PRIME ENGINEERING, INC.

Memo

DATE: November 16, 2015

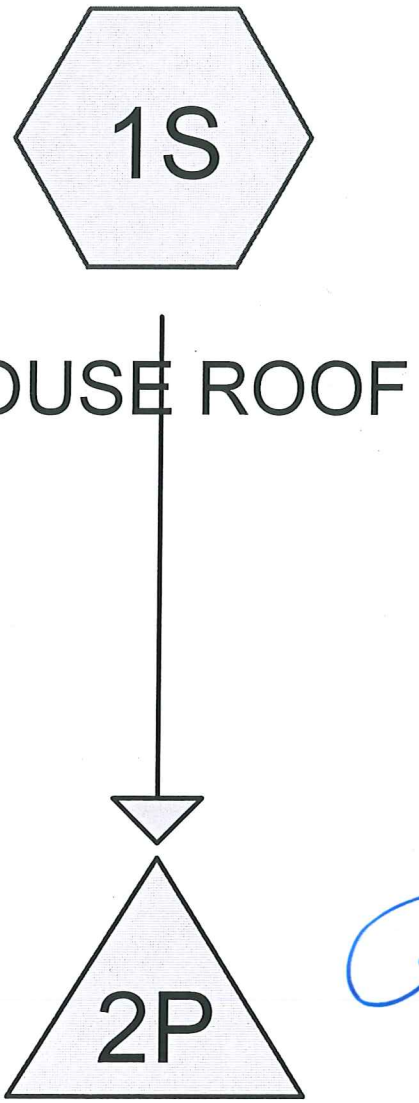
TO: Sarah Porter

FROM: Rich Rheaume

RE: **ROOF INFILTRATOR**

I hereby certify that the infiltrators proposed for Lots 2 through 5 have been sized to store and infiltrate the 100 year design shown as shown on the attached computation.

COMMONWEALTH OF MASSACHUSETTS
RICHARD J. RHEAUME
No. 28373
CIVIL
REGISTERED PROFESSIONAL ENGINEER



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Subcat Reach Pond Link

Routing Diagram for roof_100yr 1344
Prepared by Prime Engineering, Inc, Printed 11/13/2015
HydroCAD® 10.00-13 s/n 01299 © 2014 HydroCAD Software Solutions LLC

Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: HOUSE ROOF Runoff Area=1,344 sf 100.00% Impervious Runoff Depth>6.24"
Tc=6.0 min CN=98 Runoff=0.21 cfs 0.016 af

Pond 2P: 2 CULTEC 330XLHD Peak Elev=96.48' Storage=0.005 af Inflow=0.21 cfs 0.016 af
Outflow=0.02 cfs 0.016 af

Total Runoff Area = 0.031 ac Runoff Volume = 0.016 af Average Runoff Depth = 6.24"
0.00% Pervious = 0.000 ac 100.00% Impervious = 0.031 ac

Summary for Subcatchment 1S: HOUSE ROOF

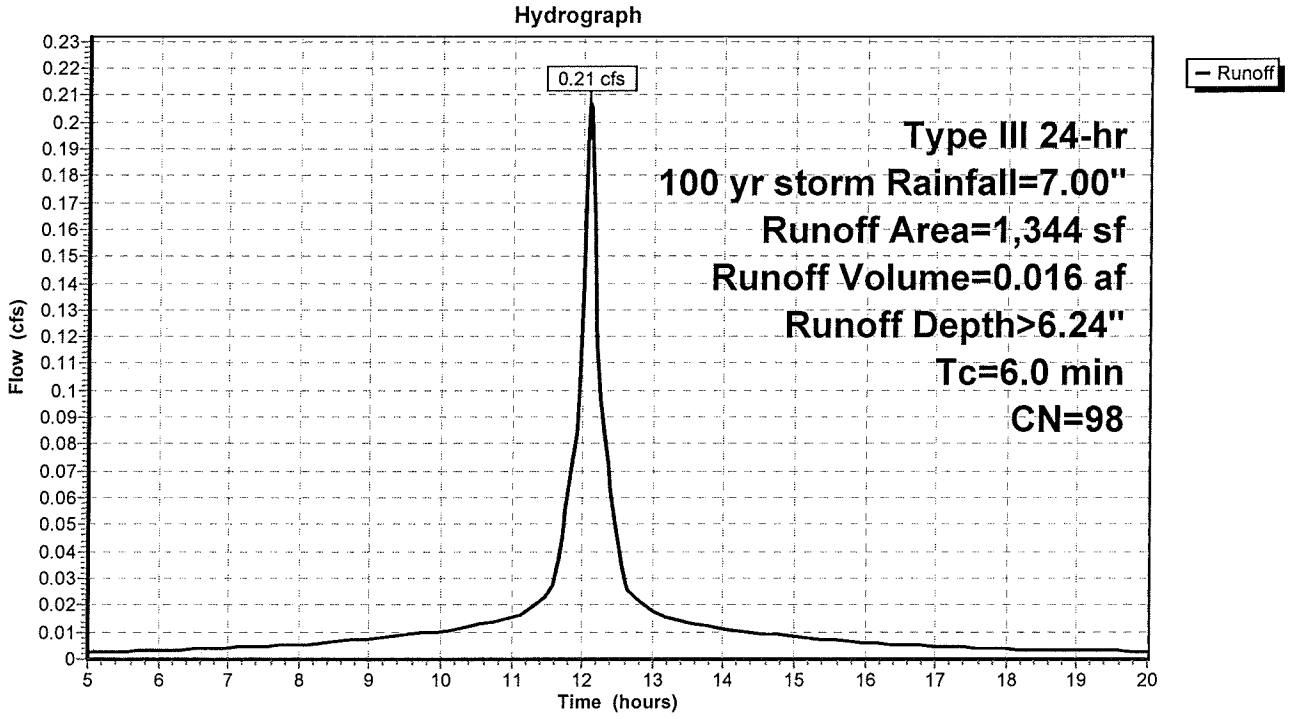
Runoff = 0.21 cfs @ 12.09 hrs, Volume= 0.016 af, Depth> 6.24"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 yr storm Rainfall=7.00"

	Area (sf)	CN	Description
*	1,344	98	
	1,344		100.00% Impervious Area

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

Subcatchment 1S: HOUSE ROOF



Summary for Pond 2P: 2 CULTEC 330XLHD

Inflow Area = 0.031 ac,100.00% Impervious, Inflow Depth > 6.24" for 100 yr storm event
Inflow = 0.21 cfs @ 12.09 hrs, Volume= 0.016 af
Outflow = 0.02 cfs @ 11.55 hrs, Volume= 0.016 af, Atten= 88%, Lag= 0.0 min
Discarded = 0.02 cfs @ 11.55 hrs, Volume= 0.016 af

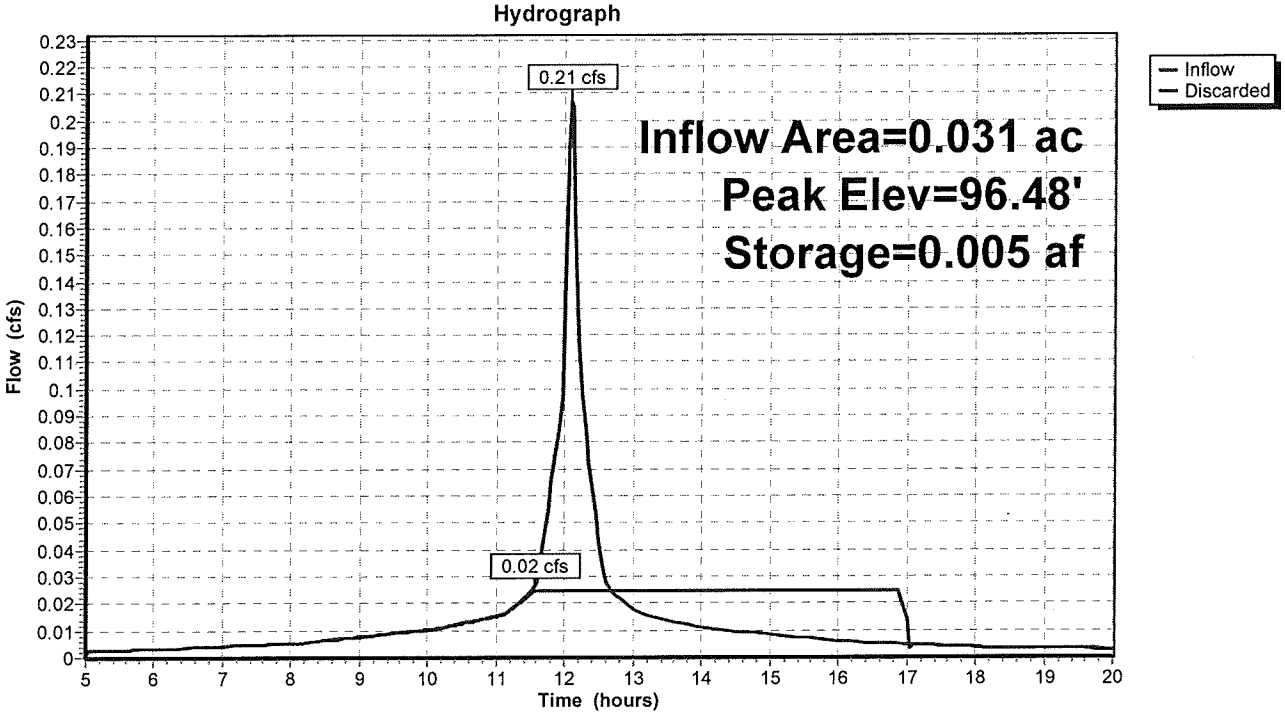
Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 96.48' @ 12.68 hrs Surf.Area= 0.003 ac Storage= 0.005 af

Plug-Flow detention time= 61.7 min calculated for 0.016 af (100% of inflow)
Center-of-Mass det. time= 61.4 min (794.9 - 733.5)

Volume	Invert	Avail.Storage	Storage Description
#1A	93.50'	0.003 af	**11.67'W x 11.00'L x 3.29'H Field A** 0.010 af Overall - 0.003 af Embedded = 0.007 af x 40.0% Voids
#2A	94.00'	0.003 af	**Cultec R-330XLHD** x 2 Inside #1 Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap Row Length Adjustment= +1.50' x 7.45 sf x 2 rows
		0.006 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	93.50'	**8.270 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.02 cfs @ 11.55 hrs HW=93.53' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.02 cfs)

Pond 2P: 2 CULTEC 330XLHD