



DiPrete Engineering

February 25, 2021

Mark Conboy
Town of East Greenwich
125 Main Street
East Greenwich, RI 02818

**RE: Highland Woods
East Greenwich, RI
Project #: 2406-001**

Dear Mr. Conboy:

The purpose of this letter is to outline BMP A’s changes for the Highland Woods project per your comments #3 and #4 dated June 12, 2019. As we previously discussed via email, the ponds have been revised to have 3:1 slopes inside and 2:1 slopes outside with an 8’ wide berm while keeping 10’ away from the wetland edge or wetland buffer. To achieve sufficient volume, subdrains have been added to lower the groundwater table at detention pond A.

The subdrains will intercept groundwater and ensure the bottom of the BMP is dry. The subdrains will then daylight at the closest possible location. While there is an infiltration pond adjacent to detention pond A, most subdrain influence is very limited, usually extending at most 25 feet.

The maximum potential flow from the groundwater (during the wet season) was determined using Darcy’s Law, $Q = kiA$,
Where Q is the flow (cfs), k is the hydraulic conductivity of the soil, i is the hydraulic gradient, and A is the area of influence. For this analysis, k has been assumed at a conservative 3.3 ft/day for sandy loamy soil and i is assumed to be 1 based on an assumed slope of 1:1 for the sandy loamy soil. A is assumed by the subdrain perimeter length (566 ft) and average depth of groundwater to be intercepted (1.5 ft) by the subdrain. Therefore,
 $Q = (3.3 \text{ ft/day}) * (1) * (566 \text{ ft} * 1.5 \text{ ft}) = 0.03 \text{ cfs}$

For these reasons, the subdrain base flow has been added to Design Point 1. HydroCAD printouts have been provided as an attachment. Even with the additional groundwater flows, there will be no or minor increases in runoff to Design Point 1 compared to the previous design flows. Any increases in flow are seasonal and insignificant. See table below for a comparison of existing flows, previous design flows, and revised design flows.

Storm Event	Water Quality	1-year	10-year	25-year	100-year
Pre existing flows (cfs)	0.00	0.27	5.47	11.57	25.01
Previous Post Development Flows approved by DEM (cfs)	0.10	0.77	5.49	11.13	24.57
Revised Post Development Flows* (cfs)	0.13	0.80	5.52	10.44	22.67

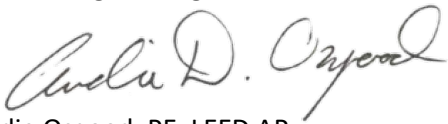
*includes 0.03 cfs of additional subdrain flows

These calculations and analysis are based on the seasonal high groundwater table. This really only occurs two months out of the year. During the rest of the year we expect there will be little or no flow out of the subdrains.

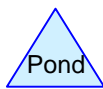
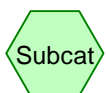
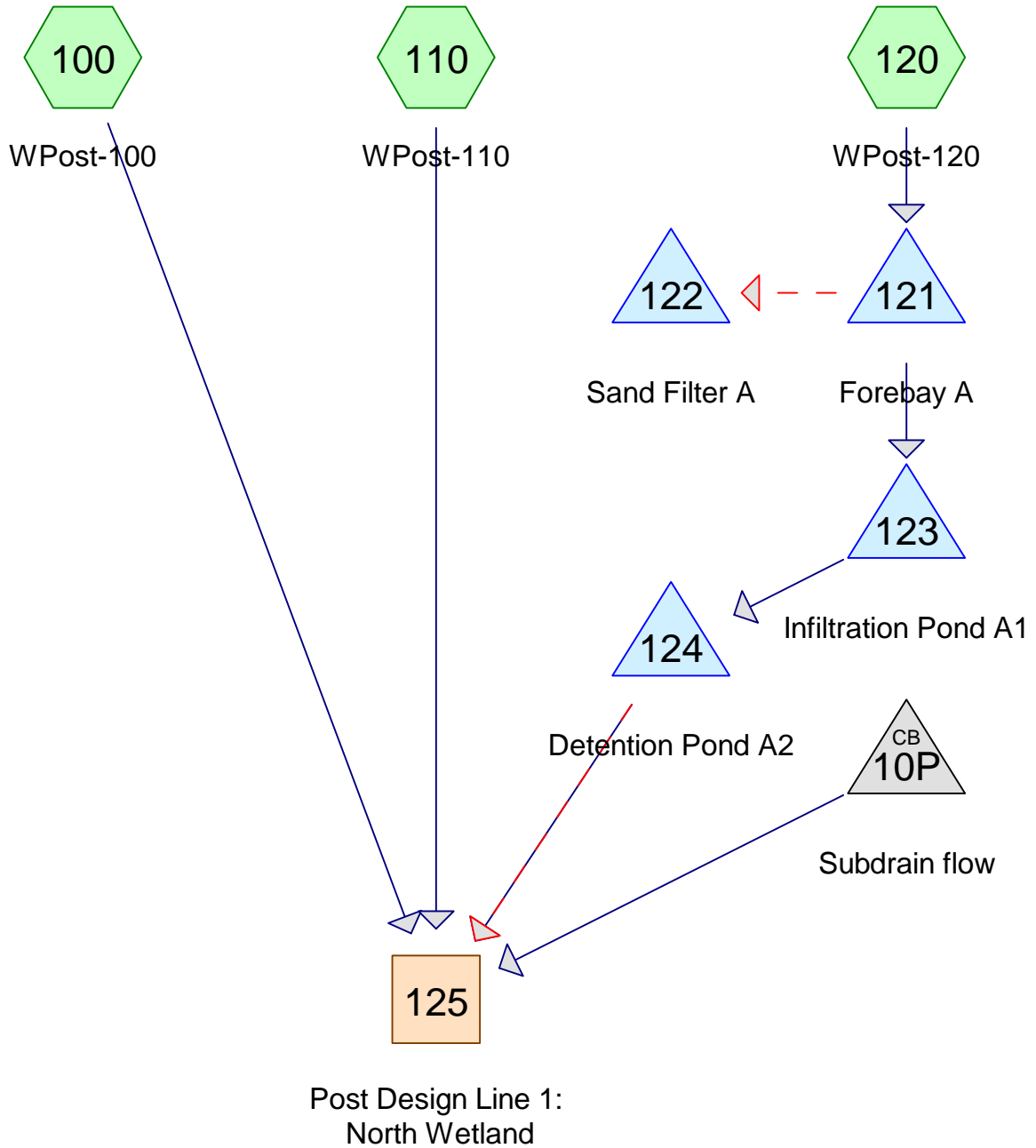
In summary, the revisions above address comments #3 and #4. BMP A has 3:1 maximum side slopes per comment #3. Comment #4 asks for 15' between the toe of the stormwater basin/pond embankments and woody vegetation and 10' has been provided per discussions via phone and email. The proposed subdrains, added to provide volume, will have no impact on the proposed BMPs, the wetlands, groundwater recharge or the Design Points.

If you have any further questions on this matter, please feel free to contact me at your earliest convenience.

Sincerely,
DiPrete Engineering Associates, Inc.

A handwritten signature in black ink that reads "Audie D. Osgood". The signature is written in a cursive style with a large, looped initial "A".

Audie Osgood, PE, LEED AP
Senior Project Manager
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Area Listing (selected nodes)

Area (acres)	CN	Description (subcatchment-numbers)
5.552	61	>75% Grass cover, Good, HSG B (100, 110, 120)
0.180	80	>75% Grass cover, Good, HSG D (100, 110)
0.299	98	Driveways (120)
0.351	98	Houses (100, 110, 120)
0.420	98	Roads (120)
4.172	55	Woods, Good, HSG B (100, 110, 120)
0.608	77	Woods, Good, HSG D (100, 110)
11.582	63	TOTAL AREA

Time span=0.00-72.00 hrs, dt=0.01 hrs, 7201 points
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv.
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 100: WPost-100

Runoff Area=4.418 ac 2.44% Impervious Runoff Depth=0.02"
Flow Length=523' Tc=18.2 min CN=59/98 Runoff=0.08 cfs 0.009 af

Subcatchment 110: WPost-110

Runoff Area=1.596 ac 1.57% Impervious Runoff Depth=0.02"
Flow Length=261' Tc=25.0 min CN=66/98 Runoff=0.02 cfs 0.003 af

Subcatchment 120: WPost-120

Runoff Area=5.568 ac 16.83% Impervious Runoff Depth=0.17"
Flow Length=403' Tc=38.1 min CN=59/98 Runoff=0.52 cfs 0.077 af

Reach 125: Post Design Line 1: North Wetland

Inflow=0.13 cfs 0.190 af
Outflow=0.13 cfs 0.190 af

Pond 10P: Subdrain flow

Peak Elev=423.46' Inflow=0.03 cfs 0.179 af
4.00" Round Culvert n=0.013 L=500.0' S=0.0000 '/' Outflow=0.03 cfs 0.179 af

Pond 121: Forebay A

Peak Elev=428.12' Storage=1,367 cf Inflow=0.52 cfs 0.077 af
Primary=0.00 cfs 0.000 af Secondary=0.50 cfs 0.077 af Outflow=0.50 cfs 0.077 af

Pond 122: Sand Filter A

Peak Elev=428.12' Storage=1,235 cf Inflow=0.50 cfs 0.077 af
Outflow=0.03 cfs 0.077 af

Pond 123: Infiltration Pond A1

Peak Elev=426.50' Storage=0 cf Inflow=0.00 cfs 0.000 af
Discarded=0.00 cfs 0.000 af Primary=0.00 cfs 0.000 af Outflow=0.00 cfs 0.000 af

Pond 124: Detention Pond A2

Peak Elev=425.00' Storage=0 cf Inflow=0.00 cfs 0.000 af
Primary=0.00 cfs 0.000 af Secondary=0.00 cfs 0.000 af Outflow=0.00 cfs 0.000 af

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Type III 24-hr 1-Year Rainfall=2.70"

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Time span=0.00-72.00 hrs, dt=0.01 hrs, 7201 points
 Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
 Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 100: WPost-100

Runoff Area=4.418 ac 2.44% Impervious Runoff Depth=0.23"
 Flow Length=523' Tc=18.2 min CN=60 Runoff=0.40 cfs 0.086 af

Subcatchment 110: WPost-110

Runoff Area=1.596 ac 1.57% Impervious Runoff Depth=0.44"
 Flow Length=261' Tc=25.0 min CN=67 Runoff=0.38 cfs 0.059 af

Subcatchment 120: WPost-120

Runoff Area=5.568 ac 16.83% Impervious Runoff Depth=0.38"
 Flow Length=403' Tc=38.1 min CN=65 Runoff=0.85 cfs 0.174 af

Reach 125: Post Design Line 1: North Wetland

Inflow=0.80 cfs 0.323 af
 Outflow=0.80 cfs 0.323 af

Pond 10P: Subdrain flow

Peak Elev=423.46' Inflow=0.03 cfs 0.179 af
 4.00" Round Culvert n=0.013 L=500.0' S=0.0000 '/ Outflow=0.03 cfs 0.179 af

Pond 121: Forebay A

Peak Elev=428.30' Storage=1,525 cf Inflow=0.85 cfs 0.174 af
 Primary=0.35 cfs 0.092 af Secondary=0.79 cfs 0.083 af Outflow=0.79 cfs 0.174 af

Pond 122: Sand Filter A

Peak Elev=428.30' Storage=1,398 cf Inflow=0.79 cfs 0.083 af
 Outflow=0.03 cfs 0.083 af

Pond 123: Infiltration Pond A1

Peak Elev=427.95' Storage=2,331 cf Inflow=0.35 cfs 0.092 af
 Discarded=0.05 cfs 0.092 af Primary=0.00 cfs 0.000 af Outflow=0.05 cfs 0.092 af

Pond 124: Detention Pond A2

Peak Elev=425.00' Storage=0 cf Inflow=0.00 cfs 0.000 af
 Primary=0.00 cfs 0.000 af Secondary=0.00 cfs 0.000 af Outflow=0.00 cfs 0.000 af

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Type III 24-hr 10-Year Rainfall=4.80"

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Time span=0.00-72.00 hrs, dt=0.01 hrs, 7201 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 100: WPost-100

Runoff Area=4.418 ac 2.44% Impervious Runoff Depth=1.19"
Flow Length=523' Tc=18.2 min CN=60 Runoff=3.76 cfs 0.437 af

Subcatchment 110: WPost-110

Runoff Area=1.596 ac 1.57% Impervious Runoff Depth=1.67"
Flow Length=261' Tc=25.0 min CN=67 Runoff=1.82 cfs 0.221 af

Subcatchment 120: WPost-120

Runoff Area=5.568 ac 16.83% Impervious Runoff Depth=1.52"
Flow Length=403' Tc=38.1 min CN=65 Runoff=4.72 cfs 0.706 af

Reach 125: Post Design Line 1: North Wetland

Inflow=5.52 cfs 1.350 af
Outflow=5.52 cfs 1.350 af

Pond 10P: Subdrain flow

Peak Elev=423.46' Inflow=0.03 cfs 0.179 af
4.00" Round Culvert n=0.013 L=500.0' S=0.0000 '/' Outflow=0.03 cfs 0.179 af

Pond 121: Forebay A

Peak Elev=428.52' Storage=1,735 cf Inflow=4.72 cfs 0.706 af
Primary=4.66 cfs 0.621 af Secondary=1.17 cfs 0.085 af Outflow=4.69 cfs 0.706 af

Pond 122: Sand Filter A

Peak Elev=428.52' Storage=1,628 cf Inflow=1.17 cfs 0.085 af
Outflow=0.03 cfs 0.085 af

Pond 123: Infiltration Pond A1

Peak Elev=428.16' Storage=2,787 cf Inflow=4.66 cfs 0.621 af
Discarded=0.05 cfs 0.107 af Primary=4.60 cfs 0.514 af Outflow=4.65 cfs 0.621 af

Pond 124: Detention Pond A2

Peak Elev=426.04' Storage=3,366 cf Inflow=4.60 cfs 0.514 af
Primary=2.68 cfs 0.514 af Secondary=0.00 cfs 0.000 af Outflow=2.68 cfs 0.514 af

Time span=0.00-72.00 hrs, dt=0.01 hrs, 7201 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 100: WPost-100

Runoff Area=4.418 ac 2.44% Impervious Runoff Depth=2.05"
Flow Length=523' Tc=18.2 min CN=60 Runoff=7.04 cfs 0.756 af

Subcatchment 110: WPost-110

Runoff Area=1.596 ac 1.57% Impervious Runoff Depth=2.68"
Flow Length=261' Tc=25.0 min CN=67 Runoff=3.03 cfs 0.357 af

Subcatchment 120: WPost-120

Runoff Area=5.568 ac 16.83% Impervious Runoff Depth=2.50"
Flow Length=403' Tc=38.1 min CN=65 Runoff=8.05 cfs 1.159 af

Reach 125: Post Design Line 1: North Wetland

Inflow=10.44 cfs 2.254 af
Outflow=10.44 cfs 2.254 af

Pond 10P: Subdrain flow

Peak Elev=423.46' Inflow=0.03 cfs 0.179 af
4.00" Round Culvert n=0.013 L=500.0' S=0.0000 '/' Outflow=0.03 cfs 0.179 af

Pond 121: Forebay A

Peak Elev=428.62' Storage=1,847 cf Inflow=8.05 cfs 1.159 af
Primary=8.00 cfs 1.071 af Secondary=0.73 cfs 0.088 af Outflow=8.04 cfs 1.159 af

Pond 122: Sand Filter A

Peak Elev=428.62' Storage=1,744 cf Inflow=0.73 cfs 0.088 af
Outflow=0.03 cfs 0.088 af

Pond 123: Infiltration Pond A1

Peak Elev=428.23' Storage=2,943 cf Inflow=8.00 cfs 1.071 af
Discarded=0.05 cfs 0.109 af Primary=7.95 cfs 0.963 af Outflow=8.00 cfs 1.071 af

Pond 124: Detention Pond A2

Peak Elev=426.87' Storage=6,725 cf Inflow=7.95 cfs 0.963 af
Primary=5.76 cfs 0.963 af Secondary=0.00 cfs 0.000 af Outflow=5.76 cfs 0.963 af

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Type III 24-hr 100-Year Rainfall=8.70"

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Time span=0.00-72.00 hrs, dt=0.01 hrs, 7201 points
 Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
 Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 100: WPost-100

Runoff Area=4.418 ac 2.44% Impervious Runoff Depth=3.87"
 Flow Length=523' Tc=18.2 min CN=60 Runoff=13.84 cfs 1.424 af

Subcatchment 110: WPost-110

Runoff Area=1.596 ac 1.57% Impervious Runoff Depth=4.71"
 Flow Length=261' Tc=25.0 min CN=67 Runoff=5.40 cfs 0.626 af

Subcatchment 120: WPost-120

Runoff Area=5.568 ac 16.83% Impervious Runoff Depth=4.47"
 Flow Length=403' Tc=38.1 min CN=65 Runoff=14.67 cfs 2.073 af

Reach 125: Post Design Line 1: North Wetland

Inflow=22.67 cfs 4.097 af
 Outflow=22.67 cfs 4.097 af

Pond 10P: Subdrain flow

Peak Elev=423.46' Inflow=0.03 cfs 0.179 af
 4.00" Round Culvert n=0.013 L=500.0' S=0.0000 '/' Outflow=0.03 cfs 0.179 af

Pond 121: Forebay A

Peak Elev=428.80' Storage=2,038 cf Inflow=14.67 cfs 2.073 af
 Primary=14.62 cfs 1.982 af Secondary=0.40 cfs 0.091 af Outflow=14.65 cfs 2.073 af

Pond 122: Sand Filter A

Peak Elev=428.80' Storage=1,932 cf Inflow=0.40 cfs 0.091 af
 Outflow=0.03 cfs 0.091 af

Pond 123: Infiltration Pond A1

Peak Elev=428.34' Storage=3,194 cf Inflow=14.62 cfs 1.982 af
 Discarded=0.05 cfs 0.113 af Primary=14.56 cfs 1.869 af Outflow=14.61 cfs 1.982 af

Pond 124: Detention Pond A2

Peak Elev=428.00' Storage=12,357 cf Inflow=14.56 cfs 1.869 af
 Primary=11.80 cfs 1.869 af Secondary=0.00 cfs 0.000 af Outflow=11.80 cfs 1.869 af

Summary for Subcatchment 100: WPost-100

Runoff = 13.84 cfs @ 12.26 hrs, Volume= 1.424 af, Depth= 3.87"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-Year Rainfall=8.70"

Area (ac)	CN	Description
2.382	61	>75% Grass cover, Good, HSG B
0.011	80	>75% Grass cover, Good, HSG D
1.856	55	Woods, Good, HSG B
0.061	77	Woods, Good, HSG D
* 0.108	98	Houses
4.418	60	Weighted Average
4.310	59	97.56% Pervious Area
0.108	98	2.44% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.9	100	0.0410	0.11		Sheet Flow, T100-1a - T100-1b
					Woods: Light underbrush n= 0.400 P2= 3.30"
2.3	423	0.0362	3.06		Shallow Concentrated Flow, T100-1b - T100-1c
					Unpaved Kv= 16.1 fps
18.2	523	Total			

Summary for Subcatchment 110: WPost-110

Runoff = 5.40 cfs @ 12.36 hrs, Volume= 0.626 af, Depth= 4.71"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-Year Rainfall=8.70"

Area (ac)	CN	Description
0.237	61	>75% Grass cover, Good, HSG B
0.169	80	>75% Grass cover, Good, HSG D
0.618	55	Woods, Good, HSG B
0.547	77	Woods, Good, HSG D
* 0.025	98	Houses
1.596	67	Weighted Average
1.571	66	98.43% Pervious Area
0.025	98	1.57% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
24.4	100	0.0140	0.07		Sheet Flow, T110-1a - T110-1b
					Woods: Light underbrush n= 0.400 P2= 3.30"
0.6	161	0.0733	4.36		Shallow Concentrated Flow, T110-1b - T110-1c
					Unpaved Kv= 16.1 fps
25.0	261	Total			

Summary for Subcatchment 120: WPost-120

Runoff = 14.67 cfs @ 12.53 hrs, Volume= 2.073 af, Depth= 4.47"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-Year Rainfall=8.70"

Area (ac)	CN	Description
2.933	61	>75% Grass cover, Good, HSG B
1.698	55	Woods, Good, HSG B
* 0.218	98	Houses
* 0.299	98	Driveways
* 0.420	98	Roads
5.568	65	Weighted Average
4.631	59	83.17% Pervious Area
0.937	98	16.83% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
36.8	100	0.0050	0.05		Sheet Flow, T120-1a - T120-1b Woods: Light underbrush n= 0.400 P2= 3.30"
1.3	303	0.0597	3.93		Shallow Concentrated Flow, T120-1b - T120-1c Unpaved Kv= 16.1 fps
38.1	403	Total			

Summary for Reach 125: Post Design Line 1: North Wetland

Inflow Area = 11.582 ac, 9.24% Impervious, Inflow Depth > 4.25" for 100-Year event
Inflow = 22.67 cfs @ 12.35 hrs, Volume= 4.097 af
Outflow = 22.67 cfs @ 12.35 hrs, Volume= 4.097 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Summary for Pond 10P: Subdrain flow

Inflow = 0.03 cfs @ 0.00 hrs, Volume= 0.179 af, Incl. 0.03 cfs Base Flow
Outflow = 0.03 cfs @ 0.00 hrs, Volume= 0.179 af, Atten= 0%, Lag= 0.0 min
Primary = 0.03 cfs @ 0.00 hrs, Volume= 0.179 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 423.46' @ 0.00 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	423.00'	4.00" Round Culvert L= 500.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 423.00' / 423.00' S= 0.0000 '/ Cc= 0.900 n= 0.013, Flow Area= 0.09 sf

Primary OutFlow Max=0.03 cfs @ 0.00 hrs HW=423.46' TW=0.00' (Dynamic Tailwater)
↑**1=Culvert** (Barrel Controls 0.03 cfs @ 0.34 fps)

Summary for Pond 121: Forebay A

Inflow Area = 5.568 ac, 16.83% Impervious, Inflow Depth = 4.47" for 100-Year event
 Inflow = 14.67 cfs @ 12.53 hrs, Volume= 2.073 af
 Outflow = 14.65 cfs @ 12.54 hrs, Volume= 2.073 af, Atten= 0%, Lag= 0.5 min
 Primary = 14.62 cfs @ 12.56 hrs, Volume= 1.982 af
 Secondary = 0.40 cfs @ 11.17 hrs, Volume= 0.091 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
 Starting Elev= 427.00' Surf.Area= 545 sf Storage= 576 cf
 Peak Elev= 428.80' @ 12.56 hrs Surf.Area= 1,103 sf Storage= 2,038 cf (1,462 cf above start)

Plug-Flow detention time= 20.7 min calculated for 2.060 af (99% of inflow)
 Center-of-Mass det. time= 14.8 min (876.0 - 861.1)

Volume	Invert	Avail.Storage	Storage Description
#1	425.50'	2,896 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
425.50	223	0	0
427.00	545	576	576
428.00	830	688	1,264
428.25	910	218	1,481
429.00	1,172	781	2,262
429.50	1,364	634	2,896

Device	Routing	Invert	Outlet Devices
#1	Secondary	427.00'	6.00" Round WQ Pipe X 2.00 L= 14.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 427.00' / 427.00' S= 0.0000 '/ Cc= 0.900 n= 0.011, Flow Area= 0.20 sf
#2	Primary	428.25'	12.0' long x 0.5' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=14.61 cfs @ 12.56 hrs HW=428.80' TW=428.34' (Dynamic Tailwater)
 ↑2=**Broad-Crested Rectangular Weir** (Weir Controls 14.61 cfs @ 2.20 fps)

Secondary OutFlow Max=0.34 cfs @ 11.17 hrs HW=428.25' TW=428.21' (Dynamic Tailwater)
 ↑1=**WQ Pipe** (Inlet Controls 0.34 cfs @ 0.87 fps)

Summary for Pond 122: Sand Filter A

Inflow = 0.40 cfs @ 11.17 hrs, Volume= 0.091 af
 Outflow = 0.03 cfs @ 9.50 hrs, Volume= 0.091 af, Atten= 92%, Lag= 0.0 min
 Discarded = 0.03 cfs @ 9.50 hrs, Volume= 0.091 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
 Peak Elev= 428.80' @ 12.55 hrs Surf.Area= 536 sf Storage= 1,932 cf

Plug-Flow detention time= 578.2 min calculated for 0.091 af (100% of inflow)
 Center-of-Mass det. time= 578.2 min (1,664.7 - 1,086.6)

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Type III 24-hr 100-Year Rainfall=8.70"

Prepared by DiPrete Engineering

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Volume	Invert	Avail.Storage	Storage Description
#1	427.00'	2,344 cf	Ponding Storage (Prismatic) Listed below -Impervious Sand/Loam (Prismatic) Listed below (Recalc) 1,340 cf Overall x 33.0% Voids
#2	424.50'	442 cf	
		2,786 cf	

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
427.00	536	0	0
428.00	836	686	686
428.25	920	220	906
429.00	1,193	792	1,698
429.50	1,392	646	2,344

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
424.50	536	0	0
427.00	536	1,340	1,340

Device	Routing	Invert	Outlet Devices
#1	Discarded	424.50'	2.410 in/hr Infiltration over Surface area Phase-In= 0.01'

Discarded OutFlow Max=0.03 cfs @ 9.50 hrs HW=424.55' (Free Discharge)

↑**1=Infiltration** (Exfiltration Controls 0.03 cfs)

Summary for Pond 123: Infiltration Pond A1

Inflow Area = 5.568 ac, 16.83% Impervious, Inflow Depth = 4.27" for 100-Year event
 Inflow = 14.62 cfs @ 12.56 hrs, Volume= 1.982 af
 Outflow = 14.61 cfs @ 12.57 hrs, Volume= 1.982 af, Atten= 0%, Lag= 0.6 min
 Discarded = 0.05 cfs @ 12.57 hrs, Volume= 0.113 af
 Primary = 14.56 cfs @ 12.57 hrs, Volume= 1.869 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
 Peak Elev= 428.34' @ 12.57 hrs Surf.Area= 2,303 sf Storage= 3,194 cf

Plug-Flow detention time= 37.6 min calculated for 1.981 af (100% of inflow)
 Center-of-Mass det. time= 37.8 min (904.0 - 866.3)

Volume	Invert	Avail.Storage	Storage Description
#1	426.50'	4,846 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
426.50	1,189	0	0
427.00	1,474	666	666
428.00	2,076	1,775	2,441
429.00	2,735	2,406	4,846

Device	Routing	Invert	Outlet Devices
#1	Discarded	426.50'	1.020 in/hr Exfiltration over Surface area Phase-In= 0.01'
#2	Primary	428.00'	25.0' long x 0.5' breadth Overflow Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Discarded OutFlow Max=0.05 cfs @ 12.57 hrs HW=428.34' (Free Discharge)

↑1=Exfiltration (Exfiltration Controls 0.05 cfs)

Primary OutFlow Max=14.56 cfs @ 12.57 hrs HW=428.34' TW=427.65' (Dynamic Tailwater)

↑2=Overflow Weir (Weir Controls 14.56 cfs @ 1.69 fps)

Summary for Pond 124: Detention Pond A2

Inflow Area = 5.568 ac, 16.83% Impervious, Inflow Depth = 4.03" for 100-Year event
 Inflow = 14.56 cfs @ 12.57 hrs, Volume= 1.869 af
 Outflow = 11.80 cfs @ 12.78 hrs, Volume= 1.869 af, Atten= 19%, Lag= 13.0 min
 Primary = 11.80 cfs @ 12.78 hrs, Volume= 1.869 af
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
 Peak Elev= 428.00' @ 12.78 hrs Surf.Area= 5,494 sf Storage= 12,357 cf

Plug-Flow detention time= 19.7 min calculated for 1.869 af (100% of inflow)
 Center-of-Mass det. time= 19.8 min (886.0 - 866.2)

Volume	Invert	Avail.Storage	Storage Description
#1	425.00'	18,332 cf	Pond Storage (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
425.00	2,789	0	0
426.00	3,657	3,223	3,223
427.00	4,559	4,108	7,331
428.00	5,494	5,027	12,358
429.00	6,455	5,975	18,332

Device	Routing	Invert	Outlet Devices
#1	Secondary	428.00'	12.0' long x 0.5' breadth Emergency Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32
#2	Primary	425.00'	15.00" W x 6.00" H Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Primary	426.00'	9.00" W x 24.00" H Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=11.80 cfs @ 12.78 hrs HW=428.00' TW=0.00' (Dynamic Tailwater)

↑2=Orifice/Grate (Orifice Controls 4.99 cfs @ 7.98 fps)

↑3=Orifice/Grate (Orifice Controls 6.81 cfs @ 4.54 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=425.00' TW=0.00' (Dynamic Tailwater)

↑1=Emergency Weir (Controls 0.00 cfs)