

**02587 (6-10-03)Existing**

Prepared by RFC ENGINEERING, INC.

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Type II 24-hr Rainfall=5.85"

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Time span=0.00-40.00 hrs, dt=0.01 hrs, 4001 points  
Runoff by SCS TR-20 method, UH=SCS, Type II 24-hr Rainfall=5.85"  
Reach routing by Sim-Route method - Pond routing by Sim-Route method

**Subcatchment 181: 181ST AVENUE**

Tc=3.9 min CN=98 Area=0.790 ac Runoff= 7.03 cfs 0.369 af

**Subcatchment 414: 414S FROM CITY CALCS**

Tc=43.3 min CN=72 Area=10.000 ac Runoff= 19.16 cfs 2.393 af

**Subcatchment 416: 416S FROM CITY CALCS**

Tc=40.0 min CN=75 Area=22.760 ac Runoff= 51.10 cfs 5.983 af

**Subcatchment 419: 419S FROM CITY CALCS**

Tc=85.4 min CN=65 Area=127.000 ac Runoff= 111.38 cfs 23.737 af

**Subcatchment 421: 421S FROM CITY CALCS**

Tc=36.2 min CN=67 Area=9.000 ac Runoff= 16.18 cfs 1.813 af

**Subcatchment BY: STREET & BACKYARDS**

Tc=12.4 min CN=77 Area=3.250 ac Runoff= 15.35 cfs 0.907 af

**Subcatchment EX1: (new node)**

Tc=21.9 min CN=44 Area=3.950 ac Runoff= 1.61 cfs 0.224 af

**Subcatchment EX2: (new node)**

Tc=19.4 min CN=57 Area=8.572 ac Runoff= 14.04 cfs 1.133 af

**Subcatchment EX3: (new node)**

Tc=15.9 min CN=59 Area=13.950 ac Runoff= 28.93 cfs 2.027 af

**Subcatchment EX4: (new node)**

Tc=12.3 min CN=50 Area=4.098 ac Runoff= 5.17 cfs 0.365 af

**Subcatchment EX65: OFFSITE HWY 65**

Tc=6.3 min CN=53 Area=347,918 sf Runoff= 16.95 cfs 0.854 af

**Subcatchment EXCC: COUNTRY CREEK 1**

Tc=33.9 min CN=70 Area=21.330 ac Runoff= 45.17 cfs 4.776 af

**Subcatchment EXTRA: RUSTIC ACRES 1**

Tc=19.2 min CN=51 Area=2.500 ac Runoff= 2.63 cfs 0.238 af

**Pond 29: DITCH TO 24" CULVERT**

Peak Storage= 15,554 cf Inflow= 36.27 cfs 10.568 af  
Primary= 17.81 cfs 10.610 af Outflow= 17.81 cfs 10.610 af

**Pond EXWA: EXISTING WETLAND A**

Peak Storage= 1.664 af Inflow= 16.84 cfs 3.617 af  
Primary= 25.77 cfs 3.287 af Outflow= 25.77 cfs 3.287 af

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Type II 24-hr Rainfall=5.85"

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**Pond EXWB: EXISTING WETLAND B**

Peak Storage= 2.653 af Inflow= 78.72 cfs 38.703 af  
Primary= 63.78 cfs 38.685 af Outflow= 63.78 cfs 38.685 af

**Pond P414: 414P FROM CITY CALCS**

Peak Storage= 1.154 af Inflow= 19.16 cfs 2.393 af  
Primary= 4.06 cfs 2.247 af Outflow= 4.06 cfs 2.247 af

**Pond P416: 416P FROM CITY CALCS**

Peak Storage= 2.160 af Inflow= 51.10 cfs 5.983 af  
Primary= 17.13 cfs 5.662 af Outflow= 17.13 cfs 5.662 af

**Pond P419: 419P FROM CITY CALCS**

Peak Storage= 14.637 af Inflow= 116.02 cfs 25.507 af  
Primary= 16.99 cfs 20.213 af Outflow= 16.99 cfs 20.213 af

**Pond P421: 421P FROM CITY CALCS**

Peak Storage= 0.716 af Inflow= 16.18 cfs 1.813 af  
Primary= 4.64 cfs 1.770 af Outflow= 4.64 cfs 1.770 af

**Pond PBY: BACKYARD POND**

Peak Storage= 20,097 cf Inflow= 15.35 cfs 0.907 af  
Primary= 3.36 cfs 0.884 af Outflow= 3.36 cfs 0.884 af

**Runoff Area = 235.187 ac Volume = 44.819 af Average Depth = 2.29"**

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Type II 24-hr Rainfall=5.85"

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**Subcatchment 181: 181ST AVENUE**

Runoff = 7.03 cfs @ 11.94 hrs, Volume= 0.369 af

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-40.00 hrs, dt= 0.01 hrs  
Type II 24-hr Rainfall=5.85"

Area (ac)	CN	Description
0.790	98	STREET

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.9	500	0.0200	2.1		Shallow Concentrated Flow, Grassed Waterway Kv= 15.0 fps

**Subcatchment 414: 414S FROM CITY CALCS**

Runoff = 19.16 cfs @ 12.41 hrs, Volume= 2.393 af

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-40.00 hrs, dt= 0.01 hrs  
Type II 24-hr Rainfall=5.85"

Area (ac)	CN	Description
2.795	100	POND
7.205	61	OPEN SPACES
10.000	72	Weighted Average

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
17.6	500	0.0010	0.5		Shallow Concentrated Flow, Grassed Waterway Kv= 15.0 fps
25.7	300	0.0200	0.2		Sheet Flow, Grass: Short n= 0.150 P2= 2.70"
43.3	800	Total			

**Subcatchment 416: 416S FROM CITY CALCS**

Runoff = 51.10 cfs @ 12.36 hrs, Volume= 5.983 af

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-40.00 hrs, dt= 0.01 hrs  
Type II 24-hr Rainfall=5.85"

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Area (ac)	CN	Description
1.390	78	SUB #1 (-3.250 AC)
10.090	74	SUB #2
2.710	78	SUB #3
2.540	81	SUB #4
1.980	82	SUB #5
0.890	76	SUB #6
0.000	98	SUB #7 (-0.790 AC)
0.160	98	SUB #8
3.000	61	OPEN SPACE
22.760	75	Weighted Average

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

**Subcatchment 419: 419S FROM CITY CALCS**

Runoff = 111.38 cfs @ 13.00 hrs, Volume= 23.737 af

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-40.00 hrs, dt= 0.01 hrs  
Type II 24-hr Rainfall=5.85"

Area (ac)	CN	Description
10.160	100	POND
6.350	85	WETLAND
110.490	61	OPEN SPACES
127.000	65	Weighted Average

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
59.7	1,700	0.0010	0.5		Shallow Concentrated Flow, Grassed Waterway Kv= 15.0 fps
25.7	300	0.0200	0.2		Sheet Flow, Grass: Short n= 0.150 P2= 2.70"
85.4	2,000	Total			

**Subcatchment 421: 421S FROM CITY CALCS**

Runoff = 16.18 cfs @ 12.34 hrs, Volume= 1.813 af

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-40.00 hrs, dt= 0.01 hrs  
Type II 24-hr Rainfall=5.85"

Area (ac)	CN	Description
1.404	100	POND
7.596	61	OPEN SPACES
9.000	67	Weighted Average

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Type II 24-hr Rainfall=5.85"

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Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.5	300	0.0010	0.5		<b>Shallow Concentrated Flow,</b> Grassed Waterway Kv= 15.0 fps
25.7	300	0.0200	0.2		
36.2	600	Total			<b>Sheet Flow,</b> Grass: Short n= 0.150 P2= 2.70"

**Subcatchment BY: STREET & BACKYARDS**

Runoff = 15.35 cfs @ 12.04 hrs, Volume= 0.907 af

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-40.00 hrs, dt= 0.01 hrs  
Type II 24-hr Rainfall=5.85"

Area (ac)	CN	Description
3.250	77	1/8 acre lots, 65% imp, HSG A

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.1	50	0.0200	0.1		<b>Sheet Flow,</b> Grass: Short n= 0.150 P2= 2.70"
6.3	800	0.0200	2.1		
12.4	850	Total			<b>Shallow Concentrated Flow,</b> Grassed Waterway Kv= 15.0 fps

**Subcatchment EX1: (new node)**

Runoff = 1.61 cfs @ 12.22 hrs, Volume= 0.224 af

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-40.00 hrs, dt= 0.01 hrs  
Type II 24-hr Rainfall=5.85"

Area (ac)	CN	Description
3.550	39	>75% Grass cover, Good, HSG A
0.400	85	WETLAND
3.950	44	Weighted Average

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
21.9	300	0.0299	0.2		<b>Sheet Flow,</b> Grass: Short n= 0.150 P2= 2.70"

**Subcatchment EX2: (new node)**

Runoff = 14.04 cfs @ 12.14 hrs, Volume= 1.133 af

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-40.00 hrs, dt= 0.01 hrs  
Type II 24-hr Rainfall=5.85"

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Area (ac)	CN	Description
5.232	39	>75% Grass cover, Good, HSG A
3.160	85	WETLAND
0.180	98	Paved roads w/curbs & sewers
8.572	57	Weighted Average

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
19.4	300	0.0405	0.3		Sheet Flow, Grass: Short n= 0.150 P2= 2.70"

**Subcatchment EX3: (new node)**

Runoff = 28.93 cfs @ 12.10 hrs, Volume= 2.027 af

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-40.00 hrs, dt= 0.01 hrs  
Type II 24-hr Rainfall=5.85"

Area (ac)	CN	Description
0.285	98	Paved parking & roofs
7.945	39	>75% Grass cover, Good, HSG A
5.720	85	WETLAND
13.950	59	Weighted Average

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.9	260	0.0500	0.3		Sheet Flow, Grass: Short n= 0.150 P2= 2.70"

**Subcatchment EX4: (new node)**

Runoff = 5.17 cfs @ 12.07 hrs, Volume= 0.365 af

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-40.00 hrs, dt= 0.01 hrs  
Type II 24-hr Rainfall=5.85"

Area (ac)	CN	Description
3.368	39	>75% Grass cover, Good, HSG A
0.250	98	PAVEMENT
0.480	100	POND
4.098	50	Weighted Average

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.3	217	0.0661	0.3		Sheet Flow, Grass: Short n= 0.150 P2= 2.70"

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**Subcatchment EX65: OFFSITE HWY 65**

Runoff = 16.95 cfs @ 11.99 hrs, Volume= 0.854 af

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-40.00 hrs, dt= 0.01 hrs  
Type II 24-hr Rainfall=5.85"

Area (sf)	CN	Description
267,598	39	>75% Grass cover, Good, HSG A
80,320	98	HIGHWAY 65
347,918	53	Weighted Average

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.3	800	0.0200	2.1		Shallow Concentrated Flow, Grassed Waterway Kv= 15.0 fps

**Subcatchment EXCC: COUNTRY CREEK 1**

Runoff = 45.17 cfs @ 12.31 hrs, Volume= 4.776 af

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-40.00 hrs, dt= 0.01 hrs  
Type II 24-hr Rainfall=5.85"

Area (ac)	CN	Description
13.320	61	1/4 acre lots, 38% imp, HSG A
7.510	85	WETLAND
0.500	100	POND
21.330	70	Weighted Average

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
33.9	300	0.0100	0.1		Sheet Flow, Grass: Short n= 0.150 P2= 2.70"

**Subcatchment EXTRA: RUSTIC ACRES 1**

Runoff = 2.63 cfs @ 12.14 hrs, Volume= 0.238 af

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-40.00 hrs, dt= 0.01 hrs  
Type II 24-hr Rainfall=5.85"

Area (ac)	CN	Description
2.500	51	1 acre lots, 20% imp, HSG A

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
19.2	250	0.0288	0.2		Sheet Flow, Grass: Short n= 0.150 P2= 2.70"

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**Pond 29: DITCH TO 24" CULVERT**

[86] Warning: Oscillations may require smaller dt

[80] Warning: Exceeded Pond EXWA by 0.98' @ 12.61 hrs (111.94 cfs)

[80] Warning: Exceeded Pond P416 by 2.83' @ 7.89 hrs (24.42 cfs)

Inflow	=	36.27 cfs @ 15.22 hrs,	Volume=	10.568 af	
Outflow	=	17.81 cfs @ 13.35 hrs,	Volume=	10.610 af,	Atten= 51%, Lag= 0.0 min
Primary	=	17.81 cfs @ 13.35 hrs,	Volume=	10.610 af	

Routing by Sim-Route method, Time Span= 0.00-40.00 hrs, dt= 0.01 hrs

Peak Elev= 902.17' Storage= 15,554 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)

Storage and wetted areas determined by Prismatic sections

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
900.70	0	0	0
901.00	6,418	963	963
902.00	13,306	9,862	10,825
904.00	41,456	54,762	65,587
905.00	65,300	53,378	118,965

**Primary OutFlow (Dynamic Tailwater)**

- 1=Culvert
- 2=Broad-Crested Rectangular Weir

#	Routing	Invert	Outlet Devices
1	Primary	899.04'	<b>24.0" x 37.0' long Culvert</b> Ke= 0.500 Outlet Invert= 898.39' S= 0.0176 '/' n= 0.012 Cc= 0.900
2	Primary	903.74'	<b>30.0' long Broad-Crested Rectangular Weir</b> Head (feet) 0.50 Coef. (English) 3.00

**Pond EXWA: EXISTING WETLAND A**

[88] Warning: Qout>Qin may require smaller dt

[86] Warning: Oscillations may require smaller dt

Inflow	=	16.84 cfs @ 12.14 hrs,	Volume=	3.617 af
Outflow	=	25.77 cfs @ 15.34 hrs,	Volume=	3.287 af,
Primary	=	25.77 cfs @ 15.34 hrs,	Volume=	3.287 af

Routing by Sim-Route method, Time Span= 0.00-40.00 hrs, dt= 0.01 hrs

Peak Elev= 901.76' Storage= 1.664 af

Flood Elev= 904.50' Storage= 5.977 af

Plug-Flow detention time= 213.2 min calculated for 3.287 af (91% of inflow)

Storage and wetted areas determined by Prismatic sections



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Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
900.70	0.000	0.000	0.000
903.35	3.146	4.168	4.168

**Primary OutFlow (Dynamic Tailwater)**

↑1=Broad-Crested Rectangular Weir

#	Routing	Invert	Outlet Devices
1	Primary	900.90'	<b>30.0' long Broad-Crested Rectangular Weir</b> Head (feet) 0.50 Coef. (English) 3.00

**Pond EXWB: EXISTING WETLAND B**

[80] Warning: Exceeded Pond 29 by 0.00' @ 39.45 hrs (0.74 cfs)

[80] Warning: Exceeded Pond P419 by 0.80' @ 12.24 hrs (4.08 cfs)

Inflow = 78.72 cfs @ 12.20 hrs, Volume= 38.703 af  
 Outflow = 63.78 cfs @ 12.46 hrs, Volume= 38.685 af, Atten= 19%, Lag= 15.6 min  
 Primary = 63.78 cfs @ 12.46 hrs, Volume= 38.685 af

Routing by Sim-Route method, Time Span= 0.00-40.00 hrs, dt= 0.01 hrs

Starting Elev= 900.70' Storage= 1.551 af  
 Peak Elev= 900.92' Storage= 2.653 af (1.102 af above starting storage)  
 Flood Elev= 904.50' Storage= 20.376 af (18.825 af above starting storage)  
 Plug-Flow detention time= 69.6 min calculated for 37.125 af (96% of inflow)  
 Storage and wetted areas determined by Prismatic sections

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
895.00	0.000	0.000	0.000
897.00	0.330	0.330	0.330
900.70	0.330	1.221	1.551
905.00	9.578	21.302	22.853

**Primary OutFlow (Dynamic Tailwater)**

↑2=Special (user-defined)

↑1=Culvert

#	Routing	Invert	Outlet Devices
1	Device 2	895.00'	<b>72.0" x 100.0' long Culvert</b> Ke= 0.500 Outlet Invert= 895.00' S= 0.0000 'l' n= 0.012 Cc= 0.900
2	Primary	895.00'	<b>Special (user-defined)</b> Head (feet) 0.00 5.70 5.80 5.90 6.00 6.10 6.20 6.30 6.40 6.50 6.60 6.70 6.80 Disch. (cfs) 0.00 0.00 42.61 60.66 74.57 86.10 96.27 105.45 113.90 121.77 12

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**Pond P414: 414P FROM CITY CALCS**

[86] Warning: Oscillations may require smaller dt

Inflow = 19.16 cfs @ 12.41 hrs, Volume= 2.393 af  
 Outflow = 4.06 cfs @ 13.42 hrs, Volume= 2.247 af, Atten= 79%, Lag= 60.7 min  
 Primary = 4.06 cfs @ 13.42 hrs, Volume= 2.247 af

Routing by Sim-Route method, Time Span= 0.00-40.00 hrs, dt= 0.01 hrs

Peak Elev= 902.18' Storage= 1.154 af  
 Flood Elev= 906.50' Storage= 11.270 af  
 Plug-Flow detention time= 280.1 min calculated for 2.247 af (94% of inflow)  
 Storage and wetted areas determined by Prismatic sections

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
901.00	0.000	0.000	0.000
902.50	1.960	1.470	1.470
904.50	2.520	4.480	5.950
906.50	2.800	5.320	11.270

**Primary OutFlow (Dynamic Tailwater)**

↑ 2=Culvert  
 ↑ 1=Broad-Crested Rectangular Weir

#	Routing	Invert	Outlet Devices
1	Device 2	901.00'	<b>30.0' long Broad-Crested Rectangular Weir</b> Head (feet) 0.50 Coef. (English) 3.00
2	Primary	901.00'	<b>18.0" x 55.0' long Culvert</b> Ke= 0.500 Outlet Invert= 900.80' S= 0.0036 '/ n= 0.012 Cc= 0.900

**Pond P416: 416P FROM CITY CALCS**

[86] Warning: Oscillations may require smaller dt

Inflow = 51.10 cfs @ 12.36 hrs, Volume= 5.983 af  
 Outflow = 17.13 cfs @ 12.74 hrs, Volume= 5.662 af, Atten= 66%, Lag= 22.8 min  
 Primary = 17.13 cfs @ 12.74 hrs, Volume= 5.662 af

Routing by Sim-Route method, Time Span= 0.00-40.00 hrs, dt= 0.01 hrs

Starting Elev= 897.87' Storage= 0.061 af  
 Peak Elev= 902.67' Storage= 2.160 af (2.098 af above starting storage)  
 Flood Elev= 903.50' Storage= 5.306 af (5.245 af above starting storage)  
 Plug-Flow detention time= 103.6 min calculated for 5.601 af (94% of inflow)  
 Storage and wetted areas determined by Prismatic sections

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Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
895.70	0.000	0.000	0.000
897.30	0.030	0.024	0.024
899.00	0.100	0.111	0.135
900.50	0.120	0.165	0.300
902.20	0.710	0.706	1.005
902.50	2.830	0.531	1.536
903.50	4.710	3.770	5.306

**Primary OutFlow (Dynamic Tailwater)**

↑1=Culvert

#	Routing	Invert	Outlet Devices
1	Primary	897.87'	<b>30.0" x 68.0' long Culvert</b> Ke= 0.500 Outlet Invert= 897.68' S= 0.0028 ' n= 0.012 Cc= 0.900

**Pond P419: 419P FROM CITY CALCS**

Inflow	=	116.02 cfs @ 13.00 hrs,	Volume=	25.507 af
Outflow	=	16.99 cfs @ 16.37 hrs,	Volume=	20.213 af, Atten= 85%, Lag= 202.2 min
Primary	=	16.99 cfs @ 16.37 hrs,	Volume=	20.213 af

Routing by Sim-Route method, Time Span= 0.00-40.00 hrs, dt= 0.01 hrs

Peak Elev= 902.26' Storage= 14.637 af

Plug-Flow detention time= 493.4 min calculated for 20.213 af (79% of inflow)

Storage and wetted areas determined by Prismatic sections

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
900.00	6.300	0.000	0.000
900.40	6.400	2.540	2.540
900.80	6.400	2.560	5.100
901.20	6.500	2.580	7.680
901.60	6.500	2.600	10.280
902.00	6.600	2.620	12.900
902.40	6.700	2.660	15.560
902.80	6.700	2.680	18.240
903.20	6.800	2.700	20.940
903.60	6.800	2.720	23.660
904.00	6.900	2.740	26.400

**Primary OutFlow (Dynamic Tailwater)**

↑2=Culvert

↑1=Broad-Crested Rectangular Weir

#	Routing	Invert	Outlet Devices
1	Device 2	900.00'	<b>30.0' long Broad-Crested Rectangular Weir</b> Head (feet) 0.50 Coef. (English) 3.00

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2 Primary 900.00' **24.0" x 50.0' long Culvert** Ke= 0.500  
 Outlet Invert= 899.50' S= 0.0100 ' n= 0.012 Cc= 0.900

**Pond P421: 421P FROM CITY CALCS**

Inflow = 16.18 cfs @ 12.34 hrs, Volume= 1.813 af  
 Outflow = 4.64 cfs @ 13.01 hrs, Volume= 1.770 af, Atten= 71%, Lag= 39.9 min  
 Primary = 4.64 cfs @ 13.01 hrs, Volume= 1.770 af

Routing by Sim-Route method, Time Span= 0.00-40.00 hrs, dt= 0.01 hrs

Peak Elev= 904.36' Storage= 0.716 af  
 Plug-Flow detention time= 163.0 min calculated for 1.769 af (98% of inflow)  
 Storage and wetted areas determined by Prismatic sections

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
902.90	0.000	0.000	0.000
904.90	0.980	0.980	0.980
906.90	1.260	2.240	3.220
908.90	1.400	2.660	5.880

**Primary OutFlow (Dynamic Tailwater)**

1=Culvert  
 2=Broad-Crested Rectangular Weir

#	Routing	Invert	Outlet Devices
1	Primary	902.90'	<b>15.0" x 55.0' long Culvert</b> Ke= 0.500 Outlet Invert= 902.66' S= 0.0044 ' n= 0.012 Cc= 0.900
2	Device 1	902.90'	<b>30.0' long Broad-Crested Rectangular Weir</b> Head (feet) 0.50 Coef. (English) 3.00

**Pond PBY: BACKYARD POND**

[86] Warning: Oscillations may require smaller dt

Inflow = 15.35 cfs @ 12.04 hrs, Volume= 0.907 af  
 Outflow = 3.36 cfs @ 12.18 hrs, Volume= 0.884 af, Atten= 78%, Lag= 8.0 min  
 Primary = 3.36 cfs @ 12.18 hrs, Volume= 0.884 af

Routing by Sim-Route method, Time Span= 0.00-40.00 hrs, dt= 0.01 hrs

Starting Elev= 899.00' Storage= 0 cf  
 Peak Elev= 902.19' Storage= 20,097 cf  
 Flood Elev= 904.50' Storage= 54,750 cf  
 Plug-Flow detention time= 218.0 min calculated for 0.884 af (97% of inflow)  
 Storage and wetted areas determined by Prismatic sections

**02587 (6-10-03)Existing**

Type II 24-hr Rainfall=5.85"

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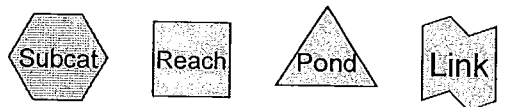
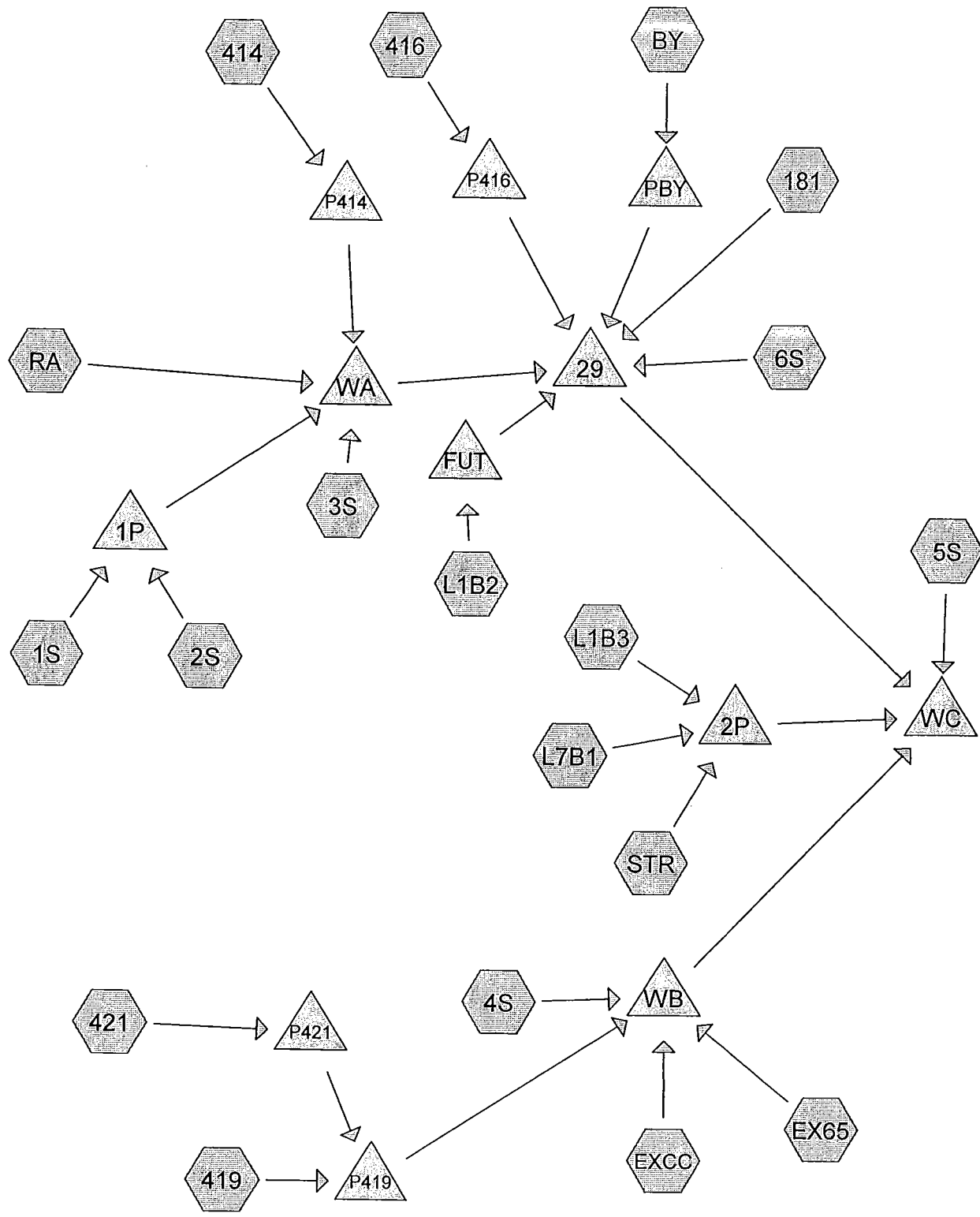
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Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
900.85	0	0	0
904.50	30,000	54,750	54,750

**Primary OutFlow (Dynamic Tailwater)**

↑1=Culvert

#	Routing	Invert	Outlet Devices
1	Primary	900.85'	<b>18.0" x 78.0' long Culvert</b> Ke= 0.500 Outlet Invert= 899.34' S= 0.0194 ' n= 0.012 Cc= 0.900



**Drainage Diagram for 02587 (6-10-03) Proposed**  
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Type II 24-hr Rainfall=4.10"

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Time span=0.00-40.00 hrs, dt=0.01 hrs, 4001 points  
Runoff by SCS TR-20 method, UH=SCS, Type II 24-hr Rainfall=4.10"  
Reach routing by Sim-Route method - Pond routing by Sim-Route method

**Subcatchment 1S: DIRECT RUNOFF TO POND 1**

Tc=8.0 min CN=57 Area=92,650 sf Runoff= 1.94 cfs 0.117 af

**Subcatchment 2S: AREA TO POND 1**

Tc=9.2 min CN=58 Area=142,000 sf Runoff= 3.09 cfs 0.193 af

**Subcatchment 3S: DIRECT RUNOFF TO WETLAND A**

Tc=11.3 min CN=70 Area=6.132 ac Runoff= 12.35 cfs 0.714 af

**Subcatchment 4S: DIRECT RUNOFF TO WETLAND B**

Tc=13.3 min CN=67 Area=9.894 ac Runoff= 15.58 cfs 0.995 af

**Subcatchment 5S: DIRECT RUNOFF TO WETLAND C**

Tc=7.1 min CN=53 Area=69,184 sf Runoff= 0.93 cfs 0.064 af

**Subcatchment 6S: DIRECT TO 29**

Tc=12.0 min CN=49 Area=1.760 ac Runoff= 0.35 cfs 0.048 af

**Subcatchment 181: 181ST AVENUE**

Tc=3.9 min CN=98 Area=0.790 ac Runoff= 4.91 cfs 0.254 af

**Subcatchment 414: 414S FROM CITY CALCS**

Tc=43.3 min CN=72 Area=10.000 ac Runoff= 9.81 cfs 1.275 af

**Subcatchment 416: 416S FROM CITY CALCS**

Tc=40.0 min CN=75 Area=22.760 ac Runoff= 27.59 cfs 3.304 af

**Subcatchment 419: 419S FROM CITY CALCS**

Tc=85.4 min CN=65 Area=127.000 ac Runoff= 48.76 cfs 11.504 af

**Subcatchment 421: 421S FROM CITY CALCS**

Tc=36.2 min CN=67 Area=9.000 ac Runoff= 7.52 cfs 0.905 af

**Subcatchment BY: STREET & BACKYARDS**

Tc=12.4 min CN=77 Area=3.250 ac Runoff= 8.69 cfs 0.512 af

**Subcatchment EX65: OFFSITE HWY 65**

Tc=6.3 min CN=53 Area=347,918 sf Runoff= 4.88 cfs 0.322 af

**Subcatchment EXCC: COUNTRY CREEK 1**

Tc=33.9 min CN=70 Area=21.330 ac Runoff= 22.41 cfs 2.483 af

**Subcatchment L1B2: COMMERCIAL AREA (L1B2)**

Tc=6.0 min CN=83 Area=63,500 sf Runoff= 6.11 cfs 0.288 af

**02587 (6-10-03) Proposed**

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Type II 24-hr Rainfall=4.10"

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**Subcatchment L1B3: COMMERCIAL AREA (L1B3)**

Tc=5.9 min CN=85 Area=106,408 sf Runoff= 10.93 cfs 0.519 af

**Subcatchment L7B1: COMMERCIAL AREA (L7B1)**

Tc=5.2 min CN=81 Area=56,500 sf Runoff= 5.24 cfs 0.238 af

**Subcatchment RA: RUSTIC ACRES**

Tc=19.2 min CN=51 Area=2.500 ac Runoff= 0.56 cfs 0.084 af

**Subcatchment STR: FRONTAGE ROAD (TO POND 2)**

Tc=5.3 min CN=76 Area=44,500 sf Runoff= 3.41 cfs 0.155 af

**Pond 1P: PROPOSED POND 1**

Peak Storage= 99,697 cf Inflow= 5.01 cfs 0.311 af  
Primary= 0.24 cfs 0.282 af Outflow= 0.24 cfs 0.282 af

**Pond 2P: PROPOSED POND 2**

Peak Storage= 37,916 cf Inflow= 19.57 cfs 0.912 af  
Primary= 4.39 cfs 0.909 af Outflow= 4.39 cfs 0.909 af

**Pond 29: Ditch 29**

Peak Storage= 13,197 cf Inflow= 17.21 cfs 5.874 af  
Primary= 16.23 cfs 5.697 af Outflow= 16.23 cfs 5.697 af

**Pond FUT: FUTURE POND (L1B2)**

Peak Storage= 12,731 cf Inflow= 6.11 cfs 0.288 af  
Primary= 3.14 cfs 0.288 af Outflow= 3.14 cfs 0.288 af

**Pond P414: 414P FROM CITY CALCS**

Peak Storage= 0.642 af Inflow= 9.81 cfs 1.275 af  
Primary= 1.46 cfs 1.141 af Outflow= 1.46 cfs 1.141 af

**Pond P416: 416P FROM CITY CALCS**

Peak Storage= 0.921 af Inflow= 27.59 cfs 3.304 af  
Primary= 15.60 cfs 2.984 af Outflow= 15.60 cfs 2.984 af

**Pond P419: 419P FROM CITY CALCS**

Peak Storage= 8.002 af Inflow= 50.37 cfs 12.368 af  
Primary= 5.81 cfs 7.567 af Outflow= 5.81 cfs 7.567 af

**Pond P421: 421P FROM CITY CALCS**

Peak Storage= 0.363 af Inflow= 7.52 cfs 0.905 af  
Primary= 1.67 cfs 0.864 af Outflow= 1.67 cfs 0.864 af

**Pond PBY: BACKYARD POND**

Peak Storage= 10,970 cf Inflow= 8.69 cfs 0.512 af  
Primary= 1.56 cfs 0.491 af Outflow= 1.56 cfs 0.491 af

**Pond WA: WETLAND A**

Peak Storage= 0.659 af Inflow= 12.62 cfs 2.221 af  
Primary= 3.45 cfs 1.808 af Outflow= 3.45 cfs 1.808 af

**Pond WB: WETLAND B**

Peak Storage= 1.241 af Inflow= 29.74 cfs 11.365 af  
Primary= 18.03 cfs 10.611 af Outflow= 18.03 cfs 10.611 af

**Pond WC: WETLAND C**

Peak Storage= 60,526 cf Inflow= 35.06 cfs 17.281 af  
Primary= 33.51 cfs 17.281 af Outflow= 33.51 cfs 17.281 af



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*Type II 24-hr Rainfall=4.10"*

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**Runoff Area = 235.597 ac Volume = 23.975 af Average Depth = 1.22"**

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Type II 24-hr Rainfall=4.10"

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**Subcatchment 1S: DIRECT RUNOFF TO POND 1**

Runoff = 1.94 cfs @ 12.02 hrs, Volume= 0.117 af

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-40.00 hrs, dt= 0.01 hrs  
Type II 24-hr Rainfall=4.10"

Area (sf)	CN	Description
21,587	100	POND NWL
65,363	39	>75% Grass cover, Good, HSG A
5,700	98	Paved parking & roofs
92,650	57	Weighted Average

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.0	120	0.0600	0.3		Sheet Flow, Grass: Short n= 0.150 P2= 2.70"

**Subcatchment 2S: AREA TO POND 1**

Runoff = 3.09 cfs @ 12.03 hrs, Volume= 0.193 af

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-40.00 hrs, dt= 0.01 hrs  
Type II 24-hr Rainfall=4.10"

Area (sf)	CN	Description
109,000	46	2 acre lots, 12% imp, HSG A
33,000	98	BITUMINOUS
142,000	58	Weighted Average

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.2	180	0.0947	0.3		Sheet Flow, Grass: Short n= 0.150 P2= 2.70"

**Subcatchment 3S: DIRECT RUNOFF TO WETLAND A**

Runoff = 12.35 cfs @ 12.04 hrs, Volume= 0.714 af

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-40.00 hrs, dt= 0.01 hrs  
Type II 24-hr Rainfall=4.10"

Area (ac)	CN	Description
2.050	39	>75% Grass cover, Good, HSG A
3.912	85	WETLAND
0.170	98	Paved parking & roofs
6.132	70	Weighted Average

**02587 (6-10-03) Proposed**

Type II 24-hr Rainfall=4.10"

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Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.3	195	0.0660	0.3		Sheet Flow, Grass: Short n= 0.150 P2= 2.70"

**Subcatchment 4S: DIRECT RUNOFF TO WETLAND B**

Runoff = 15.58 cfs @ 12.07 hrs, Volume= 0.995 af

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-40.00 hrs, dt= 0.01 hrs  
Type II 24-hr Rainfall=4.10"

Area (ac)	CN	Description
3.960	39	>75% Grass cover, Good, HSG A
5.844	85	WETLAND
0.090	98	Paved parking & roofs
9.894	67	Weighted Average

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.3	180	0.0375	0.2		Sheet Flow, Grass: Short n= 0.150 P2= 2.70"

**Subcatchment 5S: DIRECT RUNOFF TO WETLAND C**

Runoff = 0.93 cfs @ 12.02 hrs, Volume= 0.064 af

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-40.00 hrs, dt= 0.01 hrs  
Type II 24-hr Rainfall=4.10"

Area (sf)	CN	Description
48,384	39	>75% Grass cover, Good, HSG A
20,800	85	WETLAND
69,184	53	Weighted Average

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.1	82	0.0366	0.2		Sheet Flow, Grass: Short n= 0.150 P2= 2.70"

**Subcatchment 6S: DIRECT TO 29**

Runoff = 0.35 cfs @ 12.10 hrs, Volume= 0.048 af

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-40.00 hrs, dt= 0.01 hrs  
Type II 24-hr Rainfall=4.10"

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Type II 24-hr Rainfall=4.10"

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Area (ac)	CN	Description
1.460	39	>75% Grass cover, Good, HSG A
0.300	98	Paved parking & roofs
1.760	49	Weighted Average

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.0	220	0.0682	0.3		Sheet Flow, sheet Grass: Short n= 0.150 P2= 2.80"

**Subcatchment 181: 181ST AVENUE**

Runoff = 4.91 cfs @ 11.94 hrs, Volume= 0.254 af

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-40.00 hrs, dt= 0.01 hrs  
Type II 24-hr Rainfall=4.10"

Area (ac)	CN	Description
0.790	98	STREET

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.9	500	0.0200	2.1		Shallow Concentrated Flow, Grassed Waterway Kv= 15.0 fps

**Subcatchment 414: 414S FROM CITY CALCS**

Runoff = 9.81 cfs @ 12.45 hrs, Volume= 1.275 af

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-40.00 hrs, dt= 0.01 hrs  
Type II 24-hr Rainfall=4.10"

Area (ac)	CN	Description
2.795	100	POND
7.205	61	OPEN SPACES
10.000	72	Weighted Average

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
17.6	500	0.0010	0.5		Shallow Concentrated Flow, Grassed Waterway Kv= 15.0 fps
25.7	300	0.0200	0.2		Sheet Flow, Grass: Short n= 0.150 P2= 2.70"
43.3	800	Total			

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Type II 24-hr Rainfall=4.10"

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**Subcatchment 416: 416S FROM CITY CALCS**

Runoff = 27.59 cfs @ 12.40 hrs, Volume= 3.304 af

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-40.00 hrs, dt= 0.01 hrs  
Type II 24-hr Rainfall=4.10"

Area (ac)	CN	Description
1.390	78	SUB #1 (-3.250 AC)
10.090	74	SUB #2
2.710	78	SUB #3
2.540	81	SUB #4
1.980	82	SUB #5
0.890	76	SUB #6
0.000	98	SUB #7 (-0.790 AC)
0.160	98	SUB #8
3.000	60	OPEN SPACE
22.760	75	Weighted Average

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

**Subcatchment 419: 419S FROM CITY CALCS**

Runoff = 48.76 cfs @ 13.00 hrs, Volume= 11.504 af

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-40.00 hrs, dt= 0.01 hrs  
Type II 24-hr Rainfall=4.10"

Area (ac)	CN	Description
10.160	100	POND
6.350	85	WETLAND
110.490	61	OPEN SPACES
127.000	65	Weighted Average

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
59.7	1,700	0.0010	0.5		Shallow Concentrated Flow, Grassed Waterway Kv= 15.0 fps
25.7	300	0.0200	0.2		Sheet Flow, Grass: Short n= 0.150 P2= 2.70"
85.4	2,000	Total			

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Type II 24-hr Rainfall=4.10"

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**Subcatchment 421: 421S FROM CITY CALCS**

Runoff = 7.52 cfs @ 12.35 hrs, Volume= 0.905 af

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-40.00 hrs, dt= 0.01 hrs  
Type II 24-hr Rainfall=4.10"

Area (ac)	CN	Description
1.404	100	POND
7.596	61	OPEN SPACES
9.000	67	Weighted Average

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.5	300	0.0010	0.5		<b>Shallow Concentrated Flow,</b> Grassed Waterway Kv= 15.0 fps
25.7	300	0.0200	0.2		
36.2	600	Total			<b>Sheet Flow,</b> Grass: Short n= 0.150 P2= 2.70"

**Subcatchment BY: STREET & BACKYARDS**

Runoff = 8.69 cfs @ 12.05 hrs, Volume= 0.512 af

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-40.00 hrs, dt= 0.01 hrs  
Type II 24-hr Rainfall=4.10"

Area (ac)	CN	Description
3.250	77	1/8 acre lots, 65% imp, HSG A

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.1	50	0.0200	0.1		<b>Sheet Flow,</b> Grass: Short n= 0.150 P2= 2.70"
6.3	800	0.0200	2.1		
12.4	850	Total			<b>Shallow Concentrated Flow,</b> Grassed Waterway Kv= 15.0 fps

**Subcatchment EX65: OFFSITE HWY 65**

Runoff = 4.88 cfs @ 12.01 hrs, Volume= 0.322 af

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-40.00 hrs, dt= 0.01 hrs  
Type II 24-hr Rainfall=4.10"

Area (sf)	CN	Description
267,598	39	>75% Grass cover, Good, HSG A
80,320	98	HIGHWAY 65
347,918	53	Weighted Average

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Type II 24-hr Rainfall=4.10"

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Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.3	800	0.0200	2.1		Shallow Concentrated Flow, Grassed Waterway Kv= 15.0 fps

**Subcatchment EXCC: COUNTRY CREEK 1**

Runoff = 22.41 cfs @ 12.32 hrs, Volume= 2.483 af

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-40.00 hrs, dt= 0.01 hrs  
Type II 24-hr Rainfall=4.10"

Area (ac)	CN	Description
13.320	61	1/4 acre lots, 38% imp, HSG A
7.510	85	WETLAND
0.500	100	POND
21.330	70	Weighted Average

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
33.9	300	0.0100	0.1		Sheet Flow, Grass: Short n= 0.150 P2= 2.70"

**Subcatchment L1B2: COMMERCIAL AREA (L1B2)**

Runoff = 6.11 cfs @ 11.97 hrs, Volume= 0.288 af

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-40.00 hrs, dt= 0.01 hrs  
Type II 24-hr Rainfall=4.10"

Area (sf)	CN	Description
50,000	90	Commercial
10,000	39	>75% Grass cover, Good, HSG A
3,500	100	POND NWL
63,500	83	Weighted Average

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0	110	0.1000	0.3		Sheet Flow, Grass: Short n= 0.150 P2= 2.70"

**Subcatchment L1B3: COMMERCIAL AREA (L1B3)**

Runoff = 10.93 cfs @ 11.97 hrs, Volume= 0.519 af

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-40.00 hrs, dt= 0.01 hrs  
Type II 24-hr Rainfall=4.10"

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Type II 24-hr Rainfall=4.10"

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Area (sf)	CN	Description
96,408	90	Commercial
10,000	39	>75% Grass cover, Good, HSG A
106,408	85	Weighted Average

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.9	120	0.1250	0.3		<b>Sheet Flow,</b> Grass: Short n= 0.150 P2= 2.70"

**Subcatchment L7B1: COMMERCIAL AREA (L7B1)**

Runoff = 5.24 cfs @ 11.96 hrs, Volume= 0.238 af

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-40.00 hrs, dt= 0.01 hrs  
Type II 24-hr Rainfall=4.10"

Area (sf)	CN	Description
46,500	90	Commercial
10,000	39	>75% Grass cover, Good, HSG A
56,500	81	Weighted Average

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.1	30	0.0200	0.1		<b>Sheet Flow,</b> Grass: Short n= 0.150 P2= 2.70"
1.1	100	0.0100	1.5		<b>Shallow Concentrated Flow,</b> Grassed Waterway Kv= 15.0 fps
5.2	130	Total			

**Subcatchment RA: RUSTIC ACRES**

Runoff = 0.56 cfs @ 12.19 hrs, Volume= 0.084 af

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-40.00 hrs, dt= 0.01 hrs  
Type II 24-hr Rainfall=4.10"

Area (ac)	CN	Description
2.500	51	1 acre lots, 20% imp, HSG A

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
19.2	250	0.0288	0.2		<b>Sheet Flow,</b> Grass: Short n= 0.150 P2= 2.70"



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Type II 24-hr Rainfall=4.10"

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**Subcatchment STR: FRONTAGE ROAD (TO POND 2)**

Runoff = 3.41 cfs @ 11.97 hrs, Volume= 0.155 af

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-40.00 hrs, dt= 0.01 hrs  
Type II 24-hr Rainfall=4.10"

Area (sf)	CN	Description
44,500	76	Street and ROW

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.1	30	0.0200	0.1		Sheet Flow,
					Grass: Short n= 0.150 P2= 2.70"
1.2	150	0.0200	2.1		Shallow Concentrated Flow,
					Grassed Waterway Kv= 15.0 fps
5.3	180	Total			

**Pond 1P: PROPOSED POND 1**

Inflow = 5.01 cfs @ 12.02 hrs, Volume= 0.311 af  
 Outflow = 0.24 cfs @ 15.43 hrs, Volume= 0.282 af, Atten= 95%, Lag= 204.5 min  
 Primary = 0.24 cfs @ 15.43 hrs, Volume= 0.282 af

Routing by Sim-Route method, Time Span= 0.00-40.00 hrs, dt= 0.01 hrs

Starting Elev= 903.50' Storage= 93,386 cf  
 Peak Elev= 903.78' Storage= 99,697 cf (6,311 cf above starting storage)  
 Flood Elev= 905.00' Storage= 128,713 cf (35,326 cf above starting storage)  
 Plug-Flow detention time= (not calculated)  
 Storage and wetted areas determined by Prismatic sections

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
894.00	3,236	0	0
895.00	4,456	3,846	3,846
896.00	5,668	5,062	8,908
897.00	6,737	6,203	15,111
898.00	8,163	7,450	22,561
899.00	9,650	8,907	31,467
900.00	11,145	10,398	41,865
901.00	12,744	11,945	53,809
902.00	14,400	13,572	67,381
902.50	15,529	7,482	74,863
903.00	18,488	8,504	83,368
903.50	21,587	10,019	93,386
904.00	22,886	11,118	104,505
905.00	25,530	24,208	128,713

**02587 (6-10-03) Proposed**

Type II 24-hr Rainfall=4.10"

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**Primary OutFlow (Dynamic Tailwater)**



#	Routing	Invert	Outlet Devices
1	Device 2	903.50'	<b>0.50' x 1.38' Vert. Orifice/Grate</b> C= 0.600
2	Primary	902.30'	<b>15.0" x 45.0' long Culvert</b> Ke= 0.500 Outlet Invert= 902.20' S= 0.0022 ' /' n= 0.012 Cc= 0.900

**Pond 2P: PROPOSED POND 2**

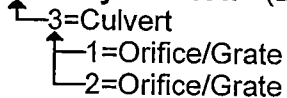
Inflow	=	19.57 cfs @ 11.97 hrs,	Volume=	0.912 af
Outflow	=	4.39 cfs @ 12.12 hrs,	Volume=	0.909 af, Atten= 78%, Lag= 9.1 min
Primary	=	4.39 cfs @ 12.12 hrs,	Volume=	0.909 af

Routing by Sim-Route method, Time Span= 0.00-40.00 hrs, dt= 0.01 hrs

Starting Elev= 900.75' Storage= 21,725 cf  
 Peak Elev= 902.24' Storage= 37,916 cf (16,191 cf above starting storage)  
 Flood Elev= 904.00' Storage= 61,776 cf (40,051 cf above starting storage)  
 Plug-Flow detention time= 405.5 min calculated for 0.410 af (45% of inflow)  
 Storage and wetted areas determined by Prismatic sections

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
895.00	827	0	0
896.00	1,671	1,249	1,249
897.00	2,591	2,131	3,380
898.00	3,608	3,100	6,480
899.00	4,689	4,149	10,628
899.75	5,248	3,726	14,354
900.00	6,409	1,457	15,812
900.75	9,361	5,914	21,725
901.00	9,811	2,397	24,122
902.00	11,674	10,743	34,864
903.00	13,554	12,614	47,478
904.00	15,042	14,298	61,776

**Primary OutFlow (Dynamic Tailwater)**



#	Routing	Invert	Outlet Devices
1	Device 3	900.75'	<b>0.75' x 2.35' Vert. Orifice/Grate</b> C= 0.600
2	Device 3	903.10'	<b>48.0" Horiz. Orifice/Grate</b> Limited to weir flow C= 0.600
3	Primary	900.00'	<b>18.0" x 38.0' long Culvert</b> Ke= 0.500 Outlet Invert= 899.70' S= 0.0079 ' /' n= 0.012 Cc= 0.900

**02587 (6-10-03) Proposed**

Type II 24-hr Rainfall=4.10"

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**Pond 29: Ditch 29**

[86] Warning: Oscillations may require smaller dt

[80] Warning: Exceeded Pond P416 by 1.24' @ 11.98 hrs (24.98 cfs)

[80] Warning: Exceeded Pond PBY by 0.03' @ 12.76 hrs (0.45 cfs)

[80] Warning: Exceeded Pond WA by 0.66' @ 12.78 hrs (50.18 cfs)

Inflow = 17.21 cfs @ 12.57 hrs, Volume= 5.874 af  
 Outflow = 16.23 cfs @ 12.82 hrs, Volume= 5.697 af, Atten= 6%, Lag= 14.6 min  
 Primary = 16.23 cfs @ 12.82 hrs, Volume= 5.697 af

Routing by Sim-Route method, Time Span= 0.00-40.00 hrs, dt= 0.01 hrs

Peak Elev= 901.58' Storage= 13,197 cf

Plug-Flow detention time= 45.2 min calculated for 5.696 af (97% of inflow)

Storage and wetted areas determined by Prismatic sections

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
896.76	0	0	0
898.00	935	580	580
899.00	2,063	1,499	2,079
900.00	3,246	2,655	4,733
901.00	5,200	4,223	8,956
902.00	9,430	7,315	16,271
903.00	17,559	13,495	29,766
904.00	21,675	19,617	49,383

**Primary OutFlow (Dynamic Tailwater)**

↑1=Culvert

#	Routing	Invert	Outlet Devices
1	Primary	896.76'	<b>30.0" x 395.0' long Culvert</b> Ke= 0.610 Outlet Invert= 895.97' S= 0.0020 ' n= 0.012 Cc= 0.900

**Pond FUT: FUTURE POND (L1B2)**

Inflow = 6.11 cfs @ 11.97 hrs, Volume= 0.288 af  
 Outflow = 3.14 cfs @ 12.06 hrs, Volume= 0.288 af, Atten= 49%, Lag= 5.5 min  
 Primary = 3.14 cfs @ 12.06 hrs, Volume= 0.288 af

Routing by Sim-Route method, Time Span= 0.00-40.00 hrs, dt= 0.01 hrs

Starting Elev= 902.00' Storage= 9,077 cf

Peak Elev= 902.85' Storage= 12,731 cf (3,654 cf above starting storage)

Flood Elev= 904.00' Storage= 18,690 cf (9,613 cf above starting storage)

Plug-Flow detention time= 456.3 min calculated for 0.080 af (28% of inflow)

Storage and wetted areas determined by Prismatic sections

**02587 (6-10-03) Proposed**

Type II 24-hr Rainfall=4.10"

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Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
898.00	992	0	0
899.00	1,534	1,263	1,263
900.00	2,188	1,861	3,124
901.00	2,951	2,570	5,694
902.00	3,816	3,384	9,077
903.00	4,781	4,299	13,376
904.00	5,848	5,315	18,690

**Primary OutFlow (Dynamic Tailwater)**

- ↑ 1=Culvert
- ↑ 2=Orifice/Grate
- ↑ 3=Orifice/Grate

#	Routing	Invert	Outlet Devices
1	Primary	899.00'	<b>15.0" x 20.0' long Culvert</b> Ke= 0.500 Outlet Invert= 898.50' S= 0.0250 '/' n= 0.012 Cc= 0.900
2	Device 1	902.00'	<b>1.25' x 1.25' Vert. Orifice/Grate</b> C= 0.600
3	Device 1	903.25'	<b>48.0" Horiz. Orifice/Grate</b> Limited to weir flow C= 0.600

**Pond P414: 414P FROM CITY CALCS**

Inflow = 9.81 cfs @ 12.45 hrs, Volume= 1.275 af  
 Outflow = 1.46 cfs @ 13.97 hrs, Volume= 1.141 af, Atten= 85%, Lag= 91.5 min  
 Primary = 1.46 cfs @ 13.97 hrs, Volume= 1.141 af

Routing by Sim-Route method, Time Span= 0.00-40.00 hrs, dt= 0.01 hrs

Peak Elev= 901.65' Storage= 0.642 af  
 Flood Elev= 906.50' Storage= 11.270 af  
 Plug-Flow detention time= 363.2 min calculated for 1.141 af (89% of inflow)  
 Storage and wetted areas determined by Prismatic sections

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
901.00	0.000	0.000	0.000
902.50	1.960	1.470	1.470
904.50	2.520	4.480	5.950
906.50	2.800	5.320	11.270

**Primary OutFlow (Dynamic Tailwater)**

- ↑ 1=Culvert
- ↑ 2=Broad-Crested Rectangular Weir

#	Routing	Invert	Outlet Devices
1	Primary	901.00'	<b>18.0" x 55.0' long Culvert</b> Ke= 0.500 Outlet Invert= 900.80' S= 0.0036 '/' n= 0.012 Cc= 0.900
2	Device 1	901.00'	<b>30.0' long Broad-Crested Rectangular Weir</b> Head (feet) 0.50 Coef. (English) 3.00

**02587 (6-10-03) Proposed**

Type II 24-hr Rainfall=4.10"

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**Pond P416: 416P FROM CITY CALCS**

[86] Warning: Oscillations may require smaller dt

Inflow = 27.59 cfs @ 12.40 hrs, Volume= 3.304 af  
 Outflow = 15.60 cfs @ 12.68 hrs, Volume= 2.984 af, Atten= 43%, Lag= 17.2 min  
 Primary = 15.60 cfs @ 12.68 hrs, Volume= 2.984 af

Routing by Sim-Route method, Time Span= 0.00-40.00 hrs, dt= 0.01 hrs

Starting Elev= 897.87' Storage= 0.061 af

Peak Elev= 902.00' Storage= 0.921 af (0.860 af above starting storage)

Flood Elev= 903.50' Storage= 5.306 af (5.245 af above starting storage)

Plug-Flow detention time= 99.2 min calculated for 2.922 af (88% of inflow)

Storage and wetted areas determined by Prismatic sections

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
895.70	0.000	0.000	0.000
897.30	0.030	0.024	0.024
899.00	0.100	0.111	0.135
900.50	0.120	0.165	0.300
902.20	0.710	0.706	1.005
902.50	2.830	0.531	1.536
903.50	4.710	3.770	5.306

**Primary OutFlow (Dynamic Tailwater)**

←1=Culvert

#	Routing	Invert	Outlet Devices
1	Primary	897.87'	30.0" x 68.0' long Culvert Ke= 0.500 Outlet Invert= 897.68' S= 0.0028 '/ n= 0.012 Cc= 0.900

**Pond P419: 419P FROM CITY CALCS**

Inflow = 50.37 cfs @ 13.00 hrs, Volume= 12.368 af  
 Outflow = 5.81 cfs @ 19.44 hrs, Volume= 7.567 af, Atten= 88%, Lag= 386.2 min  
 Primary = 5.81 cfs @ 19.44 hrs, Volume= 7.567 af

Routing by Sim-Route method, Time Span= 0.00-40.00 hrs, dt= 0.01 hrs

Peak Elev= 901.25' Storage= 8.002 af

Plug-Flow detention time= 616.7 min calculated for 7.565 af (61% of inflow)

Storage and wetted areas determined by Prismatic sections

**02587 (6-10-03) Proposed**

Type II 24-hr Rainfall=4.10"

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Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
900.00	6.300	0.000	0.000
900.40	6.400	2.540	2.540
900.80	6.400	2.560	5.100
901.20	6.500	2.580	7.680
901.60	6.500	2.600	10.280
902.00	6.600	2.620	12.900
902.40	6.700	2.660	15.560
902.80	6.700	2.680	18.240
903.20	6.800	2.700	20.940
903.60	6.800	2.720	23.660
904.00	6.900	2.740	26.400

**Primary OutFlow (Dynamic Tailwater)**

↑ 2=Culvert  
 ↑ 1=Broad-Crested Rectangular Weir

#	Routing	Invert	Outlet Devices
1	Device 2	900.00'	<b>30.0' long Broad-Crested Rectangular Weir</b> Head (feet) 0.50 Coef. (English) 3.00
2	Primary	900.00'	<b>24.0" x 50.0' long Culvert</b> Ke= 0.500 Outlet Invert= 899.50' S= 0.0100 '/' n= 0.012 Cc= 0.900

**Pond P421: 421P FROM CITY CALCS**

Inflow = 7.52 cfs @ 12.35 hrs, Volume= 0.905 af  
 Outflow = 1.67 cfs @ 13.29 hrs, Volume= 0.864 af, Atten= 78%, Lag= 56.2 min  
 Primary = 1.67 cfs @ 13.29 hrs, Volume= 0.864 af

Routing by Sim-Route method, Time Span= 0.00-40.00 hrs, dt= 0.01 hrs

Peak Elev= 903.64' Storage= 0.363 af  
 Plug-Flow detention time= 223.4 min calculated for 0.864 af (95% of inflow)  
 Storage and wetted areas determined by Prismatic sections

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
902.90	0.000	0.000	0.000
904.90	0.980	0.980	0.980
906.90	1.260	2.240	3.220
908.90	1.400	2.660	5.880

**Primary OutFlow (Dynamic Tailwater)**

↑ 1=Culvert  
 ↑ 2=Broad-Crested Rectangular Weir

#	Routing	Invert	Outlet Devices
1	Primary	902.90'	<b>15.0" x 55.0' long Culvert</b> Ke= 0.500 Outlet Invert= 902.66' S= 0.0044 '/' n= 0.012 Cc= 0.900

**02587 (6-10-03) Proposed**

Type II 24-hr Rainfall=4.10"

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2 Device 1 902.90' **30.0' long Broad-Crested Rectangular Weir**  
 Head (feet) 0.50  
 Coef. (English) 3.00

**Pond PBY: BACKYARD POND**

[86] Warning: Oscillations may require smaller dt

Inflow = 8.69 cfs @ 12.05 hrs, Volume= 0.512 af  
 Outflow = 1.56 cfs @ 12.22 hrs, Volume= 0.491 af, Atten= 82%, Lag= 10.4 min  
 Primary = 1.56 cfs @ 12.22 hrs, Volume= 0.491 af

Routing by Sim-Route method, Time Span= 0.00-40.00 hrs, dt= 0.01 hrs

Starting Elev= 899.00' Storage= 0 cf  
 Peak Elev= 901.58' Storage= 10,970 cf  
 Flood Elev= 904.50' Storage= 54,750 cf  
 Plug-Flow detention time= 209.1 min calculated for 0.491 af (96% of inflow)  
 Storage and wetted areas determined by Prismatic sections

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
900.85	0	0	0
904.50	30,000	54,750	54,750

**Primary OutFlow (Dynamic Tailwater)**

↑1=Culvert

#	Routing	Invert	Outlet Devices
1	Primary	900.85'	<b>18.0" x 78.0' long Culvert</b> Ke= 0.500 Outlet Invert= 899.34' S= 0.0194 '/ n= 0.012 Cc= 0.900

**Pond WA: WETLAND A**

[86] Warning: Oscillations may require smaller dt

Inflow = 12.62 cfs @ 12.04 hrs, Volume= 2.221 af  
 Outflow = 3.45 cfs @ 14.33 hrs, Volume= 1.808 af, Atten= 73%, Lag= 137.1 min  
 Primary = 3.45 cfs @ 14.33 hrs, Volume= 1.808 af

Routing by Sim-Route method, Time Span= 0.00-40.00 hrs, dt= 0.01 hrs

Peak Elev= 901.04' Storage= 0.659 af  
 Flood Elev= 904.50' Storage= 7.433 af  
 Plug-Flow detention time= 275.0 min calculated for 1.808 af (81% of inflow)  
 Storage and wetted areas determined by Prismatic sections

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
900.70	0.000	0.000	0.000
903.35	3.912	5.183	5.183

**02587 (6-10-03) Proposed**

Type II 24-hr Rainfall=4.10"

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**Primary OutFlow (Dynamic Tailwater)**

↑1=Broad-Crested Rectangular Weir

#	Routing	Invert	Outlet Devices
1	Primary	900.90'	<b>30.0' long Broad-Crested Rectangular Weir</b> Head (feet) 0.50 Coef. (English) 3.00

**Pond WB: WETLAND B**

[86] Warning: Oscillations may require smaller dt

[80] Warning: Exceeded Pond P419 by 0.73' @ 12.42 hrs (3.28 cfs)

Inflow = 29.74 cfs @ 12.11 hrs, Volume= 11.365 af  
 Outflow = 18.03 cfs @ 12.43 hrs, Volume= 10.611 af, Atten= 39%, Lag= 19.5 min  
 Primary = 18.03 cfs @ 12.43 hrs, Volume= 10.611 af

Routing by Sim-Route method, Time Span= 0.00-40.00 hrs, dt= 0.01 hrs

Peak Elev= 900.80' Storage= 1.241 af

Flood Elev= 904.50' Storage= 19.095 af

Plug-Flow detention time= 117.1 min calculated for 10.611 af (93% of inflow)

Storage and wetted areas determined by Prismatic sections

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
895.00	0.000	0.000	0.000
897.00	0.160	0.160	0.160
900.70	0.160	0.592	0.752
905.00	9.494	20.756	21.508

**Primary OutFlow (Dynamic Tailwater)**

↑1=Culvert

#	Routing	Invert	Outlet Devices
1	Primary	895.18'	<b>60.0' x 110.0' long Culvert</b> Ke= 0.500 Outlet Invert= 895.00' S= 0.0016 '/' n= 0.012 Cc= 0.900

**Pond WC: WETLAND C**

[80] Warning: Exceeded Pond 29 by 3.94' @ 0.00 hrs (27.06 cfs)

[80] Warning: Exceeded Pond WB by 5.70' @ 10.74 hrs (131.15 cfs)

Inflow = 35.06 cfs @ 12.43 hrs, Volume= 17.281 af  
 Outflow = 33.51 cfs @ 12.70 hrs, Volume= 17.281 af, Atten= 4%, Lag= 16.1 min  
 Primary = 33.51 cfs @ 12.70 hrs, Volume= 17.281 af

Routing by Sim-Route method, Time Span= 0.00-40.00 hrs, dt= 0.01 hrs



**02587 (6-10-03) Proposed**

Type II 24-hr Rainfall=4.10"

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Starting Elev= 900.70' Storage= 58,998 cf

Peak Elev= 900.78' Storage= 60,526 cf (1,527 cf above starting storage)

Flood Elev= 904.50' Storage= 184,907 cf (125,908 cf above starting storage)

Plug-Flow detention time= 113.7 min calculated for 15.923 af (92% of inflow)

Storage and wetted areas determined by Prismatic sections

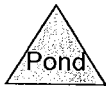
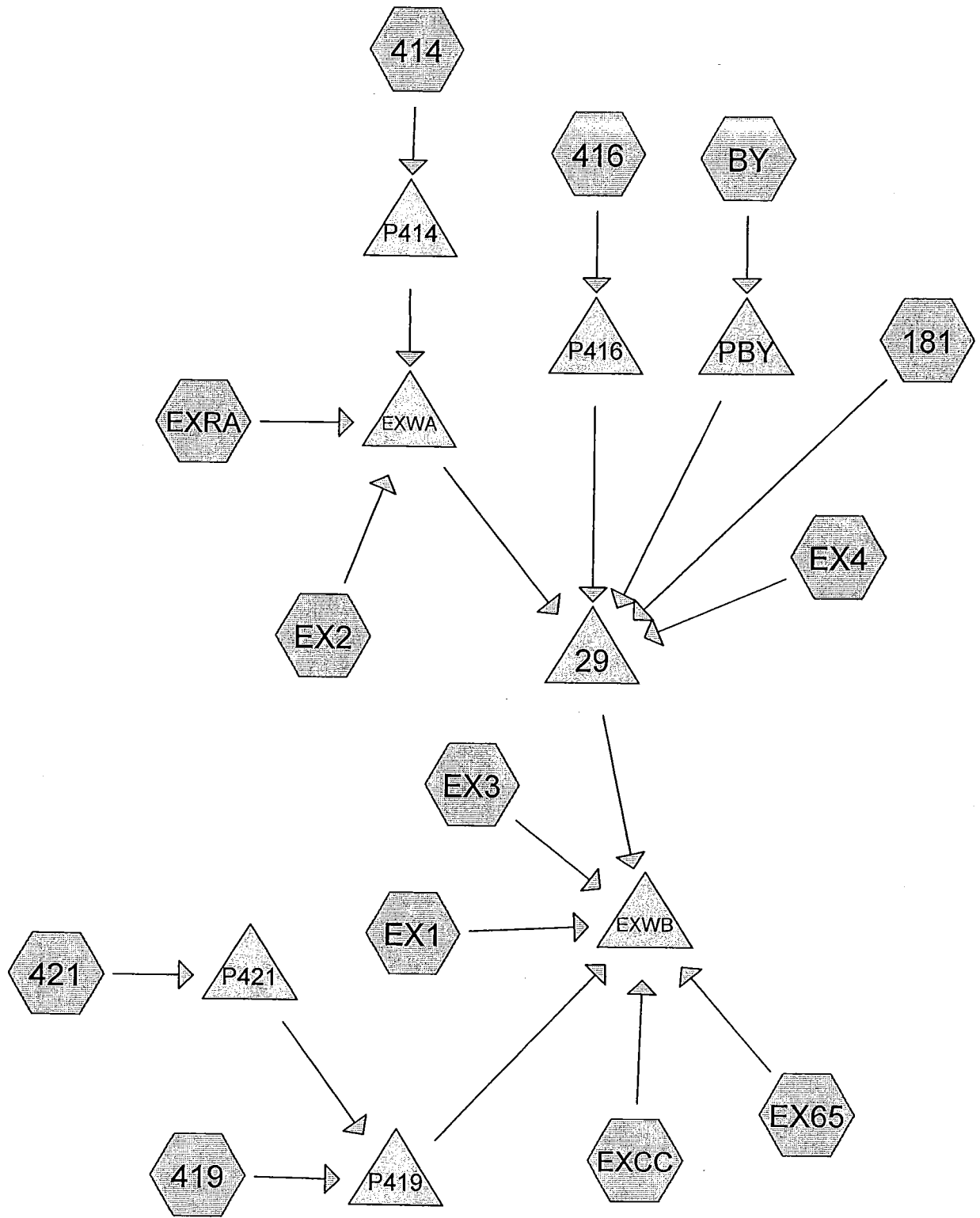
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
895.00	501	0	0
896.00	4,553	2,527	2,527
897.00	7,604	6,079	8,606
898.00	10,677	9,141	17,746
899.00	13,815	12,246	29,992
900.00	17,004	15,410	45,402
901.00	21,844	19,424	64,826
902.00	31,413	26,629	91,454
903.00	37,525	34,469	125,923
904.00	41,120	39,323	165,246

**Primary OutFlow (Dynamic Tailwater)**

↑ 2=Special (user-defined)

↑ 1=Culvert

#	Routing	Invert	Outlet Devices
1	Device 2	895.00'	<b>72.0" x 100.0' long Culvert</b> Ke= 0.500 Outlet Invert= 895.00' S= 0.0000 ' n= 0.012 Cc= 0.900
2	Primary	895.00'	<b>Special (user-defined)</b> Head (feet) 0.00 5.70 5.80 5.90 6.00 6.10 6.20 6.30 6.40 6.50 6.60 6.70 6.80 Disch. (cfs) 0.00 0.00 42.61 60.66 74.57 86.10 96.27 105.45 113.90 121.77 12



Drainage Diagram for 02587 (6-10-03) Existing  
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**02587 (6-10-03)Existing**

Type II 24-hr Rainfall=4.10"

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Time span=0.00-40.00 hrs, dt=0.01 hrs, 4001 points  
Runoff by SCS TR-20 method, UH=SCS, Type II 24-hr Rainfall=4.10"  
Reach routing by Sim-Route method - Pond routing by Sim-Route method

**Subcatchment 181: 181ST AVENUE**

Tc=3.9 min CN=98 Area=0.790 ac Runoff= 4.91 cfs 0.254 af

**Subcatchment 414: 414S FROM CITY CALCS**

Tc=43.3 min CN=72 Area=10.000 ac Runoff= 9.81 cfs 1.275 af

**Subcatchment 416: 416S FROM CITY CALCS**

Tc=40.0 min CN=75 Area=22.760 ac Runoff= 27.59 cfs 3.304 af

**Subcatchment 419: 419S FROM CITY CALCS**

Tc=85.4 min CN=65 Area=127.000 ac Runoff= 48.76 cfs 11.504 af

**Subcatchment 421: 421S FROM CITY CALCS**

Tc=36.2 min CN=67 Area=9.000 ac Runoff= 7.52 cfs 0.905 af

**Subcatchment BY: STREET & BACKYARDS**

Tc=12.4 min CN=77 Area=3.250 ac Runoff= 8.69 cfs 0.512 af

**Subcatchment EX1: (new node)**

Tc=21.9 min CN=44 Area=3.950 ac Runoff= 0.11 cfs 0.056 af

**Subcatchment EX2: (new node)**

Tc=19.4 min CN=57 Area=8.572 ac Runoff= 4.70 cfs 0.473 af

**Subcatchment EX3: (new node)**

Tc=15.9 min CN=59 Area=13.950 ac Runoff= 10.79 cfs 0.884 af

**Subcatchment EX4: (new node)**

Tc=12.3 min CN=50 Area=4.098 ac Runoff= 1.01 cfs 0.124 af

**Subcatchment EX65: OFFSITE HWY 65**

Tc=6.3 min CN=53 Area=347,918 sf Runoff= 4.88 cfs 0.322 af

**Subcatchment EXCC: COUNTRY CREEK 1**

Tc=33.9 min CN=70 Area=21.330 ac Runoff= 22.41 cfs 2.483 af

**Subcatchment EXTRA: RUSTIC ACRES 1**

Tc=19.2 min CN=51 Area=2.500 ac Runoff= 0.56 cfs 0.084 af

**Pond 29: DITCH TO 24" CULVERT**

Peak Storage= 7,470 cf Inflow= 16.17 cfs 5.222 af  
Primary= 14.33 cfs 5.264 af Outflow= 14.33 cfs 5.264 af

**Pond EXWA: EXISTING WETLAND A**

Peak Storage= 0.484 af Inflow= 5.28 cfs 1.698 af  
Primary= 3.12 cfs 1.370 af Outflow= 3.12 cfs 1.370 af

**02587 (6-10-03)Existing**

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*Type II 24-hr Rainfall=4.10"*

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**Pond EXWB: EXISTING WETLAND B**

Peak Storage= 1.945 af Inflow= 36.45 cfs 16.571 af  
Primary= 33.93 cfs 16.561 af Outflow= 33.93 cfs 16.561 af

**Pond P414: 414P FROM CITY CALCS**

Peak Storage= 0.642 af Inflow= 9.81 cfs 1.275 af  
Primary= 1.46 cfs 1.141 af Outflow= 1.46 cfs 1.141 af

**Pond P416: 416P FROM CITY CALCS**

Peak Storage= 0.930 af Inflow= 27.59 cfs 3.304 af  
Primary= 15.19 cfs 2.983 af Outflow= 15.19 cfs 2.983 af

**Pond P419: 419P FROM CITY CALCS**

Peak Storage= 7.983 af Inflow= 50.37 cfs 12.368 af  
Primary= 5.82 cfs 7.563 af Outflow= 5.82 cfs 7.563 af

**Pond P421: 421P FROM CITY CALCS**

Peak Storage= 0.363 af Inflow= 7.52 cfs 0.905 af  
Primary= 1.67 cfs 0.864 af Outflow= 1.67 cfs 0.864 af

**Pond PBY: BACKYARD POND**

Peak Storage= 11,443 cf Inflow= 8.69 cfs 0.512 af  
Primary= 1.57 cfs 0.491 af Outflow= 1.57 cfs 0.491 af

**Runoff Area = 235.187 ac Volume = 22.181 af Average Depth = 1.13"**

**02587 (6-10-03)Existing**

Type II 24-hr Rainfall=4.10"

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**Subcatchment 181: 181ST AVENUE**

Runoff = 4.91 cfs @ 11.94 hrs, Volume= 0.254 af

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-40.00 hrs, dt= 0.01 hrs  
Type II 24-hr Rainfall=4.10"

Area (ac)	CN	Description
0.790	98	STREET

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.9	500	0.0200	2.1		Shallow Concentrated Flow, Grassed Waterway Kv= 15.0 fps

**Subcatchment 414: 414S FROM CITY CALCS**

Runoff = 9.81 cfs @ 12.45 hrs, Volume= 1.275 af

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-40.00 hrs, dt= 0.01 hrs  
Type II 24-hr Rainfall=4.10"

Area (ac)	CN	Description
2.795	100	POND
7.205	61	OPEN SPACES
10.000	72	Weighted Average

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
17.6	500	0.0010	0.5		Shallow Concentrated Flow, Grassed Waterway Kv= 15.0 fps
25.7	300	0.0200	0.2		Sheet Flow, Grass: Short n= 0.150 P2= 2.70"
43.3	800	Total			

**Subcatchment 416: 416S FROM CITY CALCS**

Runoff = 27.59 cfs @ 12.40 hrs, Volume= 3.304 af

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-40.00 hrs, dt= 0.01 hrs  
Type II 24-hr Rainfall=4.10"

**02587 (6-10-03)Existing**

Type II 24-hr Rainfall=4.10"

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Area (ac)	CN	Description
1.390	78	SUB #1 (-3.250 AC)
10.090	74	SUB #2
2.710	78	SUB #3
2.540	81	SUB #4
1.980	82	SUB #5
0.890	76	SUB #6
0.000	98	SUB #7 (-0.790 AC)
0.160	98	SUB #8
3.000	61	OPEN SPACE
22.760	75	Weighted Average

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

**Subcatchment 419: 419S FROM CITY CALCS**

Runoff = 48.76 cfs @ 13.00 hrs, Volume= 11.504 af

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-40.00 hrs, dt= 0.01 hrs  
Type II 24-hr Rainfall=4.10"

Area (ac)	CN	Description
10.160	100	POND
6.350	85	WETLAND
110.490	61	OPEN SPACES
127.000	65	Weighted Average

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
59.7	1,700	0.0010	0.5		Shallow Concentrated Flow, Grassed Waterway Kv= 15.0 fps
25.7	300	0.0200	0.2		Sheet Flow, Grass: Short n= 0.150 P2= 2.70"
85.4	2,000	Total			

**Subcatchment 421: 421S FROM CITY CALCS**

Runoff = 7.52 cfs @ 12.35 hrs, Volume= 0.905 af

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-40.00 hrs, dt= 0.01 hrs  
Type II 24-hr Rainfall=4.10"

Area (ac)	CN	Description
1.404	100	POND
7.596	61	OPEN SPACES
9.000	67	Weighted Average

**02587 (6-10-03)Existing**

Type II 24-hr Rainfall=4.10"

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Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.5	300	0.0010	0.5		<b>Shallow Concentrated Flow,</b> Grassed Waterway Kv= 15.0 fps
25.7	300	0.0200	0.2		<b>Sheet Flow,</b> Grass: Short n= 0.150 P2= 2.70"
36.2	600	Total			

**Subcatchment BY: STREET & BACKYARDS**

Runoff = 8.69 cfs @ 12.05 hrs, Volume= 0.512 af

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-40.00 hrs, dt= 0.01 hrs  
Type II 24-hr Rainfall=4.10"

Area (ac)	CN	Description
3.250	77	1/8 acre lots, 65% imp, HSG A

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.1	50	0.0200	0.1		<b>Sheet Flow,</b> Grass: Short n= 0.150 P2= 2.70"
6.3	800	0.0200	2.1		<b>Shallow Concentrated Flow,</b> Grassed Waterway Kv= 15.0 fps
12.4	850	Total			

**Subcatchment EX1: (new node)**

Runoff = 0.11 cfs @ 12.59 hrs, Volume= 0.056 af

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-40.00 hrs, dt= 0.01 hrs  
Type II 24-hr Rainfall=4.10"

Area (ac)	CN	Description
3.550	39	>75% Grass cover, Good, HSG A
0.400	85	WETLAND
3.950	44	Weighted Average

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
21.9	300	0.0299	0.2		<b>Sheet Flow,</b> Grass: Short n= 0.150 P2= 2.70"

**Subcatchment EX2: (new node)**

Runoff = 4.70 cfs @ 12.16 hrs, Volume= 0.473 af

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-40.00 hrs, dt= 0.01 hrs  
Type II 24-hr Rainfall=4.10"

**02587 (6-10-03)Existing**

Type II 24-hr Rainfall=4.10"

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Area (ac)	CN	Description
5.232	39	>75% Grass cover, Good, HSG A
3.160	85	WETLAND
0.180	98	Paved roads w/curbs & sewers
8.572	57	Weighted Average

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
19.4	300	0.0405	0.3		Sheet Flow, Grass: Short n= 0.150 P2= 2.70"

**Subcatchment EX3: (new node)**

Runoff = 10.79 cfs @ 12.11 hrs, Volume= 0.884 af

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-40.00 hrs, dt= 0.01 hrs  
Type II 24-hr Rainfall=4.10"

Area (ac)	CN	Description
0.285	98	Paved parking & roofs
7.945	39	>75% Grass cover, Good, HSG A
5.720	85	WETLAND
13.950	59	Weighted Average

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.9	260	0.0500	0.3		Sheet Flow, Grass: Short n= 0.150 P2= 2.70"

**Subcatchment EX4: (new node)**

Runoff = 1.01 cfs @ 12.10 hrs, Volume= 0.124 af

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-40.00 hrs, dt= 0.01 hrs  
Type II 24-hr Rainfall=4.10"

Area (ac)	CN	Description
3.368	39	>75% Grass cover, Good, HSG A
0.250	98	PAVEMENT
0.480	100	POND
4.098	50	Weighted Average

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.3	217	0.0661	0.3		Sheet Flow, Grass: Short n= 0.150 P2= 2.70"



**02587 (6-10-03)Existing**

Type II 24-hr Rainfall=4.10"

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**Subcatchment EX65: OFFSITE HWY 65**

Runoff = 4.88 cfs @ 12.01 hrs, Volume= 0.322 af

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-40.00 hrs, dt= 0.01 hrs  
Type II 24-hr Rainfall=4.10"

Area (sf)	CN	Description
267,598	39	>75% Grass cover, Good, HSG A
80,320	98	HIGHWAY 65
347,918	53	Weighted Average

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.3	800	0.0200	2.1		Shallow Concentrated Flow, Grassed Waterway Kv= 15.0 fps

**Subcatchment EXCC: COUNTRY CREEK 1**

Runoff = 22.41 cfs @ 12.32 hrs, Volume= 2.483 af

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-40.00 hrs, dt= 0.01 hrs  
Type II 24-hr Rainfall=4.10"

Area (ac)	CN	Description
13.320	61	1/4 acre lots, 38% imp, HSG A
7.510	85	WETLAND
0.500	100	POND
21.330	70	Weighted Average

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
33.9	300	0.0100	0.1		Sheet Flow, Grass: Short n= 0.150 P2= 2.70"

**Subcatchment EXTRA: RUSTIC ACRES 1**

Runoff = 0.56 cfs @ 12.19 hrs, Volume= 0.084 af

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-40.00 hrs, dt= 0.01 hrs  
Type II 24-hr Rainfall=4.10"

Area (ac)	CN	Description
2.500	51	1 acre lots, 20% imp, HSG A

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
19.2	250	0.0288	0.2		Sheet Flow, Grass: Short n= 0.150 P2= 2.70"

**02587 (6-10-03)Existing**

Type II 24-hr Rainfall=4.10"

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**Pond 29: DITCH TO 24" CULVERT**

[86] Warning: Oscillations may require smaller dt

[80] Warning: Exceeded Pond EXWA by 0.81' @ 12.84 hrs (59.33 cfs)

[80] Warning: Exceeded Pond P416 by 2.83' @ 9.72 hrs (24.42 cfs)

[80] Warning: Exceeded Pond PBY by 0.09' @ 12.82 hrs (0.94 cfs)

Inflow = 16.17 cfs @ 12.55 hrs, Volume= 5.222 af  
 Outflow = 14.33 cfs @ 12.89 hrs, Volume= 5.264 af, Atten= 11%, Lag= 20.9 min  
 Primary = 14.33 cfs @ 12.89 hrs, Volume= 5.264 af

Routing by Sim-Route method, Time Span= 0.00-40.00 hrs, dt= 0.01 hrs

Peak Elev= 901.66' Storage= 7,470 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)

Storage and wetted areas determined by Prismatic sections

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
900.70	0	0	0
901.00	6,418	963	963
902.00	13,306	9,862	10,825
904.00	41,456	54,762	65,587
905.00	65,300	53,378	118,965

**Primary OutFlow (Dynamic Tailwater)**

1=Culvert

2=Broad-Crested Rectangular Weir

#	Routing	Invert	Outlet Devices
1	Primary	899.04'	24.0" x 37.0' long Culvert Ke= 0.500 Outlet Invert= 898.39' S= 0.0176 '/ n= 0.012 Cc= 0.900
2	Primary	903.74'	30.0' long Broad-Crested Rectangular Weir Head (feet) 0.50 Coef. (English) 3.00

**Pond EXWA: EXISTING WETLAND A**

[86] Warning: Oscillations may require smaller dt

Inflow = 5.28 cfs @ 12.16 hrs, Volume= 1.698 af  
 Outflow = 3.12 cfs @ 14.53 hrs, Volume= 1.370 af, Atten= 41%, Lag= 141.7 min  
 Primary = 3.12 cfs @ 14.53 hrs, Volume= 1.370 af

Routing by Sim-Route method, Time Span= 0.00-40.00 hrs, dt= 0.01 hrs

Peak Elev= 901.01' Storage= 0.484 af

Flood Elev= 904.50' Storage= 5.977 af

Plug-Flow detention time= 267.9 min calculated for 1.369 af (81% of inflow)

Storage and wetted areas determined by Prismatic sections

**02587 (6-10-03)Existing**

Type II 24-hr Rainfall=4.10"

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Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
900.70	0.000	0.000	0.000
903.35	3.146	4.168	4.168

**Primary OutFlow (Dynamic Tailwater)**

↑1=Broad-Crested Rectangular Weir

#	Routing	Invert	Outlet Devices
1	Primary	900.90'	<b>30.0' long Broad-Crested Rectangular Weir</b> Head (feet) 0.50 Coef. (English) 3.00

**Pond EXWB: EXISTING WETLAND B**

[80] Warning: Exceeded Pond 29 by 0.00' @ 37.29 hrs (0.69 cfs)

[80] Warning: Exceeded Pond P419 by 0.75' @ 12.26 hrs (3.20 cfs)

Inflow = 36.45 cfs @ 12.32 hrs, Volume= 16.571 af  
 Outflow = 33.93 cfs @ 12.48 hrs, Volume= 16.561 af, Atten= 7%, Lag= 9.5 min  
 Primary = 33.93 cfs @ 12.48 hrs, Volume= 16.561 af

Routing by Sim-Route method, Time Span= 0.00-40.00 hrs, dt= 0.01 hrs

Starting Elev= 900.70' Storage= 1.551 af  
 Peak Elev= 900.78' Storage= 1.945 af (0.394 af above starting storage)  
 Flood Elev= 904.50' Storage= 20.376 af (18.825 af above starting storage)  
 Plug-Flow detention time= 143.7 min calculated for 15.006 af (91% of inflow)  
 Storage and wetted areas determined by Prismatic sections

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
895.00	0.000	0.000	0.000
897.00	0.330	0.330	0.330
900.70	0.330	1.221	1.551
905.00	9.578	21.302	22.853

**Primary OutFlow (Dynamic Tailwater)**

↑2=Special (user-defined)

↑1=Culvert

#	Routing	Invert	Outlet Devices
1	Device 2	895.00'	<b>72.0" x 100.0' long Culvert</b> Ke= 0.500 Outlet Invert= 895.00' S= 0.0000 'l' n= 0.012 Cc= 0.900
2	Primary	895.00'	<b>Special (user-defined)</b> Head (feet) 0.00 5.70 5.80 5.90 6.00 6.10 6.20 6.30 6.40 6.50 6.60 6.70 6.80 Disch. (cfs) 0.00 0.00 42.61 60.66 74.57 86.10 96.27 105.45 113.90 121.77 12

**02587 (6-10-03)Existing**

Type II 24-hr Rainfall=4.10"

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**Pond P414: 414P FROM CITY CALCS**

Inflow = 9.81 cfs @ 12.45 hrs, Volume= 1.275 af  
 Outflow = 1.46 cfs @ 13.97 hrs, Volume= 1.141 af, Atten= 85%, Lag= 91.5 min  
 Primary = 1.46 cfs @ 13.97 hrs, Volume= 1.141 af

Routing by Sim-Route method, Time Span= 0.00-40.00 hrs, dt= 0.01 hrs

Peak Elev= 901.65' Storage= 0.642 af  
 Flood Elev= 906.50' Storage= 11.270 af  
 Plug-Flow detention time= 363.5 min calculated for 1.141 af (89% of inflow)  
 Storage and wetted areas determined by Prismatic sections

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
901.00	0.000	0.000	0.000
902.50	1.960	1.470	1.470
904.50	2.520	4.480	5.950
906.50	2.800	5.320	11.270

**Primary OutFlow (Dynamic Tailwater)**

↑ 2=Culvert

↑ 1=Broad-Crested Rectangular Weir

#	Routing	Invert	Outlet Devices
1	Device 2	901.00'	<b>30.0' long Broad-Crested Rectangular Weir</b> Head (feet) 0.50 Coef. (English) 3.00
2	Primary	901.00'	<b>18.0" x 55.0' long Culvert</b> Ke= 0.500 Outlet Invert= 900.80' S= 0.0036 ' n= 0.012 Cc= 0.900

**Pond P416: 416P FROM CITY CALCS**

[86] Warning: Oscillations may require smaller dt

Inflow = 27.59 cfs @ 12.40 hrs, Volume= 3.304 af  
 Outflow = 15.19 cfs @ 12.64 hrs, Volume= 2.983 af, Atten= 45%, Lag= 14.9 min  
 Primary = 15.19 cfs @ 12.64 hrs, Volume= 2.983 af

Routing by Sim-Route method, Time Span= 0.00-40.00 hrs, dt= 0.01 hrs

Starting Elev= 897.87' Storage= 0.061 af  
 Peak Elev= 902.02' Storage= 0.930 af (0.869 af above starting storage)  
 Flood Elev= 903.50' Storage= 5.306 af (5.245 af above starting storage)  
 Plug-Flow detention time= 102.3 min calculated for 2.922 af (88% of inflow)  
 Storage and wetted areas determined by Prismatic sections

**02587 (6-10-03)Existing**

Type II 24-hr Rainfall=4.10"

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Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
895.70	0.000	0.000	0.000
897.30	0.030	0.024	0.024
899.00	0.100	0.111	0.135
900.50	0.120	0.165	0.300
902.20	0.710	0.706	1.005
902.50	2.830	0.531	1.536
903.50	4.710	3.770	5.306

**Primary OutFlow (Dynamic Tailwater)**

↑1=Culvert

#	Routing	Invert	Outlet Devices
1	Primary	897.87'	<b>30.0" x 68.0' long Culvert</b> Ke= 0.500 Outlet Invert= 897.68' S= 0.0028 ' n= 0.012 Cc= 0.900

**Pond P419: 419P FROM CITY CALCS**

Inflow = 50.37 cfs @ 13.00 hrs, Volume= 12.368 af  
 Outflow = 5.82 cfs @ 19.36 hrs, Volume= 7.563 af, Atten= 88%, Lag= 381.5 min  
 Primary = 5.82 cfs @ 19.36 hrs, Volume= 7.563 af

Routing by Sim-Route method, Time Span= 0.00-40.00 hrs, dt= 0.01 hrs

Peak Elev= 901.25' Storage= 7.983 af  
 Plug-Flow detention time= 614.3 min calculated for 7.561 af (61% of inflow)  
 Storage and wetted areas determined by Prismatic sections

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
900.00	6.300	0.000	0.000
900.40	6.400	2.540	2.540
900.80	6.400	2.560	5.100
901.20	6.500	2.580	7.680
901.60	6.500	2.600	10.280
902.00	6.600	2.620	12.900
902.40	6.700	2.660	15.560
902.80	6.700	2.680	18.240
903.20	6.800	2.700	20.940
903.60	6.800	2.720	23.660
904.00	6.900	2.740	26.400

**Primary OutFlow (Dynamic Tailwater)**

↑2=Culvert

↑1=Broad-Crested Rectangular Weir

#	Routing	Invert	Outlet Devices
1	Device 2	900.00'	<b>30.0' long Broad-Crested Rectangular Weir</b> Head (feet) 0.50 Coef. (English) 3.00