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876 Hurontario Street

STORMWATER MANAGEMENT BRIEF

Dr. Christine Magalhaes Dentistry Professional Corporation

Document Control

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Issue	Date	Description
1	July 3, 2026	Final Report

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1 Introduction

Tatham Engineering Limited was retained by Dr. Christine Magalhaes Dentistry Professional Corporation to prepare this *Stormwater Management Brief* in support of the proposed redevelopment at 876 Hurontario Street in the Town of Collingwood.

1.1 REPORT PURPOSE

The objective of this report is to review the existing and proposed surface water drainage conditions for the site and its surroundings and presents a comprehensive stormwater management strategy to mitigate potential impacts from the proposed development on local water resources. Specifically, the report addresses the following:

- existing condition hydrology;
- proposed condition hydrology; and
- the stormwater management plan including:
 - water quality controls;
 - water quantity controls; and
 - erosion and sediment control.

1.2 REFERENCES & STANDARDS

The following references and standards were used in the preparation of this report:

- *Development Standards. Town of Collingwood (July 2007), amended August 5, 2022;*
- *Stormwater Management Planning and Design Manual.* Ministry of the Environment, Conservation and Parks, 2003.



2 Development Site

2.1 LOCATION

The site is located at 876 Hurontario Street (see Figure 1) and is legally described as Part of Block M and Part of James Street (closed by By-Law 31-83, Instrument No. RO818281), Registered Plan 334.

2.2 EXISTING CONDITIONS

The property is currently zoned C-5 (Highway Commercial) and has a total area of approximately 0.35 ha.

The site is surrounded by commercial properties, all of which are also zoned C-5 (Highway Commercial).

The site is currently developed with an existing dwelling, a gravel parking lot, and landscaped lawn areas. Existing topography and drainage patterns were determined through interpretation of a site survey and are illustrated on the Pre-Development Drainage Plan (Drawing DP-1), included in this submission.

The site is relatively flat and generally slopes away from the existing dwelling. On the east side of the site, runoff is directed toward two catch basins within the Hurontario Street right-of-way. On the west side of the site, runoff drains off-site to the north and west. The runoff coefficient for existing conditions was calculated as 0.45; detailed supporting calculations are included in Appendix A.

2.3 PROPOSED DEVELOPMENT PLAN

The proposed development includes the following components:

- Renovations to the existing building, including interior and exterior improvements and a second-storey addition. The building footprint will change only slightly due to the proposed front entrance porch;
- A paved parking area surrounding the building, including 18 parking spaces, one of which will be a Type A accessible parking stall; and
- An enhanced grass swale that will provide the necessary stormwater management for the proposed development.

The layout of the proposed development is shown on the Site Plan (Drawing SP.1), included in this submission.



3 Stormwater Management

3.1 EXISTING CONDITION HYDROLOGY

Existing peak flows from the 0.35 ha site were quantified using the Modified Rational Method. Rainfall data specific to the property were obtained from the Town of Collingwood Development Standards. The resulting peak flows for the 1:2-year through 1:100-year storm events are summarized in Table 1, with detailed calculations provided in Appendix A.

Table 1: Existing Condition Peak Flow Rates

STORM	PEAK FLOW RATE
1:2-year	0.034 m ³ /s
1:5-year	0.045 m ³ /s
1:10-year	0.052 m ³ /s
1:25-year	0.067 m ³ /s
1:50-year	0.081 m ³ /s
1:100-year	0.093 m ³ /s

3.2 STORMWATER MANAGEMENT PLAN

The following stormwater management (SWM) plan has been developed to address the guidelines and design criteria of the Town of Collingwood and the Nottawasaga Valley Conservation Authority (NVCA). The proposed measures will control post-development runoff, provide the required water quality treatment, and maintain appropriate drainage patterns for the site.

3.2.1 Design Criteria

The proposed stormwater management plan has been developed to satisfy the following design criteria:

- Post-development peak flow rates from the site will be controlled to be at or below existing-condition peak flow rates for the 1:2-year through 1:100-year design storms.
- The SWM plan will provide Level 1 (Enhanced) water quality treatment in accordance with Provincial criteria, equivalent to 80% total suspended solids (TSS) removal for site runoff.



3.2.2 Proposed Grading

Under post-development conditions, pre-development Area 101 (0.35 ha) will be divided into two drainage areas. Area 201 (0.14 ha) will include the existing dwelling, asphalt parking lot, and enhanced swale. Runoff from this area will be conveyed by sheet flow across the parking lot to the enhanced swale along the north side of the site, where it will receive treatment before discharging through a Hickenbottom outlet surrounded by rip-rap protection.

Area 202 (0.21 ha) will consist of the grassed areas surrounding the developed portion of the site and will drain to the existing catch basins within the Hurontario Street right-of-way.

3.2.3 Stormwater Management Facility

An enhanced swale will be constructed to provide enhanced-level water quality treatment and quantity control for storm events up to and including the 100-year design storm.

The enhanced swale will be a linear facility located along the north side of the site. The swale will have a depth of 0.45 m and a total storage volume of 31.8 m³.

A Hickenbottom outlet, surrounded by rip-rap protection, outletting to an existing catch basin within the Hurontario Street right-of-way. Larger storms are conveyed by an overflow spillway to the Hurontario Street right-of-way.

Interior side slopes will be a maximum of 2.5:1, and exterior side slopes will tie into existing grade at a maximum of 3:1.

3.2.4 Proposed Drainage Conditions

The proposed drainage conditions for the 0.35 ha site are illustrated on the Post-Development Drainage Plan (Drawing DP-2), included in this submission.

Catchment 201, which spans approximately 0.14 ha, encompasses the developed portion of the site, including the existing dwelling, asphalt parking lot, and enhanced swale. The site has been graded to convey runoff from this catchment by sheet flow to the enhanced swale for both quantity storage and quality treatment.

Catchment 202, with an area of approximately 0.21 ha, consists of uncontrolled landscaped areas around the perimeter of the developable portion of the site. This area will drain overland without direct quantity or quality control. To account for this uncontrolled drainage, the enhanced swale has been overcontrolled to maintain total site peak flows at or below existing-condition levels.



3.2.5 Water Quantity Control

The enhanced swale is designed to reduce post-development peak flows to at or below existing-condition levels. To demonstrate this, a Modified Rational Method analysis was completed to quantify proposed-condition peak flows and account for attenuation provided by the enhanced swale.

Detailed calculations for the proposed-condition runoff coefficients and Modified Rational Method analysis are included in Appendix A.

Table 2 summarizes the controlled, uncontrolled, and total peak flows from the site. Table 3 summarizes the performance of the SWMF.

Table 2: Proposed Condition Peak Flow Rates

DESIGN STORM	PEAK FLOW (CONTROLLED) CATCHMENT 201 (m ³ /s)	PEAK FLOW (UNCONTROLLED) CATCHMENT 202 (m ³ /s)	PEAK FLOW (TOTAL) (m ³ /s)
1:2-year	0.015	0.018	0.033 (0.034)
1:5-year	0.018	0.024	0.042 (0.045)
1:10-year	0.020	0.027	0.047 (0.052)
1:25-year	0.024	0.035	0.059 (0.067)
1:50-year	0.031	0.043	0.074 (0.081)
1:100-year	0.035	0.049	0.084 (0.093)

Note: *Values shown in parentheses* denote the corresponding existing-condition peak flow rates.



Table 3: SWMF Stage-Storage-Discharge

DESIGN STORM	DISCHARGE (m ³ /s)	PROVIDED STORAGE VOLUME (m ³)	WATER SURFACE ELEVATION (m)
1:2-year	0.015	8	195.00
1:5-year	0.018	12	195.05
1:10-year	0.020	15	195.09
1:25-year	0.024	21	195.15
1:50-year	0.031	23	195.17
1:100-year	0.035	25	195.19

As demonstrated in Tables 2 and 3, the proposed enhanced swale will reduce proposed-condition peak flows to at or below existing-condition levels for the 1:2-year through 1:100-year design storms.

3.2.6 Water Quality Control

The site is required to provide enhanced-level water quality treatment, equivalent to 80% total suspended solids (TSS) removal. This objective will be addressed by the enhanced swale.

Enhanced Grass Swale

According to the Sustainable Technologies Evaluation Program (STEP) guidelines for enhanced swales, a vegetated swale is expected to achieve 76% median TSS removal. The proposed enhanced swale design exceeds this performance baseline through multiple design features. The swale features a flat bottom with negligible slope, which promotes longer residence time and enhanced settling of suspended solids compared to typical sloped conditions. Additionally, the shallow depth (0.45 m) and extended length of the proposed swale result in flow velocities that are lower than those assumed in standard STEP design guidance, further enhancing particle settling and treatment efficacy.

The water quality treatment is further enhanced by the discharge configuration through a Hickenbottom outlet surrounded by riprap protection. This outlet dissipates flow energy, reduces erosion potential, and provides additional treatment during discharge from the facility. Based on the combination of these design features, the flat-bottomed geometry, low flow velocities, and energy dissipation at the outlet, the proposed enhanced swale is expected to achieve TSS removal rates exceeding 80%, thereby satisfying the enhanced-level water quality treatment requirement.



3.2.7 Operations and Maintenance

To support the long-term performance of the proposed stormwater management measures, the enhanced swale, Hickenbottom outlet, riprap protection, and associated drainage features should be inspected regularly and following major storm events. Maintenance activities should include removing accumulated sediment and debris, repairing erosion or localized settlement, and restoring vegetation as necessary to maintain the intended drainage function and treatment performance.

3.2.8 Siltation Control & Erosion Control Plan

All construction activities, including topsoil stripping, material stockpiling, building construction, and grading operations, will incorporate siltation and erosion control measures. A comprehensive erosion and sediment control plan (Drawing SW-1 included in this submission) has been prepared to illustrate these measures during construction.

To minimize erosion, sedimentation, and associated environmental impacts during construction, the following principles will be applied:

- Limit disturbance activities to the minimum necessary.
- Expose the smallest possible land area to erosion for the shortest possible duration.
- Implement erosion control measures immediately, as required.
- Establish sediment control measures prior to the commencement of construction activities.
- Conduct regular inspections of erosion and sediment control measures and complete repairs or maintenance as required.
- Inspect and maintain the enhanced swale, Hickenbottom outlet, and riprap protection regularly during and after construction, as required.

The proposed grading and building construction will be completed in a manner that minimizes erosion and ensures that sediment control facilities manage any erosion that occurs.

Additional measures that may be implemented during construction to control erosion, sediment, and pollution include the following:

- Erect silt control fencing below grading operations to control sediment movement.
- Revegetating disturbed areas to support long-term siltation and erosion control.



4 Summary

This report presents the stormwater management strategy for the proposed redevelopment at 876 Hurontario Street and has been prepared in support of the Site Plan Control application.

An enhanced swale will provide both water quantity and water quality control for site runoff. Water quality treatment will be addressed by the enhanced swale. The facility will attenuate post-development peak flows to at or below existing-condition rates, for the 2 through 100 year design storms, and support enhanced-level water quality treatment objectives.

Based on the analyses completed and the proposed design measures described herein, the development is expected to satisfy the applicable stormwater quantity, water quality, and erosion control objectives for the site, subject to detailed design review and acceptance by the Town of Collingwood, the NVCA, and other applicable approval agencies.





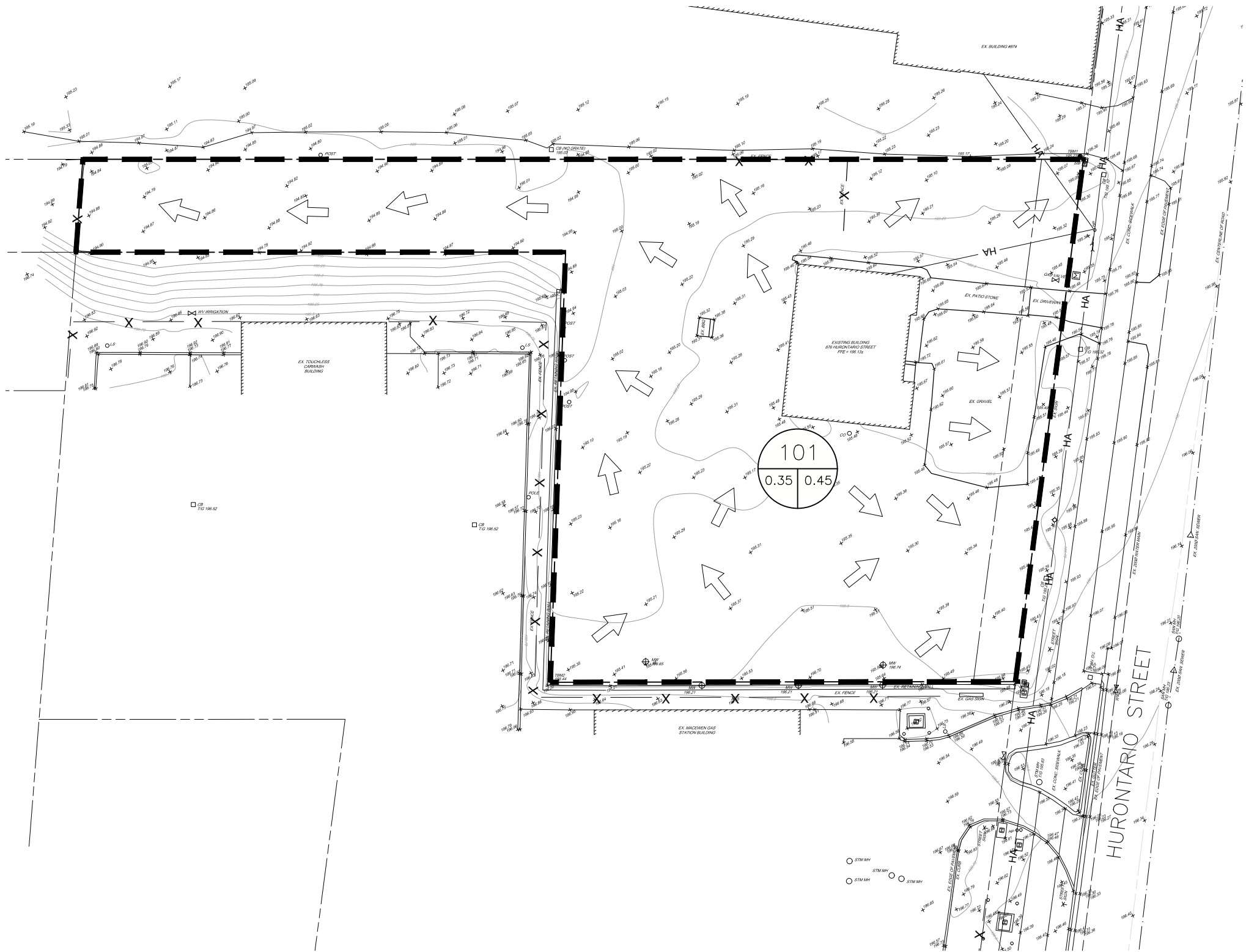
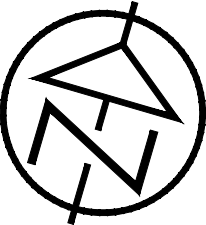
Source: Simcoe Maps

876 Hurontario Street
Figure 1: Site Location



Appendix A: Hydrologic Analysis

Drawing Path: I:\2026 Projects\126065 - 876 Hurontario Street, Collingwood\CADD\Design\Sheets\126065-DP01.dwg, Plotted: Jun 22, 2026



LEGEND

- 101

0.35

0.45
- DRAINAGE CATCHMENT ID
- RUNOFF COEFFICIENT
- DRAINAGE AREA (HA)
-
- DRAINAGE CATCHMENT BOUNDARY
- ←
- EXISTING DRAINAGE DIRECTION

	PROJECT TITLE			DRAWING	
	876 HURONTARIO STREET PRE-DEVELOPMENT DRAINAGE PLAN TOWN OF COLLINGWOOD			DP.1	
DATE	2026 06 24	DRAWN BY	KRL	SCALE	1:500
PROJECT				126065	

Drawing Path: I:\2026 Projects\126065 - 876 Hurontario Street, Collingwood\CADD\Design\Sheets\126065-DP02.dwg, Plotted: Jun 25, 2026

LEGEND

201

0.300.57

DRAINAGE CATCHMENT ID

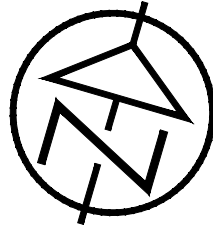
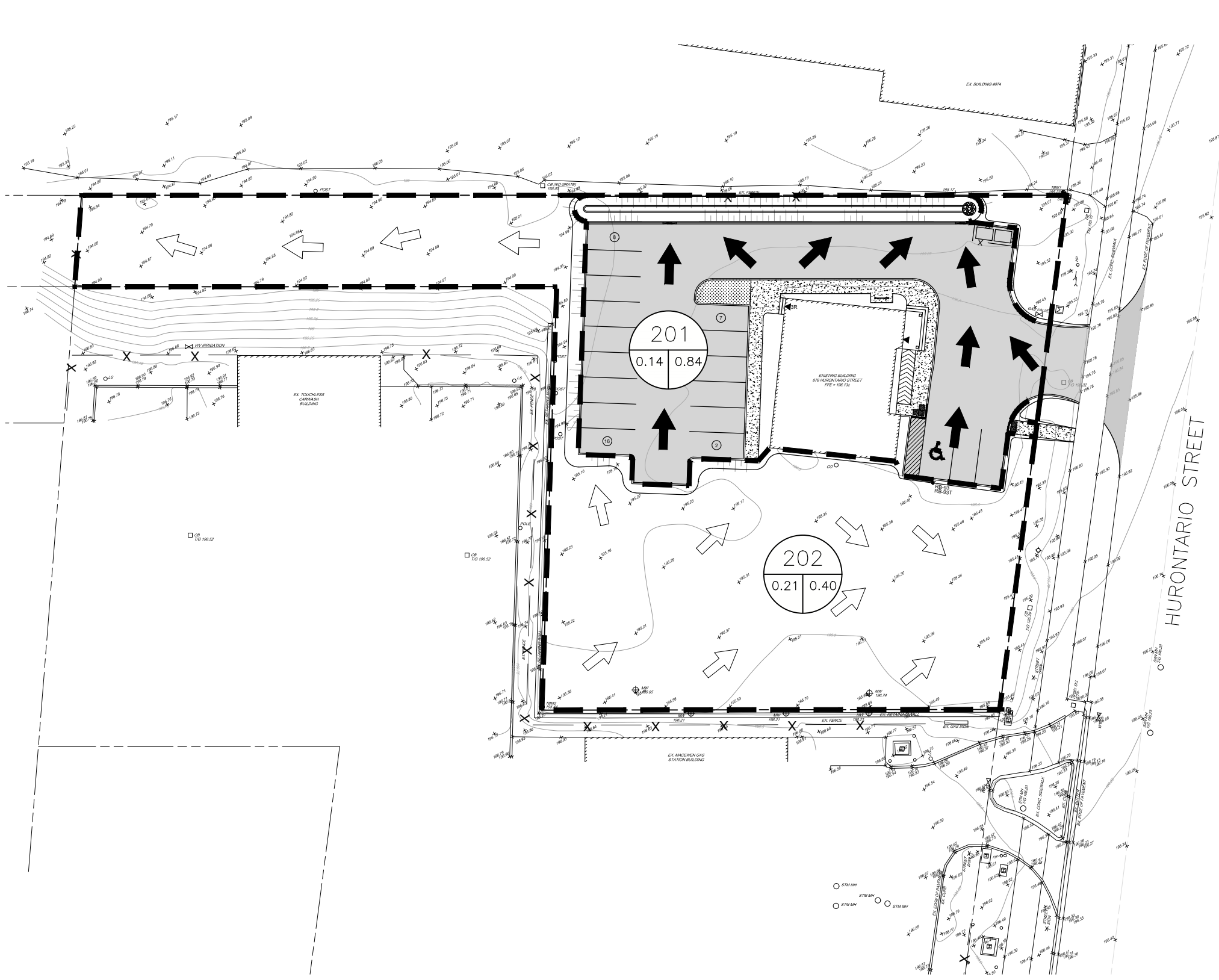
RUNOFF COEFFICIENT

DRAINAGE AREA (HA)

DRAINAGE CATCHMENT BOUNDARY

EXISTING DRAINAGE DIRECTION

PROPOSED DRAINAGE DIRECTION



	PROJECT TITLE			DRAWING	
	876 HURONTARIO STREET POST-DEVELOPMENT DRAINAGE PLAN TOWN OF COLLINGWOOD			DP.2	
DATE	2026 06 08	DRAWN BY	KRL	SCALE	1:500
PROJECT				126065	



Project: 876 Hurontario Street
Date: June. 24, 2026
File No.: 126065
Designed By: KRL
Checked By: AO
Subject: Enhanced Swale Volume Table

PANORAMA SUBDIVISION - SWM POND

Bottom Elev. 194.80
 Perm. Pool Elev. 194.80
 Top of Bank 195.25
 Stage 0.05

Elev.	Depth	Main Cell			Total
		Area	Avg. Area	Live	Accum. Total
(m)	(m)	(m ²)	(m ²)	(m ³)	(m ³)
194.80	0.00	21	0	0	0.0
194.85	0.05	32	27	1	1.3
194.90	0.10	43	37	2	3.2
194.95	0.15	54	48	2	5.6
195.00	0.20	65	59	3	8.6
195.05	0.25	76	70	4	12.1
195.10	0.30	87	82	4	16.2
195.15	0.35	98	93	5	20.8
195.20	0.40	110	104	5	26.0
195.25	0.45	121	116	6	31.8



Project: 876 Hurontario Street
Date: June. 24, 2026
File No.: 126065
Designed By: KRL
Checked By: AO
Subject: Enhanced Swale Discharge Table

ORIFICE CONTROL

Low Flow Orifice

Orifice/Pipe Size (mm) 140
 Cross-sectional Area (sq.m) 0.015394
 Orifice Coefficient 0.63
 Invert Elevation (m) 194.80

WEIR CONTROL

Overflow

Weir Width (m) 0.60
 Sill elevation (m) 195.15
 Weir Coefficient 1.70
 Weir Side Slopes (H:V) 5.0
 Downstream Weir Length (m) 0.15

CONTROL STRUCTURE CONFIGURATION

Water Level	Outlet Structure				Total Flow
	Low Flow Orifice		Overflow Weir		
	Head	Discharge	Head	Discharge	
(m)	(m)	(cms)	(m)	(cms)	(cms)
194.80	0.000	0.000	0.000	0.000	0.000
194.85	0.000	0.001	0.000	0.000	0.001
194.90	0.030	0.007	0.000	0.000	0.007
194.95	0.080	0.012	0.000	0.000	0.012
195.00	0.130	0.015	0.000	0.000	0.015
195.05	0.180	0.018	0.000	0.000	0.018
195.10	0.230	0.021	0.000	0.000	0.021
195.15	0.280	0.023	0.000	0.000	0.023
195.20	0.330	0.025	0.050	0.016	0.041
195.25	0.380	0.026	0.100	0.059	0.085

Additional Notes:

NVCA Weir Flow Calculation Applied For Weir Flow Below Circular Orifice Centroid

$$Q_w = 1.65 \left(\left[\frac{\pi (D^2)}{4} \right] (2 \cos^{-1} \left[\frac{((D/2) - d)}{(D/2)} \right] * (180/\pi) \right) / 360 - ((D/2 - d)(D - d^2)^{0.5}) / d^{1.5}$$

Where:

Q_w is weir flow (m³/s)
 D is orifice diameter (m)
 d is depth of flow above the invert (m)

Project Details

876 Hurontario Street	126065
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Municipality

Town of Collingwood

Prepared By

KRL	June 24, 2026
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Post-Development Analysis
Pre-Development Analysis

Catchment ID	101
Catchment Area (ha)	0.35
1:5-Year Runoff Coefficient	0.45
Time of Concentration (min)	10

Controlled Catchment
Uncontrolled Catchment

201	202
0.14	0.21
0.84	0.40
10	10

Rational Method Calculations

Design Storm		2	5	10	25	50	100	Design Storm		2	5	10	25	50	100
IDF Curve	A	807	1135	1387	1676	1973	2193	201	i (mm/hr)	78	102	118	138	153	168
	B	6.75	7.50	7.97	8.30	9.00	9.04		C	0.84	0.84	0.84	0.92	1.00	1.00
	C	0.83	0.84	0.85	0.86	0.87	0.87		Q (m ³ /s)	0.03	0.03	0.04	0.05	0.06	0.07
101	i (mm/hr)	78	102	118	138	153	168	202	i (mm/hr)	78	102	118	138	153	168
	C	0.45	0.45	0.45	0.50	0.54	0.56		C	0.40	0.40	0.40	0.44	0.48	0.50
	Q (m ³ /s)	0.03	0.05	0.05	0.07	0.08	0.09		Q (m ³ /s)	0.02	0.02	0.03	0.04	0.04	0.05

Peak Flow Summary (m³/s)

Storm	Q _{existing}	Q _{uncontrolled}	Q _{controlled}	Q _{total}	Q _{existing} - Q _{proposed}
2	0.034	0.018	0.015	0.033	0.001
5	0.045	0.024	0.018	0.042	0.003
10	0.052	0.027	0.020	0.047	0.005
25	0.067	0.035	0.024	0.059	0.008
50	0.081	0.043	0.031	0.074	0.008
100	0.093	0.049	0.035	0.084	0.009

Required Storage Volume Summary (m³)

Duration (min)	2	5	10	25	50	100
5	4	6	7	9	10	11
10	7	10	12	16	18	20
15	8	12	14	20	22	23
20	8	12	15	21	23	25
25	8	12	15	21	23	24
30	7	11	14	20	22	23
35	6	10	13	19	20	21
40	5	9	11	18	18	19
45	3	7	10	16	16	16
50	2	6	8	14	13	13
55	0	4	6	12	10	9

Runoff Coefficient Calculations Post Development

Project Details

876 Hurontario Street, Collingwood	126065
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Prepared By

KRL	Jun. 15, 2026
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Checked By

AO	Jun. 15, 2026
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 Data
Sources

Town of Collingwood, Development Standards, August 2022

Watershed:

NVCA

Impervious Area and Runoff Coefficient (C) for Catchment

Catchment ID		201	202		
Catchment Area		0.14	0.21		
Land Cover Category	C	Area (ha)	Area (ha)	Area (ha)	Area (ha)
Paved	0.90	0.11			
Roof	0.90	0.02			
Gravel	0.60				
Woodland	0.35				
Pasture/Lawns	0.40	0.02	0.21		
Meadows	0.38				
Cultivated	0.55				
Waterbody	0.05				
Runoff Coefficient (C)		0.84	0.40		

Runoff Coefficient Calculations Pre-Development

Project Details

876 Hurontario Street, Collingwood	126065
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Prepared By

KRL	Jun. 15, 2026
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Checked By

AO	Jun. 15, 2026
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Data
Sources

Town of Collingwood, Development Standards, August 2022

Watershed:

NVCA

Impervious Area and Runoff Coefficient (C) for Catchment

Catchment ID		101			
Catchment Area		0.35			
Land Cover Category	C	Area (ha)	Area (ha)	Area (ha)	Area (ha)
Paved	0.90	0.01			
Roof	0.90	0.02			
Gravel	0.60	0.02			
Woodland	0.35				
Pasture/Lawns	0.40	0.30			
Meadows	0.38				
Cultivated	0.55				
Waterbody	0.05				
Runoff Coefficient (C)		0.45			