



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 SW 1/4 Sec 19 Name of Business/Subdivision Willow Springs School
 Property Tax ID Number _____ Address of Property W 220 N 4460 Town Line Rd
Menomonee Falls, WI 53051

Dry Pond	<input checked="" type="checkbox"/>
Wet Pond	<input type="checkbox"/>
Other	<input type="checkbox"/>

Description: JWP 195001

Location Of Pond SE corner of property

Year Pond Constructed 2005 Year of Last Certification NA

Compliance Verification	Design	Actual	Compliant		Comments (Condition of Structure)
			Yes	No	
<i>Primary Outlet Pipe</i>					
Opening Diameter	8"	8"	✓		
Upstream Invert	860	859.26	✓		
Downstream Invert	unknown	857.82	✓		
Length	unknown	31'	✓		
Slope	unknown	4.65%	✓		
<i>Secondary Outlet Pipe</i> (If Applicable)					
Opening Diameter					
Upstream Invert					
Downstream Invert					
Length					
Slope					
<i>Riser</i> (If Applicable)					
Opening Diameter					
Elevation					
<i>Upper Discharge Control</i> (If Applicable)					
Opening Diameter	4"	4"	✓		
Elevation	860	859.26	✓		

Compliance Verification	Design	Actual	Compliant		Comments	
			Yes	No		
<i>Lower Discharge Control</i>	(If Applicable)					
Opening Diameter						
Elevation						
<i>Other (Description)</i>						
Opening Type						
Elevation						
<i>Emergency Spillway</i>						
Elevation	862	862	✓			
Length of spillway	unknown	45'	✓			
<i>Embankment</i>			Present			
			Yes	No		
Unauthorized plantings, trees, or woody vegetation						
Animal burrows or slope erosion						
Storage Properties	Design	Actual	Compliant		Points Surveyed	Equipment Used
	Yes	No				
Normal Water Elevation <i>(Wet Ponds)</i>	NA	NA				
Design High Water Elevation	861.23	861.63	✓			
Area at Normal Water Elevation (Ac) (Wet Ponds)	NA	NA				
Area at Design High Water Elevation (Ac)	unknown	0.503	✓			
Active Storage Available (Ac-Ft)*	0.78	0.46	✓			
Lowest Elevation at Top of Embankment (if Applicable)	863	862.60	✓			
Average Elevation at Top of Embankment (if Applicable)	863	863.52	✓			
Maximum Bottom Elevation	860	859.22	✓			
Average Pond Bottom Elevation	860	859.85	✓			
Pond Bottom Area (Ac)	unknown	0.2	✓			
Maximum Pond Depth	3'	4.3'	✓			
Average Pond Depth	3'	3.67	✓			

*To Determine Active Storage $V=H/3(A1+A2+(A1 \times A2)^{1/2})$

Wet Ponds Use H = Height of Section, A1 = area at normal water elevation, A2 = area at top section

Dry Ponds Use H = Height of Section, A1 = pond bottom area, A2 = area at top section

Sketch Outlet



Inspection Firm: Bonestroo
Phone Number: 262-241-4466
Address: 12075 Corporate Parkway
Suite 200
Mequon, WI 53092

Inspector Name: James Erickson
Inspection Date: _____

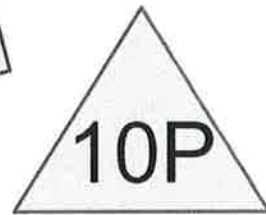
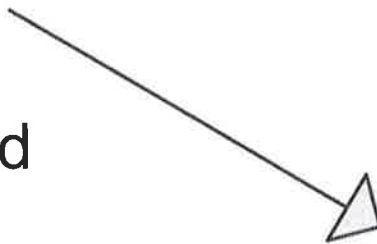
Certifying Professional Name: JoEllen Donovan
Phone Number: 262-643-9014



Date: 10/22/10
Signature: JoEllen Donovan



Watershed



Dry Pond



Pond Certification

Prepared by Bonestroo

HydroCAD® 9.11 s/n 00733 © 2010 HydroCAD Software Solutions LLC

Type II 24-hr 2 Rainfall=2.60"

Printed 11/10/2010

Page 3

Summary for Pond 10P: Dry Pond

Inflow Area = 2.950 ac, 0.00% Impervious, Inflow Depth > 1.07" for 2 event
 Inflow = 5.67 cfs @ 11.98 hrs, Volume= 0.263 af
 Outflow = 0.29 cfs @ 13.25 hrs, Volume= 0.215 af, Atten= 95%, Lag= 76.3 min
 Primary = 0.29 cfs @ 13.25 hrs, Volume= 0.215 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Peak Elev= 859.91' @ 13.25 hrs Surf.Area= 0.214 ac Storage= 0.134 af

Plug-Flow detention time= 259.4 min calculated for 0.215 af (82% of inflow)
 Center-of-Mass det. time= 179.5 min (1,022.0 - 842.5)

Volume	Invert	Avail.Storage	Storage Description
#1	859.26'	2.157 af	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
859.26	0.200	0.000	0.000
860.37	0.224	0.235	0.235
861.34	0.446	0.325	0.560
862.49	0.671	0.642	1.203
863.71	0.894	0.955	2.157

Device	Routing	Invert	Outlet Devices
#1	Primary	859.26'	8.0" Round Culvert L= 31.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 859.26' / 857.82' S= 0.0465 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.35 sf
#2	Device 1	859.26'	4.0" Vert. Orifice/Grate C= 0.600

Primary OutFlow Max=0.29 cfs @ 13.25 hrs HW=859.91' (Free Discharge)

- ↑1=Culvert (Passes 0.29 cfs of 0.95 cfs potential flow)
- ↑2=Orifice/Grate (Orifice Controls 0.29 cfs @ 3.33 fps)

Pond Certification

Prepared by Bonestroo

HydroCAD® 9.11 s/n 00733 © 2010 HydroCAD Software Solutions LLC

Type II 24-hr 10 Rainfall=4.00"

Printed 11/10/2010

Page 5

Summary for Subcatchment 11S: Watershed

Runoff = 11.54 cfs @ 11.97 hrs, Volume= 0.541 af, Depth> 2.20"

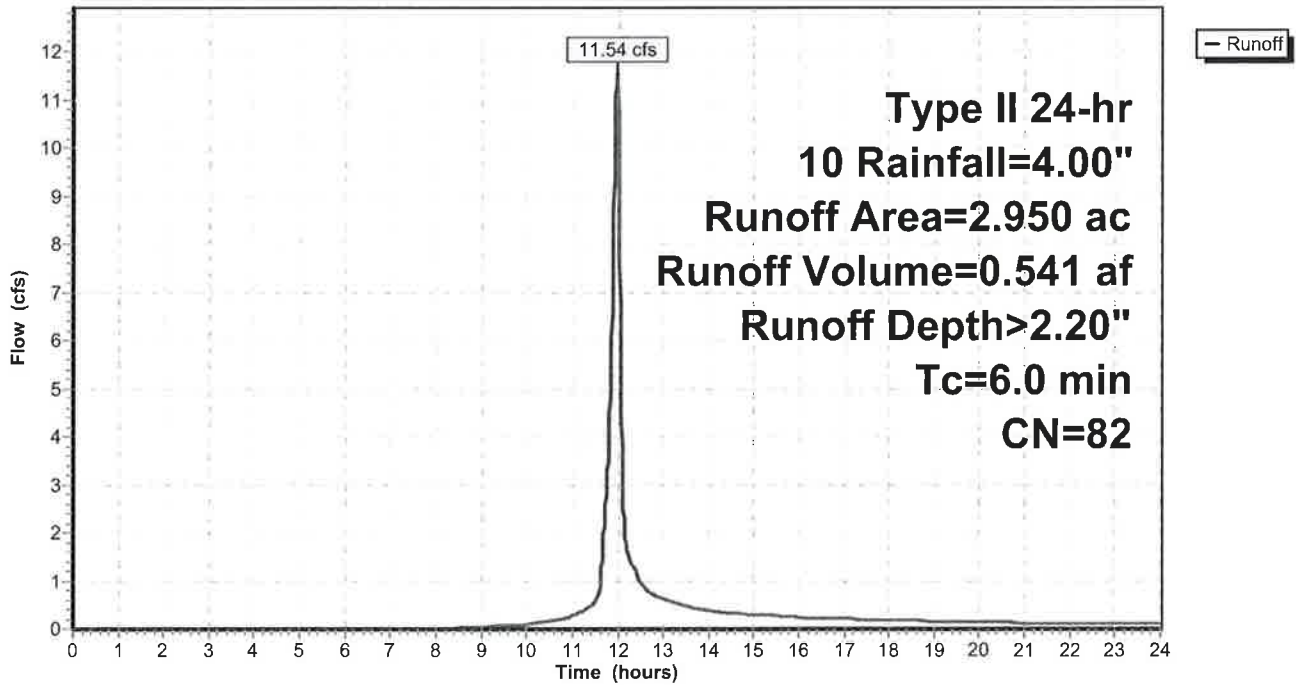
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 10 Rainfall=4.00"

Area (ac)	CN	Description
* 2.950	82	
2.950		100.00% Pervious Area

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

Subcatchment 11S: Watershed

Hydrograph



Pond Certification

Prepared by Bonestroo

HydroCAD® 9.11 s/n 00733 © 2010 HydroCAD Software Solutions LLC

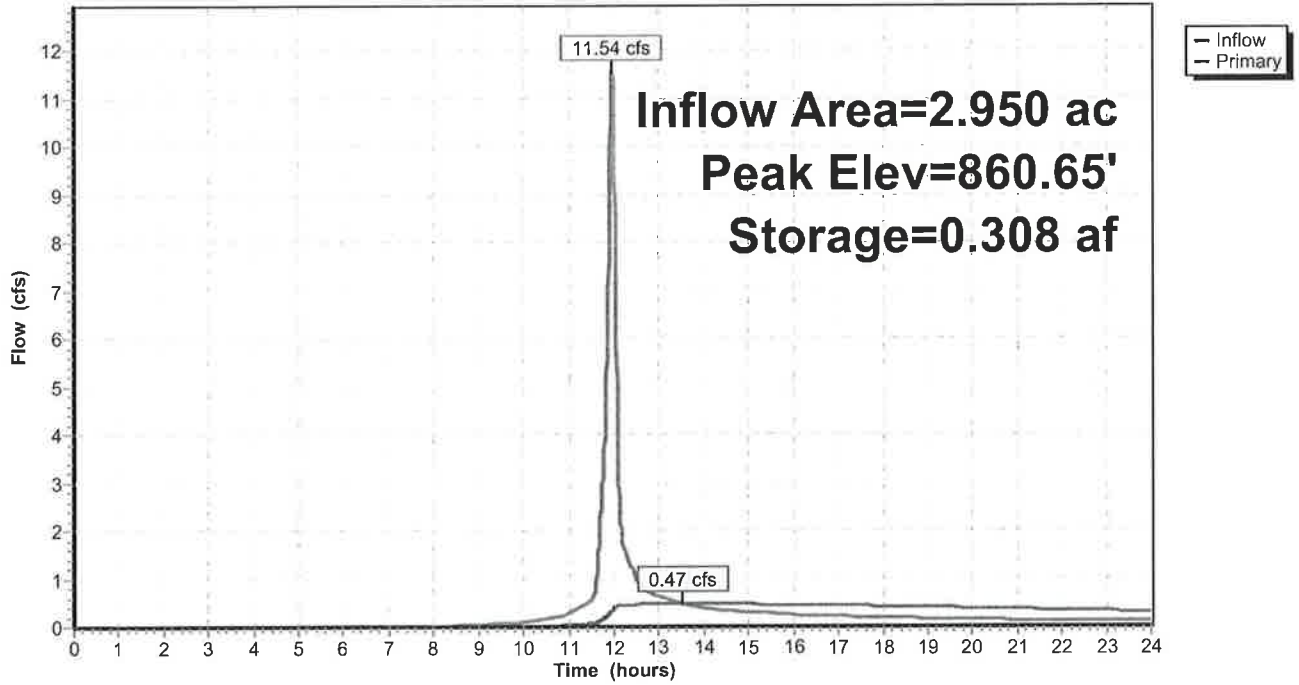
Type II 24-hr 10 Rainfall=4.00"

Printed 11/10/2010

Page 7

Pond 10P: Dry Pond

Hydrograph



Pond Certification

Prepared by Bonestroo

HydroCAD® 9.11 s/n 00733 © 2010 HydroCAD Software Solutions LLC

Type II 24-hr 50 Rainfall=5.80"

Printed 11/10/2010

Page 9

Summary for Pond 10P: Dry Pond

Inflow Area = 2.950 ac, 0.00% Impervious, Inflow Depth > 3.80" for 50 event
Inflow = 19.47 cfs @ 11.97 hrs, Volume= 0.934 af
Outflow = 0.59 cfs @ 14.03 hrs, Volume= 0.579 af, Atten= 97%, Lag= 123.3 min
Primary = 0.59 cfs @ 14.03 hrs, Volume= 0.579 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 861.37' @ 14.03 hrs Surf.Area= 0.452 ac Storage= 0.575 af

Plug-Flow detention time= 350.1 min calculated for 0.579 af (62% of inflow)
Center-of-Mass det. time= 244.5 min (1,050.8 - 806.3)

Volume	Invert	Avail.Storage	Storage Description
#1	859.26'	2.157 af	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
859.26	0.200	0.000	0.000
860.37	0.224	0.235	0.235
861.34	0.446	0.325	0.560
862.49	0.671	0.642	1.203
863.71	0.894	0.955	2.157

Device	Routing	Invert	Outlet Devices
#1	Primary	859.26'	8.0" Round Culvert L= 31.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 859.26' / 857.82' S= 0.0465 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.35 sf
#2	Device 1	859.26'	4.0" Vert. Orifice/Grate C= 0.600

Primary OutFlow Max=0.59 cfs @ 14.03 hrs HW=861.37' (Free Discharge)

↑ **1=Culvert** (Passes 0.59 cfs of 2.24 cfs potential flow)
↑ **2=Orifice/Grate** (Orifice Controls 0.59 cfs @ 6.72 fps)

Pond Certification

Prepared by Bonestroo

HydroCAD® 9.11 s/n 00733 © 2010 HydroCAD Software Solutions LLC

Type II 24-hr 100 Rainfall=7.90"

Printed 11/10/2010

Page 11

Summary for Subcatchment 11S: Watershed

Runoff = 28.83 cfs @ 11.97 hrs, Volume= 1.415 af, Depth> 5.76"

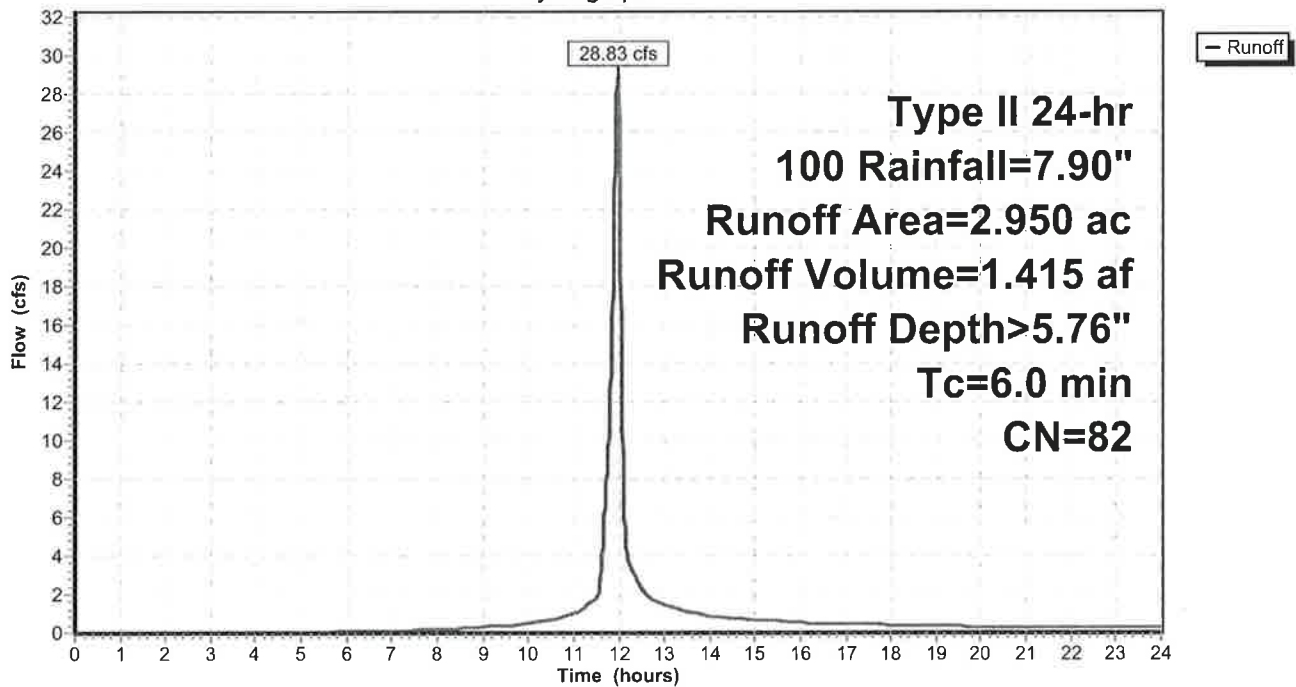
Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 100 Rainfall=7.90"

Area (ac)	CN	Description
* 2.950	82	
2.950		100.00% Pervious Area

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

Subcatchment 11S: Watershed

Hydrograph



Pond Certification

Prepared by Bonestroo

HydroCAD® 9.11 s/n 00733 © 2010 HydroCAD Software Solutions LLC

Type II 24-hr 100 Rainfall=7.90"

Printed 11/10/2010

Page 13

Pond 10P: Dry Pond

Hydrograph

