

Studebaker Residence PICP

Prepared by North Shore Engineering, Inc.

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Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.017	74	>75% Grass cover, Good, HSG C (S-2)
0.022	98	PICP Paver parking, HSG C (S-1)
0.003	98	Paver Walk, HSG C (S-2)

Stuebaker Residence PICP

MSE 24-hr 3 2-YR Rainfall=2.66"

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Time span=0.00-96.00 hrs, dt=0.05 hrs, 1921 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 S-1: PICP Driveway

Runoff Area=947 sf 100.00% Impervious Runoff Depth=2.43"
Tc=0.0 min CN=98 Runoff=0.09 cfs 0.004 af

Subcatchment S-2: Lawn & Landscape

Runoff Area=888 sf 15.20% Impervious Runoff Depth=0.89"
Tc=6.0 min CN=78 Runoff=0.03 cfs 0.002 af

Pond PICP: 947 s.f. PCIP w/ 4" U.D.

Peak Elev=100.76' Storage=187 cf Inflow=0.11 cfs 0.006 af
Primary=0.00 cfs 0.006 af Secondary=0.00 cfs 0.000 af Outflow=0.00 cfs 0.006 af

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MSE 24-hr 3 2-YR Rainfall=2.66"

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Summary for Subcatchment S-1: PICP Driveway

Runoff = 0.09 cfs @ 12.04 hrs, Volume= 0.004 af, Depth= 2.43"

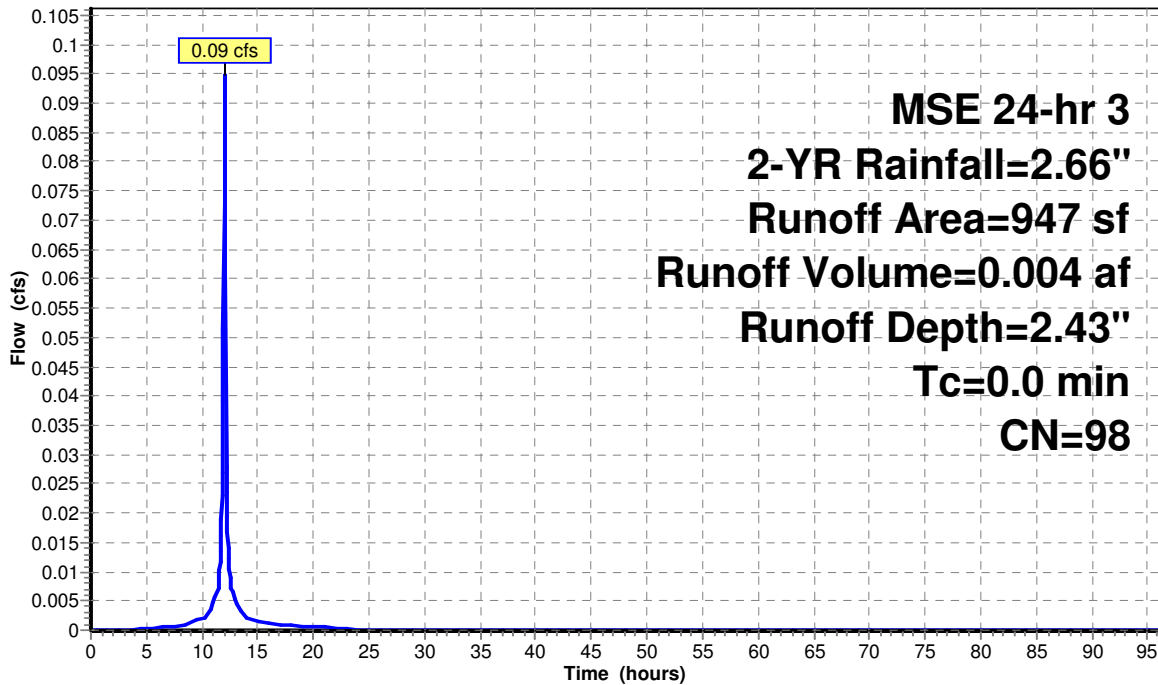
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-YR Rainfall=2.66"

Area (sf)	CN	Description
* 947	98	PICP Paver parking, HSG C
947		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.0					Direct Entry, Area onto PICP

Subcatchment S-1: PICP Driveway

Hydrograph



Runoff

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MSE 24-hr 3 2-YR Rainfall=2.66"

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Hydrograph for Subcatchment S-1: PICP Driveway

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	52.00	2.66	2.43	0.00
1.00	0.01	0.00	0.00	53.00	2.66	2.43	0.00
2.00	0.02	0.00	0.00	54.00	2.66	2.43	0.00
3.00	0.04	0.00	0.00	55.00	2.66	2.43	0.00
4.00	0.07	0.00	0.00	56.00	2.66	2.43	0.00
5.00	0.10	0.01	0.00	57.00	2.66	2.43	0.00
6.00	0.14	0.03	0.00	58.00	2.66	2.43	0.00
7.00	0.18	0.05	0.00	59.00	2.66	2.43	0.00
8.00	0.22	0.09	0.00	60.00	2.66	2.43	0.00
9.00	0.27	0.12	0.00	61.00	2.66	2.43	0.00
10.00	0.37	0.20	0.00	62.00	2.66	2.43	0.00
11.00	0.51	0.33	0.00	63.00	2.66	2.43	0.00
12.00	1.23	1.02	0.07	64.00	2.66	2.43	0.00
13.00	2.15	1.92	0.01	65.00	2.66	2.43	0.00
14.00	2.29	2.07	0.00	66.00	2.66	2.43	0.00
15.00	2.39	2.16	0.00	67.00	2.66	2.43	0.00
16.00	2.44	2.21	0.00	68.00	2.66	2.43	0.00
17.00	2.48	2.25	0.00	69.00	2.66	2.43	0.00
18.00	2.52	2.30	0.00	70.00	2.66	2.43	0.00
19.00	2.56	2.33	0.00	71.00	2.66	2.43	0.00
20.00	2.59	2.36	0.00	72.00	2.66	2.43	0.00
21.00	2.62	2.39	0.00	73.00	2.66	2.43	0.00
22.00	2.64	2.41	0.00	74.00	2.66	2.43	0.00
23.00	2.65	2.42	0.00	75.00	2.66	2.43	0.00
24.00	2.66	2.43	0.00	76.00	2.66	2.43	0.00
25.00	2.66	2.43	0.00	77.00	2.66	2.43	0.00
26.00	2.66	2.43	0.00	78.00	2.66	2.43	0.00
27.00	2.66	2.43	0.00	79.00	2.66	2.43	0.00
28.00	2.66	2.43	0.00	80.00	2.66	2.43	0.00
29.00	2.66	2.43	0.00	81.00	2.66	2.43	0.00
30.00	2.66	2.43	0.00	82.00	2.66	2.43	0.00
31.00	2.66	2.43	0.00	83.00	2.66	2.43	0.00
32.00	2.66	2.43	0.00	84.00	2.66	2.43	0.00
33.00	2.66	2.43	0.00	85.00	2.66	2.43	0.00
34.00	2.66	2.43	0.00	86.00	2.66	2.43	0.00
35.00	2.66	2.43	0.00	87.00	2.66	2.43	0.00
36.00	2.66	2.43	0.00	88.00	2.66	2.43	0.00
37.00	2.66	2.43	0.00	89.00	2.66	2.43	0.00
38.00	2.66	2.43	0.00	90.00	2.66	2.43	0.00
39.00	2.66	2.43	0.00	91.00	2.66	2.43	0.00
40.00	2.66	2.43	0.00	92.00	2.66	2.43	0.00
41.00	2.66	2.43	0.00	93.00	2.66	2.43	0.00
42.00	2.66	2.43	0.00	94.00	2.66	2.43	0.00
43.00	2.66	2.43	0.00	95.00	2.66	2.43	0.00
44.00	2.66	2.43	0.00	96.00	2.66	2.43	0.00
45.00	2.66	2.43	0.00				
46.00	2.66	2.43	0.00				
47.00	2.66	2.43	0.00				
48.00	2.66	2.43	0.00				
49.00	2.66	2.43	0.00				
50.00	2.66	2.43	0.00				
51.00	2.66	2.43	0.00				

Summary for Subcatchment S-2: Lawn & Landscape

Runoff = 0.03 cfs @ 12.14 hrs, Volume= 0.002 af, Depth= 0.89"

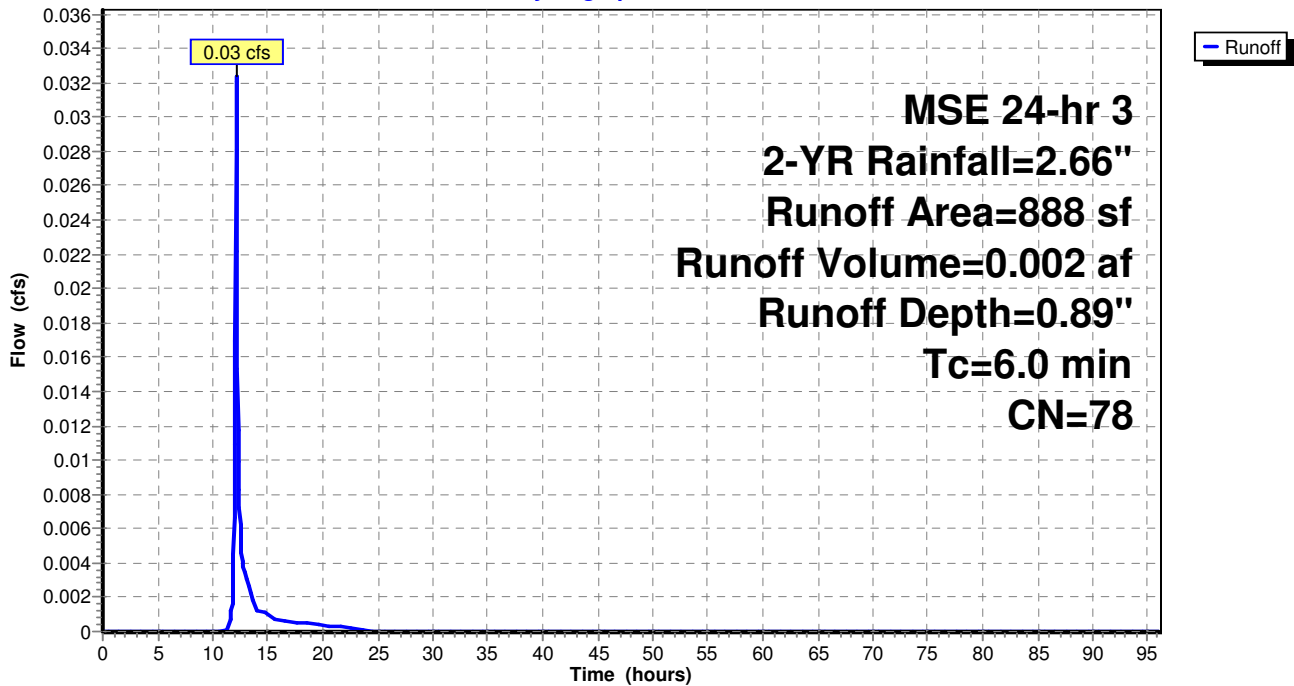
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 MSE 24-hr 3 2-YR Rainfall=2.66"

Area (sf)	CN	Description
753	74	>75% Grass cover, Good, HSG C
* 135	98	Paver Walk, HSG C
888	78	Weighted Average
753		84.80% Pervious Area
135		15.20% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry, Lawn and Landscape Area

Subcatchment S-2: Lawn & Landscape

Hydrograph



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MSE 24-hr 3 2-YR Rainfall=2.66"

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Hydrograph for Subcatchment S-2: Lawn & Landscape

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	52.00	2.66	0.89	0.00
1.00	0.01	0.00	0.00	53.00	2.66	0.89	0.00
2.00	0.02	0.00	0.00	54.00	2.66	0.89	0.00
3.00	0.04	0.00	0.00	55.00	2.66	0.89	0.00
4.00	0.07	0.00	0.00	56.00	2.66	0.89	0.00
5.00	0.10	0.00	0.00	57.00	2.66	0.89	0.00
6.00	0.14	0.00	0.00	58.00	2.66	0.89	0.00
7.00	0.18	0.00	0.00	59.00	2.66	0.89	0.00
8.00	0.22	0.00	0.00	60.00	2.66	0.89	0.00
9.00	0.27	0.00	0.00	61.00	2.66	0.89	0.00
10.00	0.37	0.00	0.00	62.00	2.66	0.89	0.00
11.00	0.51	0.00	0.00	63.00	2.66	0.89	0.00
12.00	1.23	0.13	0.01	64.00	2.66	0.89	0.00
13.00	2.15	0.57	0.00	65.00	2.66	0.89	0.00
14.00	2.29	0.66	0.00	66.00	2.66	0.89	0.00
15.00	2.39	0.71	0.00	67.00	2.66	0.89	0.00
16.00	2.44	0.75	0.00	68.00	2.66	0.89	0.00
17.00	2.48	0.78	0.00	69.00	2.66	0.89	0.00
18.00	2.52	0.80	0.00	70.00	2.66	0.89	0.00
19.00	2.56	0.83	0.00	71.00	2.66	0.89	0.00
20.00	2.59	0.85	0.00	72.00	2.66	0.89	0.00
21.00	2.62	0.86	0.00	73.00	2.66	0.89	0.00
22.00	2.64	0.88	0.00	74.00	2.66	0.89	0.00
23.00	2.65	0.89	0.00	75.00	2.66	0.89	0.00
24.00	2.66	0.89	0.00	76.00	2.66	0.89	0.00
25.00	2.66	0.89	0.00	77.00	2.66	0.89	0.00
26.00	2.66	0.89	0.00	78.00	2.66	0.89	0.00
27.00	2.66	0.89	0.00	79.00	2.66	0.89	0.00
28.00	2.66	0.89	0.00	80.00	2.66	0.89	0.00
29.00	2.66	0.89	0.00	81.00	2.66	0.89	0.00
30.00	2.66	0.89	0.00	82.00	2.66	0.89	0.00
31.00	2.66	0.89	0.00	83.00	2.66	0.89	0.00
32.00	2.66	0.89	0.00	84.00	2.66	0.89	0.00
33.00	2.66	0.89	0.00	85.00	2.66	0.89	0.00
34.00	2.66	0.89	0.00	86.00	2.66	0.89	0.00
35.00	2.66	0.89	0.00	87.00	2.66	0.89	0.00
36.00	2.66	0.89	0.00	88.00	2.66	0.89	0.00
37.00	2.66	0.89	0.00	89.00	2.66	0.89	0.00
38.00	2.66	0.89	0.00	90.00	2.66	0.89	0.00
39.00	2.66	0.89	0.00	91.00	2.66	0.89	0.00
40.00	2.66	0.89	0.00	92.00	2.66	0.89	0.00
41.00	2.66	0.89	0.00	93.00	2.66	0.89	0.00
42.00	2.66	0.89	0.00	94.00	2.66	0.89	0.00
43.00	2.66	0.89	0.00	95.00	2.66	0.89	0.00
44.00	2.66	0.89	0.00	96.00	2.66	0.89	0.00
45.00	2.66	0.89	0.00				
46.00	2.66	0.89	0.00				
47.00	2.66	0.89	0.00				
48.00	2.66	0.89	0.00				
49.00	2.66	0.89	0.00				
50.00	2.66	0.89	0.00				
51.00	2.66	0.89	0.00				

Studebaker Residence PICP

MSE 24-hr 3 2-YR Rainfall=2.66"

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Summary for Pond PICP: 947 s.f. PCIP w/ 4" U.D.

Inflow Area = 0.042 ac, 58.96% Impervious, Inflow Depth = 1.69" for 2-YR event
 Inflow = 0.11 cfs @ 12.05 hrs, Volume= 0.006 af
 Outflow = 0.00 cfs @ 10.60 hrs, Volume= 0.006 af, Atten= 99%, Lag= 0.0 min
 Primary = 0.00 cfs @ 10.60 hrs, Volume= 0.006 af
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Peak Elev= 100.76' @ 16.98 hrs Surf.Area= 947 sf Storage= 187 cf
 Flood Elev= 102.60' Surf.Area= 947 sf Storage= 639 cf

Plug-Flow detention time= 1,124.1 min calculated for 0.006 af (100% of inflow)
 Center-of-Mass det. time= 1,124.6 min (1,893.9 - 769.3)

Volume	Invert	Avail.Storage	Storage Description
#1	100.10'	639 cf	Custom Stage Data (Prismatic) Listed below (Recalc) 2,131 cf Overall x 30.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
100.10	947	0	0
102.35	947	2,131	2,131

Device	Routing	Invert	Outlet Devices
#1	Primary	100.10'	0.070 in/hr Exfiltration over Surface area Phase-In= 0.01'
#2	Secondary	101.00'	Tube/ Perforated UD Discharges@100.95' 4.000" Diameter, C= 0.600 50.0' Long Tube, Hazen-Williams C= 140

Primary OutFlow Max=0.00 cfs @ 10.60 hrs HW=100.13' (Free Discharge)
 ↑1=Exfiltration (Exfiltration Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=100.10' (Free Discharge)
 ↑2=Tube/ Perforated UD (Controls 0.00 cfs)

Studebaker Residence PICP

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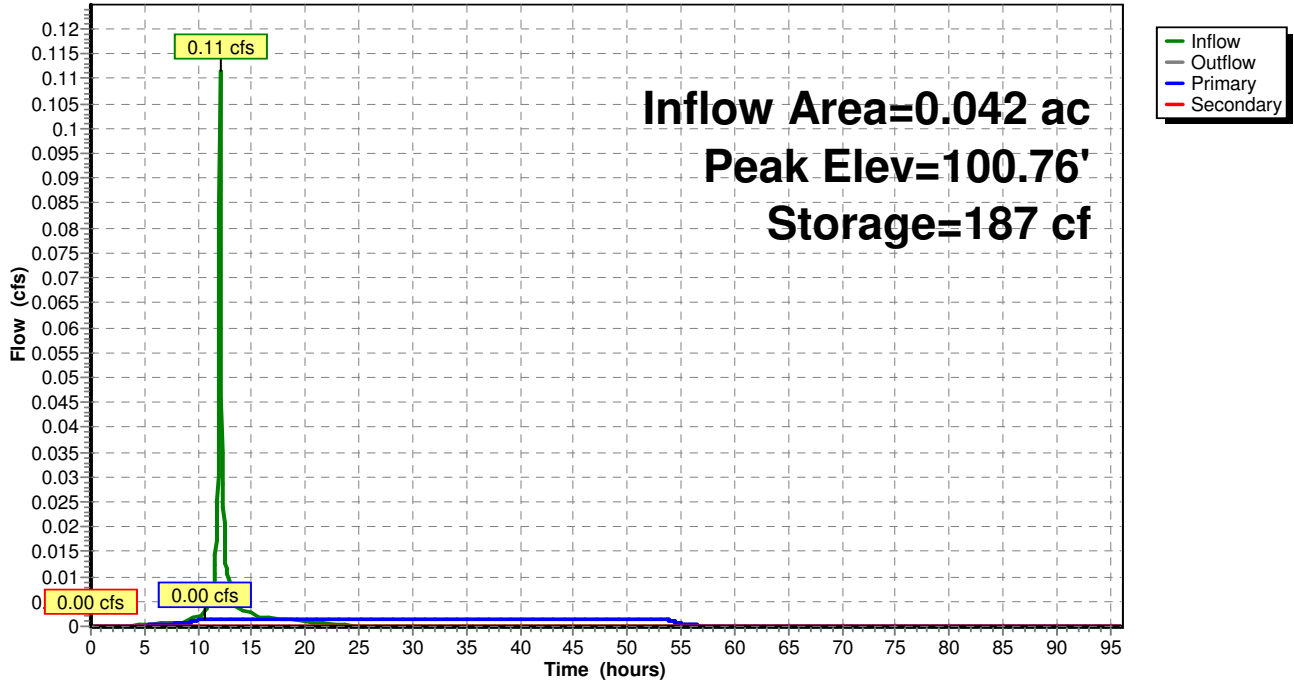
MSE 24-hr 3 2-YR Rainfall=2.66"

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Pond PICP: 947 s.f. PCIP w/ 4" U.D.

Hydrograph



Studebaker Residence PICP

MSE 24-hr 3 2-YR Rainfall=2.66"

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Hydrograph for Pond PICP: 947 s.f. PCIP w/ 4" U.D.

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Primary (cfs)	Secondary (cfs)
0.00	0.00	0	100.10	0.00	0.00	0.00
2.50	0.00	0	100.10	0.00	0.00	0.00
5.00	0.00	1	100.10	0.00	0.00	0.00
7.50	0.00	2	100.11	0.00	0.00	0.00
10.00	0.00	6	100.12	0.00	0.00	0.00
12.50	0.02	150	100.63	0.00	0.00	0.00
15.00	0.00	185	100.75	0.00	0.00	0.00
17.50	0.00	187	100.76	0.00	0.00	0.00
20.00	0.00	184	100.75	0.00	0.00	0.00
22.50	0.00	177	100.72	0.00	0.00	0.00
25.00	0.00	165	100.68	0.00	0.00	0.00
27.50	0.00	152	100.63	0.00	0.00	0.00
30.00	0.00	138	100.58	0.00	0.00	0.00
32.50	0.00	124	100.54	0.00	0.00	0.00
35.00	0.00	110	100.49	0.00	0.00	0.00
37.50	0.00	96	100.44	0.00	0.00	0.00
40.00	0.00	82	100.39	0.00	0.00	0.00
42.50	0.00	69	100.34	0.00	0.00	0.00
45.00	0.00	55	100.29	0.00	0.00	0.00
47.50	0.00	41	100.24	0.00	0.00	0.00
50.00	0.00	27	100.20	0.00	0.00	0.00
52.50	0.00	13	100.15	0.00	0.00	0.00
55.00	0.00	2	100.11	0.00	0.00	0.00
57.50	0.00	0	100.10	0.00	0.00	0.00
60.00	0.00	0	100.10	0.00	0.00	0.00
62.50	0.00	0	100.10	0.00	0.00	0.00
65.00	0.00	0	100.10	0.00	0.00	0.00
67.50	0.00	0	100.10	0.00	0.00	0.00
70.00	0.00	0	100.10	0.00	0.00	0.00
72.50	0.00	0	100.10	0.00	0.00	0.00
75.00	0.00	0	100.10	0.00	0.00	0.00
77.50	0.00	0	100.10	0.00	0.00	0.00
80.00	0.00	0	100.10	0.00	0.00	0.00
82.50	0.00	0	100.10	0.00	0.00	0.00
85.00	0.00	0	100.10	0.00	0.00	0.00
87.50	0.00	0	100.10	0.00	0.00	0.00
90.00	0.00	0	100.10	0.00	0.00	0.00
92.50	0.00	0	100.10	0.00	0.00	0.00
95.00	0.00	0	100.10	0.00	0.00	0.00

Stuebaker Residence PICP

MSE 24-hr 3 10-YR Rainfall=3.77"

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Time span=0.00-96.00 hrs, dt=0.05 hrs, 1921 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 S-1: PICP Driveway

Runoff Area=947 sf 100.00% Impervious Runoff Depth=3.54"
Tc=0.0 min CN=98 Runoff=0.14 cfs 0.006 af

Subcatchment S-2: Lawn & Landscape

Runoff Area=888 sf 15.20% Impervious Runoff Depth=1.71"
Tc=6.0 min CN=78 Runoff=0.06 cfs 0.003 af

Pond PICP: 947 s.f. PCIP w/ 4" U.D.

Peak Elev=101.04' Storage=267 cf Inflow=0.17 cfs 0.009 af
Primary=0.00 cfs 0.008 af Secondary=0.01 cfs 0.001 af Outflow=0.01 cfs 0.009 af

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MSE 24-hr 3 10-YR Rainfall=3.77"

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Summary for Subcatchment S-1: PICP Driveway

Runoff = 0.14 cfs @ 12.04 hrs, Volume= 0.006 af, Depth= 3.54"

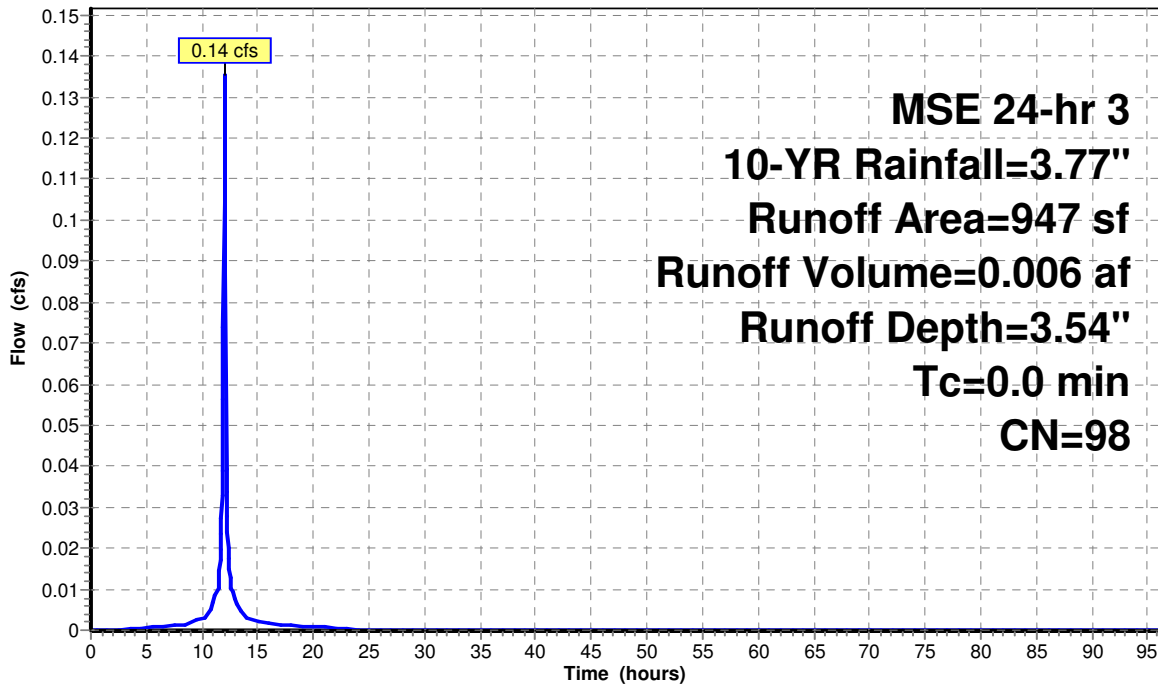
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-YR Rainfall=3.77"

Area (sf)	CN	Description
* 947	98	PICP Paver parking, HSG C
947		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.0					Direct Entry, Area onto PICP

Subcatchment S-1: PICP Driveway

Hydrograph



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MSE 24-hr 3 10-YR Rainfall=3.77"

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Hydrograph for Subcatchment S-1: PICP Driveway

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	52.00	3.77	3.54	0.00
1.00	0.01	0.00	0.00	53.00	3.77	3.54	0.00
2.00	0.03	0.00	0.00	54.00	3.77	3.54	0.00
3.00	0.06	0.00	0.00	55.00	3.77	3.54	0.00
4.00	0.10	0.01	0.00	56.00	3.77	3.54	0.00
5.00	0.14	0.03	0.00	57.00	3.77	3.54	0.00
6.00	0.19	0.06	0.00	58.00	3.77	3.54	0.00
7.00	0.25	0.11	0.00	59.00	3.77	3.54	0.00
8.00	0.32	0.16	0.00	60.00	3.77	3.54	0.00
9.00	0.39	0.22	0.00	61.00	3.77	3.54	0.00
10.00	0.52	0.33	0.00	62.00	3.77	3.54	0.00
11.00	0.73	0.53	0.01	63.00	3.77	3.54	0.00
12.00	1.75	1.52	0.10	64.00	3.77	3.54	0.00
13.00	3.04	2.81	0.01	65.00	3.77	3.54	0.00
14.00	3.25	3.02	0.00	66.00	3.77	3.54	0.00
15.00	3.38	3.15	0.00	67.00	3.77	3.54	0.00
16.00	3.45	3.22	0.00	68.00	3.77	3.54	0.00
17.00	3.52	3.29	0.00	69.00	3.77	3.54	0.00
18.00	3.58	3.34	0.00	70.00	3.77	3.54	0.00
19.00	3.63	3.39	0.00	71.00	3.77	3.54	0.00
20.00	3.67	3.44	0.00	72.00	3.77	3.54	0.00
21.00	3.71	3.47	0.00	73.00	3.77	3.54	0.00
22.00	3.74	3.50	0.00	74.00	3.77	3.54	0.00
23.00	3.76	3.52	0.00	75.00	3.77	3.54	0.00
24.00	3.77	3.54	0.00	76.00	3.77	3.54	0.00
25.00	3.77	3.54	0.00	77.00	3.77	3.54	0.00
26.00	3.77	3.54	0.00	78.00	3.77	3.54	0.00
27.00	3.77	3.54	0.00	79.00	3.77	3.54	0.00
28.00	3.77	3.54	0.00	80.00	3.77	3.54	0.00
29.00	3.77	3.54	0.00	81.00	3.77	3.54	0.00
30.00	3.77	3.54	0.00	82.00	3.77	3.54	0.00
31.00	3.77	3.54	0.00	83.00	3.77	3.54	0.00
32.00	3.77	3.54	0.00	84.00	3.77	3.54	0.00
33.00	3.77	3.54	0.00	85.00	3.77	3.54	0.00
34.00	3.77	3.54	0.00	86.00	3.77	3.54	0.00
35.00	3.77	3.54	0.00	87.00	3.77	3.54	0.00
36.00	3.77	3.54	0.00	88.00	3.77	3.54	0.00
37.00	3.77	3.54	0.00	89.00	3.77	3.54	0.00
38.00	3.77	3.54	0.00	90.00	3.77	3.54	0.00
39.00	3.77	3.54	0.00	91.00	3.77	3.54	0.00
40.00	3.77	3.54	0.00	92.00	3.77	3.54	0.00
41.00	3.77	3.54	0.00	93.00	3.77	3.54	0.00
42.00	3.77	3.54	0.00	94.00	3.77	3.54	0.00
43.00	3.77	3.54	0.00	95.00	3.77	3.54	0.00
44.00	3.77	3.54	0.00	96.00	3.77	3.54	0.00
45.00	3.77	3.54	0.00				
46.00	3.77	3.54	0.00				
47.00	3.77	3.54	0.00				
48.00	3.77	3.54	0.00				
49.00	3.77	3.54	0.00				
50.00	3.77	3.54	0.00				
51.00	3.77	3.54	0.00				

Stuebaker Residence PICP

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MSE 24-hr 3 10-YR Rainfall=3.77"

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Summary for Subcatchment S-2: Lawn & Landscape

Runoff = 0.06 cfs @ 12.14 hrs, Volume= 0.003 af, Depth= 1.71"

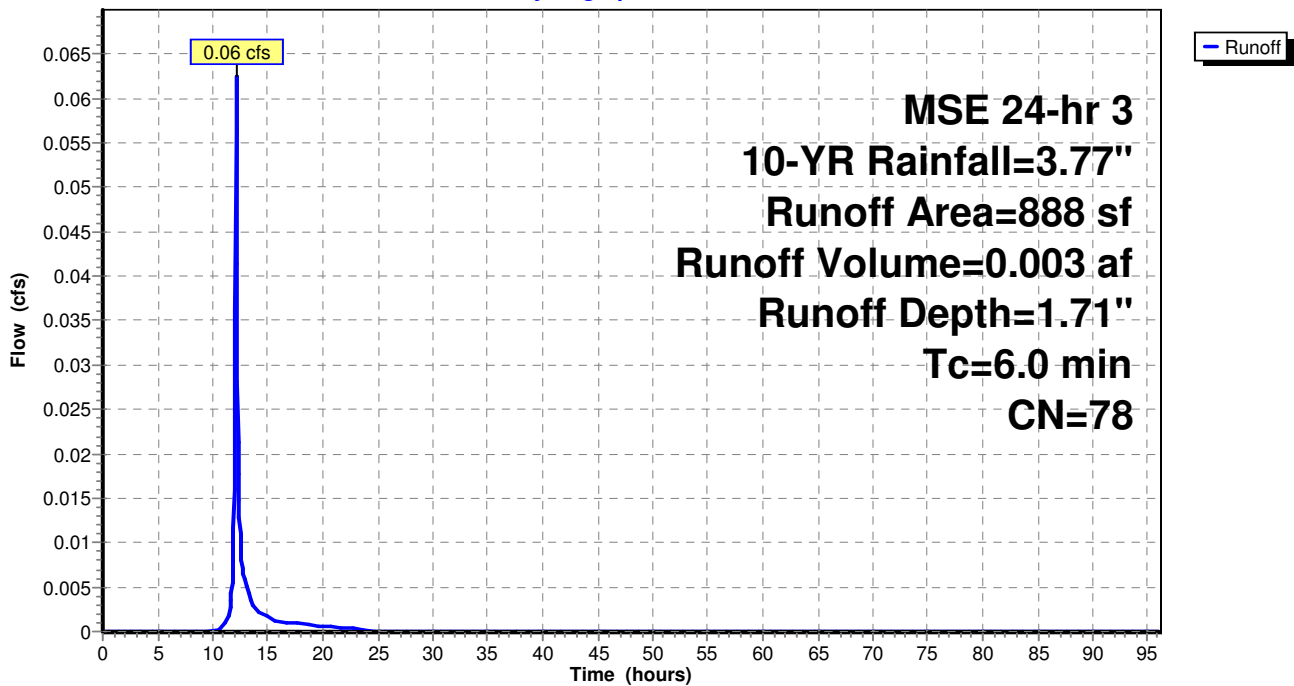
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-YR Rainfall=3.77"

Area (sf)	CN	Description
753	74	>75% Grass cover, Good, HSG C
* 135	98	Paver Walk, HSG C
888	78	Weighted Average
753		84.80% Pervious Area
135		15.20% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry, Lawn and Landscape Area

Subcatchment S-2: Lawn & Landscape

Hydrograph



Studebaker Residence PICP

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MSE 24-hr 3 10-YR Rainfall=3.77"

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Hydrograph for Subcatchment S-2: Lawn & Landscape

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	52.00	3.77	1.71	0.00
1.00	0.01	0.00	0.00	53.00	3.77	1.71	0.00
2.00	0.03	0.00	0.00	54.00	3.77	1.71	0.00
3.00	0.06	0.00	0.00	55.00	3.77	1.71	0.00
4.00	0.10	0.00	0.00	56.00	3.77	1.71	0.00
5.00	0.14	0.00	0.00	57.00	3.77	1.71	0.00
6.00	0.19	0.00	0.00	58.00	3.77	1.71	0.00
7.00	0.25	0.00	0.00	59.00	3.77	1.71	0.00
8.00	0.32	0.00	0.00	60.00	3.77	1.71	0.00
9.00	0.39	0.00	0.00	61.00	3.77	1.71	0.00
10.00	0.52	0.00	0.00	62.00	3.77	1.71	0.00
11.00	0.73	0.01	0.00	63.00	3.77	1.71	0.00
12.00	1.75	0.35	0.02	64.00	3.77	1.71	0.00
13.00	3.04	1.16	0.01	65.00	3.77	1.71	0.00
14.00	3.25	1.31	0.00	66.00	3.77	1.71	0.00
15.00	3.38	1.41	0.00	67.00	3.77	1.71	0.00
16.00	3.45	1.46	0.00	68.00	3.77	1.71	0.00
17.00	3.52	1.51	0.00	69.00	3.77	1.71	0.00
18.00	3.58	1.56	0.00	70.00	3.77	1.71	0.00
19.00	3.63	1.60	0.00	71.00	3.77	1.71	0.00
20.00	3.67	1.63	0.00	72.00	3.77	1.71	0.00
21.00	3.71	1.66	0.00	73.00	3.77	1.71	0.00
22.00	3.74	1.68	0.00	74.00	3.77	1.71	0.00
23.00	3.76	1.69	0.00	75.00	3.77	1.71	0.00
24.00	3.77	1.71	0.00	76.00	3.77	1.71	0.00
25.00	3.77	1.71	0.00	77.00	3.77	1.71	0.00
26.00	3.77	1.71	0.00	78.00	3.77	1.71	0.00
27.00	3.77	1.71	0.00	79.00	3.77	1.71	0.00
28.00	3.77	1.71	0.00	80.00	3.77	1.71	0.00
29.00	3.77	1.71	0.00	81.00	3.77	1.71	0.00
30.00	3.77	1.71	0.00	82.00	3.77	1.71	0.00
31.00	3.77	1.71	0.00	83.00	3.77	1.71	0.00
32.00	3.77	1.71	0.00	84.00	3.77	1.71	0.00
33.00	3.77	1.71	0.00	85.00	3.77	1.71	0.00
34.00	3.77	1.71	0.00	86.00	3.77	1.71	0.00
35.00	3.77	1.71	0.00	87.00	3.77	1.71	0.00
36.00	3.77	1.71	0.00	88.00	3.77	1.71	0.00
37.00	3.77	1.71	0.00	89.00	3.77	1.71	0.00
38.00	3.77	1.71	0.00	90.00	3.77	1.71	0.00
39.00	3.77	1.71	0.00	91.00	3.77	1.71	0.00
40.00	3.77	1.71	0.00	92.00	3.77	1.71	0.00
41.00	3.77	1.71	0.00	93.00	3.77	1.71	0.00
42.00	3.77	1.71	0.00	94.00	3.77	1.71	0.00
43.00	3.77	1.71	0.00	95.00	3.77	1.71	0.00
44.00	3.77	1.71	0.00	96.00	3.77	1.71	0.00
45.00	3.77	1.71	0.00				
46.00	3.77	1.71	0.00				
47.00	3.77	1.71	0.00				
48.00	3.77	1.71	0.00				
49.00	3.77	1.71	0.00				
50.00	3.77	1.71	0.00				
51.00	3.77	1.71	0.00				

Studebaker Residence PICP

MSE 24-hr 3 10-YR Rainfall=3.77"

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Summary for Pond PICP: 947 s.f. PCIP w/ 4" U.D.

Inflow Area = 0.042 ac, 58.96% Impervious, Inflow Depth = 2.65" for 10-YR event
 Inflow = 0.17 cfs @ 12.06 hrs, Volume= 0.009 af
 Outflow = 0.01 cfs @ 13.19 hrs, Volume= 0.009 af, Atten= 94%, Lag= 68.0 min
 Primary = 0.00 cfs @ 9.45 hrs, Volume= 0.008 af
 Secondary = 0.01 cfs @ 13.19 hrs, Volume= 0.001 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Peak Elev= 101.04' @ 13.19 hrs Surf.Area= 947 sf Storage= 267 cf
 Flood Elev= 102.60' Surf.Area= 947 sf Storage= 639 cf

Plug-Flow detention time= 1,282.4 min calculated for 0.009 af (100% of inflow)
 Center-of-Mass det. time= 1,283.2 min (2,048.4 - 765.2)

Volume	Invert	Avail.Storage	Storage Description
#1	100.10'	639 cf	Custom Stage Data (Prismatic) Listed below (Recalc) 2,131 cf Overall x 30.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
100.10	947	0	0
102.35	947	2,131	2,131

Device	Routing	Invert	Outlet Devices
#1	Primary	100.10'	0.070 in/hr Exfiltration over Surface area Phase-In= 0.01'
#2	Secondary	101.00'	Tube/ Perforated UD Discharges@100.95' 4.000" Diameter, C= 0.600 50.0' Long Tube, Hazen-Williams C= 140

Primary OutFlow Max=0.00 cfs @ 9.45 hrs HW=100.13' (Free Discharge)
 ↑1=Exfiltration (Exfiltration Controls 0.00 cfs)

Secondary OutFlow Max=0.01 cfs @ 13.19 hrs HW=101.04' (Free Discharge)
 ↑2=Tube/ Perforated UD (Tube Controls 0.01 cfs @ 0.11 fps)

Stuebaker Residence PICP

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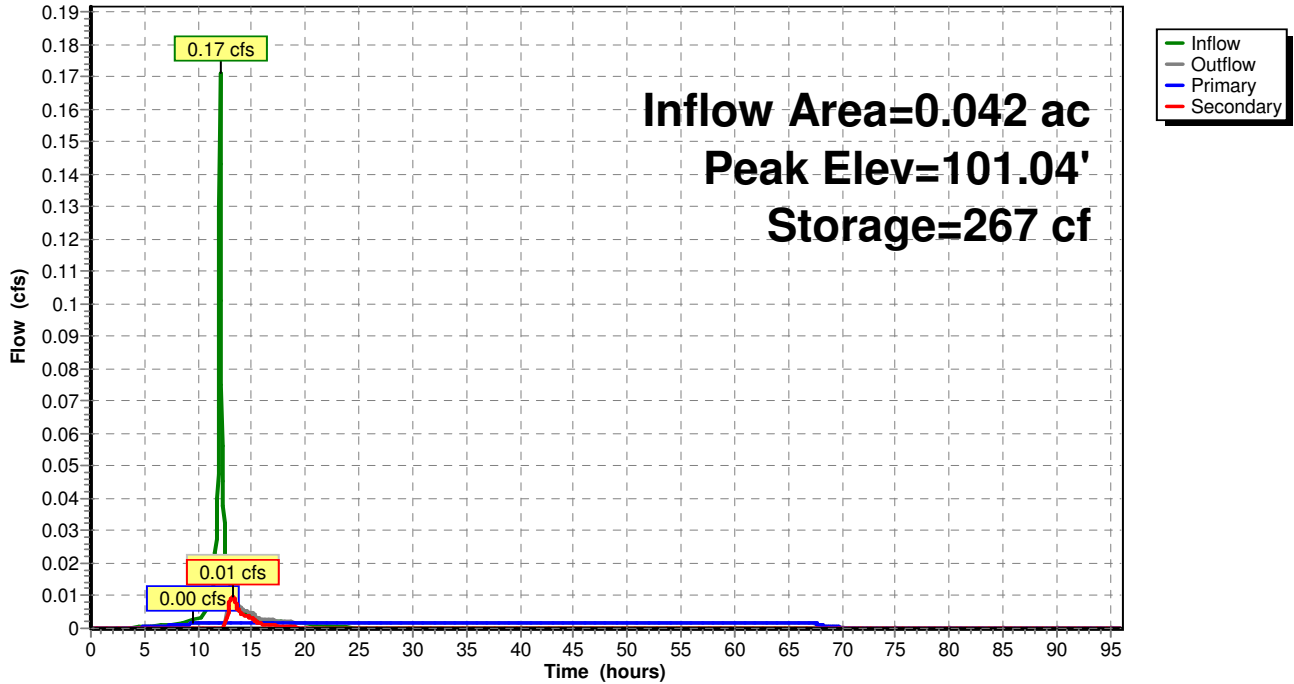
MSE 24-hr 3 10-YR Rainfall=3.77"

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Pond PICP: 947 s.f. PCIP w/ 4" U.D.

Hydrograph



Studebaker Residence PICP*MSE 24-hr 3 10-YR Rainfall=3.77"*

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Hydrograph for Pond PICP: 947 s.f. PCIP w/ 4" U.D.

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Primary (cfs)	Secondary (cfs)
0.00	0.00	0	100.10	0.00	0.00	0.00
2.50	0.00	0	100.10	0.00	0.00	0.00
5.00	0.00	1	100.11	0.00	0.00	0.00
7.50	0.00	4	100.11	0.00	0.00	0.00
10.00	0.00	9	100.13	0.00	0.00	0.00
12.50	0.02	246	100.97	0.00	0.00	0.00
15.00	0.00	260	101.01	0.00	0.00	0.00
17.50	0.00	257	101.00	0.00	0.00	0.00
20.00	0.00	256	101.00	0.00	0.00	0.00
22.50	0.00	252	100.99	0.00	0.00	0.00
25.00	0.00	242	100.95	0.00	0.00	0.00
27.50	0.00	228	100.90	0.00	0.00	0.00
30.00	0.00	214	100.85	0.00	0.00	0.00
32.50	0.00	200	100.81	0.00	0.00	0.00
35.00	0.00	186	100.76	0.00	0.00	0.00
37.50	0.00	173	100.71	0.00	0.00	0.00
40.00	0.00	159	100.66	0.00	0.00	0.00
42.50	0.00	145	100.61	0.00	0.00	0.00
45.00	0.00	131	100.56	0.00	0.00	0.00
47.50	0.00	117	100.51	0.00	0.00	0.00
50.00	0.00	104	100.46	0.00	0.00	0.00
52.50	0.00	90	100.42	0.00	0.00	0.00
55.00	0.00	76	100.37	0.00	0.00	0.00
57.50	0.00	62	100.32	0.00	0.00	0.00
60.00	0.00	48	100.27	0.00	0.00	0.00
62.50	0.00	35	100.22	0.00	0.00	0.00
65.00	0.00	21	100.17	0.00	0.00	0.00
67.50	0.00	7	100.12	0.00	0.00	0.00
70.00	0.00	1	100.10	0.00	0.00	0.00
72.50	0.00	0	100.10	0.00	0.00	0.00
75.00	0.00	0	100.10	0.00	0.00	0.00
77.50	0.00	0	100.10	0.00	0.00	0.00
80.00	0.00	0	100.10	0.00	0.00	0.00
82.50	0.00	0	100.10	0.00	0.00	0.00
85.00	0.00	0	100.10	0.00	0.00	0.00
87.50	0.00	0	100.10	0.00	0.00	0.00
90.00	0.00	0	100.10	0.00	0.00	0.00
92.50	0.00	0	100.10	0.00	0.00	0.00
95.00	0.00	0	100.10	0.00	0.00	0.00

Stuebaker Residence PICP

MSE 24-hr 3 100-YR Rainfall=6.15"

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Time span=0.00-96.00 hrs, dt=0.05 hrs, 1921 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 S-1: PICP Driveway

Runoff Area=947 sf 100.00% Impervious Runoff Depth=5.91"
Tc=0.0 min CN=98 Runoff=0.22 cfs 0.011 af

Subcatchment S-2: Lawn & Landscape

Runoff Area=888 sf 15.20% Impervious Runoff Depth=3.71"
Tc=6.0 min CN=78 Runoff=0.13 cfs 0.006 af

Pond PICP: 947 s.f. PCIP w/ 4" U.D.

Peak Elev=101.29' Storage=339 cf Inflow=0.31 cfs 0.017 af
Primary=0.00 cfs 0.008 af Secondary=0.15 cfs 0.009 af Outflow=0.15 cfs 0.017 af

Studebaker Residence PICP

Prepared by North Shore Engineering, Inc.

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MSE 24-hr 3 100-YR Rainfall=6.15"

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Summary for Subcatchment S-1: PICP Driveway

Runoff = 0.22 cfs @ 12.04 hrs, Volume= 0.011 af, Depth= 5.91"

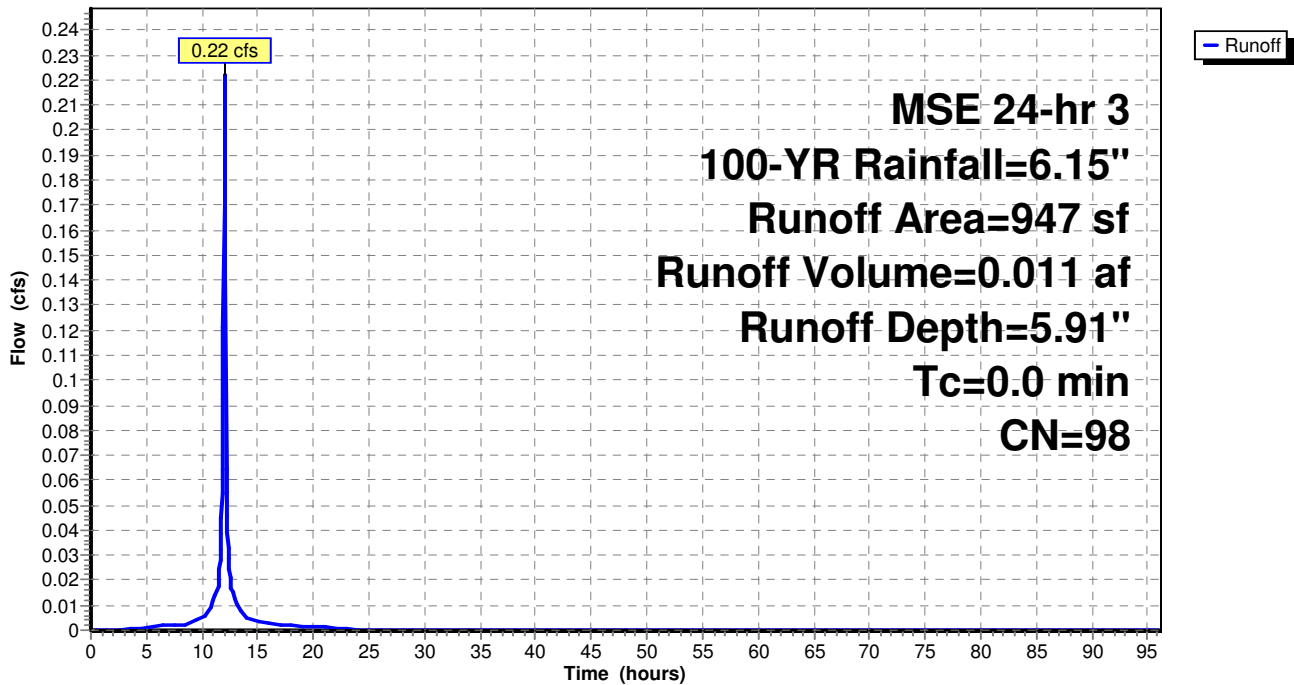
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-YR Rainfall=6.15"

Area (sf)	CN	Description
* 947	98	PICP Paver parking, HSG C
947		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.0					Direct Entry, Area onto PICP

Subcatchment S-1: PICP Driveway

Hydrograph



Studebaker Residence PICP

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MSE 24-hr 3 100-YR Rainfall=6.15"

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Hydrograph for Subcatchment S-1: PICP Driveway

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	52.00	6.15	5.91	0.00
1.00	0.02	0.00	0.00	53.00	6.15	5.91	0.00
2.00	0.06	0.00	0.00	54.00	6.15	5.91	0.00
3.00	0.10	0.01	0.00	55.00	6.15	5.91	0.00
4.00	0.16	0.04	0.00	56.00	6.15	5.91	0.00
5.00	0.23	0.09	0.00	57.00	6.15	5.91	0.00
6.00	0.31	0.16	0.00	58.00	6.15	5.91	0.00
7.00	0.41	0.24	0.00	59.00	6.15	5.91	0.00
8.00	0.51	0.33	0.00	60.00	6.15	5.91	0.00
9.00	0.63	0.44	0.00	61.00	6.15	5.91	0.00
10.00	0.85	0.64	0.00	62.00	6.15	5.91	0.00
11.00	1.19	0.97	0.01	63.00	6.15	5.91	0.00
12.00	2.85	2.62	0.17	64.00	6.15	5.91	0.00
13.00	4.96	4.73	0.01	65.00	6.15	5.91	0.00
14.00	5.30	5.07	0.00	66.00	6.15	5.91	0.00
15.00	5.52	5.28	0.00	67.00	6.15	5.91	0.00
16.00	5.64	5.40	0.00	68.00	6.15	5.91	0.00
17.00	5.74	5.50	0.00	69.00	6.15	5.91	0.00
18.00	5.84	5.60	0.00	70.00	6.15	5.91	0.00
19.00	5.92	5.68	0.00	71.00	6.15	5.91	0.00
20.00	5.99	5.75	0.00	72.00	6.15	5.91	0.00
21.00	6.05	5.81	0.00	73.00	6.15	5.91	0.00
22.00	6.09	5.86	0.00	74.00	6.15	5.91	0.00
23.00	6.13	5.89	0.00	75.00	6.15	5.91	0.00
24.00	6.15	5.91	0.00	76.00	6.15	5.91	0.00
25.00	6.15	5.91	0.00	77.00	6.15	5.91	0.00
26.00	6.15	5.91	0.00	78.00	6.15	5.91	0.00
27.00	6.15	5.91	0.00	79.00	6.15	5.91	0.00
28.00	6.15	5.91	0.00	80.00	6.15	5.91	0.00
29.00	6.15	5.91	0.00	81.00	6.15	5.91	0.00
30.00	6.15	5.91	0.00	82.00	6.15	5.91	0.00
31.00	6.15	5.91	0.00	83.00	6.15	5.91	0.00
32.00	6.15	5.91	0.00	84.00	6.15	5.91	0.00
33.00	6.15	5.91	0.00	85.00	6.15	5.91	0.00
34.00	6.15	5.91	0.00	86.00	6.15	5.91	0.00
35.00	6.15	5.91	0.00	87.00	6.15	5.91	0.00
36.00	6.15	5.91	0.00	88.00	6.15	5.91	0.00
37.00	6.15	5.91	0.00	89.00	6.15	5.91	0.00
38.00	6.15	5.91	0.00	90.00	6.15	5.91	0.00
39.00	6.15	5.91	0.00	91.00	6.15	5.91	0.00
40.00	6.15	5.91	0.00	92.00	6.15	5.91	0.00
41.00	6.15	5.91	0.00	93.00	6.15	5.91	0.00
42.00	6.15	5.91	0.00	94.00	6.15	5.91	0.00
43.00	6.15	5.91	0.00	95.00	6.15	5.91	0.00
44.00	6.15	5.91	0.00	96.00	6.15	5.91	0.00
45.00	6.15	5.91	0.00				
46.00	6.15	5.91	0.00				
47.00	6.15	5.91	0.00				
48.00	6.15	5.91	0.00				
49.00	6.15	5.91	0.00				
50.00	6.15	5.91	0.00				
51.00	6.15	5.91	0.00				

Studebaker Residence PICP

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MSE 24-hr 3 100-YR Rainfall=6.15"

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Summary for Subcatchment S-2: Lawn & Landscape

Runoff = 0.13 cfs @ 12.13 hrs, Volume= 0.006 af, Depth= 3.71"

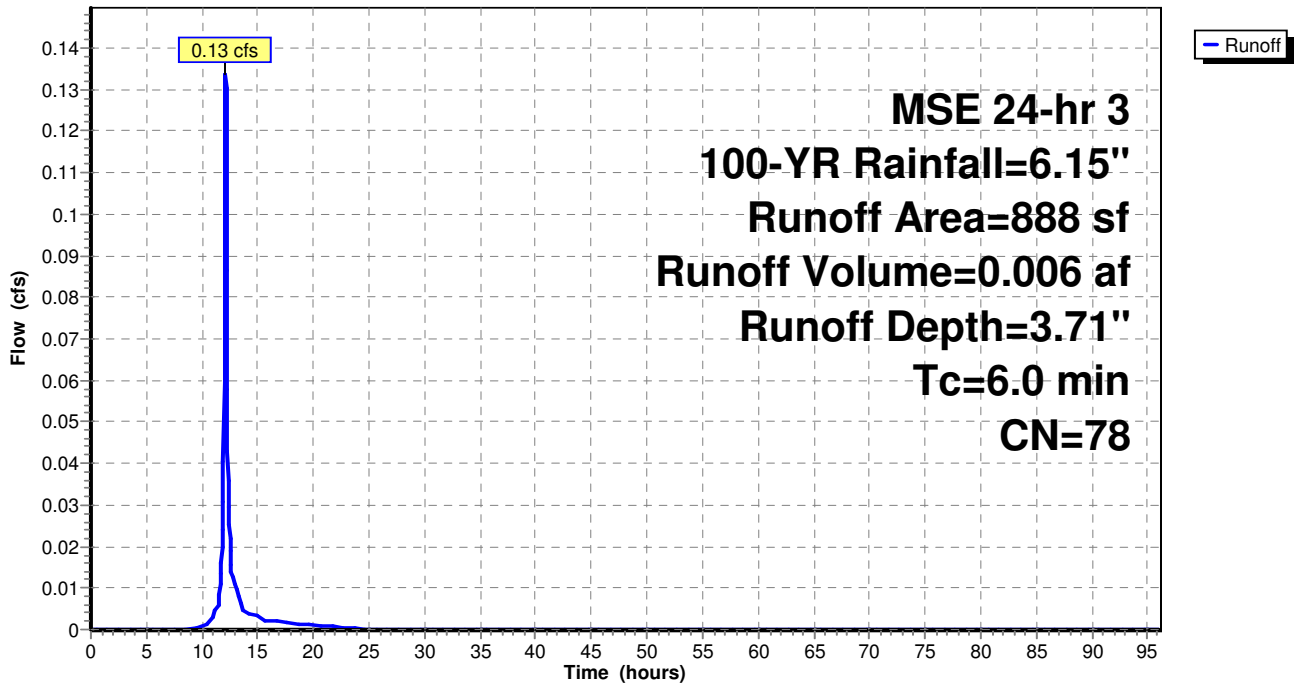
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-YR Rainfall=6.15"

Area (sf)	CN	Description
753	74	>75% Grass cover, Good, HSG C
* 135	98	Paver Walk, HSG C
888	78	Weighted Average
753		84.80% Pervious Area
135		15.20% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry, Lawn and Landscape Area

Subcatchment S-2: Lawn & Landscape

Hydrograph



Stuebaker Residence PICP

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MSE 24-hr 3 100-YR Rainfall=6.15"

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Hydrograph for Subcatchment S-2: Lawn & Landscape

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	52.00	6.15	3.71	0.00
1.00	0.02	0.00	0.00	53.00	6.15	3.71	0.00
2.00	0.06	0.00	0.00	54.00	6.15	3.71	0.00
3.00	0.10	0.00	0.00	55.00	6.15	3.71	0.00
4.00	0.16	0.00	0.00	56.00	6.15	3.71	0.00
5.00	0.23	0.00	0.00	57.00	6.15	3.71	0.00
6.00	0.31	0.00	0.00	58.00	6.15	3.71	0.00
7.00	0.41	0.00	0.00	59.00	6.15	3.71	0.00
8.00	0.51	0.00	0.00	60.00	6.15	3.71	0.00
9.00	0.63	0.00	0.00	61.00	6.15	3.71	0.00
10.00	0.85	0.03	0.00	62.00	6.15	3.71	0.00
11.00	1.19	0.11	0.00	63.00	6.15	3.71	0.00
12.00	2.85	1.02	0.06	64.00	6.15	3.71	0.00
13.00	4.96	2.68	0.01	65.00	6.15	3.71	0.00
14.00	5.30	2.97	0.00	66.00	6.15	3.71	0.00
15.00	5.52	3.16	0.00	67.00	6.15	3.71	0.00
16.00	5.64	3.26	0.00	68.00	6.15	3.71	0.00
17.00	5.74	3.35	0.00	69.00	6.15	3.71	0.00
18.00	5.84	3.44	0.00	70.00	6.15	3.71	0.00
19.00	5.92	3.51	0.00	71.00	6.15	3.71	0.00
20.00	5.99	3.57	0.00	72.00	6.15	3.71	0.00
21.00	6.05	3.62	0.00	73.00	6.15	3.71	0.00
22.00	6.09	3.66	0.00	74.00	6.15	3.71	0.00
23.00	6.13	3.69	0.00	75.00	6.15	3.71	0.00
24.00	6.15	3.71	0.00	76.00	6.15	3.71	0.00
25.00	6.15	3.71	0.00	77.00	6.15	3.71	0.00
26.00	6.15	3.71	0.00	78.00	6.15	3.71	0.00
27.00	6.15	3.71	0.00	79.00	6.15	3.71	0.00
28.00	6.15	3.71	0.00	80.00	6.15	3.71	0.00
29.00	6.15	3.71	0.00	81.00	6.15	3.71	0.00
30.00	6.15	3.71	0.00	82.00	6.15	3.71	0.00
31.00	6.15	3.71	0.00	83.00	6.15	3.71	0.00
32.00	6.15	3.71	0.00	84.00	6.15	3.71	0.00
33.00	6.15	3.71	0.00	85.00	6.15	3.71	0.00
34.00	6.15	3.71	0.00	86.00	6.15	3.71	0.00
35.00	6.15	3.71	0.00	87.00	6.15	3.71	0.00
36.00	6.15	3.71	0.00	88.00	6.15	3.71	0.00
37.00	6.15	3.71	0.00	89.00	6.15	3.71	0.00
38.00	6.15	3.71	0.00	90.00	6.15	3.71	0.00
39.00	6.15	3.71	0.00	91.00	6.15	3.71	0.00
40.00	6.15	3.71	0.00	92.00	6.15	3.71	0.00
41.00	6.15	3.71	0.00	93.00	6.15	3.71	0.00
42.00	6.15	3.71	0.00	94.00	6.15	3.71	0.00
43.00	6.15	3.71	0.00	95.00	6.15	3.71	0.00
44.00	6.15	3.71	0.00	96.00	6.15	3.71	0.00
45.00	6.15	3.71	0.00				
46.00	6.15	3.71	0.00				
47.00	6.15	3.71	0.00				
48.00	6.15	3.71	0.00				
49.00	6.15	3.71	0.00				
50.00	6.15	3.71	0.00				
51.00	6.15	3.71	0.00				

Studebaker Residence PICP

MSE 24-hr 3 100-YR Rainfall=6.15"

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Summary for Pond PICP: 947 s.f. PCIP w/ 4" U.D.

Inflow Area = 0.042 ac, 58.96% Impervious, Inflow Depth = 4.85" for 100-YR event
 Inflow = 0.31 cfs @ 12.06 hrs, Volume= 0.017 af
 Outflow = 0.15 cfs @ 12.20 hrs, Volume= 0.017 af, Atten= 52%, Lag= 8.7 min
 Primary = 0.00 cfs @ 7.20 hrs, Volume= 0.008 af
 Secondary = 0.15 cfs @ 12.20 hrs, Volume= 0.009 af

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.05 hrs
 Peak Elev= 101.29' @ 12.20 hrs Surf.Area= 947 sf Storage= 339 cf
 Flood Elev= 102.60' Surf.Area= 947 sf Storage= 639 cf

Plug-Flow detention time= 738.6 min calculated for 0.017 af (100% of inflow)
 Center-of-Mass det. time= 739.8 min (1,499.0 - 759.2)

Volume	Invert	Avail.Storage	Storage Description
#1	100.10'	639 cf	Custom Stage Data (Prismatic) Listed below (Recalc) 2,131 cf Overall x 30.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
100.10	947	0	0
102.35	947	2,131	2,131

Device	Routing	Invert	Outlet Devices
#1	Primary	100.10'	0.070 in/hr Exfiltration over Surface area Phase-In= 0.01'
#2	Secondary	101.00'	Tube/ Perforated UD Discharges@100.95' 4.000" Diameter, C= 0.600 50.0' Long Tube, Hazen-Williams C= 140

Primary OutFlow Max=0.00 cfs @ 7.20 hrs HW=100.13' (Free Discharge)
 ↑1=Exfiltration (Exfiltration Controls 0.00 cfs)

Secondary OutFlow Max=0.15 cfs @ 12.20 hrs HW=101.29' (Free Discharge)
 ↑2=Tube/ Perforated UD (Tube Controls 0.15 cfs @ 1.67 fps)

Stuebaker Residence PICP

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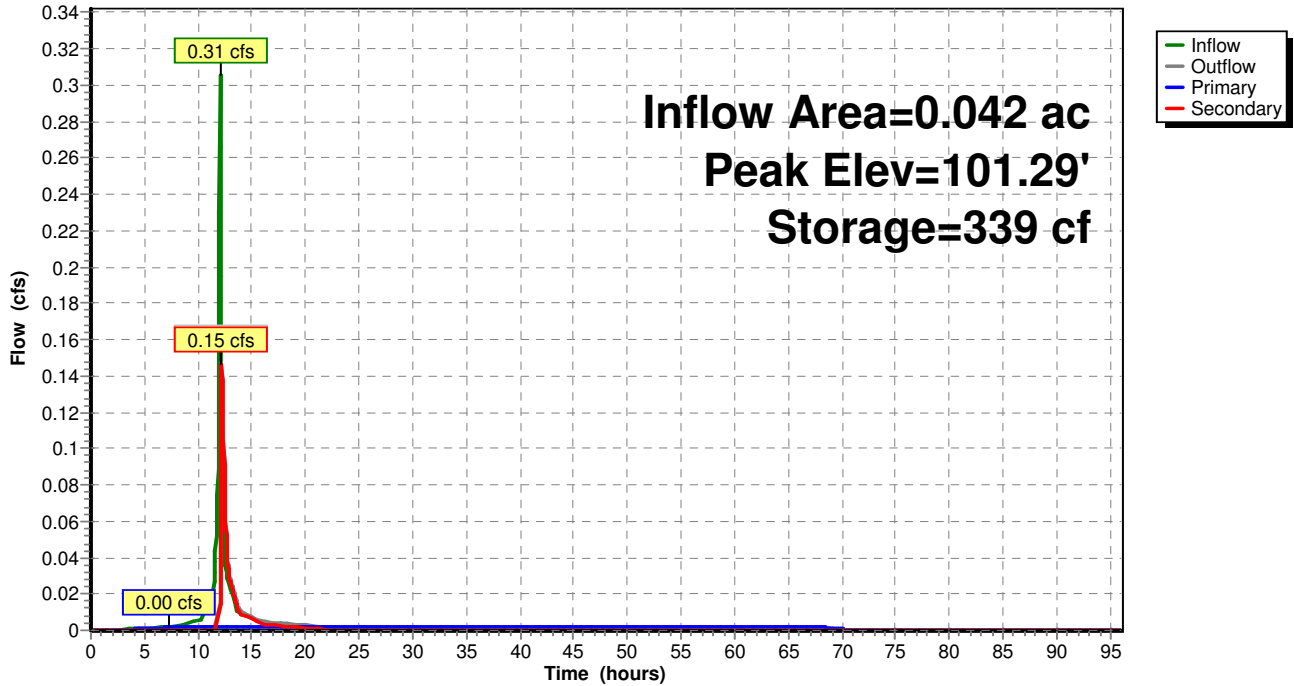
MSE 24-hr 3 100-YR Rainfall=6.15"

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Pond PICP: 947 s.f. PCIP w/ 4" U.D.

Hydrograph



Studebaker Residence PICP*MSE 24-hr 3 100-YR Rainfall=6.15"*

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Hydrograph for Pond PICP: 947 s.f. PCIP w/ 4" U.D.

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Primary (cfs)	Secondary (cfs)
0.00	0.00	0	100.10	0.00	0.00	0.00
2.50	0.00	0	100.10	0.00	0.00	0.00
5.00	0.00	4	100.11	0.00	0.00	0.00
7.50	0.00	8	100.13	0.00	0.00	0.00
10.00	0.01	24	100.18	0.00	0.00	0.00
12.50	0.04	305	101.17	0.07	0.00	0.07
15.00	0.01	264	101.03	0.01	0.00	0.01
17.50	0.00	259	101.01	0.00	0.00	0.00
20.00	0.00	257	101.01	0.00	0.00	0.00
22.50	0.00	256	101.00	0.00	0.00	0.00
25.00	0.00	248	100.97	0.00	0.00	0.00
27.50	0.00	234	100.92	0.00	0.00	0.00
30.00	0.00	220	100.87	0.00	0.00	0.00
32.50	0.00	206	100.83	0.00	0.00	0.00
35.00	0.00	192	100.78	0.00	0.00	0.00
37.50	0.00	178	100.73	0.00	0.00	0.00
40.00	0.00	165	100.68	0.00	0.00	0.00
42.50	0.00	151	100.63	0.00	0.00	0.00
45.00	0.00	137	100.58	0.00	0.00	0.00
47.50	0.00	123	100.53	0.00	0.00	0.00
50.00	0.00	109	100.49	0.00	0.00	0.00
52.50	0.00	96	100.44	0.00	0.00	0.00
55.00	0.00	82	100.39	0.00	0.00	0.00
57.50	0.00	68	100.34	0.00	0.00	0.00
60.00	0.00	54	100.29	0.00	0.00	0.00
62.50	0.00	40	100.24	0.00	0.00	0.00
65.00	0.00	27	100.19	0.00	0.00	0.00
67.50	0.00	13	100.14	0.00	0.00	0.00
70.00	0.00	2	100.11	0.00	0.00	0.00
72.50	0.00	0	100.10	0.00	0.00	0.00
75.00	0.00	0	100.10	0.00	0.00	0.00
77.50	0.00	0	100.10	0.00	0.00	0.00
80.00	0.00	0	100.10	0.00	0.00	0.00
82.50	0.00	0	100.10	0.00	0.00	0.00
85.00	0.00	0	100.10	0.00	0.00	0.00
87.50	0.00	0	100.10	0.00	0.00	0.00
90.00	0.00	0	100.10	0.00	0.00	0.00
92.50	0.00	0	100.10	0.00	0.00	0.00
95.00	0.00	0	100.10	0.00	0.00	0.00