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January 8, 2020

Patrick J. Hines
Principal
McGoey, Hauser & Edsall
33 Airport Center Drive, Suite 202
New Windsor, NY 12553

RE: SBL:109.001-4-14
Convenience Store/ Gas Station/ Dunkin Donut Drive Thru
SWPPP Amendment
CPL#60008.73

Dear Mr. Hines:

This letter is provided as a supplement to the originally approved SWPPP prepared for the subject project dated last revised December 11, 2015. Please find the following enclosed regarding the CPD Marlborough SWPPP Amendment: Green Infrastructure Worksheet Calculations, Proposed Conditions HydroCAD Model results and revised SWPPP data tables.

CPD Marlborough is a proposed gas station/convenience store and fast food eatery currently under construction in the Town of Marlborough located along NYS Route 9W. Changes to the bioretention area and the underground proprietary treatment practice are proposed due to the presence of shallow bedrock.

The change proposed to the bioretention filter is to shorten the filter length from 460 LF to 420 LF. The bioretention filter treats the proposed conditions watershed DA P-3 which has an area of 0.80 acres and impervious cover of 0.71 acres. There are no changes to the size or cover of DA P-3. The required WQv for DA P-3 is 3,468 ft^3 and the required filter area is 2,890 ft^2. With the proposed change the WQv provided is 4,536 ft^3 (originally 4,968 ft^3) and the filter area is 3,780 ft^2 (originally 4,140 ft^2). The revised bioretention filter will exceed the minimum required WQv and filter area. The changes will also affect the RRv provided for the watershed. The minimum required RRv is 1,786 ft^3 and the revised RRv provided is 1,814 ft^3 (originally 1,987 ft^3).

The enclosed Proposed HydroCAD model has been adjusted to evaluate the impact of the bioretention filter on peak flow rates. The original model indicated proposed conditions stormwater flow rates of 3.14 ft^3/s, 23.52 ft^3/s, and 65.61 ft^3/s for the 1 yr, 10 yr, and 100 yr storm events respectively. The adjusted Proposed HydroCAD model with the revised bioretention filter produces the following results at DP-1: 1 yr – 3.25

ft³/s; 10 yr – 23.30 ft³/s; and 100 yr – 66.96 ft³/s. There is a slight increase in flow rate during the 1 yr and 100 yr storm events when compared to the original model due to the reduction in detention volume available in the revised bioretention filter.

The original approved SWPPP allowed the proposed conditions flow rates to exceed the existing conditions flow rates because a downstream analysis indicated that the development resulted in peak flow rates increasing by less than 5% of the pre-developed condition and no downstream structures or buildings are impacted. The adjusted model results for the 10 yr and 100 yr storms indicate that the peak flow rate remains within the allowable 5% increase and the water surface elevations remained the same for the 10 yr storm (139.12 ft.) and increased from 139.57 ft. to 139.58 ft for the 100 yr storm.

The adjusted HydroCAD model shows no impact to the proposed DOT pipes that are currently being replaced in accordance with the originally approved plans.

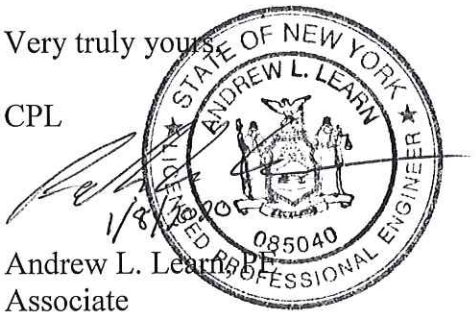
The originally proposed underground proprietary treatment practice (CONTECH Jellyfish Filter) was proposed to treat proposed conditions watershed DA P-4 which contains the underground fuel tanks and fueling stations. The Jellyfish filter is a filtering device that was selected to address the potential for petroleum products in the discharge from the watershed as it is a "Hot Spot" per NYSDEC standards. The Jellyfish Filter is a relatively large and deep structure. Due to the presence of shallow bedrock, the applicant has requested a smaller structure that will require less rock removal. As a result, a hydrodynamic separator unit (CONTECH CDS2015-4) is now proposed to replace the Jellyfish Filter. The CONTECH CDS unit is on the NYSDEC list of approved proprietary practices for redevelopment sites and has a limited ability to remove petroleum products from runoff. In order to provide a greater level of stormwater treatment for hydrocarbons as required for a fueling station, oil absorbent inserts are proposed to be installed within all catch basins that receive runoff from the fueling area.

Sizing calculations and cut sheets for the CONTECH CDS unit and inserts are enclosed. Maintenance of the CDS unit will be performed in accordance with the manufacturer's recommendations. The catch basin inserts will be replaced annually or after any reported spill.

Based on the enclosed calculations, the bioretention filter modification will not have an adverse effect on the overall project or downstream areas and the replacement of the Jellyfish Filter with a combination of the CDS unit and hydrocarbon absorbent catch basin inserts will effectively treat the fueling station area of the site.

Very truly yours,

CPL



Andrew L. Learn, PE
Associate

Enclosures

cc: File
P. Jean (CPD)
P. Tighe (NYSDOT)

Green Infrastructure Worksheet Calculations

Minimum RRv

Enter the Soils Data for the site		
Soil Group	Acres	S
A		55%
B		40%
C	0.80	30%
D		20%
Total Area	0.798	
Calculate the Minimum RRv		
S =	**0.30**	
Impervious =	1.23	*acre*
Precipitation	1.4	*in*
Rv	0.95	
Minimum RRv	**1,786**	***ft3***
	0.04	af

Bioretention Worksheet

(For use on HSG C or D Soils with underdrains)

Af=WQv*(df)/[k*(hf+df)(tf)]

Af	Required Surface Area (ft2)
WQv	Water Quality Volume (ft3)
df	Depth of the Soil Medium (feet)
hf	Average height of water above the planter bed
tf	Volume Through the Filter Media (days)

k — The hydraulic conductivity [ft/day], can be varied depending on the properties of the soil media. Some reported conductivity values are: ***Sand*** - 3.5 ft/day (City of Austin 1988); ***Peat*** - 2.0 ft/day (Galli 1990); ***Leaf Compost*** - 8.7 ft/day (Claytor and Schueler, 1996); ***Bioretention Soil*** (0.5 ft/day (Claytor &

Design Point:	1

Enter Site Data For Drainage Area to be Treated by Practice							
Catchment Number	**Total Area** *(Acres)*	**Impervious Area** *(Acres)*	**Percent Impervious** *%*	**Rv**	**WQv** *(ft^3)*	**Precipitation** *(in)*	**Description**
1	0.80	0.71	0.89	0.86	3468.47	1.40	Bioretention
Enter Impervious Area Reduced by Disconnection of Rooftops		0.00	89%	0.86	3,468	<<WQv after adjusting for Disconnected Rooftops	
Enter the portion of the WQv that is not reduced for all practices routed to this practice.						*ft^3*	

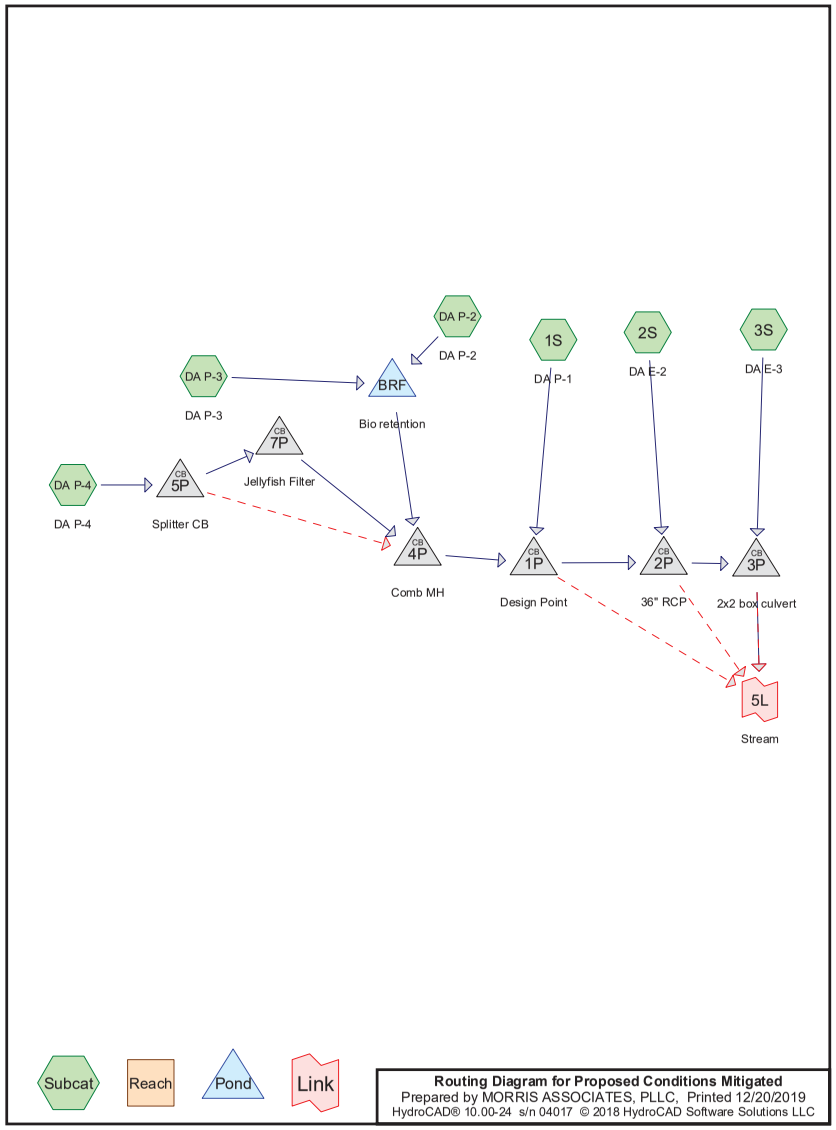
Soil Information			
Soil Group	C		
Soil Infiltration Rate	0.00	*in/hour*	*Okay*
Using Underdrains?	Yes	*Okay*	

Calculate the Minimum Filter Area				
		Value	Units	Notes
WQv		3,468	*ft^3*	
Enter Depth of Soil Media	*df*	2.5	*ft*	*2.5-4 ft*
Enter Hydraulic Conductivity	*k*	0.5	*ft/day*	
Enter Average Height of Ponding	*hf*	0.5	*ft*	*6 inches max.*
Enter Filter Time	*tf*	2	*days*	
Required Filter Area	***Af***	**2890**	***ft^2***	

Determine Actual Bio-Retention Area			
Filter Width	9	*ft*	
Filter Length	420	*ft*	
Filter Area	3780	*ft^2*	
Actual Volume Provided	4536	*ft^3*	

Determine Runoff Reduction				
Is the Bioretention contributing flow to another practice?		No	Select Practice	
RRv	1,814			
RRv applied	**1,814**	***ft^3***	***This is 40% of the storage provided or WQv whichever is less.***	
Volume Treated	1,654	*ft^3*	*This is the portion of the WQv that is not reduced in the practice.*	
Volume Directed	0	*ft^3*	This volume is directed another practice	
Sizing √	OK		*Check to be sure Area provided ≥ Af*	

Proposed Conditions
HydroCAD Model Results



Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
63.425	61	(1S, 2S, 3S, DA P-2)
0.084	79	50-75% Grass cover, Fair, HSG C (DA P-3)
1.233	98	Paved parking, HSG C (DA P-3, DA P-4)
64.742	**62**	**TOTAL AREA**

Pipe Listing (all nodes)

Line#	Node Number	In-Invert (feet)	Out-Invert (feet)	Length (feet)	Slope (ft/ft)	n	Diam/Width (inches)	Height (inches)	Inside-Fill (inches)
1	1P	134.66	134.16	40.0	0.0125	0.012	36.0	0.0	0.0
2	2P	134.16	133.16	90.0	0.0111	0.012	36.0	0.0	0.0
3	3P	133.16	132.66	45.0	0.0111	0.013	24.0	24.0	0.0
4	4P	136.66	134.66	185.0	0.0108	0.012	24.0	0.0	0.0
5	5P	140.60	140.50	5.0	0.0200	0.012	8.0	0.0	0.0
6	5P	140.60	140.00	15.0	0.0400	0.012	15.0	0.0	0.0
7	7P	140.00	139.81	6.0	0.0317	0.012	10.0	0.0	0.0
8	BRF	138.10	136.66	75.0	0.0192	0.012	8.0	0.0	0.0

Summary for Subcatchment 1S: DA P-1

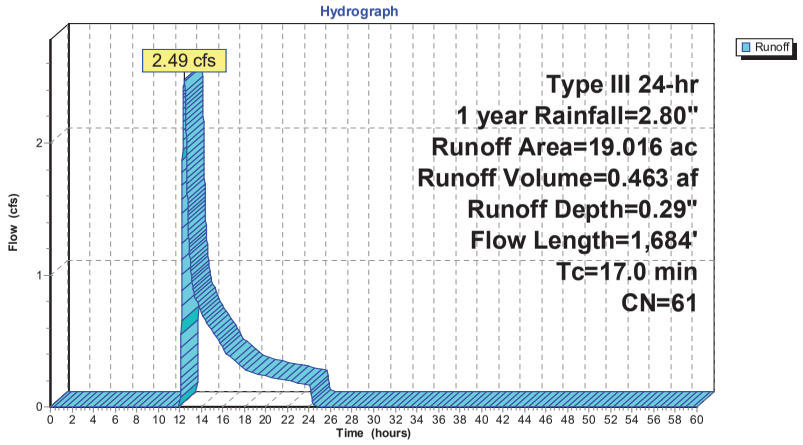
Runoff = 2.49 cfs @ 12.44 hrs, Volume= 0.463 af, Depth= 0.29"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
Type III 24-hr 1 year Rainfall=2.80"

	Area (ac)	CN	Description
*	19.016	61	
	19.016		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.8	150	0.0533	0.29		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.50"
3.1	433	0.2192	2.34		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
5.1	1,101	0.0500	3.60		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
17.0	1,684	Total			

Subcatchment 1S: DA P-1



Summary for Subcatchment 2S: DA E-2

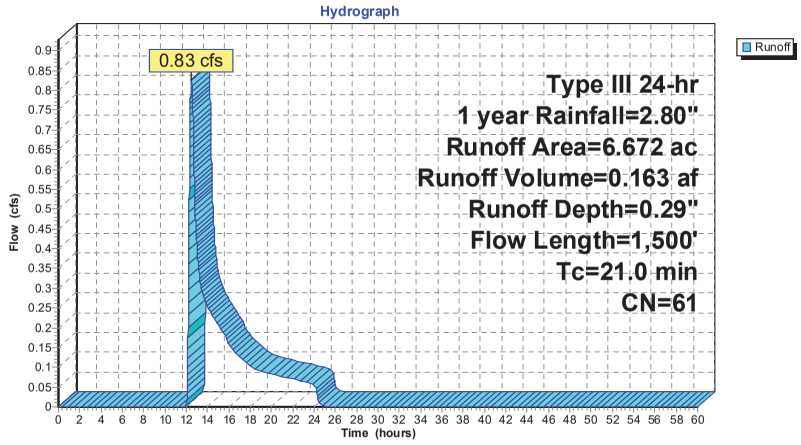
Runoff = 0.83 cfs @ 12.49 hrs, Volume= 0.163 af, Depth= 0.29"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
Type III 24-hr 1 year Rainfall=2.80"

	Area (ac)	CN	Description
*	6.672	61	
	6.672		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.6	100	0.0400	0.11		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.50"
3.7	700	0.0386	3.16		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
1.7	700	0.1870	6.96		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
21.0	1,500	Total			

Subcatchment 2S: DA E-2



Summary for Subcatchment 3S: DA E-3

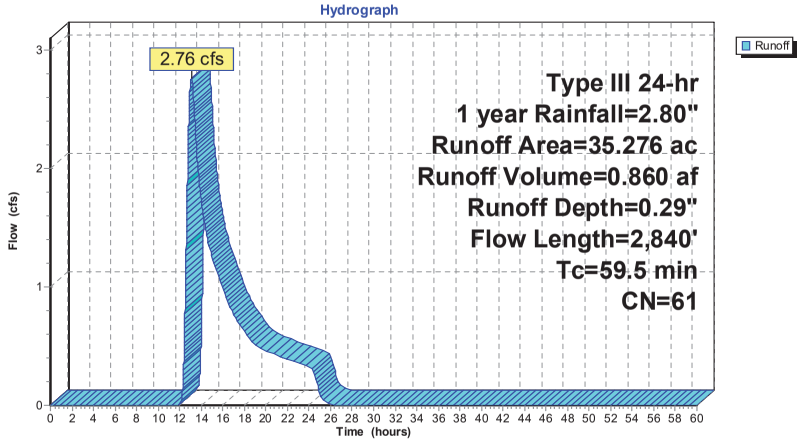
Runoff = 2.76 cfs @ 13.09 hrs, Volume= 0.860 af, Depth= 0.29"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
Type III 24-hr 1 year Rainfall=2.80"

	Area (ac)	CN	Description
*	35.276	61	
	35.276		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
33.4	150	0.0533	0.07		**Sheet Flow,** Woods: Dense underbrush n= 0.800 P2= 3.50"
2.2	180	0.0777	1.39		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
16.2	1,179	0.0590	1.21		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
5.0	759	0.1310	2.53		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
2.7	572	0.0559	3.55		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
59.5	2,840	Total			

Subcatchment 3S: DA E-3



Summary for Subcatchment DA P-2: DA P-2

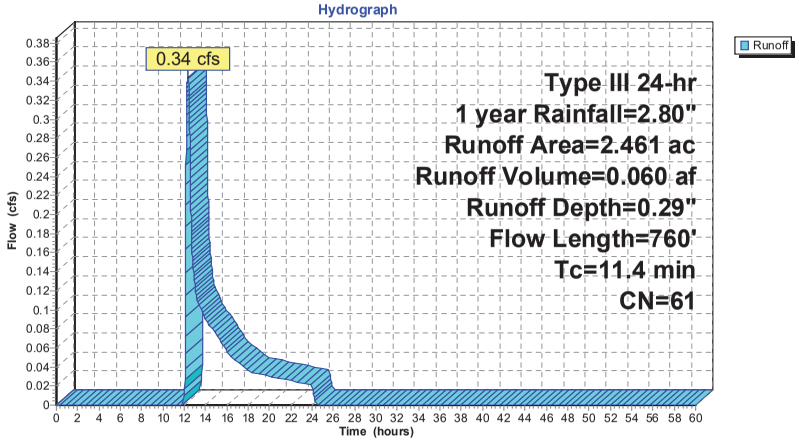
Runoff = 0.34 cfs @ 12.35 hrs, Volume= 0.060 af, Depth= 0.29"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
Type III 24-hr 1 year Rainfall=2.80"

	Area (ac)	CN	Description
*	2.461	61	
	2.461		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.5	100	0.0500	0.18		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.50"
1.9	660	0.1288	5.78		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
11.4	760	Total			

Subcatchment DA P-2: DA P-2



Summary for Subcatchment DA P-3: DA P-3

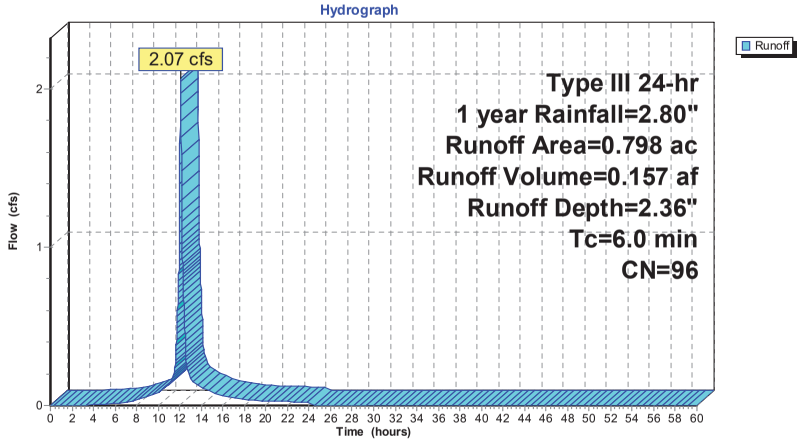
Runoff = 2.07 cfs @ 12.08 hrs, Volume= 0.157 af, Depth= 2.36"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
Type III 24-hr 1 year Rainfall=2.80"

Area (ac)	CN	Description
0.714	98	Paved parking, HSG C
0.084	79	50-75% Grass cover, Fair, HSG C
0.798	96	Weighted Average
0.084		10.53% Pervious Area
0.714		89.47% Impervious Area

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

Subcatchment DA P-3: DA P-3



Summary for Subcatchment DA P-4: DA P-4

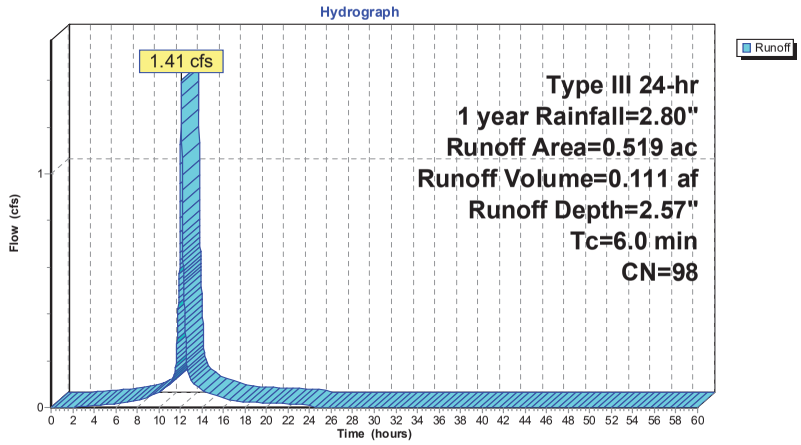
Runoff = 1.41 cfs @ 12.08 hrs, Volume= 0.111 af, Depth= 2.57"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
Type III 24-hr 1 year Rainfall=2.80"

Area (ac)	CN	Description
0.519	98	Paved parking, HSG C
0.000	70	Woods, Good, HSG C
0.000	79	50-75% Grass cover, Fair, HSG C
0.519	98	Weighted Average
0.519		100.00% Impervious Area

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

Subcatchment DA P-4: DA P-4



Summary for Pond 1P: Design Point

Inflow Area = 22.794 ac, 5.41% Impervious, Inflow Depth = 0.42" for 1 year event
Inflow = 3.25 cfs @ 12.52 hrs, Volume= 0.791 af
Outflow = 3.25 cfs @ 12.52 hrs, Volume= 0.791 af, Atten= 0%, Lag= 0.0 min
Primary = 3.25 cfs @ 12.52 hrs, Volume= 0.791 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

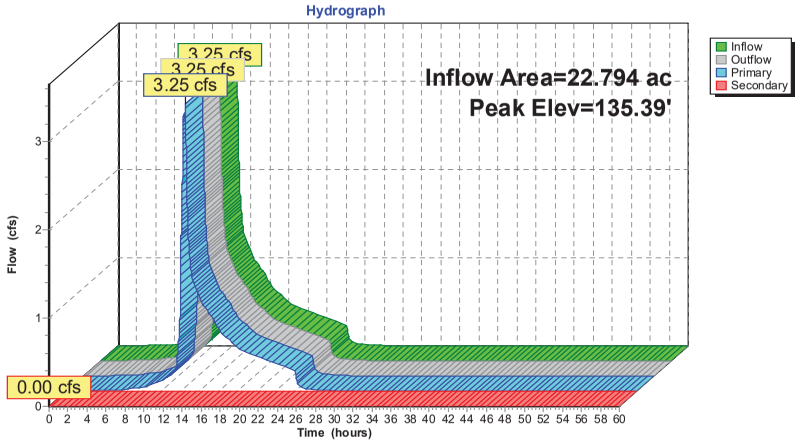
Routing by Dyn-Stor-Ind method, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 135.39' @ 12.52 hrs
Flood Elev= 138.80'

Device	Routing	Invert	Outlet Devices
#1	Primary	134.66'	**36.0" Round Culvert** L= 40.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 134.66' / 134.16' S= 0.0125 '/' Cc= 0.900 n= 0.012 Concrete pipe, straight & clean, Flow Area= 7.07 sf
#2	Primary	138.80'	**Overflow Along Route 9W, Cv= 2.62 (C= 3.28)** Head (feet) 0.00 0.34 1.00 Width (feet) 4.00 20.00 20.00
#3	Secondary	139.14'	**35.0' long x 1.0' breadth Overflow Across Route 9W** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32

Primary OutFlow Max=3.24 cfs @ 12.52 hrs HW=135.39' TW=134.93' (Dynamic Tailwater)
└**1=Culvert** (Outlet Controls 3.24 cfs @ 3.65 fps)
└**2=Overflow Along Route 9W** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=134.66' TW=0.00' (Dynamic Tailwater)
└**3=Overflow Across Route 9W** (Controls 0.00 cfs)

Pond 1P: Design Point



Summary for Pond 2P: 36" RCP

Inflow Area = 29.466 ac, 4.18% Impervious, Inflow Depth = 0.39" for 1 year event
Inflow = 4.08 cfs @ 12.52 hrs, Volume= 0.954 af
Outflow = 4.08 cfs @ 12.52 hrs, Volume= 0.954 af, Atten= 0%, Lag= 0.0 min
Primary = 4.08 cfs @ 12.52 hrs, Volume= 0.954 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

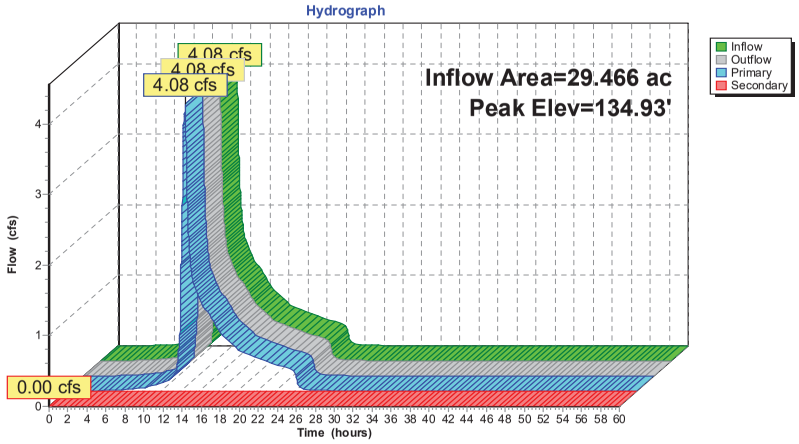
Routing by Dyn-Stor-Ind method, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 134.93' @ 12.52 hrs
Flood Elev= 138.79'

Device	Routing	Invert	Outlet Devices
#1	Primary	134.16'	**36.0" Round Culvert** L= 90.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 134.16' / 133.16' S= 0.0111 '/' Cc= 0.900 n= 0.012 Concrete pipe, straight & clean, Flow Area= 7.07 sf
#2	Primary	138.79'	**Overflow Along Route 9W, Cv= 2.62 (C= 3.28)** Head (feet) 0.00 0.34 Width (feet) 4.00 20.00
#3	Secondary	139.13'	**35.0' long x 1.0' breadth Overflow Across Route 9W** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32

Primary OutFlow Max=4.07 cfs @ 12.52 hrs HW=134.93' TW=134.08' (Dynamic Tailwater)
└**1=Culvert** (Outlet Controls 4.07 cfs @ 4.26 fps)
└**2=Overflow Along Route 9W** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=134.16' TW=0.00' (Dynamic Tailwater)
└**3=Overflow Across Route 9W** (Controls 0.00 cfs)

Pond 2P: 36" RCP



Summary for Pond 3P: 2x2 box culvert

Inflow Area = 64.742 ac, 1.90% Impervious, Inflow Depth = 0.34" for 1 year event
Inflow = 5.03 cfs @ 12.54 hrs, Volume= 1.813 af
Outflow = 5.03 cfs @ 12.54 hrs, Volume= 1.813 af, Atten= 0%, Lag= 0.0 min
Primary = 5.03 cfs @ 12.54 hrs, Volume= 1.813 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

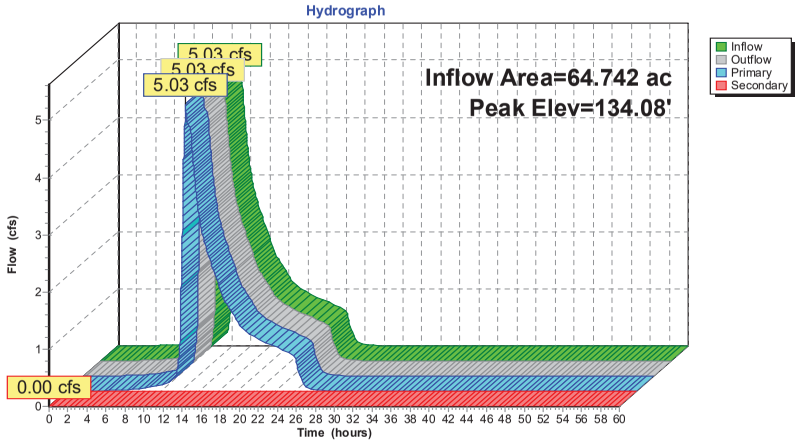
Routing by Dyn-Stor-Ind method, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 134.08' @ 12.54 hrs
Flood Elev= 137.79'

Device	Routing	Invert	Outlet Devices
#1	Primary	133.16'	**24.0" W x 24.0" H Box Culvert** L= 45.0' Box, 0° wingwalls, square crown edge, Ke= 0.700 Inlet / Outlet Invert= 133.16' / 132.66' S= 0.0111 '/' Cc= 0.900 n= 0.013 Concrete pipe, straight & clean, Flow Area= 4.00 sf
#2	Secondary	138.13'	**35.0' long x 1.0' breadth Route 9W Crown** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32

Primary OutFlow Max=5.03 cfs @ 12.54 hrs HW=134.08' TW=0.00' (Dynamic Tailwater)
↑—**1=Culvert** (Inlet Controls 5.03 cfs @ 2.72 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=133.16' TW=0.00' (Dynamic Tailwater)
↑—**2=Route 9W Crown** (Controls 0.00 cfs)

Pond 3P: 2x2 box culvert



Summary for Pond 4P: Comb MH

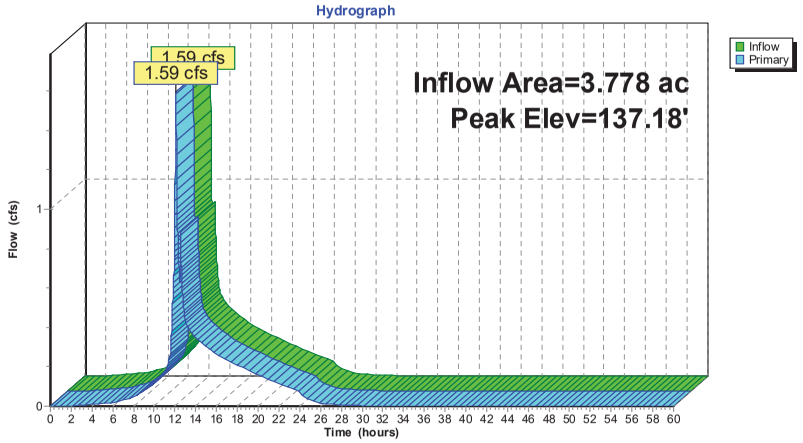
Inflow Area = 3.778 ac, 32.64% Impervious, Inflow Depth = 1.04" for 1 year event
Inflow = 1.59 cfs @ 12.09 hrs, Volume= 0.328 af
Outflow = 1.59 cfs @ 12.09 hrs, Volume= 0.328 af, Atten= 0%, Lag= 0.0 min
Primary = 1.59 cfs @ 12.09 hrs, Volume= 0.328 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 137.18' @ 12.09 hrs
Flood Elev= 143.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	136.66'	**24.0" Round Culvert** L= 185.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 136.66' / 134.66' S= 0.0108 '/' Cc= 0.900 n= 0.012 Corrugated PE, smooth interior, Flow Area= 3.14 sf
#2	Primary	143.50'	**4.0' long x 0.5' breadth Rim** 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=1.59 cfs @ 12.09 hrs HW=137.18' TW=135.15' (Dynamic Tailwater)
1=Culvert (Inlet Controls 1.59 cfs @ 2.45 fps)
2=Rim (Controls 0.00 cfs)

Pond 4P: Comb MH



Summary for Pond 5P: Splitter CB

Inflow Area = 0.519 ac,100.00% Impervious, Inflow Depth = 2.57" for 1 year event
Inflow = 1.41 cfs @ 12.08 hrs, Volume= 0.111 af
Outflow = 1.41 cfs @ 12.08 hrs, Volume= 0.111 af, Atten= 0%, Lag= 0.0 min
Primary = 1.14 cfs @ 12.08 hrs, Volume= 0.109 af
Secondary = 0.27 cfs @ 12.08 hrs, Volume= 0.002 af

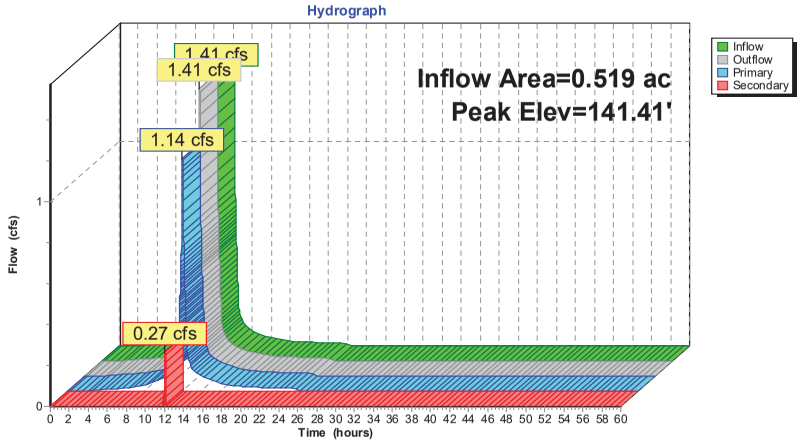
Routing by Dyn-Stor-Ind method, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 141.41' @ 12.08 hrs
Flood Elev= 143.70'

Device	Routing	Invert	Outlet Devices
#1	Primary	140.60'	**8.0" Round Culvert** L= 5.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 140.60' / 140.50' S= 0.0200 '/' Cc= 0.900 n= 0.012 Corrugated PE, smooth interior, Flow Area= 0.35 sf
#2	Device 3	141.30'	**2.5' 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
#3	Secondary	140.60'	**15.0" Round Culvert** L= 15.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 140.60' / 140.00' S= 0.0400 '/' Cc= 0.900 n= 0.012 Corrugated PE, smooth interior, Flow Area= 1.23 sf
#4	Secondary	143.70'	**4.0' long x 0.5' breadth Rim** 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=1.14 cfs @ 12.08 hrs HW=141.41' TW=140.62' (Dynamic Tailwater)
└─**1=Culvert** (Barrel Controls 1.14 cfs @ 3.40 fps)

Secondary OutFlow Max=0.26 cfs @ 12.08 hrs HW=141.41' TW=137.18' (Dynamic Tailwater)
├─**3=Culvert** (Passes 0.26 cfs of 2.59 cfs potential flow)
│ └─**2=Broad-Crested Rectangular Weir** (Weir Controls 0.26 cfs @ 0.94 fps)
└─**4=Rim** (Controls 0.00 cfs)

Pond 5P: Splitter CB



Summary for Pond 7P: Jellyfish Filter

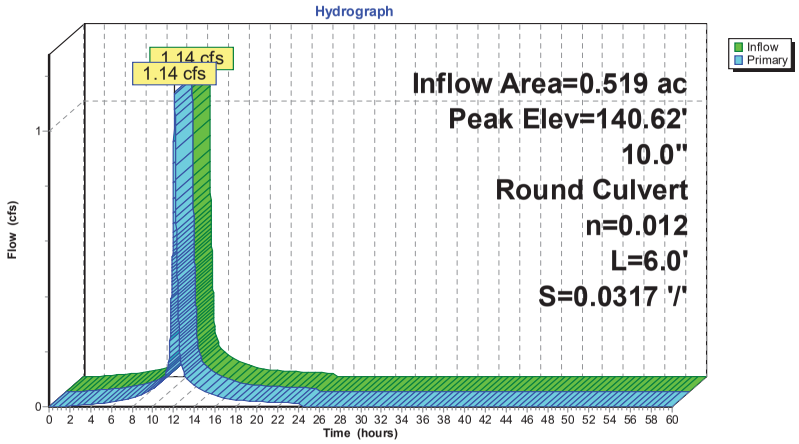
Inflow Area = 0.519 ac,100.00% Impervious, Inflow Depth = 2.52" for 1 year event
Inflow = 1.14 cfs @ 12.08 hrs, Volume= 0.109 af
Outflow = 1.14 cfs @ 12.08 hrs, Volume= 0.109 af, Atten= 0%, Lag= 0.0 min
Primary = 1.14 cfs @ 12.08 hrs, Volume= 0.109 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 140.62' @ 12.08 hrs
Flood Elev= 143.75'

Device	Routing	Invert	Outlet Devices
#1	Primary	140.00'	**10.0" Round Culvert** L= 6.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 140.00' / 139.81' S= 0.0317 '/' Cc= 0.900 n= 0.012 Corrugated PE, smooth interior, Flow Area= 0.55 sf

Primary OutFlow Max=1.14 cfs @ 12.08 hrs HW=140.62' TW=137.18' (Dynamic Tailwater)
↑**1=Culvert** (Barrel Controls 1.14 cfs @ 3.63 fps)

Pond 7P: Jellyfish Filter



Summary for Pond BRF: Bio retention

Inflow Area = 3.259 ac, 21.91% Impervious, Inflow Depth = 0.80" for 1 year event
Inflow = 2.14 cfs @ 12.09 hrs, Volume= 0.217 af
Outflow = 0.64 cfs @ 12.54 hrs, Volume= 0.216 af, Atten= 70%, Lag= 26.9 min
Primary = 0.64 cfs @ 12.54 hrs, Volume= 0.216 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 139.99' @ 12.54 hrs Surf.Area= 7,461 sf Storage= 3,462 cf

Plug-Flow detention time= 161.8 min calculated for 0.216 af (100% of inflow)
Center-of-Mass det. time= 161.3 min (983.9 - 822.6)

Volume	Invert	Avail.Storage	Storage Description
#1	138.10'	1,271 cf	**10.00'W x 420.00'L x 1.50'H Stone** 6,300 cf Overall - 2,062 cf Embedded = 4,238 cf x 30.0% Voids
#2	138.10'	2,062 cf	**15.0" Round Underdrain/Storage** x 4 Inside #1 L= 420.0'
#3	139.60'	783 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc) 7,826 cf Overall x 10.0% Voids
#4	142.00'	6,522 cf	**Bioretention Filter (Prismatic)**Listed below (Recalc)
		10,638 cf	Total Available Storage

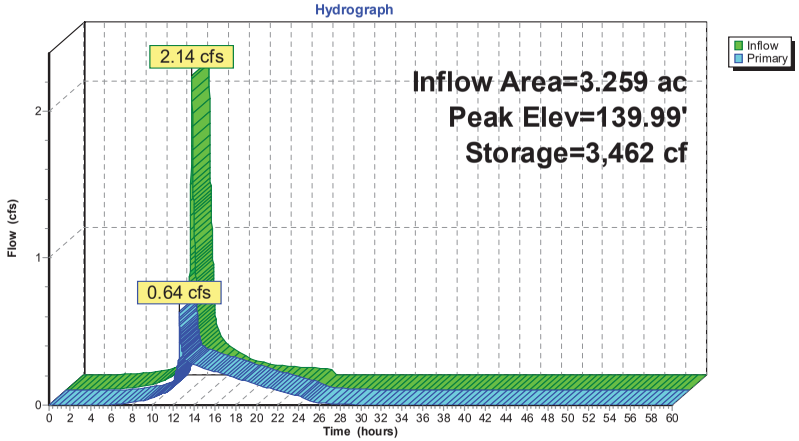
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
139.60	3,261	0	0
142.00	3,261	7,826	7,826

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
142.00	3,261	0	0
144.00	3,261	6,522	6,522

Device	Routing	Invert	Outlet Devices
#1	Primary	138.10'	**8.0" Round Culvert** L= 75.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 138.10' / 136.66' S= 0.0192 '/' Cc= 0.900 n= 0.012 Corrugated PE, smooth interior, Flow Area= 0.35 sf
#2	Device 1	138.10'	**3.0" Vert. Orifice/Grate** C= 0.600
#3	Device 1	139.90'	**4.0' 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
#4	Primary	143.20'	**4.0' long x 2.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Primary OutFlow Max=0.64 cfs @ 12.54 hrs HW=139.99' TW=137.04' (Dynamic Tailwater)
- **1=Culvert** (Passes 0.64 cfs of 2.06 cfs potential flow)
  - **2=Orifice/Grate** (Orifice Controls 0.31 cfs @ 6.40 fps)
  - **3=Broad-Crested Rectangular Weir** (Weir Controls 0.32 cfs @ 0.86 fps)
- **4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond BRF: Bio retention

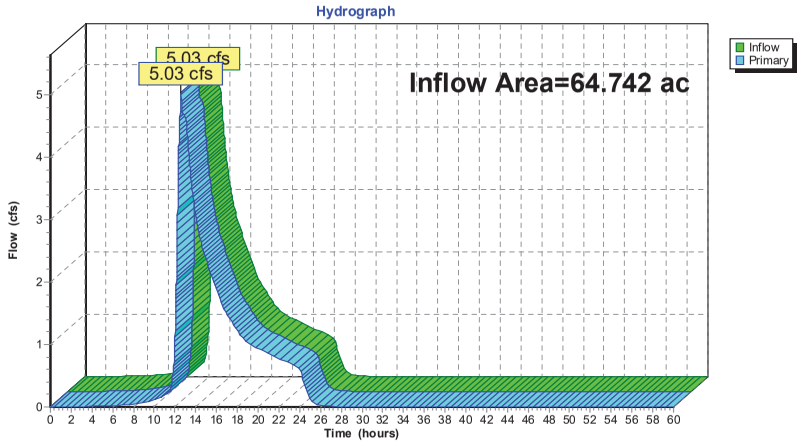


Summary for Link 5L: Stream

Inflow Area = 64.742 ac, 1.90% Impervious, Inflow Depth = 0.34" for 1 year event
Inflow = 5.03 cfs @ 12.54 hrs, Volume= 1.813 af
Primary = 5.03 cfs @ 12.54 hrs, Volume= 1.813 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs

Link 5L: Stream



Summary for Subcatchment 1S: DA P-1

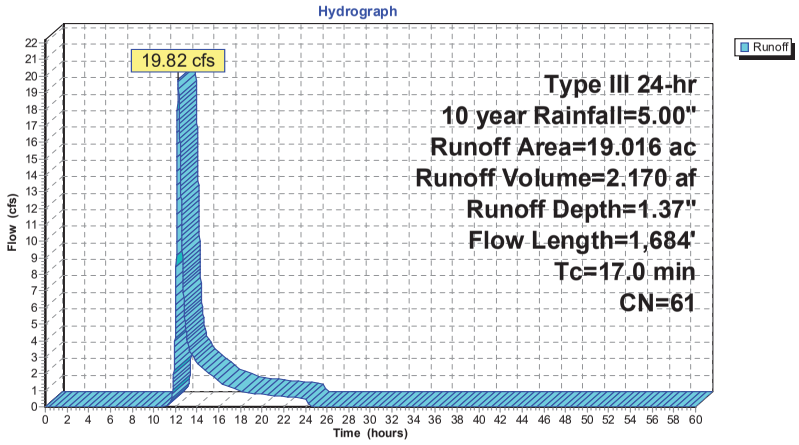
Runoff = 19.82 cfs @ 12.26 hrs, Volume= 2.170 af, Depth= 1.37"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 year Rainfall=5.00"

	Area (ac)	CN	Description
*	19.016	61	
	19.016		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.8	150	0.0533	0.29		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.50"
3.1	433	0.2192	2.34		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
5.1	1,101	0.0500	3.60		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
17.0	1,684	Total			

Subcatchment 1S: DA P-1



Summary for Subcatchment 2S: DA E-2

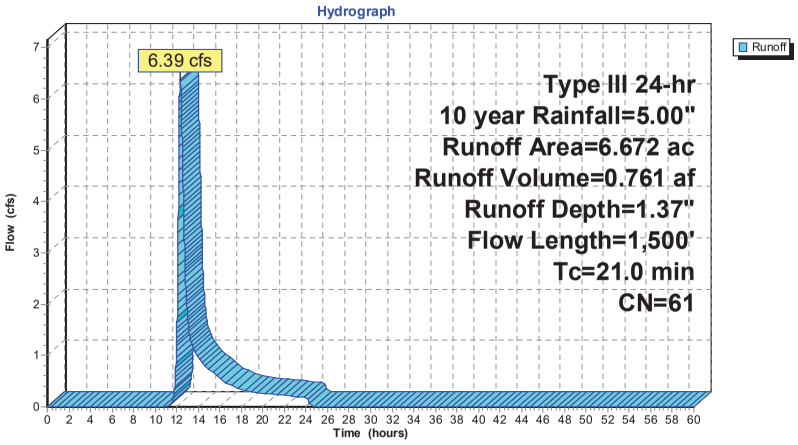
Runoff = 6.39 cfs @ 12.32 hrs, Volume= 0.761 af, Depth= 1.37"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 year Rainfall=5.00"

	Area (ac)	CN	Description
*	6.672	61	
	6.672		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.6	100	0.0400	0.11		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.50"
3.7	700	0.0386	3.16		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
1.7	700	0.1870	6.96		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
21.0	1,500	Total			

Subcatchment 2S: DA E-2



Summary for Subcatchment 3S: DA E-3

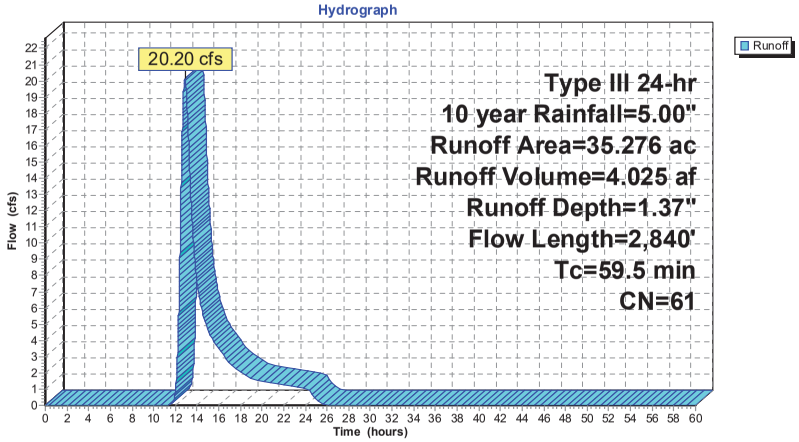
Runoff = 20.20 cfs @ 12.89 hrs, Volume= 4.025 af, Depth= 1.37"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 year Rainfall=5.00"

	Area (ac)	CN	Description
*	35.276	61	
	35.276		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
33.4	150	0.0533	0.07		**Sheet Flow,** Woods: Dense underbrush n= 0.800 P2= 3.50"
2.2	180	0.0777	1.39		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
16.2	1,179	0.0590	1.21		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
5.0	759	0.1310	2.53		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
2.7	572	0.0559	3.55		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
59.5	2,840	Total			

Subcatchment 3S: DA E-3



Summary for Subcatchment DA P-2: DA P-2

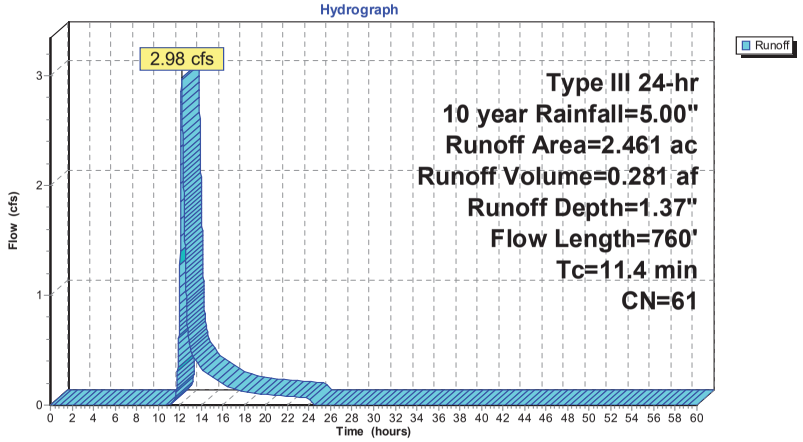
Runoff = 2.98 cfs @ 12.17 hrs, Volume= 0.281 af, Depth= 1.37"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 year Rainfall=5.00"

	Area (ac)	CN	Description
*	2.461	61	
	2.461		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.5	100	0.0500	0.18		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.50"
1.9	660	0.1288	5.78		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
11.4	760	Total			

Subcatchment DA P-2: DA P-2



Summary for Subcatchment DA P-3: DA P-3

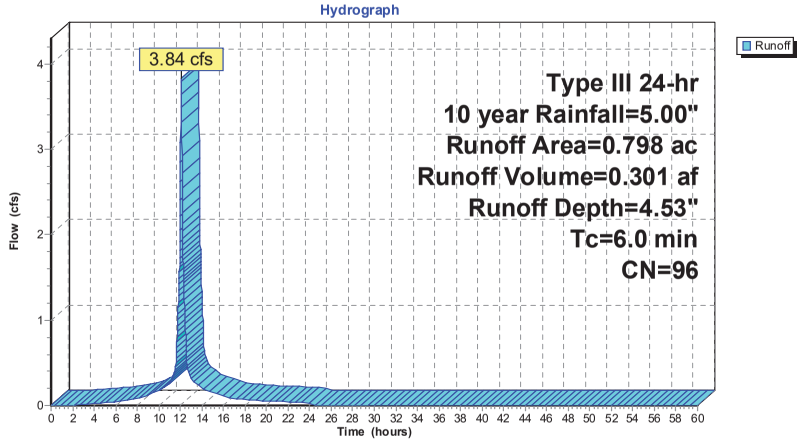
Runoff = 3.84 cfs @ 12.08 hrs, Volume= 0.301 af, Depth= 4.53"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 year Rainfall=5.00"

Area (ac)	CN	Description
0.714	98	Paved parking, HSG C
0.084	79	50-75% Grass cover, Fair, HSG C
0.798	96	Weighted Average
0.084		10.53% Pervious Area
0.714		89.47% Impervious Area

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

Subcatchment DA P-3: DA P-3



Summary for Subcatchment DA P-4: DA P-4

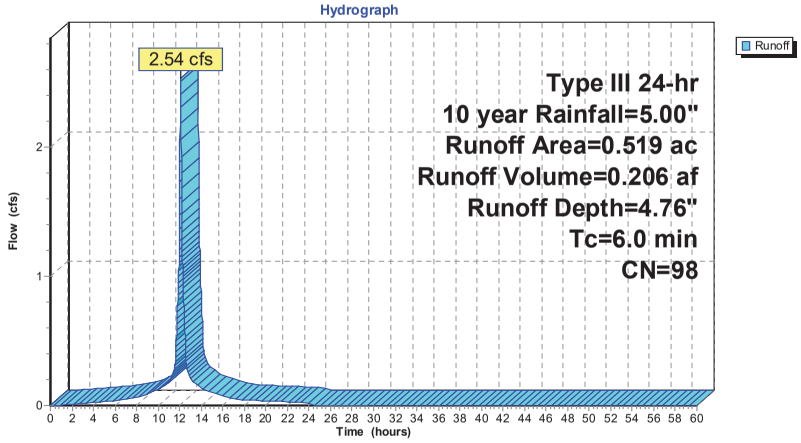
Runoff = 2.54 cfs @ 12.08 hrs, Volume= 0.206 af, Depth= 4.76"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 year Rainfall=5.00"

Area (ac)	CN	Description
0.519	98	Paved parking, HSG C
0.000	70	Woods, Good, HSG C
0.000	79	50-75% Grass cover, Fair, HSG C
0.519	98	Weighted Average
0.519		100.00% Impervious Area

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

Subcatchment DA P-4: DA P-4



Summary for Pond 1P: Design Point

[58] Hint: Peaked 0.32' above defined flood level

Inflow Area = 22.794 ac, 5.41% Impervious, Inflow Depth = 1.56" for 10 year event
Inflow = 23.30 cfs @ 12.26 hrs, Volume= 2.958 af
Outflow = 23.30 cfs @ 12.26 hrs, Volume= 2.958 af, Atten= 0%, Lag= 0.0 min
Primary = 23.30 cfs @ 12.26 hrs, Volume= 2.958 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

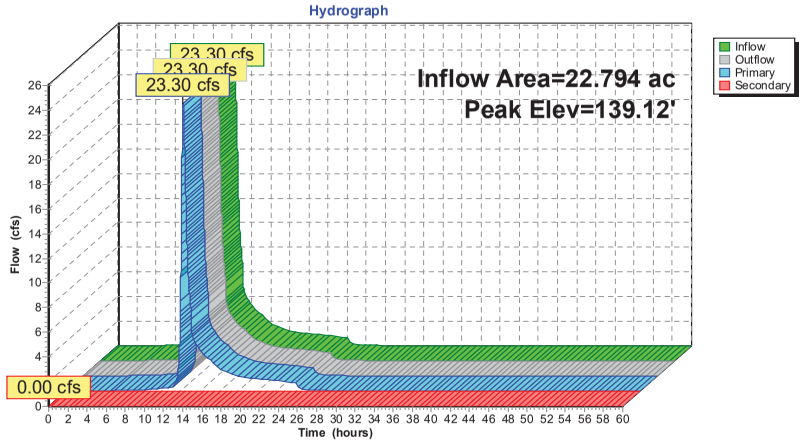
Routing by Dyn-Stor-Ind method, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 139.12' @ 12.28 hrs
Flood Elev= 138.80'

Device	Routing	Invert	Outlet Devices
#1	Primary	134.66'	**36.0" Round Culvert** L= 40.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 134.66' / 134.16' S= 0.0125 '/' Cc= 0.900 n= 0.012 Concrete pipe, straight & clean, Flow Area= 7.07 sf
#2	Primary	138.80'	**Overflow Along Route 9W, Cv= 2.62 (C= 3.28)** Head (feet) 0.00 0.34 1.00 Width (feet) 4.00 20.00 20.00
#3	Secondary	139.14'	**35.0' long x 1.0' breadth Overflow Across Route 9W** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32

Primary OutFlow Max=20.71 cfs @ 12.26 hrs HW=139.07' TW=138.83' (Dynamic Tailwater)
└─**1=Culvert** (Inlet Controls 16.54 cfs @ 2.34 fps)
└─**2=Overflow Along Route 9W** (Weir Controls 4.17 cfs @ 1.49 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=134.66' TW=0.00' (Dynamic Tailwater)
└─**3=Overflow Across Route 9W** (Controls 0.00 cfs)

Pond 1P: Design Point



Summary for Pond 2P: 36" RCP

[58] Hint: Peaked 0.08' above defined flood level

Inflow Area = 29.466 ac, 4.18% Impervious, Inflow Depth = 1.51" for 10 year event
Inflow = 29.35 cfs @ 12.26 hrs, Volume= 3.719 af
Outflow = 29.35 cfs @ 12.26 hrs, Volume= 3.719 af, Atten= 0%, Lag= 0.0 min
Primary = 29.35 cfs @ 12.26 hrs, Volume= 3.719 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

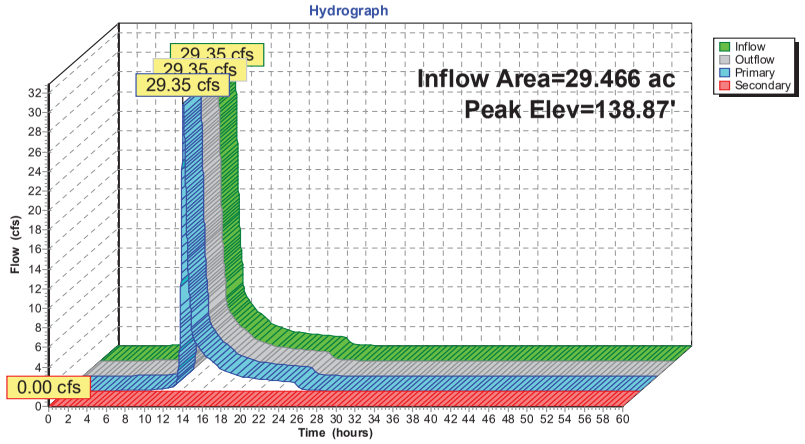
Routing by Dyn-Stor-Ind method, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 138.87' @ 12.29 hrs
Flood Elev= 138.79'

Device	Routing	Invert	Outlet Devices
#1	Primary	134.16'	**36.0" Round Culvert** L= 90.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 134.16' / 133.16' S= 0.0111 '/' Cc= 0.900 n= 0.012 Concrete pipe, straight & clean, Flow Area= 7.07 sf
#2	Primary	138.79'	**Overflow Along Route 9W, Cv= 2.62 (C= 3.28)** Head (feet) 0.00 0.34 Width (feet) 4.00 20.00
#3	Secondary	139.13'	**35.0' long x 1.0' breadth Overflow Across Route 9W** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32

Primary OutFlow Max=29.34 cfs @ 12.26 hrs HW=138.86' TW=138.14' (Dynamic Tailwater)
└─**1=Culvert** (Inlet Controls 28.97 cfs @ 4.10 fps)
└─**2=Overflow Along Route 9W** (Weir Controls 0.36 cfs @ 0.84 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=134.16' TW=0.00' (Dynamic Tailwater)
└─**3=Overflow Across Route 9W** (Controls 0.00 cfs)

Pond 2P: 36" RCP



Summary for Pond 3P: 2x2 box culvert

[58] Hint: Peaked 0.38' above defined flood level

Inflow Area = 64.742 ac, 1.90% Impervious, Inflow Depth = 1.44" for 10 year event
Inflow = 34.66 cfs @ 12.33 hrs, Volume= 7.744 af
Outflow = 34.66 cfs @ 12.33 hrs, Volume= 7.744 af, Atten= 0%, Lag= 0.0 min
Primary = 33.94 cfs @ 12.33 hrs, Volume= 7.732 af
Secondary = 0.72 cfs @ 12.33 hrs, Volume= 0.012 af

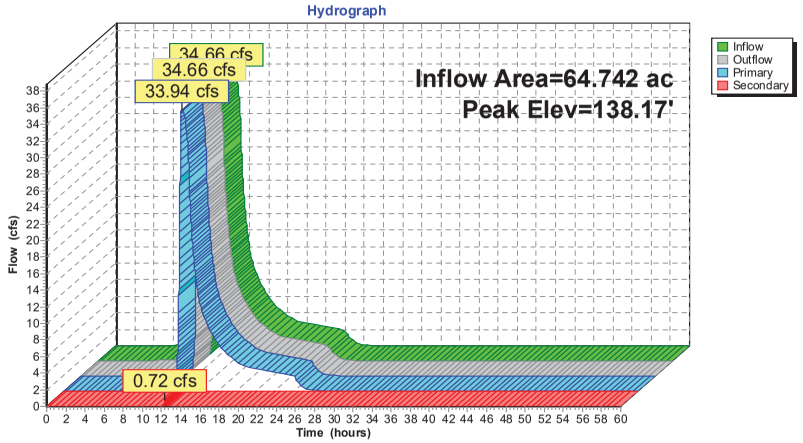
Routing by Dyn-Stor-Ind method, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 138.17' @ 12.33 hrs
Flood Elev= 137.79'

Device	Routing	Invert	Outlet Devices
#1	Primary	133.16'	**24.0" W x 24.0" H Box Culvert** L= 45.0' Box, 0° wingwalls, square crown edge, Ke= 0.700 Inlet / Outlet Invert= 133.16' / 132.66' S= 0.0111 '/' Cc= 0.900 n= 0.013 Concrete pipe, straight & clean, Flow Area= 4.00 sf
#2	Secondary	138.13'	**35.0' long x 1.0' breadth Route 9W Crown** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32

Primary OutFlow Max=33.94 cfs @ 12.33 hrs HW=138.17' TW=0.00' (Dynamic Tailwater)
└**1=Culvert** (Inlet Controls 33.94 cfs @ 8.48 fps)

Secondary OutFlow Max=0.72 cfs @ 12.33 hrs HW=138.17' TW=0.00' (Dynamic Tailwater)
└**2=Route 9W Crown** (Weir Controls 0.72 cfs @ 0.53 fps)

Pond 3P: 2x2 box culvert



Summary for Pond 4P: Comb MH

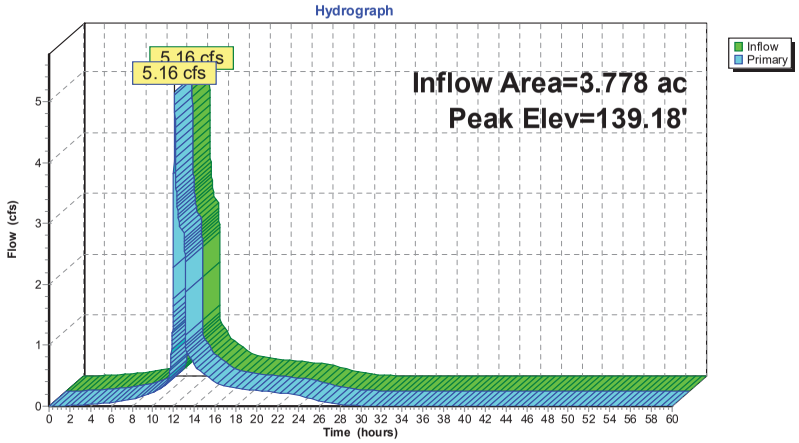
Inflow Area = 3.778 ac, 32.64% Impervious, Inflow Depth = 2.50" for 10 year event
Inflow = 5.16 cfs @ 12.08 hrs, Volume= 0.788 af
Outflow = 5.16 cfs @ 12.08 hrs, Volume= 0.788 af, Atten= 0%, Lag= 0.0 min
Primary = 5.16 cfs @ 12.08 hrs, Volume= 0.788 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 139.18' @ 12.28 hrs
Flood Elev= 143.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	136.66'	**24.0" Round Culvert** L= 185.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 136.66' / 134.66' S= 0.0108 '/' Cc= 0.900 n= 0.012 Corrugated PE, smooth interior, Flow Area= 3.14 sf
#2	Primary	143.50'	**4.0' long x 0.5' breadth Rim** 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=5.10 cfs @ 12.08 hrs HW=137.74' TW=136.62' (Dynamic Tailwater)
└─**1=Culvert** (Outlet Controls 5.10 cfs @ 4.30 fps)
└─**2=Rim** (Controls 0.00 cfs)

Pond 4P: Comb MH



Summary for Pond 5P: Splitter CB

Inflow Area = 0.519 ac,100.00% Impervious, Inflow Depth = 4.76" for 10 year event
Inflow = 2.54 cfs @ 12.08 hrs, Volume= 0.206 af
Outflow = 2.54 cfs @ 12.08 hrs, Volume= 0.206 af, Atten= 0%, Lag= 0.0 min
Primary = 1.37 cfs @ 12.08 hrs, Volume= 0.191 af
Secondary = 1.17 cfs @ 12.08 hrs, Volume= 0.015 af

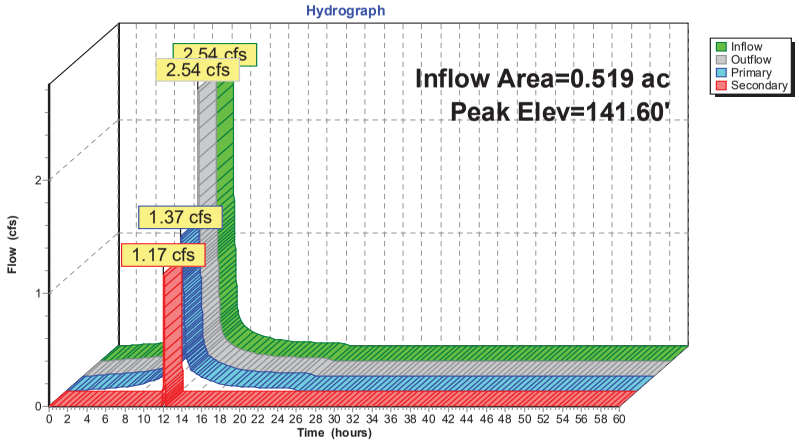
Routing by Dyn-Stor-Ind method, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 141.60' @ 12.08 hrs
Flood Elev= 143.70'

Device	Routing	Invert	Outlet Devices
#1	Primary	140.60'	**8.0" Round Culvert** L= 5.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 140.60' / 140.50' S= 0.0200 '/' Cc= 0.900 n= 0.012 Corrugated PE, smooth interior, Flow Area= 0.35 sf
#2	Device 3	141.30'	**2.5' 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
#3	Secondary	140.60'	**15.0" Round Culvert** L= 15.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 140.60' / 140.00' S= 0.0400 '/' Cc= 0.900 n= 0.012 Corrugated PE, smooth interior, Flow Area= 1.23 sf
#4	Secondary	143.70'	**4.0' long x 0.5' breadth Rim** 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=1.37 cfs @ 12.08 hrs HW=141.60' TW=140.70' (Dynamic Tailwater)
└─**1=Culvert** (Inlet Controls 1.37 cfs @ 3.93 fps)

Secondary OutFlow Max=1.16 cfs @ 12.08 hrs HW=141.60' TW=137.73' (Dynamic Tailwater)
└─**3=Culvert** (Passes 1.16 cfs of 3.57 cfs potential flow)
└─**2=Broad-Crested Rectangular Weir** (Weir Controls 1.16 cfs @ 1.56 fps)
└─**4=Rim** (Controls 0.00 cfs)

Pond 5P: Splitter CB



Summary for Pond 7P: Jellyfish Filter

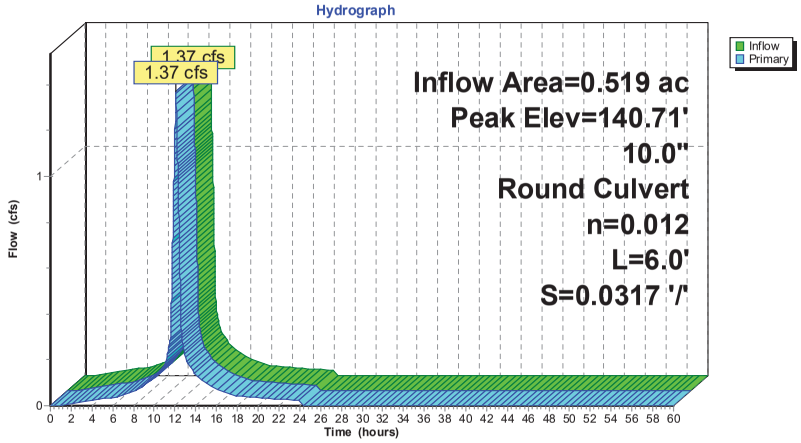
Inflow Area = 0.519 ac,100.00% Impervious, Inflow Depth = 4.41" for 10 year event
Inflow = 1.37 cfs @ 12.08 hrs, Volume= 0.191 af
Outflow = 1.37 cfs @ 12.08 hrs, Volume= 0.191 af, Atten= 0%, Lag= 0.0 min
Primary = 1.37 cfs @ 12.08 hrs, Volume= 0.191 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 140.71' @ 12.08 hrs
Flood Elev= 143.75'

Device	Routing	Invert	Outlet Devices
#1	Primary	140.00'	**10.0" Round Culvert** L= 6.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 140.00' / 139.81' S= 0.0317 '/' Cc= 0.900 n= 0.012 Corrugated PE, smooth interior, Flow Area= 0.55 sf

Primary OutFlow Max=1.37 cfs @ 12.08 hrs HW=140.70' TW=137.73' (Dynamic Tailwater)
↑—**1=Culvert** (Barrel Controls 1.37 cfs @ 3.76 fps)

Pond 7P: Jellyfish Filter



Summary for Pond BRF: Bio retention

Inflow Area = 3.259 ac, 21.91% Impervious, Inflow Depth = 2.14" for 10 year event
Inflow = 6.15 cfs @ 12.11 hrs, Volume= 0.582 af
Outflow = 2.65 cfs @ 12.15 hrs, Volume= 0.582 af, Atten= 57%, Lag= 2.3 min
Primary = 2.65 cfs @ 12.15 hrs, Volume= 0.582 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 142.79' @ 12.47 hrs Surf.Area= 10,722 sf Storage= 6,687 cf

Plug-Flow detention time= 104.8 min calculated for 0.582 af (100% of inflow)
Center-of-Mass det. time= 104.8 min (922.7 - 817.8)

Volume	Invert	Avail.Storage	Storage Description
#1	138.10'	1,271 cf	**10.00'W x 420.00'L x 1.50'H Stone** 6,300 cf Overall - 2,062 cf Embedded = 4,238 cf x 30.0% Voids
#2	138.10'	2,062 cf	**15.0" Round Underdrain/Storage** x 4 Inside #1 L= 420.0'
#3	139.60'	783 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc) 7,826 cf Overall x 10.0% Voids
#4	142.00'	6,522 cf	**Bioretention Filter (Prismatic)**Listed below (Recalc)
		10,638 cf	Total Available Storage

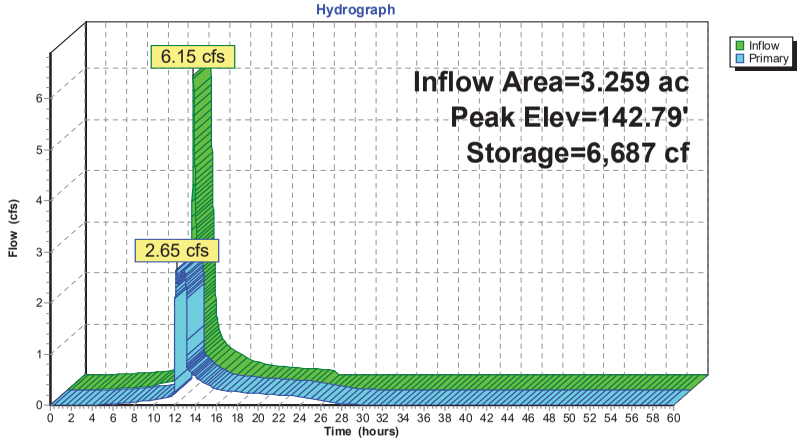
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
139.60	3,261	0	0
142.00	3,261	7,826	7,826

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
142.00	3,261	0	0
144.00	3,261	6,522	6,522

Device	Routing	Invert	Outlet Devices
#1	Primary	138.10'	**8.0" Round Culvert** L= 75.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 138.10' / 136.66' S= 0.0192 '/' Cc= 0.900 n= 0.012 Corrugated PE, smooth interior, Flow Area= 0.35 sf
#2	Device 1	138.10'	**3.0" Vert. Orifice/Grate** C= 0.600
#3	Device 1	139.90'	**4.0' 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
#4	Primary	143.20'	**4.0' long x 2.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Primary OutFlow Max=2.64 cfs @ 12.15 hrs HW=142.28' TW=137.90' (Dynamic Tailwater)
- **1=Culvert** (Outlet Controls 2.64 cfs @ 7.56 fps)
  - **2=Orifice/Grate** (Passes < 0.48 cfs potential flow)
  - **3=Broad-Crested Rectangular Weir** (Passes < 48.83 cfs potential flow)
- **4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond BRF: Bio retention

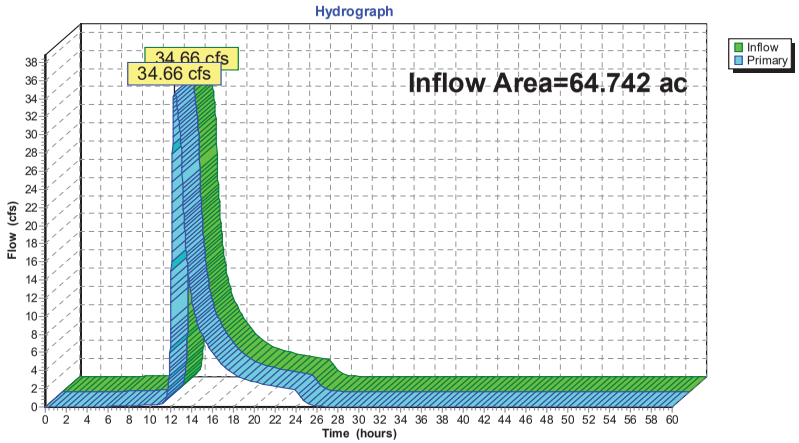


Summary for Link 5L: Stream

Inflow Area = 64.742 ac, 1.90% Impervious, Inflow Depth = 1.44" for 10 year event
Inflow = 34.66 cfs @ 12.33 hrs, Volume= 7.744 af
Primary = 34.66 cfs @ 12.33 hrs, Volume= 7.744 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs

Link 5L: Stream



Summary for Subcatchment 1S: DA P-1

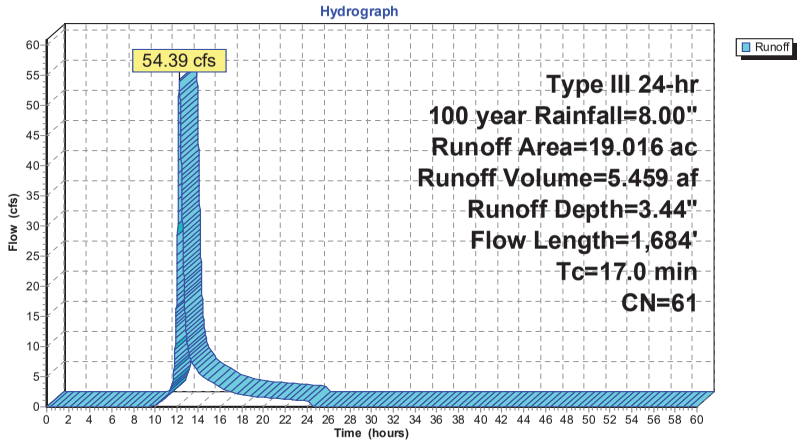
Runoff = 54.39 cfs @ 12.24 hrs, Volume= 5.459 af, Depth= 3.44"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 year Rainfall=8.00"

	Area (ac)	CN	Description
*	19.016	61	
	19.016		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.8	150	0.0533	0.29		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.50"
3.1	433	0.2192	2.34		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
5.1	1,101	0.0500	3.60		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
17.0	1,684	Total			

Subcatchment 1S: DA P-1



Summary for Subcatchment 2S: DA E-2

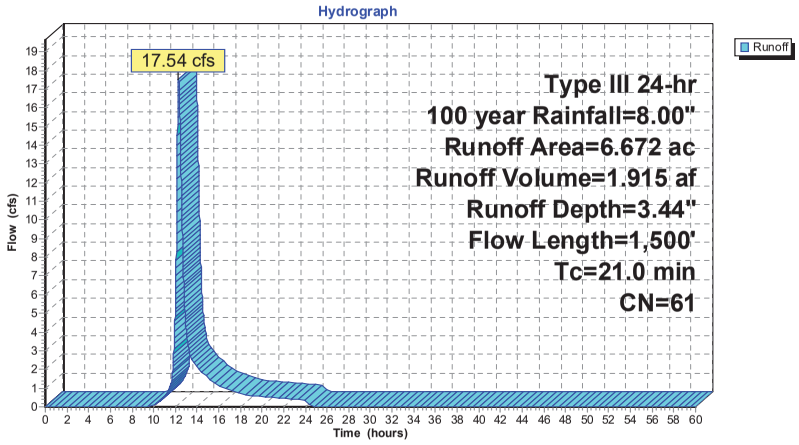
Runoff = 17.54 cfs @ 12.30 hrs, Volume= 1.915 af, Depth= 3.44"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 year Rainfall=8.00"

	Area (ac)	CN	Description
*	6.672	61	
	6.672		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.6	100	0.0400	0.11		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.50"
3.7	700	0.0386	3.16		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
1.7	700	0.1870	6.96		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
21.0	1,500	Total			

Subcatchment 2S: DA E-2



Summary for Subcatchment 3S: DA E-3

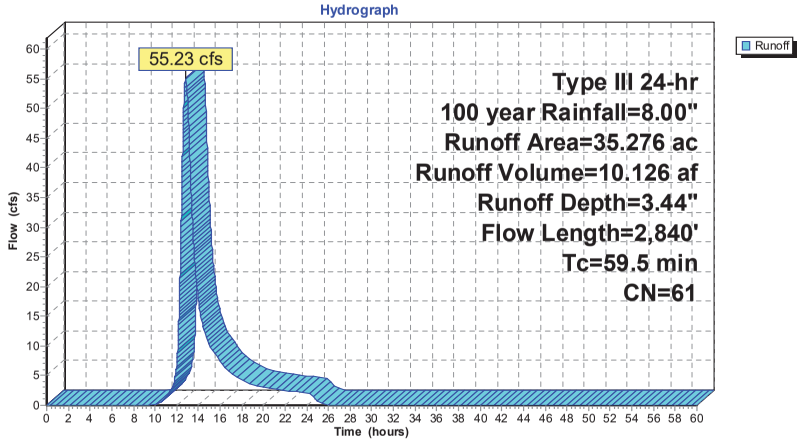
Runoff = 55.23 cfs @ 12.83 hrs, Volume= 10.126 af, Depth= 3.44"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 year Rainfall=8.00"

	Area (ac)	CN	Description
*	35.276	61	
	35.276		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
33.4	150	0.0533	0.07		**Sheet Flow,** Woods: Dense underbrush n= 0.800 P2= 3.50"
2.2	180	0.0777	1.39		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
16.2	1,179	0.0590	1.21		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
5.0	759	0.1310	2.53		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
2.7	572	0.0559	3.55		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
59.5	2,840	Total			

Subcatchment 3S: DA E-3



Summary for Subcatchment DA P-2: DA P-2

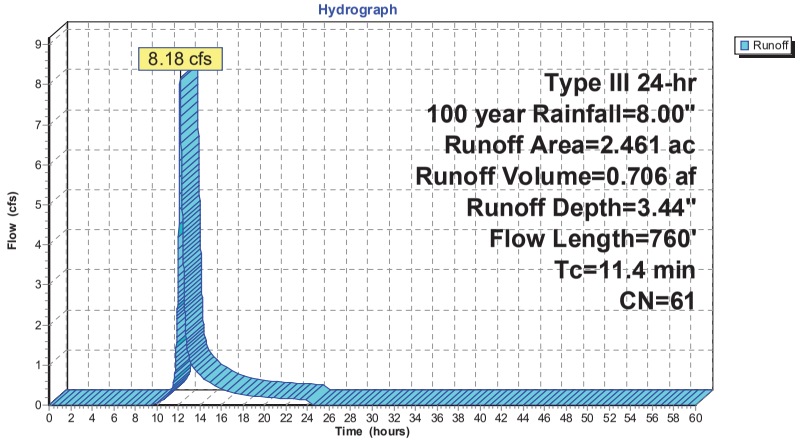
Runoff = 8.18 cfs @ 12.16 hrs, Volume= 0.706 af, Depth= 3.44"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 year Rainfall=8.00"

	Area (ac)	CN	Description
*	2.461	61	
	2.461		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.5	100	0.0500	0.18		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.50"
1.9	660	0.1288	5.78		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
11.4	760	Total			

Subcatchment DA P-2: DA P-2



Summary for Subcatchment DA P-3: DA P-3

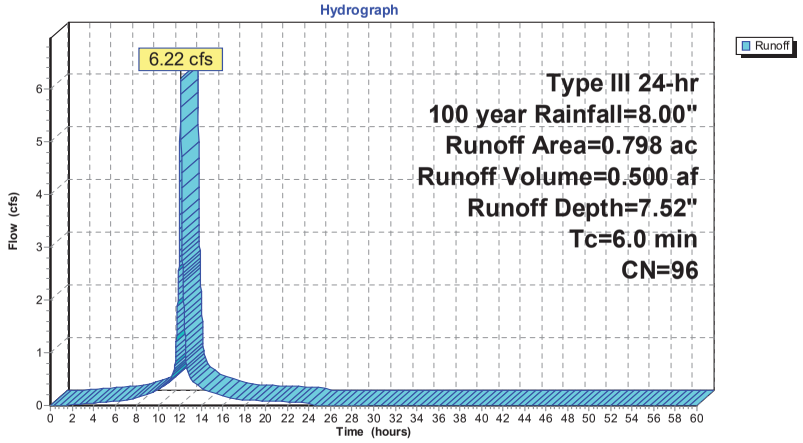
Runoff = 6.22 cfs @ 12.08 hrs, Volume= 0.500 af, Depth= 7.52"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 year Rainfall=8.00"

Area (ac)	CN	Description
0.714	98	Paved parking, HSG C
0.084	79	50-75% Grass cover, Fair, HSG C
0.798	96	Weighted Average
0.084		10.53% Pervious Area
0.714		89.47% Impervious Area

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

Subcatchment DA P-3: DA P-3



Summary for Subcatchment DA P-4: DA P-4

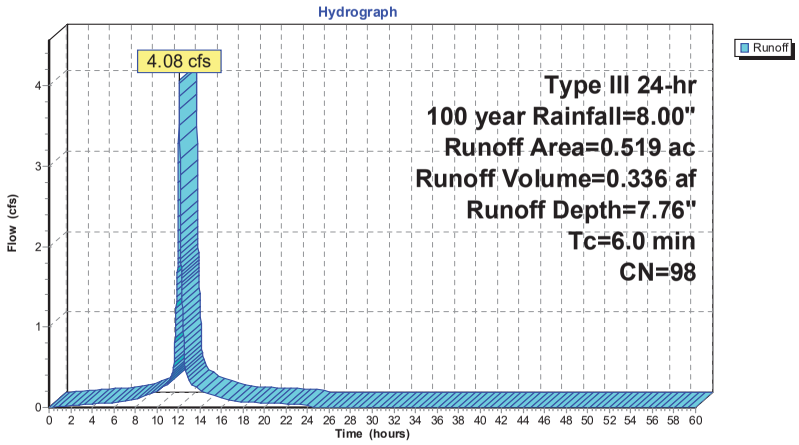
Runoff = 4.08 cfs @ 12.08 hrs, Volume= 0.336 af, Depth= 7.76"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 year Rainfall=8.00"

Area (ac)	CN	Description
0.519	98	Paved parking, HSG C
0.000	70	Woods, Good, HSG C
0.000	79	50-75% Grass cover, Fair, HSG C
0.519	98	Weighted Average
0.519		100.00% Impervious Area

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

Subcatchment DA P-4: DA P-4



Summary for Pond 1P: Design Point

[58] Hint: Peaked 0.78' above defined flood level

Inflow Area = 22.794 ac, 5.41% Impervious, Inflow Depth = 3.69" for 100 year event
Inflow = 66.96 cfs @ 12.23 hrs, Volume= 7.001 af
Outflow = 66.96 cfs @ 12.23 hrs, Volume= 7.001 af, Atten= 0%, Lag= 0.0 min
Primary = 39.51 cfs @ 12.23 hrs, Volume= 6.149 af
Secondary = 27.46 cfs @ 12.23 hrs, Volume= 0.851 af

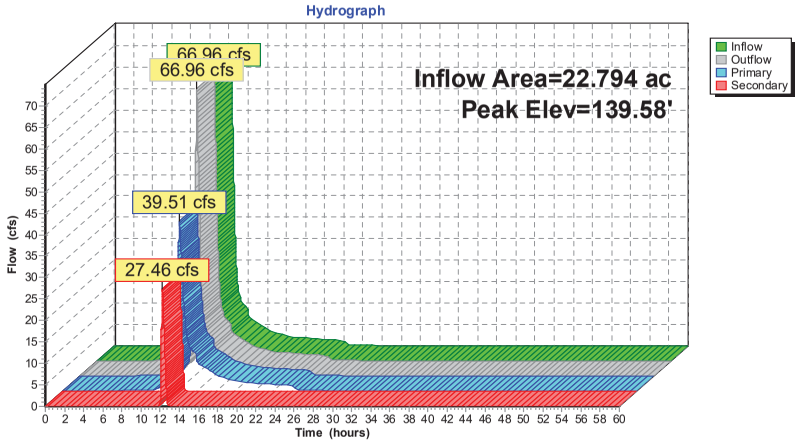
Routing by Dyn-Stor-Ind method, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 139.58' @ 12.23 hrs
Flood Elev= 138.80'

Device	Routing	Invert	Outlet Devices
#1	Primary	134.66'	**36.0" Round Culvert** L= 40.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 134.66' / 134.16' S= 0.0125 '/' Cc= 0.900 n= 0.012 Concrete pipe, straight & clean, Flow Area= 7.07 sf
#2	Primary	138.80'	**Overflow Along Route 9W, Cv= 2.62 (C= 3.28)** Head (feet) 0.00 0.34 1.00 Width (feet) 4.00 20.00 20.00
#3	Secondary	139.14'	**35.0' long x 1.0' breadth Overflow Across Route 9W** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32

Primary OutFlow Max=39.63 cfs @ 12.23 hrs HW=139.58' TW=139.38' (Dynamic Tailwater)
└─**1=Culvert** (Inlet Controls 14.89 cfs @ 2.11 fps)
└─**2=Overflow Along Route 9W** (Weir Controls 24.74 cfs @ 1.93 fps)

Secondary OutFlow Max=27.40 cfs @ 12.23 hrs HW=139.58' TW=0.00' (Dynamic Tailwater)
└─**3=Overflow Across Route 9W** (Weir Controls 27.40 cfs @ 1.80 fps)

Pond 1P: Design Point



Summary for Pond 2P: 36" RCP

[95] Warning: Outlet Device #2 rise exceeded
[58] Hint: Peaked 0.60' above defined flood level

Inflow Area =	29.466 ac,	4.18% Impervious,	Inflow Depth =	3.28"	for 100 year event
Inflow =	55.90 cfs @	12.25 hrs,	Volume=	8.065 af	
Outflow =	55.90 cfs @	12.25 hrs,	Volume=	8.065 af,	Atten= 0%, Lag= 0.0 min
Primary =	43.70 cfs @	12.23 hrs,	Volume=	7.745 af	
Secondary =	12.40 cfs @	12.26 hrs,	Volume=	0.319 af	

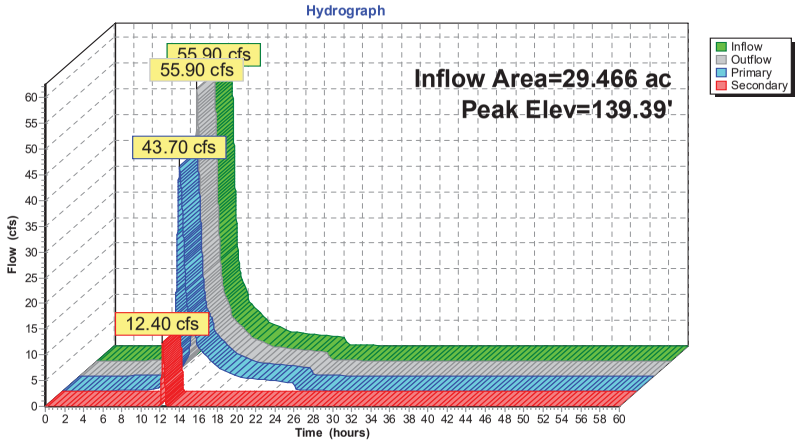
Routing by Dyn-Stor-Ind method, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 139.39' @ 12.26 hrs
Flood Elev= 138.79'

Device	Routing	Invert	Outlet Devices
#1	Primary	134.16'	**36.0" Round Culvert** L= 90.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 134.16' / 133.16' S= 0.0111 '/' Cc= 0.900 n= 0.012 Concrete pipe, straight & clean, Flow Area= 7.07 sf
#2	Primary	138.79'	**Overflow Along Route 9W, Cv= 2.62 (C= 3.28)** Head (feet) 0.00 0.34 Width (feet) 4.00 20.00
#3	Secondary	139.13'	**35.0' long x 1.0' breadth Overflow Across Route 9W** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32

Primary OutFlow Max=43.73 cfs @ 12.23 hrs HW=139.38' TW=138.54' (Dynamic Tailwater)
↑└─**1=Culvert** (Inlet Controls 31.34 cfs @ 4.43 fps)
└─**2=Overflow Along Route 9W** (Orifice Controls 12.38 cfs @ 3.04 fps)

Secondary OutFlow Max=12.39 cfs @ 12.26 hrs HW=139.39' TW=0.00' (Dynamic Tailwater)
↑└─**3=Overflow Across Route 9W** (Weir Controls 12.39 cfs @ 1.37 fps)

Pond 2P: 36" RCP



Summary for Pond 3P: 2x2 box culvert

[58] Hint: Peaked 0.94' above defined flood level

Inflow Area =	64.742 ac,	1.90% Impervious,	Inflow Depth =	3.31"	for 100 year event
Inflow =	80.61 cfs @	12.68 hrs,	Volume=	17.872 af	
Outflow =	80.61 cfs @	12.68 hrs,	Volume=	17.872 af,	Atten= 0%, Lag= 0.0 min
Primary =	36.24 cfs @	12.68 hrs,	Volume=	14.340 af	
Secondary =	44.37 cfs @	12.68 hrs,	Volume=	3.532 af	

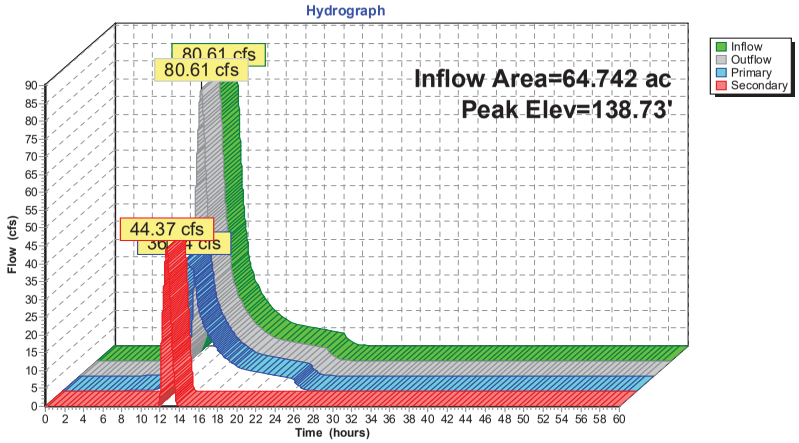
Routing by Dyn-Stor-Ind method, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 138.73' @ 12.68 hrs
Flood Elev= 137.79'

Device	Routing	Invert	Outlet Devices
#1	Primary	133.16'	**24.0" W x 24.0" H Box Culvert** L= 45.0' Box, 0° wingwalls, square crown edge, Ke= 0.700 Inlet / Outlet Invert= 133.16' / 132.66' S= 0.0111 '/' Cc= 0.900 n= 0.013 Concrete pipe, straight & clean, Flow Area= 4.00 sf
#2	Secondary	138.13'	**35.0' long x 1.0' breadth Route 9W Crown** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32

Primary OutFlow Max=36.24 cfs @ 12.68 hrs HW=138.73' TW=0.00' (Dynamic Tailwater)
↑—**1=Culvert** (Inlet Controls 36.24 cfs @ 9.06 fps)

Secondary OutFlow Max=44.37 cfs @ 12.68 hrs HW=138.73' TW=0.00' (Dynamic Tailwater)
↑—**2=Route 9W Crown** (Weir Controls 44.37 cfs @ 2.12 fps)

Pond 3P: 2x2 box culvert



Summary for Pond 4P: Comb MH

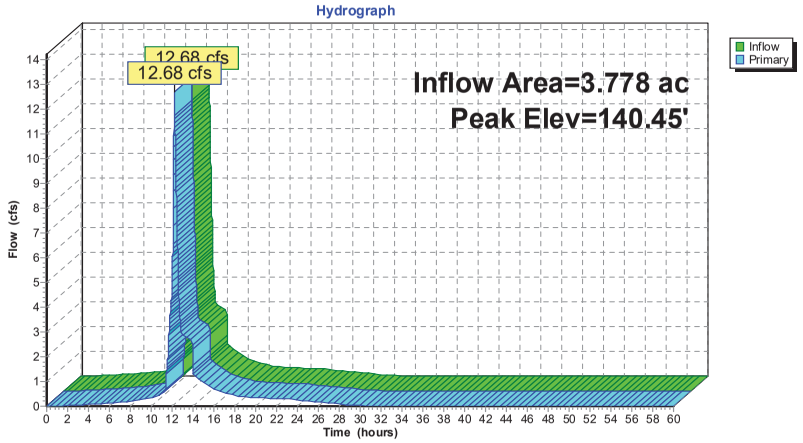
Inflow Area = 3.778 ac, 32.64% Impervious, Inflow Depth = 4.90" for 100 year event
Inflow = 12.68 cfs @ 12.23 hrs, Volume= 1.542 af
Outflow = 12.68 cfs @ 12.23 hrs, Volume= 1.542 af, Atten= 0%, Lag= 0.0 min
Primary = 12.68 cfs @ 12.23 hrs, Volume= 1.542 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 140.45' @ 12.23 hrs
Flood Elev= 143.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	136.66'	**24.0" Round Culvert** L= 185.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 136.66' / 134.66' S= 0.0108 '/' Cc= 0.900 n= 0.012 Corrugated PE, smooth interior, Flow Area= 3.14 sf
#2	Primary	143.50'	**4.0' long x 0.5' breadth Rim** 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=12.62 cfs @ 12.23 hrs HW=140.44' TW=139.58' (Dynamic Tailwater)
└─**1=Culvert** (Outlet Controls 12.62 cfs @ 4.02 fps)
└─**2=Rim** (Controls 0.00 cfs)

Pond 4P: Comb MH



Summary for Pond 5P: Splitter CB

Inflow Area = 0.519 ac,100.00% Impervious, Inflow Depth = 7.76" for 100 year event
Inflow = 4.08 cfs @ 12.08 hrs, Volume= 0.336 af
Outflow = 4.08 cfs @ 12.08 hrs, Volume= 0.336 af, Atten= 0%, Lag= 0.0 min
Primary = 1.55 cfs @ 12.08 hrs, Volume= 0.288 af
Secondary = 2.53 cfs @ 12.08 hrs, Volume= 0.047 af

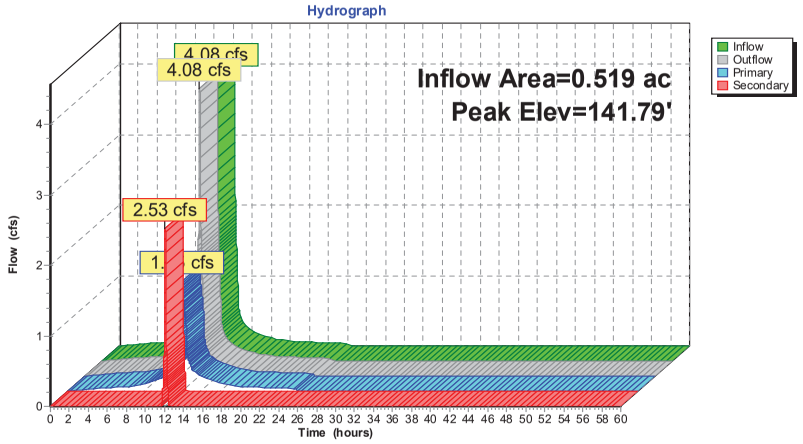
Routing by Dyn-Stor-Ind method, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 141.79' @ 12.08 hrs
Flood Elev= 143.70'

Device	Routing	Invert	Outlet Devices
#1	Primary	140.60'	**8.0" Round Culvert** L= 5.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 140.60' / 140.50' S= 0.0200 '/' Cc= 0.900 n= 0.012 Corrugated PE, smooth interior, Flow Area= 0.35 sf
#2	Device 3	141.30'	**2.5' 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
#3	Secondary	140.60'	**15.0" Round Culvert** L= 15.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 140.60' / 140.00' S= 0.0400 '/' Cc= 0.900 n= 0.012 Corrugated PE, smooth interior, Flow Area= 1.23 sf
#4	Secondary	143.70'	**4.0' long x 0.5' breadth Rim** 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=1.55 cfs @ 12.08 hrs HW=141.78' TW=140.77' (Dynamic Tailwater)
└─**1=Culvert** (Inlet Controls 1.55 cfs @ 4.44 fps)

Secondary OutFlow Max=2.52 cfs @ 12.08 hrs HW=141.78' TW=139.56' (Dynamic Tailwater)
├─**3=Culvert** (Passes 2.52 cfs of 4.46 cfs potential flow)
│ └─**2=Broad-Crested Rectangular Weir** (Weir Controls 2.52 cfs @ 2.08 fps)
└─**4=Rim** (Controls 0.00 cfs)

Pond 5P: Splitter CB



Summary for Pond 7P: Jellyfish Filter

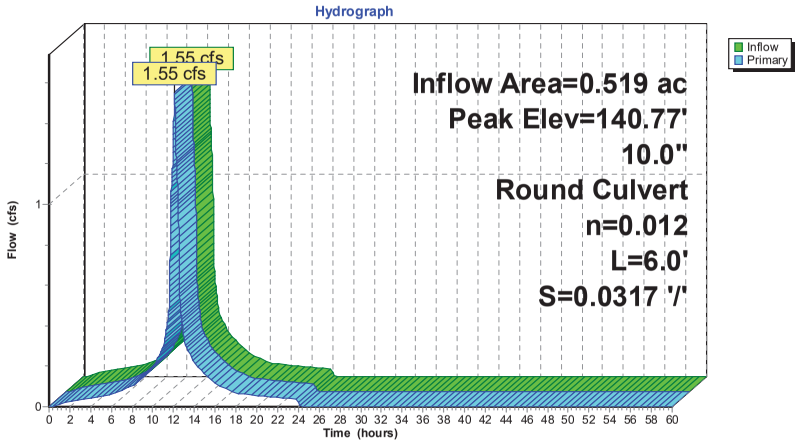
Inflow Area = 0.519 ac,100.00% Impervious, Inflow Depth = 6.67" for 100 year event
Inflow = 1.55 cfs @ 12.08 hrs, Volume= 0.288 af
Outflow = 1.55 cfs @ 12.08 hrs, Volume= 0.288 af, Atten= 0%, Lag= 0.0 min
Primary = 1.55 cfs @ 12.08 hrs, Volume= 0.288 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 140.77' @ 12.08 hrs
Flood Elev= 143.75'

Device	Routing	Invert	Outlet Devices
#1	Primary	140.00'	**10.0" Round Culvert** L= 6.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 140.00' / 139.81' S= 0.0317 '/' Cc= 0.900 n= 0.012 Corrugated PE, smooth interior, Flow Area= 0.55 sf

Primary OutFlow Max=1.55 cfs @ 12.08 hrs HW=140.77' TW=139.56' (Dynamic Tailwater)
↑**1=Culvert** (Barrel Controls 1.55 cfs @ 3.85 fps)

Pond 7P: Jellyfish Filter



Summary for Pond BRF: Bio retention

[93] Warning: Storage range exceeded by 0.06'

Inflow Area = 3.259 ac, 21.91% Impervious, Inflow Depth = 4.44" for 100 year event
Inflow = 13.24 cfs @ 12.12 hrs, Volume= 1.207 af
Outflow = 10.70 cfs @ 12.23 hrs, Volume= 1.206 af, Atten= 19%, Lag= 6.6 min
Primary = 10.70 cfs @ 12.23 hrs, Volume= 1.206 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 144.06' @ 12.23 hrs Surf.Area= 10,722 sf Storage= 10,638 cf

Plug-Flow detention time= 73.9 min calculated for 1.206 af (100% of inflow)
Center-of-Mass det. time= 74.1 min (883.0 - 808.9)

Volume	Invert	Avail.Storage	Storage Description
#1	138.10'	1,271 cf	**10.00'W x 420.00'L x 1.50'H Stone** 6,300 cf Overall - 2,062 cf Embedded = 4,238 cf x 30.0% Voids
#2	138.10'	2,062 cf	**15.0" Round Underdrain/Storage** x 4 Inside #1 L= 420.0'
#3	139.60'	783 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc) 7,826 cf Overall x 10.0% Voids
#4	142.00'	6,522 cf	**Bioretention Filter (Prismatic)**Listed below (Recalc)
		10,638 cf	Total Available Storage

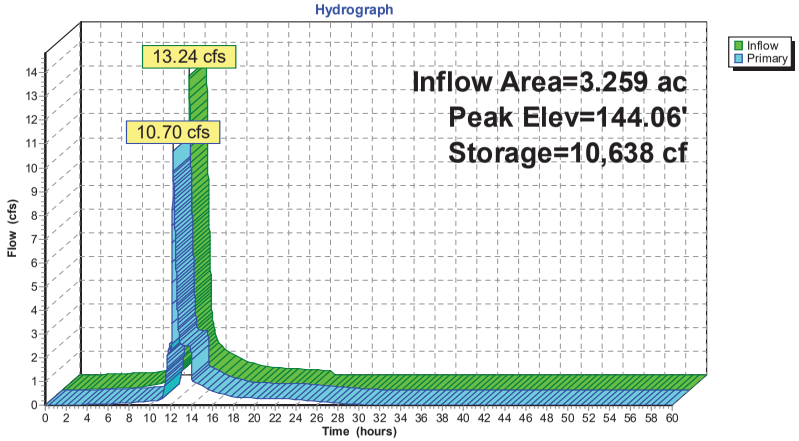
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
139.60	3,261	0	0
142.00	3,261	7,826	7,826

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
142.00	3,261	0	0
144.00	3,261	6,522	6,522

Device	Routing	Invert	Outlet Devices
#1	Primary	138.10'	**8.0" Round Culvert** L= 75.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 138.10' / 136.66' S= 0.0192 '/' Cc= 0.900 n= 0.012 Corrugated PE, smooth interior, Flow Area= 0.35 sf
#2	Device 1	138.10'	**3.0" Vert. Orifice/Grate** C= 0.600
#3	Device 1	139.90'	**4.0' 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
#4	Primary	143.20'	**4.0' long x 2.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Primary OutFlow Max=10.69 cfs @ 12.23 hrs HW=144.06' TW=140.45' (Dynamic Tailwater)
- **1=Culvert** (Outlet Controls 2.39 cfs @ 6.86 fps)
  - **2=Orifice/Grate** (Passes < 0.45 cfs potential flow)
  - **3=Broad-Crested Rectangular Weir** (Passes < 110.43 cfs potential flow)
- **4=Broad-Crested Rectangular Weir** (Weir Controls 8.30 cfs @ 2.42 fps)

Pond BRF: Bio retention

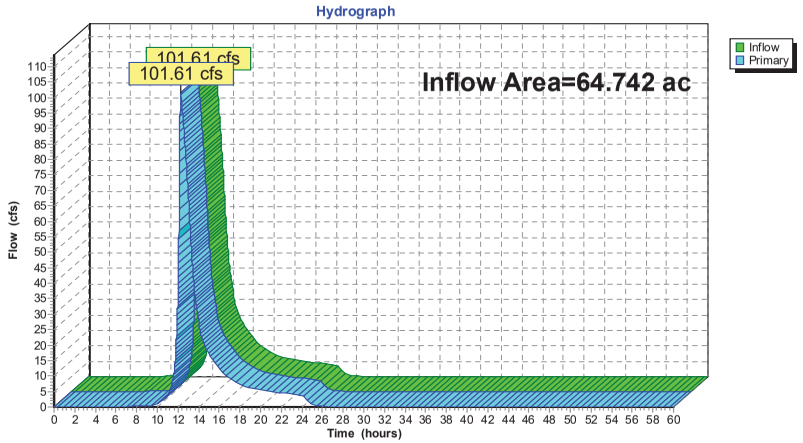


Summary for Link 5L: Stream

Inflow Area = 64.742 ac, 1.90% Impervious, Inflow Depth = 3.53" for 100 year event
Inflow = 101.61 cfs @ 12.28 hrs, Volume= 19.042 af
Primary = 101.61 cfs @ 12.28 hrs, Volume= 19.042 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs

Link 5L: Stream



Revised SWPPP Data Tables

Storm Event	Exist (cfs)	Post Mitigated (cfs)	Δ
1-Year Storm	2.98	3.25	0.27
10-Year Storm	23.76	23.30	(0.46)
100-Year Storm	65.20	66.96	1.76

Table 7: DP-1 Pre and Post Developed Peak Flow Rate Comparison (Mitigated)

To achieve the above mentioned flows, stormwater management practices will need to be installed along with site grading and diversion swales. These proposed stormwater management practices include a bioretention filter that will be located behind the proposed building at the base of the rock cut. This bioretention filter will also act as a rock catch for the rock cut. Another form of mitigation being used is the jellyfish filter that will be positioned in the northeast corner of the property. Diversion swales are proposed to direct runoff from undisturbed areas above the site away from impervious surfaces within the site, so the runoff will not have to be treated.

In addition to the permanent stormwater management practices, temporary erosion and sediment control practices are to be installed during the course of construction. These practices are incorporated to minimize and reduce the soil erosion and sediment impacts from construction activity involving soil disturbance. The overall course of construction will be phased to limit the overall disturbance to less than five (5) acres at a time in accordance with the NYS Phase II requirements. For a brief overview and description of the erosion and sediment control practices and construction phasing, refer to Sections 5 and 6 of this report.

4. WATER QUALITY AND QUANTITY CONTROLS

4.1 UNIFIED SIZING CRITERIA

The unified stormwater sizing criteria has been used to analyze the impacts of the proposed development and to develop stormwater management practices that reduce erosion, prevent overbank flooding, and help control extreme floods. This criteria as presented in the NYS Stormwater Management Design Manual (2015), provides a means for sizing stormwater practices for such sites. Chapter 9 of the Design Manual provides guidance on the treatment of runoff originating from redevelopment projects. In

The site is considered the developed portion of the property where the store, fueling station and parking areas will be constructed. This area is identified in the HydroCAD model as sub-catchments DA P-3 and P-4 with a total area of 1.317 acres. At the design point DP-1, the site is 6% of the overall drainage area (22.794 acres) but it is not practical to evaluate a point upstream where the site is exactly 10% of the overall watershed because DP-1 is the point at which discharges from the site enter the NYSDOT drainage system. As indicated by Table 7 above, the peak flow rates at DP-1 are slightly reduced during the 10-year storm and increase by less than 5% during the 100-year storm. The table below summarizes the change in peak water surface elevation at DP-1 during the design storm events.

Design Storm	Peak Water Surface Elevation		
	Exist.	Post Mitigated	Δ
10-Year	139.29	139.12	(0.17)
100-Year	139.58	139.58	(0.00)

Table 13: DP-1 Peak Water Surface Elevation

As indicated by the water surface elevations noted in the table above, the depth of flooding is expected to be reduced significantly during the 10-year storm and will decrease slightly during the 100-year storm. As a result, it is not likely that any downstream structures will be impacted and the site meets the criteria for waiver of the overbank and extreme flood control criteria.

At the request of the Town of Marlborough, the drainage analysis has been extended to evaluate the capacity of the existing downstream piping that will receive runoff from the site. Based upon this analysis, the downstream piping was found to be undersized and is proposed to be replaced with larger diameter pipe sized in accordance with NYSOT requirements. The pipe sizes indicated on the plans have been selected to accommodate the 10-year 24 hour storm event per Table 8-2 of Chapter 8 of the NYSDOT Highway Design Manual. The results of this analysis indicate increases in peak flow rate at the discharge point of the system (existing swale through agricultural fields) during the 10- and 100-year storms of less than 2%, well within the allowable 5% increase. Although minor increases in the peak flow rate from the system are predicted, installation of the new piping with the NYSDOT right-of-way will improve the capacity of the system and reduce the frequency of flooding on Route 9W.

4.1.6 Stream Channel Protection & Water Quantity Control Waivers

As mentioned above, the New York State Stormwater Management Design Manual outlines specific instances in which any and all of the unified stormwater sizing criteria may be waived due to a number of varying circumstances. Such circumstances

The minimum Runoff Reduction Volume is calculated with the following equation:

$$\min RR_V = \frac{P \times R_V * \times Ai}{12}$$

Where:

Rv* = 0.05+0.09(I) where I = 100%

= 0.95

I = Impervious Cover (%)

Ai = Impervious Cover Targeted for Runoff Reduction

Ai = (S)(Aic)

Aic = Total area of new impervious cover

S = Hydrologic Soil Group Specific Reduction Factor

P = 90% Rainfall Event Number (1.1")

Based upon the HSG classification of the on-site soils, a Hydrologic Soil Group Specific Reduction Factor of 0.30 was used to calculate the minimum runoff reduction volume for this site. The table below summarizes the total runoff reduction volume provided for each design point impacted by the development.

Design Point	Area Reduced RRv (Acre-Feet)	Structurally Reduced RRv (Acre-Feet)	Total RRv Provided (Acre-Feet)	Required WQv (Acre-Feet)	Min. RRv (Acre-Feet)
P-1	0.000	0.042	0.042	0.123*	0.041
* For Drainage area P-3 and P-4, RRv is only required to be provided for P-3.					

Table 11: Runoff Reduction Volume Summary

As illustrated by the table above, the Runoff Reduction Volume provided exceeds the minimum Runoff Reduction Volume but does not meet the goal of reducing 100% of the Water Quality Volume for the entire site. The construction of this project over soils with shallow bedrock and limited infiltration capacity as well as the limitations on the use of infiltration practices in hotspot areas restricts the ability to fully implement Green Infrastructure techniques and practices. All of the Green Infrastructure techniques and practices noted in Figures 9 and 10 were given ample consideration and those feasible have been implemented. The remaining water quality volume that has not been reduced by Green Infrastructure design practices must be provided by standard stormwater management practices. The table below illustrates how the remaining water quality volume has been provided.

Type	RRv Capacity (% of WQv provided by practice)	Sub-Area	RRv Provided (acre-feet)
Infiltration Practices (by source control)	90%	NA	0
		NA	0
Bioretention Practices	80% in HSG A and B (without underdrain)	NA	0
	40% HSG C and D (with underdrain)	DA P-3	0.042
Dry Swale (Open Channel Practice)	40% in HSG A and B	NA	0
	20% in HSG C and D	NA	0
Rain garden	100% in HSG A and B (without underdrain)	NA	0
	40% HSG C and D (with underdrain)	NA	0
Green roof	100%	NA	0
Stormwater planter	100% in HSG A and B (without underdrain)	NA	0
	40% HSG C and D (with underdrain)	NA	0
Rain tank/Cistern	100%	NA	0
Porous Pavement	100%	NA	0
Total Structural RRv Provided			0.042

Table 10: Runoff Reduction Volume Provided by Structural SMPs

Projects that do not achieve runoff reduction volume equal to the total required water quality volume must, at a minimum, reduce a percentage of the runoff from impervious areas to be constructed on the site. The percent reduction is based on the Hydrologic Soil Group(s) (HSG) of the site and is defined as Specific Reduction Factor (S). The following lists the specific reduction factors for the HSGs:

HSG A = 0.55

HSG B = 0.40

HSG C = 0.30

HSG D = 0.20

Design Point	Sub-Area	Provided RRv (Acre-Feet)	Required WQ_v (acre-feet)	Remaining WQv (acre-feet)	Provided WQv (acre-feet)	Standard SMP
DP 1	DA P-1^	-	-	-	-	-
	DA P-2^	-	-	-	-	-
	DA P-3	0.042	0.080	0.038	0.038	Bioretention Filter
	DA P-4*	-	0.295	0.295	0.295**	Jellyfish Filter
^Denotes DA's with diversion swales directing water around site. *Demotes redevelopment **Denotes calculated by others, specifically Contech Engineered Solutions LLC						

Table 12: Water Quality Volume Summary

For DA P-4 the treatment process that has been proposed is a Contech Jellyfish filter. This style of treatment was chosen due to the limitations of the site that would not allow more conventional treatment practices. Design and sizing assistance for this treatment practice was provided by the manufacturer Contech Engineered Solutions. A conservative design approach was taken when designing the practice by sizing the practice for the full WQv rather than the minimum 75% WQv allowed by the redevelopment standards. Sizing of this practice is based upon the on WQv flow rate. The WQv storm event calculations which were used to size the practice have been included in Appendix B. The proposed Jellyfish Filter will be installed as an offline practice to prevent pollutants collected in the structure from being washed away during large storm events. Design of the low flow splitter catch basin will be included in the final SWPPP.

The proposed design meets the NYSDEC requirements for Green Infrastructure design by providing the minimum Runoff Reduction Volume and providing 100% of the required Water Quality Volume for DA P-3.

4.1.2 Stream Channel Protection

Unified Stormwater Sizing Criteria is used to determine the required Stream Channel Protection volume (CP_V). In accordance with the New York State Stormwater Management Design Manual, stream channel protection is accomplished by providing 24-hour extended detention of the 1-year, 24-hour storm event. The requirement does not apply for discharges directly discharging to streams determined to be fourth order or

Contech CDS Sizing Calculations

CONTECH ENGINEERED SOLUTIONS

Sizing Estimate

Prepared by Josh Stackhouse on April 22, 2016

Stormwater Treatment System Design Summary
Route 9W Gas Station

Marlboro, NY

Information provided by Andrew Learn (Morris Associates)

Site information:

Structure ID	Area (ac)	Percent Impervious	Tc (min)	WQF- 90% Average Runoff Flow (cfs)	Peak Flow (cfs)
Treatment	0.5	100%	6	0.72	Unknown

Assumptions:

- NYSDEC has adopted the NJCAT/NJDEP verified flow rates for the CDS system. NYSDEC has effectively created three categories of treatment, new development (standalone), redevelopment and pretreatment. Specific approval and sizing criteria are applied to each category. Per the specifying engineer, this project falls under **Redevelopment.**

CDS System Sizing:

The CDS Stormwater Treatment System is a high-performance hydrodynamic separator. Using patented continuous deflective separation technology, the CDS system screens, separates and traps debris, sediment, and oil and grease from stormwater runoff. The indirect screening capability of the system allows for 100% removal of floatables and neutrally buoyant material without blinding. Flow and screening controls physically separate captured solids, preventing re-suspension and release of previously trapped pollutants.

Contech typically selects the CDS model that based on the NJCAT/NJDEP verified flow rates meets or exceeds the Water Quality Flow generated by the Water Quality Volume. The NJCAT/NJDEP verification uses the TARP protocol and as such meets the requirement laid out by NYSDEC on page 9-8 of the New York State Stormwater Management Design Manual for redevelopment projects. No such specification exists for pretreatment projects, but in the best interest of the environment Contech holds to those flows for pretreatment projects as well. Based on the flows above, Contech recommends:

Structure ID	Treatment Device	NYSDEC Approved Treatment Flow (cfs)
Treatment	CDS2015-4 (CDS-4)	0.93

Maintenance:

Like any stormwater best management practice, the CDS system requires regular inspection and maintenance to ensure optimal performance. Maintenance frequency will be driven by site conditions. Quarterly visual inspections are recommended, at which time the accumulation of pollutants can be determined. On average, the CDS system requires annual removal of accumulated pollutants.

71 U.S. Route One Suite F, Scarborough ME 04074
Toll-free: 877.907.8676 Fax: 207.885.9825

Site Information:

Structure ID	Area (ac)	Percent Impervious	Tc (min)	WQF- 90% Average Runoff Flow (gpm)	Peak Flow (gpm)
Treatment	0.5	100%	6	323.15	Unknown

Assumptions:

- Groundwater elevation at pipe invert
- VortClarex® oil influent concentration, mean droplet size and operating temperature per the attached calculation sheet

Treatment Solution/Performance:

Because of the variable nature of flows and pollutant loads in stormwater from industrial sites, we can make general projections about the removal capability and efficiency of the treatment systems and cannot guarantee that the system(s) we recommend will achieve the required benchmarks all the time.

Technology Description:

VortClarex® system

The VortClarex® is an enhanced gravity separation system made of precast concrete for removal of oil and solids from stormwater and other waste water streams. Oil droplets, being lighter (lower specific gravity) than water, tend to rise and separate from the water stream. In a similar manner, the higher specific gravity (heavier) solid particles fall to the bottom of the separator. The VortClarex® contains an inlet separation section set off from the rest of the separator by a down turned flow spreader, a coalescing plate section (MPak) and an outlet section set off by a downed turned pipe. The coalescing plate section will contain rows of plate packs. The number and size of the plate packs are determined by the design conditions.

The VortClarex® system shall be designed to remove 90-95% of freely dispersed oil droplets down to a 60 micron oil droplet size and produce an oil effluent quality of less than 15 ppm.

System Orientation

With an off-line configuration high peak runoff rates will be diverted away from the system, or bypassed. This is typically done via an external bypass structure, which is typically a standard manhole or vault with a 6" thick concrete weir wall cast or blocked in it. Contech can also provide a Stormgate, which is designed with an adjustable weir to offer tighter control over the system hydraulics than other high flow bypass methods. With either case Contech will specify the length, location, and crest elevation for the bypass weir wall as it is directly impacts the operation of the VortClarex.

Size Estimate:

Structure ID	Treatment Device	Design Flow Rate (cfs)	Maximum Allowable Flow Rate	Approximate Spill Volume (Gal)
Drainage Area	VCL60-2	440	1,666	1,391

71 U.S. Route One Suite F, Scarborough ME 04074
Toll-free: 877.907.8676 Fax: 207.885.9825

The price for the VortClarex system includes the system itself, manhole frames and covers/hatches and delivery to the site. The price does not include installation or risers, if necessary, to bring the rims to finished grade. The price may also be higher if the ground water table in the area of the system is within a couple feet of finished grade and we need to put an anti-flotation collar on the system to combat buoyancy. We can check these issues once the system is oriented on the plans and we have the final rim and invert elevations as well as the ground water elevation.

We generally suggest for Engineers to estimate installation costs at about 25 to 35 percent of the capital cost of the system (this rough estimate includes excavation costs). This figure may be larger if dewatering is needed, or if ledge is encountered and blasting is necessary

Please contact us if you have any questions or need any additional information. Again, thank you for your interest in the VortClarex and CDS systems. We look forward to receiving your feedback and working with you

Date: 4/22/2016
Project: Route 9W Gas Station
Location: Marlboro, NY
Prepared For: Morris Associates

Purpose: To calculate the water quality flow rate (Qwq) over a given site area. In this situation the WQv to be analyzed is the runoff produced by the first 1.5 inch(es) of rainfall, per Fig 4.1 of the New York State Stormwater Management Design Manual

Reference: United States Department of Agriculture Natural Resources Conservation Service TR-55 Manual, New York State Stormwater Management Design Manual - 2015

Formulas:

$$WQv = \frac{(P)(R_v)(A)}{12}$$

$$R_v = (0.05+0.009(I)$$

$$CN = 1000/[10+5P+10Qa-10(Qa^2+1.25QaP)^{1/2}]$$

$$Qwq = (q_u)*(A)*(Qa)$$

Structure: Treatment

P	**1.50**	in.
A	0.50	ac
I	100.00	%
t_c	0.6	min.
t_c	0.010	hr.
R_v	0.95	
90% WQv	0.059	ac-ft ← WQv Provided
90% WQv	2587.46	ft^3
Qa	1.426	in.
CN	99.36	
I_a	0.041	
I_a/P	0.027	
qu	**650**	(csm/in)
A	0.00078	$miles^2$
Qwq	0.72	cfs

NOT USED

COALESCING PLATE "MPak" DESIGN EVALUATION

Facet International
a CLARCOR company

CUSTOMER: Contech Engineered Solutions, LLC
CUST REF: NA
REFERENCE: VCL60-2
DATE: 3/9/2012

CONTINUOUS FLUID

FLUID =	WATER
FLOW RATE (GPM) =	440
TEMPERATURE (F) =	50
VISCOSITY (Cp) =	0
DIS SLDS (K PPM) =	0
VIS CF (1) =	0
VISC CF USED =	1.000
VISC. USED (Cp) =	1.308
SPEC GRAVITY =	0
SPEC GRAV USED =	1.000

IMMISCIBLE PHASE

MATERIAL =	Oil
SPEC GRAVITY =	0.88
MEASURED @ DEG F =	60
SPEC GR @ OPER TEMP =	0.884
CONCENT - PPM =	100
MEAN - MICRONS =	130
STAND DEV =	2.5

PLATE PACK CONFIGURATION

PACKS WIDE (2)--NO =	6
TTL WIDTH--INCHES =	72
HEIGHT (3)--INCHES =	50
NUMBER OF ROWS =	2
FLOW PATH, INCHES =	48
PLATE SPACING-IN. =	1/2

OUTPUT DATA

PLATE/FLUID CHARACTERISTICS

FLOW RATE - GPM	440.00
STACK FEET (4)	50.00
GPM/STACK FOOT	8.80
FRONTAL AREA - FT2	25.00
PLATES VOLUME - FT3	100.00
GPM/FT2 FRONTAL AREA	17.60
VEL IN PL-FT/MIN	2.67
RES TIME IN PLATES-MIN	1.50
PLATES/STACK FT	20.00
TTL PLATE SURFACE, FT2	6000.00
FT2/GPM	13.64
GPM/FT2	0.073
PRESS DROP- IN. WATER	0.023
REYNOLDS NO. IN PLATES	175.0
% LAMINAR LIMIT	8.8%

EFFLUENT CHARACTERISTICS

	Oil
PPM	**< 10**
% REMOVED	**90.0%**
SMALLEST DROPLET COMPLETELY REMOVED (MICRONS)	**55.7**
COLLECTION RATE, LBS/HR	**19.83**
-GAL/HR	**2.69**
CRIT SIZE -MICR(5)	**378.7**
STOKES' LAW, FLOW(6)	**VALID**
STOKES' LAW, PART (7)	**VALID**

NOTES: (1) VISC. CORRECTION FACTOR, FLUIDS OTHER THAN WATER, FRESH H20=1
(2) WIDTH PERPENDICULAR TO FLOW
(3) HEIGHT OF PLATES, MUST ADD SUPPORTS FOR TTL. HEIGHT
(4) ONE STACK FOOT = ONE FOOT OF PLATE = TWO CUBIC FEET
(5) CRIT. SIZE IS LARGEST SIZE DROP FOR WHICH STOKES' LAW VALID
(6) INDICATES STOKES' LAW VALID FOR LAMINAR FLOW BETWEEN PLATES
(7) INDICATES STOKES' LAW VALID FOR PARTICLE RISE

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REVISED: 8-7-01

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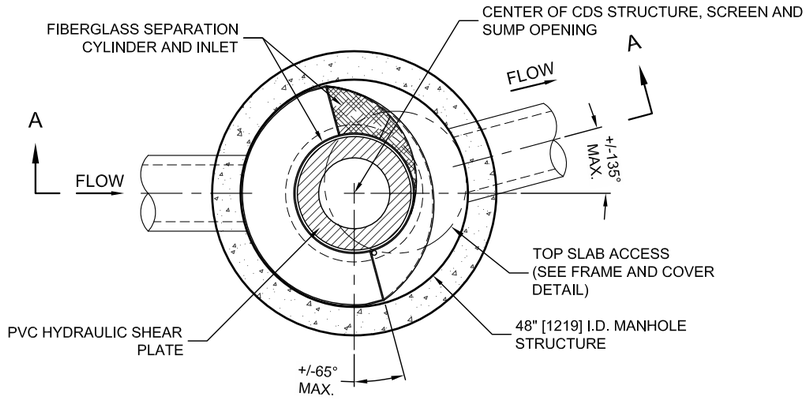
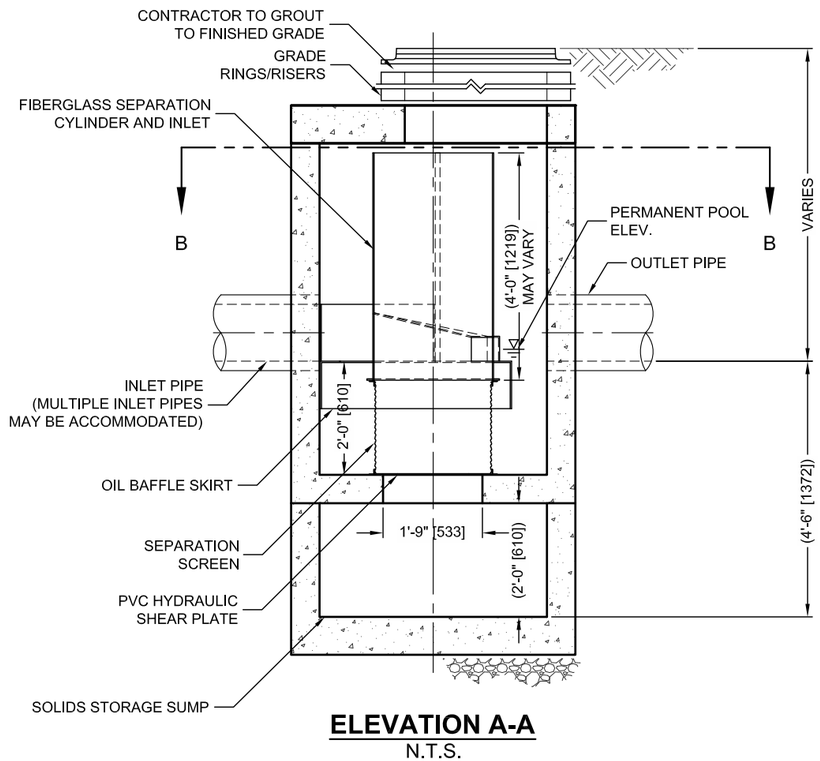
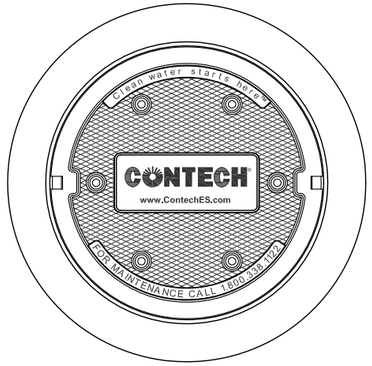


PLAN VIEW B-B
N.T.S.



ELEVATION A-A
N.T.S.



FRAME AND COVER
(DIAMETER VARIES)
N.T.S.

CDS-4-C (CDS2015-4) DESIGN NOTES

CDS-4-C (CDS2015-4) RATED TREATMENT CAPACITY IS 0.93 CFS. IF THE SITE CONDITIONS EXCEED MAXIMUM HYDRAULIC INTERNAL BYPASS CAPACITY, AN UPSTREAM BYPASS STRUCTURE IS REQUIRED.

SITE SPECIFIC DATA REQUIREMENTS

STRUCTURE ID	
WATER QUALITY FLOW RATE (CFS OR L/s)	*
PEAK FLOW RATE (CFS OR L/s)	*
RETURN PERIOD OF PEAK FLOW (YRS)	*
SCREEN APERTURE (2400)	*

PIPE DATA:	I.E.	MATERIAL	DIAMETER
INLET PIPE 1	*	*	*
INLET PIPE 2	*	*	*
OUTLET PIPE	*	*	*

RIM ELEVATION	*

ANTI-FLOTATION BALLAST	WIDTH	HEIGHT
	*	*

NOTES/SPECIAL REQUIREMENTS:

* PER ENGINEER OF RECORD

GENERAL NOTES
1. CONTECH TO PROVIDE ALL MATERIALS UNLESS NOTED OTHERWISE.
2. DIMENSIONS MARKED WITH ( ) ARE REFERENCE DIMENSIONS. ACTUAL DIMENSIONS MAY VARY.
3. FOR FABRICATION DRAWINGS WITH DETAILED STRUCTURE DIMENSIONS AND WEIGHTS, PLEASE CONTACT YOUR CONTECH ENGINEERED SOLUTIONS LLC REPRESENTATIVE. www.ContechES.com
4. CDS WATER QUALITY STRUCTURE SHALL BE IN ACCORDANCE WITH ALL DESIGN DATA AND INFORMATION CONTAINED IN THIS DRAWING.
5. STRUCTURE SHALL MEET AASHTO HS20 LOAD RATING, ASSUMING GROUNDWATER ELEVATION AT, OR BELOW, THE OUTLET PIPE INVERT ELEVATION. ENGINEER OF RECORD TO CONFIRM ACTUAL GROUNDWATER ELEVATION. CASTINGS SHALL MEET HS20 (AASHTO M 306) AND BE CAST WITH THE CONTECH LOGO.
6. IF REQUIRED, PVC HYDRAULIC SHEAR PLATE IS PLACED ON SHELF AT BOTTOM OF SCREEN CYLINDER. REMOVE AND REPLACE AS NECESSARY DURING MAINTENANCE CLEANING.

INSTALLATION NOTES
A. ANY SUB-BASE, BACKFILL DEPTH, AND/OR ANTI-FLOTATION PROVISIONS ARE SITE-SPECIFIC DESIGN CONSIDERATIONS AND SHALL BE SPECIFIED BY ENGINEER OF RECORD.
B. CONTRACTOR TO PROVIDE EQUIPMENT WITH SUFFICIENT LIFTING AND REACH CAPACITY TO LIFT AND SET THE CDS MANHOLE STRUCTURE (LIFTING CLUTCHES PROVIDED).
C. CONTRACTOR TO ADD JOINT SEALANT BETWEEN ALL STRUCTURE SECTIONS, AND ASSEMBLE STRUCTURE.
D. CONTRACTOR TO PROVIDE, INSTALL, AND GROUT PIPES. MATCH PIPE INVERTS WITH ELEVATIONS SHOWN.
E. CONTRACTOR TO TAKE APPROPRIATE MEASURES TO ASSURE UNIT IS WATER TIGHT, HOLDING WATER TO FLOWLINE INVERT MINIMUM. IT IS SUGGESTED THAT ALL JOINTS BELOW PIPE INVERTS ARE GROUTED.

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CDS-4-C (CDS2015-4) INLINE CDS STANDARD DETAIL

Oil Absorbent Insert Cutsheet

PIG™ Storm Drain Filter

FLT007 For Oil; Sediment; Trash; Debris, For Storm Drains from 23" x 34" to 36" x 48", Max Flow Rate 750 gal./Minute

Finally, a drain insert that won't fall into your catch basin! Innovative design guards your drains with improved filtering of oil, sediment and debris from stormwater runoff.

- Stainless steel adjustable frame adds strength and secures filter in place, so you'll never have to fish out a failed insert again
- Holds up to 60 lbs. of oil, sediment, debris and trash; stays in place even when grate is not installed
- Frame easily adjusts by hand to perfectly fit your square or rectangular drains from 23" x 34" up to 36" x 48"
- Installation, maintenance and removal are now easy, one-person jobs to reduce your labor costs
- Four-stage filtration: PET construction removes contaminants from stormwater at multiple stages, increasing the amount of pollutants captured
- Stormwater flows through drain grate onto fabric shelf (Stage 1), passes over filter ring (Stage 2) into collection bag (Stage 3) and over four sets of filter strips (Stage 4)
- Filter ring (patent-pending) channels water to center of collection bag to prevent untreated water from escaping through overflow ports
- Filter strips float freely like tentacles to remove hydrocarbons as water moves through collection bag
- Overflow ports help prevent blockage during high water flow
- Heavy-duty straps on all four sides allow easy handling and are visible even with grate in place
- Hi-viz straps help inspectors see from a distance that you're proactively managing your stormwater, and serve as a visual reminder for on-site maintenance
- Grommet on bottom of collection bag gives you the option of attaching extra absorbents, filters or other water treatment accessories
- The pore size is 0.077 mm, 74 microns, 0.0029 inches or 200 sieve

Autoship Eligible

Specifications

Max Flow Rate	750 gal./Minute
Style	Drain Filters
Use With	Storm Drains from 23" x 34" to 36" x 48"
Color	Black
Dimensions	23" W x 34" L x 26" H
Absorbency	Up to 1.25 gal.
Substance Filtered	Oil; Sediment; Trash; Debris
Sold as	1 each
Weight	8.4 lbs.
New Pig Patent	Pending
# per Pallet	35
Composition	Filter - PET; Absorbent Strips - PET Frame - 304 Stainless Steel Handles - Nylon Edge Fabric - Urethane Coated Nylon
Opening Dimensions	12" Dia.
UNSPSC	47101514
UV Resistant	Yes
Pigalog® Page Number	Page 275

Metric Equivalent

Absorbency	Up to 4.7 L
Dimensions	58.4cm W x 86.4cm L x 66cm H
Weight	3.8 kg

Technical Information

Technical Documents

Instructions for PIG Storm Drain Filter

40 CFR 122.26

New Pig
World's best stuff for leaks, drips and spills.

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1-855-493-4647 • Fax: 1-800-621-7447• newpig.com • hothogs@newpig.com