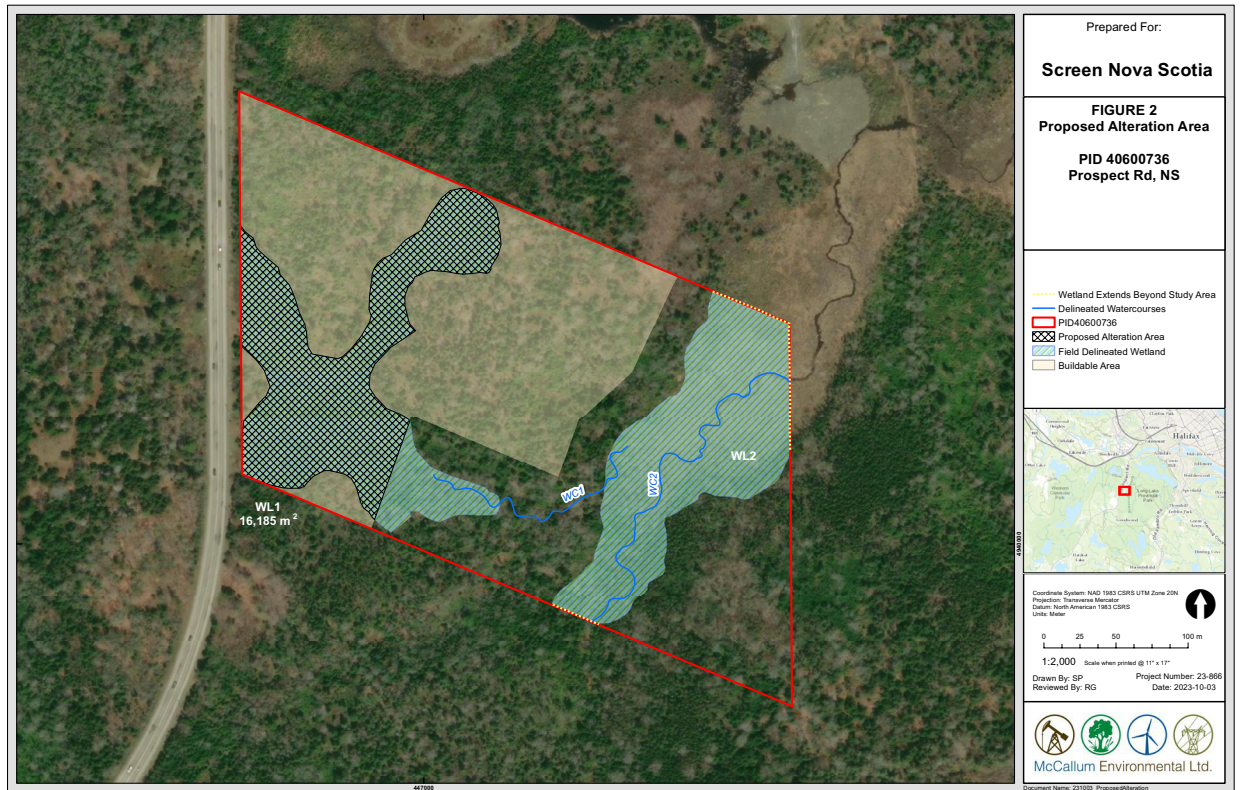
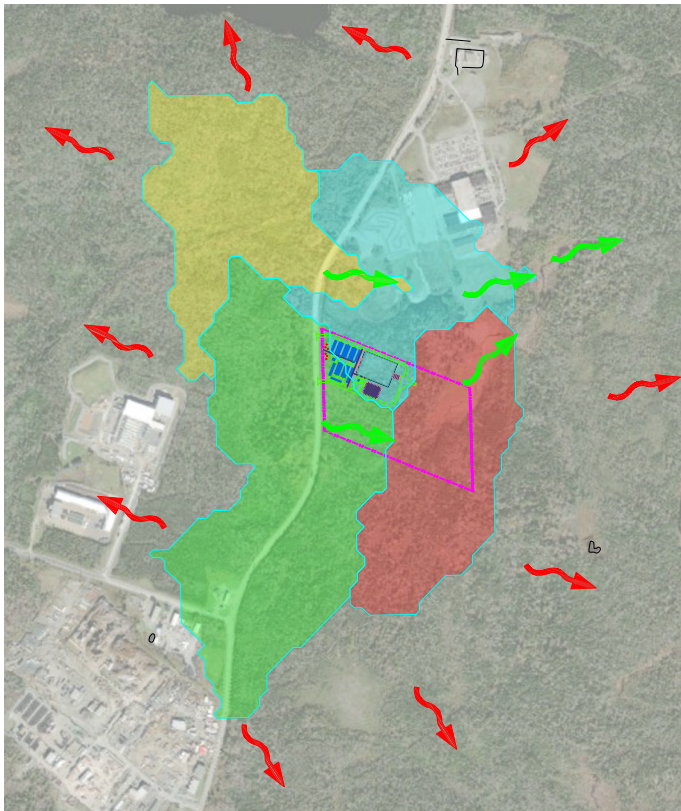


NS Studio Site Development - Stormwater Management Plan

Dear Alyson,

Fathom has completed a preliminary stormwater management plan for the proposed NS Studio Development taking into account the existing identified wetland areas as shown below and included in previous submissions. The areas included two wetlands (WL 1 - 18,929m², and WL 2 - 16,505m²) and two watercourses. WL 2 is the more significant wetland area and will be preserved along with the two watercourses and lands within the associated 30m buffer zones). About 16,185m² (4 acres or 1.6 Ha) of WL1 will be removed as part of a wetland bank. The wetland consultants (McCallum Environmental) are currently going through the wetland alteration process with the province.





Stormwater - Big Picture

From an overall stormwater management perspective, the development falls (shown by the magenta property line) in the middle of 4 larger stormwater catchment areas as shown in the figure to the left.

The northern yellow and blue shaded areas collect water from areas north and west of the site, discharging water north of the NS Studio development area and south of Exhibition Park. About 23,700m² of this catchment area is included within the development and is part of the altered area proposed for the development as noted above.

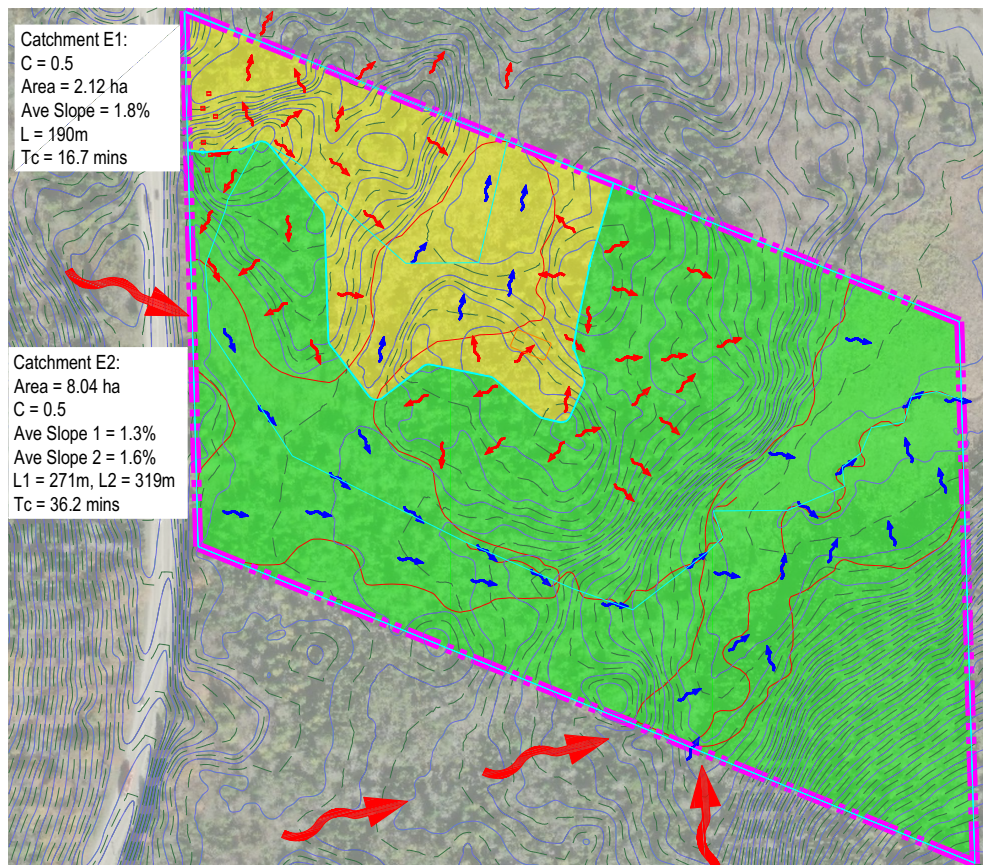
The green and red areas along the south and east sides of the property collect water from larger catchments west, south and east of the site including conveyance of water from areas west of Prospect Road under the Highway into the wetland areas. The majority of this area will remain unaltered under the proposed development, with the exception of about 6,000 m² of land located along the southwest corner of the development nearest Prospect Road.

Stormwater - Pre-Development

The development property is a total of about 101,750 m² or 10.2 hectares. Functionally, the development areas under existing conditions can be segmented into two primary catchments - those draining to the north (yellow), and those draining through the wetland areas along the south and east sides of the site (green).

Both catchments are composed of a portion of forested and wetland areas contributing to similar combined C factor of 0.5 with average slopes and time of concentration values calculated based on existing drawings and contour data. Rainfall intensity values were based on the climate adjusted Intensity, Duration and Frequency data provided in Halifax Waters Standard Design Specifications.

Calculations for the 2, 5, 10, 25, 50 and 100 year storm events are shown in the attached spreadsheet at the end of this letter.

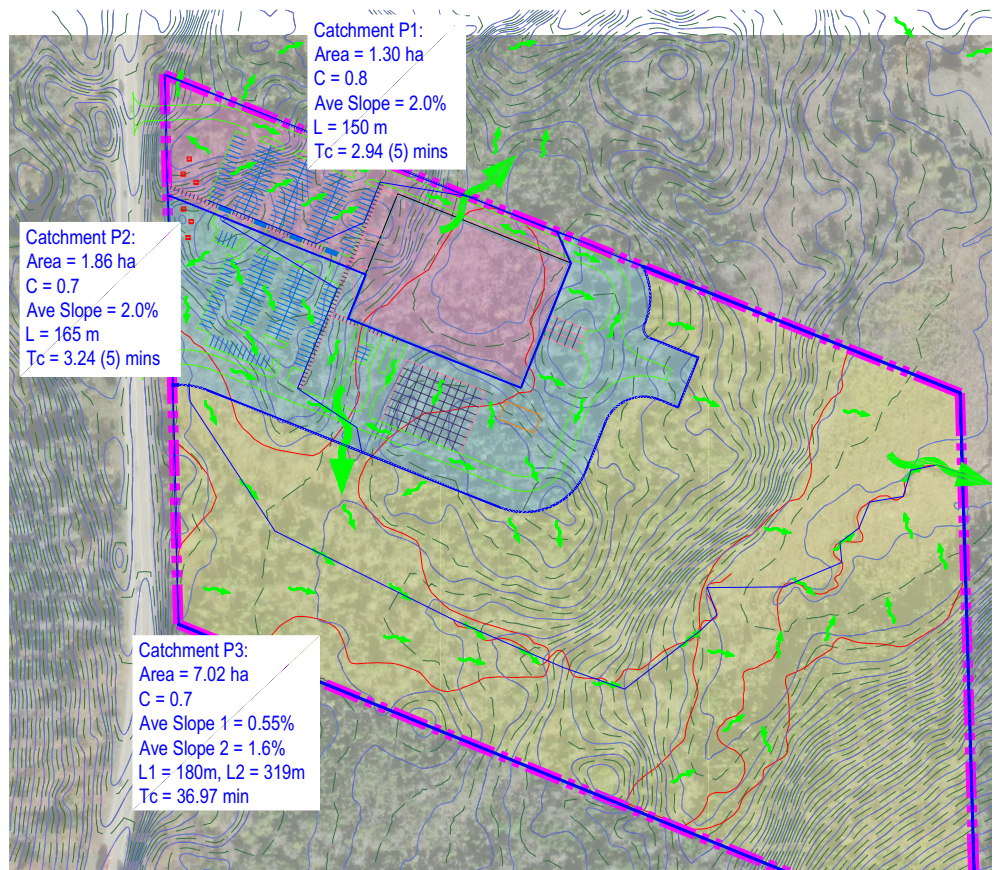


Stormwater - Post-Development

The post development area was separated into 3 functional areas. Catchment P1 includes the northern portion of the developed property including a portion of the parking lots and building with the intension to discharge this stormwater to the north toward the existing wetland routing.

Catchment P2 captures the remaining developed area including parking areas, access roadways and the areas south and to the rear of the proposed building. This catchment is intended to discharge into the wetland areas to the south of the development and into the existing wetland / stream routing.

Catchment P3 is the remaining portion of the site south of the development which remain the same as todays existing conditions. Similar to pre-development conditions, calculations for the 2, 5, 10, 25, 50 and 100 year storm events are shown in the attached spreadsheet at the end of this letter.



Pre- and Post-Development Comparisons

The table below shows the calculated peak flows (Q) values for both pre-development and post-development conditions as well as the change in peak flows between the 2 scenarios. Values are shown for the 2, 5, 10, 25, 50 and 100 year storm events, and include the storage requirements based on accommodating flows equivalent to the peak time of concentration.

Event	Q - Pre-Development (m ³ /s)	Q - Post-Development (m ³ /s)	Q Difference in Pre/Post-Development	Storage Volume m ³
2 Yr	0.508	0.683	0.176	443
5 Yr	0.639	0.886	0.248	624
10 Yr	0.724	1.028	0.304	767
25 Yr	0.834	1.207	0.372	938
50 Yr	0.914	1.328	0.414	1044
100 Yr	0.997	1.463	0.466	1175

Based on an assumed depth of 1.5 meters, the dimensions of the storage area for the 1:100 year storm event would be in the range of a 30m x 30m square. A number of areas at the front, rear and south side of the building area available to accommodate this storage in a single, or multiple stormwater management facilities. Specific dimensions, locations and storage methods are to be determined as the development progresses through detailed design.

Summary

As noted in this letter, the site is surrounded by a variety of wetlands and watercourses that make the discharge of stormwater from the site relatively straight forward. There is significant downstream capacity to accommodate stormwater from minor and major storm events, and there are no known flooding issues in the areas surrounding the development. Further, preliminary design for the development shows numerous areas along the front, rear and south side of the building to accommodate a variety of different stormwater management options that can be specifically defined as the design of the development matures.

Care will have to be taken at the rear of the building to integrate any stormwater discharge points and management features with accommodation of the proposed septic tank(s) and disposal fields along the east side of the property. There are no foreseeable issues with such integration, though early and frequent coordination is recommended.

Should there be any questions, comments or additional information required, please contact the undersigned.

Sincerely,

A black rectangular redaction box covers the signature of Roger Boychuk. A blue ink scribble is visible above the redaction.

Roger Boychuk, P. Eng.

Senior Infrastructure Engineer
roger.boychuk@fathomstudio.ca
902-233-1152

NS Sound Studio Stormwater Calculations

04-Jan-24

Catchment E1

Td (mins)	16.0	C	A
Td (hrs)	0.27	0.5	2.2

Event	I (mm/hr)	Q (m3/s)
2 Yr	48.8	0.149
5 Yr	61.8	0.189
10 Yr	70.2	0.215
25 Yr	81.2	0.248
50 Yr	88.9	0.272
100 Yr	97.2	0.297

Catchment E2

Td (mins)	36.0	C	A
Td (hrs)	0.60	0.5	8.0

Event	I (mm/hr)	Q (m3/s)
2 Yr	32.2	0.358
5 Yr	40.4	0.450
10 Yr	45.8	0.509
25 Yr	52.7	0.586
50 Yr	57.8	0.642
100 Yr	62.9	0.700

Total Site

Pre-Development

Event	Q (m3/s)
2 Yr	0.508
5 Yr	0.639
10 Yr	0.724
25 Yr	0.834
50 Yr	0.914
100 Yr	0.997

Catchment P1

Td (mins)	5.0	C	A
Td (hrs)	0.08	0.8	1.3

Event	I (mm/hr)	Q (m3/s)
2 Yr	80.6	0.233
5 Yr	105.8	0.306
10 Yr	123.8	0.358
25 Yr	146.3	0.423
50 Yr	161.4	0.467
100 Yr	178.4	0.516

Catchment P2

Td (mins)	5.0	C	A
Td (hrs)	0.08	0.65	1.8

Event	I (mm/hr)	Q (m3/s)
2 Yr	80.6	0.262
5 Yr	105.8	0.344
10 Yr	123.8	0.403
25 Yr	146.3	0.476
50 Yr	161.4	0.525
100 Yr	178.4	0.580

Catchment P3

Td (mins)	37.0	C	A
Td (hrs)	0.62	0.3	7.1

Event	I (mm/hr)	Q (m3/s)
2 Yr	31.8	0.188
5 Yr	39.8	0.236
10 Yr	45.1	0.267
25 Yr	51.9	0.308
50 Yr	56.9	0.337
100 Yr	62.0	0.367

Total Site Post-Development

Event	Q (m3/s)	Pre / Post		Storage for Peak TOC
		Difference	Volume	
2 Yr	0.683	0.176	443	
5 Yr	0.886	0.248	624	
10 Yr	1.028	0.304	767	
25 Yr	1.207	0.372	938	
50 Yr	1.328	0.414	1044	
100 Yr	1.463	0.466	1175	