



9-30-11

Village of Menomonee Falls
 W156 N8480 Pilgrim Road
 Menomonee Falls, WI 53051-3140
 Telephone: (262) 532-4200

STORMWATER MANAGEMENT FACILITIES OPERATION AND INSPECTION REPORT

Quarter Section SE 1/4 Sect 29 Name of Business/Subdivision Spencer's Pass
 Property Tax ID Number 0116-059 Address of Property East Subdivision

Dry Pond	
Wet Pond	X
Other	

Description: SWP 29 s001 Location Of Pond North of Fox River Way
Tear drop shape in Outlot 4 of Spencer's
Approx. 2 acres in size Pass East Subdivision

Year Pond Constructed 2005 Year of Last Certification 2005

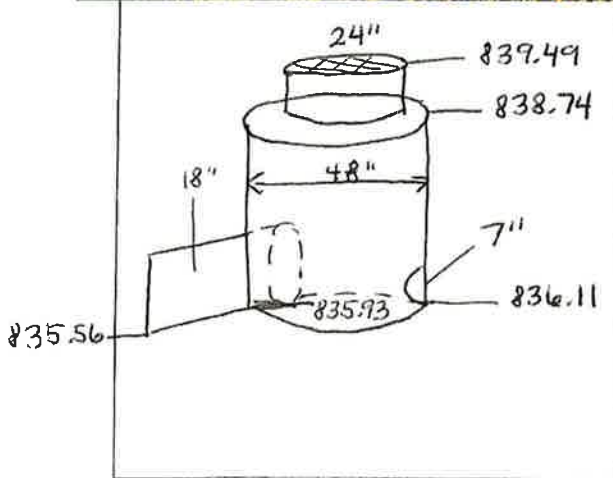
Compliance Verification	Design	Actual	Compliant Yes No	Comments (Condition of Structure)
Primary Outlet Pipe				
Opening Diameter	15"	18"	X	Larger diameter increases the amount of flow allowed to leave the pond.
Upstream Invert	836.2	835.93	X	Invert 3" lower.
Downstream Invert	—	835.56	X	
Length	—	78'	X	
Slope	—	.005	X	
Secondary Outlet Pipe (If Applicable)				
Opening Diameter				
Upstream Invert				
Downstream Invert				
Length				
Slope				
Riser (If Applicable)				
Opening Diameter	—	24"		
Elevation	840.00	839.49	X	A 0.5' lower riser means runoff discharges faster sooner.
Upper Discharge Control (If Applicable)				
Opening Diameter				
Elevation				

Compliance Verification	Design	Actual	Compliant Yes No		Comments	
Lower Discharge Control	(If Applicable)					
Opening Diameter	7"	7"	X			
Elevation	836.20	836.18	X			
Other (Description)	NA					
Opening Type						
Elevation						
Emergency Spillway						
Elevation	844.75	844.73	X			
Length of spillway		10'	X		The length of spillway does not appear to have been defined in the design. A 10' width should be adequate.	
Embankment			Present Yes No			
Unauthorized plantings, trees, or woody vegetation				X		
Animal burrows or slope erosion				X		
Storage Properties	Design	Actual	Compliant Yes No		Points Surveyed	Equipment Used
Normal Water Elevation (Wet Ponds)	836.20	836.18	X			Design - From original report Actual -
Design High Water Elevation	844.75	844.73	X			
Area at Normal Water Elevation (Ac) (Wet Ponds)	0.525	0.511	X			Calculated area in AutoCAD drawing based on surface from surveyed points.
Area at Design High Water Elevation (Ac)	1.373	1.358	X			"
Active Storage Available (Ac-Ft)*	6.436	6.316	X			
Lowest Elevation at Top of Embankment (If Applicable)	844.75	844.73	X			
Average Elevation at Top of Embankment (If Applicable)	845.75	845.75	X			
Maximum Bottom Elevation	831.20	830.68	X			
Average Pond Bottom Elevation	831.20	831.20	X			
Pond Bottom Area (Ac)	0.123	0.041	X			Although the pond bottom is smaller, there is still an average of 5' depth
Maximum Pond Depth	5'	5.5'	X			
Average Pond Depth	5'	5'	X			

*To Determine Active Storage $V = H/3(A_1 + A_2 + (A_1 \times A_2)^{1/2})$

Wet Ponds Use H = Height of Section, A_1 = area at normal water elevation, A_2 = area at top section

Dry Ponds Use H = Height of Section, A_1 = pond bottom area, A_2 = area at top section



Inspection Firm: Bonestroo (now Stantec)
 Phone Number: 262-643-9012
 Address: 12075 Corporate Parkway,
 Suite 200
 Megun, WI 53092

Inspector Name : Joseph K. Tew
 Inspection Date: 8-24-11

Certifying
 Professional Name: CarrieAnn M. Hewitt
 Phone Number: 262-643-9012



Date: <u>9-23-11</u>	Signature: <u>CarrieAnn M. Hewitt</u>
-------------------------	--

Project	Project No	Page	
Client	Prepared by	Date	
Calculations for	Reviewed by	Date	

Area at Normal Water (A1) - 0.525^{acres} from table in report

Area at Design High Water Elevation (A2)

844.5 - 58,863 sf

845.5 - 62,654 sf

$$\frac{845.5 - 844.5}{62,654 - 58,863} = \frac{1}{3791} = \frac{.25}{x} \quad x = 947.75$$

$$58,863 + 947.75 = 59,810.75 \text{ sf or } 1.373 \text{ acres}$$

Active Storage Available (Design)

$$V = H/3 (A1 + A2 + (A1 \times A2)^{1/2})$$

$$H = 844.75 - 836.20 = 8.55$$

$$V = (8.55/3) (0.525 + 1.373 + (0.525 \times 1.373)^{1/2})$$

$$V = 6.436$$

Active Storage Available (Actual)

$$V = H/3 (A1 + A2 + (A1 \times A2)^{1/2})$$

$$H = 844.73 - 836.18 = 8.55$$

$$V = (8.55/3) (.511 + 1.358 + (\frac{.511 \times 1.358}{2}))$$

$$V = 6.316$$

ATTACHMENT 2

HydroCAD Calculations



PER DESIGN



POND PER DESIGN

2 year = 1.90 cfs
100 year = 16.85 cfs



ASBUILT



POND ASBUILT

2 year = 1.90 cfs
100 year = 24.80 cfs



PROPOSED CHANGES

*Restrict
18" Discharge
Pipe to
12"*



REVISED POND

2 year = 1.90 cfs
100 year = 10.76 cfs

MMSD Requirements

2 year max. release = 32.36 acres x 0.15 cfs/acre = 4.85 cfs
100 year max. release = 32.36 acres x 0.50 cfs/acre = 16.18 cfs



Routing Diagram for Spencers Pass Calculations

Prepared by Bonestroo, Printed 9/28/2011

HydroCAD® 10.00 s/n 00733 © 2011 HydroCAD Software Solutions LLC

Spencers Pass Calculations

Prepared by Bonestroo

HydroCAD® 10.00 s/n 00733 © 2011 HydroCAD Software Solutions LLC

Type II 24-hr 2 year event Rainfall=2.60"

Printed 9/28/2011

Page 2

Summary for Subcatchment 1S: PER DESIGN

Runoff = 34.88 cfs @ 12.14 hrs, Volume= 2.474 af, Depth> 0.92"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 2 year event Rainfall=2.60"

Area (ac)	CN	Description
* 32.360	81	
32.360		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.6					Direct Entry, Per Applied Technologies Report dated 4/20/05

Summary for Subcatchment 3S: ASBUILT

Runoff = 34.88 cfs @ 12.14 hrs, Volume= 2.474 af, Depth> 0.92"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 2 year event Rainfall=2.60"

Area (ac)	CN	Description
* 32.360	81	
32.360		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.6					Direct Entry, Per Applied Technologies Report dated 4/20/05

Summary for Subcatchment 5S: PROPOSED CHANGES

Runoff = 34.88 cfs @ 12.14 hrs, Volume= 2.474 af, Depth> 0.92"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 2 year event Rainfall=2.60"

Area (ac)	CN	Description
* 32.360	81	
32.360		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.6					Direct Entry, Per Applied Technologies Report dated 4/20/05

Spencers Pass Calculations

Prepared by Bonestroo

HydroCAD® 10.00 s/n 00733 © 2011 HydroCAD Software Solutions LLC

Type II 24-hr 2 year event Rainfall=2.60"

Printed 9/28/2011

Page 3

Summary for Pond 2P: POND PER DESIGN

Inflow Area = 32.360 ac, 0.00% Impervious, Inflow Depth > 0.92" for 2 year event event
Inflow = 34.88 cfs @ 12.14 hrs, Volume= 2.474 af
Outflow = 1.87 cfs @ 14.88 hrs, Volume= 1.188 af, Atten= 95%, Lag= 164.1 min
Primary = 1.87 cfs @ 14.88 hrs, Volume= 1.188 af
Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 838.60' @ 14.88 hrs Surf.Area= 32,539 sf Storage= 66,783 cf

Plug-Flow detention time= 236.2 min calculated for 1.188 af (48% of inflow)
Center-of-Mass det. time= 150.8 min (962.2 - 811.4)

Volume	Invert	Avail.Storage	Storage Description
#1	836.20'	397,464 cf	Custom Stage Data (Prismatic) Listed below

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
836.20	22,869	0	0
837.00	25,918	19,515	19,515
838.00	29,969	27,944	47,458
839.00	34,238	32,104	79,562
840.00	38,638	36,438	116,000
841.00	43,212	40,925	156,925
842.00	47,872	45,542	202,467
843.00	52,708	50,290	252,757
843.50	55,147	26,964	279,721
844.50	58,850	56,999	336,719
845.50	62,639	60,745	397,464

Device	Routing	Invert	Outlet Devices
#1	Primary	835.93'	15.0" Round RCP_Round 15" L= 78.0' RCP, groove end projecting, Ke= 0.200 Inlet / Outlet Invert= 835.93' / 835.56' S= 0.0047 ' / Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 1.23 sf
#2	Device 1	836.20'	7.0" Vert. Orifice/Grate C= 0.600
#3	Device 1	840.00'	24.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#4	Secondary	844.75'	50.0' 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=1.87 cfs @ 14.88 hrs HW=838.60' (Free Discharge)
1=RCP_Round 15" (Passes 1.87 cfs of 8.33 cfs potential flow)
2=Orifice/Grate (Orifice Controls 1.87 cfs @ 6.99 fps)
3=Orifice/Grate (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=836.20' (Free Discharge)
4=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Spencers Pass Calculations

Prepared by Bonestroo

HydroCAD® 10.00 s/n 00733 © 2011 HydroCAD Software Solutions LLC

Type II 24-hr 2 year event Rainfall=2.60"

Printed 9/28/2011

Page 4

Summary for Pond 4P: POND ASBUILT

Inflow Area = 32.360 ac, 0.00% Impervious, Inflow Depth > 0.92" for 2 year event event
Inflow = 34.88 cfs @ 12.14 hrs, Volume= 2.474 af
Outflow = 1.90 cfs @ 14.79 hrs, Volume= 1.209 af, Atten= 95%, Lag= 158.9 min
Primary = 1.90 cfs @ 14.79 hrs, Volume= 1.209 af
Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 838.65' @ 14.79 hrs Surf.Area= 31,963 sf Storage= 66,373 cf

Plug-Flow detention time= 235.3 min calculated for 1.209 af (49% of inflow)
Center-of-Mass det. time= 150.2 min (961.6 - 811.4)

Volume	Invert	Avail.Storage	Storage Description
#1	836.20'	354,620 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
836.20	22,275	0	0
837.00	25,374	19,060	19,060
838.00	29,288	27,331	46,391
839.00	33,388	31,338	77,729
840.00	37,608	35,498	113,227
841.00	41,923	39,766	152,992
842.00	46,370	44,147	197,139
843.00	50,913	48,642	245,780
844.00	55,589	53,251	299,031
845.00	55,589	55,589	354,620

Device	Routing	Invert	Outlet Devices
#1	Primary	835.93'	18.0" Round Culvert L= 78.0' RCP, groove end projecting, Ke= 0.200 Inlet / Outlet Invert= 835.93' / 835.56' S= 0.0047 ' / Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 1.77 sf
#2	Device 1	836.18'	7.0" Vert. Orifice/Grate C= 0.600
#3	Device 1	839.49'	24.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#4	Secondary	844.73'	10.0' 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=1.90 cfs @ 14.79 hrs HW=838.65' (Free Discharge)
1=Culvert (Passes 1.90 cfs of 12.01 cfs potential flow)
2=Orifice/Grate (Orifice Controls 1.90 cfs @ 7.11 fps)
3=Orifice/Grate (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=836.20' (Free Discharge)
4=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Spencers Pass Calculations

Prepared by Bonestroo

HydroCAD® 10.00 s/n 00733 © 2011 HydroCAD Software Solutions LLC

Type II 24-hr 2 year event Rainfall=2.60"

Printed 9/28/2011

Page 5

Summary for Pond 6P: REVISED POND

Inflow Area = 32.360 ac, 0.00% Impervious, Inflow Depth > 0.92" for 2 year event event
Inflow = 34.88 cfs @ 12.14 hrs, Volume= 2.474 af
Outflow = 1.90 cfs @ 14.79 hrs, Volume= 1.209 af, Atten= 95%, Lag= 158.9 min
Primary = 1.90 cfs @ 14.79 hrs, Volume= 1.209 af
Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 838.65' @ 14.79 hrs Surf.Area= 31,963 sf Storage= 66,373 cf

Plug-Flow detention time= 235.3 min calculated for 1.209 af (49% of inflow)
Center-of-Mass det. time= 150.2 min (961.6 - 811.4)

Volume	Invert	Avail.Storage	Storage Description
#1	836.20'	354,620 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
836.20	22,275	0	0
837.00	25,374	19,060	19,060
838.00	29,288	27,331	46,391
839.00	33,388	31,338	77,729
840.00	37,608	35,498	113,227
841.00	41,923	39,766	152,992
842.00	46,370	44,147	197,139
843.00	50,913	48,642	245,780
844.00	55,589	53,251	299,031
845.00	55,589	55,589	354,620

Device	Routing	Invert	Outlet Devices
#1	Primary	835.93'	12.0" Round Culvert L= 78.0' RCP, groove end projecting, Ke= 0.200 Inlet / Outlet Invert= 835.93' / 835.56' S= 0.0047 ' / Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 0.79 sf
#2	Device 1	836.18'	7.0" Vert. Orifice/Grate C= 0.600
#3	Device 1	839.49'	24.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#4	Secondary	844.73'	10.0' 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=1.90 cfs @ 14.79 hrs HW=838.65' (Free Discharge)

1=Culvert (Passes 1.90 cfs of 5.31 cfs potential flow)
2=Orifice/Grate (Orifice Controls 1.90 cfs @ 7.11 fps)
3=Orifice/Grate (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=836.20' (Free Discharge)

4=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Spencers Pass Calculations

Type II 24-hr 2 year event Rainfall=2.60"

Prepared by Bonestroo

Printed 9/28/2011

HydroCAD® 10.00 s/n 00733 © 2011 HydroCAD Software Solutions LLC

Page 6

Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points

Runoff by SCS TR-20 method, UH=SCS

Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: PER DESIGN

Runoff Area=32.360 ac 0.00% Impervious Runoff Depth>0.92"
Tc=20.6 min CN=81 Runoff=34.88 cfs 2.474 af

Subcatchment 3S: ASBUILT

Runoff Area=32.360 ac 0.00% Impervious Runoff Depth>0.92"
Tc=20.6 min CN=81 Runoff=34.88 cfs 2.474 af

Subcatchment 5S: PROPOSED CHANGES

Runoff Area=32.360 ac 0.00% Impervious Runoff Depth>0.92"
Tc=20.6 min CN=81 Runoff=34.88 cfs 2.474 af

Pond 2P: POND PER DESIGN

Peak Elev=838.60' Storage=66,783 cf Inflow=34.88 cfs 2.474 af
Primary=1.87 cfs 1.188 af Secondary=0.00 cfs 0.000 af Outflow=1.87 cfs 1.188 af

Pond 4P: POND ASBUILT

Peak Elev=838.65' Storage=66,373 cf Inflow=34.88 cfs 2.474 af
Primary=1.90 cfs 1.209 af Secondary=0.00 cfs 0.000 af Outflow=1.90 cfs 1.209 af

Pond 6P: REVISED POND

Peak Elev=838.65' Storage=66,373 cf Inflow=34.88 cfs 2.474 af
Primary=1.90 cfs 1.209 af Secondary=0.00 cfs 0.000 af Outflow=1.90 cfs 1.209 af

Total Runoff Area = 97.080 ac Runoff Volume = 7.422 af Average Runoff Depth = 0.92"
100.00% Pervious = 97.080 ac 0.00% Impervious = 0.000 ac

Spencers Pass Calculations

Prepared by Bonestroo

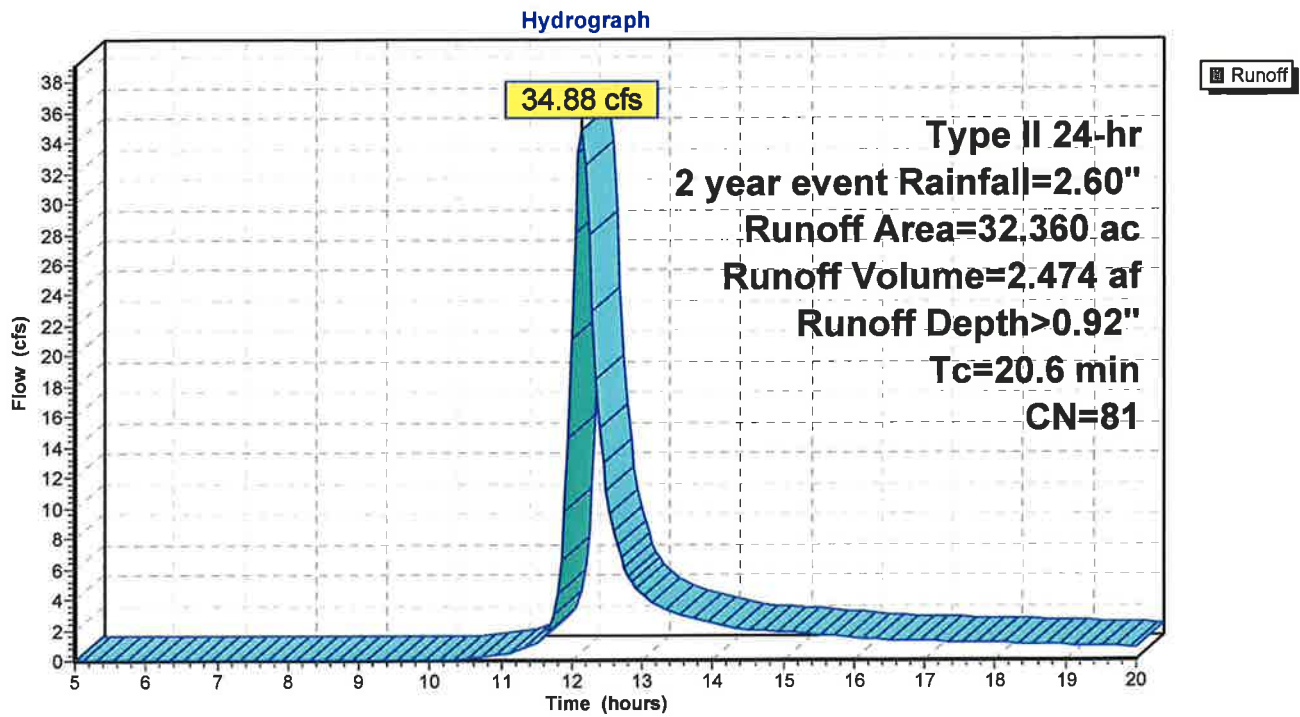
HydroCAD® 10.00 s/n 00733 © 2011 HydroCAD Software Solutions LLC

Type II 24-hr 2 year event Rainfall=2.60"

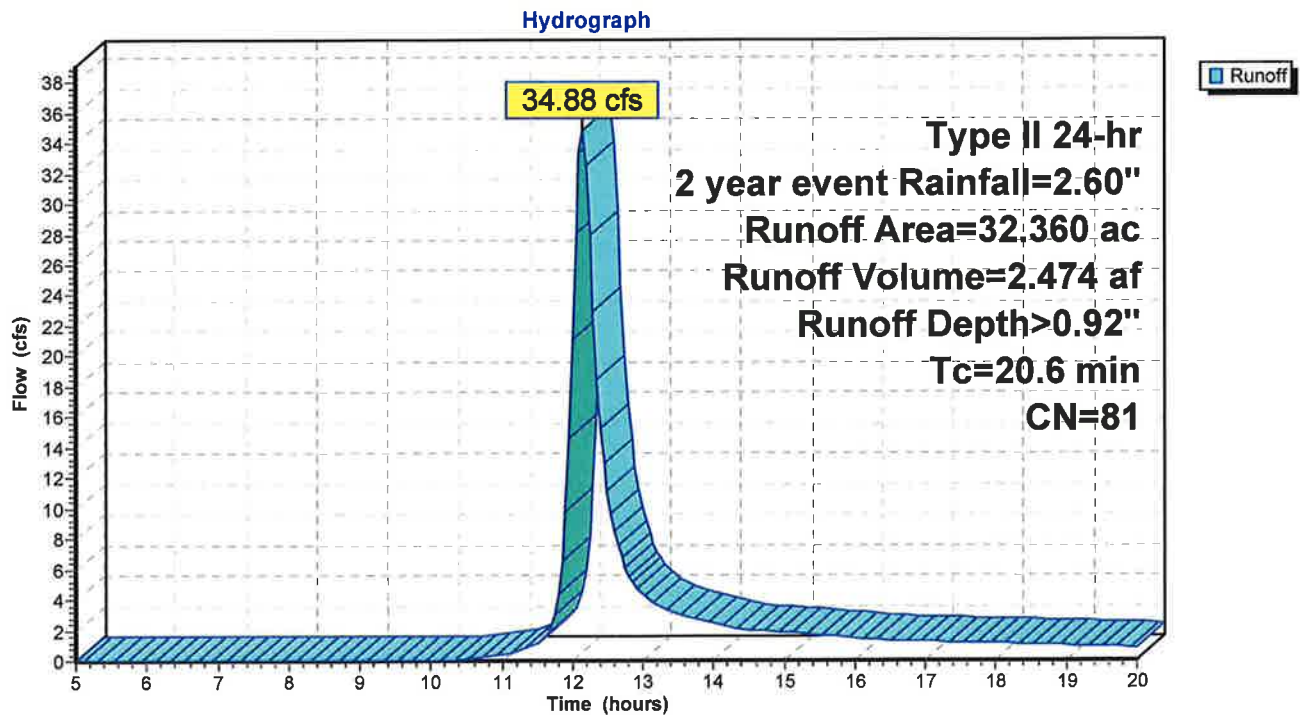
Printed 9/28/2011

Page 7

Subcatchment 1S: PER DESIGN



Subcatchment 3S: ASBUILT



Spencers Pass Calculations

Prepared by Bonestroo

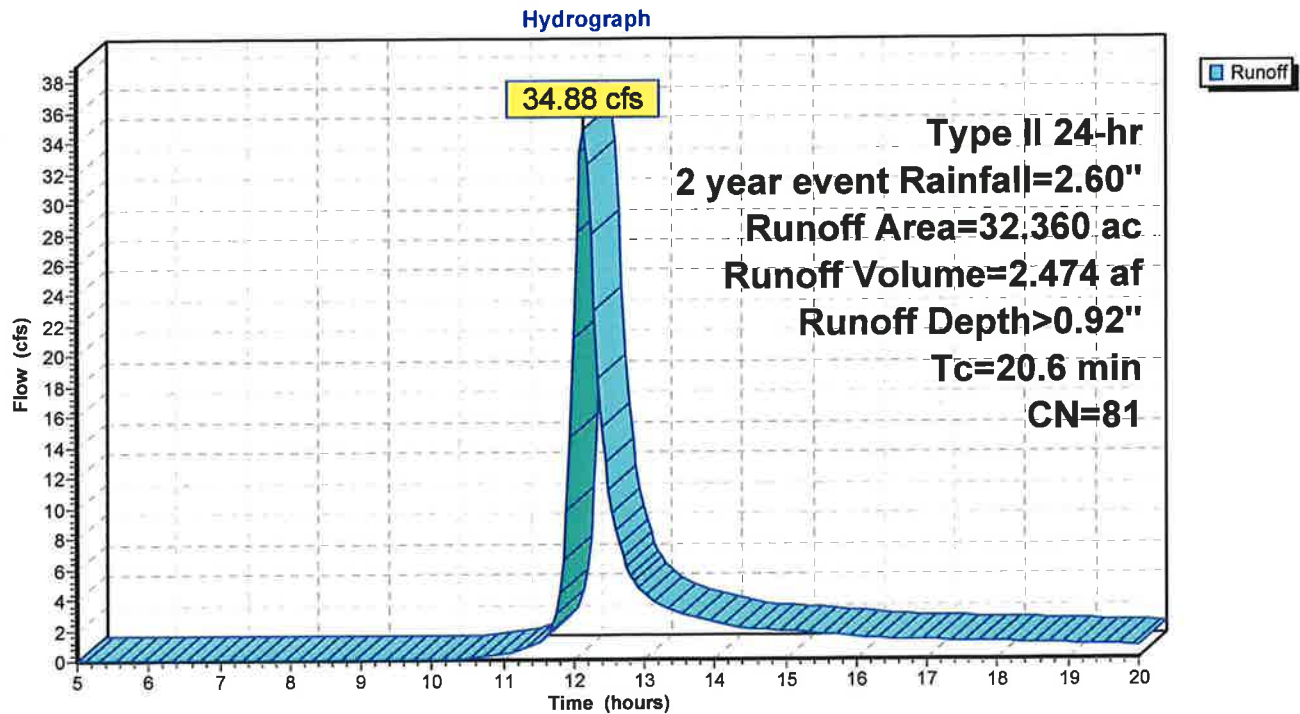
HydroCAD® 10.00 s/n 00733 © 2011 HydroCAD Software Solutions LLC

Type II 24-hr 2 year event Rainfall=2.60"

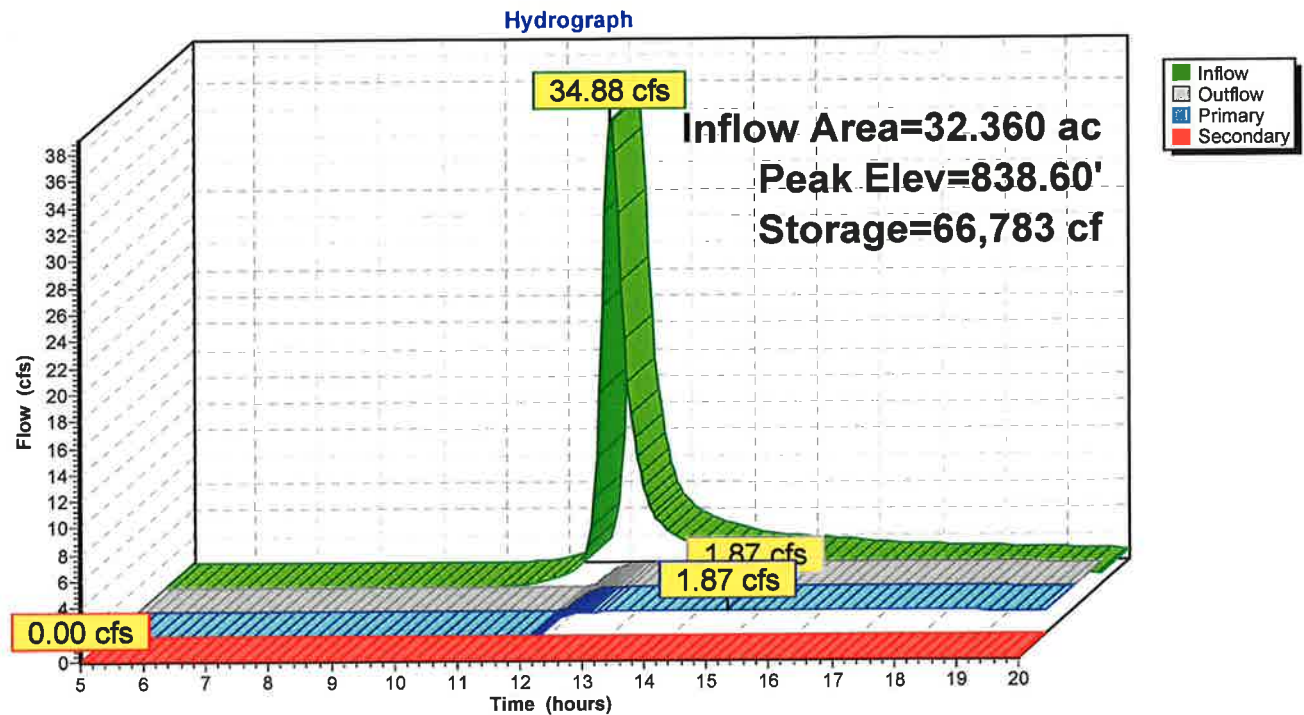
Printed 9/28/2011

Page 8

Subcatchment 5S: PROPOSED CHANGES



Pond 2P: POND PER DESIGN



Spencers Pass Calculations

Prepared by Bonestroo

HydroCAD® 10.00 s/n 00733 © 2011 HydroCAD Software Solutions LLC

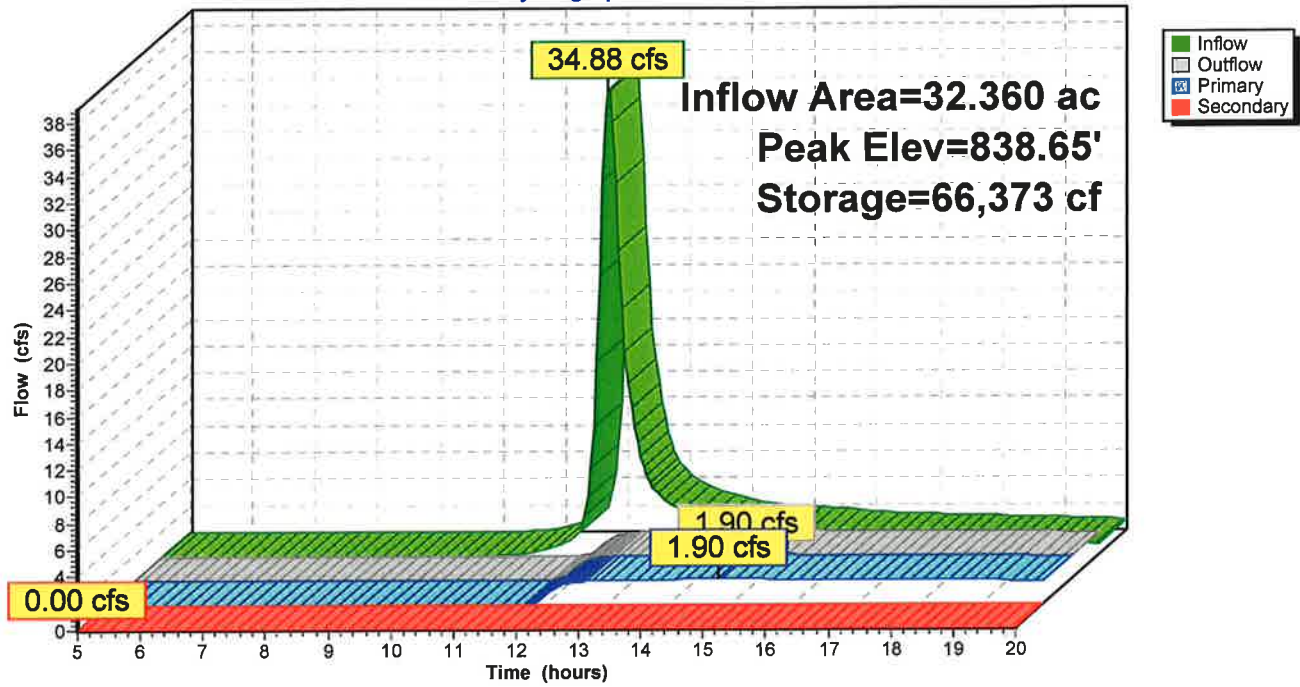
Type II 24-hr 2 year event Rainfall=2.60"

Printed 9/28/2011

Page 9

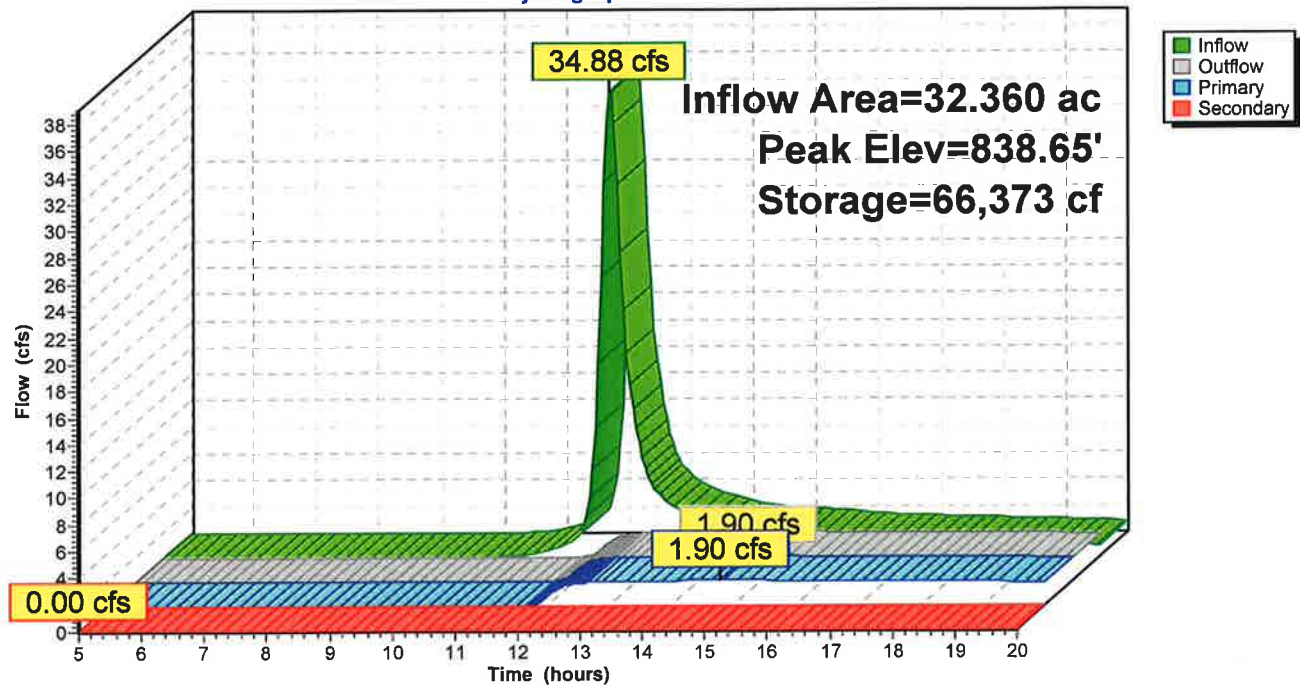
Pond 4P: POND ASBUILT

Hydrograph



Pond 6P: REVISED POND

Hydrograph



Spencers Pass Calculations

Type II 24-hr 100 year event Rainfall=7.10"

Prepared by Bonestroo

Printed 9/28/2011

HydroCAD® 10.00 s/n 00733 © 2011 HydroCAD Software Solutions LLC

Page 10

Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points

Runoff by SCS TR-20 method, UH=SCS

Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: PER DESIGN

Runoff Area=32.360 ac 0.00% Impervious Runoff Depth>4.56"
Tc=20.6 min CN=81 Runoff=170.52 cfs 12.285 af

Subcatchment 3S: ASBUILT

Runoff Area=32.360 ac 0.00% Impervious Runoff Depth>4.56"
Tc=20.6 min CN=81 Runoff=170.52 cfs 12.285 af

Subcatchment 5S: PROPOSED CHANGES

Runoff Area=32.360 ac 0.00% Impervious Runoff Depth>4.56"
Tc=20.6 min CN=81 Runoff=170.52 cfs 12.285 af

Pond 2P: POND PER DESIGN

Peak Elev=844.13' Storage=315,772 cf Inflow=170.52 cfs 12.285 af
Primary=16.85 cfs 9.425 af Secondary=0.00 cfs 0.000 af Outflow=16.85 cfs 9.425 af

Pond 4P: POND ASBUILT

Peak Elev=843.85' Storage=290,931 cf Inflow=170.52 cfs 12.285 af
Primary=24.80 cfs 9.998 af Secondary=0.00 cfs 0.000 af Outflow=24.80 cfs 9.998 af

Pond 6P: REVISED POND

Peak Elev=844.77' Storage=341,632 cf Inflow=170.52 cfs 12.285 af
Primary=10.51 cfs 6.920 af Secondary=0.26 cfs 0.012 af Outflow=10.76 cfs 6.932 af

Total Runoff Area = 97.080 ac Runoff Volume = 36.854 af Average Runoff Depth = 4.56"
100.00% Pervious = 97.080 ac 0.00% Impervious = 0.000 ac

Spencers Pass Calculations

Prepared by Bonestroo

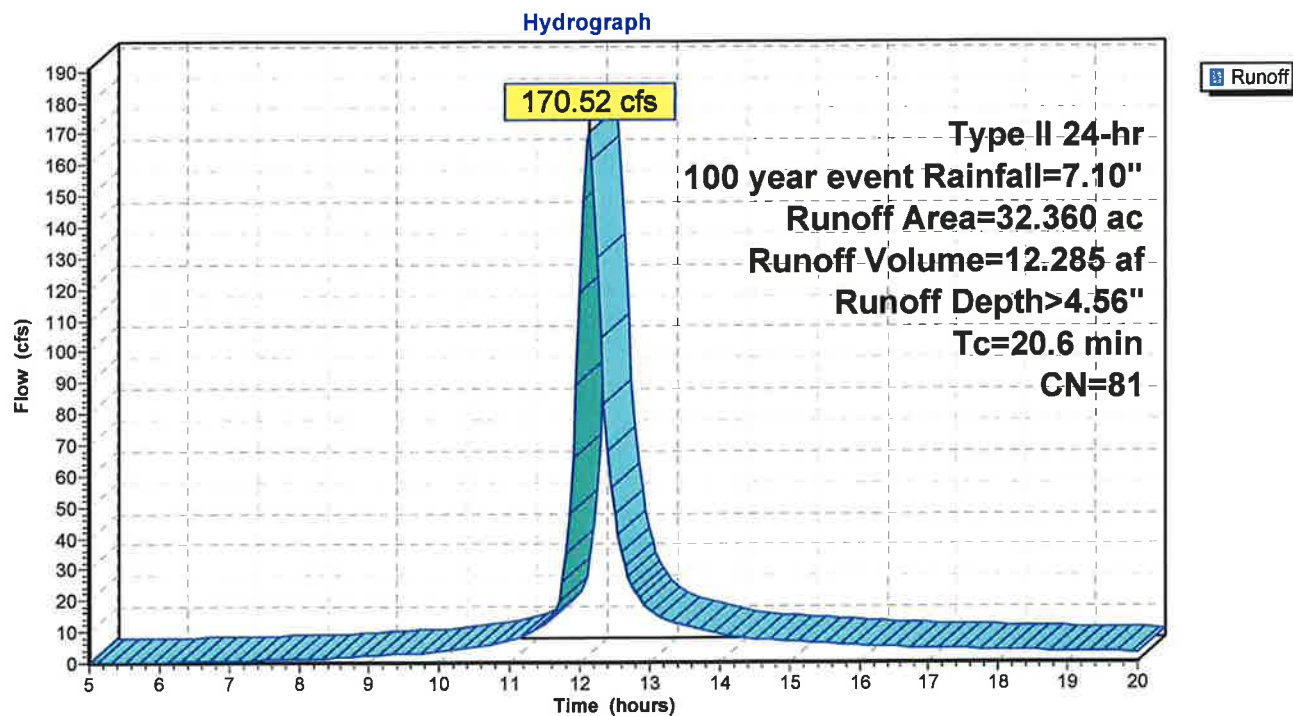
HydroCAD® 10.00 s/n 00733 © 2011 HydroCAD Software Solutions LLC

Type II 24-hr 100 year event Rainfall=7.10"

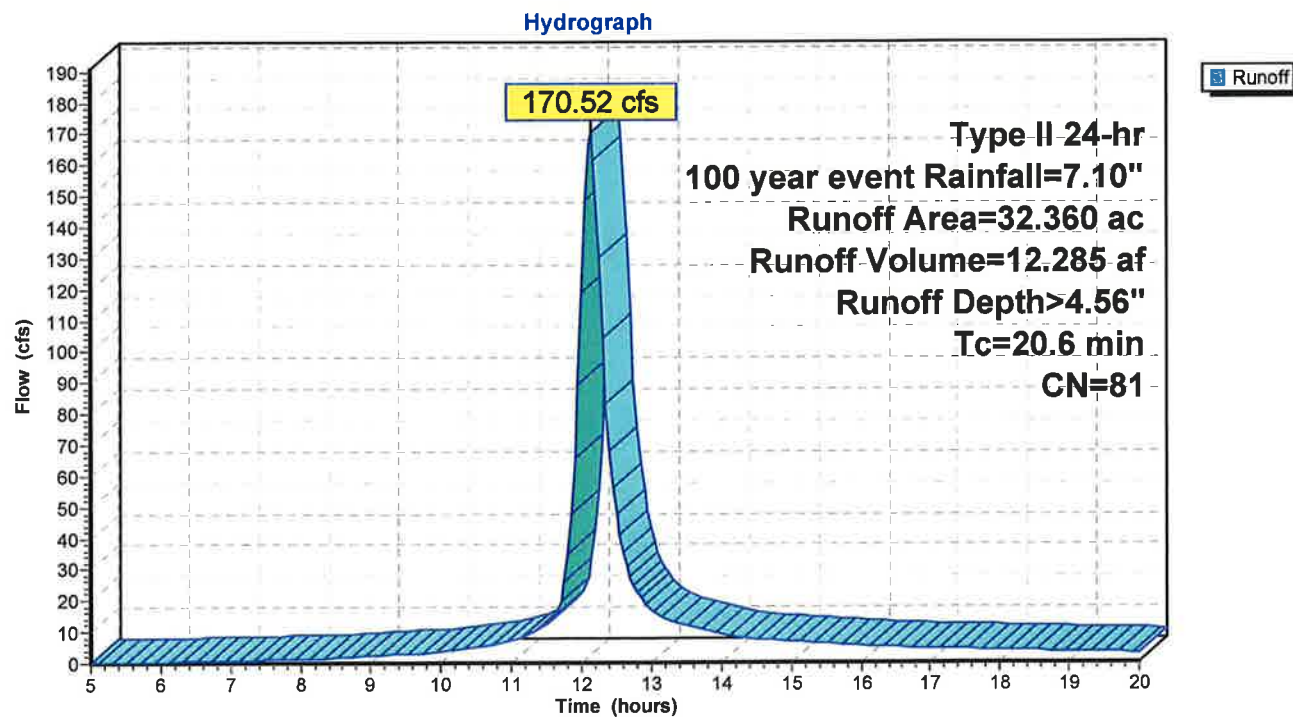
Printed 9/28/2011

Page 11

Subcatchment 1S: PER DESIGN



Subcatchment 3S: ASBUILT



Spencers Pass Calculations

Prepared by Bonestroo

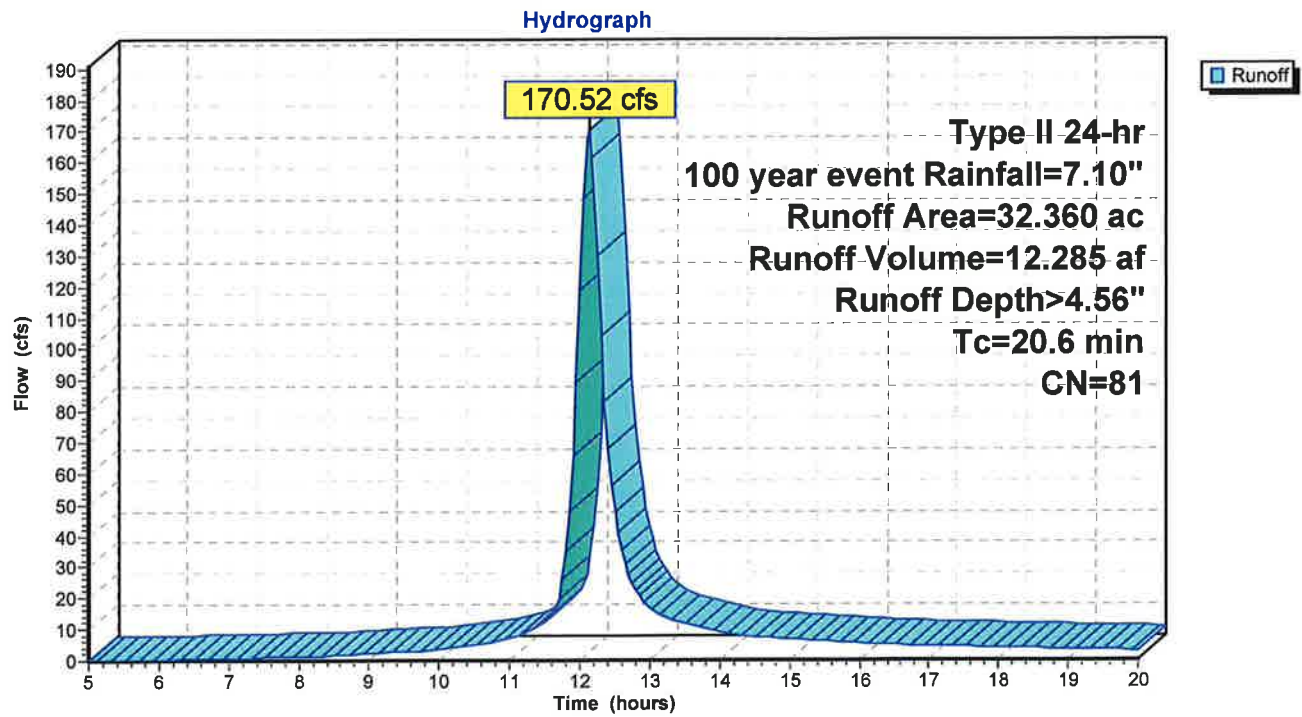
HydroCAD® 10.00 s/n 00733 © 2011 HydroCAD Software Solutions LLC

Type II 24-hr 100 year event Rainfall=7.10"

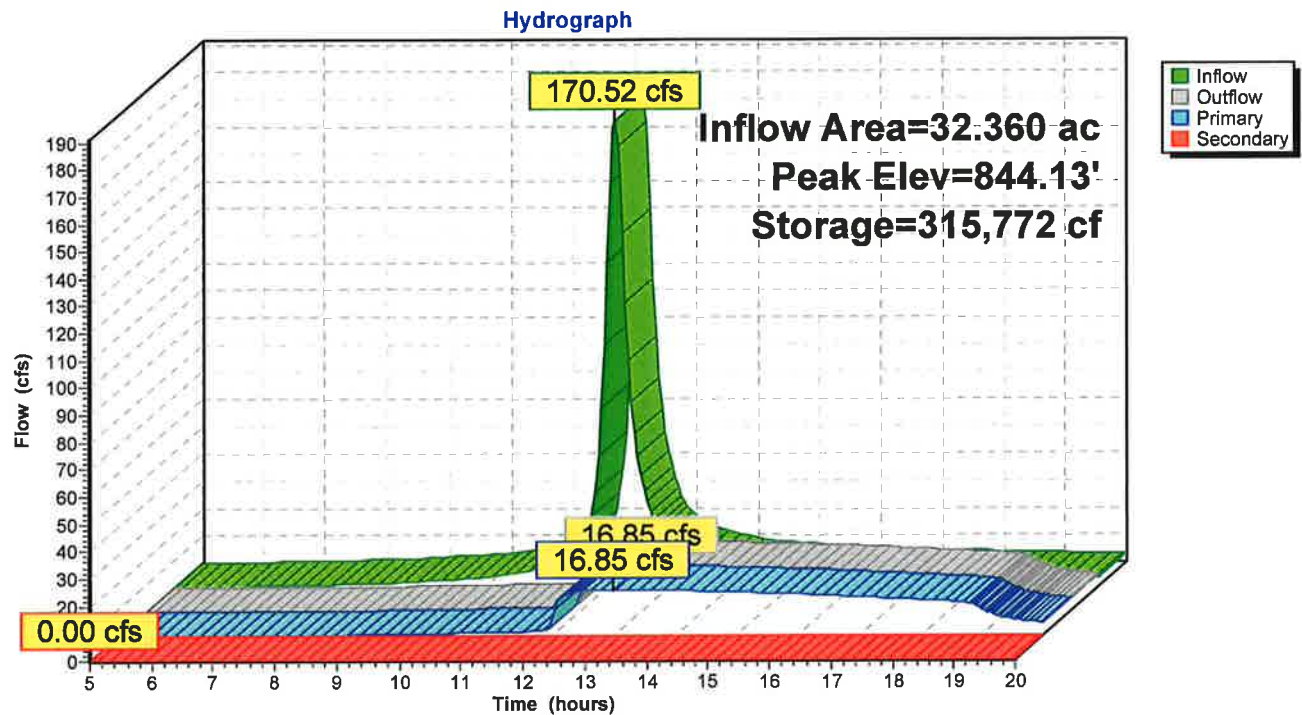
Printed 9/28/2011

Page 12

Subcatchment 5S: PROPOSED CHANGES



Pond 2P: POND PER DESIGN



Spencers Pass Calculations

Prepared by Bonestroo

HydroCAD® 10.00 s/n 00733 © 2011 HydroCAD Software Solutions LLC

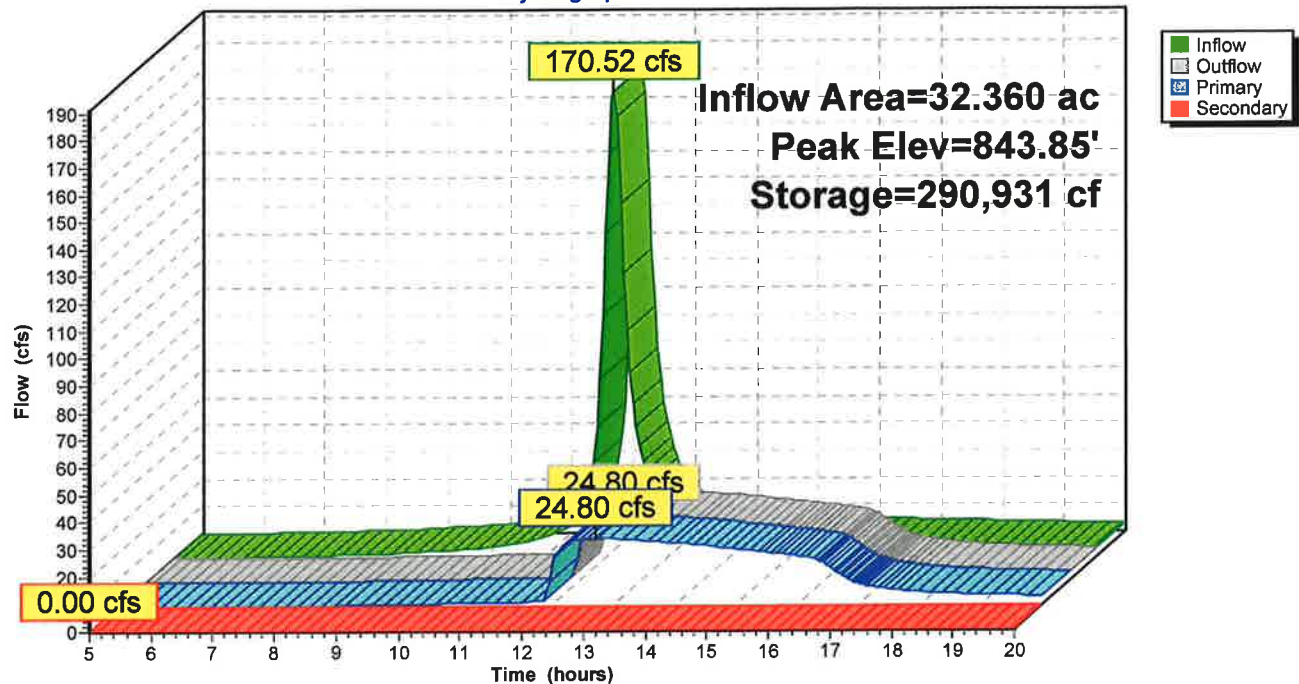
Type II 24-hr 100 year event Rainfall=7.10"

Printed 9/28/2011

Page 13

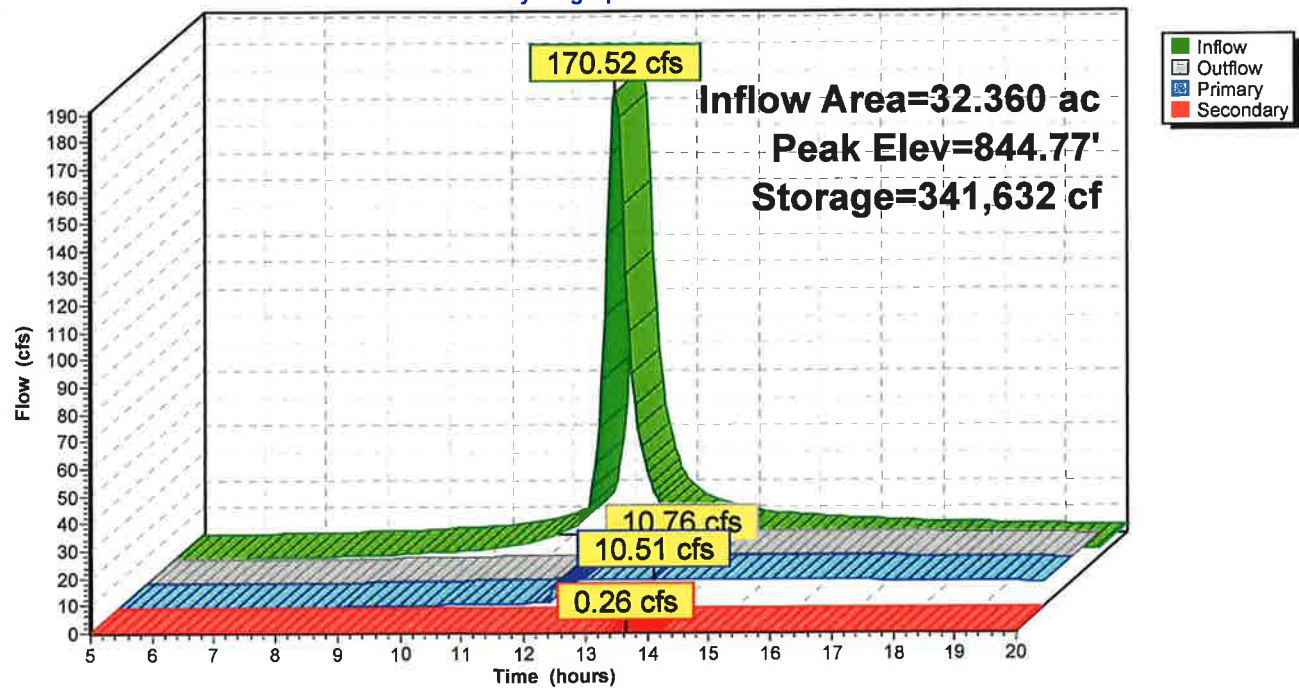
Pond 4P: POND ASBUILT

Hydrograph



Pond 6P: REVISED POND

Hydrograph





Stantec

Stantec Consulting Services Inc.
12075 Corporate Parkway Suite 200
Mequon WI 53092
Tel: (262) 241-4466
Fax: (262) 241-4901



Rec 9/30/11

Carter's +
cranes

September 28, 2011

Ms. Nancy Greifenhagen
Village of Menomonee Falls
W156 N8480 Pilgrim Rd.
Menomonee Falls, WI 53051-3140

RE: Carter's Crossing and Spencer's Pass Pond Recertifications

Dear Ms. Greifenhagen,

We have attached Stormwater Management Facilities Operation and Inspection Reports for the stormwater ponds located within the Carter's Crossing Development and Spencer's Pass East Subdivision. Our survey crew collected data in regards to the current layout and elevations of the ponds. These were then compared to the original design.

Although some of the data collected did not appear to match the original design, the data was entered in to a computer model to verify if the overall Milwaukee Metropolitan Sewerage District (MMSD) requirements were met. The Carter's Crossing development met the criteria by which it was approved in 2005 making some exceptions for off-site drainage, but the Spencer's Pass Development did not. On the Spencer's Pass Subdivision, a larger discharge pipe was installed and the structure riser was placed 0.5' lower than designed. These both allow stormwater runoff to leave the site more quickly than designed. To correct this, we recommend a 12" opening be placed over the 18" discharge pipe. According to our model, this will reduce the discharge rates enough to meet the MMSD requirements.

Attachment 1 contains each of our Inspection Reports, handwritten calculations, copies of pertinent design data, and an 11x17 drawing for each pond displaying survey data and pictures of the site. Attachment 2 contains printouts of HydroCAD calculations for each development.

If you have any questions or comments, please call me at 262-643-9012. Thank you!

Respectfully,

STANTEC CONSULTING SERVICES INC.

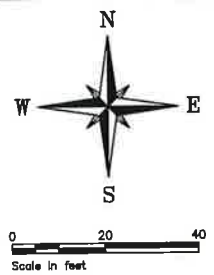
Carrie Ann M. Hewitt, PE
Project Manager
Tel: 262-643-9012
Fax: 262-241-4901
Email: carrieann.hewitt@stantec.com

Attachments: Stormwater Management Facilities Operation and Inspection Reports with supporting data

ATTACHMENT 1

Stormwater Management Facilities Operation and Inspection Reports

766711002
Menomonee Falls
Spencers Pass Pond
Surveyed 2011-08-24
JKT MJD



0.011 @ 832.0 bottom contour
0.030 @ 831.0 bottom contour
0.511 acres at nwl 836.18 (onrice elevation)
1.358 acres @ 844.72 trail

