

STORMWATER MANAGEMENT REPORT
WEST PORT LOFTS CONDOMINIUM
22-28 TATE STREET
PORTLAND, MAINE
October 9, 2015

The site is a very small urban site that is currently developed. It is 6,176 square feet in size with an impervious cover of 3,445 square feet. The redevelopment of the site will add an 8 unit building and 8 parking spaces with an impervious cover of 4,318 square feet.

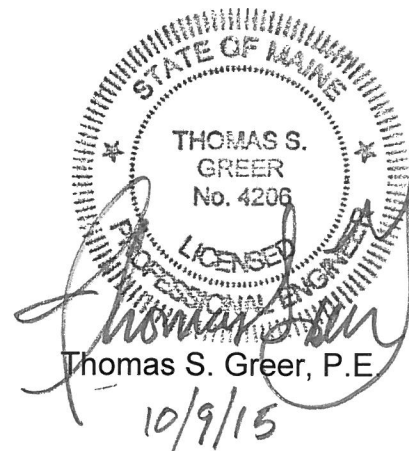
The new sewer discharge will be 1,000 gallons per day of domestic wastewater. To ensure sewer capacity, the site's design includes an infiltration box of stones. It is placed within the existing foundation of the home that is on site. The foundation and cellar will be completely removed and replaced with sand and the stone box.

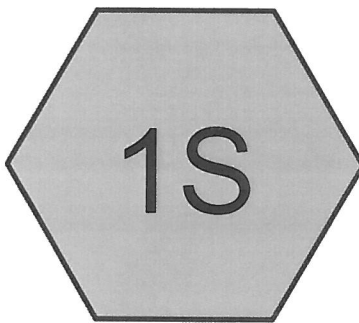
The volume of the stone box's void space is in excess of the 1,000 gallons per day of wastewater generated. There will be no net impact on the sewer system during rain events.

The roof drain will be piped to the stone box and the flow will be distributed over the box via 6" perforated pipe. The box will exfiltrate water into the soil until the elevation of the overflow pipe is reached. The overflow pipe and field inlet function to take excess water away and to vent the infiltration box.

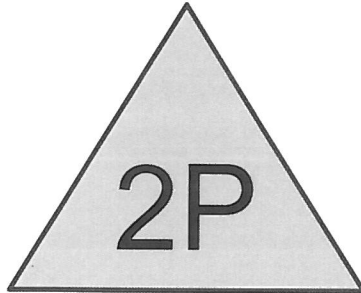
This system will also reduce the peak flows leaving the site.

Attached are Hydrocad calculations for the roof drain going to the infiltration system.

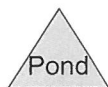




ROOF RUNOFF



INFILTRATION BOX



TATE STREET TSG 15133

Prepared by Hewlett-Packard Company
 HydroCAD® 9.10 s/n 01454 © 2010 HydroCAD Software Solutions LLC

Type III 24-hr 2 YEAR Rainfall=3.00"

Printed 10/8/2015

Page 2

Summary for Subcatchment 1S: ROOF RUNOFF

Runoff = 0.29 cfs @ 12.06 hrs, Volume= 0.021 af, Depth> 2.59"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Type III 24-hr 2 YEAR Rainfall=3.00"

Area (sf)	CN	Description
* 4,200	98	ROOF
4,200		100.00% Impervious Area

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

Summary for Pond 2P: INFILTRATION BOX

Inflow Area = 0.096 ac, 100.00% Impervious, Inflow Depth > 2.59" for 2 YEAR event
 Inflow = 0.29 cfs @ 12.06 hrs, Volume= 0.021 af
 Outflow = 0.24 cfs @ 12.11 hrs, Volume= 0.021 af, Atten= 17%, Lag= 3.0 min
 Discarded = 0.20 cfs @ 12.00 hrs, Volume= 0.020 af
 Primary = 0.04 cfs @ 12.11 hrs, Volume= 0.001 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 89.12' @ 12.11 hrs Surf.Area= 180 sf Storage= 22 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 0.5 min (738.2 - 737.7)

Volume	Invert	Avail.Storage	Storage Description
#1	89.00'	540 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
89.00	180	0	0
91.00	180	360	360
92.00	180	180	540

Device	Routing	Invert	Outlet Devices
#1	Discarded	89.00'	0.20 cfs Exfiltration at all elevations
#2	Primary	89.00'	6.0" Vert. Orifice/Grate C= 0.600

Discarded OutFlow Max=0.20 cfs @ 12.00 hrs HW=89.03' (Free Discharge)
 ↗1=Exfiltration (Exfiltration Controls 0.20 cfs)

Primary OutFlow Max=0.04 cfs @ 12.11 hrs HW=89.12' (Free Discharge)
 ↗2=Orifice/Grate (Orifice Controls 0.04 cfs @ 1.17 fps)

TATE STREET TSG 15133

Type III 24-hr 10 YEAR Rainfall=4.70"

Prepared by Hewlett-Packard Company

Printed 10/8/2015

HydroCAD® 9.10 s/n 01454 © 2010 HydroCAD Software Solutions LLC

Page 3

Summary for Subcatchment 1S: ROOF RUNOFF

Runoff = 0.46 cfs @ 12.06 hrs, Volume= 0.033 af, Depth> 4.15"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 YEAR Rainfall=4.70"

Area (sf)	CN	Description
* 4,200	98	ROOF
4,200		100.00% Impervious Area

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

Summary for Pond 2P: INFILTRATION BOX

Inflow Area = 0.096 ac, 100.00% Impervious, Inflow Depth > 4.15" for 10 YEAR event
 Inflow = 0.46 cfs @ 12.06 hrs, Volume= 0.033 af
 Outflow = 0.41 cfs @ 12.10 hrs, Volume= 0.033 af, Atten= 12%, Lag= 2.7 min
 Discarded = 0.20 cfs @ 11.95 hrs, Volume= 0.030 af
 Primary = 0.21 cfs @ 12.10 hrs, Volume= 0.003 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 89.28' @ 12.10 hrs Surf.Area= 180 sf Storage= 51 cf

Plug-Flow detention time= 0.8 min calculated for 0.033 af (100% of inflow)
 Center-of-Mass det. time= 0.7 min (734.7 - 734.0)

Volume	Invert	Avail.Storage	Storage Description
#1	89.00'	540 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
89.00	180	0	0
91.00	180	360	360
92.00	180	180	540

Device	Routing	Invert	Outlet Devices
#1	Discarded	89.00'	0.20 cfs Exfiltration at all elevations
#2	Primary	89.00'	6.0" Vert. Orifice/Grate C= 0.600

Discarded OutFlow Max=0.20 cfs @ 11.95 hrs HW=89.04' (Free Discharge)
 ↗ **1=Exfiltration** (Exfiltration Controls 0.20 cfs)

Primary OutFlow Max=0.21 cfs @ 12.10 hrs HW=89.28' (Free Discharge)
 ↗ **2=Orifice/Grate** (Orifice Controls 0.21 cfs @ 1.81 fps)

Summary for Subcatchment 1S: ROOF RUNOFF

Runoff = 0.55 cfs @ 12.06 hrs, Volume= 0.039 af, Depth> 4.87"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 YEAR Rainfall=5.50"

Area (sf)	CN	Description
* 4,200	98	ROOF
4,200		100.00% Impervious Area

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

Summary for Pond 2P: INFILTRATION BOX

Inflow Area = 0.096 ac, 100.00% Impervious, Inflow Depth > 4.87" for 25 YEAR event
 Inflow = 0.55 cfs @ 12.06 hrs, Volume= 0.039 af
 Outflow = 0.49 cfs @ 12.10 hrs, Volume= 0.039 af, Atten= 10%, Lag= 2.5 min
 Discarded = 0.20 cfs @ 11.90 hrs, Volume= 0.035 af
 Primary = 0.29 cfs @ 12.10 hrs, Volume= 0.005 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 89.34' @ 12.10 hrs Surf.Area= 180 sf Storage= 62 cf

Plug-Flow detention time= 0.9 min calculated for 0.039 af (100% of inflow)
 Center-of-Mass det. time= 0.8 min (733.9 - 733.1)

Volume	Invert	Avail.Storage	Storage Description
#1	89.00'	540 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
89.00	180	0	0
91.00	180	360	360
92.00	180	180	540

Device	Routing	Invert	Outlet Devices
#1	Discarded	89.00'	0.20 cfs Exfiltration at all elevations
#2	Primary	89.00'	6.0" Vert. Orifice/Grate C= 0.600

Discarded OutFlow Max=0.20 cfs @ 11.90 hrs HW=89.04' (Free Discharge)
 ↖1=Exfiltration (Exfiltration Controls 0.20 cfs)

Primary OutFlow Max=0.29 cfs @ 12.10 hrs HW=89.34' (Free Discharge)
 ↖2=Orifice/Grate (Orifice Controls 0.29 cfs @ 2.00 fps)