

Routing Diagram for 3659-12003C-Existing Conditions POA 3-01
 Prepared by {enter your company name here}, Printed 1/17/2013
 HydroCAD® 10.00 s/n 00983 © 2012 HydroCAD Software Solutions LLC

3659-12003C-Existing Conditions POA 3-01

Prepared by {enter your company name here}

HydroCAD® 10.00 s/n 00983 © 2012 HydroCAD Software Solutions LLC

Printed 1/17/2013

Page 2

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
26.915	49	50-75% Grass cover, Fair, HSG A (5.1E, S5.1A, S5.1B, S5.1C, S5.1D, S63)
12.922	69	50-75% Grass cover, Fair, HSG B (S5.1C, S52)
3.195	79	50-75% Grass cover, Fair, HSG C (S5.1B)
12.923	98	Paved parking & roofs (5.1E, S5.1A, S5.1B, S5.1C, S5.1D, S52, S54, S54.1, S55, S56, S62, S63)
0.340	98	Water Surface, HSG A (S53)
22.950	65	Woods/grass comb., Fair, HSG B (S53, S54, S54.1, S55, S56)
79.245	66	TOTAL AREA

3659-12003C-Existing Conditions POA 3-01

Prepared by {enter your company name here}

Printed 1/17/2013

HydroCAD® 10.00 s/n 00983 © 2012 HydroCAD Software Solutions LLC

Page 3

Ground Covers (all nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
26.915	12.922	3.195	0.000	0.000	43.032	50-75% Grass cover, Fair	5.1E, S5.1A, S5.1B, S5.1C, S5.1D, S52, S63
0.000	0.000	0.000	0.000	12.923	12.923	Paved parking & roofs	5.1E, S5.1A, S5.1B, S5.1C, S5.1D, S52, S54, S54.1, S55, S56, S62, S63
0.340	0.000	0.000	0.000	0.000	0.340	Water Surface	S53
0.000	22.950	0.000	0.000	0.000	22.950	Woods/grass comb., Fair	S53, S54, S54.1, S55, S56
27.255	35.872	3.195	0.000	12.923	79.245	TOTAL AREA	

3659-12003C-Existing Conditions POA 3-01

Prepared by {enter your company name here}

Printed 1/17/2013

HydroCAD® 10.00 s/n 00983 © 2012 HydroCAD Software Solutions LLC

Page 4

Pipe Listing (all nodes)

Line#	Node Number	In-Invert (feet)	Out-Invert (feet)	Length (feet)	Slope (ft/ft)	n	Diam/Width (inches)	Height (inches)	Inside-Fill (inches)
1	5.1E	0.00	0.00	42.0	0.0090	0.012	12.0	0.0	0.0
2	S5.1A	0.00	0.00	20.0	0.0100	0.012	12.0	0.0	0.0
3	S5.1B	0.00	0.00	1,200.0	0.0250	0.012	15.0	0.0	0.0
4	S5.1C	0.00	0.00	1,400.0	0.0500	0.012	12.0	0.0	0.0
5	S5.1D	0.00	0.00	45.0	0.0100	0.012	12.0	0.0	0.0
6	S52	0.00	0.00	285.0	0.0128	0.014	24.0	0.0	0.0
7	1R	42.10	41.90	150.0	0.0013	0.014	24.0	0.0	0.0
8	7R	43.90	42.10	20.0	0.0900	0.014	24.0	0.0	0.0
9	L164	45.80	42.10	720.0	0.0051	0.014	24.0	0.0	0.0
10	L176	45.80	43.38	242.0	0.0100	0.014	12.0	0.0	0.0
11	L179	41.90	41.10	60.0	0.0133	0.014	24.0	0.0	0.0
12	LINK 110.1	46.45	42.50	260.0	0.0152	0.014	18.0	0.0	0.0
13	MH-A	157.00	149.00	250.0	0.0320	0.014	15.0	0.0	0.0
14	MH-B	149.00	147.20	300.0	0.0060	0.012	21.0	0.0	0.0
15	MH-C	146.35	145.32	373.0	0.0028	0.012	24.0	0.0	0.0
16	MH-C	150.19	150.09	10.0	0.0100	0.012	12.0	0.0	0.0
17	MH-D	148.04	145.89	140.0	0.0154	0.012	24.0	0.0	0.0
18	MH-E	145.89	139.09	260.0	0.0262	0.012	24.0	0.0	0.0
19	MH-F	136.51	134.29	75.0	0.0296	0.012	24.0	0.0	0.0
20	P3	41.10	40.66	52.0	0.0085	0.014	24.0	0.0	0.0
21	P3B	42.40	41.90	63.0	0.0079	0.014	18.0	0.0	0.0
22	P3C	43.38	41.20	127.0	0.0172	0.014	18.0	0.0	0.0

Time span=0.00-20.00 hrs, dt=0.01 hrs, 2001 points x 2

Runoff by SCS TR-20 method, UH=SCS

Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment S5.1E: Runoff Area=31,933 sf 41.91% Impervious Runoff Depth>2.23"
Flow Length=142' Tc=7.6 min CN=70 Runoff=1.94 cfs 0.136 af

Subcatchment S5.1A: Runoff Area=558,034 sf 9.74% Impervious Runoff Depth>1.04"
Flow Length=1,375' Tc=21.0 min CN=54 Runoff=9.62 cfs 1.108 af

Subcatchment S5.1B: Runoff Area=740,256 sf 17.91% Impervious Runoff Depth>1.66"
Flow Length=2,092' Tc=24.8 min CN=63 Runoff=21.35 cfs 2.351 af

Subcatchment S5.1C: Runoff Area=16.789 ac 12.17% Impervious Runoff Depth>2.13"
Flow Length=2,090' Tc=25.1 min CN=69 Runoff=27.60 cfs 2.980 af

Subcatchment S5.1D: Runoff Area=50,009 sf 28.94% Impervious Runoff Depth>1.67"
Flow Length=355' Tc=11.3 min CN=63 Runoff=1.96 cfs 0.160 af

Subcatchment S52: Runoff Area=3.030 ac 53.14% Impervious Runoff Depth>3.51"
Flow Length=606' Tc=5.6 min CN=84 Runoff=13.30 cfs 0.885 af

Subcatchment S53: Runoff Area=5.340 ac 6.37% Impervious Runoff Depth>1.98"
Tc=15.8 min CN=67 Runoff=9.74 cfs 0.880 af

Subcatchment S54: Runoff Area=1.790 ac 11.17% Impervious Runoff Depth>2.14"
Flow Length=472' Tc=15.4 min CN=69 Runoff=3.59 cfs 0.319 af

Subcatchment S54.1: Runoff Area=1.570 ac 5.10% Impervious Runoff Depth>1.97"
Flow Length=540' Tc=17.8 min CN=67 Runoff=2.73 cfs 0.258 af

Subcatchment S55: Runoff Area=13.380 ac 10.31% Impervious Runoff Depth>2.05"
Flow Length=2,374' Tc=29.5 min CN=68 Runoff=19.66 cfs 2.280 af

Subcatchment S56: Runoff Area=4.240 ac 32.31% Impervious Runoff Depth>2.74"
Flow Length=954' Tc=14.6 min CN=76 Runoff=11.21 cfs 0.968 af

Subcatchment S62: Runoff Area=0.380 ac 100.00% Impervious Runoff Depth>5.02"
Tc=5.0 min CN=98 Runoff=2.12 cfs 0.159 af

Subcatchment S63: Runoff Area=1.040 ac 89.42% Impervious Runoff Depth>4.45"
Tc=5.0 min CN=93 Runoff=5.53 cfs 0.386 af

Reach 2R: Avg. Flow Depth=0.74' Max Vel=2.16 fps Inflow=30.53 cfs 2.967 af
n=0.030 L=460.0' S=0.0073 '/ Capacity=417.73 cfs Outflow=29.94 cfs 2.956 af

Reach 3R: Avg. Flow Depth=0.89' Max Vel=1.53 fps Inflow=30.74 cfs 2.974 af
n=0.030 L=195.0' S=0.0028 '/ Capacity=122.08 cfs Outflow=30.53 cfs 2.967 af

Reach 4R: Avg. Flow Depth=0.46' Max Vel=2.81 fps Inflow=15.25 cfs 0.521 af
n=0.030 L=183.0' S=0.0231 '/ Capacity=117.03 cfs Outflow=15.13 cfs 0.521 af

Reach 5R: Ditch	Avg. Flow Depth=0.00' Max Vel=0.00 fps Inflow=0.00 cfs 0.000 af x 2.00 n=0.030 L=65.0' S=0.2385 '/ Capacity=303.75 cfs Outflow=0.00 cfs 0.000 af
Reach 8R:	Avg. Flow Depth=0.00' Max Vel=0.00 fps Inflow=0.00 cfs 0.000 af n=0.030 L=730.0' S=0.0080 '/ Capacity=10.87 cfs Outflow=0.00 cfs 0.000 af
Reach G-1: Gutter	Avg. Flow Depth=0.28' Max Vel=2.31 fps Inflow=9.37 cfs 0.270 af x 2.00 n=0.030 L=240.0' S=0.0304 '/ Capacity=42.29 cfs Outflow=9.25 cfs 0.270 af
Reach G-2: Gutter	Avg. Flow Depth=0.00' Max Vel=0.00 fps Inflow=0.00 cfs 0.000 af n=0.030 L=260.0' S=0.0247 '/ Capacity=19.05 cfs Outflow=0.00 cfs 0.000 af
Reach L108: Ditch	Avg. Flow Depth=0.14' Max Vel=3.38 fps Inflow=19.92 cfs 1.538 af n=0.030 L=774.0' S=0.0646 '/ Capacity=1,762.00 cfs Outflow=19.42 cfs 1.527 af
Reach L133:	Avg. Flow Depth=0.57' Max Vel=4.72 fps Inflow=28.73 cfs 2.720 af n=0.030 L=344.0' S=0.0343 '/ Capacity=842.72 cfs Outflow=28.66 cfs 2.716 af
Reach L162:	Avg. Flow Depth=1.00' Max Vel=4.06 fps Inflow=26.43 cfs 2.406 af n=0.030 L=394.0' S=0.0124 '/ Capacity=120.49 cfs Outflow=26.31 cfs 2.401 af
Reach O5:	Inflow=13.48 cfs 2.217 af Outflow=13.48 cfs 2.217 af
Reach POA3:	Inflow=90.00 cfs 10.875 af Outflow=90.00 cfs 10.875 af
Pond 1R:	Peak Elev=47.58' Inflow=34.46 cfs 5.254 af Primary=19.75 cfs 4.211 af Secondary=20.47 cfs 1.083 af Outflow=34.46 cfs 5.254 af
Pond 2P: Blue Hill Intersection	Peak Elev=46.45' Storage=7,913 cf Inflow=69.48 cfs 3.687 af Outflow=66.13 cfs 3.663 af
Pond 7R:	Peak Elev=47.50' Inflow=19.66 cfs 2.280 af Primary=9.16 cfs 1.413 af Secondary=19.72 cfs 1.012 af Outflow=19.66 cfs 2.280 af
Pond L164:	Peak Elev=51.30' Storage=0 cf Inflow=13.30 cfs 0.885 af Primary=13.30 cfs 0.885 af Secondary=0.00 cfs 0.000 af Outflow=13.30 cfs 0.885 af
Pond L176:	Peak Elev=48.27' Inflow=2.12 cfs 0.159 af 12.0" Round Culvert n=0.014 L=242.0' S=0.0100 '/ Outflow=2.12 cfs 0.159 af
Pond L179:	Peak Elev=46.46' Inflow=31.92 cfs 6.746 af Primary=27.52 cfs 6.667 af Secondary=5.83 cfs 0.140 af Outflow=31.90 cfs 6.746 af
Pond LINK 110.1:	Peak Elev=52.32' Inflow=27.60 cfs 2.980 af Primary=12.59 cfs 2.459 af Secondary=15.25 cfs 0.521 af Outflow=27.60 cfs 2.980 af
Pond MH-A: 15" RCP	Peak Elev=163.16' Inflow=21.35 cfs 2.351 af Primary=11.98 cfs 2.081 af Secondary=9.37 cfs 0.270 af Outflow=21.35 cfs 2.351 af
Pond MH-B: 21" RCP	Peak Elev=150.94' Inflow=11.98 cfs 2.081 af 21.0" Round Culvert n=0.012 L=300.0' S=0.0060 '/ Outflow=11.98 cfs 2.081 af

Pond MH-C: Overflow Manhole Peak Elev=148.61' Inflow=13.48 cfs 2.217 af
Primary=13.48 cfs 2.217 af Secondary=0.00 cfs 0.000 af Outflow=13.48 cfs 2.217 af

Pond MH-D: Peak Elev=152.99' Storage=0 cf Inflow=18.72 cfs 1.378 af
Primary=18.72 cfs 1.378 af Secondary=0.00 cfs 0.000 af Outflow=18.72 cfs 1.378 af

Pond MH-E: 24" RCP Peak Elev=150.95' Inflow=19.92 cfs 1.538 af
24.0" Round Culvert n=0.012 L=260.0' S=0.0262 '/' Outflow=19.92 cfs 1.538 af

Pond MH-F: 24" RCP Peak Elev=148.29' Storage=0 cf Inflow=19.92 cfs 1.538 af
Primary=19.92 cfs 1.538 af Secondary=0.00 cfs 0.000 af Outflow=19.92 cfs 1.538 af

Pond P3: Peak Elev=45.89' Inflow=29.54 cfs 7.212 af
Primary=29.54 cfs 7.212 af Secondary=0.00 cfs 0.000 af Outflow=29.54 cfs 7.212 af

Pond P3B: Peak Elev=47.11' Inflow=23.19 cfs 3.427 af
Primary=12.18 cfs 2.535 af Secondary=16.54 cfs 0.931 af Outflow=23.19 cfs 3.427 af

Pond P3C: Peak Elev=46.88' Inflow=7.65 cfs 0.545 af
18.0" Round Culvert n=0.014 L=127.0' S=0.0172 '/' Outflow=7.65 cfs 0.545 af

Pond P53: Peak Elev=79.00' Storage=1,081 cf Inflow=26.49 cfs 2.407 af
Outflow=26.43 cfs 2.406 af

Total Runoff Area = 79.245 ac Runoff Volume = 12.871 af Average Runoff Depth = 1.95"
83.26% Pervious = 65.982 ac 16.74% Impervious = 13.263 ac

Summary for Subcatchment 5.1E:

Runoff = 1.94 cfs @ 12.11 hrs, Volume= 0.136 af, Depth> 2.23"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-20.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=5.50"

Area (sf)	CN	Description
18,551	49	50-75% Grass cover, Fair, HSG A
13,382	98	Paved parking & roofs
31,933	70	Weighted Average
18,551		58.09% Pervious Area
13,382		41.91% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.4	100	0.0400	0.22		Sheet Flow, Sheet Grass: Short n= 0.150 P2= 3.20"
0.2	42	0.0090	4.66	3.66	Pipe Channel, 12" RCP 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.012
7.6	142	Total			

Summary for Subcatchment S5.1A:

Runoff = 9.62 cfs @ 12.34 hrs, Volume= 1.108 af, Depth> 1.04"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-20.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=5.50"

Area (sf)	CN	Description
503,709	49	50-75% Grass cover, Fair, HSG A
54,325	98	Paved parking & roofs
558,034	54	Weighted Average
503,709		90.26% Pervious Area
54,325		9.74% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.9	100	0.0100	0.13		Sheet Flow, Sheet Grass: Short n= 0.150 P2= 3.20"
7.2	1,100	0.0250	2.55		Shallow Concentrated Flow, Shallow Conc Unpaved Kv= 16.1 fps
0.8	155	0.0250	3.21		Shallow Concentrated Flow, Shallow Conc Paved Kv= 20.3 fps
0.1	20	0.0100	4.91	3.86	Pipe Channel, 12" RCP 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.012
21.0	1,375	Total			

Summary for Subcatchment S5.1B:

Runoff = 21.35 cfs @ 12.37 hrs, Volume= 2.351 af, Depth> 1.66"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-20.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=5.50"

Area (sf)	CN	Description
468,516	49	50-75% Grass cover, Fair, HSG A
139,183	79	50-75% Grass cover, Fair, HSG C
132,557	98	Paved parking & roofs
740,256	63	Weighted Average
607,699		82.09% Pervious Area
132,557		17.91% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.9	100	0.0500	0.11		Sheet Flow, Sheet Woods: Light underbrush n= 0.400 P2= 3.20"
4.2	461	0.0130	1.84		Shallow Concentrated Flow, Shallow Conc Unpaved Kv= 16.1 fps
3.5	331	0.0060	1.57		Shallow Concentrated Flow, Shallow Conc Paved Kv= 20.3 fps
2.2	1,200	0.0250	9.02	11.06	Pipe Channel, 15" RCP 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012
24.8	2,092	Total			

Summary for Subcatchment S5.1C:

Runoff = 27.60 cfs @ 12.36 hrs, Volume= 2.980 af, Depth> 2.13"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-20.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=5.50"

Area (ac)	CN	Description
3.244	49	50-75% Grass cover, Fair, HSG A
11.502	69	50-75% Grass cover, Fair, HSG B
2.043	98	Paved parking & roofs
16.789	69	Weighted Average
14.746		87.83% Pervious Area
2.043		12.17% Impervious Area

3659-12003C-Existing Conditions POA 3-01

Type III 24-hr 25-Year Rainfall=5.50"

Prepared by {enter your company name here}

Printed 1/17/2013

HydroCAD® 10.00 s/n 00983 © 2012 HydroCAD Software Solutions LLC

Page 10

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.9	100	0.0500	0.11		Sheet Flow, Sheet Woods: Light underbrush n= 0.400 P2= 3.20"
8.1	590	0.0590	1.21		Shallow Concentrated Flow, Shallow Conc Woodland Kv= 5.0 fps
2.1	1,400	0.0500	10.99	8.63	Pipe Channel, Pipe 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.012
25.1	2,090	Total			

Summary for Subcatchment S5.1D:

Runoff = 1.96 cfs @ 12.17 hrs, Volume= 0.160 af, Depth> 1.67"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-20.00 hrs, dt= 0.01 hrs

Type III 24-hr 25-Year Rainfall=5.50"

Area (sf)	CN	Description
35,534	49	50-75% Grass cover, Fair, HSG A
14,475	98	Paved parking & roofs
50,009	63	Weighted Average
35,534		71.06% Pervious Area
14,475		28.94% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.8	100	0.0200	0.17		Sheet Flow, Sheet Grass: Short n= 0.150 P2= 3.20"
1.3	210	0.0280	2.69		Shallow Concentrated Flow, Shallow Conc Unpaved Kv= 16.1 fps
0.2	45	0.0100	4.91	3.86	Pipe Channel, 12" RCP 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.012
11.3	355	Total			

Summary for Subcatchment S52:

Runoff = 13.30 cfs @ 12.08 hrs, Volume= 0.885 af, Depth> 3.51"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-20.00 hrs, dt= 0.01 hrs

Type III 24-hr 25-Year Rainfall=5.50"

Area (ac)	CN	Description
1.420	69	50-75% Grass cover, Fair, HSG B
1.610	98	Paved parking & roofs
3.030	84	Weighted Average
1.420		46.86% Pervious Area
1.610		53.14% Impervious Area

3659-12003C-Existing Conditions POA 3-01

Type III 24-hr 25-Year Rainfall=5.50"

Prepared by {enter your company name here}

Printed 1/17/2013

HydroCAD® 10.00 s/n 00983 © 2012 HydroCAD Software Solutions LLC

Page 11

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.9	57	0.1316	0.32		Sheet Flow, Sheet Grass: Short n= 0.150 P2= 3.20"
2.1	264	0.0172	2.11		Shallow Concentrated Flow, Shallow Conc Unpaved Kv= 16.1 fps
0.6	285	0.0128	7.57	23.77	Pipe Channel, 24" RCP 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.014
5.6	606	Total			

Summary for Subcatchment S53:

Runoff = 9.74 cfs @ 12.23 hrs, Volume= 0.880 af, Depth> 1.98"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-20.00 hrs, dt= 0.01 hrs

Type III 24-hr 25-Year Rainfall=5.50"

Area (ac)	CN	Description
5.000	65	Woods/grass comb., Fair, HSG B
0.340	98	Water Surface, HSG A
5.340	67	Weighted Average
5.000		93.63% Pervious Area
0.340		6.37% Impervious Area

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

Summary for Subcatchment S54:

Runoff = 3.59 cfs @ 12.22 hrs, Volume= 0.319 af, Depth> 2.14"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-20.00 hrs, dt= 0.01 hrs

Type III 24-hr 25-Year Rainfall=5.50"

Area (ac)	CN	Description
1.590	65	Woods/grass comb., Fair, HSG B
0.200	98	Paved parking & roofs
1.790	69	Weighted Average
1.590		88.83% Pervious Area
0.200		11.17% Impervious Area

3659-12003C-Existing Conditions POA 3-01

Type III 24-hr 25-Year Rainfall=5.50"

Prepared by {enter your company name here}

Printed 1/17/2013

HydroCAD® 10.00 s/n 00983 © 2012 HydroCAD Software Solutions LLC

Page 12

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.8	100	0.0900	0.14		Sheet Flow, Sheet Woods: Light underbrush n= 0.400 P2= 3.20"
2.2	205	0.1000	1.58		Shallow Concentrated Flow, Shallow Conc Woodland Kv= 5.0 fps
1.4	167	0.0144	1.93		Shallow Concentrated Flow, Shallow Conc Unpaved Kv= 16.1 fps
15.4	472	Total			

Summary for Subcatchment S54.1:

Runoff = 2.73 cfs @ 12.25 hrs, Volume= 0.258 af, Depth> 1.97"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-20.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=5.50"

Area (ac)	CN	Description
1.490	65	Woods/grass comb., Fair, HSG B
0.080	98	Paved parking & roofs
1.570	67	Weighted Average
1.490		94.90% Pervious Area
0.080		5.10% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.0	100	0.0420	0.10		Sheet Flow, Sheet Woods: Light underbrush n= 0.400 P2= 3.20"
1.8	440	0.0641	4.08		Shallow Concentrated Flow, Shallow Conc Unpaved Kv= 16.1 fps
17.8	540	Total			

Summary for Subcatchment S55:

Runoff = 19.66 cfs @ 12.42 hrs, Volume= 2.280 af, Depth> 2.05"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-20.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=5.50"

Area (ac)	CN	Description
12.000	65	Woods/grass comb., Fair, HSG B
1.380	98	Paved parking & roofs
13.380	68	Weighted Average
12.000		89.69% Pervious Area
1.380		10.31% Impervious Area

3659-12003C-Existing Conditions POA 3-01

Type III 24-hr 25-Year Rainfall=5.50"

Prepared by {enter your company name here}

Printed 1/17/2013

HydroCAD® 10.00 s/n 00983 © 2012 HydroCAD Software Solutions LLC

Page 13

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.8	100	0.0500	0.25		Sheet Flow, Sheet Grass: Short n= 0.150 P2= 3.20"
1.0	275	0.0870	4.75		Shallow Concentrated Flow, Shallow Conc Unpaved Kv= 16.1 fps
2.7	585	0.0513	3.65		Shallow Concentrated Flow, Shallow Conc Unpaved Kv= 16.1 fps
3.1	257	0.0778	1.39		Shallow Concentrated Flow, Shallow Conc Woodland Kv= 5.0 fps
2.8	172	0.0407	1.01		Shallow Concentrated Flow, Shallow Conc Woodland Kv= 5.0 fps
5.1	380	0.0605	1.23		Shallow Concentrated Flow, Shallow Conc Woodland Kv= 5.0 fps
3.9	140	0.0143	0.60		Shallow Concentrated Flow, Shallow Conc Woodland Kv= 5.0 fps
4.1	465	0.0088	1.90		Shallow Concentrated Flow, Shallow Conc Paved Kv= 20.3 fps
29.5	2,374	Total			

Summary for Subcatchment S56:

Runoff = 11.21 cfs @ 12.20 hrs, Volume= 0.968 af, Depth> 2.74"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-20.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=5.50"

Area (ac)	CN	Description
2.870	65	Woods/grass comb., Fair, HSG B
1.370	98	Paved parking & roofs
4.240	76	Weighted Average
2.870		67.69% Pervious Area
1.370		32.31% Impervious Area

3659-12003C-Existing Conditions POA 3-01

Type III 24-hr 25-Year Rainfall=5.50"

Prepared by {enter your company name here}

Printed 1/17/2013

HydroCAD® 10.00 s/n 00983 © 2012 HydroCAD Software Solutions LLC

Page 14

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.6	100	0.0800	0.30		Sheet Flow, Sheet Grass: Short n= 0.150 P2= 3.20"
0.5	100	0.0500	3.60		Shallow Concentrated Flow, Sheet Unpaved Kv= 16.1 fps
0.2	42	0.0350	3.80		Shallow Concentrated Flow, Sheet Paved Kv= 20.3 fps
2.2	208	0.1024	1.60		Shallow Concentrated Flow, Shallow Conc Woodland Kv= 5.0 fps
0.7	170	0.0394	4.03		Shallow Concentrated Flow, Shallow Conc Paved Kv= 20.3 fps
1.6	132	0.0758	1.38		Shallow Concentrated Flow, Shallow Conc Woodland Kv= 5.0 fps
1.0	142	0.0141	2.41		Shallow Concentrated Flow, Shallow Conc Paved Kv= 20.3 fps
2.8	60	0.0050	0.35		Shallow Concentrated Flow, Shallow Conc Woodland Kv= 5.0 fps
14.6	954	Total			

Summary for Subcatchment S62:

Runoff = 2.12 cfs @ 12.07 hrs, Volume= 0.159 af, Depth> 5.02"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-20.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=5.50"

Area (ac)	CN	Description
0.380	98	Paved parking & roofs
0.380		100.00% Impervious Area

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

Summary for Subcatchment S63:

Runoff = 5.53 cfs @ 12.07 hrs, Volume= 0.386 af, Depth> 4.45"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-20.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=5.50"

Area (ac)	CN	Description
0.110	49	50-75% Grass cover, Fair, HSG A
0.930	98	Paved parking & roofs
1.040	93	Weighted Average
0.110		10.58% Pervious Area
0.930		89.42% Impervious Area

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

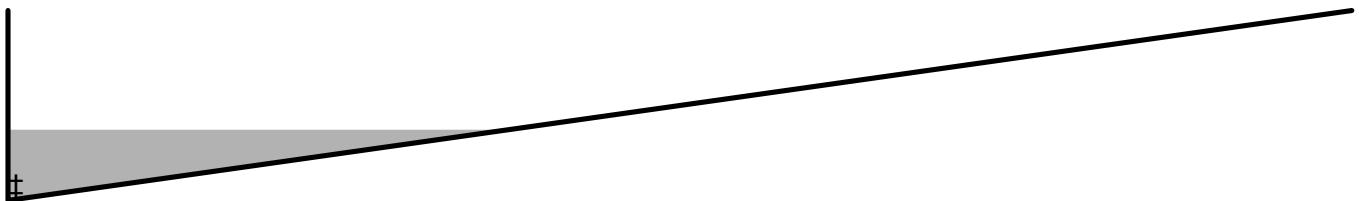
Summary for Reach 2R:

Inflow Area = 22.659 ac, 9.71% Impervious, Inflow Depth > 1.57" for 25-Year event
 Inflow = 30.53 cfs @ 12.45 hrs, Volume= 2.967 af
 Outflow = 29.94 cfs @ 12.50 hrs, Volume= 2.956 af, Atten= 2%, Lag= 2.8 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.01 hrs / 2
 Max. Velocity= 2.16 fps, Min. Travel Time= 3.5 min
 Avg. Velocity = 1.07 fps, Avg. Travel Time= 7.2 min

Peak Storage= 6,372 cf @ 12.50 hrs
 Average Depth at Peak Storage= 0.74'
 Bank-Full Depth= 2.00' Flow Area= 100.0 sf, Capacity= 417.73 cfs

0.00' x 2.00' deep channel, n= 0.030
 Side Slope Z-value= 0.0 50.0 '/' Top Width= 100.00'
 Length= 460.0' Slope= 0.0073 '/'
 Inlet Invert= 50.25', Outlet Invert= 46.89'



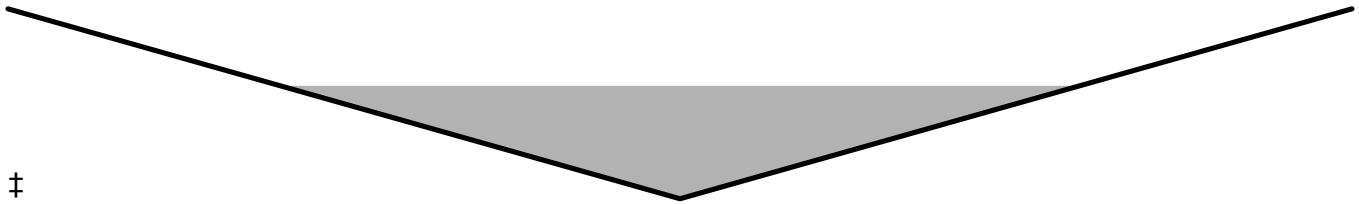
Summary for Reach 3R:

Inflow Area = 22.659 ac, 9.71% Impervious, Inflow Depth > 1.58" for 25-Year event
 Inflow = 30.74 cfs @ 12.43 hrs, Volume= 2.974 af
 Outflow = 30.53 cfs @ 12.45 hrs, Volume= 2.967 af, Atten= 1%, Lag= 1.6 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.01 hrs / 2
 Max. Velocity= 1.53 fps, Min. Travel Time= 2.1 min
 Avg. Velocity = 0.75 fps, Avg. Travel Time= 4.3 min

Peak Storage= 3,879 cf @ 12.45 hrs
 Average Depth at Peak Storage= 0.89'
 Bank-Full Depth= 1.50' Flow Area= 56.3 sf, Capacity= 122.08 cfs

0.00' x 1.50' deep channel, n= 0.030
 Side Slope Z-value= 25.0 '/' Top Width= 75.00'
 Length= 195.0' Slope= 0.0028 '/'
 Inlet Invert= 50.80', Outlet Invert= 50.25'



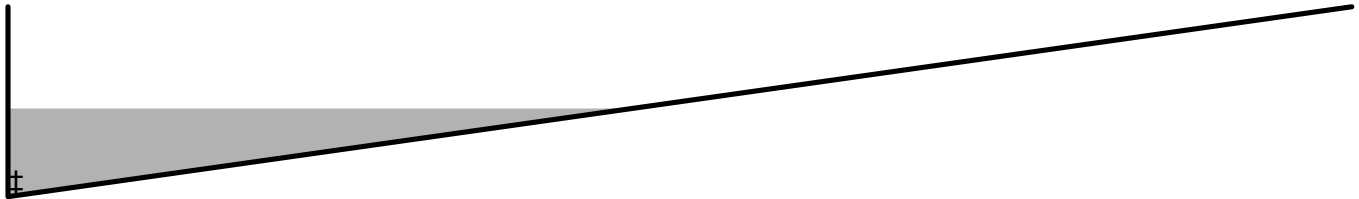
Summary for Reach 4R:

Inflow = 15.25 cfs @ 12.36 hrs, Volume= 0.521 af
 Outflow = 15.13 cfs @ 12.37 hrs, Volume= 0.521 af, Atten= 1%, Lag= 0.6 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.01 hrs / 2
 Max. Velocity= 2.81 fps, Min. Travel Time= 1.1 min
 Avg. Velocity = 1.04 fps, Avg. Travel Time= 2.9 min

Peak Storage= 986 cf @ 12.37 hrs
 Average Depth at Peak Storage= 0.46'
 Bank-Full Depth= 1.00' Flow Area= 25.0 sf, Capacity= 117.03 cfs

0.00' x 1.00' deep channel, n= 0.030
 Side Slope Z-value= 0.0 50.0 '/' Top Width= 50.00'
 Length= 183.0' Slope= 0.0231 '/'
 Inlet Invert= 51.23', Outlet Invert= 47.00'



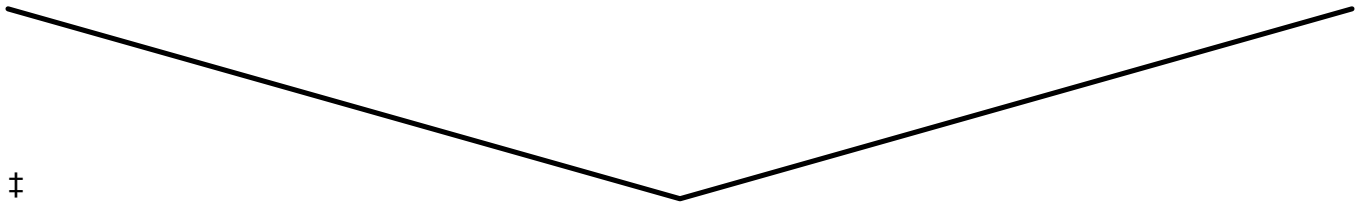
Summary for Reach 5R: Ditch

Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
 Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.01 hrs / 2
 Max. Velocity= 0.00 fps, Min. Travel Time= 0.0 min
 Avg. Velocity = 0.00 fps, Avg. Travel Time= 0.0 min

Peak Storage= 0 cf @ 0.00 hrs
 Average Depth at Peak Storage= 0.00'
 Bank-Full Depth= 1.00' Flow Area= 20.0 sf, Capacity= 303.75 cfs

A factor of 2.00 has been applied to the storage and discharge capacity
 0.00' x 1.00' deep channel, n= 0.030 Earth, dense weeds
 Side Slope Z-value= 10.0 '/' Top Width= 20.00'
 Length= 65.0' Slope= 0.2385 '/'
 Inlet Invert= 149.79', Outlet Invert= 134.29'



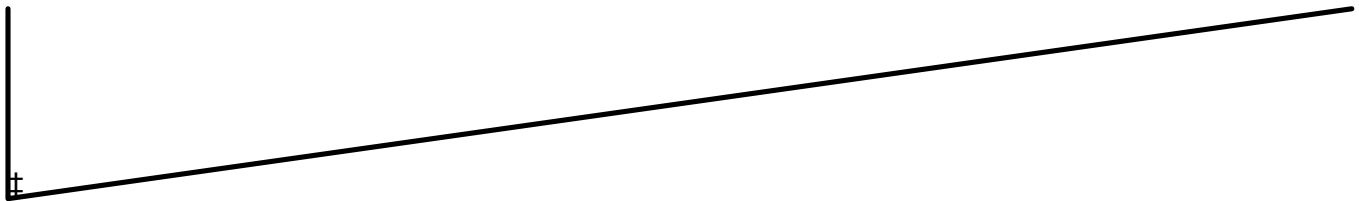
Summary for Reach 8R:

Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
 Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.01 hrs / 2
 Max. Velocity= 0.00 fps, Min. Travel Time= 0.0 min
 Avg. Velocity = 0.00 fps, Avg. Travel Time= 0.0 min

Peak Storage= 0 cf @ 0.00 hrs
 Average Depth at Peak Storage= 0.00'
 Bank-Full Depth= 0.50' Flow Area= 6.3 sf, Capacity= 10.87 cfs

0.00' x 0.50' deep channel, n= 0.030
 Side Slope Z-value= 0.0 50.0 '/' Top Width= 25.00'
 Length= 730.0' Slope= 0.0080 '/'
 Inlet Invert= 52.20', Outlet Invert= 46.33'



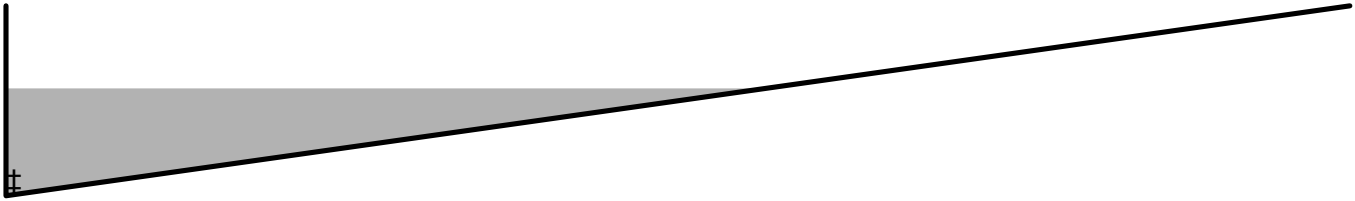
Summary for Reach G-1: Gutter

Inflow = 9.37 cfs @ 12.37 hrs, Volume= 0.270 af
 Outflow = 9.25 cfs @ 12.39 hrs, Volume= 0.270 af, Atten= 1%, Lag= 1.3 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.01 hrs / 2
 Max. Velocity= 2.31 fps, Min. Travel Time= 1.7 min
 Avg. Velocity = 0.63 fps, Avg. Travel Time= 6.4 min

Peak Storage= 959 cf @ 12.39 hrs
 Average Depth at Peak Storage= 0.28'
 Bank-Full Depth= 0.50' Flow Area= 12.5 sf, Capacity= 42.29 cfs

A factor of 2.00 has been applied to the storage and discharge capacity
 0.00' x 0.50' deep channel, n= 0.030
 Side Slope Z-value= 0.0 50.0 '/' Top Width= 25.00'
 Length= 240.0' Slope= 0.0304 '/'
 Inlet Invert= 162.60', Outlet Invert= 155.30'



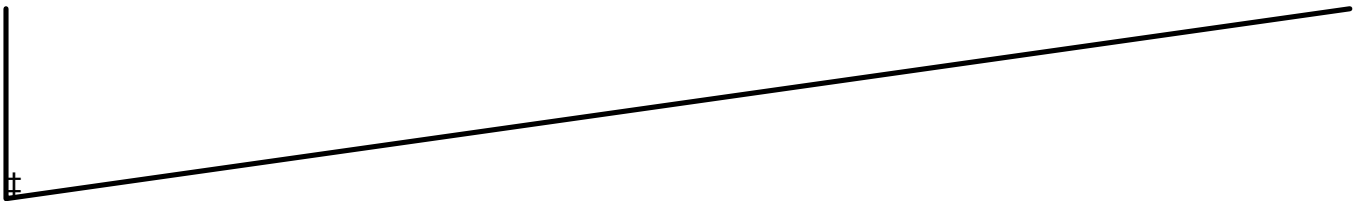
Summary for Reach G-2: Gutter

Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
 Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.01 hrs / 2
 Max. Velocity= 0.00 fps, Min. Travel Time= 0.0 min
 Avg. Velocity = 0.00 fps, Avg. Travel Time= 0.0 min

Peak Storage= 0 cf @ 0.00 hrs
 Average Depth at Peak Storage= 0.00'
 Bank-Full Depth= 0.50' Flow Area= 6.3 sf, Capacity= 19.05 cfs

0.00' x 0.50' deep channel, n= 0.030
 Side Slope Z-value= 0.0 50.0 '/' Top Width= 25.00'
 Length= 260.0' Slope= 0.0247 '/'
 Inlet Invert= 154.71', Outlet Invert= 148.29'



Summary for Reach L108: Ditch

Inflow Area = 13.959 ac, 11.31% Impervious, Inflow Depth > 1.32" for 25-Year event
 Inflow = 19.92 cfs @ 12.38 hrs, Volume= 1.538 af
 Outflow = 19.42 cfs @ 12.42 hrs, Volume= 1.527 af, Atten= 3%, Lag= 2.6 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.01 hrs / 2
 Max. Velocity= 3.38 fps, Min. Travel Time= 3.8 min
 Avg. Velocity = 1.24 fps, Avg. Travel Time= 10.4 min

Peak Storage= 4,451 cf @ 12.42 hrs
 Average Depth at Peak Storage= 0.14'
 Bank-Full Depth= 2.00' Flow Area= 100.0 sf, Capacity= 1,762.00 cfs

40.00' x 2.00' deep channel, n= 0.030
 Side Slope Z-value= 5.0 '/' Top Width= 60.00'
 Length= 774.0' Slope= 0.0646 '/'
 Inlet Invert= 132.00', Outlet Invert= 82.00'



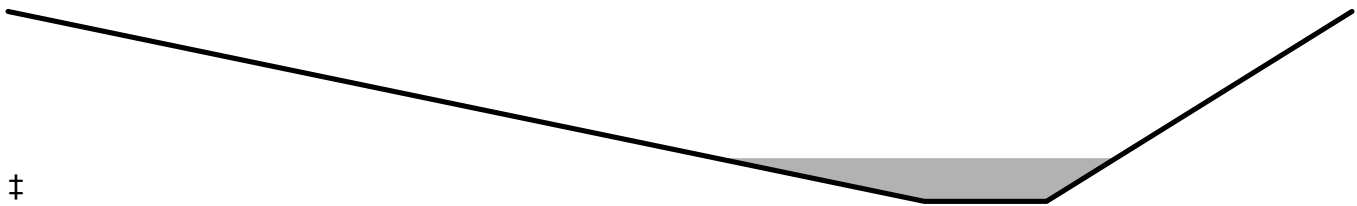
Summary for Reach L133:

Inflow Area = 21.089 ac, 10.05% Impervious, Inflow Depth > 1.55" for 25-Year event
 Inflow = 28.73 cfs @ 12.42 hrs, Volume= 2.720 af
 Outflow = 28.66 cfs @ 12.44 hrs, Volume= 2.716 af, Atten= 0%, Lag= 0.9 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.01 hrs / 2
 Max. Velocity= 4.72 fps, Min. Travel Time= 1.2 min
 Avg. Velocity = 2.10 fps, Avg. Travel Time= 2.7 min

Peak Storage= 2,088 cf @ 12.44 hrs
 Average Depth at Peak Storage= 0.57'
 Bank-Full Depth= 2.50' Flow Area= 75.0 sf, Capacity= 842.72 cfs

5.00' x 2.50' deep channel, n= 0.030
 Side Slope Z-value= 15.0 5.0 '/' Top Width= 55.00'
 Length= 344.0' Slope= 0.0343 '/'
 Inlet Invert= 62.60', Outlet Invert= 50.80'



Summary for Reach L162:

Inflow Area = 19.299 ac, 9.95% Impervious, Inflow Depth > 1.50" for 25-Year event
 Inflow = 26.43 cfs @ 12.41 hrs, Volume= 2.406 af
 Outflow = 26.31 cfs @ 12.43 hrs, Volume= 2.401 af, Atten= 0%, Lag= 1.2 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.01 hrs / 2
 Max. Velocity= 4.06 fps, Min. Travel Time= 1.6 min
 Avg. Velocity = 1.81 fps, Avg. Travel Time= 3.6 min

Peak Storage= 2,551 cf @ 12.43 hrs
 Average Depth at Peak Storage= 1.00'
 Bank-Full Depth= 2.00' Flow Area= 20.0 sf, Capacity= 120.49 cfs

3.00' x 2.00' deep channel, n= 0.030
 Side Slope Z-value= 3.5 '/' Top Width= 17.00'
 Length= 394.0' Slope= 0.0124 '/'
 Inlet Invert= 67.50', Outlet Invert= 62.60'



Summary for Reach O5:

Inflow Area = 17.727 ac, 18.90% Impervious, Inflow Depth > 1.50" for 25-Year event
 Inflow = 13.48 cfs @ 12.16 hrs, Volume= 2.217 af
 Outflow = 13.48 cfs @ 12.16 hrs, Volume= 2.217 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.01 hrs / 2

Summary for Reach POA3:

Inflow Area = 61.518 ac, 16.11% Impervious, Inflow Depth > 2.12" for 25-Year event
 Inflow = 90.00 cfs @ 12.42 hrs, Volume= 10.875 af
 Outflow = 90.00 cfs @ 12.42 hrs, Volume= 10.875 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.01 hrs / 2

Summary for Pond 1R:

Inflow Area = 39.069 ac, 13.28% Impervious, Inflow Depth > 1.61" for 25-Year event
 Inflow = 34.46 cfs @ 12.44 hrs, Volume= 5.254 af
 Outflow = 34.46 cfs @ 12.44 hrs, Volume= 5.254 af, Atten= 0%, Lag= 0.0 min
 Primary = 19.75 cfs @ 12.75 hrs, Volume= 4.211 af
 Secondary = 20.47 cfs @ 12.44 hrs, Volume= 1.083 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.01 hrs / 2

Peak Elev= 47.58' @ 12.44 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	42.10'	24.0" Round Culvert L= 150.0' Ke= 0.500 Inlet / Outlet Invert= 42.10' / 41.90' S= 0.0013 '/ Cc= 0.900 n= 0.014, Flow Area= 3.14 sf
#2	Secondary	46.33'	24.0" x 24.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=4.42 cfs @ 12.75 hrs HW=46.54' TW=46.43' (Dynamic Tailwater)

↑**1=Culvert** (Outlet Controls 4.42 cfs @ 1.41 fps)

Secondary OutFlow Max=20.46 cfs @ 12.44 hrs HW=47.58' TW=46.45' (Dynamic Tailwater)

↑**2=Orifice/Grate** (Orifice Controls 20.46 cfs @ 5.11 fps)

Summary for Pond 2P: Blue Hill Intersection

Inflow = 69.48 cfs @ 12.37 hrs, Volume= 3.687 af
 Outflow = 66.13 cfs @ 12.44 hrs, Volume= 3.663 af, Atten= 5%, Lag= 4.1 min
 Primary = 66.13 cfs @ 12.44 hrs, Volume= 3.663 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.01 hrs / 2
 Peak Elev= 46.45' @ 12.44 hrs Surf.Area= 26,059 sf Storage= 7,913 cf

Plug-Flow detention time= 2.6 min calculated for 3.661 af (99% of inflow)
 Center-of-Mass det. time= 2.3 min (752.0 - 749.6)

Volume	Invert	Avail.Storage	Storage Description
#1	45.50'	29,372 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
45.50	1	0	0
46.00	4,216	1,054	1,054
47.00	52,420	28,318	29,372

Device	Routing	Invert	Outlet Devices
#1	Primary	46.00'	Curb, C= 3.27 Offset (feet) 0.00 140.50 231.95 323.40 493.00 Elev. (feet) 47.50 46.50 46.00 46.50 47.50

Primary OutFlow Max=66.13 cfs @ 12.44 hrs HW=46.45' TW=0.00' (Dynamic Tailwater)
 ←1=Curb (Weir Controls 66.13 cfs @ 0.88 fps)

Summary for Pond 7R:

Inflow Area = 13.380 ac, 10.31% Impervious, Inflow Depth > 2.05" for 25-Year event
 Inflow = 19.66 cfs @ 12.42 hrs, Volume= 2.280 af
 Outflow = 19.66 cfs @ 12.42 hrs, Volume= 2.280 af, Atten= 0%, Lag= 0.0 min
 Primary = 9.16 cfs @ 12.89 hrs, Volume= 1.413 af
 Secondary = 19.72 cfs @ 12.43 hrs, Volume= 1.012 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.01 hrs / 2
 Peak Elev= 47.50' @ 12.43 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	43.90'	24.0" Round Culvert L= 20.0' Ke= 0.500 Inlet / Outlet Invert= 43.90' / 42.10' S= 0.0900 1/ S= 0.0900 1/ Cc= 0.900 n= 0.014, Flow Area= 3.14 sf
#2	Secondary	46.33'	24.0" x 24.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.00 cfs @ 12.89 hrs HW=46.83' TW=46.95' (Dynamic Tailwater)

↑1=Culvert (Controls 0.00 cfs)

Secondary OutFlow Max=19.47 cfs @ 12.43 hrs HW=47.47' TW=46.45' (Dynamic Tailwater)

↑2=Orifice/Grate (Orifice Controls 19.47 cfs @ 4.87 fps)

Summary for Pond L164:

Inflow Area = 3.030 ac, 53.14% Impervious, Inflow Depth > 3.51" for 25-Year event
 Inflow = 13.30 cfs @ 12.08 hrs, Volume= 0.885 af
 Outflow = 13.30 cfs @ 12.08 hrs, Volume= 0.885 af, Atten= 0%, Lag= 0.0 min
 Primary = 13.30 cfs @ 12.08 hrs, Volume= 0.885 af
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.01 hrs / 2
 Peak Elev= 51.30' @ 12.07 hrs Surf.Area= 2 sf Storage= 0 cf

Plug-Flow detention time= 0.0 min calculated for 0.885 af (100% of inflow)
 Center-of-Mass det. time= 0.0 min (774.0 - 774.0)

Volume	Invert	Avail.Storage	Storage Description
#1	51.30'	5,183 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
51.30	1	0	0
52.00	4,805	1,682	1,682
52.50	9,200	3,501	5,183

Device	Routing	Invert	Outlet Devices
#1	Primary	45.80'	24.0" Round Culvert L= 720.0' Ke= 0.500 Inlet / Outlet Invert= 45.80' / 42.10' S= 0.0051 '/' Cc= 0.900 n= 0.014, Flow Area= 3.14 sf
#2	Secondary	51.50'	30.0' long x 10.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=15.32 cfs @ 12.08 hrs HW=51.30' TW=46.90' (Dynamic Tailwater)

↑1=Culvert (Outlet Controls 15.32 cfs @ 4.88 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=51.30' TW=52.20' (Dynamic Tailwater)

↑2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Summary for Pond L176:

Inflow Area = 0.380 ac, 100.00% Impervious, Inflow Depth > 5.02" for 25-Year event
 Inflow = 2.12 cfs @ 12.07 hrs, Volume= 0.159 af
 Outflow = 2.12 cfs @ 12.07 hrs, Volume= 0.159 af, Atten= 0%, Lag= 0.0 min
 Primary = 2.12 cfs @ 12.07 hrs, Volume= 0.159 af

3659-12003C-Existing Conditions POA 3-01

Type III 24-hr 25-Year Rainfall=5.50"

Prepared by {enter your company name here}

Printed 1/17/2013

HydroCAD® 10.00 s/n 00983 © 2012 HydroCAD Software Solutions LLC

Page 23

Routing by Dyn-Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.01 hrs / 2
 Peak Elev= 48.27' @ 12.07 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	45.80'	12.0" Round Culvert L= 242.0' Square-edged headwall, Ke= 0.500 Inlet / Outlet Invert= 45.80' / 43.38' S= 0.0100 '/ Cc= 0.900 n= 0.014, Flow Area= 0.79 sf

Primary OutFlow Max=3.50 cfs @ 12.07 hrs HW=48.26' TW=45.08' (Dynamic Tailwater)

↑1=Culvert (Outlet Controls 3.50 cfs @ 4.46 fps)

Summary for Pond L179:

Inflow Area = 60.098 ac, 14.31% Impervious, Inflow Depth > 1.35" for 25-Year event
 Inflow = 31.92 cfs @ 12.75 hrs, Volume= 6.746 af
 Outflow = 31.90 cfs @ 12.75 hrs, Volume= 6.746 af, Atten= 0%, Lag= 0.0 min
 Primary = 27.52 cfs @ 12.91 hrs, Volume= 6.667 af
 Secondary = 5.83 cfs @ 12.06 hrs, Volume= 0.140 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.01 hrs / 2
 Peak Elev= 46.46' @ 12.36 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	41.90'	24.0" Round Culvert L= 60.0' Square-edged headwall, Ke= 0.500 Inlet / Outlet Invert= 41.90' / 41.10' S= 0.0133 '/ Cc= 0.900 n= 0.014, Flow Area= 3.14 sf
#2	Secondary	45.92'	24.0" x 24.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=13.72 cfs @ 12.91 hrs HW=46.26' TW=45.44' (Dynamic Tailwater)

↑1=Culvert (Inlet Controls 13.72 cfs @ 4.37 fps)

Secondary OutFlow Max=0.00 cfs @ 12.06 hrs HW=46.18' TW=46.26' (Dynamic Tailwater)

↑2=Orifice/Grate (Controls 0.00 cfs)

Summary for Pond LINK 110.1:

Inflow Area = 16.789 ac, 12.17% Impervious, Inflow Depth > 2.13" for 25-Year event
 Inflow = 27.60 cfs @ 12.36 hrs, Volume= 2.980 af
 Outflow = 27.60 cfs @ 12.36 hrs, Volume= 2.980 af, Atten= 0%, Lag= 0.0 min
 Primary = 12.59 cfs @ 12.35 hrs, Volume= 2.459 af
 Secondary = 15.25 cfs @ 12.36 hrs, Volume= 0.521 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.01 hrs / 2
 Peak Elev= 52.32' @ 12.36 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	46.45'	18.0" Round Culvert L= 260.0' Square-edged headwall, Ke= 0.500 Inlet / Outlet Invert= 46.45' / 42.50' S= 0.0152 '/ Cc= 0.900

3659-12003C-Existing Conditions POA 3-01

Type III 24-hr 25-Year Rainfall=5.50"

Prepared by {enter your company name here}

Printed 1/17/2013

HydroCAD® 10.00 s/n 00983 © 2012 HydroCAD Software Solutions LLC

Page 24

#2 Secondary 51.23' n= 0.014, Flow Area= 1.77 sf
24.0" x 24.0" Horiz. Orifice/Grate C= 0.600
 Limited to weir flow at low heads

Primary OutFlow Max=12.33 cfs @ 12.35 hrs HW=52.30' TW=47.00' (Dynamic Tailwater)
 ↑**1=Culvert** (Outlet Controls 12.33 cfs @ 6.97 fps)

Secondary OutFlow Max=15.21 cfs @ 12.36 hrs HW=52.32' TW=51.69' (Dynamic Tailwater)
 ↑**2=Orifice/Grate** (Orifice Controls 15.21 cfs @ 3.80 fps)

Summary for Pond MH-A: 15" RCP

Inflow Area = 16.994 ac, 17.91% Impervious, Inflow Depth > 1.66" for 25-Year event
 Inflow = 21.35 cfs @ 12.37 hrs, Volume= 2.351 af
 Outflow = 21.35 cfs @ 12.37 hrs, Volume= 2.351 af, Atten= 0%, Lag= 0.0 min
 Primary = 11.98 cfs @ 12.37 hrs, Volume= 2.081 af
 Secondary = 9.37 cfs @ 12.37 hrs, Volume= 0.270 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.01 hrs / 2
 Peak Elev= 163.16' @ 12.37 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	157.00'	15.0" Round Culvert L= 250.0' Ke= 0.500 Inlet / Outlet Invert= 157.00' / 149.00' S= 0.0320 '/' Cc= 0.900 n= 0.014, Flow Area= 1.23 sf
#2	Secondary	162.60'	24.0" x 24.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=11.98 cfs @ 12.37 hrs HW=163.16' TW=150.94' (Dynamic Tailwater)
 ↑**1=Culvert** (Outlet Controls 11.98 cfs @ 9.76 fps)

Secondary OutFlow Max=9.36 cfs @ 12.37 hrs HW=163.16' TW=162.88' (Dynamic Tailwater)
 ↑**2=Orifice/Grate** (Weir Controls 9.36 cfs @ 2.08 fps)

Summary for Pond MH-B: 21" RCP

Inflow Area = 16.994 ac, 17.91% Impervious, Inflow Depth > 1.47" for 25-Year event
 Inflow = 11.98 cfs @ 12.37 hrs, Volume= 2.081 af
 Outflow = 11.98 cfs @ 12.37 hrs, Volume= 2.081 af, Atten= 0%, Lag= 0.0 min
 Primary = 11.98 cfs @ 12.37 hrs, Volume= 2.081 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.01 hrs / 2
 Peak Elev= 150.94' @ 12.37 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	149.00'	21.0" Round Culvert L= 300.0' Ke= 0.500 Inlet / Outlet Invert= 149.00' / 147.20' S= 0.0060 '/' Cc= 0.900 n= 0.012, Flow Area= 2.41 sf

Primary OutFlow Max=11.98 cfs @ 12.37 hrs HW=150.94' TW=148.51' (Dynamic Tailwater)
 ↑**1=Culvert** (Inlet Controls 11.98 cfs @ 4.98 fps)

Summary for Pond MH-C: Overflow Manhole

Inflow Area = 17.727 ac, 18.90% Impervious, Inflow Depth > 1.50" for 25-Year event
 Inflow = 13.48 cfs @ 12.16 hrs, Volume= 2.217 af
 Outflow = 13.48 cfs @ 12.16 hrs, Volume= 2.217 af, Atten= 0%, Lag= 0.0 min
 Primary = 13.48 cfs @ 12.16 hrs, Volume= 2.217 af
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.01 hrs / 2
 Peak Elev= 148.61' @ 12.16 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	146.35'	24.0" Round Culvert L= 373.0' Ke= 0.500 Inlet / Outlet Invert= 146.35' / 145.32' S= 0.0028 '/ Cc= 0.900 n= 0.012, Flow Area= 3.14 sf
#2	Secondary	150.19'	12.0" Round Culvert L= 10.0' Ke= 0.500 Inlet / Outlet Invert= 150.19' / 150.09' S= 0.0100 '/ Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=13.47 cfs @ 12.16 hrs HW=148.61' TW=0.00' (Dynamic Tailwater)
 ↑1=Culvert (Barrel Controls 13.47 cfs @ 4.75 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=146.35' TW=145.91' (Dynamic Tailwater)
 ↑2=Culvert (Controls 0.00 cfs)

Summary for Pond MH-D:

Inflow Area = 12.811 ac, 9.74% Impervious, Inflow Depth > 1.29" for 25-Year event
 Inflow = 18.72 cfs @ 12.38 hrs, Volume= 1.378 af
 Outflow = 18.72 cfs @ 12.38 hrs, Volume= 1.378 af, Atten= 0%, Lag= 0.0 min
 Primary = 18.72 cfs @ 12.38 hrs, Volume= 1.378 af
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.01 hrs / 2
 Peak Elev= 152.99' @ 12.38 hrs Surf.Area= 14 sf Storage= 0 cf

Plug-Flow detention time= 0.0 min calculated for 1.378 af (100% of inflow)
 Center-of-Mass det. time= 0.0 min (827.9 - 827.9)

Volume	Invert	Avail.Storage	Storage Description
#1	152.99'	89,175 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
152.99	0	0	0
154.71	14,500	12,470	12,470
160.00	14,500	76,705	89,175

Device	Routing	Invert	Outlet Devices
#1	Primary	148.04'	24.0" Round Culvert L= 140.0' Ke= 0.500 Inlet / Outlet Invert= 148.04' / 145.89' S= 0.0154 '/ Cc= 0.900

#2 Secondary 154.71' n= 0.012, Flow Area= 3.14 sf
20.0' long x 20.0' breadth Broad-Crested Rectangular Weir
 Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60
 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=20.86 cfs @ 12.38 hrs HW=152.99' TW=150.95' (Dynamic Tailwater)
 ↑1=Culvert (Outlet Controls 20.86 cfs @ 6.64 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=152.99' TW=154.71' (Dynamic Tailwater)
 ↑2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Summary for Pond MH-E: 24" RCP

Inflow Area = 13.959 ac, 11.31% Impervious, Inflow Depth > 1.32" for 25-Year event
 Inflow = 19.92 cfs @ 12.38 hrs, Volume= 1.538 af
 Outflow = 19.92 cfs @ 12.38 hrs, Volume= 1.538 af, Atten= 0%, Lag= 0.0 min
 Primary = 19.92 cfs @ 12.38 hrs, Volume= 1.538 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.01 hrs / 2
 Peak Elev= 150.95' @ 12.38 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	145.89'	24.0" Round Culvert L= 260.0' Ke= 0.500 Inlet / Outlet Invert= 145.89' / 139.09' S= 0.0262 '/' Cc= 0.900 n= 0.012, Flow Area= 3.14 sf

Primary OutFlow Max=19.92 cfs @ 12.38 hrs HW=150.95' TW=148.29' (Dynamic Tailwater)
 ↑1=Culvert (Outlet Controls 19.92 cfs @ 6.34 fps)

Summary for Pond MH-F: 24" RCP

Inflow Area = 13.959 ac, 11.31% Impervious, Inflow Depth > 1.32" for 25-Year event
 Inflow = 19.92 cfs @ 12.38 hrs, Volume= 1.538 af
 Outflow = 19.92 cfs @ 12.38 hrs, Volume= 1.538 af, Atten= 0%, Lag= 0.0 min
 Primary = 19.92 cfs @ 12.38 hrs, Volume= 1.538 af
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.01 hrs / 2
 Peak Elev= 148.29' @ 12.35 hrs Surf.Area= 0 sf Storage= 0 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 0.0 min (827.2 - 827.2)

Volume	Invert	Avail.Storage	Storage Description
#1	148.29'	8,878 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
148.29	0	0	0
149.79	810	608	608
160.00	810	8,270	8,878

Device	Routing	Invert	Outlet Devices
#1	Primary	136.51'	24.0" Round Culvert L= 75.0' Ke= 0.500 Inlet / Outlet Invert= 136.51' / 134.29' S= 0.0296 '/ Cc= 0.900 n= 0.012, Flow Area= 3.14 sf
#2	Secondary	149.79'	40.0' long x 5.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=49.67 cfs @ 12.38 hrs HW=148.29' TW=132.14' (Dynamic Tailwater)

↑1=Culvert (Inlet Controls 49.67 cfs @ 15.81 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=148.29' TW=149.79' (Dynamic Tailwater)

↑2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Summary for Pond P3:

Inflow Area = 61.518 ac, 16.11% Impervious, Inflow Depth > 1.41" for 25-Year event
 Inflow = 29.54 cfs @ 12.06 hrs, Volume= 7.212 af
 Outflow = 29.54 cfs @ 12.06 hrs, Volume= 7.212 af, Atten= 0%, Lag= 0.0 min
 Primary = 29.54 cfs @ 12.06 hrs, Volume= 7.212 af
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.01 hrs / 2
 Peak Elev= 45.89' @ 12.06 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	41.10'	24.0" Round Culvert L= 52.0' Ke= 0.500 Inlet / Outlet Invert= 41.10' / 40.66' S= 0.0085 '/ Cc= 0.900 n= 0.014, Flow Area= 3.14 sf
#2	Secondary	45.79'	24.0" x 24.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=28.73 cfs @ 12.06 hrs HW=45.71' TW=0.00' (Dynamic Tailwater)

↑1=Culvert (Inlet Controls 28.73 cfs @ 9.15 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=41.10' TW=45.50' (Dynamic Tailwater)

↑2=Orifice/Grate (Controls 0.00 cfs)

Summary for Pond P3B:

Inflow Area = 21.029 ac, 16.23% Impervious, Inflow Depth > 1.96" for 25-Year event
 Inflow = 23.19 cfs @ 12.20 hrs, Volume= 3.427 af
 Outflow = 23.19 cfs @ 12.20 hrs, Volume= 3.427 af, Atten= 0%, Lag= 0.0 min
 Primary = 12.18 cfs @ 12.88 hrs, Volume= 2.535 af
 Secondary = 16.54 cfs @ 12.20 hrs, Volume= 0.931 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.01 hrs / 2

3659-12003C-Existing Conditions POA 3-01

Type III 24-hr 25-Year Rainfall=5.50"

Prepared by {enter your company name here}

Printed 1/17/2013

HydroCAD® 10.00 s/n 00983 © 2012 HydroCAD Software Solutions LLC

Page 28

Peak Elev= 47.11' @ 12.23 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	42.40'	18.0" Round Culvert L= 63.0' Square-edged headwall, Ke= 0.500 Inlet / Outlet Invert= 42.40' / 41.90' S= 0.0079 '/ Cc= 0.900 n= 0.014, Flow Area= 1.77 sf
#2	Secondary	45.92'	24.0" x 24.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.00 cfs @ 12.88 hrs HW=46.02' TW=46.31' (Dynamic Tailwater)↑**1=Culvert** (Controls 0.00 cfs)**Secondary OutFlow** Max=16.03 cfs @ 12.20 hrs HW=47.06' TW=46.37' (Dynamic Tailwater)↑**2=Orifice/Grate** (Orifice Controls 16.03 cfs @ 4.01 fps)**Summary for Pond P3C:**

Inflow Area = 1.420 ac, 92.25% Impervious, Inflow Depth > 4.60" for 25-Year event
 Inflow = 7.65 cfs @ 12.07 hrs, Volume= 0.545 af
 Outflow = 7.65 cfs @ 12.07 hrs, Volume= 0.545 af, Atten= 0%, Lag= 0.0 min
 Primary = 7.65 cfs @ 12.07 hrs, Volume= 0.545 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.01 hrs / 2

Peak Elev= 46.88' @ 12.05 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	43.38'	18.0" Round Culvert L= 127.0' Square-edged headwall, Ke= 0.500 Inlet / Outlet Invert= 43.38' / 41.20' S= 0.0172 '/ Cc= 0.900 n= 0.014, Flow Area= 1.77 sf

Primary OutFlow Max=5.78 cfs @ 12.07 hrs HW=45.16' TW=44.49' (Dynamic Tailwater)↑**1=Culvert** (Outlet Controls 5.78 cfs @ 3.47 fps)**Summary for Pond P53:**

Inflow Area = 19.299 ac, 9.95% Impervious, Inflow Depth > 1.50" for 25-Year event
 Inflow = 26.49 cfs @ 12.40 hrs, Volume= 2.407 af
 Outflow = 26.43 cfs @ 12.41 hrs, Volume= 2.406 af, Atten= 0%, Lag= 0.8 min
 Primary = 26.43 cfs @ 12.41 hrs, Volume= 2.406 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.01 hrs / 2

Peak Elev= 79.00' @ 12.41 hrs Surf.Area= 2,169 sf Storage= 1,081 cf

Plug-Flow detention time= 0.5 min calculated for 2.405 af (100% of inflow)

Center-of-Mass det. time= 0.4 min (826.9 - 826.5)

Volume	Invert	Avail.Storage	Storage Description
#1	78.00'	43,344 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

3659-12003C-Existing Conditions POA 3-01

Type III 24-hr 25-Year Rainfall=5.50"

Prepared by {enter your company name here}

Printed 1/17/2013

HydroCAD® 10.00 s/n 00983 © 2012 HydroCAD Software Solutions LLC

Page 29

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
78.00	0	0	0
78.25	545	68	68
78.50	1,089	204	272
78.75	1,634	340	613
79.00	2,178	477	1,089
79.25	3,920	762	1,852
79.50	5,663	1,198	3,049
79.75	7,405	1,634	4,683
80.00	9,148	2,069	6,752
84.00	9,148	36,592	43,344

Device	Routing	Invert	Outlet Devices
#1	Primary	78.00'	10.0' long x 2.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Primary OutFlow Max=26.43 cfs @ 12.41 hrs HW=79.00' TW=68.50' (Dynamic Tailwater)

↑1=**Broad-Crested Rectangular Weir** (Weir Controls 26.43 cfs @ 2.65 fps)