.11				
177.87	0.11	0.00	0.11				

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Stage-Area-Storage for Pond 6P: Subsurface Infiltration System B

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
176.83	138	0	177.89	578	395
176.85	138	3	177.91	578	406
176.87	138	6	177.93	578	418
176.89	138	8	177.95	578	430
176.91	138	11	177.97	578	441
176.93	138	14	177.99	578	453
176.95	138	17	178.01	578	464
176.97	138	19	178.03	578	476
176.99	138	22	178.05	578	487
177.01	138	25	178.07	578	499
177.03	138	28	178.09	578	510
177.05	138	30	178.11	578	522
177.07	138	33	178.13	578	534
177.09	138	36	178.15	578	545
177.11	138	39	178.17	578	557
177.13	138	41	178.19	578	568
177.15	138	44	178.21	578	580
177.17	138	47	178.23	578	591
177.19	138	50	178.25	578	603
177.21	138	52	178.27	578	615
177.23	138	55	178.29	578	626
177.25	138	58	178.31	578	638
177.27	138	61	178.33	578	649
177.29	138	63	178.35	566	661
177.31	138	66	178.37	555	672
177.33	578	71	178.39	543	683
177.35	578	83	178.41	532	694
177.37	578	94	178.43	520	704
177.39	578	106	178.45	509	714
177.41	578	117	178.47	497	724
177.43	578	129	178.49	486	734
177.45	578	141	178.51	474	744
177.47	578	152	178.53	462	753
177.49	578	164	178.55	451	762
177.51	578	175	178.57	439	771
177.53	578	187	178.59	428	780
177.55	578	198	178.61	416	788
177.57	578	210	178.63	405	797
177.59	578	221	178.65	393	805
177.61	578	233	178.67	381	812
177.63	578	245	178.69	370	820
177.65	578	256	178.71	358	827
177.67	578	268	178.73	347	834
177.69	578	279	178.75	335	841
177.71	578	291	178.77	324	848
177.73	578	302	178.79	312	854
177.75	578	314	178.81	301	860
177.77	578	326	178.83	289	866
177.79	578	337			
177.81	578	349			
177.83	578	360			
177.85	578	372			
177.87	578	383			

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Summary for Pond 10P: Natural Low Area - East

Inflow Area = 4.340 ac, 12.33% Impervious, Inflow Depth > 1.99"
 Inflow = 11.26 cfs @ 12.17 hrs, Volume= 0.720 af
 Outflow = 7.14 cfs @ 12.41 hrs, Volume= 0.719 af, Atten= 37%, Lag= 14.7 min
 Primary = 5.59 cfs @ 12.41 hrs, Volume= 0.095 af
 Routed to Link DP : Design Point
 Secondary = 1.55 cfs @ 12.41 hrs, Volume= 0.625 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 178.57' @ 12.41 hrs Surf.Area= 8,104 sf Storage= 11,811 cf

Plug-Flow detention time= 78.5 min calculated for 0.717 af (100% of inflow)
 Center-of-Mass det. time= 78.0 min (869.7 - 791.7)

Volume	Invert	Avail.Storage	Storage Description
#1	176.00'	15,599 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
176.00	1,202	0	0
178.00	6,482	7,684	7,684
179.00	9,348	7,915	15,599

Device	Routing	Invert	Outlet Devices
#1	Secondary	176.00'	8.270 in/hr Exfiltration over Surface area
#2	Primary	178.50'	100.0' long x 1.00' rise Sharp-Crested Rectangular Weir 2 End Contraction(s) 1.0' Crest Height

Primary OutFlow Max=4.98 cfs @ 12.41 hrs HW=178.56' (Free Discharge)
 ↳ **2=Sharp-Crested Rectangular Weir** (Weir Controls 4.98 cfs @ 0.81 fps)

Secondary OutFlow Max=1.55 cfs @ 12.41 hrs HW=178.56' (Free Discharge)
 ↳ **1=Exfiltration** (Exfiltration Controls 1.55 cfs)

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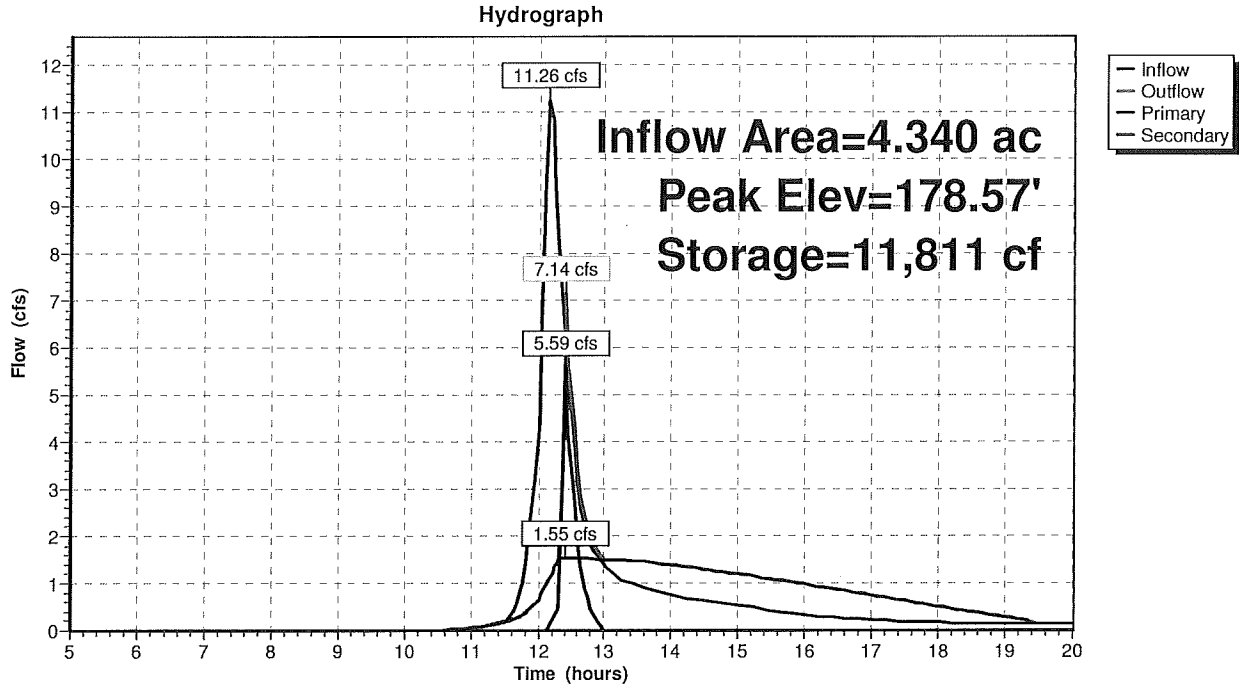
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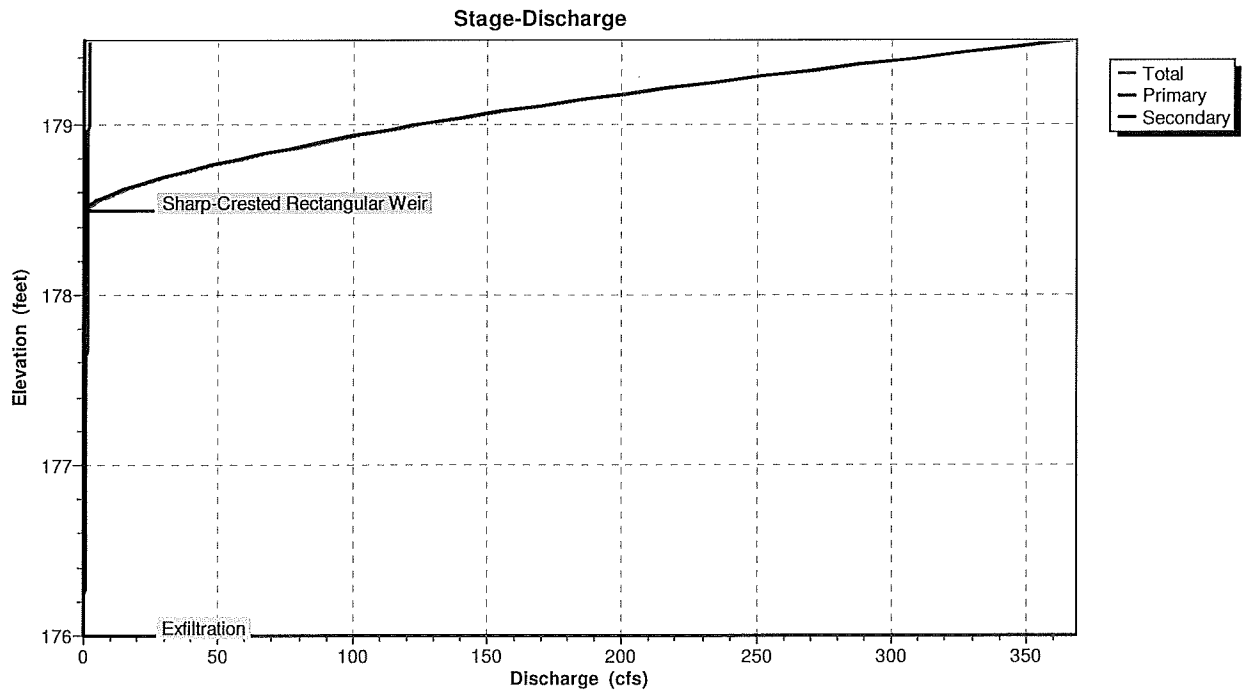
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Pond 10P: Natural Low Area - East



Pond 10P: Natural Low Area - East



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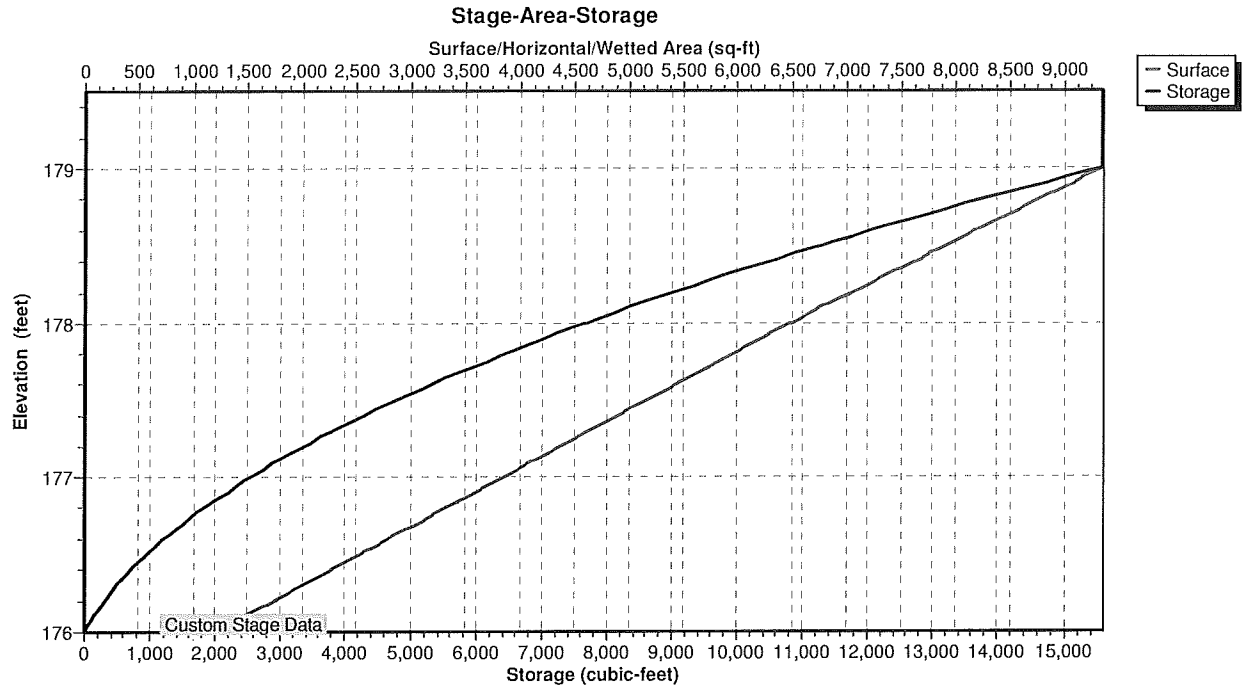
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Pond 10P: Natural Low Area - East



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Hydrograph for Pond 10P: Natural Low Area - East

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Primary (cfs)	Secondary (cfs)
5.00	0.00	0	176.00	0.00	0.00	0.00
5.50	0.00	0	176.00	0.00	0.00	0.00
6.00	0.00	0	176.00	0.00	0.00	0.00
6.50	0.00	0	176.00	0.00	0.00	0.00
7.00	0.00	0	176.00	0.00	0.00	0.00
7.50	0.00	0	176.00	0.00	0.00	0.00
8.00	0.00	0	176.00	0.00	0.00	0.00
8.50	0.00	0	176.00	0.00	0.00	0.00
9.00	0.00	0	176.00	0.00	0.00	0.00
9.50	0.00	0	176.00	0.00	0.00	0.00
10.00	0.00	0	176.00	0.00	0.00	0.00
10.50	0.00	0	176.00	0.00	0.00	0.00
11.00	0.06	9	176.01	0.05	0.00	0.05
11.50	0.20	32	176.03	0.18	0.00	0.18
12.00	4.37	1,960	176.85	0.66	0.00	0.66
12.50	4.63	11,656	178.55	5.00	3.46	1.54
13.00	1.40	11,276	178.50	1.51	0.00	1.51
13.50	0.96	10,594	178.41	1.47	0.00	1.47
14.00	0.76	9,558	178.27	1.39	0.00	1.39
14.50	0.62	8,360	178.10	1.30	0.00	1.30
15.00	0.53	7,148	177.92	1.20	0.00	1.20
15.50	0.43	5,942	177.71	1.10	0.00	1.10
16.00	0.33	4,750	177.50	0.99	0.00	0.99
16.50	0.27	3,611	177.26	0.87	0.00	0.87
17.00	0.22	2,600	177.02	0.75	0.00	0.75
17.50	0.19	1,741	176.78	0.62	0.00	0.62
18.00	0.17	1,047	176.54	0.51	0.00	0.51
18.50	0.15	527	176.32	0.39	0.00	0.39
19.00	0.15	181	176.13	0.30	0.00	0.30
19.50	0.14	25	176.02	0.14	0.00	0.14
20.00	0.13	24	176.02	0.13	0.00	0.13

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Stage-Discharge for Pond 10P: Natural Low Area - East

Elevation (feet)	Discharge (cfs)	Primary (cfs)	Secondary (cfs)	Elevation (feet)	Discharge (cfs)	Primary (cfs)	Secondary (cfs)
176.00	0.00	0.00	0.00	178.65	20.94	19.34	1.60
176.05	0.26	0.00	0.26	178.70	31.58	29.95	1.62
176.10	0.28	0.00	0.28	178.75	43.76	42.10	1.65
176.15	0.31	0.00	0.31	178.80	57.35	55.67	1.68
176.20	0.33	0.00	0.33	178.85	72.27	70.56	1.71
176.25	0.36	0.00	0.36	178.90	88.44	86.70	1.73
176.30	0.38	0.00	0.38	178.95	105.81	104.05	1.76
176.35	0.41	0.00	0.41	179.00	124.35	122.56	1.79
176.40	0.43	0.00	0.43	179.05	143.99	142.20	1.79
176.45	0.46	0.00	0.46	179.10	164.72	162.93	1.79
176.50	0.48	0.00	0.48	179.15	186.54	184.75	1.79
176.55	0.51	0.00	0.51	179.20	209.41	207.62	1.79
176.60	0.53	0.00	0.53	179.25	233.32	231.53	1.79
176.65	0.56	0.00	0.56	179.30	258.26	256.47	1.79
176.70	0.58	0.00	0.58	179.35	284.21	282.42	1.79
176.75	0.61	0.00	0.61	179.40	311.17	309.38	1.79
176.80	0.63	0.00	0.63	179.45	339.12	337.33	1.79
176.85	0.66	0.00	0.66	179.50	368.06	366.27	1.79
176.90	0.68	0.00	0.68				
176.95	0.71	0.00	0.71				
177.00	0.74	0.00	0.74				
177.05	0.76	0.00	0.76				
177.10	0.79	0.00	0.79				
177.15	0.81	0.00	0.81				
177.20	0.84	0.00	0.84				
177.25	0.86	0.00	0.86				
177.30	0.89	0.00	0.89				
177.35	0.91	0.00	0.91				
177.40	0.94	0.00	0.94				
177.45	0.96	0.00	0.96				
177.50	0.99	0.00	0.99				
177.55	1.01	0.00	1.01				
177.60	1.04	0.00	1.04				
177.65	1.06	0.00	1.06				
177.70	1.09	0.00	1.09				
177.75	1.11	0.00	1.11				
177.80	1.14	0.00	1.14				
177.85	1.17	0.00	1.17				
177.90	1.19	0.00	1.19				
177.95	1.22	0.00	1.22				
178.00	1.24	0.00	1.24				
178.05	1.27	0.00	1.27				
178.10	1.30	0.00	1.30				
178.15	1.32	0.00	1.32				
178.20	1.35	0.00	1.35				
178.25	1.38	0.00	1.38				
178.30	1.41	0.00	1.41				
178.35	1.43	0.00	1.43				
178.40	1.46	0.00	1.46				
178.45	1.49	0.00	1.49				
178.50	1.52	0.00	1.52				
178.55	5.22	3.68	1.54				
178.60	12.04	10.47	1.57				

56 Fountain Street- Post development

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Stage-Area-Storage for Pond 10P: Natural Low Area - East

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
176.00	1,202	0	178.65	8,345	12,503
176.05	1,334	63	178.70	8,488	12,924
176.10	1,466	133	178.75	8,632	13,352
176.15	1,598	210	178.80	8,775	13,787
176.20	1,730	293	178.85	8,918	14,229
176.25	1,862	383	178.90	9,061	14,679
176.30	1,994	479	178.95	9,205	15,135
176.35	2,126	582	179.00	9,348	15,599
176.40	2,258	692	179.05	9,348	15,599
176.45	2,390	808	179.10	9,348	15,599
176.50	2,522	931	179.15	9,348	15,599
176.55	2,654	1,060	179.20	9,348	15,599
176.60	2,786	1,196	179.25	9,348	15,599
176.65	2,918	1,339	179.30	9,348	15,599
176.70	3,050	1,488	179.35	9,348	15,599
176.75	3,182	1,644	179.40	9,348	15,599
176.80	3,314	1,806	179.45	9,348	15,599
176.85	3,446	1,975	179.50	9,348	15,599
176.90	3,578	2,151			
176.95	3,710	2,333			
177.00	3,842	2,522			
177.05	3,974	2,717			
177.10	4,106	2,919			
177.15	4,238	3,128			
177.20	4,370	3,343			
177.25	4,502	3,565			
177.30	4,634	3,793			
177.35	4,766	4,028			
177.40	4,898	4,270			
177.45	5,030	4,518			
177.50	5,162	4,773			
177.55	5,294	5,034			
177.60	5,426	5,302			
177.65	5,558	5,577			
177.70	5,690	5,858			
177.75	5,822	6,146			
177.80	5,954	6,440			
177.85	6,086	6,741			
177.90	6,218	7,049			
177.95	6,350	7,363			
178.00	6,482	7,684			
178.05	6,625	8,012			
178.10	6,769	8,347			
178.15	6,912	8,689			
178.20	7,055	9,038			
178.25	7,199	9,394			
178.30	7,342	9,758			
178.35	7,485	10,128			
178.40	7,628	10,506			
178.45	7,772	10,891			
178.50	7,915	11,283			
178.55	8,058	11,683			
178.60	8,202	12,089			

56 Fountain Street- Post development

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Summary for Pond 11P: Natural Low Area - West

Inflow Area = 1.980 ac, 18.94% Impervious, Inflow Depth > 3.12"
Inflow = 8.18 cfs @ 12.10 hrs, Volume= 0.516 af
Outflow = 6.73 cfs @ 12.17 hrs, Volume= 0.514 af, Atten= 18%, Lag= 3.7 min
Primary = 6.38 cfs @ 12.17 hrs, Volume= 0.325 af
Routed to Reach 7R : Driveway Culvert
Secondary = 0.36 cfs @ 12.17 hrs, Volume= 0.189 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 177.90' @ 12.17 hrs Surf.Area= 1,882 sf Storage= 2,600 cf

Plug-Flow detention time= 16.3 min calculated for 0.512 af (99% of inflow)
Center-of-Mass det. time= 14.7 min (804.3 - 789.6)

Volume	Invert	Avail.Storage	Storage Description
#1	176.00'	4,976 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
176.00	862	0	0
178.00	1,938	2,800	2,800
179.00	2,413	2,176	4,976

Device	Routing	Invert	Outlet Devices
#1	Secondary	176.00'	8.210 in/hr Exfiltration over Surface area
#2	Primary	176.50'	18.0" Round Culvert L= 50.0' Ke= 0.600 Inlet / Outlet Invert= 176.50' / 176.00' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf

Primary OutFlow Max=6.26 cfs @ 12.17 hrs HW=177.88' (Free Discharge)

↑**2=Culvert** (Barrel Controls 6.26 cfs @ 4.82 fps)

Secondary OutFlow Max=0.36 cfs @ 12.17 hrs HW=177.88' (Free Discharge)

↑**1=Exfiltration** (Exfiltration Controls 0.36 cfs)

56 Fountain Street- Post development

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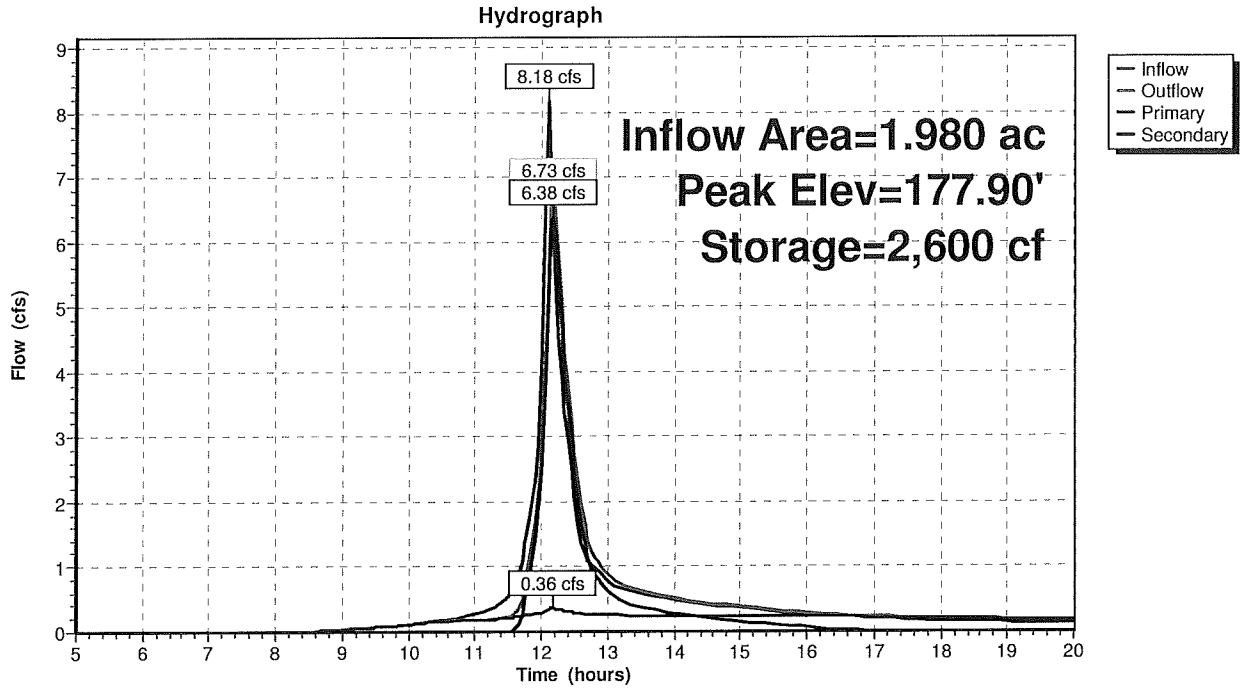
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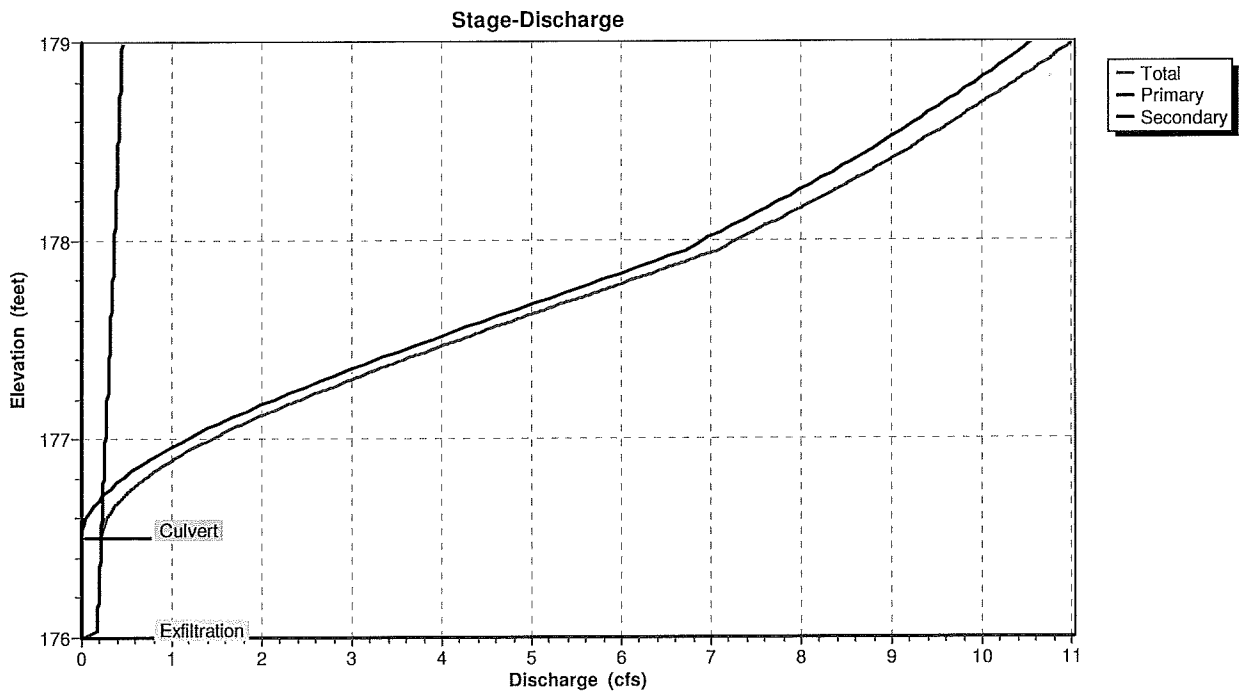
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Pond 11P: Natural Low Area - West



Pond 11P: Natural Low Area - West



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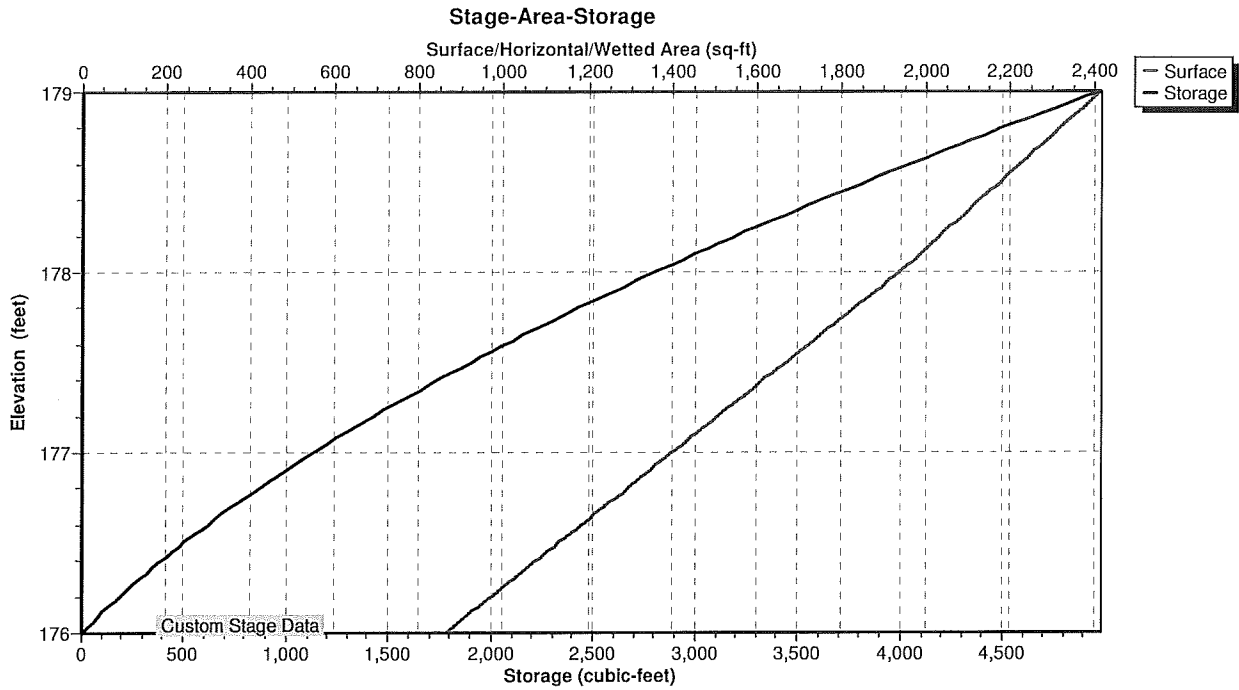
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Pond 11P: Natural Low Area - West



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Hydrograph for Pond 11P: Natural Low Area - West

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Primary (cfs)	Secondary (cfs)
5.00	0.00	0	176.00	0.00	0.00	0.00
5.50	0.00	0	176.00	0.00	0.00	0.00
6.00	0.00	0	176.00	0.00	0.00	0.00
6.50	0.00	0	176.00	0.00	0.00	0.00
7.00	0.00	0	176.00	0.00	0.00	0.00
7.50	0.00	0	176.00	0.00	0.00	0.00
8.00	0.00	0	176.00	0.00	0.00	0.00
8.50	0.01	1	176.00	0.01	0.00	0.01
9.00	0.04	5	176.01	0.03	0.00	0.03
9.50	0.07	10	176.01	0.07	0.00	0.07
10.00	0.11	17	176.02	0.11	0.00	0.11
10.50	0.18	28	176.03	0.17	0.00	0.17
11.00	0.27	123	176.14	0.18	0.00	0.18
11.50	0.52	459	176.47	0.21	0.00	0.21
12.00	4.12	1,522	177.27	2.79	2.49	0.29
12.50	2.09	1,518	177.26	2.77	2.48	0.29
13.00	0.78	945	176.86	0.89	0.64	0.25
13.50	0.59	832	176.78	0.62	0.38	0.24
14.00	0.48	778	176.73	0.51	0.27	0.24
14.50	0.42	736	176.70	0.44	0.20	0.24
15.00	0.37	704	176.67	0.39	0.15	0.23
15.50	0.32	668	176.65	0.34	0.11	0.23
16.00	0.26	627	176.61	0.29	0.06	0.23
16.50	0.23	586	176.58	0.25	0.03	0.22
17.00	0.21	551	176.55	0.23	0.01	0.22
17.50	0.19	505	176.51	0.22	0.00	0.22
18.00	0.16	434	176.44	0.21	0.00	0.21
18.50	0.15	344	176.36	0.20	0.00	0.20
19.00	0.14	256	176.27	0.19	0.00	0.19
19.50	0.14	171	176.19	0.18	0.00	0.18
20.00	0.13	89	176.10	0.17	0.00	0.17

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Stage-Discharge for Pond 11P: Natural Low Area - West

Elevation (feet)	Discharge (cfs)	Primary (cfs)	Secondary (cfs)	Elevation (feet)	Discharge (cfs)	Primary (cfs)	Secondary (cfs)
176.00	0.00	0.00	0.00	178.65	9.87	9.44	0.43
176.05	0.17	0.00	0.17	178.70	10.04	9.61	0.43
176.10	0.17	0.00	0.17	178.75	10.21	9.77	0.44
176.15	0.18	0.00	0.18	178.80	10.37	9.93	0.44
176.20	0.18	0.00	0.18	178.85	10.54	10.09	0.45
176.25	0.19	0.00	0.19	178.90	10.70	10.25	0.45
176.30	0.19	0.00	0.19	178.95	10.85	10.40	0.45
176.35	0.20	0.00	0.20	179.00	11.01	10.55	0.46
176.40	0.20	0.00	0.20				
176.45	0.21	0.00	0.21				
176.50	0.21	0.00	0.21				
176.55	0.23	0.01	0.22				
176.60	0.27	0.05	0.23				
176.65	0.34	0.11	0.23				
176.70	0.44	0.20	0.24				
176.75	0.55	0.31	0.24				
176.80	0.69	0.44	0.25				
176.85	0.84	0.59	0.25				
176.90	1.02	0.76	0.26				
176.95	1.22	0.95	0.26				
177.00	1.43	1.16	0.27				
177.05	1.66	1.39	0.27				
177.10	1.91	1.63	0.28				
177.15	2.16	1.88	0.28				
177.20	2.43	2.14	0.29				
177.25	2.70	2.41	0.29				
177.30	2.98	2.69	0.30				
177.35	3.27	2.97	0.30				
177.40	3.57	3.27	0.31				
177.45	3.88	3.57	0.31				
177.50	4.19	3.87	0.32				
177.55	4.51	4.18	0.32				
177.60	4.83	4.50	0.33				
177.65	5.15	4.82	0.33				
177.70	5.47	5.13	0.34				
177.75	5.80	5.45	0.34				
177.80	6.12	5.77	0.35				
177.85	6.44	6.09	0.35				
177.90	6.76	6.41	0.36				
177.95	7.08	6.72	0.36				
178.00	7.28	6.91	0.37				
178.05	7.51	7.13	0.37				
178.10	7.73	7.35	0.38				
178.15	7.95	7.57	0.38				
178.20	8.16	7.77	0.39				
178.25	8.37	7.98	0.39				
178.30	8.57	8.17	0.40				
178.35	8.77	8.37	0.40				
178.40	8.96	8.55	0.40				
178.45	9.15	8.74	0.41				
178.50	9.33	8.92	0.41				
178.55	9.51	9.10	0.42				
178.60	9.69	9.27	0.42				

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Stage-Area-Storage for Pond 11P: Natural Low Area - West

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
176.00	862	0	178.65	2,247	4,160
176.05	889	44	178.70	2,270	4,273
176.10	916	89	178.75	2,294	4,387
176.15	943	135	178.80	2,318	4,502
176.20	970	183	178.85	2,342	4,619
176.25	997	232	178.90	2,366	4,737
176.30	1,023	283	178.95	2,389	4,855
176.35	1,050	335	179.00	2,413	4,976
176.40	1,077	388			
176.45	1,104	442			
176.50	1,131	498			
176.55	1,158	555			
176.60	1,185	614			
176.65	1,212	674			
176.70	1,239	735			
176.75	1,266	798			
176.80	1,292	862			
176.85	1,319	927			
176.90	1,346	994			
176.95	1,373	1,062			
177.00	1,400	1,131			
177.05	1,427	1,202			
177.10	1,454	1,274			
177.15	1,481	1,347			
177.20	1,508	1,422			
177.25	1,535	1,498			
177.30	1,561	1,575			
177.35	1,588	1,654			
177.40	1,615	1,734			
177.45	1,642	1,815			
177.50	1,669	1,898			
177.55	1,696	1,982			
177.60	1,723	2,068			
177.65	1,750	2,155			
177.70	1,777	2,243			
177.75	1,804	2,332			
177.80	1,830	2,423			
177.85	1,857	2,515			
177.90	1,884	2,609			
177.95	1,911	2,704			
178.00	1,938	2,800			
178.05	1,962	2,897			
178.10	1,985	2,996			
178.15	2,009	3,096			
178.20	2,033	3,197			
178.25	2,057	3,299			
178.30	2,081	3,403			
178.35	2,104	3,507			
178.40	2,128	3,613			
178.45	2,152	3,720			
178.50	2,176	3,828			
178.55	2,199	3,938			
178.60	2,223	4,048			

56 Fountain Street- Post development

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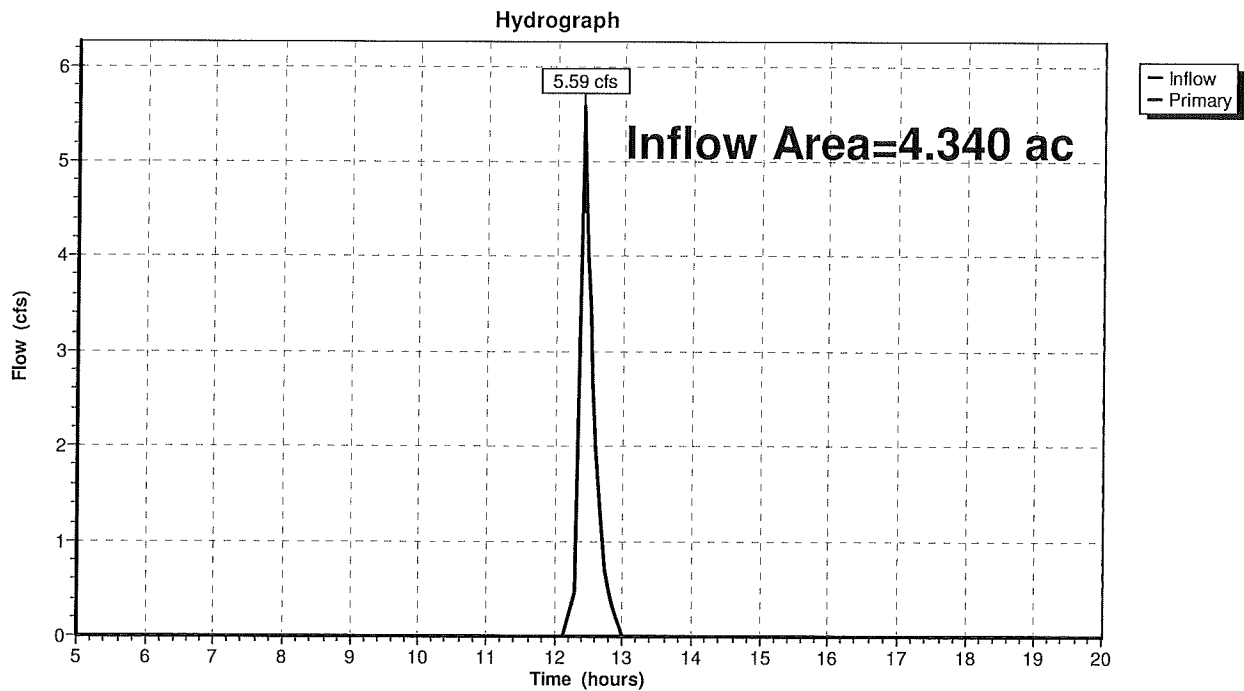
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Summary for Link DP: Design Point

Inflow Area = 4.340 ac, 12.33% Impervious, Inflow Depth = 0.26"
Inflow = 5.59 cfs @ 12.41 hrs, Volume= 0.095 af
Primary = 5.59 cfs @ 12.41 hrs, Volume= 0.095 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Link DP: Design Point



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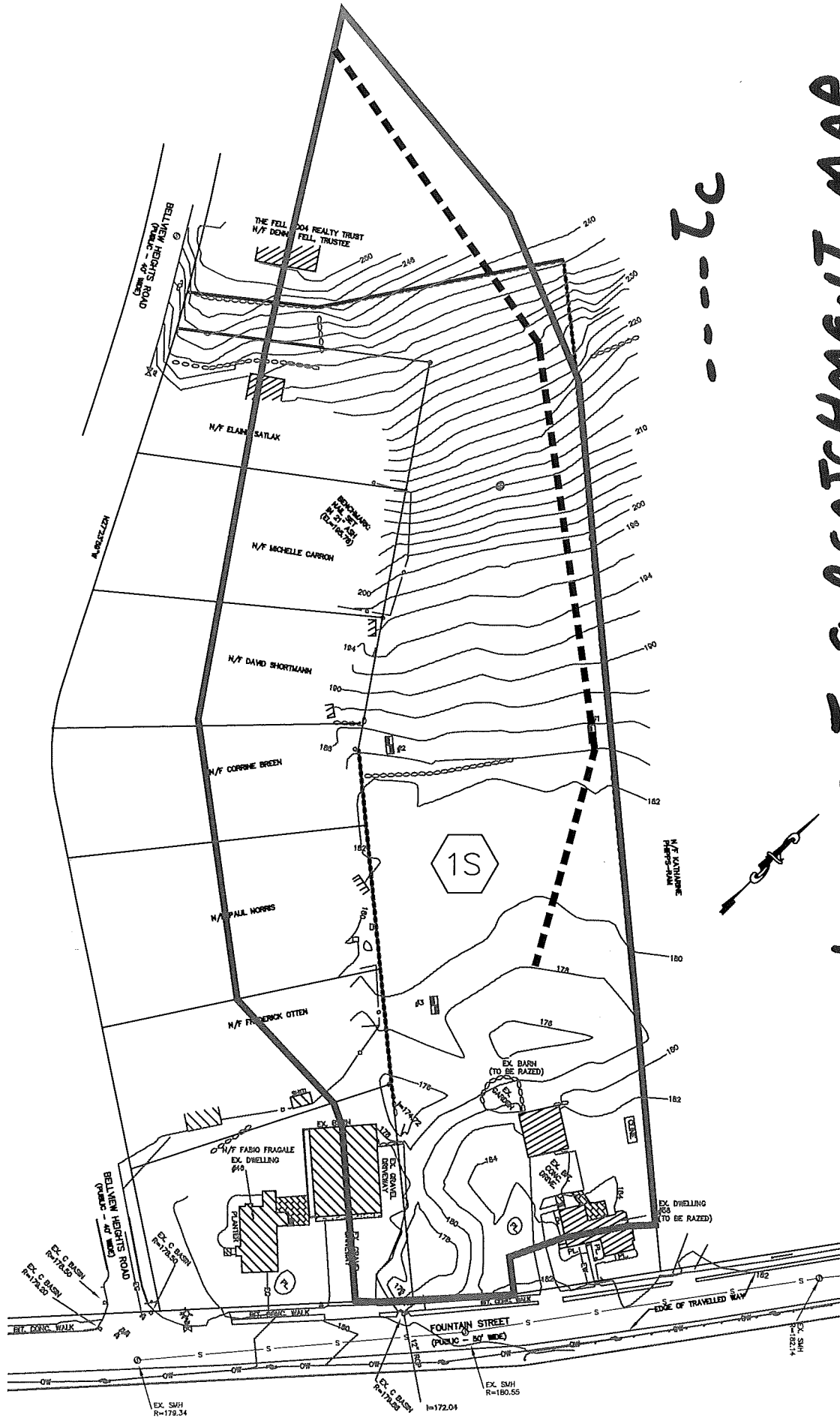
100 Year Storm
Type III 24-hr Rainfall=6.70"

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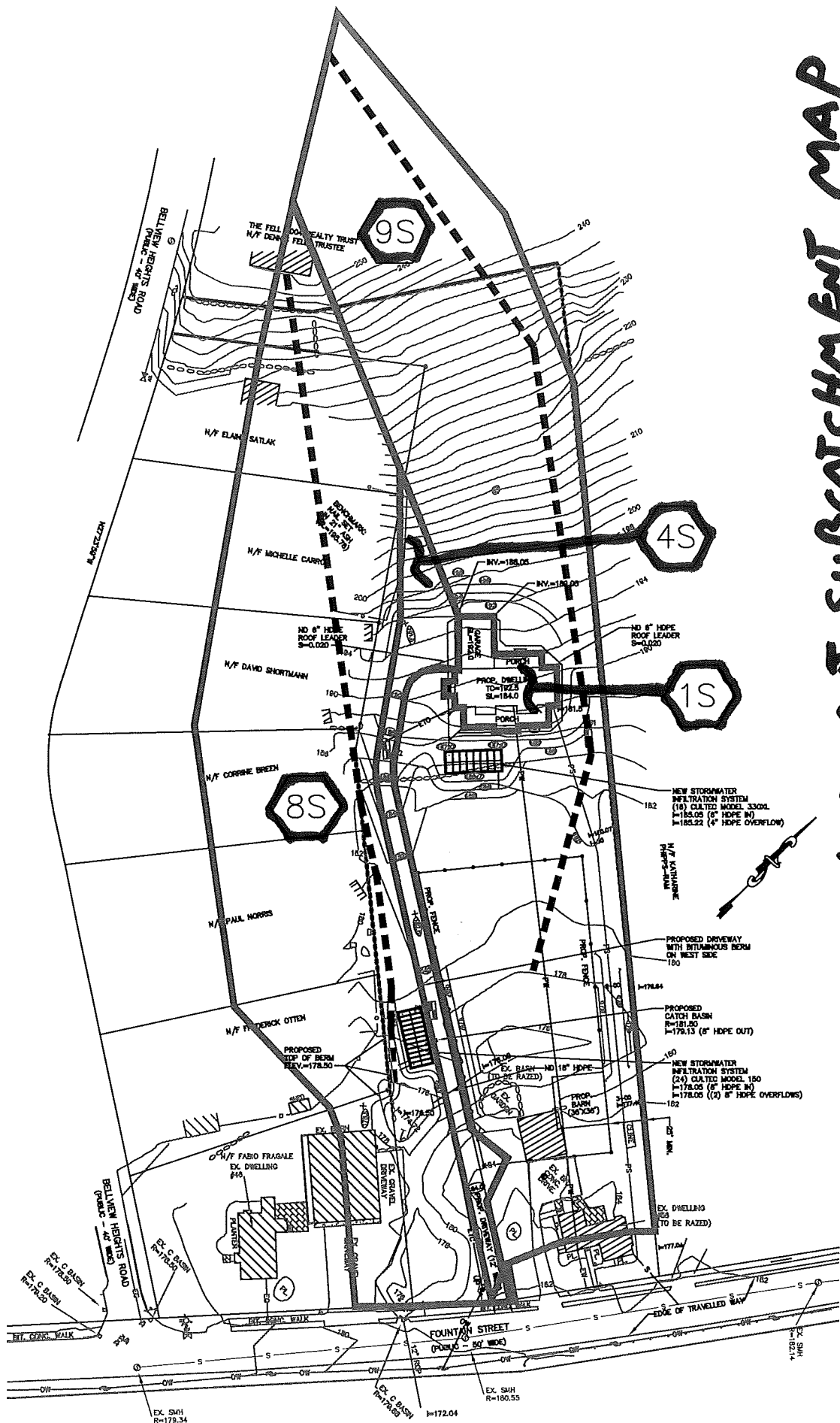
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Hydrograph for Link DP: Design Point

Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)	Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
5.00	0.00	0.00	0.00	18.25	0.00	0.00	0.00
5.25	0.00	0.00	0.00	18.50	0.00	0.00	0.00
5.50	0.00	0.00	0.00	18.75	0.00	0.00	0.00
5.75	0.00	0.00	0.00	19.00	0.00	0.00	0.00
6.00	0.00	0.00	0.00	19.25	0.00	0.00	0.00
6.25	0.00	0.00	0.00	19.50	0.00	0.00	0.00
6.50	0.00	0.00	0.00	19.75	0.00	0.00	0.00
6.75	0.00	0.00	0.00	20.00	0.00	0.00	0.00
7.00	0.00	0.00	0.00				
7.25	0.00	0.00	0.00				
7.50	0.00	0.00	0.00				
7.75	0.00	0.00	0.00				
8.00	0.00	0.00	0.00				
8.25	0.00	0.00	0.00				
8.50	0.00	0.00	0.00				
8.75	0.00	0.00	0.00				
9.00	0.00	0.00	0.00				
9.25	0.00	0.00	0.00				
9.50	0.00	0.00	0.00				
9.75	0.00	0.00	0.00				
10.00	0.00	0.00	0.00				
10.25	0.00	0.00	0.00				
10.50	0.00	0.00	0.00				
10.75	0.00	0.00	0.00				
11.00	0.00	0.00	0.00				
11.25	0.00	0.00	0.00				
11.50	0.00	0.00	0.00				
11.75	0.00	0.00	0.00				
12.00	0.00	0.00	0.00				
12.25	0.00	0.00	0.00				
12.50	3.46	0.00	3.46				
12.75	0.69	0.00	0.69				
13.00	0.00	0.00	0.00				
13.25	0.00	0.00	0.00				
13.50	0.00	0.00	0.00				
13.75	0.00	0.00	0.00				
14.00	0.00	0.00	0.00				
14.25	0.00	0.00	0.00				
14.50	0.00	0.00	0.00				
14.75	0.00	0.00	0.00				
15.00	0.00	0.00	0.00				
15.25	0.00	0.00	0.00				
15.50	0.00	0.00	0.00				
15.75	0.00	0.00	0.00				
16.00	0.00	0.00	0.00				
16.25	0.00	0.00	0.00				
16.50	0.00	0.00	0.00				
16.75	0.00	0.00	0.00				
17.00	0.00	0.00	0.00				
17.25	0.00	0.00	0.00				
17.50	0.00	0.00	0.00				
17.75	0.00	0.00	0.00				
18.00	0.00	0.00	0.00				



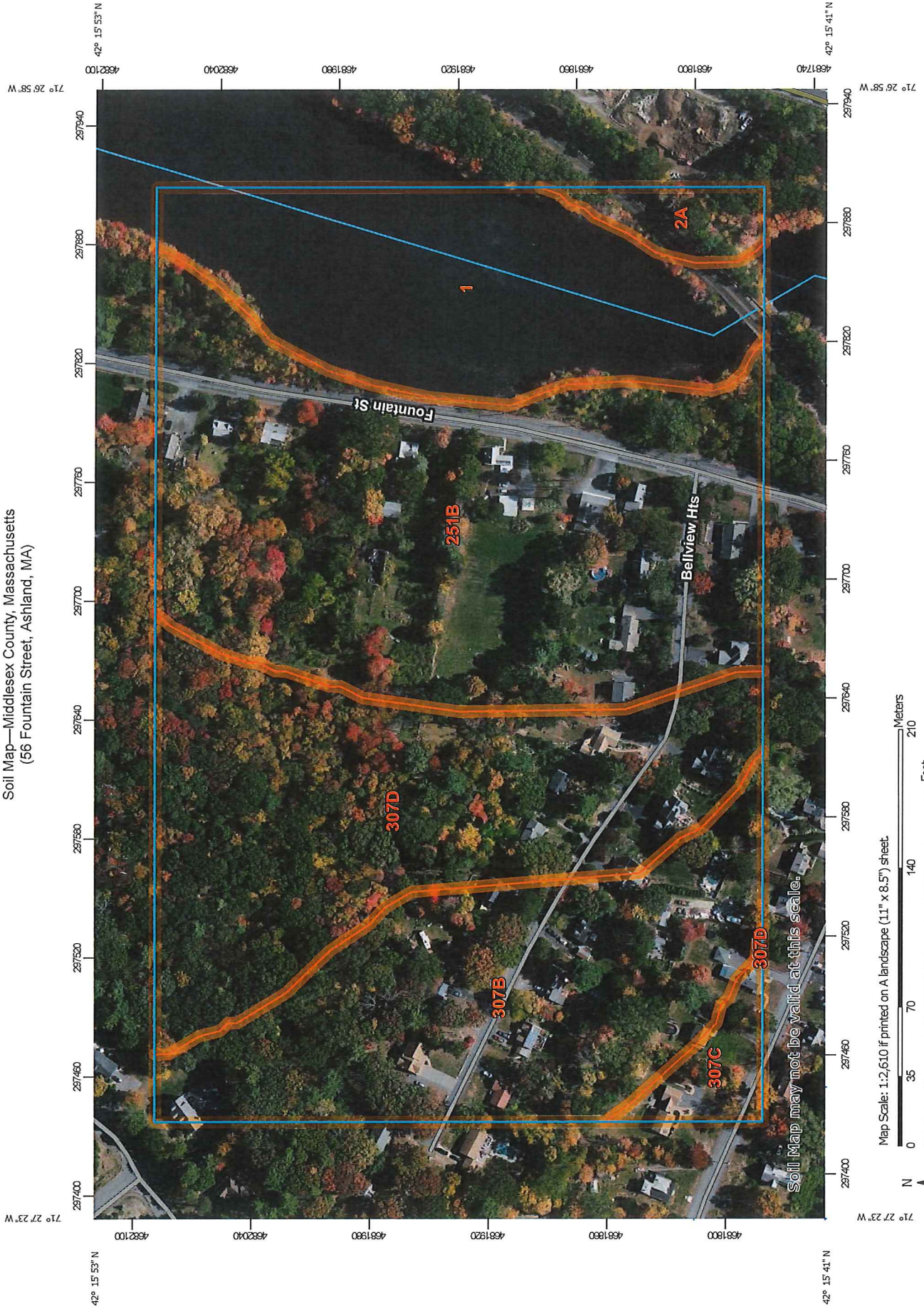
PRE DEVELOPMENT SUBCATCHMENT MAP
 SCALE: 1" = 100'







POST DEVELOPMENT SUBCATCHMENT MAP

SCALE: 1" = 100'

Soil Map—Middlesex County, Massachusetts
(56 Fountain Street, Ashland, MA)



MAP LEGEND

- Area of Interest (AOI)
 - Area of Interest (AOI) 
- Soils
 - Soil Map Unit Polygons 
 - Soil Map Unit Lines 
 - Soil Map Unit Points 
- Special Point Features
 - Blowout 
 - Borrow Pit 
 - Clay Spot 
 - Closed Depression 
 - Gravel Pit 
 - Gravelly Spot 
 - Landfill 
 - Lava Flow 
 - Marsh or swamp 
 - Mine or Quarry 
 - Miscellaneous Water 
 - Perennial Water 
 - Rock Outcrop 
 - Saline Spot 
 - Sandy Spot 
 - Severely Eroded Spot 
 - Sinkhole 
 - Slide or Slip 
 - Sodic Spot 
- Water Features
 - Streams and Canals 
- Transportation
 - Rails 
 - Interstate Highways 
 - US Routes 
 - Major Roads 
 - Local Roads 
- Background
 - Aerial Photography 
- Soil Area
 - Stony Spot 
 - Very Stony Spot 
 - Wet Spot 
 - Other 
 - Special Line Features 

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:25,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Middlesex County, Massachusetts
Survey Area Data: Version 20, Jun 9, 2020

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Aug 31, 2020—Oct 22, 2020

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
1	Water	6.2	17.1%
2A	Pootatuck fine sandy loam, 0 to 3 percent slopes	0.7	2.0%
251B	Haven silt loam, 3 to 8 percent slopes	12.4	34.5%
307B	Paxton fine sandy loam, 0 to 8 percent slopes, extremely stony	7.3	20.3%
307C	Paxton fine sandy loam, 8 to 15 percent slopes, extremely stony	0.7	2.1%
307D	Paxton fine sandy loam, 15 to 25 percent slopes, extremely stony	8.7	24.1%
Totals for Area of Interest		36.0	100.0%

**LONG TERM
STORMWATER MANAGEMENT SYSTEM
INSPECTION AND MAINTENANCE PLAN**

56 Fountain Street
Ashland, Massachusetts

Prepared for:

Mr. Fabio Fragale
56 Fountain Street
Ashland, MA 01721

Date: September 7, 2021

The proposed 56 Fountain Street site has been designed to function properly provided that routine maintenance is performed. Maintenance of the catch basin, culvert and subsurface infiltration systems are required to ensure that sedimentation and pollution is controlled and storm water retention capacity is sustained. To ensure the proper functioning of these facilities the following maintenance practices will be used:

Owner and Party Responsible for Maintenance:

Mr. Fabio Fragale
56 Fountain Street
Ashland, MA 01721

The owner shall develop a chart with a list of the following Best Management Practices (BMP's) with the chart listing the maintenance requirement, frequency of maintenance and the date the maintenance was performed.

The owner shall allow the Planning Board or its designee to enter the property at reasonable times and in a reasonable manner for the purpose of inspection.

Owner Signature

Date

INSPECTION AND MAINTENANCE (POST-CONSTRUCTION)

- A. It shall be the responsibility of the Owner to ensure that the long-term inspection and maintenance of the stormwater management system on-site is performed. The on-site system shall include the following individual components of the stormwater management system: catch basin, culvert and subsurface infiltration systems as shown on the approved plans. The Owner shall obtain the services of a qualified Contractor to perform the required inspections and maintenance of the individual components of the stormwater management system on-site, as listed above. All inspections and maintenance of the components of the stormwater management system.
- B. It shall be the responsibility of the Owner to maintain adequate records to demonstrate conformance with this inspection and maintenance plan.
- C. The inspection and maintenance plan for the on-site stormwater management system (as listed in Section A above) shall be carried out by the current owner (project applicant) and by any and all future owners of the site in perpetuity.
- D. The inspection and maintenance plan shall be carried out as outlined below upon completion and final stabilization of the project site:
- E. During the first six months of operation of the facility the stormwater management system shall be inspected a minimum of once per month and after every rainstorm (defined in Part 1 above). A portion of this time period must be in the growing season. As warranted by these inspections maintenance of the system shall be performed including, but not limited to the following:
 1. Visual inspection of the catch basin, culvert and subsurface infiltration system access ports to ensure that the system is not backed up and is emptying properly.
- F. After the six month time period above has elapsed, thorough investigations shall be conducted four times a year. Maintenance requirements may be adjusted based upon the results obtained from the first year of operation. As warranted by these inspections maintenance of the system shall be performed including, but not limited to the following:
 1. The catch basin, culvert and subsurface infiltration systems requires an annual inspection for necessary maintenance (refer to attached plan). This consists of visually inspecting for the accumulation of sediment; obstructions within the catch basin, culvert and subsurface infiltration system access ports. Remove sediments from the structures as necessary. Sediment, which is removed, shall be legally disposed of. The catch basin, culvert and subsurface infiltration systems shall be monitored at several intervals during and after a small and large rainfall event to ensure the basin is functional.

- G. On and off-site material storage areas including all construction and waste materials shall be properly protected and managed. The contractor shall implement practices to minimize sources of pollution and reduce the possibility of accidental safety hazards.
1. The contractor shall conduct daily inspections of vehicles brought to the site.
 2. Daily inspection of excavations for the collection of water.
 3. Regular maintenance of site vehicles.
 4. Proper handling and storage of construction materials and fuels.
 5. All waste materials will be collected and stored in containers. No waste material will be buried on site.
 6. All excess materials will not be discharged to the storm or sewer systems.
 7. All construction activities will comply with federal, state and municipal rules and regulations.
 8. All maintenance personnel must be made aware of work related safety precautions and regulations.

MAINTENANCE LOGS

Maintain a log of all operation and maintenance activities including without limitation inspections, repairs, replacement and disposal (for disposal, the log shall indicate the type of material and disposal location). A copy of the yearly maintenance logs shall be made accessible to the following agencies:

Conservation Commission
101 Main Street
Ashland, MA 01721

Department of Environmental Protection
Northeast Regional Office
205B Lowell Street
Wilmington, MA 01887

CATCH BASIN INSPECTION FORM

Mr. Fabio Fragale
56 Fountain Street
Ashland, MA 01721

Owner: _____

Property Manager: _____

Inspected By: _____

Date of Inspection: _____

Catch Basin Inspected:

Acceptable Needs Work

Add notes below if structures need work:

Date of cleaning: _____

By Whom: _____

Date of repair: _____

By Whom: _____

Below note any further actions that need to be taken as necessary:

CULVERT INSPECTION FORM

Mr. Fabio Fragale
56 Fountain Street
Ashland, MA 01721

Owner: _____

Property Manager: _____

Inspected By: _____

Date of Inspection: _____

Driveway Culvert Inspected:

Acceptable Needs Work

Add notes below if structures need work:

Date of cleaning: _____

By Whom: _____

Date of repair: _____

By Whom: _____

Below note any further actions that need to be taken as necessary:

SUBSURFACE INFILTRATION SYSTEM INSPECTION FORM

Mr. Fabio Fragale
56 Fountain Street
Ashland, MA 01721

Owner: _____

Property Manager: _____

Inspected By: _____

Date of Inspection: _____

Subsurface Infiltration System Inspected (Describe location):

Acceptable Needs Work

Add notes below if structure needs work:

Date of cleaning: _____

By Whom: _____

Date of repair: _____

By Whom: _____

Below note any further actions that need to be taken as necessary: