

Civil & Environmental Engineering Consultants 174 Main Street, Beacon, New York 12508 13 Chambers Street, Newburgh, New York 12550 Phone: 845-440-6926 Fax: 845-440-6637 www.HudsonLandDesign.com

December 26, 2018

Lt. Timothy Dexter City of Beacon Building Inspector 1 Municipal Center Beacon, NY 12508

Re: Infiltration and Inflow Investigation

234 Main Street Project

234 Main Street

City of Beacon, New York

Tax ID:  $5954-27-869916 (\pm 0.09 \text{ acres})$ 

Dear Mr. Dexter,

Hudson Land Design (HLD) has completed an infiltration and inflow investigation at the above referenced parcel as required by the City of Beacon. The investigation was conducted on November 27, 2018 at the existing building located at 234 Main Street, which consists of a singles-story retail space which is currently vacant.

The first phase of the study consisted of an exterior inspection of the building to determine the location of roof leader discharge points. There were no roof leaders observed on the exterior of the building. The building roof was accessed to determine if there were roof drains that could be piped through the interior of the building. No roof drains were observed. Upon inspection the existing brick building has a flat roof pitched slightly to the rear (away from Main Street) with no roof leaders. Runoff from the roof drains off the back edge of the roof to the ground surface and overland toward the north.

It should be noted that the adjacent building's second floor roof located at 232 Main Street discharges to the 234 Main roof. The roof leader is attached to the second story wall down to the 234 Main roof where there is a 90 degree elbow directed toward the north. The pipe travels toward the north to a point that is located approximately the midpoint of the rear outdoor seating area for 232 Main. It appears that the roof leader used to continue down the first floor wall of 234 main on its west side to the ground surface within the outdoor seating area; however, the pipe has been disconnected from

234 Main Street Infiltration and Inflow Report December 26, 2018 Page 2 of 2

the lower downspout and discharges to the 234 Main rooftop where it flows toward the rear of the building. The roof area of 232 Main Street is approximately 1,375 sqft of additional runoff area. Considering a frequent storm event of 1.3 inches of rainfall over a 24-hour period (90% probability storm) accounts for an additional 1,105 gallons of stormwater runoff to the 234 Main roof. This roof leader will need to be re-connected to the downspout that it once was connected to.

The second phase of the study consisted of interior inspection of the building to determine if there are any illicit connections to the building sewer line from sump pumps, floor drains and the like. The building is on slab with no basement. There were sump pumps observed within the building. There was a floor drain observed in the northwest edge of the building where the furnace and HVAC system is located. There is a condensate line from the HVAC system that drains into the floor drain. No sump pumps or floor drains were observed throughout the interior of the building.

HLD personnel located the last section of the interior sanitary sewer plumbing. The sanitary sewer line flows south west towards Main Streets sanitary sewer collection system from the front of building foundation.

Based on our observations, HLD believes that there are not illicit stormwater connections from the building located at 234 Main Street to the City of Beacon's sanitary sewer collection system.

The proposed design will provide two roof leaders on the east side of the building to discharge to the grass area besides the building. A small infiltration trench has been designed to capture the roof runoff and allow it to infiltrate into the ground. Larger storms overflow through a stone-lined overflow weir. An infiltration test has been preformed within the infiltration trench area. The stabilized rate is approximately 20 inches per hour.

Design plans, hydraulic and hydrologic calculations have been provided at the end of this report using an infiltration rate of 5 inches per hour.

Should you have any questions, please feel free to call me at 845-440-6926.

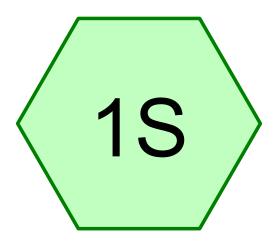
Sincerely,

Mu Bolund

Michael A. Bodendorf, P.E.

cc: 234 Main, LLC Aryeh Seigel

Daniel G. Koehler, P.E. (HLD file)



# ROOF DRAINAGE









#### **DRAINAGE-PRE**

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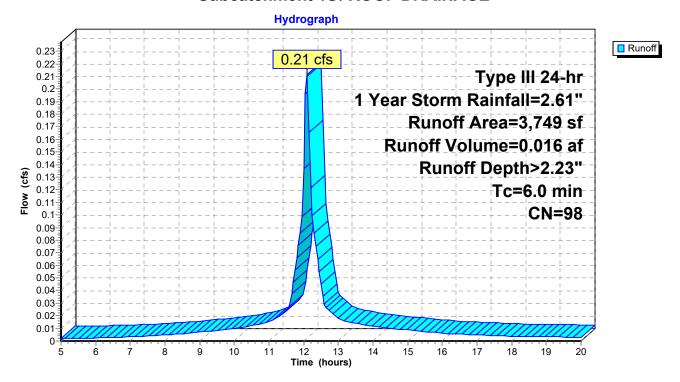
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# **Summary for Subcatchment 1S: ROOF DRAINAGE**

Runoff = 0.21 cfs @ 12.09 hrs, Volume= 0.016 af, Depth> 2.23"

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 1 Year Storm Rainfall=2.61"

	Α	rea (sf)	CN	Description					
		3,749	98	Roofs, HSG B					
		3,749		100.00% Impervious Area					
(m	Tc nin)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description			
	6.0					Direct Entry, ROOF DRAINAGE			



#### **DRAINAGE-PRE**

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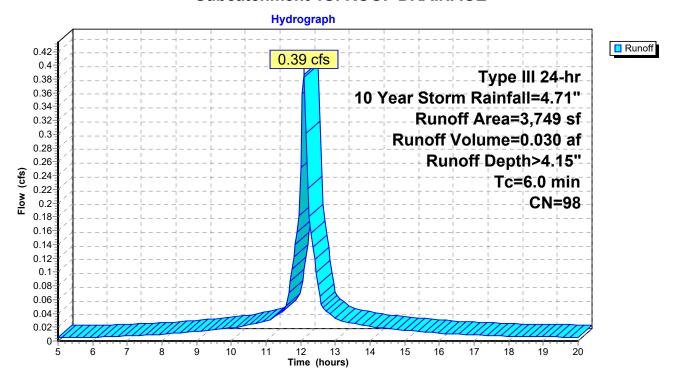
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## **Summary for Subcatchment 1S: ROOF DRAINAGE**

Runoff = 0.39 cfs @ 12.09 hrs, Volume= 0.030 af, Depth> 4.15"

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 10 Year Storm Rainfall=4.71"

_	Α	rea (sf)	CN	Description					
		3,749	98	Roofs, HSG B					
		3,749		100.00% Impervious Area					
	Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description			
	6.0					Direct Entry, ROOF DRAINAGE			



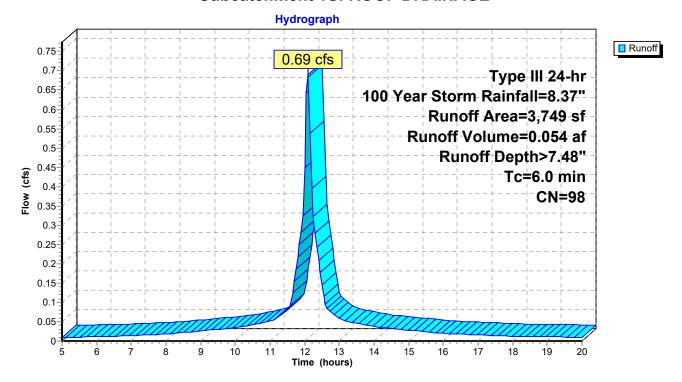
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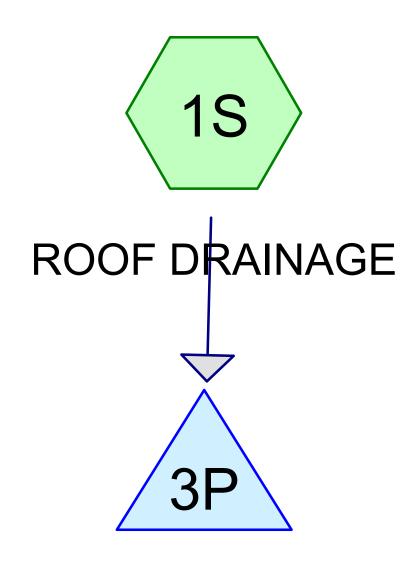
# **Summary for Subcatchment 1S: ROOF DRAINAGE**

Runoff = 0.69 cfs @ 12.09 hrs, Volume= 0.054 af, Depth> 7.48"

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 Year Storm Rainfall=8.37"

	Α	rea (sf)	CN	Description						
		3,749	98	Roofs, HSG B						
		3,749		100.00% Impervious Area						
_	Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description				
	6.0	·	·		·	Direct Entry, ROOF DRAINAGE				





# INFILTRATION TRENCH









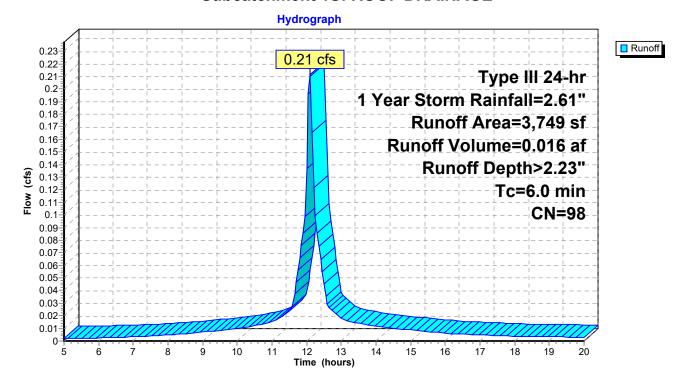
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# **Summary for Subcatchment 1S: ROOF DRAINAGE**

Runoff = 0.21 cfs @ 12.09 hrs, Volume= 0.016 af, Depth> 2.23"

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 1 Year Storm Rainfall=2.61"

	Α	rea (sf)	CN	Description						
		3,749	98	Roofs, HSG B						
		3,749		100.00% Impervious Area						
_	Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description				
	6.0	·	·		·	Direct Entry, ROOF DRAINAGE				



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# **Summary for Pond 3P: INFILTRATION TRENCH**

Inflow Area = 0.086 ac,100.00% Impervious, Inflow Depth > 2.23" for 1 Year Storm event 
Inflow = 0.21 cfs @ 12.09 hrs, Volume= 0.016 af 
Outflow = 0.20 cfs @ 12.11 hrs, Volume= 0.016 af, Atten= 4%, Lag= 1.6 min 
Discarded = 0.18 cfs @ 12.11 hrs, Volume= 0.012 af 
Primary = 0.18 cfs @ 12.11 hrs, Volume= 0.004 af

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs Peak Elev= 100.57' @ 12.11 hrs Surf.Area= 349 sf Storage= 129 cf

Plug-Flow detention time= 41.9 min calculated for 0.016 af (99% of inflow) Center-of-Mass det. time= 36.8 min (777.6 - 740.8)

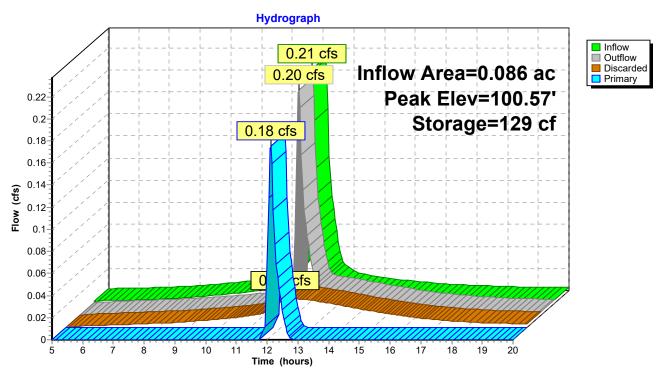
<u>Volume</u>	Inve	ert Avail.Sto	rage Storage	Description			
#1	100.0	0' 3	19 cf Custon	n Stage Data (Pr	rismatic)Listed below (Recalc)		
Elevation (feet)		Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)			
100.0	00	103	0	0			
101.0	00	535	319	319			
Device	Routing	Invert	Outlet Device	es			
#1	Primary	100.50'	Head (feet) ( 2.50 3.00 3. Coef. (English	0.20 0.40 0.60 50 4.00 4.50 5 h) 2.38 2.54 2.	69 2.68 2.67 2.67 2.65 2.66 2.66		
#2 Discarded		d 100.00'	2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32 <b>5.000 in/hr Exfiltration over Surface area above 100.00'</b> Excluded Surface area = 103 sf				

**Discarded OutFlow** Max=0.03 cfs @ 12.11 hrs HW=100.57' (Free Discharge) **2=Exfiltration** (Exfiltration Controls 0.03 cfs)

Primary OutFlow Max=0.17 cfs @ 12.11 hrs HW=100.57' (Free Discharge) 1=Broad-Crested Rectangular Weir (Weir Controls 0.17 cfs @ 0.62 fps)

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# **Pond 3P: INFILTRATION TRENCH**



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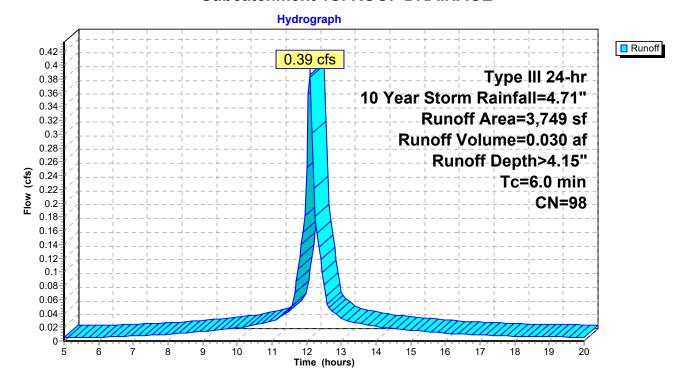
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# **Summary for Subcatchment 1S: ROOF DRAINAGE**

Runoff = 0.39 cfs @ 12.09 hrs, Volume= 0.030 af, Depth> 4.15"

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 10 Year Storm Rainfall=4.71"

_	Α	rea (sf)	CN	Description					
		3,749	98	Roofs, HSG B					
		3,749		100.00% Impervious Area					
	Tc (min)	Length (feet)	Slope (ft/ft	Velocity (ft/sec)	Capacity (cfs)	Description			
	6.0					Direct Entry, ROOF DRAINAGE			



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# **Summary for Pond 3P: INFILTRATION TRENCH**

Inflow Area = 0.086 ac,100.00% Impervious, Inflow Depth > 4.15" for 10 Year Storm event 0.39 cfs @ 12.09 hrs, Volume= 0.030 af 0.030 af 0.38 cfs @ 12.11 hrs, Volume= 0.029 af, Atten= 3%, Lag= 1.3 min 0.03 cfs @ 12.11 hrs, Volume= 0.018 af 0.35 cfs @ 12.11 hrs, Volume= 0.012 af

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs Peak Elev= 100.61' @ 12.11 hrs Surf.Area= 366 sf Storage= 143 cf

Plug-Flow detention time= 36.4 min calculated for 0.029 af (98% of inflow) Center-of-Mass det. time= 30.6 min ( 766.1 - 735.5 )

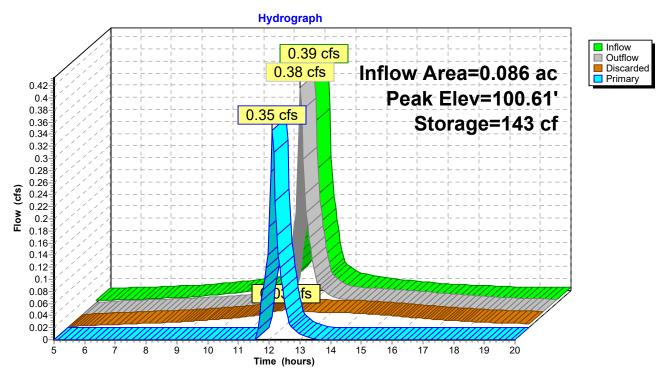
Volume	Inve	ert Avail.Sto	rage Storage	Description	
#1	100.0	0' 3	19 cf Custom	Stage Data (P	rismatic)Listed below (Recalc)
Elevation		Surf.Area	Inc.Store	Cum.Store	
(fee	et)	(sq-ft)	(cubic-feet)	(cubic-feet)	
100.0	00	103	0	0	
101.0	00	535	319	319	
Device	Routing	Invert	Outlet Devices	S	
#1	Primary	100.50'	Head (feet) 0 2.50 3.00 3.5	.20 0.40 0.60 50 4.00 4.50 5	ad-Crested Rectangular Weir 0.80 1.00 1.20 1.40 1.60 1.80 2.00 0.00 5.50 69 2.68 2.67 2.67 2.65 2.66 2.66
#2	Discarde	d 100.00'	2.68 2.72 2.7 5.000 in/hr Ex	73 2.76 2.79 2	.88 3.07 3.32 Surface area above 100.00'

**Discarded OutFlow** Max=0.03 cfs @ 12.11 hrs HW=100.61' (Free Discharge) **2=Exfiltration** (Exfiltration Controls 0.03 cfs)

Primary OutFlow Max=0.34 cfs @ 12.11 hrs HW=100.61' (Free Discharge) 1=Broad-Crested Rectangular Weir (Weir Controls 0.34 cfs @ 0.78 fps)

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# **Pond 3P: INFILTRATION TRENCH**



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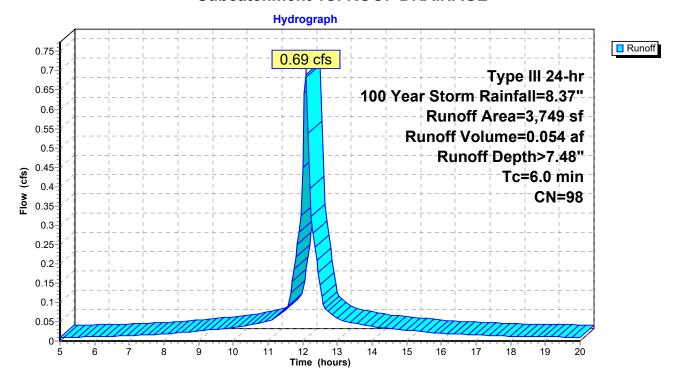
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# **Summary for Subcatchment 1S: ROOF DRAINAGE**

Runoff = 0.69 cfs @ 12.09 hrs, Volume= 0.054 af, Depth> 7.48"

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 Year Storm Rainfall=8.37"

	Α	rea (sf)	CN	Description					
		3,749	98	Roofs, HSG B					
		3,749		100.00% Impervious Area					
(m	Tc nin)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description			
	6.0					Direct Entry, ROOF DRAINAGE			



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# **Summary for Pond 3P: INFILTRATION TRENCH**

Inflow Area = 0.086 ac,100.00% Impervious, Inflow Depth > 7.48" for 100 Year Storm event 
Inflow = 0.69 cfs @ 12.09 hrs, Volume= 0.054 af 
Outflow = 0.68 cfs @ 12.11 hrs, Volume= 0.053 af, Atten= 2%, Lag= 1.1 min 
Discarded = 0.03 cfs @ 12.11 hrs, Volume= 0.024 af 
Primary = 0.64 cfs @ 12.11 hrs, Volume= 0.029 af

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs Peak Elev= 100.67' @ 12.11 hrs Surf.Area= 391 sf Storage= 164 cf

Plug-Flow detention time= 29.8 min calculated for 0.053 af (98% of inflow) Center-of-Mass det. time= 22.7 min (755.7 - 732.9)

Volume	Inve	<u>rt Avail.Sto</u>	rage Storage	Description			
#1	100.0	0' 3	19 cf Custon	n Stage Data (Pi	rismatic)Listed below (Recalc)		
Elevatio		Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)			
100.0	00	103	0	0			
101.0	00	535	319	319			
Device	Routing	Invert	Outlet Device	es			
#1	Primary	100.50'			ad-Crested Rectangular Weir		
			` ,		0.80 1.00 1.20 1.40 1.60 1.80 2.00		
			2.50 3.00 3.50 4.00 4.50 5.00 5.50				
					69 2.68 2.67 2.67 2.65 2.66 2.66		
				73 2.76 2.79 2			
#2	Discarded	d 100.00'			Surface area above 100.00'		
			Excluded Sur	face area = 103	sf		

**Discarded OutFlow** Max=0.03 cfs @ 12.11 hrs HW=100.66' (Free Discharge) **2=Exfiltration** (Exfiltration Controls 0.03 cfs)

Primary OutFlow Max=0.64 cfs @ 12.11 hrs HW=100.66' (Free Discharge) 1=Broad-Crested Rectangular Weir (Weir Controls 0.64 cfs @ 0.97 fps)

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# **Pond 3P: INFILTRATION TRENCH**

