

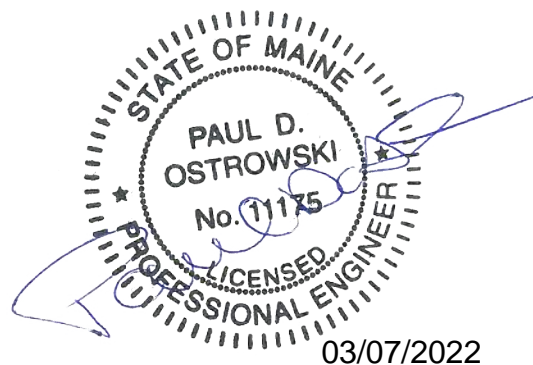
### Stormwater Narrative

This proposed project involves the development of a 7,500 square feet commercial building and a 1,500 square feet garage with associated parking, driveway, and utilities. The site is located at 1312 Portland Road in Arundel, Maine. The subject site is not within a direct watershed which is identified as most at risk per Chapter 502, Direct Watersheds Of Lakes Most At Risk From New Development, And Urban Impaired Streams. The proposed development will create more than an acre of disturbed area – however; the project does not propose more than an acre of impervious area. Therefore, the project is required to meet the Basic Standards and Section 10.6.4.5. of the Arundel Land Use Ordinance which states that: “The project must provide adequate stormwater management facilities for produce no additional peak runoff from the site during a 25-year storm event and will not have a undue impact on municipal stormwater facilities or downstream properties.”

The existing site is mostly vegetated, and runoff generally drains west and south towards existing wetland areas. The project involves the construction of two building with office and commercial space and a parking lot area. Two depression areas, identified as Stormwater Detention Areas A and B have been proposed to detain and store runoff from the proposed site. HydroCAD modeling has also been provided to show that post-peak runoff do not exceed pre-peak runoff, as such;

Stormwater Runoff Summary Table			
Analysis Point	Storm Event	Existing Development (cfs)	Proposed Development (cfs)
POA1	25-year	6.09	5.77
POA2	25-year	6.33	6.32
POA3	25-year	0.61	0.61

Basic Standards per Section 4(A) of the MDEP Chapter 500 outline specific guidelines for erosion control practices that will be generally followed for the development of this lot. An Erosion and Sedimentation Control Plan was created for the project that emphasizes the installation of sedimentation barriers and vegetation to minimize erosion potential from development activities during and after construction. The Erosion and Sedimentation Control Plan is incorporated into the original design plans and includes the locations of the erosion control provisions (i.e., silt fence) along with notes and construction details for reference by the contractor during construction of the structure. With the incorporation of these measures, no significant impacts to off-site drainage related to erosion are anticipated.

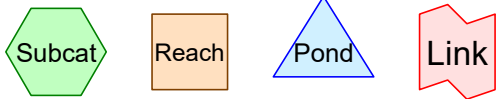
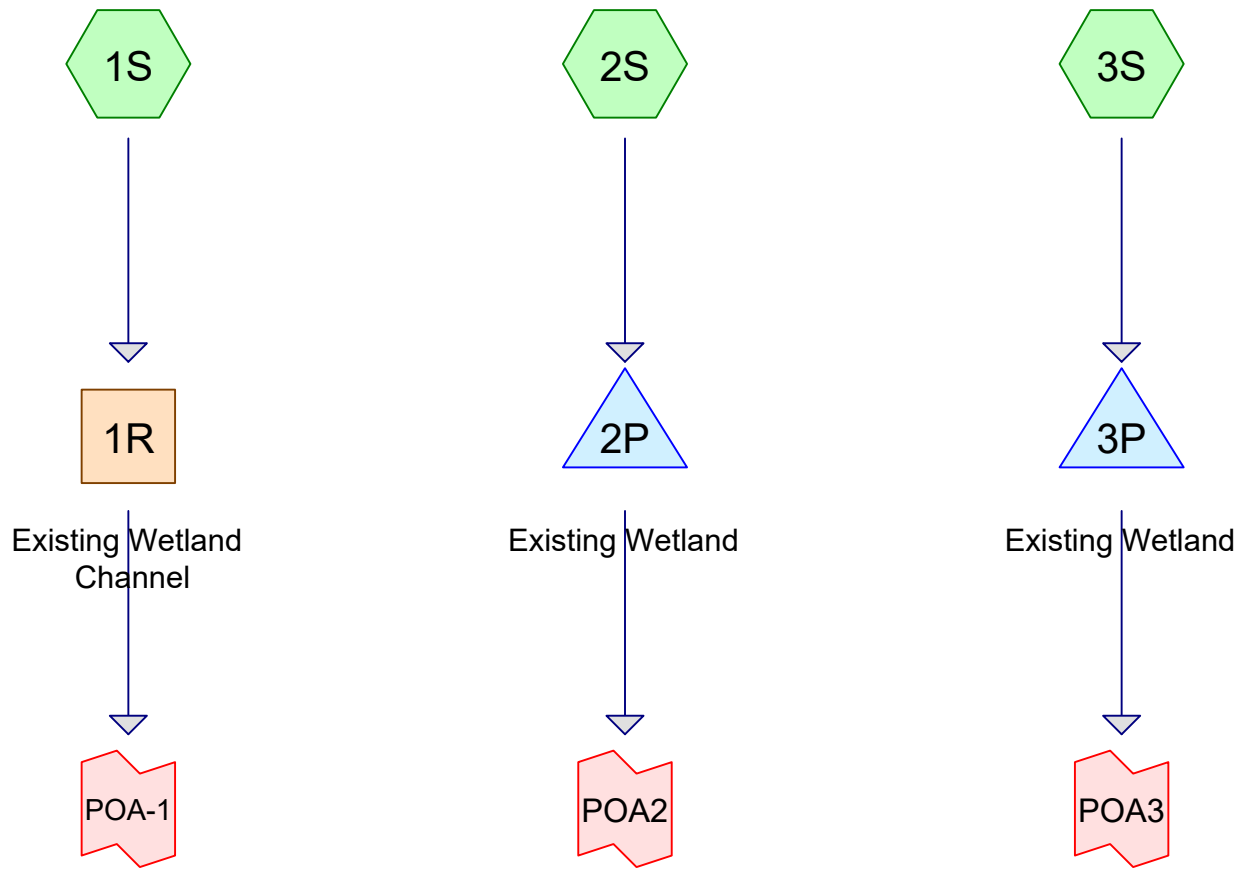


# Appendix 1

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## Hydrologic Modeling – Existing Conditions (HydroCAD) Summary

Existing



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**Area Listing (all nodes)**

Area (acres)	CN	Description (subcatchment-numbers)
0.857	80	>75% Grass cover, Good, HSG D (1S, 2S)
5.549	77	Woods, Good, HSG D (1S, 2S, 3S)
<b>6.407</b>	<b>77</b>	<b>TOTAL AREA</b>

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Time span=0.00-50.00 hrs, dt=0.01 hrs, 5001 points  
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN  
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

**Subcatchment1S:** Runoff Area=96,465 sf 0.00% Impervious Runoff Depth=3.76"  
Flow Length=125' Slope=0.0500 '/' Tc=15.1 min CN=78 Runoff=7.36 cfs 0.693 af

**Subcatchment2S:** Runoff Area=113,745 sf 0.00% Impervious Runoff Depth=3.65"  
Flow Length=160' Slope=0.0100 '/' Tc=29.9 min CN=77 Runoff=6.33 cfs 0.795 af

**Subcatchment3S:** Runoff Area=68,865 sf 0.00% Impervious Runoff Depth=3.65"  
Flow Length=90' Slope=0.0167 '/' Tc=20.9 min CN=77 Runoff=4.49 cfs 0.481 af

**Reach 1R: Existing Wetland Channel** Avg. Flow Depth=0.95' Max Vel=0.31 fps Inflow=7.36 cfs 0.693 af  
n=0.400 L=190.0' S=0.0105 '/' Capacity=108.07 cfs Outflow=6.09 cfs 0.693 af

**Pond 2P: Existing Wetland** Peak Elev=114.18' Storage=243 cf Inflow=6.33 cfs 0.795 af  
Outflow=6.33 cfs 0.795 af

**Pond 3P: Existing Wetland** Peak Elev=115.02' Storage=12,951 cf Inflow=4.49 cfs 0.481 af  
Outflow=0.61 cfs 0.193 af

**Link POA-1:** Inflow=6.09 cfs 0.693 af  
Primary=6.09 cfs 0.693 af

**Link POA2:** Inflow=6.33 cfs 0.795 af  
Primary=6.33 cfs 0.795 af

**Link POA3:** Inflow=0.61 cfs 0.193 af  
Primary=0.61 cfs 0.193 af

**Total Runoff Area = 6.407 ac Runoff Volume = 1.970 af Average Runoff Depth = 3.69"**  
**100.00% Pervious = 6.407 ac 0.00% Impervious = 0.000 ac**

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Type III 24-hr 25-YR Rainfall=6.20"

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**Summary for Subcatchment 1S:**

Runoff = 7.36 cfs @ 12.20 hrs, Volume= 0.693 af, Depth= 3.76"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs  
Type III 24-hr 25-YR Rainfall=6.20"

Area (sf)	CN	Description
28,895	80	>75% Grass cover, Good, HSG D
67,570	77	Woods, Good, HSG D
96,465	78	Weighted Average
96,465		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.7	100	0.0500	0.11		<b>Sheet Flow, AB</b>
					Woods: Light underbrush n= 0.400 P2= 3.30"
0.4	25	0.0500	1.12		<b>Shallow Concentrated Flow, BC</b>
					Woodland Kv= 5.0 fps
15.1	125	Total			

**Summary for Subcatchment 2S:**

Runoff = 6.33 cfs @ 12.40 hrs, Volume= 0.795 af, Depth= 3.65"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs  
Type III 24-hr 25-YR Rainfall=6.20"

Area (sf)	CN	Description
8,445	80	>75% Grass cover, Good, HSG D
105,300	77	Woods, Good, HSG D
113,745	77	Weighted Average
113,745		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
27.9	100	0.0100	0.06		<b>Sheet Flow, AB</b>
					Woods: Light underbrush n= 0.400 P2= 3.30"
2.0	60	0.0100	0.50		<b>Shallow Concentrated Flow, BC</b>
					Woodland Kv= 5.0 fps
29.9	160	Total			

**Summary for Subcatchment 3S:**

Runoff = 4.49 cfs @ 12.29 hrs, Volume= 0.481 af, Depth= 3.65"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs  
Type III 24-hr 25-YR Rainfall=6.20"

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Type III 24-hr 25-YR Rainfall=6.20"

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Area (sf)	CN	Description
68,865	77	Woods, Good, HSG D
68,865		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.9	90	0.0167	0.07		<b>Sheet Flow, AB</b> Woods: Light underbrush n= 0.400 P2= 3.30"

**Summary for Reach 1R: Existing Wetland Channel**

Inflow Area = 2.215 ac, 0.00% Impervious, Inflow Depth = 3.76" for 25-YR event  
 Inflow = 7.36 cfs @ 12.20 hrs, Volume= 0.693 af  
 Outflow = 6.09 cfs @ 12.31 hrs, Volume= 0.693 af, Atten= 17%, Lag= 6.5 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs  
 Max. Velocity= 0.31 fps, Min. Travel Time= 10.2 min  
 Avg. Velocity = 0.08 fps, Avg. Travel Time= 37.8 min

Peak Storage= 3,715 cf @ 12.31 hrs  
 Average Depth at Peak Storage= 0.95'  
 Bank-Full Depth= 4.00' Flow Area= 156.0 sf, Capacity= 108.07 cfs

15.00' x 4.00' deep channel, n= 0.400 Sheet flow: Woods+light brush  
 Side Slope Z-value= 6.0 ' Top Width= 63.00'  
 Length= 190.0' Slope= 0.0105 '  
 Inlet Invert= 109.00', Outlet Invert= 107.00'

**Summary for Pond 2P: Existing Wetland**

Inflow Area = 2.611 ac, 0.00% Impervious, Inflow Depth = 3.65" for 25-YR event  
 Inflow = 6.33 cfs @ 12.40 hrs, Volume= 0.795 af  
 Outflow = 6.33 cfs @ 12.42 hrs, Volume= 0.795 af, Atten= 0%, Lag= 0.8 min  
 Primary = 6.33 cfs @ 12.42 hrs, Volume= 0.795 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs  
 Peak Elev= 114.18' @ 12.42 hrs Surf.Area= 1,543 sf Storage= 243 cf

Plug-Flow detention time= 1.2 min calculated for 0.795 af (100% of inflow)  
 Center-of-Mass det. time= 1.1 min ( 843.4 - 842.4 )

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Volume	Invert	Avail.Storage	Storage Description
#1	114.00'	2,305 cf	<b>Custom Stage Data (Prismatic)</b> Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
114.00	1,100	0	0
115.00	3,510	2,305	2,305

Device	Routing	Invert	Outlet Devices
#1	Primary	114.00'	<b>30.0' long x 15.0' breadth Broad-Crested Rectangular Weir</b> Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

**Primary OutFlow** Max=6.33 cfs @ 12.42 hrs HW=114.18' TW=0.00' (Dynamic Tailwater)  
 ↑1=**Broad-Crested Rectangular Weir**(Weir Controls 6.33 cfs @ 1.15 fps)

**Summary for Pond 3P: Existing Wetland**

Inflow Area = 1.581 ac, 0.00% Impervious, Inflow Depth = 3.65" for 25-YR event  
 Inflow = 4.49 cfs @ 12.29 hrs, Volume= 0.481 af  
 Outflow = 0.61 cfs @ 13.38 hrs, Volume= 0.193 af, Atten= 86%, Lag= 65.6 min  
 Primary = 0.61 cfs @ 13.38 hrs, Volume= 0.193 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs  
 Peak Elev= 115.02' @ 13.38 hrs Surf.Area= 16,027 sf Storage= 12,951 cf

Plug-Flow detention time= 298.1 min calculated for 0.193 af (40% of inflow)  
 Center-of-Mass det. time= 175.1 min ( 1,009.1 - 834.0 )

Volume	Invert	Avail.Storage	Storage Description
#1	114.00'	32,260 cf	<b>Custom Stage Data (Prismatic)</b> Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
114.00	9,290	0	0
115.00	15,840	12,565	12,565
116.00	23,550	19,695	32,260

Device	Routing	Invert	Outlet Devices
#1	Primary	115.00'	<b>60.0' long x 15.0' breadth Broad-Crested Rectangular Weir</b> Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

**Primary OutFlow** Max=0.61 cfs @ 13.38 hrs HW=115.02' TW=0.00' (Dynamic Tailwater)  
 ↑1=**Broad-Crested Rectangular Weir**(Weir Controls 0.61 cfs @ 0.42 fps)

**Summary for Link POA-1:**

Inflow Area = 2.215 ac, 0.00% Impervious, Inflow Depth = 3.76" for 25-YR event  
Inflow = 6.09 cfs @ 12.31 hrs, Volume= 0.693 af  
Primary = 6.09 cfs @ 12.31 hrs, Volume= 0.693 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs

**Summary for Link POA2:**

Inflow Area = 2.611 ac, 0.00% Impervious, Inflow Depth = 3.65" for 25-YR event  
Inflow = 6.33 cfs @ 12.42 hrs, Volume= 0.795 af  
Primary = 6.33 cfs @ 12.42 hrs, Volume= 0.795 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs

**Summary for Link POA3:**

Inflow Area = 1.581 ac, 0.00% Impervious, Inflow Depth = 1.46" for 25-YR event  
Inflow = 0.61 cfs @ 13.38 hrs, Volume= 0.193 af  
Primary = 0.61 cfs @ 13.38 hrs, Volume= 0.193 af, Atten= 0%, Lag= 0.0 min

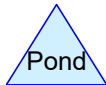
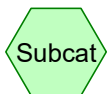
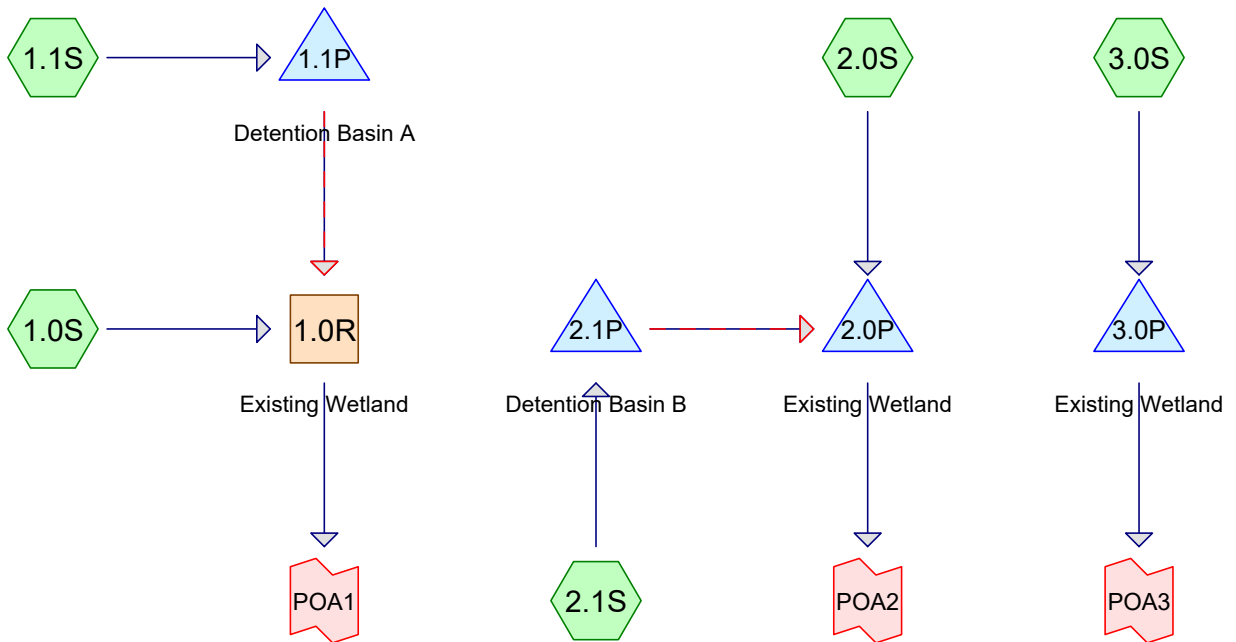
Primary outflow = Inflow, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs

## **Appendix 2**

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### **Hydrologic Modeling – Proposed Conditions (HydroCAD) Summary**

Proposed



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**Area Listing (all nodes)**

Area (acres)	CN	Description (subcatchment-numbers)
0.705	80	>75% Grass cover, Good, HSG D (1.0S, 1.1S, 2.0S, 2.1S)
0.832	98	Paved parking, HSG D (1.0S, 1.1S, 2.0S, 2.1S)
4.870	77	Woods, Good, HSG D (1.0S, 2.0S, 3.0S)
<b>6.407</b>	<b>80</b>	<b>TOTAL AREA</b>

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Time span=0.00-50.00 hrs, dt=0.01 hrs, 5001 points  
 Runoff by SCS TR-20 method, UH=SCS, Weighted-CN  
 Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

**Subcatchment1.0S:** Runoff Area=68,656 sf 3.69% Impervious Runoff Depth=3.76"  
 Flow Length=125' Slope=0.0500 '/' Tc=15.1 min CN=78 Runoff=5.24 cfs 0.493 af

**Subcatchment1.1S:** Runoff Area=22,705 sf 70.31% Impervious Runoff Depth=5.38"  
 Tc=6.0 min CN=93 Runoff=3.05 cfs 0.234 af

**Subcatchment2.0S:** Runoff Area=90,310 sf 0.84% Impervious Runoff Depth=3.65"  
 Flow Length=160' Slope=0.0100 '/' Tc=29.9 min CN=77 Runoff=5.03 cfs 0.631 af

**Subcatchment2.1S:** Runoff Area=28,540 sf 59.46% Impervious Runoff Depth=5.15"  
 Tc=6.0 min CN=91 Runoff=3.74 cfs 0.281 af

**Subcatchment3.0S:** Runoff Area=68,865 sf 0.00% Impervious Runoff Depth=3.65"  
 Flow Length=90' Slope=0.0167 '/' Tc=20.9 min CN=77 Runoff=4.49 cfs 0.481 af

**Reach 1.0R: Existing Wetland** Avg. Flow Depth=0.92' Max Vel=0.31 fps Inflow=6.86 cfs 0.665 af  
 n=0.400 L=190.0' S=0.0105 '/' Capacity=108.07 cfs Outflow=5.77 cfs 0.665 af

**Pond 1.1P: Detention Basin A** Peak Elev=114.22' Storage=3,945 cf Inflow=3.05 cfs 0.234 af  
 Outflow=1.62 cfs 0.171 af

**Pond 2.0P: Existing Wetland** Peak Elev=114.18' Storage=222 cf Inflow=6.33 cfs 0.820 af  
 Outflow=6.32 cfs 0.820 af

**Pond 2.1P: Detention Basin B** Peak Elev=116.66' Storage=4,516 cf Inflow=3.74 cfs 0.281 af  
 Outflow=3.52 cfs 0.188 af

**Pond 3.0P: Existing Wetland** Peak Elev=115.02' Storage=12,951 cf Inflow=4.49 cfs 0.481 af  
 Outflow=0.61 cfs 0.193 af

**Link POA1:** Inflow=5.77 cfs 0.665 af  
 Primary=5.77 cfs 0.665 af

**Link POA2:** Inflow=6.32 cfs 0.820 af  
 Primary=6.32 cfs 0.820 af

**Link POA3:** Inflow=0.61 cfs 0.193 af  
 Primary=0.61 cfs 0.193 af

**Total Runoff Area = 6.407 ac Runoff Volume = 2.121 af Average Runoff Depth = 3.97"**  
**87.02% Pervious = 5.575 ac 12.98% Impervious = 0.832 ac**

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**Summary for Subcatchment 1.0S:**

Runoff = 5.24 cfs @ 12.20 hrs, Volume= 0.493 af, Depth= 3.76"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs  
Type III 24-hr 25-YR Rainfall=6.20"

Area (sf)	CN	Description
7,545	80	>75% Grass cover, Good, HSG D
58,576	77	Woods, Good, HSG D
2,535	98	Paved parking, HSG D
68,656	78	Weighted Average
66,121		96.31% Pervious Area
2,535		3.69% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.7	100	0.0500	0.11		<b>Sheet Flow, AB</b>
					Woods: Light underbrush n= 0.400 P2= 3.30"
0.4	25	0.0500	1.12		<b>Shallow Concentrated Flow, BC</b>
					Woodland Kv= 5.0 fps
15.1	125	Total			

**Summary for Subcatchment 1.1S:**

Runoff = 3.05 cfs @ 12.08 hrs, Volume= 0.234 af, Depth= 5.38"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs  
Type III 24-hr 25-YR Rainfall=6.20"

Area (sf)	CN	Description
6,740	80	>75% Grass cover, Good, HSG D
15,965	98	Paved parking, HSG D
22,705	93	Weighted Average
6,740		29.69% Pervious Area
15,965		70.31% Impervious Area

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

**Summary for Subcatchment 2.0S:**

Runoff = 5.03 cfs @ 12.40 hrs, Volume= 0.631 af, Depth= 3.65"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs  
Type III 24-hr 25-YR Rainfall=6.20"

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Area (sf)	CN	Description
84,675	77	Woods, Good, HSG D
760	98	Paved parking, HSG D
4,875	80	>75% Grass cover, Good, HSG D
90,310	77	Weighted Average
89,550		99.16% Pervious Area
760		0.84% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
27.9	100	0.0100	0.06		<b>Sheet Flow, AB</b> Woods: Light underbrush n= 0.400 P2= 3.30"
2.0	60	0.0100	0.50		<b>Shallow Concentrated Flow, BC</b> Woodland Kv= 5.0 fps
29.9	160	Total			

**Summary for Subcatchment 2.1S:**

Runoff = 3.74 cfs @ 12.08 hrs, Volume= 0.281 af, Depth= 5.15"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs  
Type III 24-hr 25-YR Rainfall=6.20"

Area (sf)	CN	Description
11,570	80	>75% Grass cover, Good, HSG D
16,970	98	Paved parking, HSG D
28,540	91	Weighted Average
11,570		40.54% Pervious Area
16,970		59.46% Impervious Area

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

**Summary for Subcatchment 3.0S:**

Runoff = 4.49 cfs @ 12.29 hrs, Volume= 0.481 af, Depth= 3.65"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs  
Type III 24-hr 25-YR Rainfall=6.20"

Area (sf)	CN	Description
68,865	77	Woods, Good, HSG D
68,865		100.00% Pervious Area

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Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.9	90	0.0167	0.07		<b>Sheet Flow, AB</b> Woods: Light underbrush n= 0.400 P2= 3.30"

**Summary for Reach 1.0R: Existing Wetland**

Inflow Area = 2.097 ac, 20.25% Impervious, Inflow Depth = 3.80" for 25-YR event  
 Inflow = 6.86 cfs @ 12.20 hrs, Volume= 0.665 af  
 Outflow = 5.77 cfs @ 12.32 hrs, Volume= 0.665 af, Atten= 16%, Lag= 7.1 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs  
 Max. Velocity= 0.31 fps, Min. Travel Time= 10.3 min  
 Avg. Velocity = 0.08 fps, Avg. Travel Time= 38.6 min

Peak Storage= 3,580 cf @ 12.32 hrs  
 Average Depth at Peak Storage= 0.92'  
 Bank-Full Depth= 4.00' Flow Area= 156.0 sf, Capacity= 108.07 cfs

15.00' x 4.00' deep channel, n= 0.400 Sheet flow: Woods+light brush  
 Side Slope Z-value= 6.0 '/' Top Width= 63.00'  
 Length= 190.0' Slope= 0.0105 '/'  
 Inlet Invert= 109.00', Outlet Invert= 107.00'



**Summary for Pond 1.1P: Detention Basin A**

Inflow Area = 0.521 ac, 70.31% Impervious, Inflow Depth = 5.38" for 25-YR event  
 Inflow = 3.05 cfs @ 12.08 hrs, Volume= 0.234 af  
 Outflow = 1.62 cfs @ 12.21 hrs, Volume= 0.171 af, Atten= 47%, Lag= 7.6 min  
 Primary = 1.62 cfs @ 12.21 hrs, Volume= 0.171 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs  
 Peak Elev= 114.22' @ 12.21 hrs Surf.Area= 2,887 sf Storage= 3,945 cf

Plug-Flow detention time= 159.7 min calculated for 0.171 af (73% of inflow)  
 Center-of-Mass det. time= 72.1 min ( 844.2 - 772.1 )

Volume	Invert	Avail.Storage	Storage Description
#1	112.00'	4,803 cf	<b>Custom Stage Data (Prismatic)</b> Listed below (Recalc)

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Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
112.00	800	0	0
113.00	1,640	1,220	1,220
114.00	2,600	2,120	3,340
114.50	3,250	1,463	4,803

Device	Routing	Invert	Outlet Devices
#1	Primary	111.50'	<b>12.0" Round Culvert</b> L= 10.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 111.50' / 111.25' S= 0.0250 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Device 1	113.75'	<b>1.2" x 1.2" Horiz. Grate X 49.00</b> C= 0.600 Limited to weir flow at low heads

**Primary OutFlow** Max=1.62 cfs @ 12.21 hrs HW=114.22' TW=109.84' (Dynamic Tailwater)

↑1=Culvert (Passes 1.62 cfs of 4.45 cfs potential flow)

↑2=Grate (Orifice Controls 1.62 cfs @ 3.30 fps)

**Summary for Pond 2.0P: Existing Wetland**

Inflow Area = 2.728 ac, 14.92% Impervious, Inflow Depth = 3.61" for 25-YR event  
 Inflow = 6.33 cfs @ 12.36 hrs, Volume= 0.820 af  
 Outflow = 6.32 cfs @ 12.37 hrs, Volume= 0.820 af, Atten= 0%, Lag= 0.5 min  
 Primary = 6.32 cfs @ 12.37 hrs, Volume= 0.820 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs  
 Peak Elev= 114.18' @ 12.37 hrs Surf.Area= 1,385 sf Storage= 222 cf

Plug-Flow detention time= 1.0 min calculated for 0.820 af (100% of inflow)  
 Center-of-Mass det. time= 1.0 min ( 846.7 - 845.8 )

Volume	Invert	Avail.Storage	Storage Description
#1	114.00'	1,998 cf	<b>Custom Stage Data (Prismatic)</b> Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
114.00	1,030	0	0
115.00	2,965	1,998	1,998

Device	Routing	Invert	Outlet Devices
#1	Primary	114.00'	<b>30.0' long x 15.0' breadth Broad-Crested Rectangular Weir</b> Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

**Primary OutFlow** Max=6.32 cfs @ 12.37 hrs HW=114.18' TW=0.00' (Dynamic Tailwater)

↑1=Broad-Crested Rectangular Weir (Weir Controls 6.32 cfs @ 1.15 fps)

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## Summary for Pond 2.1P: Detention Basin B

Inflow Area = 0.655 ac, 59.46% Impervious, Inflow Depth = 5.15" for 25-YR event  
 Inflow = 3.74 cfs @ 12.08 hrs, Volume= 0.281 af  
 Outflow = 3.52 cfs @ 12.11 hrs, Volume= 0.188 af, Atten= 6%, Lag= 1.7 min  
 Secondary = 3.52 cfs @ 12.11 hrs, Volume= 0.188 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs  
 Peak Elev= 116.66' @ 12.11 hrs Surf.Area= 2,969 sf Storage= 4,516 cf

Plug-Flow detention time= 173.0 min calculated for 0.188 af (67% of inflow)  
 Center-of-Mass det. time= 77.2 min ( 857.2 - 780.0 )

Volume	Invert	Avail.Storage	Storage Description
#1	114.00'	6,564 cf	<b>Custom Stage Data (Prismatic)</b> Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
114.00	600	0	0
115.00	1,320	960	960
116.00	2,300	1,810	2,770
117.00	3,310	2,805	5,575
117.25	4,600	989	6,564

Device	Routing	Invert	Outlet Devices
#1	Secondary	116.50'	<b>20.0' long x 20.0' breadth Broad-Crested Rectangular Weir</b> Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

**Secondary OutFlow** Max=3.52 cfs @ 12.11 hrs HW=116.66' TW=114.17' (Dynamic Tailwater)  
 #1=**Broad-Crested Rectangular Weir**(Weir Controls 3.52 cfs @ 1.08 fps)

## Summary for Pond 3.0P: Existing Wetland

Inflow Area = 1.581 ac, 0.00% Impervious, Inflow Depth = 3.65" for 25-YR event  
 Inflow = 4.49 cfs @ 12.29 hrs, Volume= 0.481 af  
 Outflow = 0.61 cfs @ 13.38 hrs, Volume= 0.193 af, Atten= 86%, Lag= 65.6 min  
 Primary = 0.61 cfs @ 13.38 hrs, Volume= 0.193 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs  
 Peak Elev= 115.02' @ 13.38 hrs Surf.Area= 16,027 sf Storage= 12,951 cf

Plug-Flow detention time= 298.1 min calculated for 0.193 af (40% of inflow)  
 Center-of-Mass det. time= 175.1 min ( 1,009.1 - 834.0 )

Volume	Invert	Avail.Storage	Storage Description
#1	114.00'	32,260 cf	<b>Custom Stage Data (Prismatic)</b> Listed below (Recalc)

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Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
114.00	9,290	0	0
115.00	15,840	12,565	12,565
116.00	23,550	19,695	32,260

Device	Routing	Invert	Outlet Devices
#1	Primary	115.00'	<b>60.0' long x 15.0' breadth Broad-Crested Rectangular Weir</b> Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

**Primary OutFlow** Max=0.61 cfs @ 13.38 hrs HW=115.02' TW=0.00' (Dynamic Tailwater)  
↑1=**Broad-Crested Rectangular Weir**(Weir Controls 0.61 cfs @ 0.42 fps)

### Summary for Link POA1:

Inflow Area = 2.097 ac, 20.25% Impervious, Inflow Depth = 3.80" for 25-YR event  
Inflow = 5.77 cfs @ 12.32 hrs, Volume= 0.665 af  
Primary = 5.77 cfs @ 12.32 hrs, Volume= 0.665 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs

### Summary for Link POA2:

Inflow Area = 2.728 ac, 14.92% Impervious, Inflow Depth = 3.61" for 25-YR event  
Inflow = 6.32 cfs @ 12.37 hrs, Volume= 0.820 af  
Primary = 6.32 cfs @ 12.37 hrs, Volume= 0.820 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs

### Summary for Link POA3:

Inflow Area = 1.581 ac, 0.00% Impervious, Inflow Depth = 1.46" for 25-YR event  
Inflow = 0.61 cfs @ 13.38 hrs, Volume= 0.193 af  
Primary = 0.61 cfs @ 13.38 hrs, Volume= 0.193 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs

# **Appendix 3**

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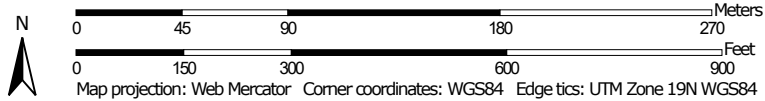
## **Subsurface Investigations**

Soil Map—York County, Maine  
(Strickland Lane )



Soil Map may not be valid at this scale.

Map Scale: 1:3,210 if printed on A portrait (8.5" x 11") sheet.



Natural Resources  
Conservation Service

Web Soil Survey  
National Cooperative Soil Survey



8/23/2021  
Page 1 of 3

## MAP LEGEND




















### Area of Interest (AOI)







Area of Interest (AOI)

### Soils


-  Soil Map Unit Polygons
-  Soil Map Unit Lines
-  Soil Map Unit Points

### Special Point Features






-  Blowout
-  Borrow Pit
-  Clay Spot
-  Closed Depression
-  Gravel Pit
-  Gravelly Spot
-  Landfill
-  Lava Flow
-  Marsh or swamp
-  Mine or Quarry
-  Miscellaneous Water
-  Perennial Water
-  Rock Outcrop
-  Saline Spot
-  Sandy Spot
-  Severely Eroded Spot
-  Sinkhole
-  Slide or Slip
-  Sodic Spot

-  Spoil Area
-  Stony Spot
-  Very Stony Spot
-  Wet Spot
-  Other
-  Special Line Features

### Water Features

-  Streams and Canals

### Transportation

-  Rails
-  Interstate Highways
-  US Routes
-  Major Roads
-  Local Roads

### Background

-  Aerial Photography

## MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service  
Web Soil Survey URL:  
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: York County, Maine  
Survey Area Data: Version 19, May 29, 2020

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Dec 31, 2009—Sep 9, 2017

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

## Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
AIB	Allagash very fine sandy loam, 3 to 8 percent slopes	11.2	26.3%
Ch	Chocorua peat	3.0	6.9%
LnB	Lyman loam, 3 to 8 percent slopes, rocky	12.8	30.0%
MaB	Madawaska fine sandy loam, 0 to 8 percent slopes	1.7	3.9%
Na	Naumburg sand	14.0	32.9%
<b>Totals for Area of Interest</b>		<b>42.7</b>	<b>100.0%</b>

# Appendix 4

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## Stormwater Management Plans





**POST-DEVELOPMENT LEGEND**

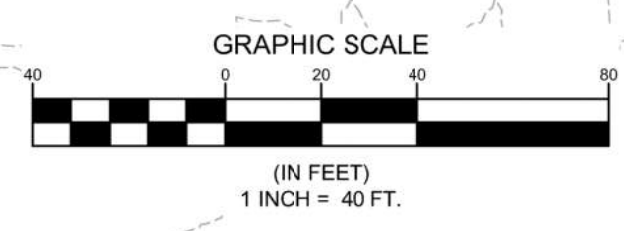
- WATERSHED BOUNDARY
- TIME OF CONCENTRATION
- REACH
- WATERSHED LABEL
- REACH
- POINT OF ANALYSIS
- STORMWATER TREATMENT/DETENTION POND
- SOILS BOUNDARY

**LEGEND**

EXISTING	PROPOSED
PROPERTY LINE/R.O.W.	PROPERTY LINE/R.O.W.
ABUTTER LINE/R.O.W.	ABUTTER LINE/R.O.W.
TIE LINE	TIE LINE
SETBACK	SETBACK
CENTERLINE	CENTERLINE
MONUMENT	MONUMENT
IRON PIPE/ROD	IRON PIPE/ROD
DRILL HOLE	DRILL HOLE
CURVE/LINE NO.	CURVE/LINE NO.
BUILDING	BUILDING
EDGE WETLAND	EDGE WETLAND
WETLANDS	WETLANDS
EDGE PAVEMENT	EDGE PAVEMENT
PAVEMENT SAWCUT	PAVEMENT SAWCUT
EDGE CONCRETE	EDGE CONCRETE
PAVEMENT PAINT	PAVEMENT PAINT
CHAIN LINK FENCE	CHAIN LINK FENCE
CURB LINE	CURB LINE
TREELINE	TREELINE
DECIDUOUS TREE	DECIDUOUS TREE
CONIFEROUS TREE	CONIFEROUS TREE
BOLLARD	BOLLARD
SIGN	SIGN
CONTOURS	CONTOURS
SPOT GRADE	SPOT GRADE
FILTER BARRIER	FILTER BARRIER
RIPRAP	RIPRAP

**SOIL REFERENCE:**  
 ON-SITE SOIL INFORMATION IS BASED ON THE NATURAL RESOURCES CONSERVATION SERVICE (NRCS) CUSTOM SOIL RESOURCE REPORT FOR YORK COUNTY, MAINE DATED AUGUST 23, 2021. IT WAS RETRIEVED USING THE WEB SOIL SURVEY TOOL. PLEASE SEE STORMWATER NARRATIVE ATTACHMENTS WITHIN THE SITE PLAN APPLICATION THAT HAS BEEN SUBMITTED FOR A COPY OF THE SOIL REPORT.

SOILS TABLE					
SYMBOL	SOIL SERIES	PHASE	SLOPE	HSG	DRAINAGE CLASS
Ch	CHOCORUA	PEAT	0 - 2	D	VERY POORLY DRAINED
LnB	LYMAN	ROCKY	3 - 8	D	SOMEWHAT EXCESSIVELY DRAINED
MaB	MADAWASKA	FINE SANDY LOAM	0 - 8	B	MODERATELY WELL DRAINED
Na	NAUMBURG	SANDY	0 - 3	D	POORLY DRAINED



PROGRESS PRINT

PAUL D. OSTROWSKI, P.E. 11175  
 STATE OF MAINE  
 PROFESSIONAL ENGINEER  
 NO. 11175  
 EXPIRES 03/07/2022

NO.	DATE	REVISION PER TOWN COMMENTS
A	03/03/2022	STATUS: REVISED

REV. BY: DATE: STATUS: REVISION PER TOWN COMMENTS  
 AUTHORIZED OR OTHERWISE, SHALL BE AT THE USER'S SOLE RISK AND WITHOUT LIABILITY TO SEBAGO TECHNICS, INC.

**SEBAGO**  
 TECHNICALS  
 WWW.SEBAGOTECHNICALS.COM  
 75 John Roberts Rd.  
 South Portland, ME 04106  
 Tel. 207-200-2100

PROPOSED CONDITIONS DRAINAGE PLAN  
 OF:  
**STRICKLAND LANE**  
 1312 PORTLAND ROAD  
 AURUNDEL, MAINE  
 FOR:  
**THOMAS & LORD, LLC**  
 P.O. BOX 1730  
 KENNEBUNKPORT, MAINE 04048

DESIGNED	JF
DRAWN	MRS
CHECKED	PDO
DATE	09/11/2020
SCALE	1" = 40'
PROJECT	19586